

INSTALLATION, USE AND MAINTENANCE MANUAL

MYDENS FLOOR STANDING
CONDENSING BOILER

60T
70T
100T
115T
140T
180T
210T
280T



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 qualified heating installer. Refer to the User's Information section for your reference.

Maintenance: at least once a year the user must call a Qualified installer for routine maintenance.

If you smell gas

1. - Close the gas cock.
2. - Ventilate the room.
3. - Do not switch on any electric device, telephone included.
4. - From another room, call a professionally qualified technician immediately or the gas supply company. Call the Fire Service if the former are not available.

Carbon Monoxide.

Every year deaths and serious injuries occur due to carbon monoxide poisoning. This 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 pallets 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.

Qualified installer: qualified installer 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 Qualified installer 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 venting to an existing vent system, if it is shared with other appliances.
- Do not restrict or seal any air intake or outlet openings (terminals).

Hazards and Your Safety - Hot Water Can Scald! Water temperature over 125°F (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 licensed authorized technician 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!!! 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.

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 not be installed on carpeting.

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 exclusively by a Qualified installer 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 professionally qualified technician.
- ☞ The end user must have maintenance performed on the appliance only by professionally qualified technicians in accordance with this manual and in full compliance with both local and national standards.
- ☞ 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 - CODE REQUIREMENTS

1.1 - National laws and regulations

- M.D. no.37 dated 22/01/2008 (former Law no.46 dated 05/03/90)
- Law no.10 dated 09/01/91

- Presidential Decree no.412 dated 26/08/93
- Presidential Decree no.551 dated 21/12/99
- Legislative Decree no.192 dated 19/08/05
- Legislative Decree no.311 dated 29.12.06

- UNI 7129 Standard
- UNI 7131 Standard
- UNI 11071 Standard
- IEC 64-8 Standard

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.
- IEE Wiring Regulations.
- BS 5546:2010 - Specification for installation and maintenance of gas-fired water-heating appliances of rated input not exceeding 70 kW net.
- BS 5440-2:2009 - Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases) specification for the installation and maintenance of ventilation provision for gas appliances.
- 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 6891:2005+A2:2008 - Installation of low pressure gas pipework of up to 35 mm (R1 1/4) in domestic premises (2nd family gas) specification.
- 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 5482-2:AMD 12046: June 2001 - Domestic butane and propane gas burning installations. Installations in caravans and non-permanent dwellings.
- BS 5482-3:2005 - Domestic butane and propane gas burning installations. Installations in boats, yachts and other vessels.
- Building regulations issued by the Department of the Environment and Building Standards Regulations.
- Gas safety (Installation and Use) Regulations current issue.

- BS 6700 - Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their cartilages - Specification.

- UK Health and safety at work Act.

- 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.



2.1 - Introduction

Congratulations! You have purchased truly one of the best products on the market. Every single part is proudly designed, built, tested and assembled at the COSMOGAS plants, thereby ensuring the best quality control.

2.2 - Overview of the models

XXXXDENS XXXTXX

v = Appliance with 2-way valves
s = Appliance with stainless steel manifold
sv = Appliance with 2-way valves and stainless steel manifold
c = Appliance with carbon steel manifold
cv = Appliance with 2-way valve and carbon steel manifold









“60T” = Floor standing appliance with 60kW maximum heat output;
“70T” = Floor standing appliance with 69,9kW maximum heat output;
“100T” = Floor standing appliance with 100kW maximum heat output;
“115T” = Floor standing appliance with 115kW maximum heat output;
“140T” = Floor standing appliance with 140kW maximum heat output;
“180T” = Floor standing appliance with 180kW maximum heat output;
“210T” = Floor standing appliance with 210kW maximum heat output;
“280T” = Floor standing appliance with 280kW maximum heat output;

“MYDENS” = Indoor gas condensing boiler with low emission pre-mixed burner.

2 - GENERAL INFORMATION

2.3 - Included accessories

The appliance is supplied with the following accessories:

| Amount No. | Description | | Code | Figure |
|------------|--|------------------------------------|----------|--|
| 1 | 60T, 100T AND 115T METH GAS-LP gas CONVERSION KIT. | | 62630197 |  |
| | 70T, 140T, 180T, 210T AND 280T METH GAS-LP gas CONVERSION KIT. | | 62630198 | |
| 1 | 10K SENSOR D6X45 L=2500 T | | 62110071 |  |
| 1 | EXTERNAL PROBE | | 62110067 |  |
| 4 | ADJUSTABLE FEET | | 60805006 |  |
| 1 | 10KG SACK OF CONDENSATE NEUTRALISER GRANULES | | 62801022 |  |
| 1 | 1P NPT - 1P GAS REDUCTION | Only in 100T, 115T and 140T models | 60101290 |  |
| | 1P1/4 NPT - 1P1/4 GAS REDUCTION | Only in 180T, 210T and 280T models | 60101289 | |
| 2 | 2P NPT - 1P1/2 GAS REDUCTION | Only in 100T, 115T and 140T models | 60110053 |  |
| 2 | EN 1092-1-13 DN65 PN16 NPT FLANGE | Only in 180T, 210T and 280T models | 60338043 |  |

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

2.5 - Meaning of the symbols used



ATTENTION !!!

Danger of electrical shock. Failure to follow these warnings can compromise proper appliance operation or cause serious harm to persons, animals or things.



ATTENTION !!!

General danger. Failure to follow these warnings can compromise proper appliance operation or cause serious harm to persons, animals or things.

 Important instruction symbol

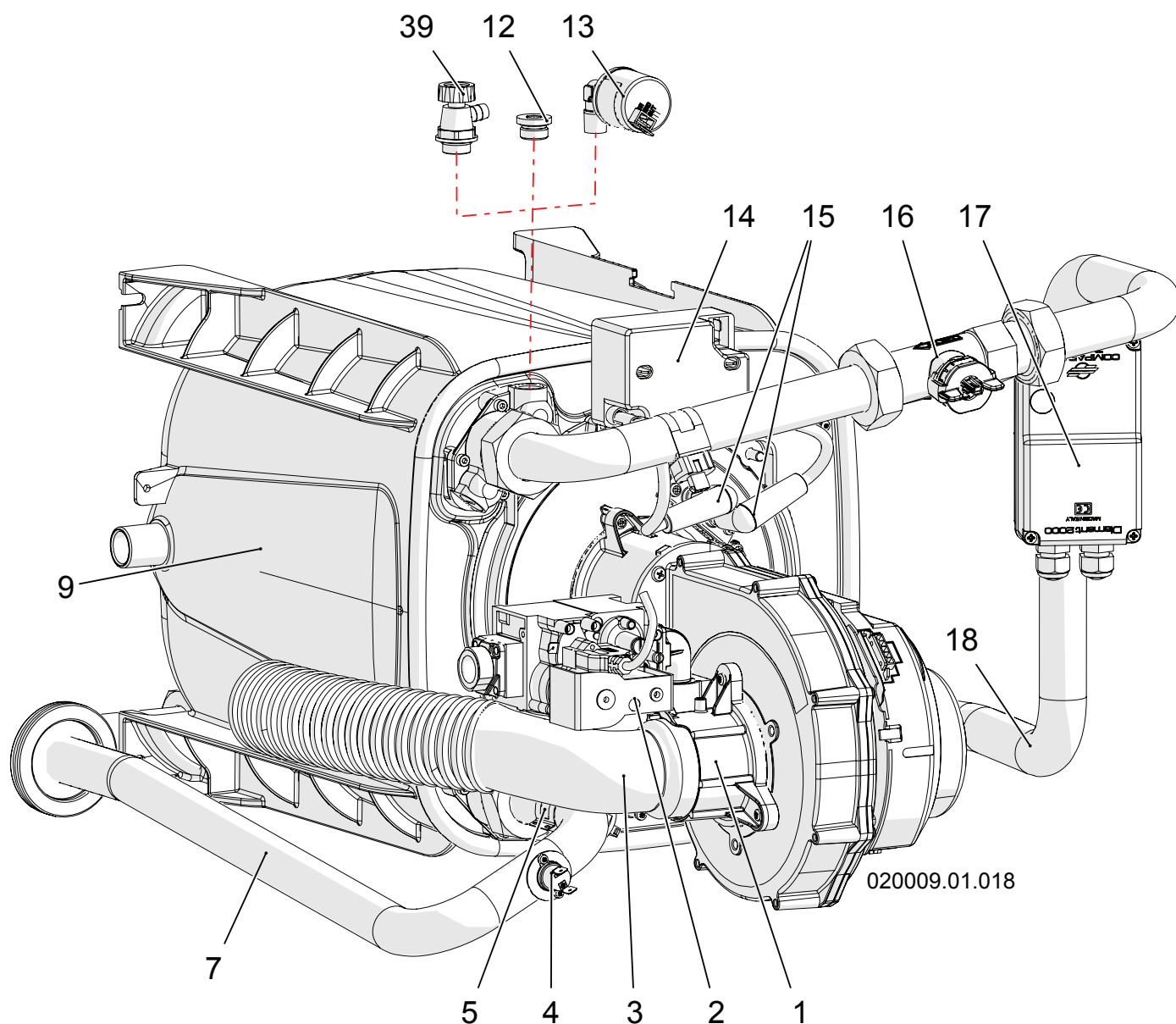
2.6 - Maintenance

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

- to maintain high output and manage the heating system affordably (low fuel consumption);
- to reach high work safety;
- to keep the level of fuel environmental compatibility high;

Offer your customers a periodic maintenance contract.

3 - MAIN COMPONENTS



- 1 - Air/gas mixing unit
- 2 - Gas valve
- 3 - Air inlet manifold
- 4 - Hot water safety thermostat
- 5 - Hot water temperature probe
- 6 - -----
- 7 - Hot water supply pipe
- 8 - -----
- 9 - Heat exchanger
- 10 - -----

- 11 - -----
- 12 - Plug (not present)
- 13 - Water pressure sensor (present on the MASTER burner 1)
- 14 - Spark generator
- 15 - Ignition cables
- 16 - Water flow rate measuring device
- 17 - Motorised 2-way valve (on request)
- 18 - Water inlet pipe
- 39 - Air bleed valve (present on all slave burners)

Figure 3-1 - Components inside 60T, 70T, 100T, 115T, 140T, 180T, 210T and 280T models

3 - MAIN COMPONENTS

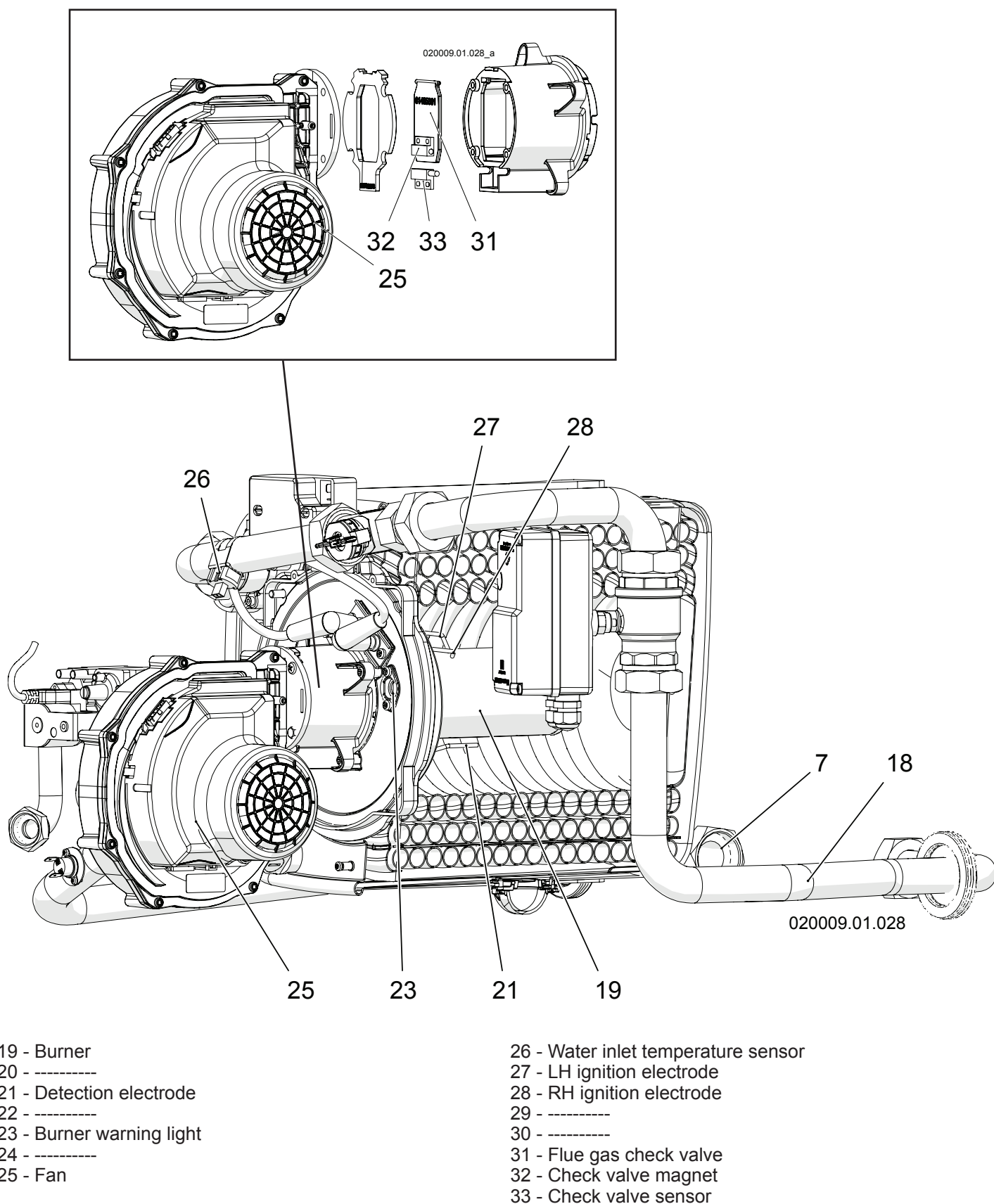
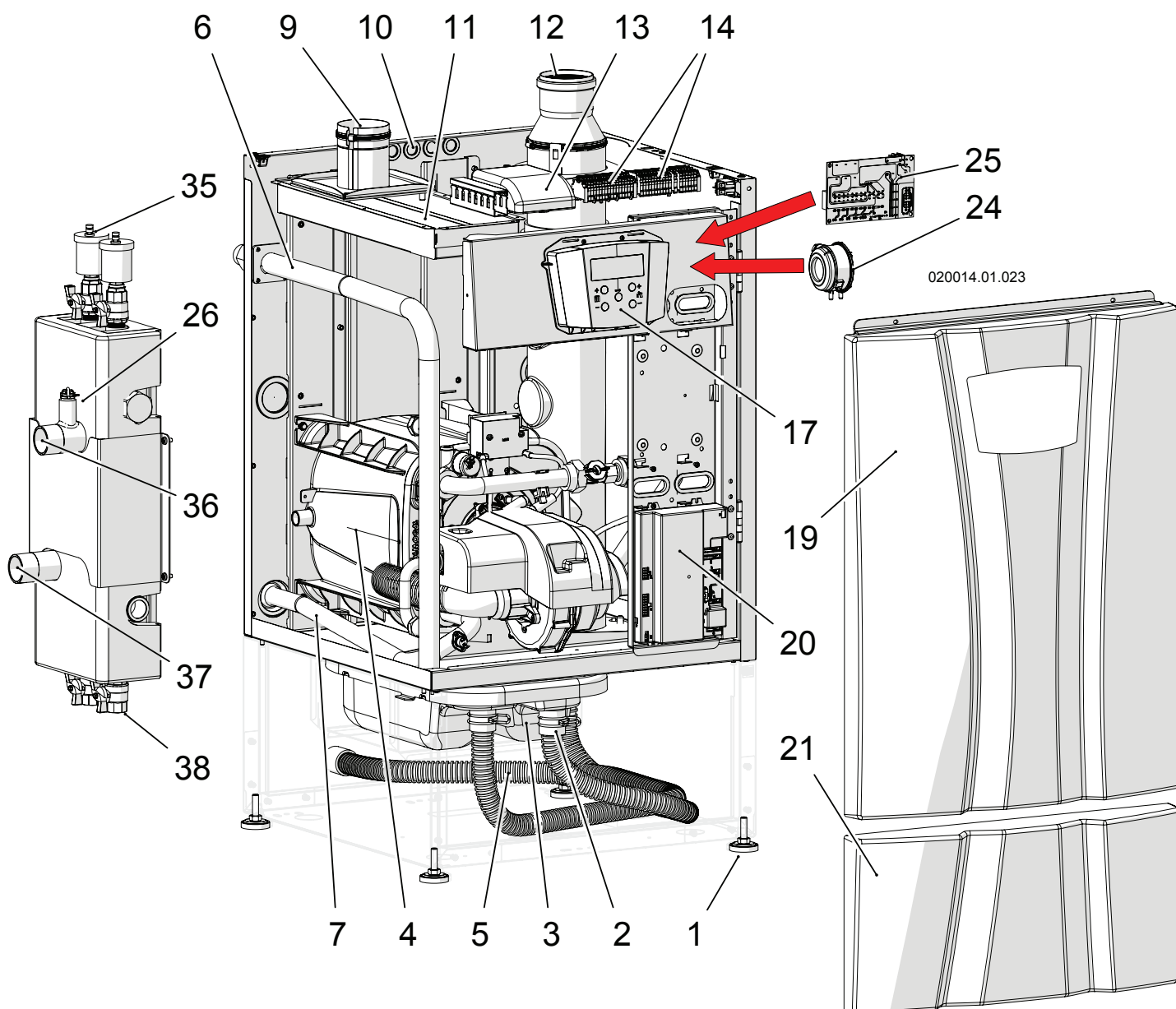


Figure 3-2 - Components inside 60T, 70T, 100T, 115T, 140T, 180T, 210T and 280T models

3 - MAIN COMPONENTS

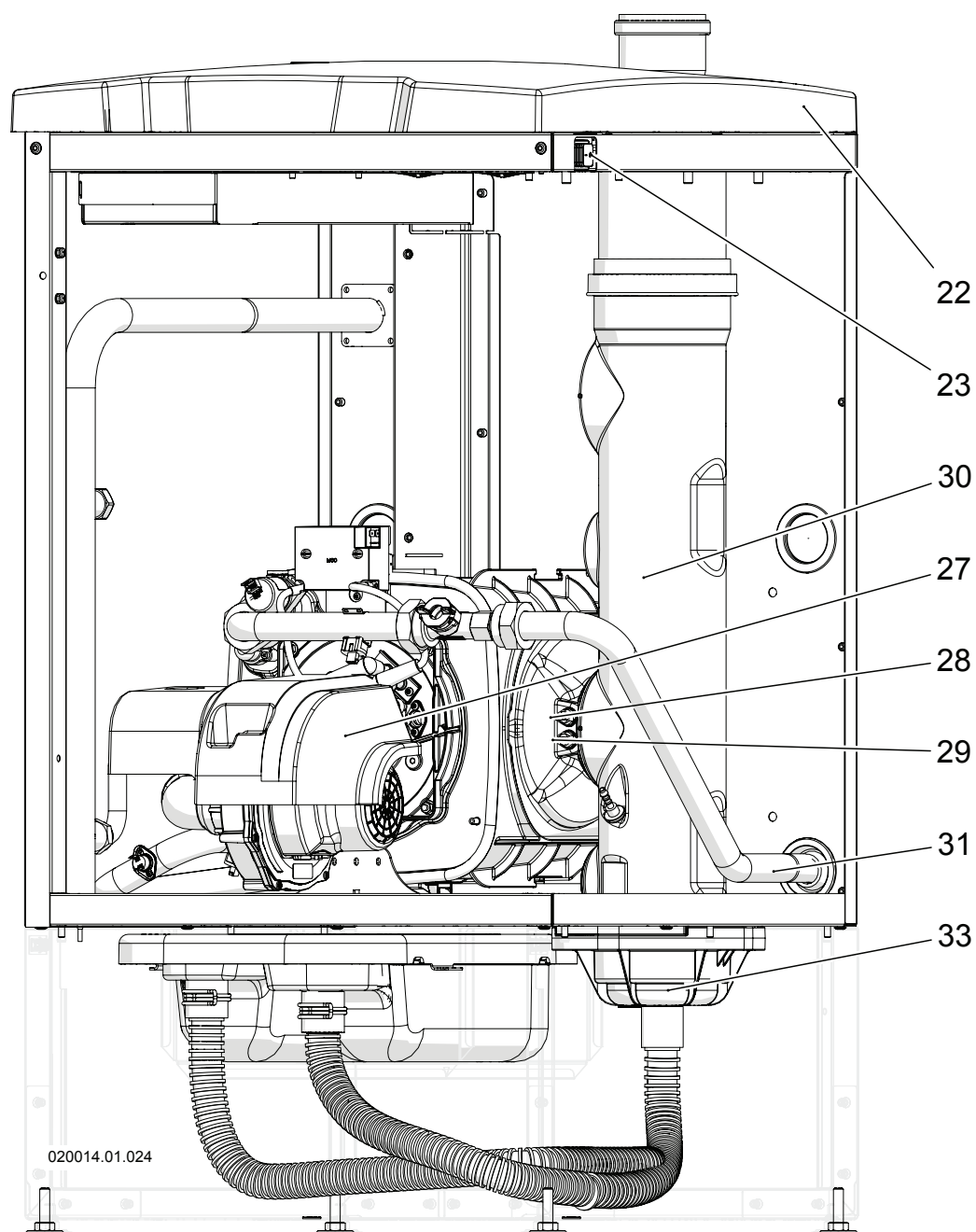


- 1 - Adjustable feet
- 2 - Flue exhaust condensate drain pipe
- 3 - Condensate neutraliser
- 4 - Burner "1" (MASTER)
- 5 - Condensate drain pipe
- 6 - Gas inlet pipe
- 7 - Hot water supply pipe
- 9 - Air intake
- 10 - Electrical wire passage
- 11 - Air intake filter
- 12 - Flue exhaust
- 13 - 885 IF board (on request)

- 14 - Electrical connections
- 15 - -----
- 16 - -----
- 17 - Control panel
- 19 - Upper front casing
- 20 - "Burner 1" command and control board
- 21 - Lower front casing
- 24 - Pressure switch against discharge clogging
- 25 - Wiring diagram
- 35 - Automatic air vent
- 36 - Water supply connection
- 37 - Water return connection
- 38 - Drain valves

Figure 3-3 - Components inside 60T and 70T models

3 - MAIN COMPONENTS

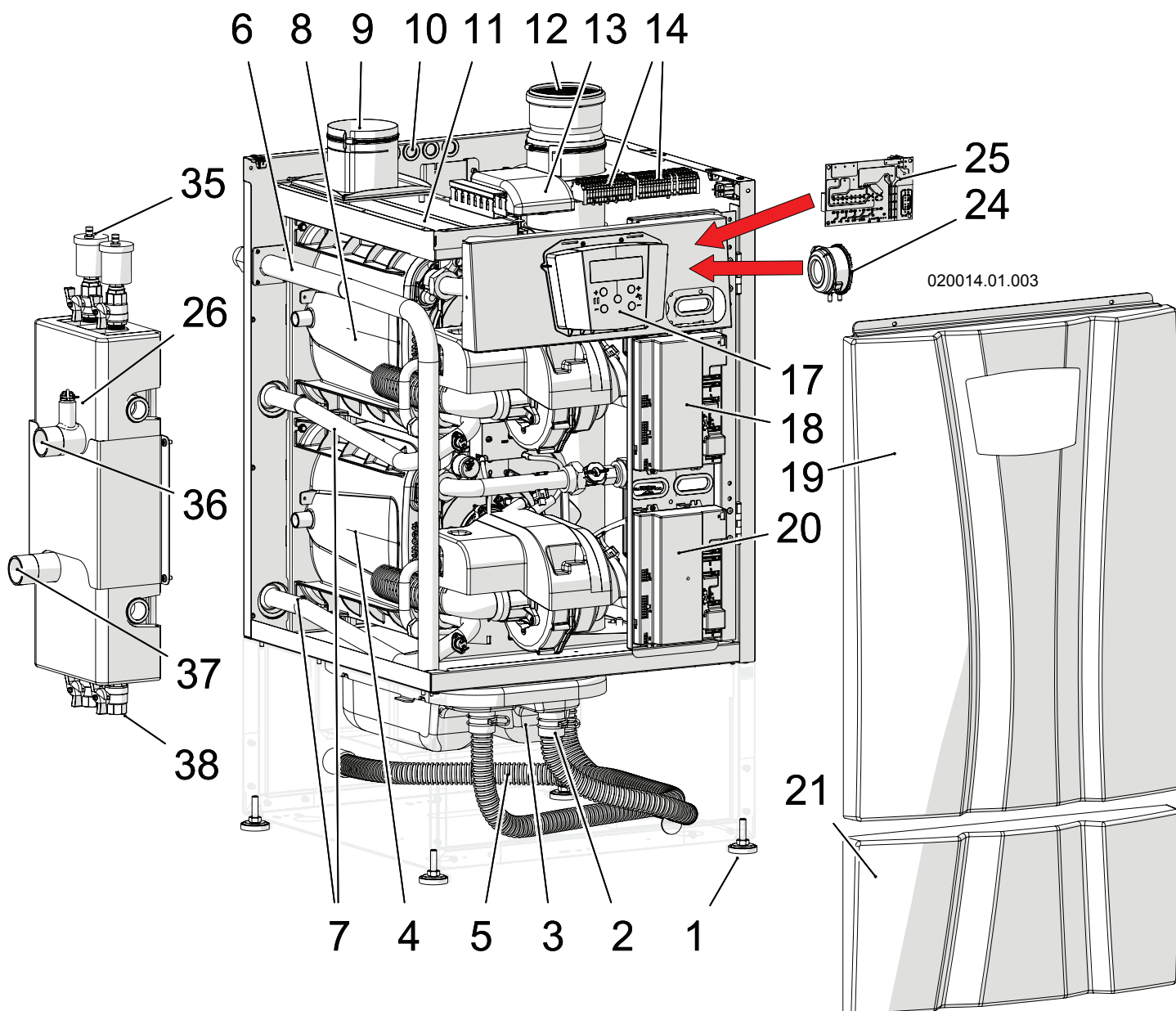


- 22 - Upper covering
- 23 - Main ON/OFF switch
- 27 - Fan covering
- 28 - Flue exhaust temperature safety fuse
- 29 - Flue exhaust temperature probe

- 30 - Flue exhaust manifold
- 31 - Water inlet pipe
- 32 - -----
- 33 - Condensate level sensor
- 34 - -----

Figure 3-4 - Components inside 60T and 70T models

3 - MAIN COMPONENTS



- 1 - Adjustable feet
- 2 - Flue exhaust condensate drain pipe
- 3 - Condensate neutraliser
- 4 - Burner "1" (MASTER)
- 5 - Condensate drain pipe
- 6 - Gas inlet pipe
- 7 - Hot water supply pipe
- 8 - Burner "2" (SLAVE)
- 9 - Air intake
- 10 - Electrical wire passage
- 11 - Air intake filter
- 12 - Flue exhaust
- 13 - 885 IF board (on request)
- 14 - Electrical connections

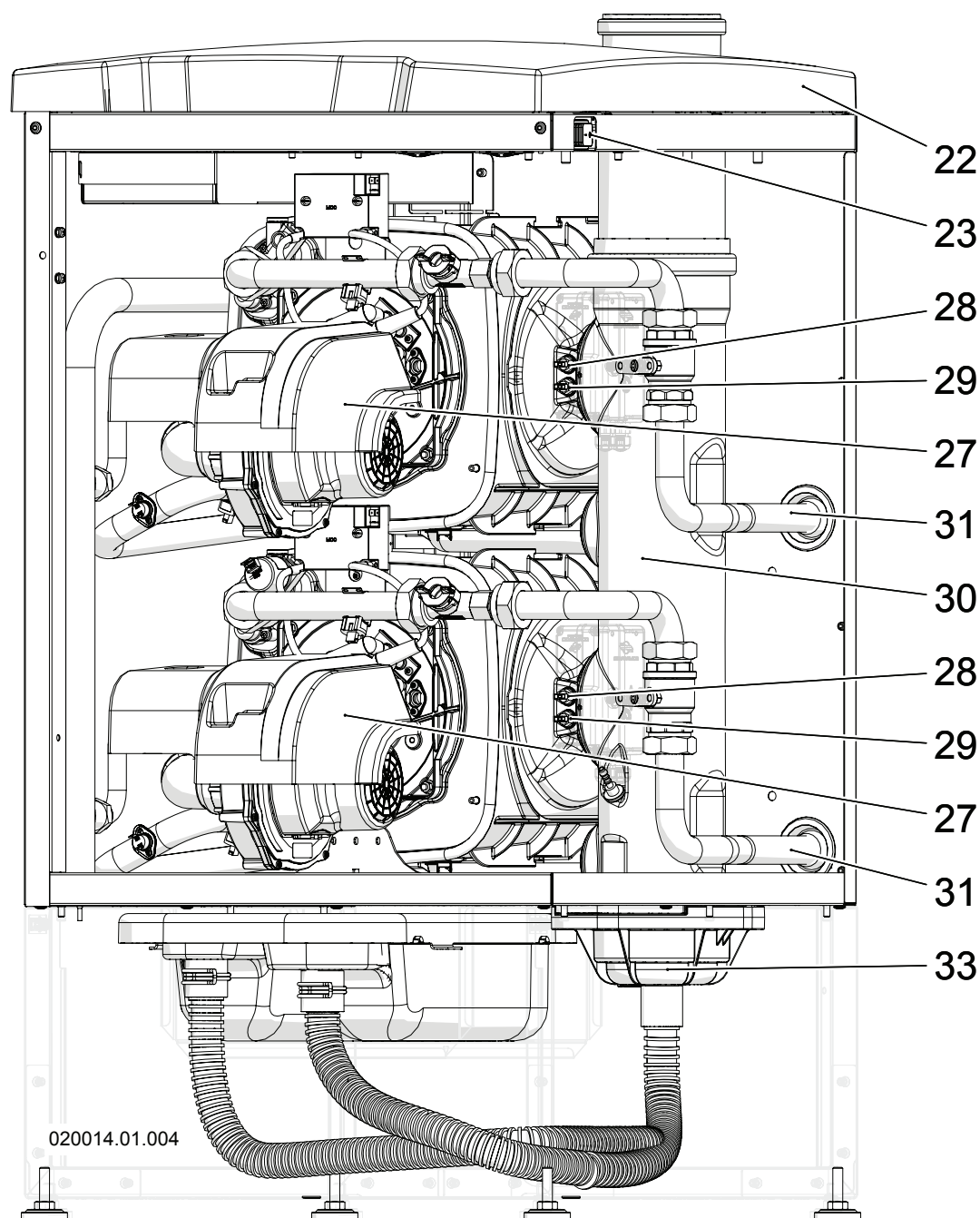
- 15 - -----
- 16 - -----
- 17 - Control panel
- 18 - "Burner 2" command and control board
- 19 - Upper front casing
- 20 - "Burner 1" command and control board
- 21 - Lower front casing
- 24 - Pressure switch against discharge clogging
- 25 - Wiring diagram
- 26 - Water outlet manifold temperature sensor
- 35 - Air bleed valve
- 36 - Water outlet
- 37 - Water inlet
- 38 - Drain cock

Figure 3-5 - Components inside 100T, 115T and 140T models

3 - MAIN COMPONENTS

BURNER 2

BURNER 1
(Master)

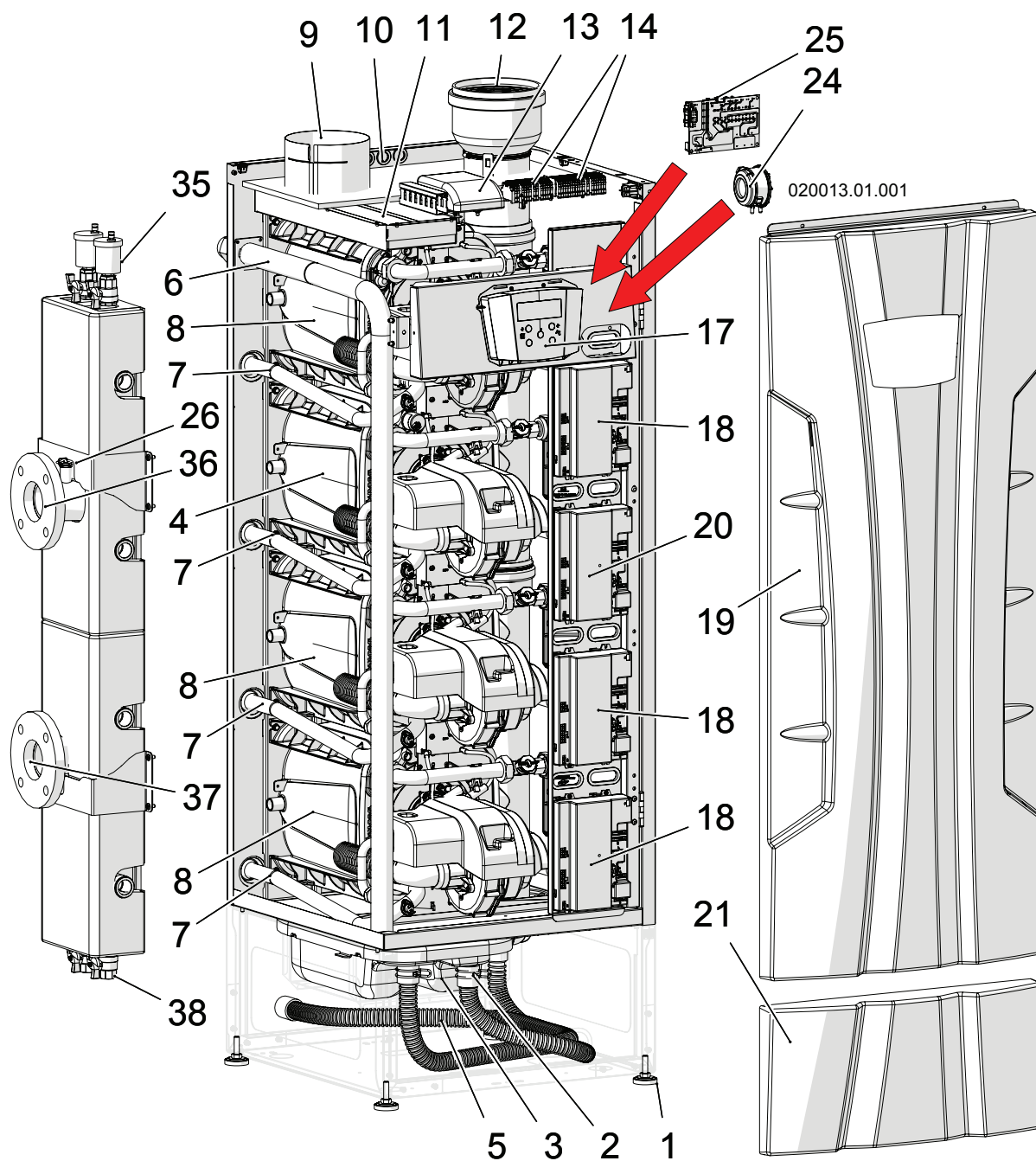


- 22 - Upper covering
- 23 - Main ON/OFF switch
- 26 - Water general outlet temperature sensor
- 27 - Fan covering
- 28 - Flue exhaust temperature safety fuse
- 29 - Flue exhaust temperature probe

- 30 - Flue exhaust manifold
- 31 - Water inlet pipe
- 32 - -----
- 33 - Condensate level sensor
- 34 - -----

Figure 3-6 - Components inside 100T, 115T and 140T models

3 - MAIN COMPONENTS



- 1 - Adjustable feet
- 2 - Flue exhaust condensate drain pipe
- 3 - Condensate neutraliser
- 4 - Burner "1" (MASTER)
- 5 - Condensate drain pipe
- 6 - Gas inlet pipe
- 7 - Hot water supply pipe
- 8 - Burner "2"- "3"- "4" (SLAVE)
- 9 - Air intake
- 10 - Electrical wire passage
- 11 - Air intake filter
- 12 - Flue exhaust
- 13 - 885 IF board (on request)
- 14 - Electrical connections

- 15 - -----
- 16 - -----
- 17 - Control panel
- 18 - Burner "2"- "3"- "4" command and control board
- 19 - Upper front casing
- 20 - Burner "1" command and control board
- 21 - Lower front casing
- 24 - Pressure switch against discharge clogging
- 25 - Wiring diagram
- 26 - Water outlet manifold temperature sensor
- 35 - Air bleed valve
- 36 - Water outlet
- 37 - Water inlet
- 38 - Drain cock

Figure 3-7 - Components inside 180T, 210T and 280T models

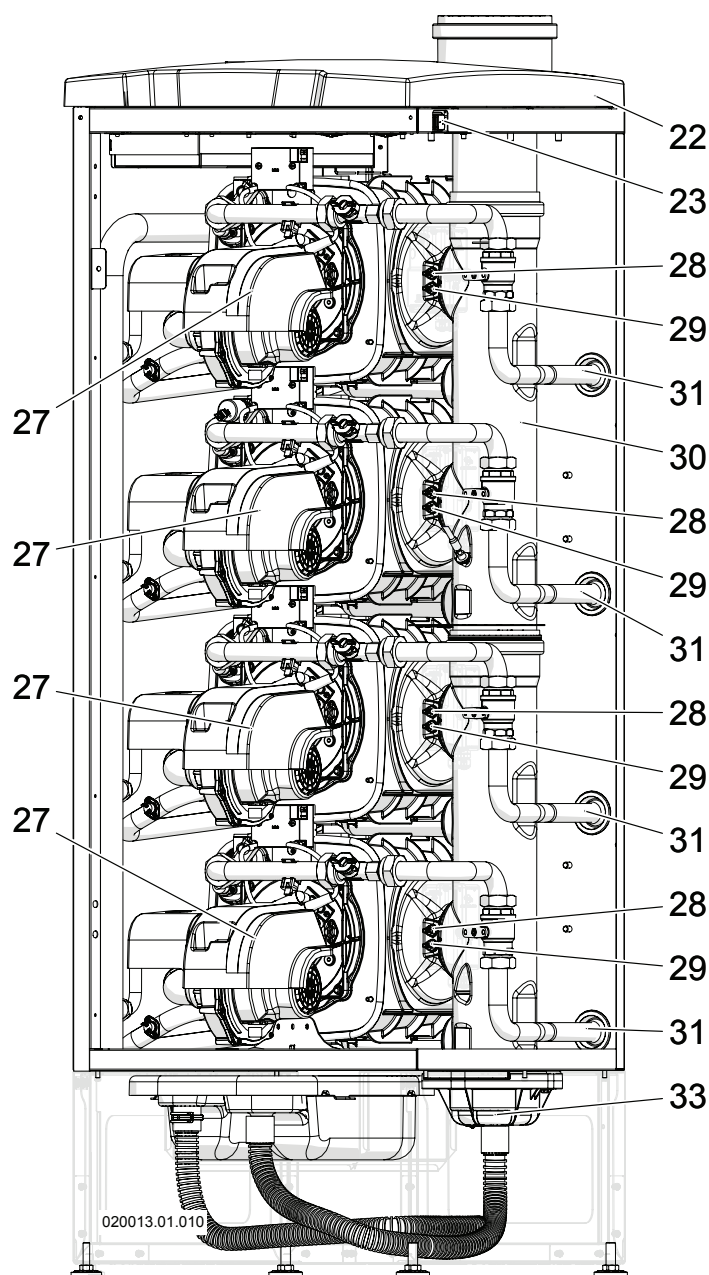
3 - MAIN COMPONENTS

BURNER 2
(Not present on 180T
and 210T models)

BURNER 1
(Master)

BURNER 3

BURNER 4



22 - Upper covering
23 - Main ON/OFF switch
27 - Fan covering
28 - Flue exhaust temperature safety fuse
29 - Flue exhaust temperature probe

30 - Flue exhaust manifold
31 - Water inlet pipe
32 - -----
33 - Condensate level sensor
34 - -----

Figure 3-8 - Components inside 180T, 210T and 280T models

4 - OPERATION

Figure 4-1 key:

- 1 - Air intake
- 2 - Flue exhaust
- 3 - Air bleed valve
- 4 - Sealed chamber
- 6 - Water outlet temperature safety thermostat
- 7 - Water outlet temperature sensor
- 8 - Water pressure measuring device
- 9 - Flue exhaust temperature probe
- 10 - Flue exhaust temperature safety fuse
- 12 - Pre-mixed burner
- 13 - Ignition electrodes
- 14 - Spark generator
- 15 - Water inlet temperature sensor
- 16 - Fan
- 17 - Flue gas non-return valve
- 20 - Gas valve
- 22 - Detection electrode
- 24 - CRV Heat exchanger
- 25 - Water outlet
- 26 - Water inlet
- 27 - Gas inlet
- 28 - Pressure switch against discharge clogging
- 29 - Condensate level sensor
- 30 - Condensate drain
- 31 - Condensate drain siphon
- 36 - Condensate neutraliser
- 47 - Water flow rate measuring device

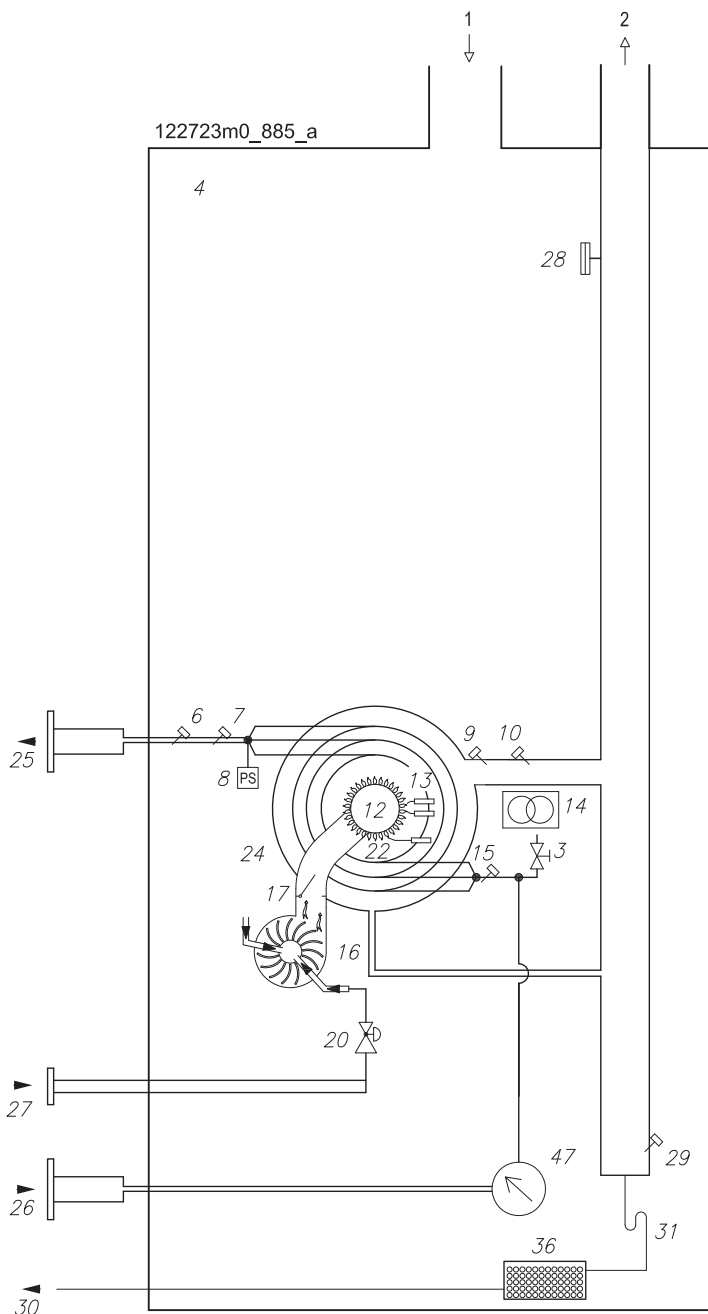


Figure 4-1 - 60T and 70T model functional hydraulic diagram

4 - OPERATION

Figure 4-2 key:

- 1 - Air intake
- 2 - Flue exhaust
- 3 - Air bleed valve
- 4 - Sealed chamber
- 6 - Water outlet temperature safety thermostat
- 7 - Water outlet temperature sensor
- 8 - Water pressure measuring device
- 9 - Flue exhaust temperature probe
- 10 - Flue exhaust temperature safety fuse
- 12 - Pre-mixed burner
- 13 - Ignition electrodes
- 14 - Spark generator
- 15 - Water inlet temperature sensor
- 16 - Fan
- 17 - Flue gas non-return valve
- 20 - Gas valve
- 22 - Detection electrode
- 24 - CRV Heat exchanger
- 25 - Water outlet
- 26 - Water inlet
- 27 - Gas inlet
- 28 - Pressure switch against discharge clogging
- 29 - Condensate level sensor
- 30 - Condensate drain
- 31 - Condensate drain siphon
- 33 - Manifold outlet temperature sensor
- 36 - Condensate neutraliser
- 47 - Water flow rate measuring device
- 48 - Motorised 2-way valve (on request)

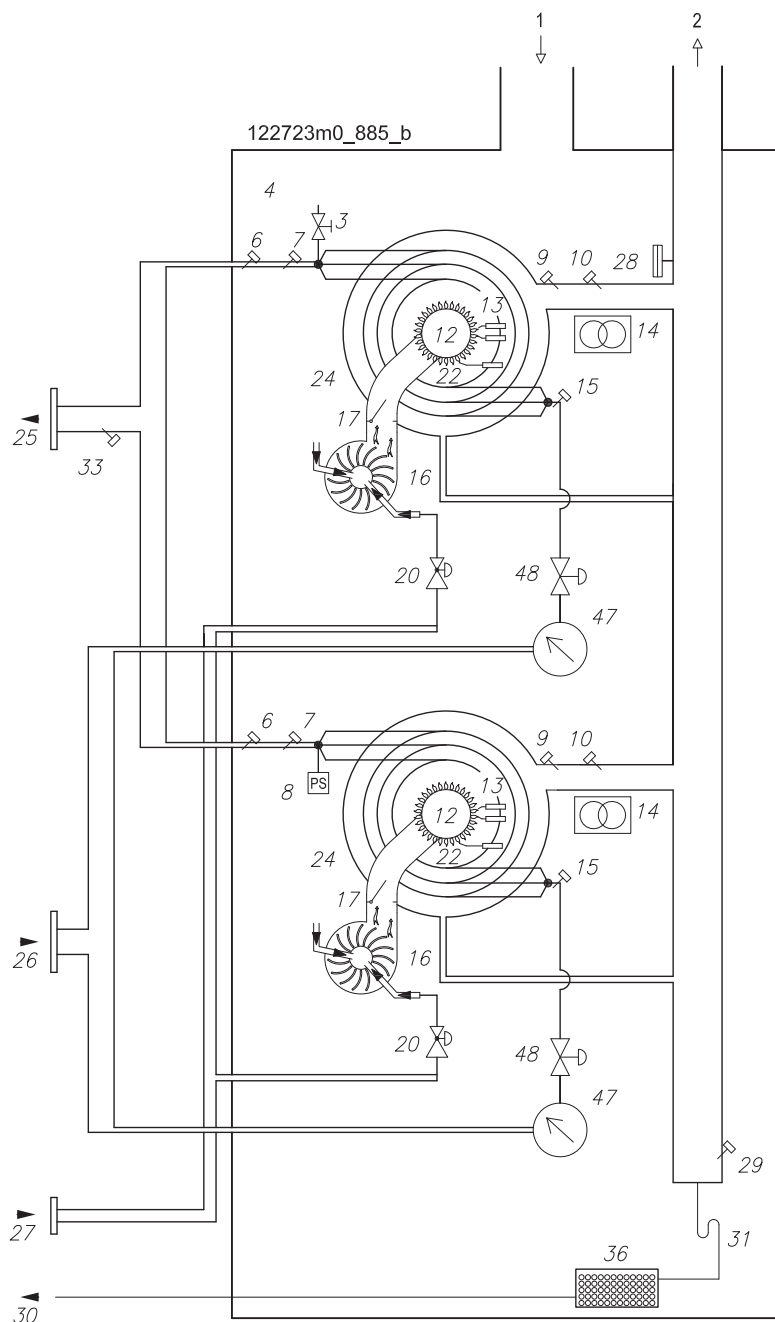


Figure 4-2 - 100T, 115T and 140T model functional hydraulic diagram

4 - OPERATION

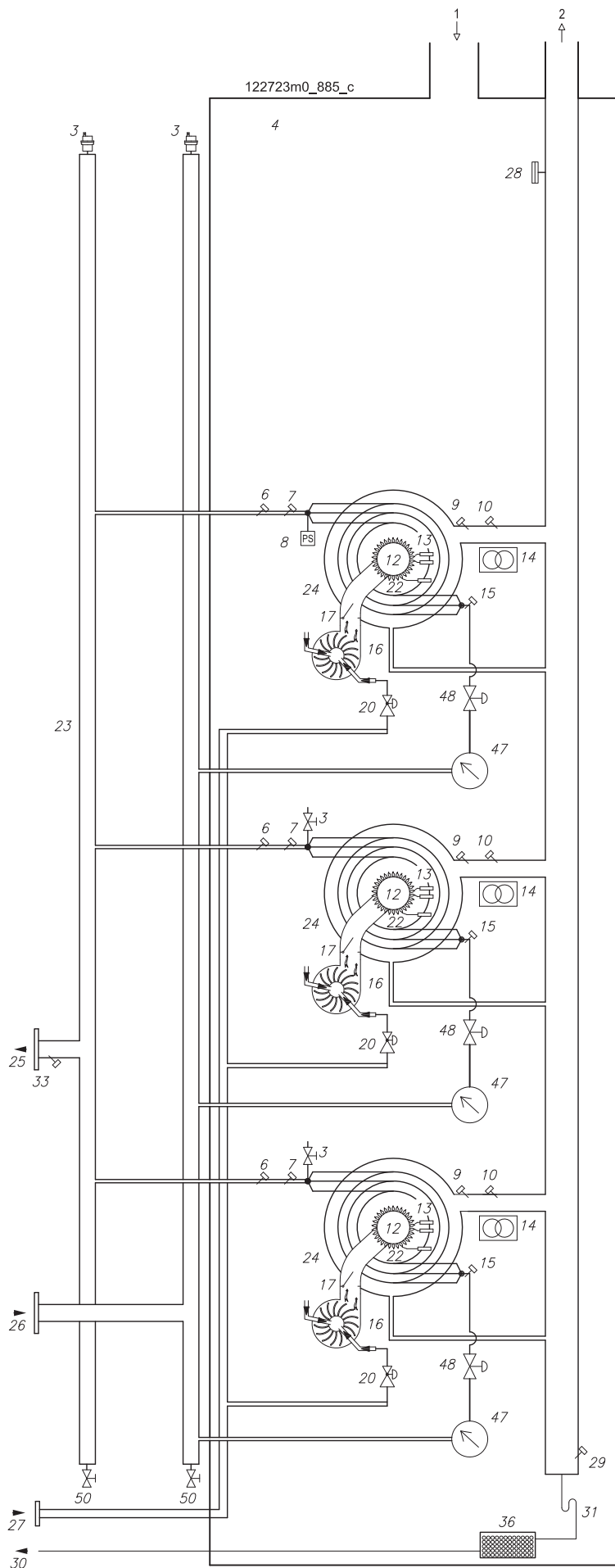


Figure 4-3 key:

- 1 - Air intake
- 2 - Flue exhaust
- 3 - Air bleed valve
- 4 - Sealed chamber
- 6 - Water outlet temperature safety thermostat
- 7 - Water outlet temperature sensor
- 8 - Water pressure measuring device
- 9 - Flue exhaust temperature probe
- 10 - Flue exhaust temperature safety fuse
- 12 - Pre-mixed burner
- 13 - Ignition electrodes
- 14 - Spark generator
- 15 - Water inlet temperature sensor
- 16 - Fan
- 17 - Flue gas non-return valve
- 20 - Gas valve
- 22 - Detection electrode
- 23 - Inlet and outlet manifold
- 24 - CRV Heat exchanger
- 25 - Water outlet
- 26 - Water inlet
- 27 - Gas inlet
- 28 - Pressure switch against discharge clogging
- 29 - Condensate level sensor
- 30 - Condensate drain
- 31 - Condensate drain siphon
- 33 - Manifold outlet temperature sensor
- 36 - Condensate neutraliser
- 47 - Water flow rate measuring device
- 48 - Motorised 2-way valve (on request)
- 50 - Drain cocks

Figure 4-3 - 180T, 210T model functional hydraulic diagram

4 - OPERATION

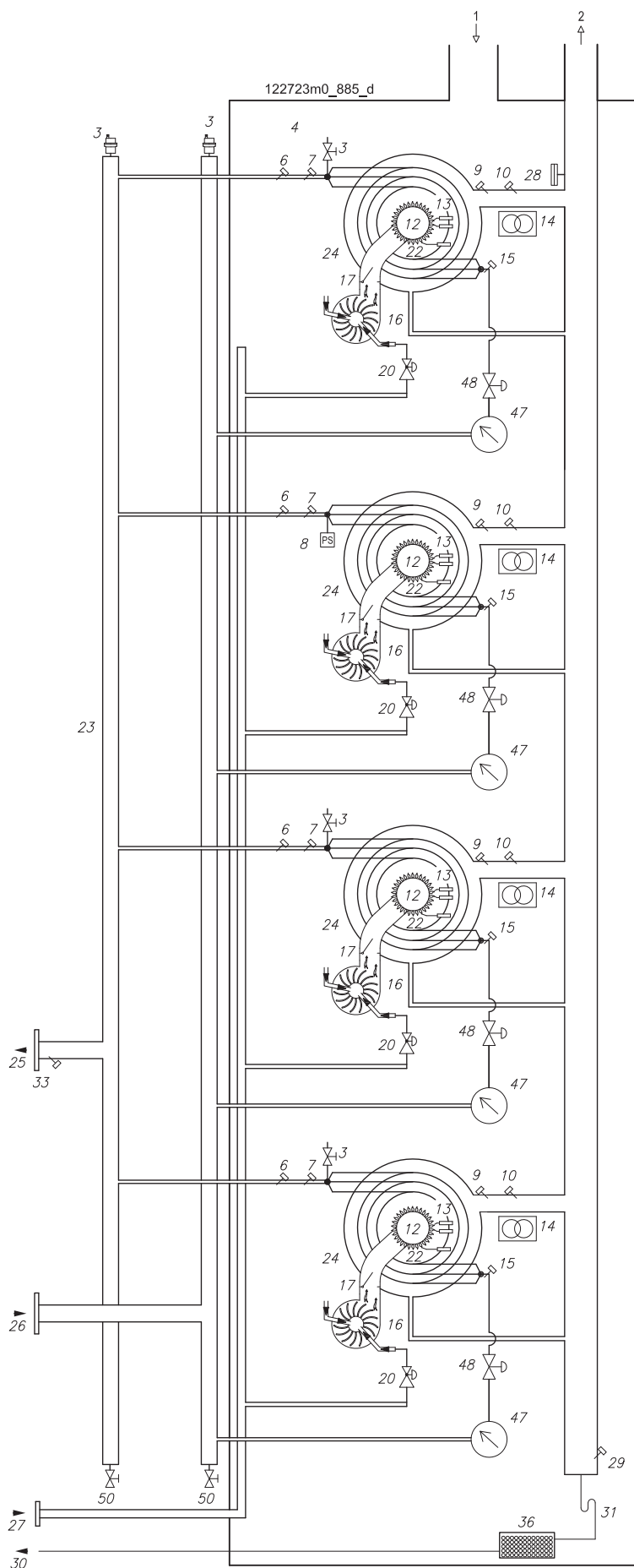


Figure 4-4 key:

- 1 - Air intake
- 2 - Flue exhaust
- 3 - Air bleed valve
- 4 - Sealed chamber
- 6 - Water outlet temperature safety thermostat
- 7 - Water outlet temperature sensor
- 8 - Water pressure measuring device
- 9 - Flue exhaust temperature probe
- 10 - Flue exhaust temperature safety fuse
- 12 - Pre-mixed burner
- 13 - Ignition electrodes
- 14 - Spark generator
- 15 - Water inlet temperature sensor
- 16 - Fan
- 17 - Flue gas non-return valve
- 20 - Gas valve
- 22 - Detection electrode
- 23 - Inlet and outlet manifold
- 24 - CRV Heat exchanger
- 25 - Water outlet
- 26 - Water inlet
- 27 - Gas inlet
- 28 - Pressure switch against discharge clogging
- 29 - Condensate level sensor
- 30 - Condensate drain
- 31 - Condensate drain siphon
- 33 - Manifold outlet temperature sensor
- 36 - Condensate neutraliser
- 47 - Water flow rate measuring device
- 48 - Motorised 2-way valve (on request)
- 50 - Drain cocks

Figure 4-4 - 280T model functional hydraulic diagram

4 - OPERATION

4.1 - Operation and intended use

4.1.1 - Boiler operation and intended use

This is a gas condensing appliance intended to generate centralised heating. It can also be used for domestic hot water production for civil use, but it must be appropriately connected to a storage tank (see fig. 10-2). Any other use is prohibited.

Maximum domestic hot water service output heat is always guaranteed as the appliance give priority to said service.

Follow the procedure described in section 16.6 to adjust the domestic hot water temperature.

The heating system can be created with heat elements that work at a temperature range from 30°C to 80°C.

The boiler can be connected to a room thermostat, an external probe or a 0-10Vdc analogue input.

This boiler must be connected to a heating and domestic hot water production system with required output heat that is compatible with the features of the appliance itself.

4.1.2 - Wide range of modulation and maximum performance

The appliance management program, depending on the head required by the system, provides for the gradual ignition of each single heating element at minimum output (see figure 4-5). After which, if the head required by the system increases, all the heating elements progressively increase output. This achieves modulated output heat that goes from a minimum of 14kW to a maximum corresponding to the architecture of the appliance (figure 4-5 shows a 280T module with 4 heating elements), with maximum efficiency consequently maintained for the entire modulation range. When the boiler is connected to an external probe, it always works at maximum output (see section 16.9).

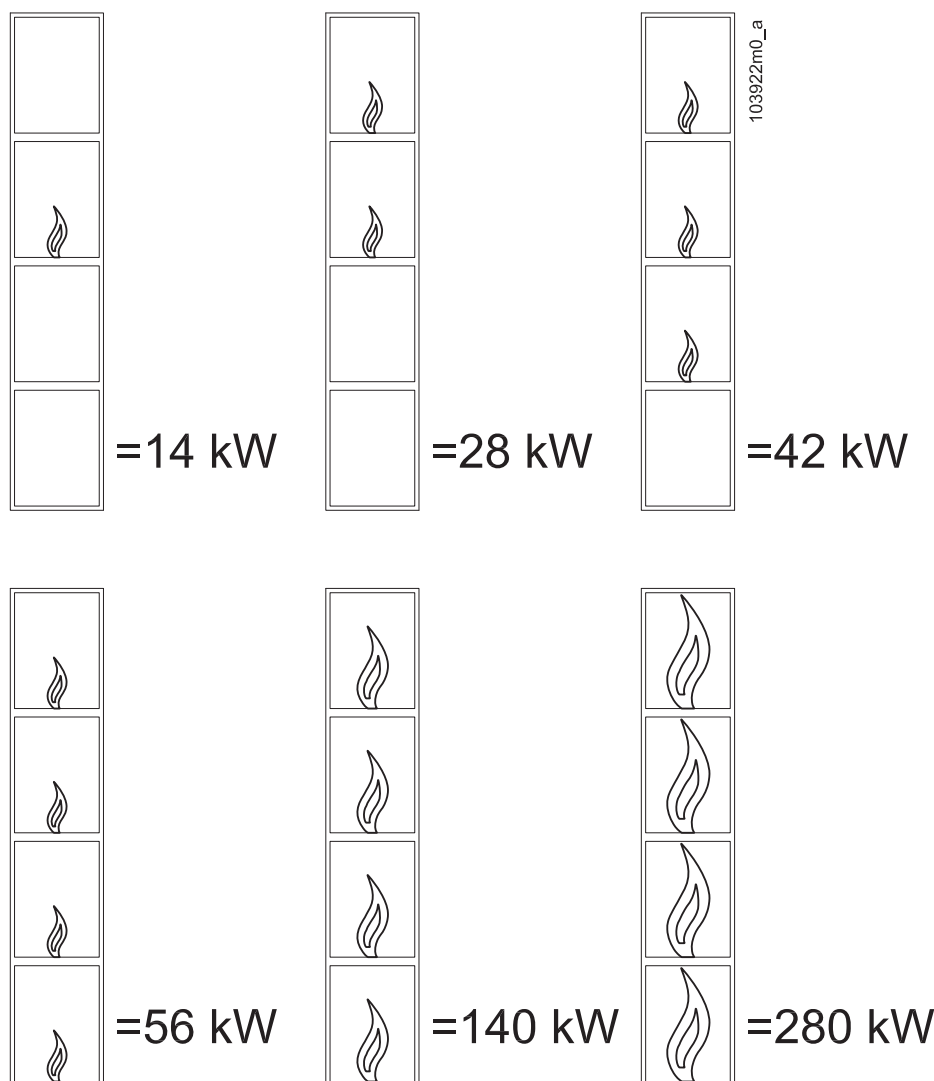


Figure 4-5 - 280T model appliance modulation

4 - OPERATION

This system allows the supply temperature to be managed automatically based on the external temperature. An operating example is shown as a graphic in figure 4-6. The graphic shows an example in which the supply and return temperatures are 55°C and 43°C respectively and the external temperature is 0°C. The external probe controls boiler modulation, progressively reducing the supply temperature and optimising output. Output changes from 97% when the external temperature is -15°C to 105,8% with 0°C external temperature and up to 109% with 20°C external temperature.

4.1.3 - Main circuit pump

The appliance is specifically built without an inner pump to give installers the option of connecting it to any pump, even a modulating one. The main circuit pump is part “36” in figures 10-1 and 10-2. To choose this pump, the designer must check what is described in section 10.11 as well as the system features.

4.1.4 - Heating circuit pump

The heating circuit pump, part “19” in figures 10-1 and 10-2, is not supplied to give the installer the option of connecting it to any pump, even a modulating one. To choose this pump, the designer must check the system features.

4.1.5 - Domestic hot water circuit pump

The domestic hot water circuit pump, part “28” in figure 10-2 and part “36” in figure 11-1, is not supplied to give the installer the option of connecting it to any pump, even a modulating one. To choose this pump, the designer must check the system features.

4.1.6 - Hydraulic separator

If the system needs to be served by a higher water flow rate than what the pump is able to dispense, a hydraulic separator must be put between the boiler and the system (see figures 10-1 and 10-2, part “20”).

4.1.7 - Boiler domestic hot water production

A storage tank must be connected for domestic hot water production following the diagram referred to in figure 10-2. The domestic hot water temperature is adjusted following the specific procedure in section 16.6.

4.1.8 - System types

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

- Only centralised heating system (see figure 10-1)
- Only domestic hot water production system (see figure 11-1)
- Centralised heating and domestic hot water production system (see figure 10-2).

4.2 - Precautions when installing

For proper appliance operation, respect the following instructions:

- ☞ It must be connected to a heating system and, if necessary, to a domestic hot water distribution mains, compatibly with the features, performance and output of the appliance itself.
- ☞ Check figures 7-1 and 7-2 regarding the minimum distances to respect for installation and future maintenance.

4.3 - Anti-legionella

Boiler (when connected to a storage tank) have no anti-legionella protection:

It is the installer's responsibility to keep the storage tank temperature no lower than 60°C to disinfect it or adopt equivalent systems.

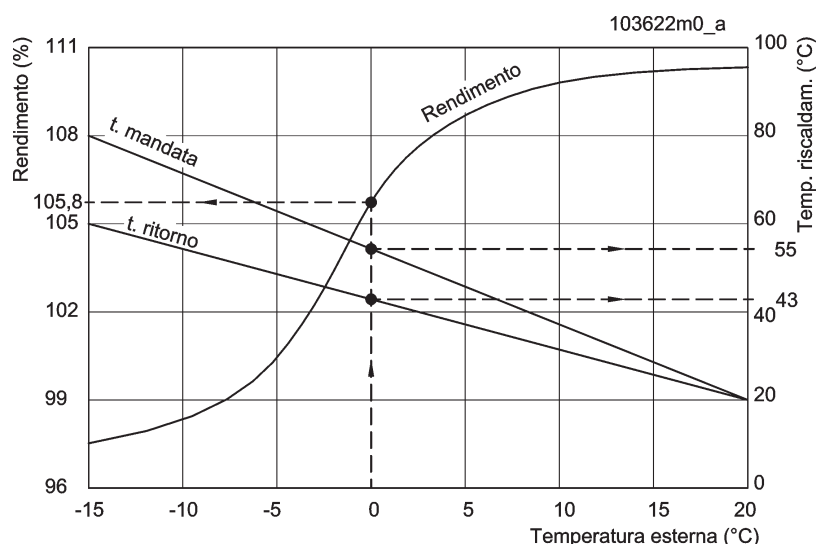





Figure 4-6 - Example of output diagram / supply and return temperature / external temperature, for a home in a very cold area and radiator system.


5 - INSTALLATION - Installation site


5.1 - Choosing the installation site


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


 **ATTENTION !!!** Do not install the appliance on carpeting.


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


 **ATTENTION !!!** Insufficient appliance ventilation can cause high air temperatures.

 **ATTENTION !!!** Make sure the intake and exhaust openings are appropriately sized and that there are no obstructions or clogs. If the problem is not resolved, do not start the appliance. Please keep these restrictions in mind, as well as the dangers they can present to the operator.

 **ATTENTION !!!** LP gas Liquefied Petroleum gas - Installation requires special attention: LP gas appliances must not be installed in pits, cellars or similar locations where the gas, which is heavier than air, could stagnate. Appliances with this kind of fuel must not be installed in spaces under the level of the floor or cellars. Failure to respect this precaution could cause explosions and serious harm to people, death or enormous material damage.

 **ATTENTION !!!** Installing the appliance in rooms with thin floors could create resonance noise. Install elements that reduce the noise.

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

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

☞ Before installing, wash the heating system and, if necessary, the domestic hot water system thoroughly in order to remove any residues or impurities that could compromise proper appliance operation.

☞ This appliance is not made to be installed in the open. 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.

☞ This device must be installed in this sort of location so that any water leaks coming from it, from the connections between the pipes or from potential safety valve drainage cannot damage materials or things underneath it.

Establish the appropriate room and position for installation, keeping the following factors in mind:

- flue exhaust/air intake duct connection;
- gas adduction duct connection;
- water supply connection;
- centralised heating system connection;
- domestic hot water system connection (if present);
- electrical connection;
- connection of the condensate drain generated by the boiler;
- room thermostat electrical connection;
- safety valve discharge connection;
- any external temperature sensor connection;
- room ventilation.

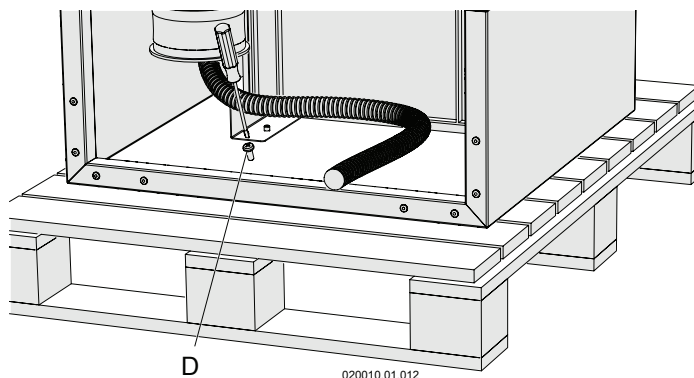
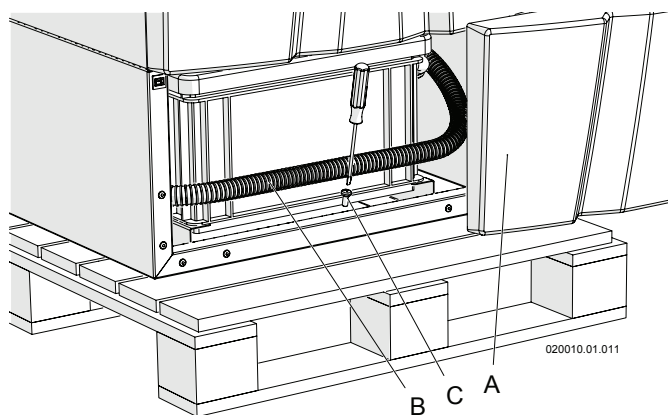


Figure 5-1 - Disassembling transport pallet screws

5 - INSTALLATION - Installation site

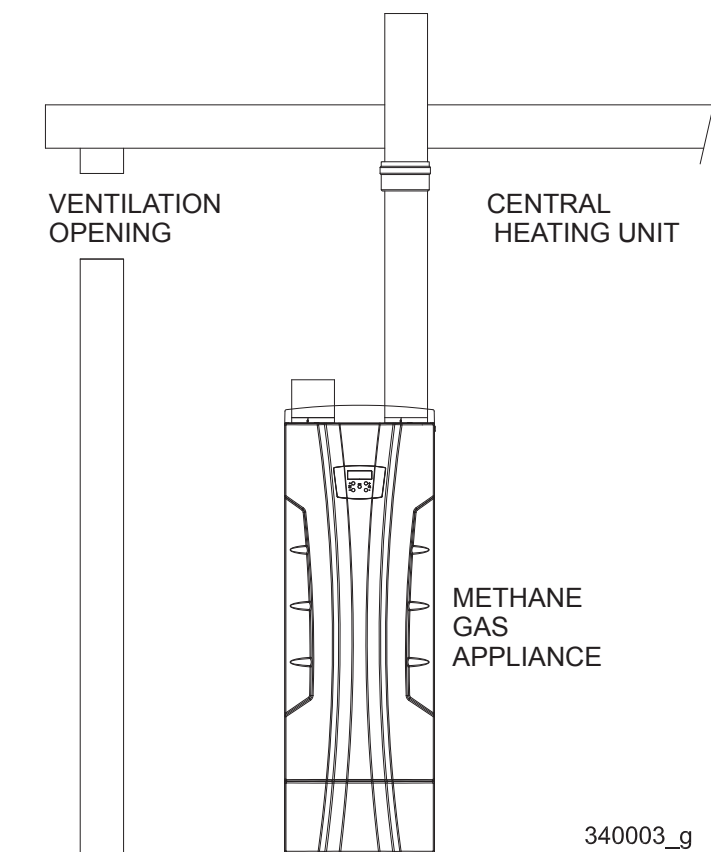


Figure 5-2 Example of ventilation with methane gas appliance

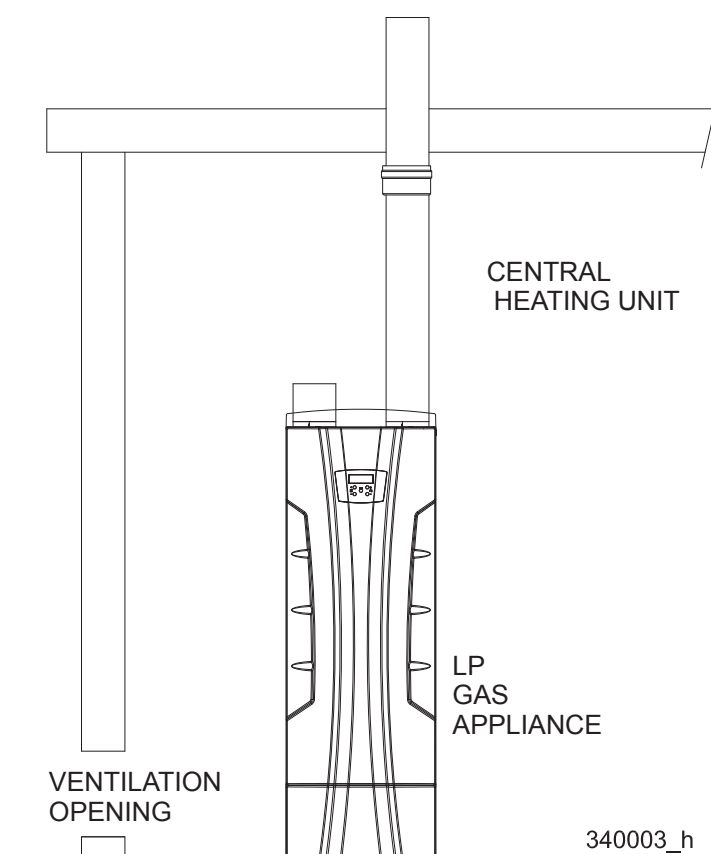


Figure 5-3 Example of ventilation with LP gas appliance

5.1.1 Requirements for proper ventilation

The utility room **MUST** have a properly sized ventilation opening. To ensure proper ventilation for combustion in compliance with the national and local standards in force, abide by the following: At least one direct opening to the outside is required for combustion, which must have a minimum area of 3000 cm² of 5000 cm² if the appliance runs on LP gas. Said opening must be positioned less than 30 cm from the ceiling if the appliance runs on METHANE gas (see fig 5-2) or along the floor if it runs on LP gas (see fig 5-3).

The openings must communicate directly with the outside. The requisites described above refer to one appliance; in rooms where there are several appliances, greater free floor space is required to provide adequate ventilation for the combustion of all the appliances.



ATTENTION !!! In no case must the central heating unit be in a negative pressure state. Therefore, consider the presence of any discharge fans, ceiling fans, dryers, compressors, air heating units, etc. that can take air away from the appliance.



ATTENTION !!! EXTRACTORS: Extractors or similar devices to discharge air from the central heating unit can decrease the ventilation required for combustion and/or cause vacuums in the ventilation system. Flue exhaust leaks from the ventilation system in an inhabited room can cause very dangerous conditions that must be corrected immediately.

5.1.2 - Preventing combustion air contamination

Do not position air intake and/or flue exhaust outlets in rooms where combustion air can be contaminated.



ATTENTION !!! Contaminated combustion air can damage the appliance.

Make sure the combustion air does not contain any of the following contaminating agents.

Products that can contaminate combustion air:

- Permanent wave solutions;
- Chlorinated waxes/cleaning products;
- Chlorine-based pool chemical products;
- Calcium chloride used for defrosting;
- Sodium chloride used to soften water;
- Coolant leaks;
- Solutions to remove paint or varnish;
- Hydrochloric acid/muratic acid;
- Cements and adhesives;
- Antistatic softeners used in dryers;
- Chloro-type bleaches, detergents and cleaning solvents found in laundry rooms for home use;
- Adhesives used to secure construction products and other similar products;

6 - INSTALLATION - Setup

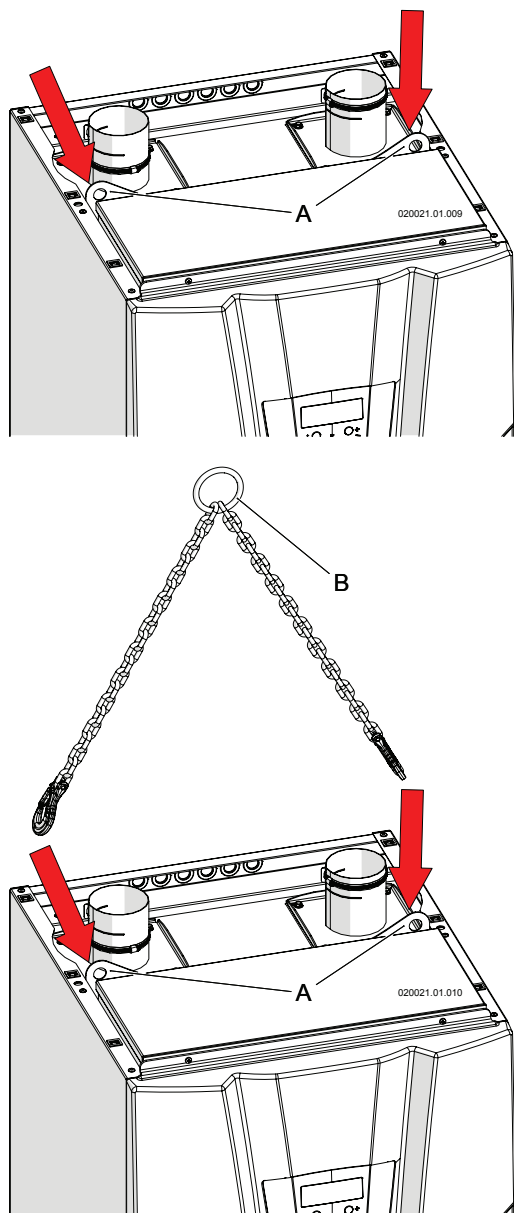


Figure 6-1 - Lifting system

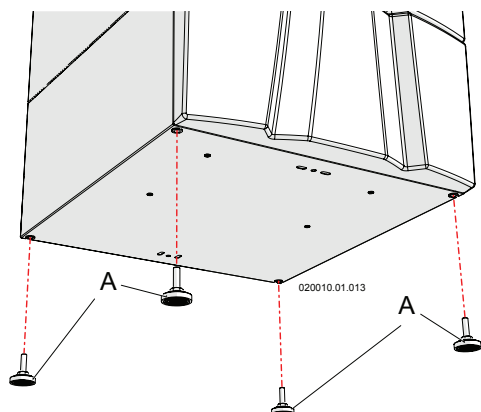


Figure 6-2 - Levelling feet

6.1 - Setup

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

6.1.1 - Moving the appliance



ATTENTION !!! Use appropriate forklifts for the type of appliance to move it. Failure to respect this could cause enormous damages.

Position the appliance in the area chosen for installation, handling it with the pallet on which it is secured, making sure to keep it upright without making any sudden movements that could cause it to overturn.

To free the appliance from the pallet, unscrew the front (part "C" in figure 5-1) and rear (part "D" in figure 5-1) fixing screws.

6.1.2 - Opening the package

The appliance is supplied in cardboard packaging secured to a pallet for transport. Be careful when opening, lift the cardboard box upwards after having detached it from the pallet.

6.1.3 - Lifting the appliance

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

☞ remove the upper covering as per section 17.2;

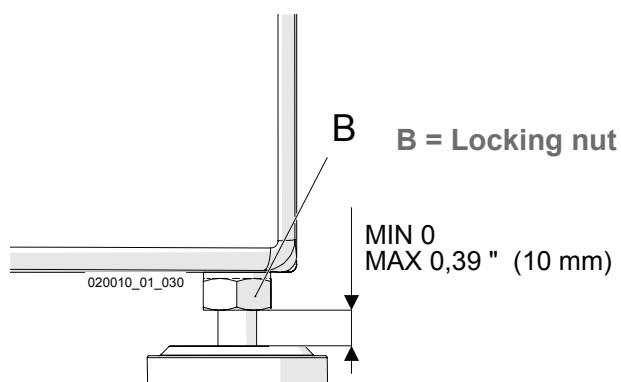
☞ hook the lifting cables, "B" in figure 6-1, to the bracket, "A" in figure 6-1, and lift the heating module;



ATTENTION !!! The lifting cables and system must be suitable to the purpose. In particular, they must resist the weight of the appliance, which you can check in section 18.

☞ install the adjustable feet "A" to level the appliance as per figure 6-2.

Once the appliance has been positioned properly, the lifting cables (part "B" in figure 6-1) must be removed before applying the upper covering.



7 - INSTALLATION - Minimum distances to respect

7.1 - Dimensions and minimum distances to respect

Free space must be left around the appliance both for installation and maintenance, as illustrated in figures 7-1 and 7-2. Figures 8-1, 8-2, 9-1 and 9-2 show the appliance connection dimensions and centre distances.

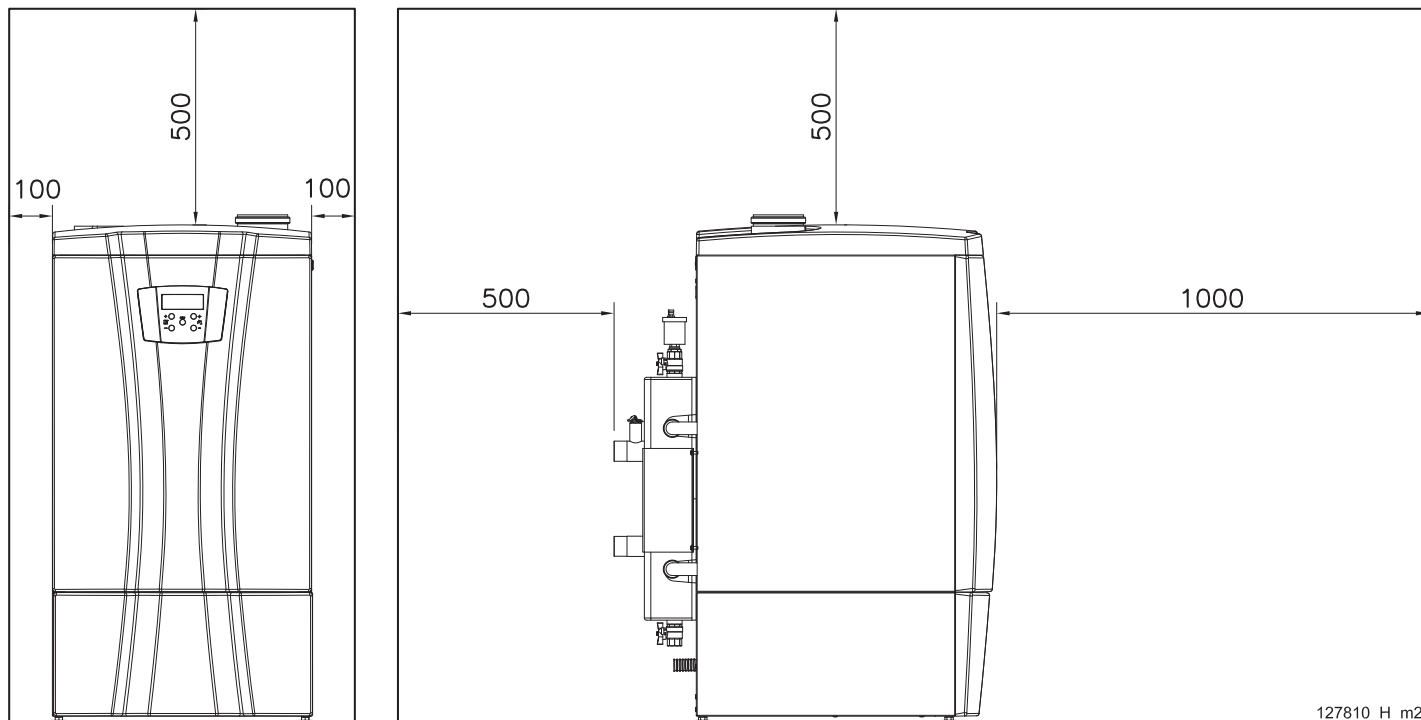


Figure 7-1 - Minimum distances to respect for 60T, 70T, 100T, 115T and 140T models

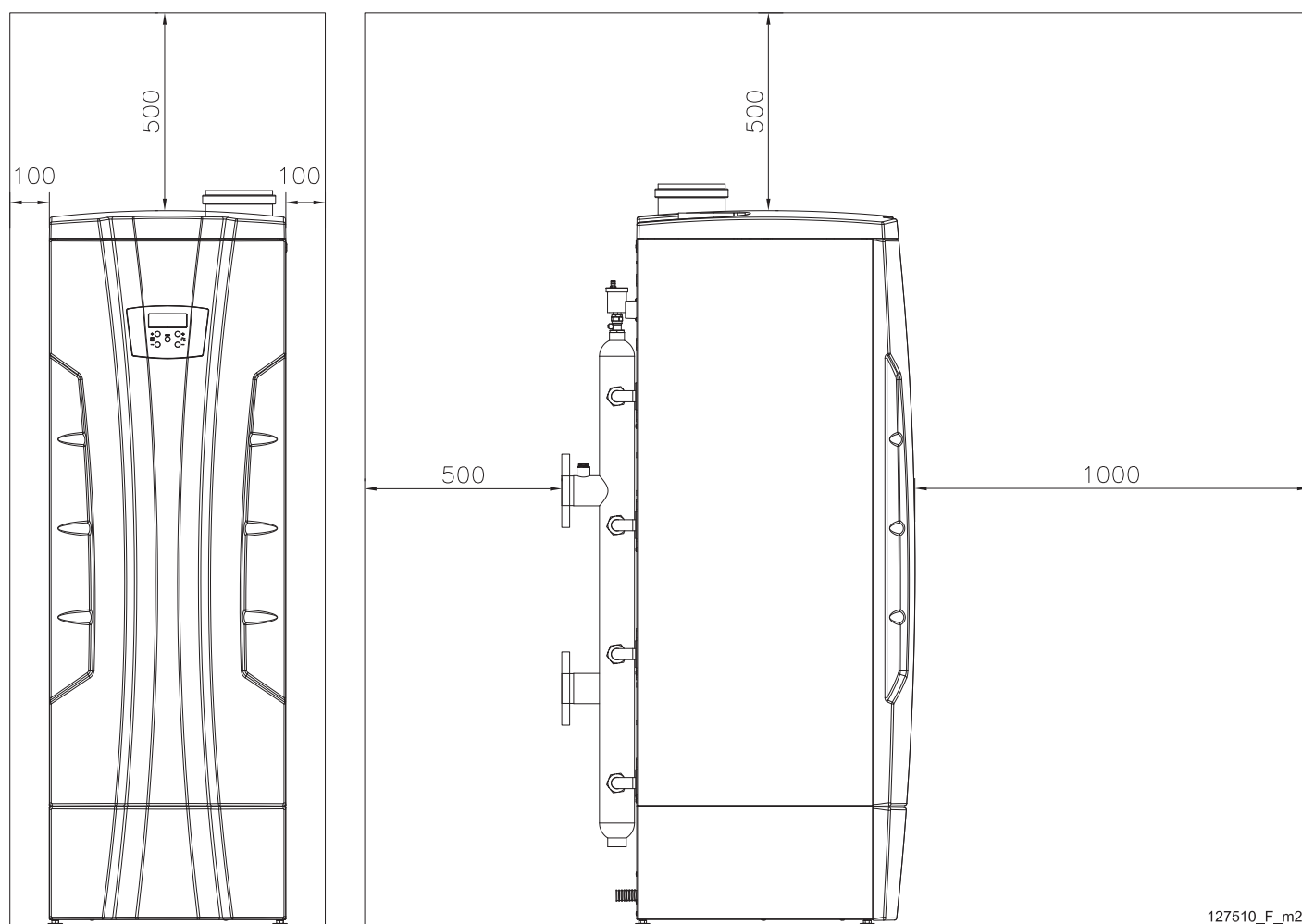


Figure 7-2 - Minimum distances to respect for 180T, 210T and 280T models

8 - INSTALLATION - Dimensions and centre distances - Boiler

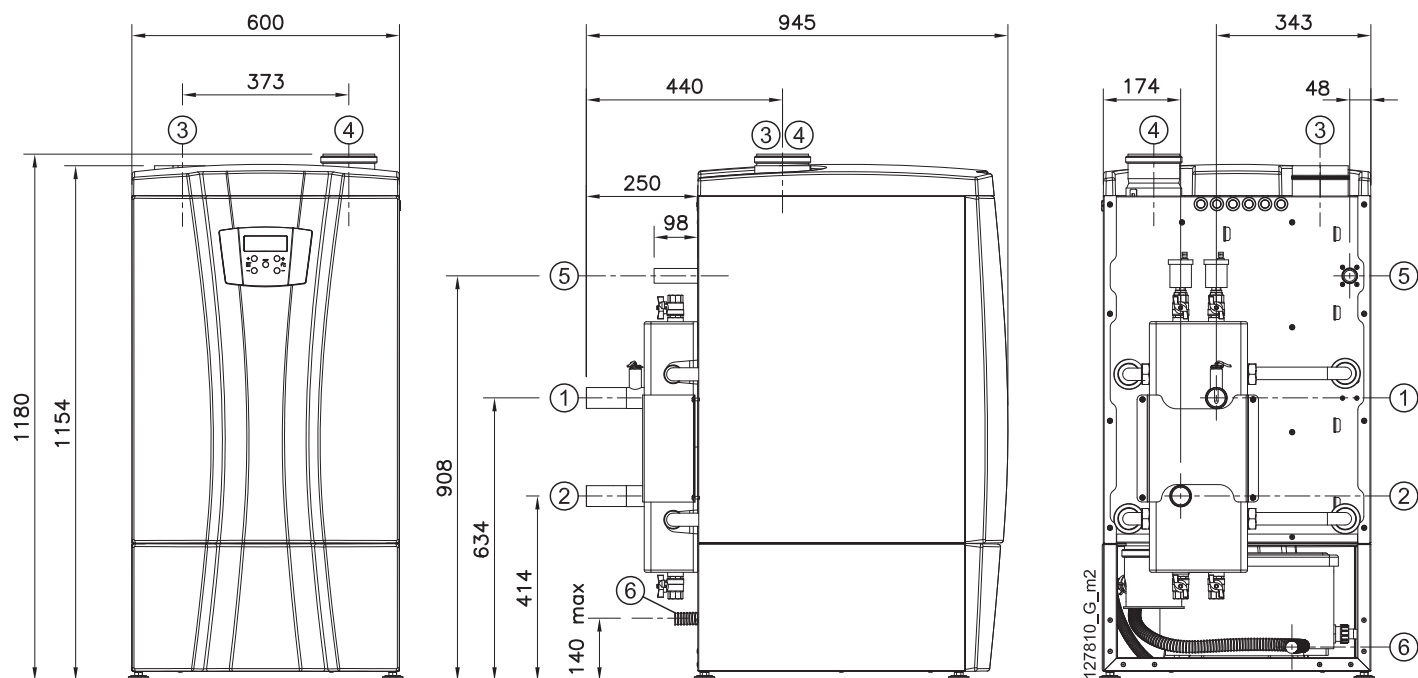


Figure 8-1 - Fitting dimensions and centre distances for 60T, 70T, 100T, 115T and 140T models (References in figure 9-1)

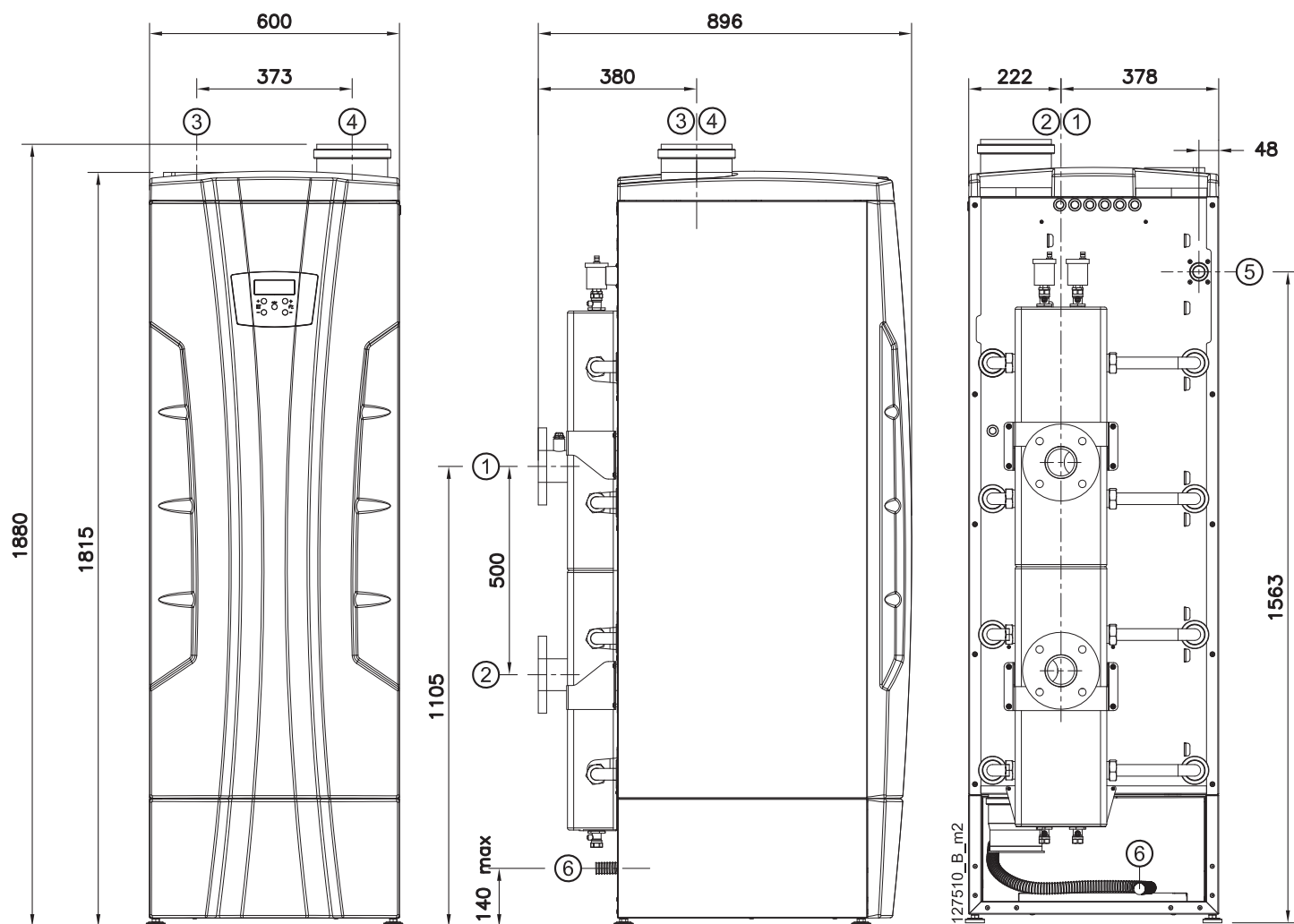


Figure 8-2 - Fitting dimensions and centre distances for 180T, 210T and 280T models (References in figure 9-1)

9 - INSTALLATION - Dimensions and centre distances table - Boiler

| MODEL | ① SUPPLY | ② RETURN | ③ AIR INTAKE | ④ FLUE EXHAUST | ⑤ GAS | ⑥ CONDENSATE DRAIN |
|-------|-------------|-------------|-----------------|-------------------|----------|-----------------------|
| 60T | 1"1/2 | 1"1/2 | 80 mm | 80 mm | 1" | 28mm |
| 70T | 1"1/2 | 1"1/2 | 80 mm | 80 mm | 1" | 28mm |
| 100T | 1"1/2 * | 1"1/2 * | 110 mm | 110 mm | 1" | 28mm |
| 115T | 1"1/2 * | 1"1/2 * | 110 mm | 110 mm | 1" | 28mm |
| 140T | 1"1/2 * | 1"1/2 * | 110 mm | 110 mm | 1" | 28mm |
| 180T | DN65 PN16 * | DN65 PN16 * | 160 mm | 160 mm | 1"1/4 | 28mm |
| 210T | DN65 PN16 * | DN65 PN16 * | 160 mm | 160 mm | 1"1/4 | 28mm |
| 280T | DN65 PN16 * | DN65 PN16 * | 160 mm | 160 mm | 1"1/4 | 28mm |

* Fittings and flanges are not factory assembled

Figure 9-1 - Figure 8-1 and 8-2 connection diameter table

10 - INSTALLATION - Hydraulic connections - boiler

10.1 - Boiler gas and hydraulic connections



ATTENTION !!! Before installing, wash the heating system and, if necessary, the domestic hot water system thoroughly in order to remove any residues or impurities that could compromise proper appliance operation.

To identify the position of the fittings, see figures 8-1 and 8-2.

Gas connection

The gas connection must be done at the corresponding fitting with a rigid metal pipe. The gas counter flow rate must be sufficient for simultaneous use of all the gas appliances connected to it. Connect the gas to the appliance according to the standards in force. The diameter of the gas pipe coming out of the generator does not determine the choice of the diameter of the pipe between the appliance and the counter; the latter must be chosen based on its length and head loss.



ATTENTION !!! Remember to install a gas shut-off valve right before the appliance in order to be able to shut off the gas supply.



ATTENTION !!! Supplying the boiler with a different type of gas than those provided for is prohibited.

10.2 - Boiler safety valve (installer's responsibility)

The appliance is supplied without an overpressure safety valve to all the installer to choose the appropriate valve for the system service pressure (check appliance operation pressure in the technical features). Installation must be done so as to allow the user to check valve intervention, should it open. The safety valve drain (the installer's responsibility) must then be directed in order to avoid danger for people in the event it intervenes.



ATTENTION !!! If the safety valve is not directed, it could harm persons, animals or objects should it intervene.

10.3 - Examples of boiler installations

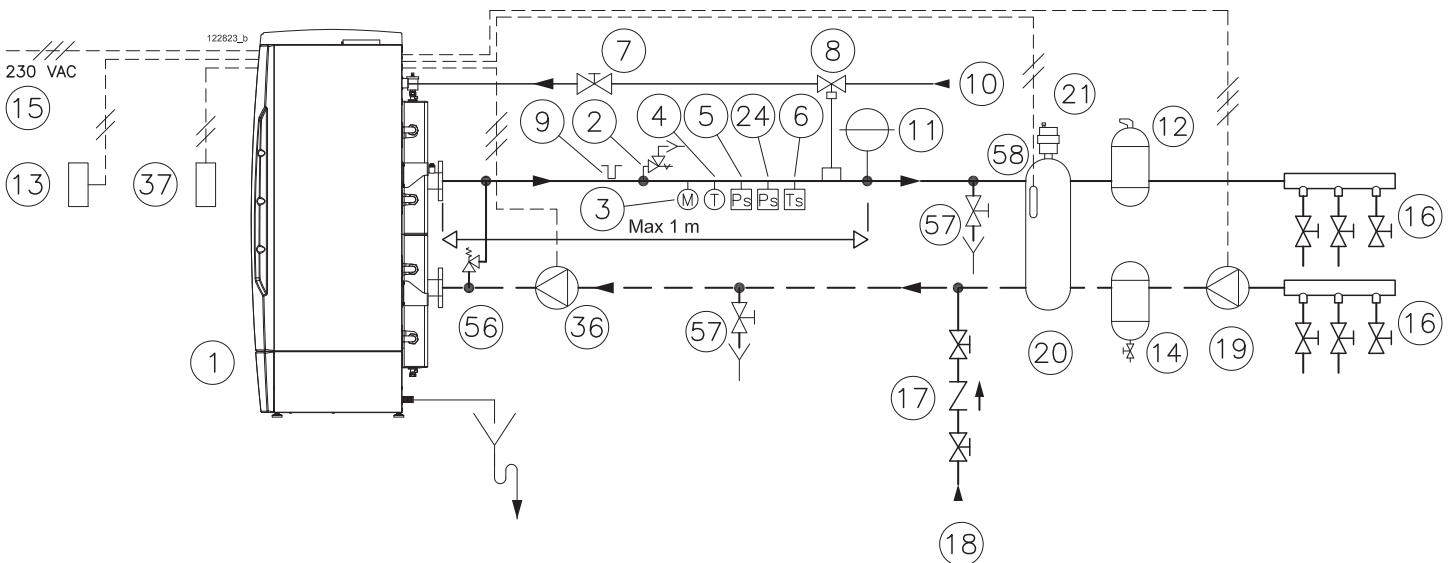


Figure 10-1 - Example of boiler connection diagram

Figure 10-1 KEY

1 Boiler 60T-280T model boiler

2 INAIL safety valve

3 INAIL manometer

4 INAIL thermometer

5 INAIL maximum safety pressure switch

6 INAIL safety thermostat

7 Gas cock

8 INAIL gas shut-off valve

9 INAIL well

10 Gas inlet

11 Expansion tank

12 Micro-bubble separator

13 External probe

14 Filter

15 Electrical power supply

16 Low or high temperature heating system

17 System loading unit

18 Domestic cold water

19 Heating circuit pump

20 - Hydraulic separator

21 Air bleed valve

23 -----

24 INAIL minimum safety pressure switch

36 Main circuit pump

37 Room thermostat or equivalent system

56 Balancing valve (necessary if there is a motorised valve, part "17" in figure 3-1, on the appliance and the pump, "36", is **NOT** the modulating type)

57 Drain cock (Mandatory in the 60, 70, 100, 115, 140 models)

58 Manifold sensor

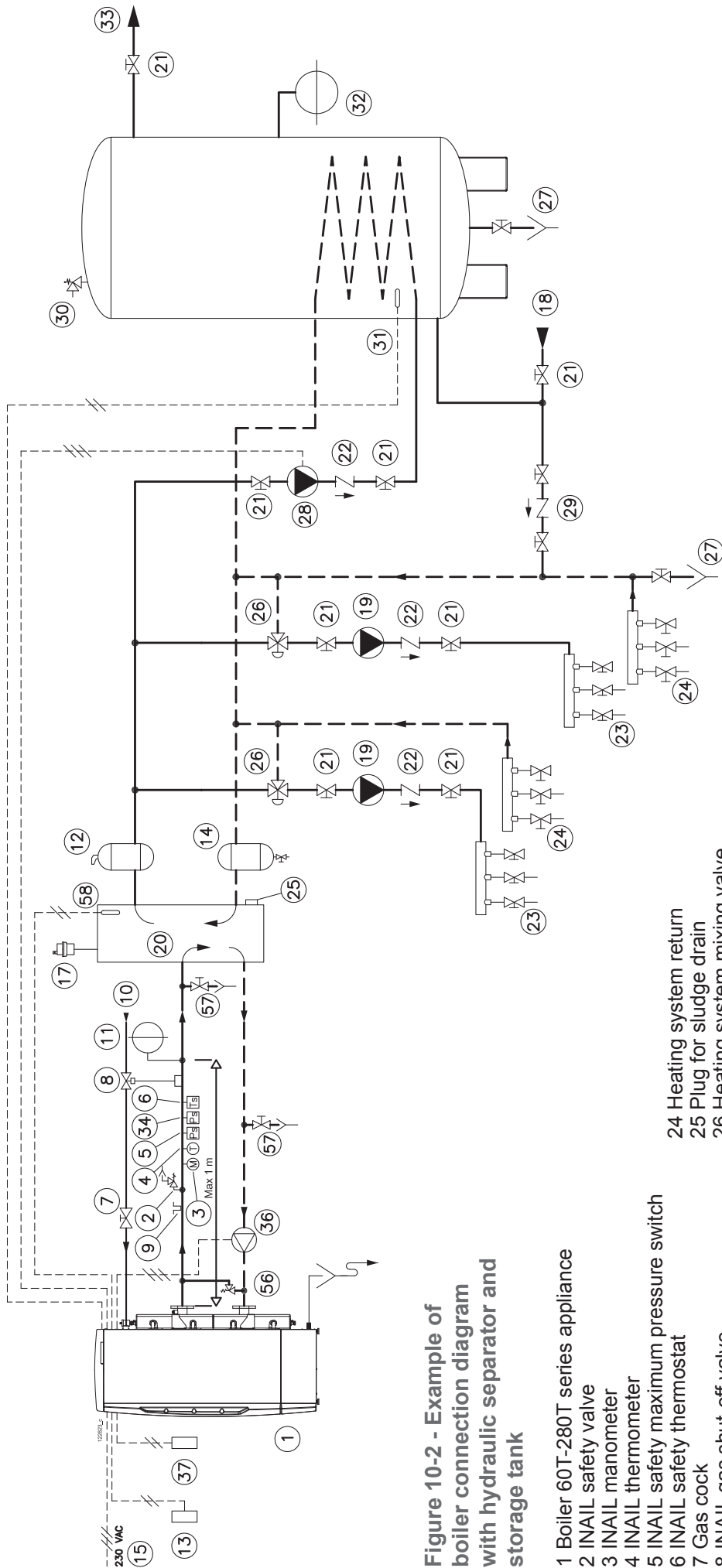


Figure 10-2 - Example of boiler connection diagram and storage tank

- 1 Boiler 60T-280T series appliance
- 2 INAIL safety valve
- 3 INAIL manometer
- 4 INAIL thermometer
- 5 INAIL safety maximum pressure switch
- 6 INAIL safety thermostat
- 7 Gas cock
- 8 INAIL gas shut-off valve
- 9 INAIL well
- 10 Gas inlet
- 11 Expansion tank
- 12 Micro-bubble separator
- 13 External probe
- 14 Filter
- 15 Electrical power supply
- 16 -----
- 17 Air bleed valve
- 18 Domestic cold water
- 19 Heating circuit pump
- 20 - Hydraulic separator
- 21 Shut-off valve
- 22 Check valve
- 23 Heating system supply
- 24 Heating system return
- 25 Plug for sludge drain
- 26 Heating system mixing valve
- 27 System drain
- 28 Storage tank loading pump
- 29 System loading unit
- 30 Storage tank safety valve
- 31 Hot water tank temperature sensor
- 32 Domestic circuit expansion tank
- 33 Domestic hot water supply
- 34 INAIL safety minimum pressure switch
- 36 Main circuit pump
- 37 Room thermostat or equivalent system
- 56 Balancing valve (necessary if there is a motorised valve, part "17" in Figure 3-1, on the appliance and the pump, "36", is **NOT** the modulating type)
- 57 Drain cock (Mandatory in the 60, 70, 100, 115, 140 models)
- 58 Manifold sensor

10 - INSTALLATION - Hydraulic connections - boiler

10.4 - Boiler INAIL safety devices

The appliance comes standard supplied without the INAIL safety devices.



ATTENTION !!! All appliances over 35 kW of output heat must, under the installer's responsibility, be equipped with safety devices as provided by Rule "R" issued by the National Institute for Insurance against Accidents at Work (INAIL).



ATTENTION !!! Installing shut-off elements between the appliance and the safety valve (part "7" in fig. 10-3 and "15" in figure 10-4) is prohibited.

To facilitate installation, COSMOGAS provides, on request, INAIL kits complete with the required devices and a special pipe to install them.

Figure 10-3 shows the kit for the 60T, 70T, 100T, 115T and 140T models.

Figure 10-3 key

- 1 = Nipple
- 2 = Gasket
- 3 = Manifold
- 4 = Well for Valve probe "11"
- 5 = INAIL thermometer
- 6 = INAIL manometer
- 7 = INAIL safety valve
- 8 = Connection unit
- 11 = INAIL gas shut-off valve
- 12 = Inspection well
- 13 = INAIL safety thermostat
- 14 = INAIL safety pressure switch
- 15 = INAIL safety pressure switch
- 16 = Expansion tank connection fitting

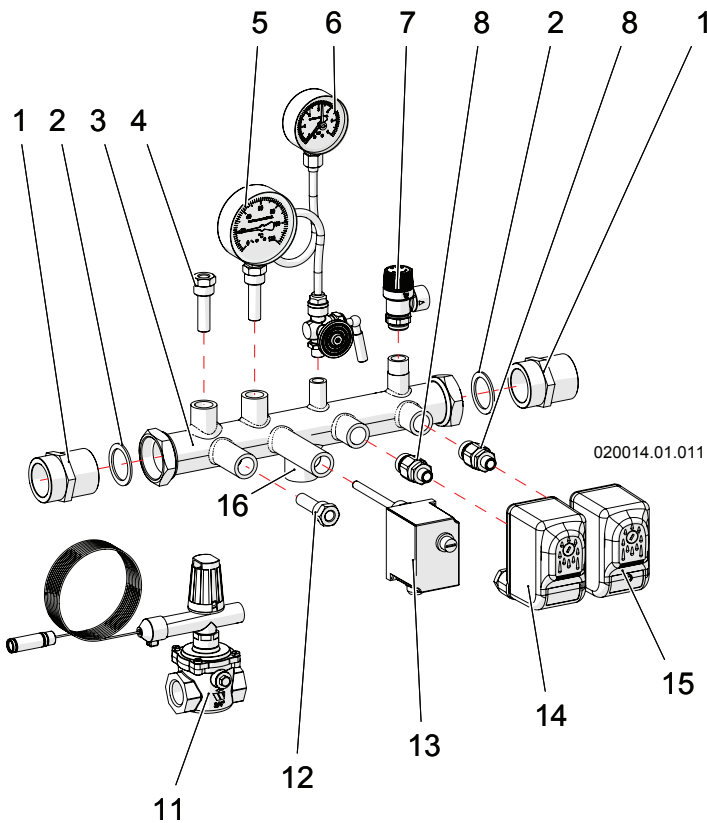


Figure 10-3 - 60T to 140T INAIL KIT



ATTENTION !!! The valve sensor "11" (figure 10-3) goes into the probe carrier well "4" and secured with the specific anti-slip locking screw.

Figure 10-4 shows the kit for the 180T, 210T and 280T models

Figure 10-4 key

- 1 = Fixing nuts and bolts
- 2 = Gasket
- 3 = INAIL safety pressure switch
- 4 = INAIL safety pressure switch
- 5 = Connection unit
- 6 = INAIL safety thermostat
- 7 = Manifold
- 10 = INAIL gas shut-off valve
- 11 = Well for Valve probe "10"
- 12 = Inspection well
- 13 = Expansion tank connection fitting
- 14 = INAIL manometer
- 15 = INAIL safety valve
- 16 = INAIL thermometer

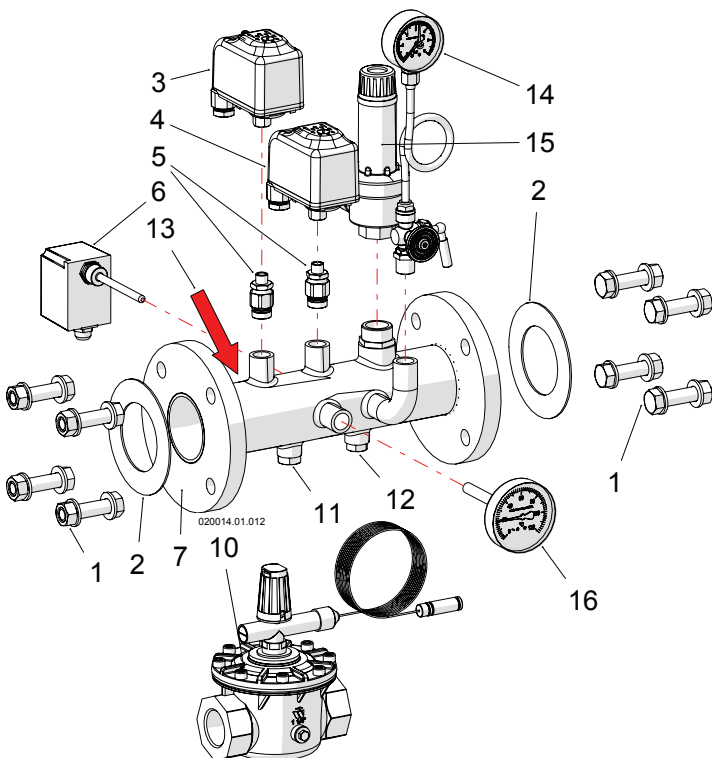


Figure 10-4 - 180T to 280T INAIL KIT



ATTENTION !!! The valve sensor "10" (figure 10-4) goes into the probe carrier well "11" and secured with the specific anti-slip locking screw.

10 - INSTALLATION - Hydraulic connections - boiler

10.5 - Expansion tank connection



ATTENTION !!! The appliance does not have an expansion tank. Provide the system with an appropriately sized expansion tank as required by the national and local installation standards.

10.6 - Supply and return



ATTENTION !!! COSMOGAS is not liable for any damage caused by incorrect use of additives in the heating system.



ATTENTION !!! The system downstream of the appliance must be built with materials that resist temperatures up to 97°C and 11 bar of pressure. Otherwise (i.e. plastic piping), the system must be equipped with appropriate protection and safety devices.

Before making the hydraulic connections, wash the system thoroughly to remove any slag (hemp, radiator foundry sands, etc.) that could damage the appliance. The system must also be washed if an appliance is replaced. You can check the positioning of the supply and return fittings in figures 8-1 and 8-2.

☞ Install a metal mesh filter with a 1 mm² opening on the return pipe in order to stop any system residues before they go back into the appliance.

☞ Do not use the appliance to introduce any type of additives into the system.

10.7 - Boiler water supply



ATTENTION !!! The system (and, therefore, the appliance) must be connected to the water mains interposing a device to prevent backwash into the potable water system, as required by the pollution prevention safety standards in force.

10.7.1 - Recommendations on the characteristics of the water used in the system

Filling the heating system is an extremely delicate operation that must not be underestimated, both when simply replacing the heat generator as well as for new installations. A mistaken assessment of the system water characteristics can, in certain cases, lead to damages to the system and heating module. A system is almost never perfectly sealed; at times, there can be water leaks or oxygen inlets. Both of these phenomena are harmful.

Of the parameters that can negatively impact the life of a system, the main ones are:

- The simultaneous presence of different metals (copper, brass, steel and aluminium) that, in a watery environment, lead to galvanic corrosion.

- The presence of free oxygen, due to air leaks that form near fittings or gaskets, is a typical corrosive agent, particularly active at temperatures between 50 and 70°C.

- Water loss, leading to frequent top-ups, can lead both to corrosion as well as scale build-up, depending on the type of water available for the top-ups. In any case, the extent of the leaks (and corresponding top-ups) must be kept under control,

especially when an automatic filling system is installed. In this case, installing a counter indicating the amount of water that is reintegrated is highly recommended.

Natural or additional impurities in the water. Many types of drinking water can contain even considerable concentrations of chlorides and sulphates that can increase how quickly the metal surfaces corrode. Other undesirable components could have got into the system before or during installation (construction materials, metal shavings, sawdust, grease, deposits, and dirt in general). Welding residues can also cause corrosion, both in new systems as well as in the event of modifications or repairs. In old systems designed to work with radiators, featuring very large pipe diameters, the water content is considerable and favours the formation of sludge and deposits.

Sludge and scale build-up Black deposits (magnetite) indicate that corrosion is limited. However, the high specific gravity of this oxide can create clogs that are difficult to remove, especially in the hotter areas. Scale build-up is due to water hardness, that is, the presence of calcium and magnesium minerals. Calcium, in the form of carbonate, falls on the hotter areas of the system. Magnetite often contributes in intensifying the scale build-up. Iron oxide (the water has a reddish colour), instead, is a sign of oxygen corrosion.

Frequent leaks. In the event of frequent leaks, hydrogen and/or air accumulates on the high part of the exchanger and the radiators, preventing complete heat exchange. When the electrolytic corrosion process begins, the water level in the system goes down, gases accumulate in the high part of the heat exchanger and on the radiators. The presence of air is caused by the fact that the system might not be perfectly sealed. Slow system pressure loss due to a leak is often difficult to find, especially when the breach is very small (during winter, leaks on the radiator valves are often not visible as the heat generated by the radiator or the boiler dry them). However, these micro-leaks allow air to get into the system. The main points that can lead to micro-leaks are found in the joints and, in particular, on the circulator intake side (air bleed valve, seals with o-rings, loading valves). In these cases, to avoid damage, the system must be protected with an appropriate corrosion inhibitor.

10.7.2 - For the system to operate properly, you must make sure that:

1) the system has no leaks or, at the least, the most evident leaks have been removed;

2) if there is an automatic filling system, a litre counter must have been installed in order to accurately know the extent of any leaks;

3) system filling and top-ups are done with softened water to reduce the overall hardness. The water **must** also be treated in order to keep the pH within the required threshold to prevent corrosion;

4) Both in new systems and for replacements, the system must be equipped with efficient devices that eliminate air and impurities: filters, micro-impurity separators and micro-air bubble separators;

5) Avoid draining system water during scheduled maintenance, even seemingly insignificant amounts: for example, to clean the filters, equip the system with specific shut-off valves upstream and downstream of the filter itself;

6) Always analyse the system water before opening communication between the new generator and the system to establish whether the chemical and physical characteristics of the water indicate you should completely drain the system, use the water already in the system, or chemically wash the system using water from the mains plus a cleaning solution when there is the suspicion that the system might be dirty or

10 - INSTALLATION - Hydraulic connections - boiler

particularly clogged. Then fill it with new treated water. If the analysis of a sample of water that will be used to fill the system shows the following values:

- Hardness from 12°F to 20°F
- $7,5 < \text{pH} < 9,5$

then you can proceed with loading. If the characteristics are different, an inhibitor must be used.

10.7.3 Treating water in heating systems for civil use

Water must always be treated in heating systems for civil use, both when replacing the generator and in the event of a new system.

The design stage, based on the characteristics of the raw water, must provide for all the treatment and chemical conditioning systems needed to obtain water with the following characteristics:

- Appearance: clear, colourless and non-foamy;
- pH: from 7,5 a 9,5;
- Hardness from 12°F to 20°F;
- Conditioners: present within the concentrations prescribed by the *supplier*.

If the water characteristics are unknown, there is a very high probability of encountering the following typical setbacks:

a. SCALE BUILD-UP

$30^\circ \text{fr} = 300 \text{ mg/kg CaCO}_3$

In a system containing 1000 litres of water at 30°F, the CaCO_3 content is equal to 300 g. If not appropriately treated, it will deposit on the surface of the heat exchanger as that is the hottest point of the system, creating concentrated increases in temperature and leading to the heat exchanger breaking.

b. CORROSION

Corrosion is usually facilitated by the presence of oxygen, by contact between different metals or by the presence of chlorides.

c. DEPOSITS

SLUDGE, PROCESSING RESIDUES are organic and inorganic insoluble substances.

10.8 - Draining the boiler heating circuit

In order to avoid constant water top-ups and subsequent oxygen and scale, it is advisable to limit draining the heating circuit as much as possible.

10.9 - Boiler low temperature (or floor) systems



ATTENTION !!! If the boiler is installed in a floor system built with plastic piping, all precautions against corrosion due to water oxygenation must be taken:

make sure the system is built with plastic piping with an oxygen permeability no greater than 0,1 g/m³ at 40°C. Should the pipe not meet these features, the boiler radiant panel circuit must be isolated using a plate heat exchanger that can resist the corrosion caused by the oxygen dissolved in the water.

10.10 - Manifold probe

The manifold probe (part 26 in figure 3-5 and 3-7) is factory installed on the boiler manifold. However, that position may not be correct in some systems where there is a hydraulic separator or plate exchanger (see figures 10-1 and 10-2). It is advisable to move the probe from the boiler manifold to the hydraulic separator as shown in figures 10-1 and 10-2, part "58".



ATTENTION !!! For the system to work properly, the manifold sensor must be positioned in a point of the hydraulic separator/plate exchanger, able to detect the correct supply temperature and able to be influenced by the secondary circuit water flow temperature

11 - Characteristic curve
of the boiler head loss

The boiler are not equipped with a circulation pump. To size the pump to use, the designer must consider the hydraulic resistances of the system and the hydraulic resistances of the boiler itself. To this end, figure 11-1 shows the hydraulic resistances of the boiler in graphic form.

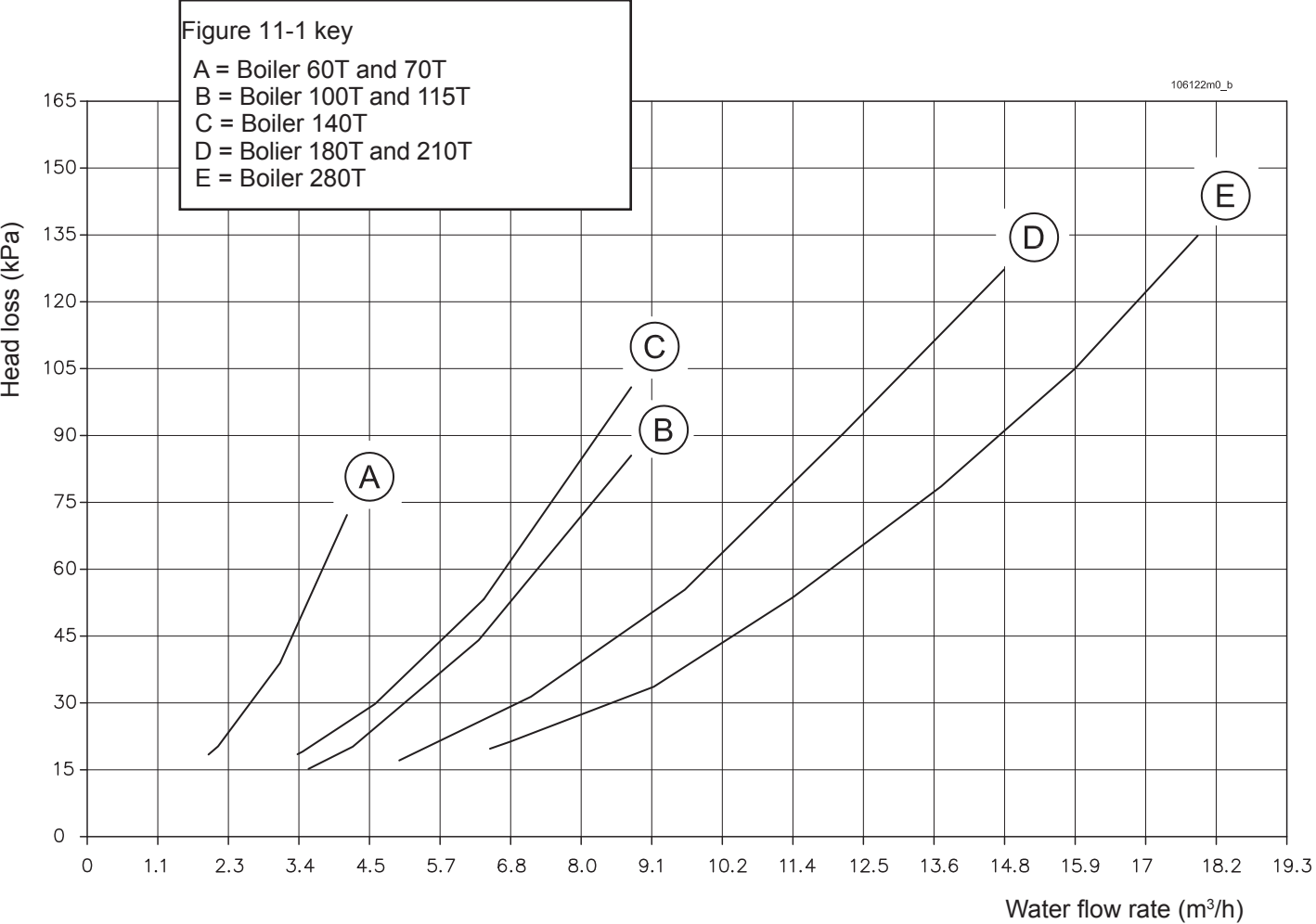


Figure 11-1 - Boiler “60T-280T” model hydraulic resistances

12 - INSTALLATION - Eliminating condensate

12.1 - Condensate drain

Inside the appliance, there is a siphon and condensate neutraliser system to evacuate condensate (see figures 3-3, 3-5 and 3-7, parts "2"- "3") and to prevent the combustion exhaust from escaping, the outlet of which corresponds to duct "5" referred to in figures 3-3, 3-5 and 3-7. This outlet must be directed into another anti-odour siphon (installer's responsibility) in order to prevent bad odours from coming back into the room.

In particular, the condensate disposal system must:

- ☞ be made with a pipe that has an inner diameter greater than or equal to 13 mm;
 - ☞ be installed so as to prevent the liquid from freezing; therefore, be aware of any sections passing outdoors. Draining into gutters or drainpipes is prohibited;
 - ☞ be in continuous incline towards the drain point; avoid high points that could put the duct under pressure;
- Figure 12-2 shows how a condensate disposal system must be made downstream of the appliance.

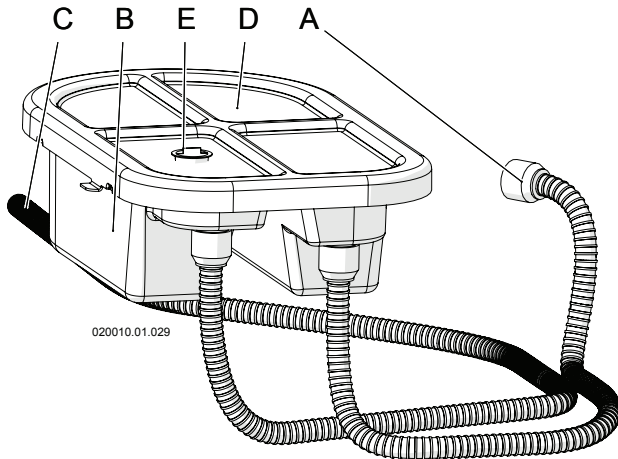


Figure 12-1 - Condensate neutraliser

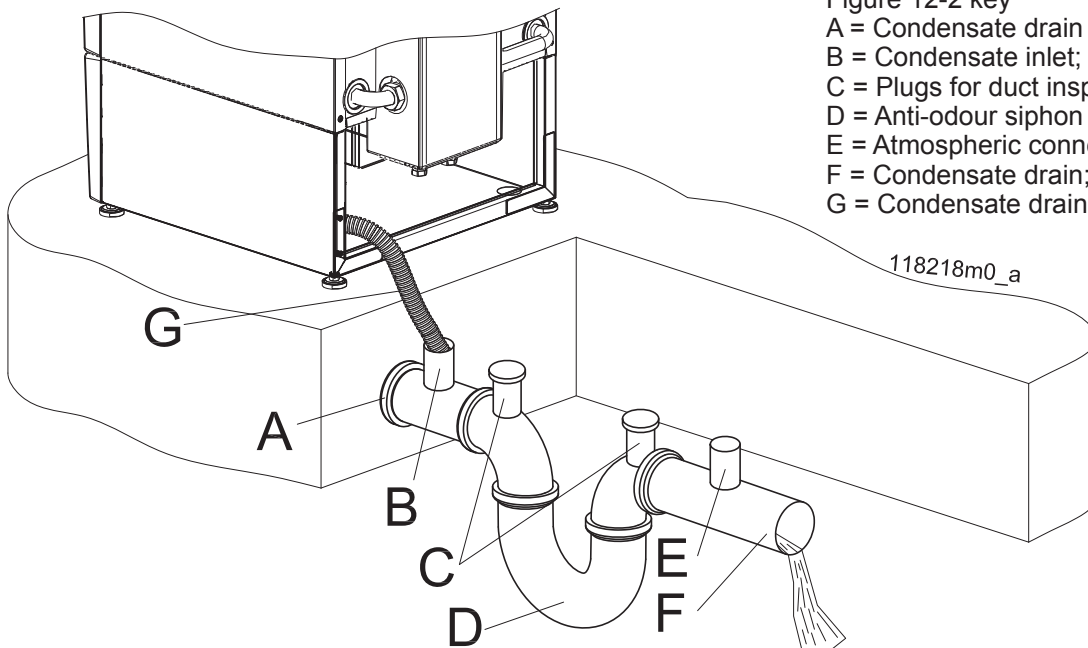


Figure 12-2 key

- A = Condensate drain duct start plug;
- B = Condensate inlet;
- C = Plugs for duct inspection;
- D = Anti-odour siphon system;
- E = Atmospheric connection (duct bleed);
- F = Condensate drain;
- G = Condensate drain pipe;

Figure 12-2 - Condensate drain

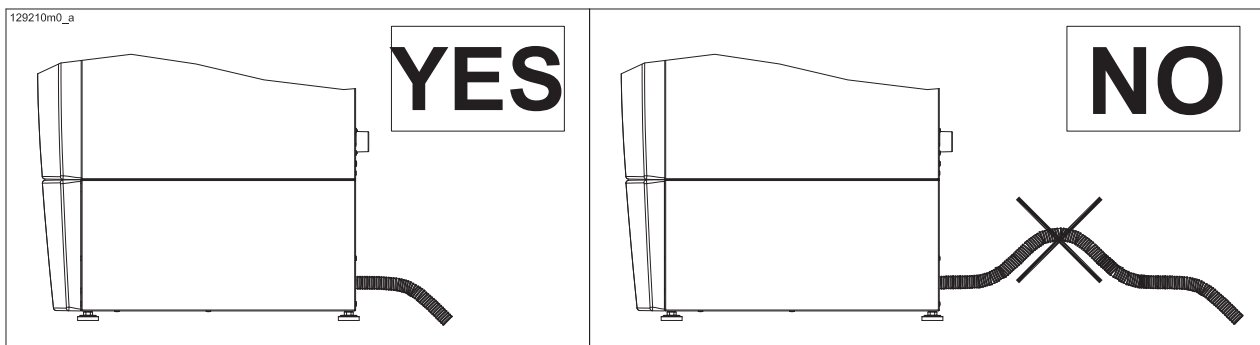


Figure 12-3 - Proper condensate drain pipe installation

13 - INSTALLATION - Electrical connections

13.1 - Electrical connections: general information



ATTENTION !!! Disconnect power before doing any operations inside the appliance.



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



ATTENTION !!! The appliance is only electrically safe when it is properly connected to an efficient grounding system built as required by the safety standards in force.

This fundamental safety requirement must be checked. In you have any doubts, ask a professionally qualified electrician to check the electrical system thoroughly.

- ☞ 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 with a mobile plug connection. Using adapters, power strips, extension cords, etc. is not allowed.
- ☞ The appliance must be connected to the electrical mains with a double insulated tri-rated cable with appropriate cross-section.

☞ To connect to the electrical mains, provide a bipolar switch near the appliance with a contact opening distance of at least 3 mm, as required by the applicable standards in force.

☞ Respect the polarity between phase and neutral when connecting the appliance.

☞ Make sure the piping for the hydraulic, heating and gas systems is not used to ground the electrical or telephone system. This sort of piping is absolutely not appropriate for this purpose. In addition, the appliance, the piping and the radiators can suffer serious corrosion damage in a short time.

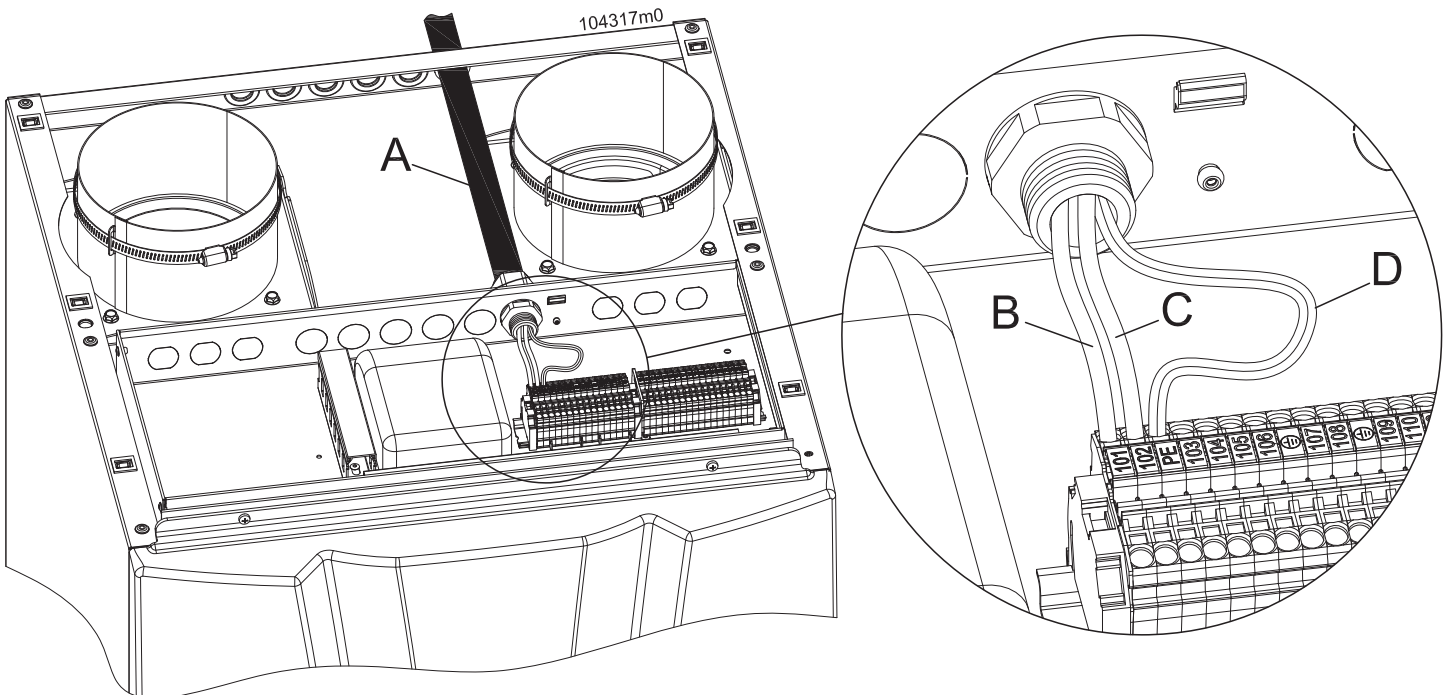


ATTENTION !!! The appliance has no protections against the effects of lightning.

13.1.1 - Connecting the power cable

To connect the electrical power cable, proceed as follows (refer to figure 13-1):

- 1.- use a double insulation tri-rated cable
- 2.- access the electrical connection terminal board following the specific instructions in section 17.2;
- 3.- lay the power cable using the cable gland near contacts "101", "102" and "PE";
- 6.- strip the cable, taking care to keep the grounding cable (green yellow) 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"



Key

A = Electrical wire sheath;
B = Line;
C = Neutral;
D = Earth.

Figure 13-1 - Electrical connections

13 - INSTALLATION - Electrical connections

13.1.2 - Choosing the room thermostat/ time-programmable thermostat

The boiler is equipped to work with any room thermostat or programmable thermostat that has a contact to connect to the cables coming from the boiler, with the following characteristics:

- open/closed (ON/OFF);
- clean (not powered);
- closed when heat is required;
- electrical characteristic of 24Vac, 1A.

13.1.3 - Connecting the room thermostat/ time-programmable thermostat

Install the room thermostat in a part of the room in which the temperature is as close as possible to the typical temperature in the house and, in any case, in an area that is **not** subject to sudden drastic temperature changes, away from windows or doors that lead directly outdoors (see figure 13-2).

To connect the room thermostat cable, proceed as follows (refer to figures 13-4 and 13-5):

- 1.- use a bipolar cable with 1,5 mm² minimum cross-section that goes from the boiler to the room thermostat/programmable thermostat. The maximum allowed length is 100 metres; use a shielded cable with shield grounding;
- 2.- disassemble the boiler casing following the specific instructions in section 17.2;
- 3.- lay the electrical cable using the cable gland near contacts "10" and "11";
- 4.- use a free cable gland that is not used by other conductors;
- 5.- strip the cable;
- 6.- connect the 2 ends of the cable to terminals "10" and "11" (see figures 13-4 and 13-5).



ATTENTION !!! As the room thermostat/programmable thermostat cables are subjected to extremely low safety voltage (24Vdc), they must run in different ducts than 230Vac power cables.

13.1.4 - Installing the external temperature probe

Install the external temperature probe outside the building on a wall facing NORTH or NORTH-EAST at a height from the ground of between 2 and 2,5 metres. On buildings with several storeys, install it at about the upper half of the second storey. Do not install it above windows, doors or air vents, nor directly underneath balconies or gutters. Do not plaster the external temperature probe. Do not install the sensor on walls without overhangs, that is, that are not protected from the rain.

Should the sensor be installed on a wall that still needs to be plastered, it must be installed with an appropriate spacer or remove it before plastering.

To connect the external temperature sensor cable, proceed as follows:

- 1.- lay a bipolar electrical cable with 1,5 mm² minimum cross-section going from the boiler to the external temperature sensor. The maximum allowed length is 100 metres; use a shielded cable with shield grounding;




ATTENTION !!! As the cables are subjected to extremely low safety voltage (24Vdc), they must run in different ducts than 230Vac power cables.

- 2.- connect the bipolar cable to terminals "14" and "15" shown in figures 13-4 and 13-5;
- 3.- connect the bipolar cable to the ends of the external temperature sensor.

Set the boiler to recognise the external temperature sensor as follows:

- 4.- access the "installer menu" as described in section 16.15 and set the parameter **2003 = 1**.

The  icon on the display confirms that the external probe is enabled.

Proceed with the steps in section 16.9.1 to set the correct supply temperature adjustment values based on the external temperature.

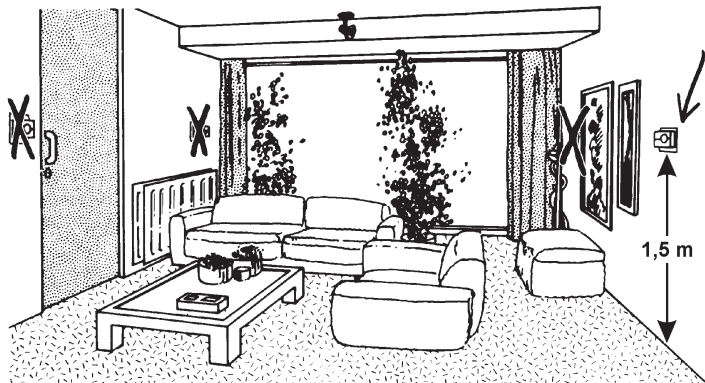


Figure 13-2 - Correct room thermostat/controllable thermostat positioning

13 - INSTALLATION - Electrical connections

13.1.5 - 885 IF board connection (on request)

The 885 IF board is supplied on request for all models (see part "13" in figures 3-3, 3-5 and 3-7).

The board allows:

- 1.- the appliances to be controlled via 0-10Vdc analogue signal;
- 2.- the appliances to be controlled via MODBUS communication digital signal;
- 3.- up to 8 appliances to be connected in cascade (see section 13.4)

0-10 Vdc type dialogue (on request)

The 885 IF board allows the appliance to be controlled via 0-10 Vdc dialogue, proceeding as follows:

- 1.- Install the board as per the instructions provided;
- 2.- Access the "installer menu" as described in section 16.15

and set the parameter **2003** = 4.

- 3.- The appliance can now be controlled via 0-10 Vdc signal according to the rules in figure 13-3;

MODBUS type dialogue (on request)

The 885 IF board allows the appliance to be controlled via MODBUS dialogue, proceeding as described on the instructions provided on request.

13.1.6 - Alarm contact

Alarm contact works only in presence of the 885 IF board (see figures 3-3, 3-5, 3-7 item "13"). Alarm contact does not react in case a dependent module (burner 2, 3 or 4) is in error.

13.2 - Connecting boiler to the storage tank

In order to generate domestic hot water, the boiler must be connected to a storage tank.

The hydraulic connection must be done as per figure 10-2 or the like.

For the electrical connection, proceed as follows (refer to figures 13-4 and 13-5):

- 1.- disconnect power to the boiler;
- 2.- lay a bipolar electrical cable with 1,5 mm² minimum cross-section going from the boiler to the storage tank temperature sensor and connect it on the boiler to terminals "12" and "13" (SB);
- 3.- connect the other end of the cable to the storage tank temperature probe;
- 4.- put the temperature sensor probe inside the storage tank well (see figure 10-2, part "31").
- 5.- set parameter **30 12** to "1" (see section 19)
- 6.- electrically connect the storage tank pump to terminals 107 and 108 of the boiler (see figures 13-4 and 13-5).

The temperature of the water stored inside the storage tank can be selected by the user within a 40-60°C range.



ATTENTION !!! A water temperature exceeding 51°C can cause even permanent harm to persons, animals and objects.

Above all, children, the elderly and the disabled must be protected against the potential risk of scalds by putting in devices that limit the temperature of domestic hot water use to the domestic utilities.

13.2.1 - D.H.W. production priority

The boiler comes out of the factory set with total priority given to domestic hot water production. This means that the boiler works in domestic mode until the required temperature in the connected storage tank is reached. For this reason, said setting could lead to cooling of the room that needs to be heated. Once the domestic hot water demand is met, the appliance automatically goes back to working for the heating circuit.

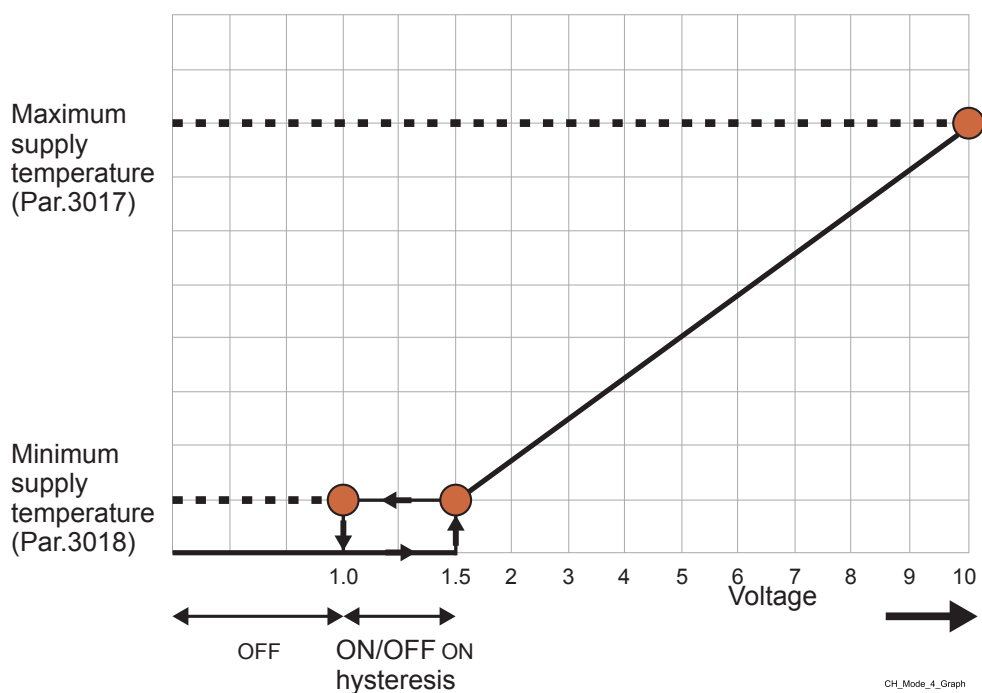


Figure 13-3 - 0-10 Vdc analogue input operating rules

13 - INSTALLATION - Electrical connections

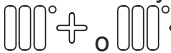
13.3 - Connecting water heater to the storage tank

The water heater must be connected to a storage tank.

The hydraulic connection must be done as per figure 11-1. For the electrical connection, proceed as follows (refer to figure 13-6):

- 1.- disconnect power to the boiler;
 - 2.- Access the connection electrical terminals;
 - 3.- Disconnect the manifold temperature sensor from terminals "8" and "9";
 - 4.- use the storage tank probe supplied with the water heater and connect to terminals "8" and "9".
- lay a bipolar electrical cable with 1,5 mm² minimum cross-section going from the water heater to the storage tank temperature sensor and connect it on the water heater to terminals "8" and "9" (Manifold temperature sensor);
- 5.- connect the other end of the cable to the storage tank temperature probe;
 - 6.- put the temperature sensor probe inside the storage tank well (see figure 11-1, part "42").

The temperature of the water stored inside the storage tank can be selected by the user within a 40-80°C range

using the  heating temperature adjustment controls, as described in section 16.5.



ATTENTION !!! A water temperature exceeding 51°C can cause even permanent harm to persons, animals and objects. Above all, children, the elderly and the disabled must be protected against the potential risk of scalds by putting in devices that limit the temperature of domestic hot water use to the domestic utilities.

13 - INSTALLATION - Electrical connections

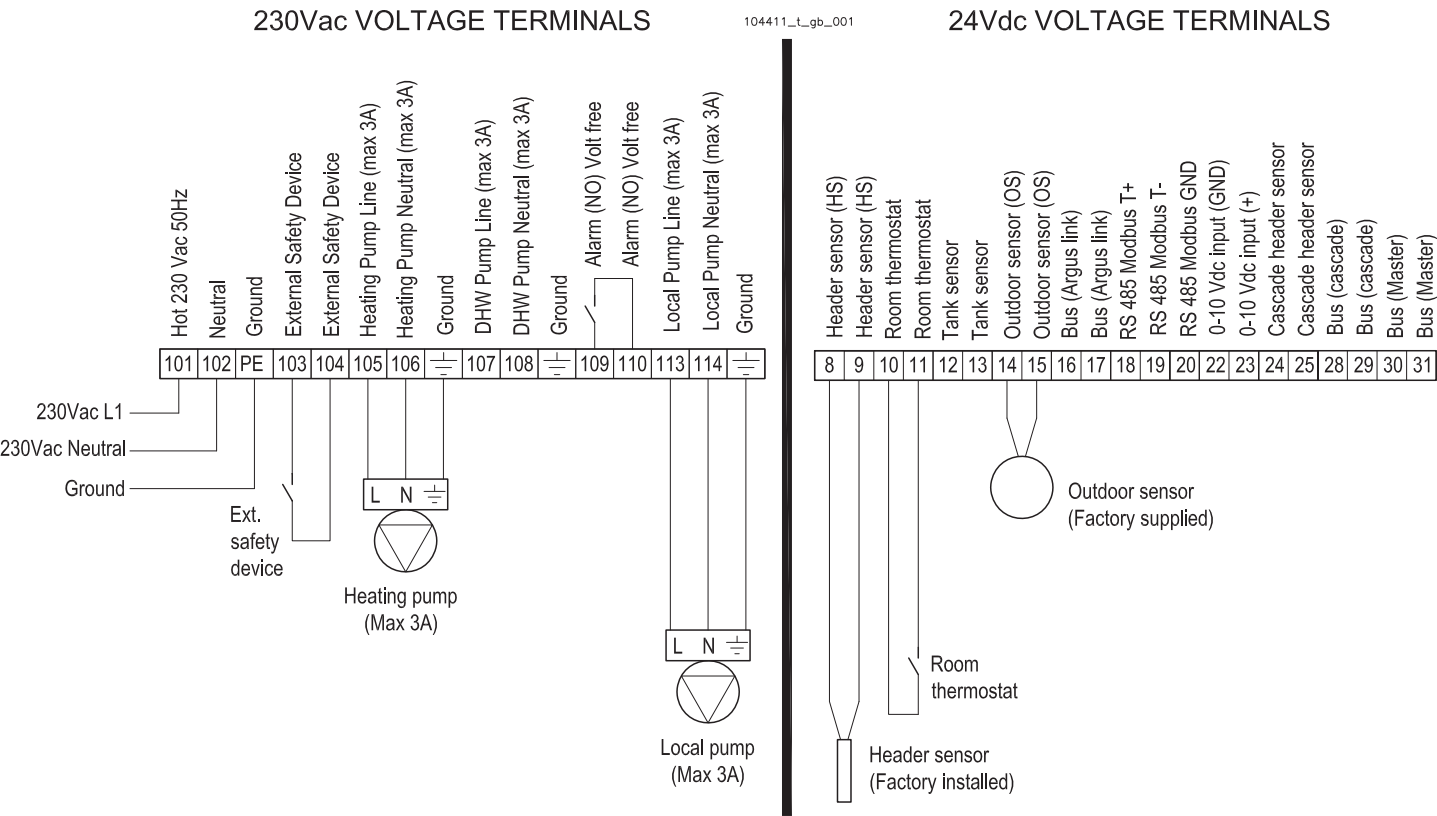


Figure 13-4 - Boiler electrical connections (Example of system shown in figure 10-1)

230Vac VOLTAGE TERMINALS

1044111_t_gb_002

24Vdc VOLTAGE TERMINALS

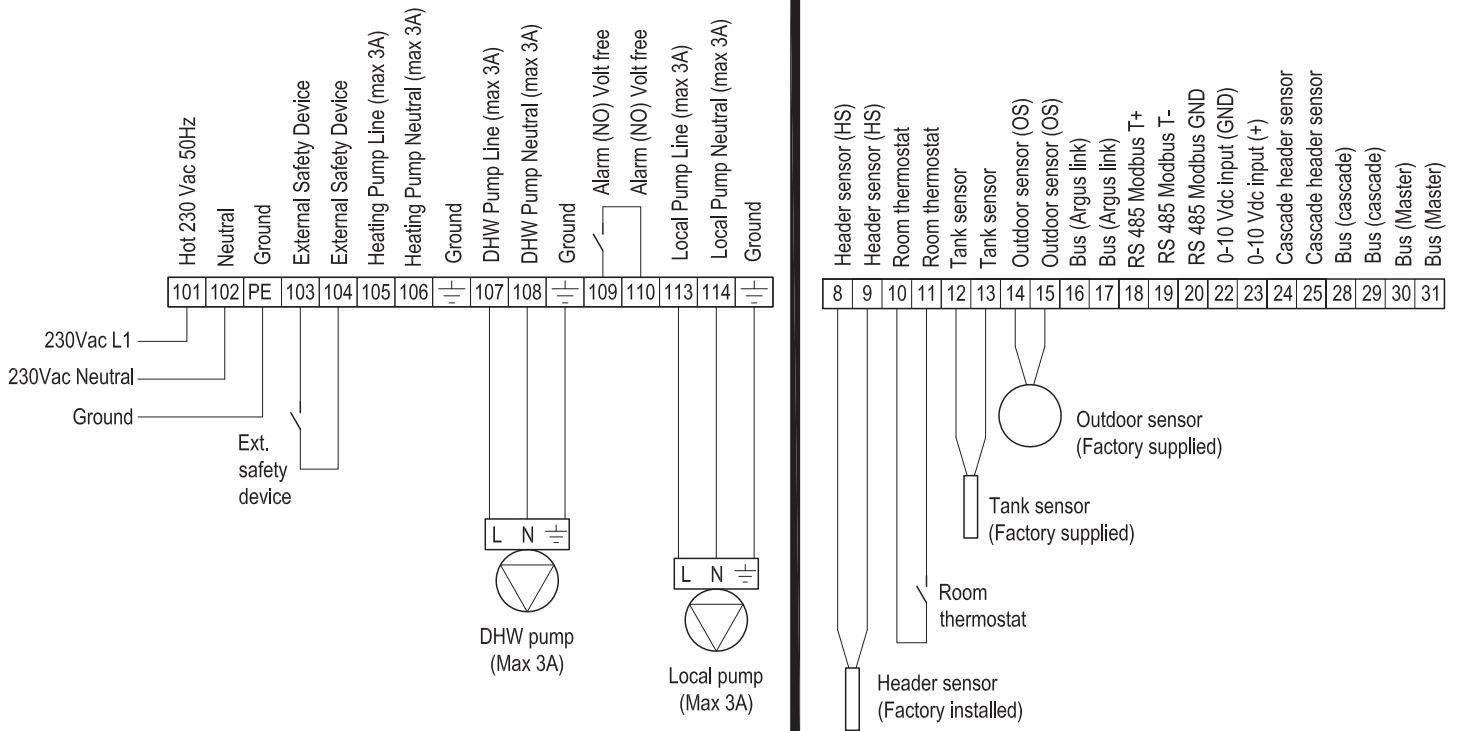


Figure 13-5 - Boiler electrical connections (Example of system shown in figure 10-2)

COSMOGAS

13 - INSTALLATION - Electrical connections

13.4 - Connecting cascade appliances

Connecting cascade appliances is done as shown in the diagrams in figure 13-6 (boiler). Preemptively, an 885 IF board (part "13" in figure 3-3, 3-5 and 3-7) must be installed in each appliance and an 885 HC cascade control (see figure 13-7) must be purchased.

At most 8 appliances can be connected in cascade (figure 13-6 show examples with 4).

Follow the 885 HC control manual for instructions on connecting the appliances in cascade.

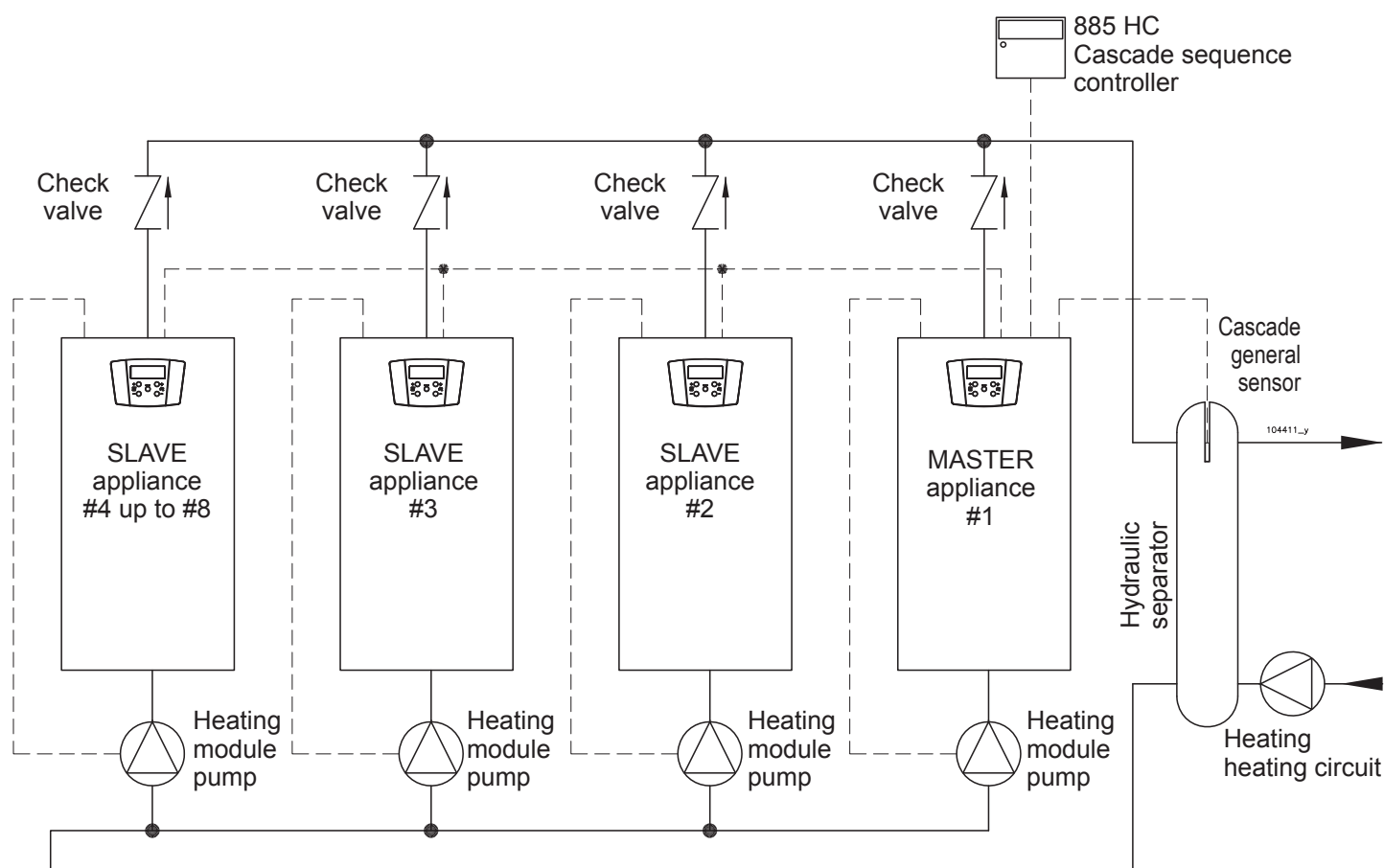




Figure 13-6 Boiler appliances in cascade connection conceptual diagram


14 - INSTALLATION - Air intake and flue exhaust ducts

14.1 - Flue exhaust and combustion air intake duct

 **ATTENTION !!!** This appliance must be connected to a flue exhaust system that can bring the flue gas into the open air outside of the building.


 **ATTENTION !!!** The flue exhaust duct and combustion air intake must be connected in compliance with the national and local standards in force.

 **ATTENTION !!!** 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.

 **ATTENTION !!!** 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. To this end, remember that this type of appliances must have 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, room intake and wall or ceiling mounted flue exhaust.

 **ATTENTION !!!** If you install an appliance with a B23 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.

- C53, separated with ceiling-mounted exhaust and wall-mounted intake or, in any case, in two potentially different pressure points.

- C63, the boiler can be jointed to approved exhaust and intake ducts of other brands.

 **ATTENTION !!!** With the C63 type exhaust, the condensate coming from the chimney cannot be directed to the boiler.

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.

14.1.1 - B23 suction/discharge type

In the event of B23 type combustion air intake/flue exhaust, it is essential that at least as much air as is required for combustion and room ventilation can flow through the room where these appliances are installed. As such, it is a good idea to remember that the combustion of 1m³ of gas requires 11m³ of air. The natural inflow of air must be direct through permanent openings to the outside on the walls of the room to ventilate, away from sources of pollution like: roof vents of dubious origin, industrial air exhausts, etc. (see section 5.1.1).

The vents must meet the following requisites:

- ☞ have net passage cross-sections of at least 0,3 m²;
- ☞ be made so that the vent openings both on the inside and outside of the wall cannot be obstructed;
- ☞ be protected, by example with grids, metal netting, etc. The net passage cross-section must not be reduced by these systems;
- ☞ be located at a height near the level of the floor and such not to interfere with proper flue exhaust device operation; should this position not be possible, the ventilation opening cross-section must be increased by 50%.

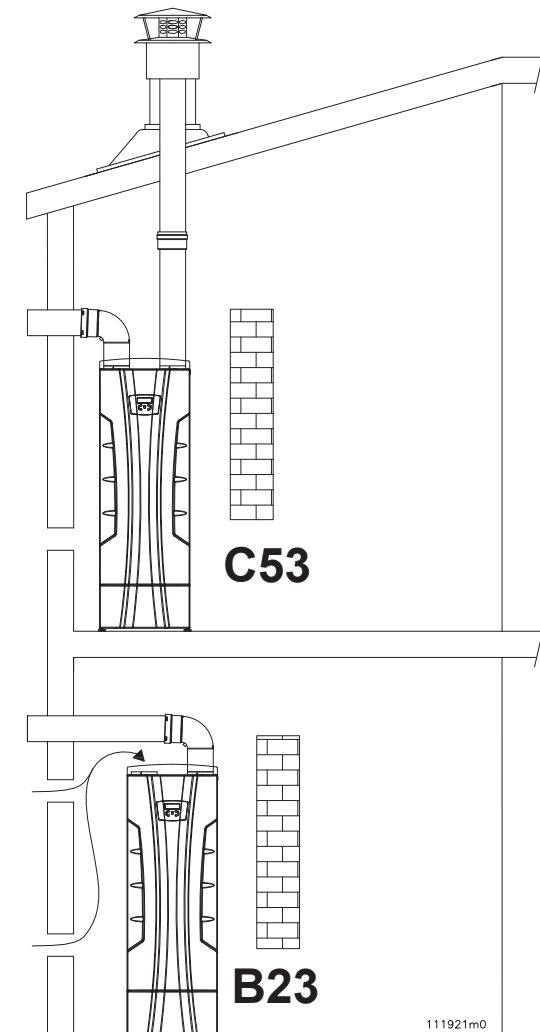


Figure 14-1 - Exhaust/intake systems

14 - INSTALLATION - Air intake and flue exhaust ducts

14.1.2 - Split system

The appliance is standard supplied with fittings to connect to the flue exhaust and air intake. To install, proceed as shown in figure 14-2.

- 1.- put duct "D" in fitting "A" and secure it using the tightening clamp in fitting "A";
- 2.- reducer "C" is standard assembled on fitting "B";
- 3.- 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 12).



ATTENTION !!! 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/air intake system can be extended up to a maximum distance as instructed in section 18. Each 90° curve has a loss equivalent to what is described in section 18.



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



ATTENTION !!! Mechanically secure the joints between the various exhaust and intake duct components using fixing or equivalent systems. See figure 14-4.



ATTENTION !!! 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.



ATTENTION !!! If the air intake and flue exhaust outlets are positioned on the same wall, they must be at least 1 metre away from each other.



ATTENTION !!! The exhaust and intake 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.

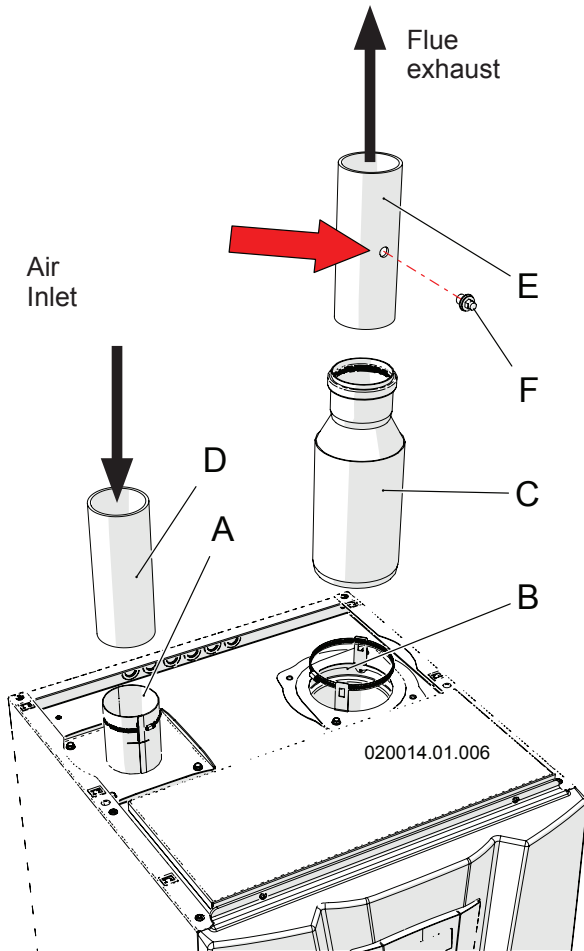


Figure 14-2 - Split system installation

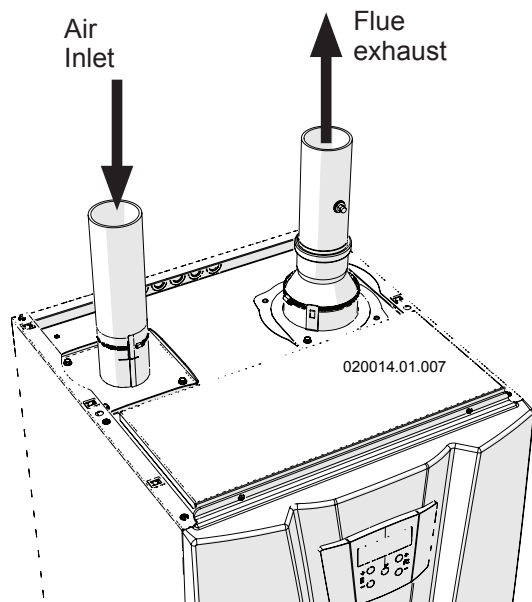


Figure 14-3 - Assembled system

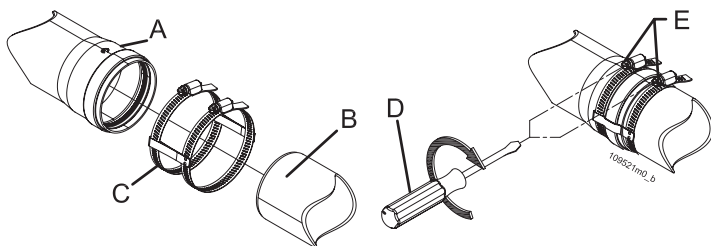


Figure 14-4 Securing exhaust and intake ducts

15 - COMMISSIONING

15.1 - Commissioning

Before commissioning the appliance, the following operations must be done.

15.1.1 - User instructions

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/room thermostats and radiators for energy saving.

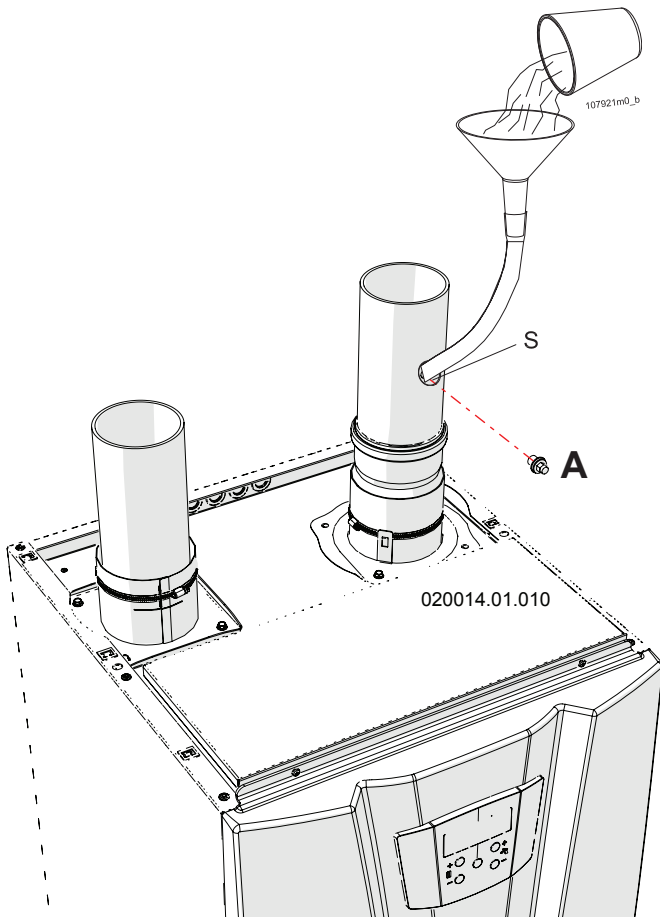
15.1.2 - Filling the condensate drain siphon

The siphon located inside the appliance must be filled with water to create the stop that can prevent flue gases from escaping out of duct "5" in figures 3-3, 3-5 and 3-7.

To this end, proceed as follows:

(refer to figure 15-1)

- 1.- unscrew and remove plug "A" shown in the figure;
- 2.- put a rubber hose into opening "S" and position a funnel at the other end of the hose;
- 3.- slowly pour about 5 litres of water through the funnel;
- 4.- reassemble everything in reverse order.



15-1 - Filling the condensate drain siphon



ATTENTION!!! If the boiler stays off for more than 3 months, the siphon must be filled again as explained above.



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

15.1.3 - Filling the heating system

When the appliance is being powered, if **Err 59** appears on the display, it means that the system needs to be filled. Proceed as follows:

- ☞ only use clean water from the water mains.



ATTENTION!!! Chemicals like antifreeze must be added as per the instructions on the product. In any case, said substances must not be put directly into the boiler.



ATTENTION!!! for water heaters, adding chemicals like antifreeze is absolutely prohibited. Failure to follow this provision could cause serious harm to human health or even death.

- 1.- open the air bleed valve (part "35" in figure 3-7)
- 2.- open the filling device provided for by the installer upstream of the appliance and fill the system until the manometer detects a pressure of 1,5 bar, shown on the display (part "M" in figure 16-1) (**Err 59** appears on the display); If you wish to increase the filling pressure level, parameter **3022** must be set to the desired value (see section 19);
- 2.- make sure no water leaks from the fittings;
- 3.- close the filling device provided for by the installer upstream of the appliance;
- 4.- bleed the heating elements;
- 5.- check the pressure on the display again (part "M" in figure 16-1). If it has gone down, fill the system to 1,5 bar again (or up to the set value).

15 - COMMISSIONING

15.2 - General warnings on the gas power supply

For the first commissioning of the appliance, run the following checks:

- ☞ That it is powered for the type of fuel for which it is equipped.
- ☞ That the gas supply pressure (with the operating appliance stopped) is within the maximum and minimum values shown in the table in section 18.
- ☞ That the gas adduction system is equipped with all the safety and control parts required by the national and local standards in force.
- ☞ That the flue exhaust outlet and the combustion air intake outlet are free of any obstructions.
- ☞ That the flue exhaust and combustion air intake outlets are positioned outside the building.
- ☞ That the condensate drain connection is connected.



ATTENTION !!! Supplying the appliance with a different type of gas than those provided for is prohibited.



ATTENTION !!! Make sure the gas and supply pressure are those for which the appliance is regulated.

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 shut-off cock on the gas adduction pipe;
- ☞ 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 cock located immediately upstream of the appliance to cut it off from the rest of the system.

In figures 8-1, 8-2, 9-1 and 9-2, you can check the 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.



ATTENTION!!! If you smell gas:

- A - Do not activate any electrical appliances, including telephones or any objects that could create sparks;**
- B - Immediately open the doors and windows to create an air current to quickly rid the room of gas;**
- C - From another room or from a neighbour's if there is no other room, immediately call a professionally qualified technician or the gas supply company. If they are unavailable, call the Fire Brigade.**

15.3 - Type of gas for which the appliance is regulated.

There is a label on the front of the appliance bearing the gas supply type and pressure for which the appliance is regulated.

The appliance can have the following 2 phrases:

2H-G20-20mbar METHANE

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

3P-G31-37mbar L.P.G.

it 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.

15 - COMMISSIONING

15.4 - Converting 60T and 70T model appliances from one type of gas to another



ATTENTION !!! 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.

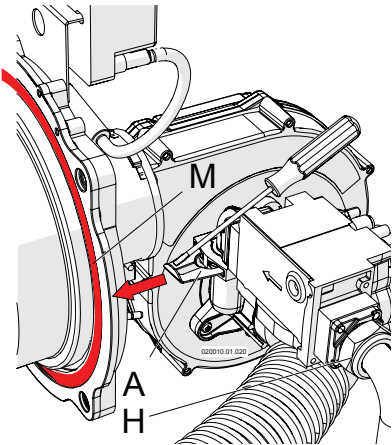


Figure 15-2 - Gas valve disassembly

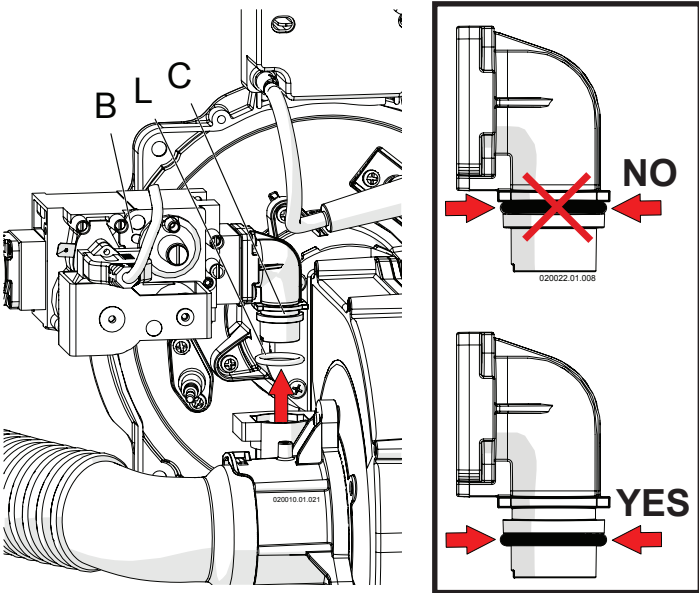


Figure 15-3 - Gas valve lifting

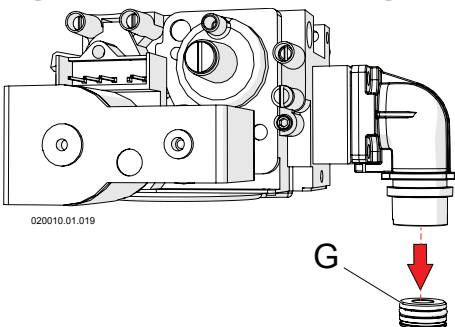


Figure 15-4 - Gas nozzle replacement

Contents:

The Kit (standard supplied with the appliance) is made up of
- label bearing the new type of gas, a gas nozzle for each burner and an instruction sheet;

To change the gas, proceed as follows:

- 1 - Switch off the appliance by turning the main switch to the OFF position (part "T" in figure 16-1);
- 2 - Close the gas supply cock;
- 3 - open the boiler casing as described in section 17.2;
- 4 - Unscrew fitting "H" in figure 15-2;
- 5 - With the help of a screwdriver, remove fork "A" in figure 15-2;
- 6 - Remove the gas valve with fitting "C" as in figure 15-3 (being careful of OR "L" in figure 15-3);
- 7 - Replace nozzle "G" in figure 15-4 with the one in the kit, checking table 15-8 to make sure the diameter corresponds;
- 8 - Reinstall the gas valve, taking care to correctly position OR "L" in figure 15-3 and the gasket of fitting "H" in figure 15-2;
- 9 - Reposition fork "A" in the locking seat;
- 10 - Screw on fitting "H" in figure 15-2;
- 11 - Open the gas supply valve;
- 12 - Make sure there are no leaks from fitting "H" in figure 15-2;



ATTENTION !!! Run the seal test exclusively with a soap-based water solution. Using naked flames is absolutely prohibited.

- 13 - Switch on the appliance by turning the main switch to the ON position (part "T" in figure 16-1);
- 14 - Completely unscrew screw "E" in figure 15-6 anticlockwise;
- 15 - Check the gas pressure, following section 15.7; 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 15.8 and checking the value in figure 15-8;



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

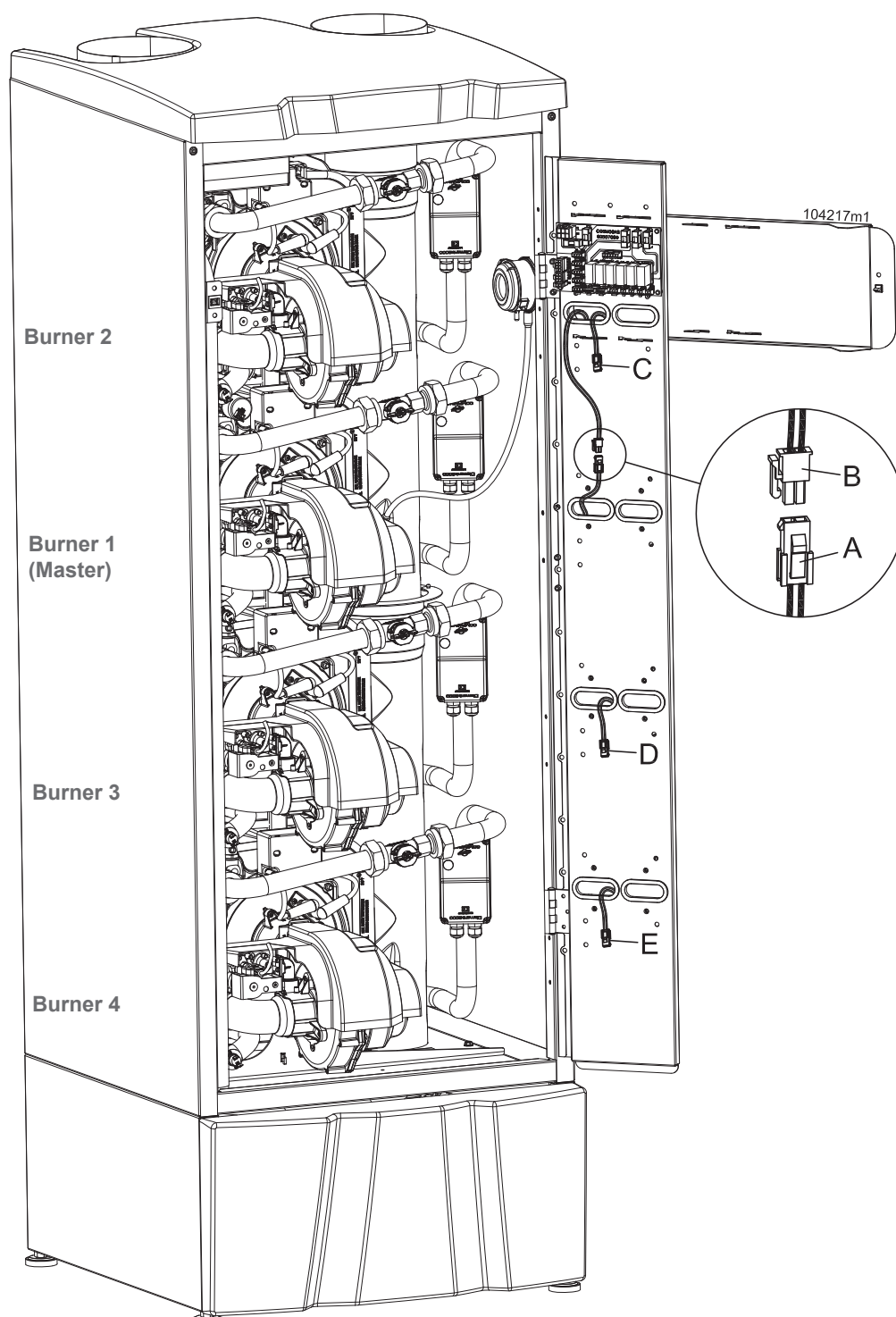
- 17.- Check the appliance output heat following section 15.9;
- 18.- on the front casing of the appliance, in the place of the label identifying the old adjustment status, apply the self-adhesive plate (see figure 15-7), bearing the new adjustment status of the appliance, as follows: apply label "B" if the appliance was converted from methane to LP gas; apply label "A" if the appliance as converted from LP gas to methane.



ATTENTION !!! If you smell gas:

- A - Do not activate any electrical appliances, including telephones or any objects that could create sparks;
- B - Immediately open the doors and windows to create an air current to quickly rid the room of gas;
- C - From another room or from a neighbour's if there is no other room, immediately call a professionally qualified technician or the gas supply company. If they are unavailable, call the Fire Brigade.

15 - COMMISSIONING



- A - Connector from Burner 1 (MASTER)
- B - Connector from display
- C - Connector from Burner 2
- D - Connector from Burner 3
- E - Connector from Burner 4

Figure 15-5 - Burner Position

15 - COMMISSIONING

15.5 - Converting appliance models from 100T to 280T from one type of gas to another

Appliances from 100T to 280T are multi-burners, which means that the type of gas must be converted on every burner.



ATTENTION !!! 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 (standard supplied with the appliance) is made up of

- label bearing the new type of gas;
- a gas nozzle for every burner;
- an instruction sheet;

To change the gas, proceed as follows:

- 1 - Convert "Burner 1" (MASTER). See figure 15-5 to identify "Burner 1" (MASTER);
- 2 - Convert "Burner 1" (MASTER), following points 1 to 16 in section 15.4;

After converting "Burner 1", proceed with "Burner 2" as described below:

- 3 - Convert "Burner 2", following points 1 to 16 in section 15.4;

After converting "Burner 2", proceed with "Burner 3" (if present) as described below:

- 4 - Convert "Burner 3", following points 1 to 16 in section 15.4;

After converting "Burner 3", proceed with "Burner 4" (if present) as described below:

- 5 - Convert "Burner 4", following points 1 to 16 in section 15.4;

After converting all the Burners, proceed as described below:

- 6 - Check the gas inlet pressure as described in section 15.7;
- 7 - Check the appliance output heat as described in section 15.9;



ATTENTION !!! The measurements must be taken with calibrated instruments that ensure an accurate reading.

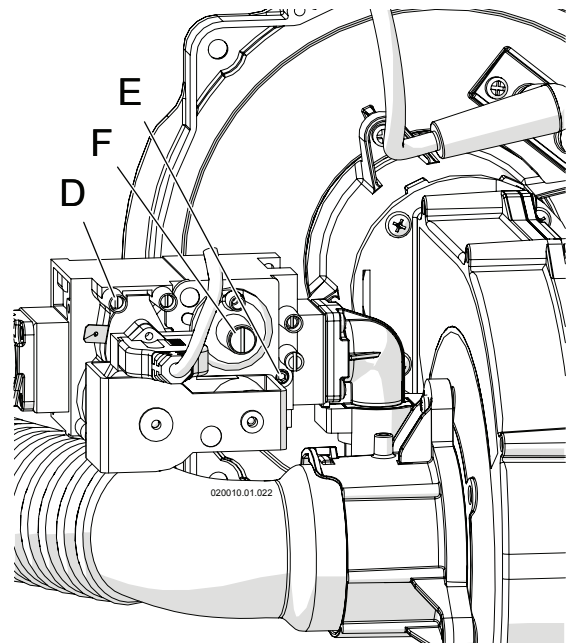
- 8.- on the front casing of the appliance, in the place of the label identifying the old adjustment status, apply the self-adhesive plate (see figure 15-7), bearing the new adjustment status of the appliance, as follows: apply label "B" if the appliance was converted from methane to LP gas; apply label "A" if the appliance as converted from

LP gas to methane.



ATTENTION !!! If you smell gas:

- A - Do not activate any electrical appliances, including telephones or any objects that could create sparks;**
- B - Immediately open the doors and windows to create an air current to quickly rid the room of gas;**
- C - From another room or from a neighbour's if there is no other room, immediately call a professionally qualified technician or the gas supply company. If they are unavailable, call the Fire Brigade.**



D - Gas inlet pressure plug.

E - CO2 adjustment screw.

F - Factory default adjustment screw (do not touch).

Figure 15-6 - Gas valve

15 - COMMISSIONING

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

62408090m11

Figure 15-7 - Label bearing the new adjustment status of the appliance





| | U.M | 60T | 70T | 100T | 115T | 140T | 180T 210T | 280T |
|--|------|-------------------|------|------|------|------|--------------|------|
| Gas supply minimum pressure | mbar | 10 | | | | | | |
| Gas supply maximum pressure | mbar | 45 | | | | | | |
| Nozzle diameter for Methane gas (G20) | mm | 8,9 | 9,5 | 8,9 | 8,9 | 9,5 | 9,5 | 9,5 |
| Nozzle diameter for Methane gas (G25) | mm | N.P. | N.P. | N.P. | N.P. | N.P. | N.P. | N.P. |
| Nozzle diameter for LP gas (G31) | mm | 6,2 | 6,5 | 6,2 | 6,2 | 6,5 | 6,5 | 6,5 |
| Nozzle diameter for LP gas (G30) | mm | 5,7 | 6,0 | 5,7 | 5,7 | 6,0 | 6,0 | 6,0 |
| Methane gas CO ₂ (G20) at maximum output heat | % | from 8,4 to 9,0 | | | | | | |
| Methane gas CO ₂ (G20) at minimum output heat | % | from 8,3 to 8,7 | | | | | | |
| Methane gas O ₂ (G20) at maximum output heat | % | from 4,7 to 5,1 | | | | | | |
| Methane gas O ₂ (G20) at minimum output heat | % | from 5,6 to 6,0 | | | | | | |
| Methane gas CO (G20) at maximum and minimum output heat | ppm | Less than 150 | | | | | | |
| Methane gas CO ₂ (G25) at maximum output heat | % | from 8,5 to 9,1 | | | | | | |
| Methane gas CO ₂ (G25) at minimum output heat | % | from 8,1 to 8,5 | | | | | | |
| Methane gas O ₂ (G25) at maximum output heat | % | from 4,7 to 5,1 | | | | | | |
| Methane gas O ₂ (G25) at minimum output heat | % | from 5,6 to 6,0 | | | | | | |
| Methane gas CO (G25) at maximum and minimum output heat | ppm | Less than 150 | | | | | | |
| LP gas CO ₂ (G31) at maximum output heat | % | from 9,9 to 10,5 | | | | | | |
| LP gas CO ₂ (G31) at minimum output heat | % | from 9,6 to 10,0 | | | | | | |
| LP gas O ₂ (G31) at maximum output heat | % | from 5,2 to 5,6 | | | | | | |
| LP gas O ₂ (G31) at minimum output heat | % | from 5,8 to 6,2 | | | | | | |
| LP gas CO (G31) at maximum and minimum output heat | ppm | Less than 250 | | | | | | |
| LP gas CO ₂ (G30) at maximum output heat | % | from 10,3 to 10,9 | | | | | | |
| LP gas CO ₂ (G30) at minimum output heat | % | from 9,9 to 10,3 | | | | | | |
| LP gas O ₂ (G30) at maximum output heat | % | from 4,9 to 5,3 | | | | | | |
| LP gas O ₂ (G30) at minimum output heat | % | from 5,7 to 6,1 | | | | | | |
| LP gas CO (G30) at maximum and minimum output heat | ppm | Less than 250 | | | | | | |

Figure 15-8 - Settings for the various operating gases

15 - COMMISSIONING


15.6 - Ignition

15.6.1 - Boiler ignition

- 1.- open the gas cock;
- 2.- power the appliance and position the main switch to ON (part "T" in figure 16-1);
- 3.- the appliance only switches on when the temperature required by the room thermostat is higher than the current supply temperature. Adjust the desired temperature for heating service using the  and  keys. If the external probe is connected (see section 13.1.4), make sure that the calculated temperature (see section 16.14, parameter **1012** or parameter **1107** for appliances from 115T to 280T) is higher than the current exchanger temperature and that the external temperature (see section 16.14 parameter **1004**) is lower than the external temperature that switches off the heating (see section 16.15 parameter **2020**);
- 4.- if the appliance is connected to a storage tank (see section 13.2), press the  and  keys to select the desired temperature of the domestic hot water.
- 5.- if the display shows a low water pressure error (see section 16.16.2), bleed the air again.

15.7 - Checking the supply gas pressure and any adjustments


The gas supply pressure must correspond with what is in the table in section 18. To check it, proceed as follows:

- 1.- close the gas cock;
- 2.- access the inner components of the appliance by following the procedure in section 17.2;
- 3.- loosen pressure plug "D" (see figure 15-6);
- 4.- connect to a manometer with a resolution of at least 0,1 mbar (1 mmH₂O). For models from 115T to 280T you can use any one of the valves;
- 5.- open the gas cock;
- 6.- make sure the pressure does not exceed 45 mbar;
- 7.- position the main switch to ON (part "T" in figure 16-1) 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 60T and 70T models, use parameter **2010**). 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 10 mbar (100 mmH₂O). If the pressure is lower, do not attempt to adjust the appliance; you must work upstream to reset proper pressure and gas flow rate.



ATTENTION !!! Do not touch screws "E" and "F" in figure 15-10. 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 60T and 70T models, use parameter **2010**).
 - 2.- close the gas cock;
 - 3.- disconnect the manometer and close pressure plug "D" again;
 - 4.- check for and gas leaks from pressure plug "D" (figure 15-6);
-  Do not force the pressure plug locking screws to avoid damaging the gas valve.



ATTENTION!!! Run the seal test exclusively with a soap-based water solution. Using naked flames is absolutely prohibited.

15 - COMMISSIONING

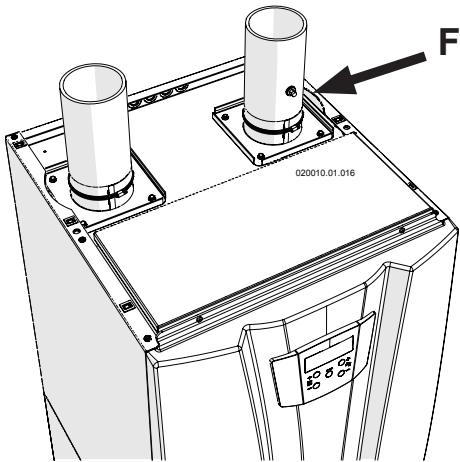
15.8 - Checking the CO2 seal and any adjustments

Table 15-8 shows the correct CO2 values for an appliance working in normal conditions at an altitude of less than 1000 metres. Values differing from those shown can cause malfunctions. To check and, if necessary, adjust said value a combustion analysis must be done. Proceed as follows:

15.8.1 - Checking the CO2 seal and any adjustments on 60T and 70T model appliances

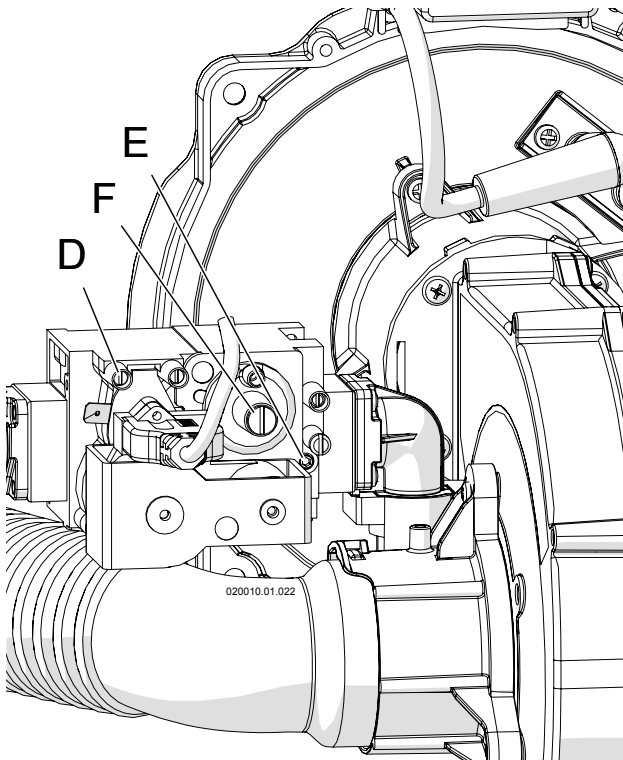


ATTENTION!!! If, during this procedure, a CO value greater than 1000 ppm is detected, stop the appliance and contact the retailer.



F - Combustion analysis socket

Figure 15-9 - Combustion analysis socket



D - Gas inlet pressure plug.

E - CO2 adjustment screw.

F - Factory default adjustment screw (do not touch).

Figure 15-10 - Gas valve

- 1.- If there isn't one already, a hole must be made for combustion analysis positioned about 200 mm from the flue exhaust fitting (see figure 15-9 near the plug, 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 boiler/water heater temperature;
- 4.- Access the installer menu (see section 16.15) and set parameter **20 10** to **HIGH**. The appliance 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 15-9;
- 7.- Compare the CO2 value detected with the one shown in table 15-8. Be sure to read the value for the type of gas being used. If the CO2 value does not match the one in table 15-8, it must be adjusted via screw "E" in figure 15-10. 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 CO2 value to stabilise before continuing, until you reach the desired value.
- 8.- Once the correct CO2 value as per table 15-8 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 15-8. 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 15-9 with appropriate plug "F" as per the instructions from the drain pipe manufacturer.




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

15 - COMMISSIONING

15.8.2 - Checking the CO2 seal and any adjustments on appliance models from 100T up to 280T



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

- 1.- If there isn't one already, a hole must be made for combustion analysis positioned about 200 mm from the flue exhaust fitting (see figure 15-9 near the plug, part "F").
- 2.- Put the appliance in stand-by, shutting down all heating demands (remove the room thermostat bridge, if any, or adjust the heating service to off using the  key).
- 3.- Make sure that the required temperature is higher than the boiler/water heater temperature;
- 4.- Access the installer menu (see section 16.15) 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 15-9;
- 7.- Compare the CO2 value detected with the one shown in table 15-8. Be sure to read the value for the type of gas being used. If the CO2 value does not match the one in table 15-8, it must be adjusted via screw "E" in figure 15-10. 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 15-8 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 15-8. 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.



ATTENZION!!! The CO2 reading, at low fire, could be affected by the natural draught of the chimney (negative pressure inside the chimney). If this is the case, take the CO2 reading removing the correspondent flue gas sensor.


- 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 15-9 with appropriate plug "F" as per the instructions from the drain pipe manufacturer.



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

15.9 - 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 16-1) 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 60T and 70T 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 18 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 18;
 - c) That the air intake filter (part "11" in figures 3-3, 3-5 and 3-7) is clean;
5. If the gas flow rate is within the tolerance, set parameter **2200** to **OFF**. In 60T and 70T 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 15.9.

15.10 - Minimum water flow rate

The appliance has a protection system against low water flow rate. The water flow rate measuring device (part "16" in figure 3-1) continuously measures the flow rate on each exchanger. If the flow rate drops below the "Minimum operating water flow rate" referred to in section 18, the appliance automatically switches off and, if the flow rate does not increase after three minutes, the corresponding error appears on the display.

16 - USE

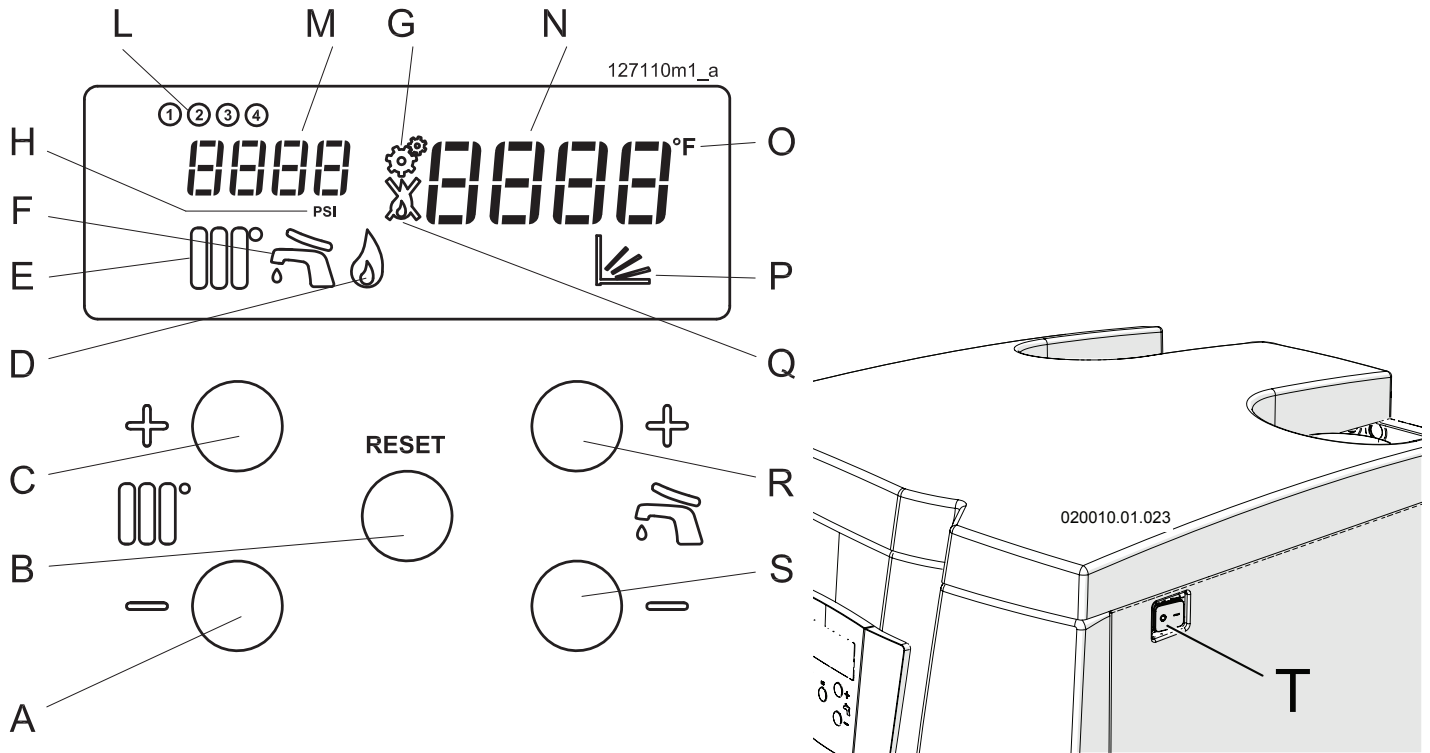


Figure 16-1 - Control panel

FIGURE 16-1 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 heating or domestic service
Icon off = Service off
Icon on = Service active but not working
Flashing icon = Service active and working
- F - State of domestic service with accumulation:
Icon off = Service off
Icon on = Service active but not working
Flashing icon = Service active and working
- G - "Installer menu" access icon
- H - Unit of measurement of the displayed pressure
- L - Burner unit indicator
① = Burner 1 (master)
② = Burner 2
③ = Burner 3
④ = Burner 4
- M - Water pressure or indicator of the different parameters in the various menus
- N - Heating or domestic hot water temperature or indicator of the values assumed by the various parameters
- O - Unit of measurement of the displayed temperature
- P - Heating service adjusted by the external probe
- R - Key to increase the temperature of the domestic hot water with storage tank and change the parameter values
- S - Key to reduce the temperature of the domestic hot water with storage tank and change the parameter values
- T - on/off switch

16.1 - Checking water pressure

16.1.1 - Checking boiler water pressure

If the pressure inside the heating circuit drops below 0,5

bar, display "N" in figure 16-1 displays **Err 59** to show that correct pressure needs to be restored. To do so, proceed as follows:

- 1.- open the device provided for by the installed upstream of the appliance to load the system;
- 2.- check the pressure on view "M" in figure 16-1; it must reach a pressure of 1,5 bar (the **Err 59** warning must disappear);
- 3.- close the filling device provided for by the installer upstream of the appliance.



ATTENTION !!! During normal operation the device provided for by the installer upstream of the appliance to load the system must always remain in the closed position.

If, over time, the pressure goes down, restore the correct value. In the first month of operation, it might be necessary to repeat this operation several times to remove any air bubbles in the system.

16 - USE

16.2- 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 16.14) and the "installer menu" (section 16.15). During operation, the display shows the appliance operating status in addition to other information as described in section 16.16 (Diagnostics).


16.3 - Display

During normal operation, you can consult further parameters through the "User menu" (see section 16.14) 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 16.13 (Energy saving).

16.4 - Ignition and shutdown procedure

To switch ON the appliance, proceed as follows:

- 1.- open the gas cock;
- 2.- power the appliance;
- 3.- If the display shows **Err 55**, 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, if any, and the heating temperature respectively as per sections 16.5, 16.6 and 16.7.

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 **L o c k** along with the  icon and the corresponding flashing ① ② ③ ④ burner icon. Press the RESET key to restore normal operating conditions. The appliance will automatically attempt another ignition.



ATTENTION!!! 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 16-1 to cut power;
- 2.- close the gas cock;

16.5 - Boiler domestic hot water adjustment

If the appliance is installed for double service (heating and domestic hot water production), adjust the domestic hot water



temperature using the  + and  - keys (see figure

16-1). When the keys are pressed, the display, part "N" in figure 16-1, shows the requested D.H.W. temperature. The temperature adjustment ranges goes from 40°C to 60°C.





ATTENTION!!! Domestic water temperature over 51°C can cause scalding. Children, the disabled and the elderly are at high risk for scalds. Check the water temperature before getting into a bath or shower.

16.6 - Boiler heating adjustment

Adjust the appliance heating temperature using the  + or  - keys (see figure 16-1). The room thermostat switches on the circulation pump in order to meet heating requests.

16.7 - Thermostat type heating adjustment

The boiler is standard adjusted with parameter **2003** at **0**, that is, the boiler supplies the heating system with hot water

at a temperature adjusted using the  + and  - keys. Any room thermostats enable or disable the heating function to adjust the temperature of the rooms. To take full advantage of boiler performance, it is advisable to adjust the heating temperature to a value that is just enough to obtain the desired room temperature. If the season grows colder, progressively increase the heating temperature value. Do the opposite when the season grows milder.

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16.8 - Climatic adjustment

Adjust parameter **2003** to **1** using the "Installer menu". The heating supply temperature is related to the external temperature sensor according to the algorithm referred to in figure 16-2. To adapt the calculation line to the various rooms/climatic conditions, all the adjustment parameters must be set according to the following sections.

16.8.1 - Climatic adjustment: setting the parameters

Through the "Installer menu" (see section 16.15), set:

- **2020** = "External heating switch-off temperature", adjustable between 0 and 35°C. When the external temperature reaches the value set in this parameter, the heating switches off automatically. When the external temperature drops below that value again, the heating automatically switches back on. The recommended start value is 22°C.
 - **2021** = "External design temperature (winter)", adjustable between -20 and 5°C. This is the external design temperature used to define the output heat the system requires. The recommended start value for a typical home is -5°C;
 - **2022** = "Supply temperature corresponding to the external design temperature (winter)", adjustable between 0 and 80°C. The supply temperature takes on the value set in this parameter when the external temperature correspond with what is set in parameter **2021**. The recommended start values are: 40°C for low temperature systems (floor heating); 70°C for high temperature systems (radiators);
 - **2023** = "Spring external temperature", adjustable between 0 and 30°C. This is the external temperature at which you wish the heating to reach its minimum supply temperature. The recommended start value is 18°C.
 - **2024** = "Supply temperature corresponding to spring external temperature", adjustable between 0 and 40°C. The supply temperature takes on the value set in this parameter when the external temperature correspond with what is set in parameter **2023**. The recommended start values are: 30°C for low temperature systems (floor heating); 42°C for high temperature systems (radiators);
 - In addition, you can set the minimum and maximum heating temperature, using respective parameters **3016** and **3015** in section 19.
- If, for some reason, the heating service does not correspond to the load, using parameters **2022** (Supply temperature corresponding to the external design temperature (winter)), you can raise or lower the calculated temperature and match the desired room temperature.

16.8.2 - Climatic adjustment: switching the heating system on and off

The climatic adjustment service is completely automatic, even as far as switching off at the end of the season and reignition at the beginning of the season is concerned, via parameter

2020. When the external temperature exceeds the value set in this parameter, the heating switches off automatically. When the external temperature drops below the value set in this parameter, the heating switches back on automatically.

16.9 - Timing of the various functions

To protect the lifespan of the appliance, improve the comfort generated and increase energy savings, timers were put in during operation. These timers are:

- Pump post-circulation: every time the room thermostat detects the end of a heating service, the pump continues to work for 4 minutes;
- Pump anti-lock: every 24 hours, the heating pump and the domestic hot water pump (if present) are forced;
- Ignition delay: In all operating modes, every time the burner switches off, it waits 3 minutes before switching back on.

16.10 - Pump anti-locking

During the summertime, the circulator switches on once every 24 hours for 15 seconds to prevent any limescale build-ups from clogging it. At the same time, the diverter valve and the hot water tank pump (if present) are activated for the same reason.

16.11 - Antifreeze protection



ATTENTION !!!

In order for the antifreeze protection to be effective, the appliance must be left with the power and gas supply on and the two services (domestic water and heating)

in the OFF position.



ATTENTION !!!

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

Once the boiler temperature of 10°C is reached, the heating 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.

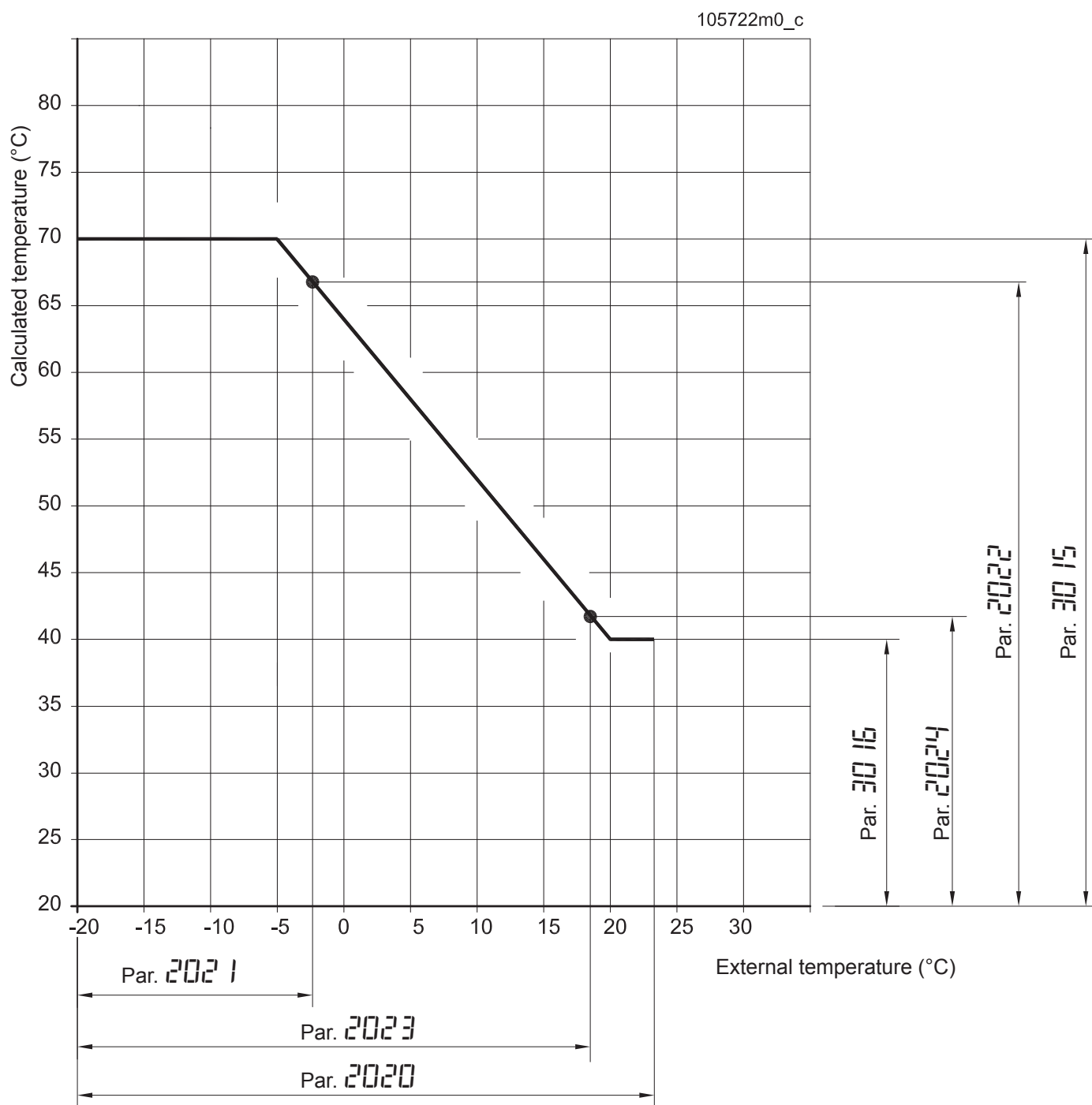
If you do not use the appliance for a long period of time (over a year), we recommend draining it, following the procedure in section 17.10.

16.12 - Energy Saving

To reduce display energy consumption (figure 16-1), it switches off automatically 5 minutes after the last operation done. You

can disable this function or edit the time via parameter **2100** in the "installer menu" (section 16.15). If you set the parameter

to **0**, the display will remain on constantly.



Par. 2020 = External heating switch-off temperature

Par. 2021 = External design temperature (winter)

Par. 2022 = Supply temperature corresponding to the external design temperature (winter)

Par. 2023 = Spring external temperature

Par. 2024 = Supply temperature corresponding to spring external temperature

Par. 30 16 = Minimum supply temperature

Par. 30 15 = Maximum supply temperature



Figure 16-2 - Climatic adjustment graphic

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16.13 - "User menu"

Pressing the RESET key for 2 seconds accesses the "user menu". Display "M" in figure 16-1 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 100T to 280T, 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 17.8. 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 (if present) | °C |
| 1004 | External temperature (visible when an external temperature sensor is installed) | °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 | ON/OFF |
| 1011 | Domestic hot water circuit pump status | ON/OFF |
| 1012 | Calculated heating setpoint (with external probe enabled) (only for 60T and 70T models. See Parameter 1107 for the other models) | °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 16.16.1) (255 means no block) | / |
| 1052 | Burner 1 - Last recorded error (Err) (see section 16.16.2) (255 means no error) | / |
| 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 errors (Err) | 1: value in minutes; 2: value in hours; 3: value in days; 4: value in weeks; |
| 1060 | * interval of time between the last two lock-ups (Loc) | |
| 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 100T, 115T, 140T, 210T and 280T models) (see Parameter 1012 for the other models) | °C |
| 1120 | Multi-burner: Burner 1 modulation level | % |
| 1121 | Multi-burner: Burner 2 modulation level | % |
| 1122 | Multi-burner: Burner 3 modulation level | % |
| 1123 | Multi-burner: Burner 4 modulation level | % |

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

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

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

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

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

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16.14 - "Installer menu"



ATTENTION !!! 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 16-1 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 100T to 280T 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 17.8.



ATTENTION !!! 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 | BOILER default value | WATER HEATER default value | Cus-tomised values |
|-----------|---|------|--|----------------------|----------------------------|--------------------|
| 2001 | Minimum output heat level | % | From 1 to 50 | 1 | 1 | |
| 2002 | Maximum output heat level | % | From 1 to 100 | 100 | 100 | |
| 2003 | Heating operating mode | nn | 0 = With room thermostat 1 = External probe with TA 2 = External probe closing TA reduce of 2027 3 = Permanent heating closing TA reduce of 2027 4 = With 0-10 Volt input 5 = N/A | 00 | 00 | |
| 2004 | Stand-by time after differential maximum | sec | From 10 to 30 | 30 | 30 | |
| 2005 | Heating pump post-circulation | sec | From 10 to 260 | 240 | 240 | |
| 2010 | Burner 1 - Burner forcing | / | Off = No forcing Low = Minimum output heat Ign = Ignition output heat High = Maximum output heat | OFF | OFF | |
| 2011 | Main circuit pump and motorised 2-way valve forcing (Burner 1) | / | On or OFF | OFF | OFF | |
| 2012 | Heating circuit pump forcing | / | On or OFF | OFF | OFF | |
| 2013 | Domestic hot water circuit pump forcing | / | On or OFF | 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 | °C | From 0 to 35 | 22 | N/A | |
| 2021 | Climatic adjustment : external design temperature (winter) | °C | From -20 to 5 | -5 | N/A | |
| 2022 | Climatic adjustment: supply temperature corresponding to the external design temperature (winter) | °C | From 0 to 80 | 80 | N/A | |




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| | | | | | | |
|------|--|-----|--|-----|-----|---|
| 2023 | Climatic adjustment : spring external design temperature | °C | From 0 to 30 | 20 | N/A | |
| 2024 | Climatic adjustment: supply temperature corresponding to the spring external temperature | °C | From 0 to 40 | 40 | N/A | |
| 2027 | Nighttime Reduction | °C | From 0 to 50 | 10 | N/A | |
| 2040 | N/A | N/A | N/A | N/A | N/A | |
| 2041 | N/A | N/A | N/A | N/A | N/A | |
| 2042 | Burner 1 - Protection against frequent ignitions: time | sec | From 10 to 900 | 180 | 180 | |
| 2043 | Burner 1 - Protection against frequent ignitions: temperature differential | °C | From 0 to 20 | 16 | 5 | |
| 2062 | Domestic water pump post-circulation | sec | From 10 to 255 | 240 | 240 | |
| 2063 | Maximum D.H.W. priority time | min | From 1 to 60 | 30 | N/A | / |
| 2067 | D.H.W. production priority | / | 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; | 2 | N/A | |
| 2100 | Display energy saving | min | From 0 to 30 = delay to switch-off in minutes. | 5 | 5 | |
| 2101 | Multi-burner: emergency mode | / | Yes or No | Yes | Yes | |
| 2102 | Multi-burner: Emergency temperature adjustment | °C | from 20 to 65 | 45 | 45 | |
| 2103 | Multi-burner: ignition delay | sec | from 1 to 900 | 180 | 15 | |
| 2104 | Multi-burner: switch-off delay | sec | from 1 to 900 | 180 | 15 | |
| 2105 | Multi-burner: burner ignition temp. delta | °C | from 0 to 20 | 5 | 5 | |
| 2106 | Multi-burner: burner switch-off temp. delta | °C | from 0 to 20 | 5 | 5 | |
| 2107 | Multi burner: maximum temp. increase with respect to calculated temp. | °C | from 0 to 20 | 10 | 4 | |
| 2108 | Multi burner: maximum temp. decrease with respect to calculated temp. | °C | from 0 to 20 | 20 | 4 | |
| 2109 | Multi-burner: Subsequent burner ignition | % | from 1 to 100 | 70 | 70 | |
| 2110 | Multi-burner: Subsequent burner switch-off | % | from 1 to 100 | 10 | 10 | |
| 2111 | Multi-burner: Burner rotation | dd | from 0 to 9 | 6 | 6 | |
| 2113 | Multi-burner: Modulation start delay | min | from 0 to 60 | 5 | 0 | |
| 2114 | Burner 1: Main circuit pump shutdown time | sec | from 0 to 255 | 240 | 240 | |
| 2200 | Forcing: All the Burners together. | \ | Off, Low, Ign, High | OFF | OFF | |
| 2201 | Forcing: Burner 1 (Master). | \ | Off, Low, Ign, High | OFF | OFF | |
| 2202 | Forcing: Burner 2. | \ | Off, Low, Ign, High | OFF | OFF | |
| 2203 | Forcing: Burner 3. | \ | Off, Low, Ign, High | OFF | OFF | |
| 2204 | Forcing: Burner 4. | \ | Off, Low, Ign, High | OFF | OFF | |

N/A = Not Applicable

16.15 - Diagnostics

During normal appliance operation, display “N” in figure 16-1 continuously shows the appliance work status via the following indications:

| Parameter | Parameter description | Display on display “N” in figure 16-1 |
|---|--|---------------------------------------|
|  | Antifreeze function active | Boiler temperature (°C) |
|  | Domestic hot water with storage tank operating status | Domestic hot water temperature (°C) |
|  | Heating or instantaneous domestic hot water operating status | Supply temperature (°C) |

16.15.1 - Diagnostics: “Loc” lock

| Lock-up | Lock-up description | Checks | Solutions |
|-----------|--|--|--|
| Loc 1 | No flame detected after 5 consecutive ignition attempts. | A - Supply gas pressure (see section 15.7); B - Sparks on the ignition electrodes (see section 17.5); C - Correct gas pressure and CO ₂ value (see sections 15.7 and 15.8); D - 230Vac power supply to the gas valve; E - 0,88 Kohm and 6,59 Kohm electrical resistance of the two gas valve coils F - 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 17.12) | A - If the pressure is incorrect, it must be restored upstream of the appliance; B - Check and correct electrode positions (section 17.5); C - Remove any obstructions in the air intake and flue exhaust ducts; D - If the supply current to the gas valve is not 230 Vac, replace the control board; E - If the resistance does not match, replace the gas valve; F - If the ionisation current does not match, check the CO ₂ as per section 15.8. 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 | A - Check whether the supply safety thermostat has tripped; B - Check whether the flue exhaust safety fuse has tripped; | ⚠ATTENTION !!! If the flue exhaust temperature safety fuse trips, you must contact the appliance manufacturer to avoid serious damage to the exchanger. |
| Loc 3 | Gas valve loses power during operation | Make sure the electrical connections between the gas valve and control board are in good condition; | A - If the electrical connections are interrupted, restore them; B - 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; | A - If the electrical connections are interrupted, restore them; B - If the connections are in good condition, try replacing the gas valve or the control board; |
| Loc 5 (*) | Gas valve circuit | A - Check whether the supply safety thermostat has tripped; B - Check whether the flue exhaust safety fuse has tripped; | ⚠ATTENTION !!! If the flue exhaust temperature safety fuse trips, you must contact the appliance manufacturer to avoid serious damage to the exchanger. |
| 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 | A - Check the 230Vac power supply to the fan; B - Check the PWM connection to the fan; | A - If the power supply does not match, replace the control board; B - If there is no fan PWM dialogue, replace the control board; C - 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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| | | | |
|------------|---|--|--|
| Loc 20 | Flame lost three times | <p>Make sure: that the ionisation current is at a value higher than 4 (follow the procedure in section 17.12)</p> <p>Make sure: that the flue exhaust is appropriately protected from obstructions caused by gusts of wind</p> | <p>If the ionisation current is not over 4, you must check the CO₂ (follow section 15.8) 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.</p> <p>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.</p> |
| 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 | <p>A - Check whether the heating supply safety thermostat has tripped;</p> <p>B - Check whether the flue exhaust temperature safety fuse has tripped;</p> | <p>⚠ATTENTION !!! If the flue exhaust temperature safety fuse trips, you must contact the appliance manufacturer to avoid serious damage to the exchanger.</p> |
| 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 (*) | Interlock input | <p>A - Check LWCO connection;</p> <p>B - Check flue blocked pressure switch;</p> | <p>A - If LWCO intervenes, try to reset it.</p> <p>B - Check if flue gas line is free from any blockage</p> |
| Loc 30 | Software error inside command board | | Replace the command and control board |
| Loc 31 | Flame lost three times | <p>A - Check the detection electrode;</p> <p>B - Make sure that the flue exhaust is appropriately protected from obstructions caused by gusts of wind.</p> <p>C - Check for any flue exhaust recirculation</p> | <p>A - Try replacing the detection electrode.</p> <p>B - Check for and, if necessary, remove any obstructions from the air intake and flue exhaust ducts;</p> <p>C - Find the cause of the flue exhaust recirculation</p> |
| 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 | <p>a-make sure the flue gas sensor meets the requirement in section 17.14.</p> <p>b - Make sure that the flue gas sensor (parameter 1006) increases the temperature when the burner ignites.</p> | <p>a-If the flue gas sensor does not meet section 17.14, it must be replaced.</p> <p>b - If the temperature does not rise, replace the flue gas temperature sensor or the command and control board.</p> |

* This error stops all the burners

16.15.2 - Diagnostics: “E” errors

| 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 | Low water pressure error | Check the state of the pressure measuring device | Replace the pressure measuring device. |
| Err 56 | Low water pressure error | Check the state of the pressure measuring device | Replace the pressure measuring device. |
| Err 57 | Low water pressure error | Check the state of the pressure measuring device | Replace the pressure measuring device. |
| Err 58 | Low water pressure error | Check the state of the pressure measuring device | Replace the pressure measuring device. |
| 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 | A - Check the combustion output of the burner in error; the output must be higher than 97% (referring to the PCI). B - Make sure the flue exhaust temperature sensor resistance matches with the graphic in section 17.14. | A - If the output is lower than 97%, try cleaning the flue gas side and the water side of the heat exchanger. B - 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 17.14. | If the sensor does not match, it must be replaced. |
| Err 62 (*) | Condensate level sensor error | A - Make sure the condensate exhaust duct is not obstructed; B - Check the state of the condensate neutraliser; | A - Free the condensate exhaust duct of any obstructions; B - Replace the product contained in the condensate neutraliser; |
| Err 64 | Frequency signal error or WD communication error | A - Check the signal frequency. It must be between 55 and 65 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 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 55 and 65 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. |

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|------------|---------------------------------------|--|--|
| 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 |
| Err 72 | Supply sensor open | Make sure the sensor electrical resistance matches with the graphic in section 17.14. | If the sensor does not match, it must be replaced. |
| Err 73 | Return sensor open | Make sure the sensor electrical resistance matches with the graphic in section 17.14. | 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 17.14. | 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 17.14. | 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 17.14. | 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 17.14. | 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 17.14. | 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 19) | |
| 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 burner 2,3 or 4 | When burner 1 (MASTER) goes in a general error, will stops all others burner generating an Err 109 | Resolve the error to burner 1 (MASTER) |
| Err 110 | Flapper valve not open error | | A - Check for and, if necessary, remove any obstructions in the air intake and flue exhaust ducts; B - 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. | A - Increase the water flow rate to the system; B - Check for and, if necessary, remove any obstructions from the system. |
| Err 115 | Master board error | | Reset via parameter 3013. |
| Err 116(*) | Multiple burner communication failure | A - BUS communication interrupted B - A burner is not powered | A - Check the BUS connection. B - Restore power to all the burners |
| NO CONN | Microprocessor locked up | A - Make sure that the pressure measuring device wires are not short circuiting B - Make sure that the supply measuring device wires are not short circuiting C - Check display wires are connected to the burner 1 (MASTER) | A - If it is not short circuiting, replace the pressure measuring device (or disconnect it via menu 3000). B - If it is not short circuiting, replace the supply measuring device (or disconnect it via menu 3000). C - If the display is not connected to burner 1 (MASTER) shows "NO CONN". D - If it is none of the above cases, replace the control board and/or the display. |

* This error stops all the burners


17 - MAINTENANCE


17.1 - General warnings

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;

 **ATTENTION!!! The appliance must only be serviced by a professionally qualified technician.**

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

 **ATTENTION!!! Close the gas cock before any maintenance operations**

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

| MAINTENANCE PROTOCOL |
|--|
| <div><div>- Make sure there are no gas leaks (Follow section 17.1.1.);</div><div>- Make sure the air intake and flue exhaust system is in good conditions (Follow section 17.1.2);</div><div>- Make sure the system water pressure is correct (Follow section 17.1.3.);</div><div>- Check the ignition and detection electrodes (Follow section 17.1.4.);</div><div>- Clean the burner and the flue gas side main exchanger and make sure the heat insulators are in good condition (Follow section 17.4.);</div><div>- Clean the air intake filter (Follow section 17.6.);</div><div>- Clean the condensate exhaust system (Follow section 17.7.).</div><div>- Check appliance performance (Follow section 17.13.);</div></div> |

17.1.1 - 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.


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

17.1.2 - Making sure the air intake and flue exhaust ducts are in good conditions

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.

17.1.3 - Checking the system water pressure

- 1.- Make sure the system is full of water and under pressure as shown in section 18 technical features.
- 2.- Make sure there are no leaks in the hydraulic connections.

 **ATTENTION!!! Repair any system or appliance leaks. Continuously adding new water leads to increased minerals that reduce the flow cross-section, decreasing heat exchange and causing the heat exchanger to overheat. All of this leads to failures and reduced appliance life.**

17.1.4 - Checking the ignition and detection electrodes

- 1.- Remove the burner fan unit (as shown in section 17.3).
- 2.- Clean any operating material build-up from the electrodes.
- 3.- Make sure the electrodes are in the correct position as shown in section 17.5.

17 - MAINTENANCE

17.2 - Disassembling the casing and accessing the inner components

To disassemble the casing, proceed as follows (refer to figure 17-1):

- 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 fixing screw located on the left and turning it as shown in the figure.
- 6.- Unscrew screw "G";
- 7.- Lift cover "F";

17.3 - Disassembling the burner fan unit

To disassemble the burner fan unit, proceed as follows:

- 1.- close the gas adduction cock and disconnect power;
- 2.- access the inner components following section 17.2;
- 3.- disassemble spark generator "A" in figure 17-2, unscrewing screws "D" in figure 17-2 and disconnecting it from the ignition glow plugs.

- 4.- disassemble air manifold "A" in figure 17-3, turning it clockwise then removing it towards the left;
- 5.- unscrew nut "H" in figure 17-4, being careful of the gasket on the connection;
- 6.- with the aid of a flathead screwdriver, remove spring "A" in figure 17-4;
- 7.- remove the electrical plug from the gas valve;
- 8.- pull the gas valve out upwards, being careful of O-ring "L" (see figure 17-4);
- 9.- Unscrew the four bolts "B" in figure 17-5;
- 10.- remove the fan/burner unit (part "C" in figure 17-5).

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 17-4, 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 Oring "L" in figure 17-4. 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 17-4.



ATTENTION!!! Run the seal test exclusively with a soap-based water solution. Using naked flames is absolutely prohibited.

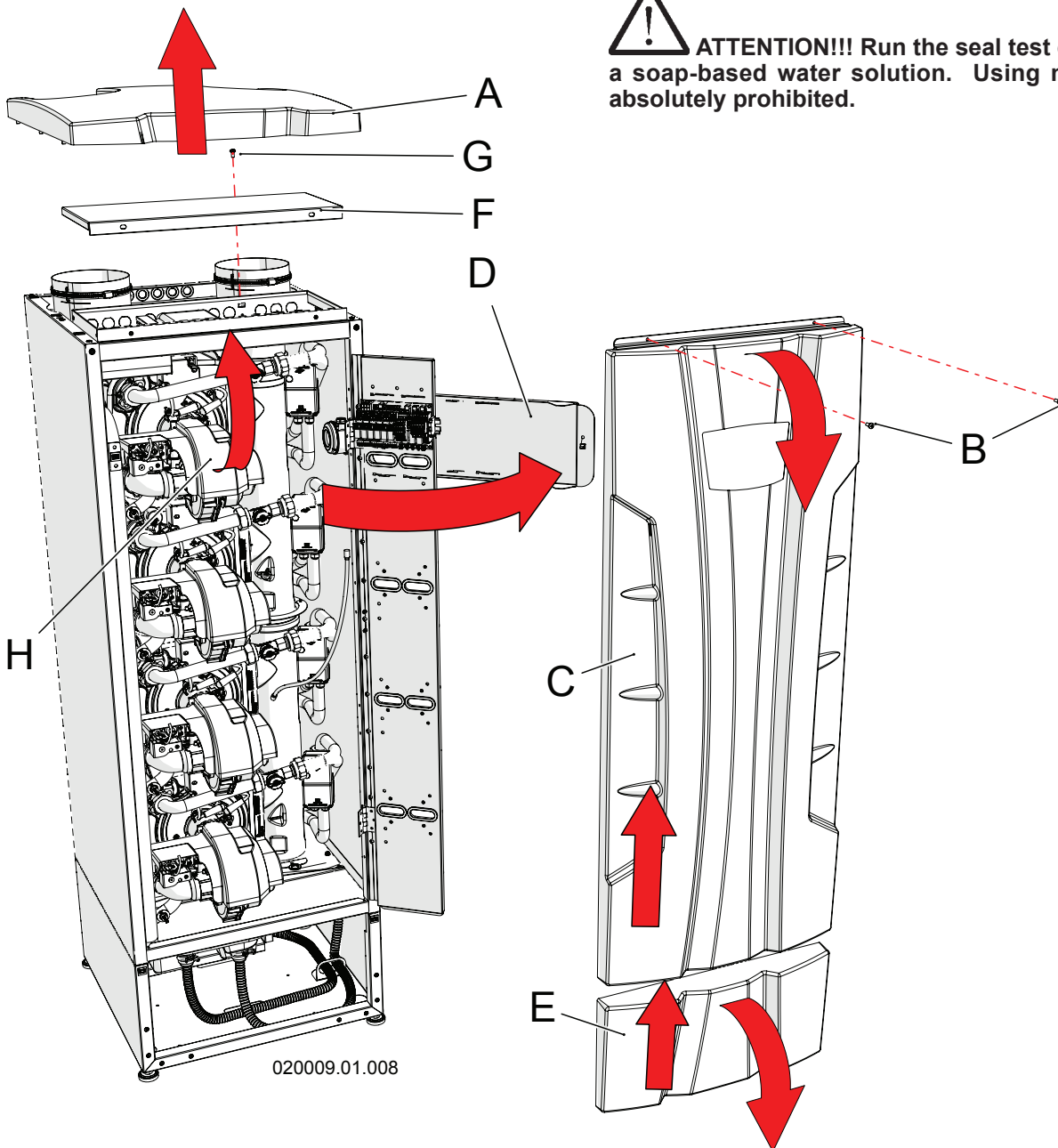


Figure 17-1 - Disassembling the casing and opening the control panel

17 - MAINTENANCE

17.4 - 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 17-5 when not otherwise specified):

- 1.- access the inner components following section 17.2;
- 2.- disassemble the fan burner unit following section 17.3;
- 4.- Run a cylindrical brush with nylon bristles inside combustion chamber "H"

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

- 5.- Using an extractor, suction the unburnt residues inside combustion chamber "H";

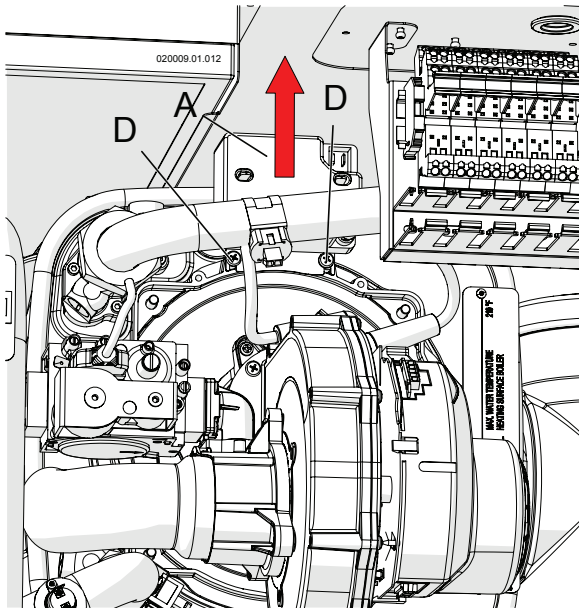


Figure 17-2 - Spark generator disassembly

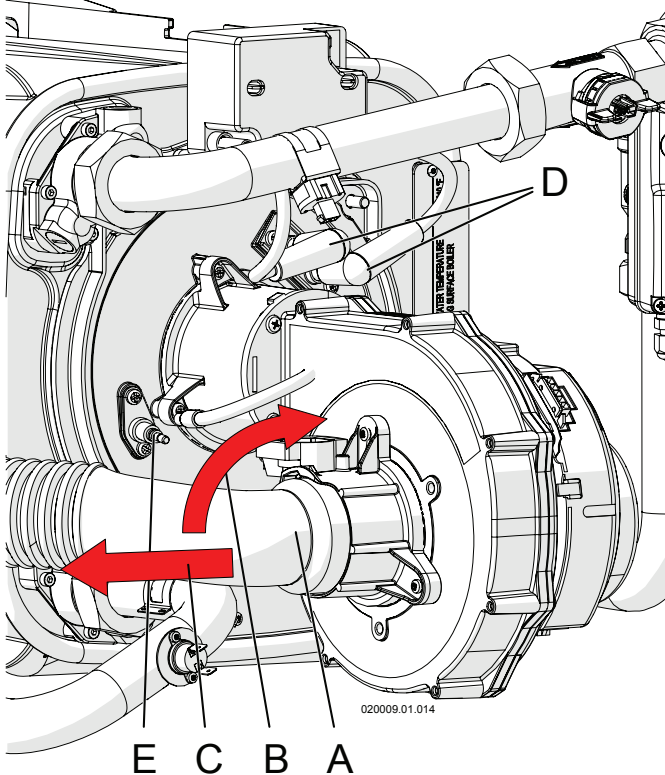


Figure 17-3 - Air manifold disassembly

- 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 cock;
- 9.- restore power.
- 10.- make sure there are no gas leaks between the removed joints;



ATTENTION !!! Run the seal test exclusively with a soap-based water solution. Using naked flames is absolutely prohibited.



ATTENTION !!! 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 17-5). If necessary, replace them along with burner gasket "T" (see figure 17-5), requesting the specific kit, code 62632006.

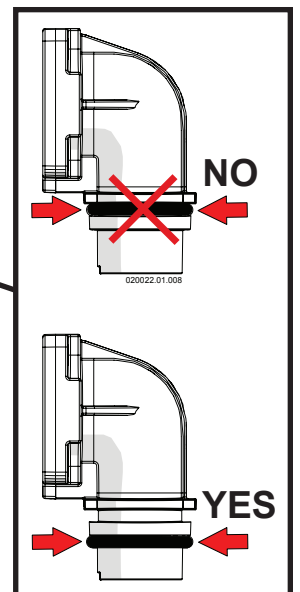
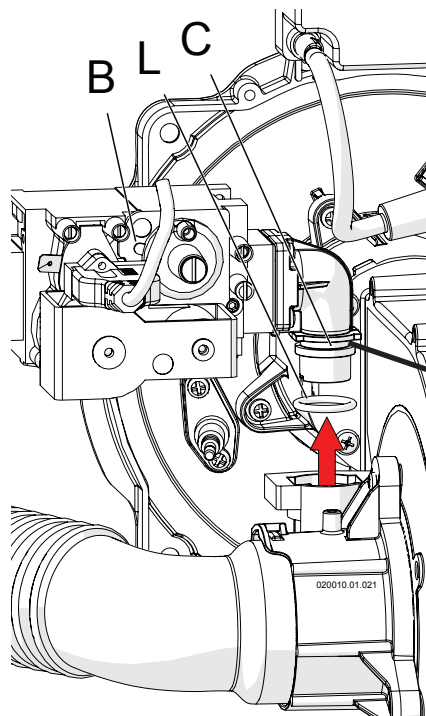
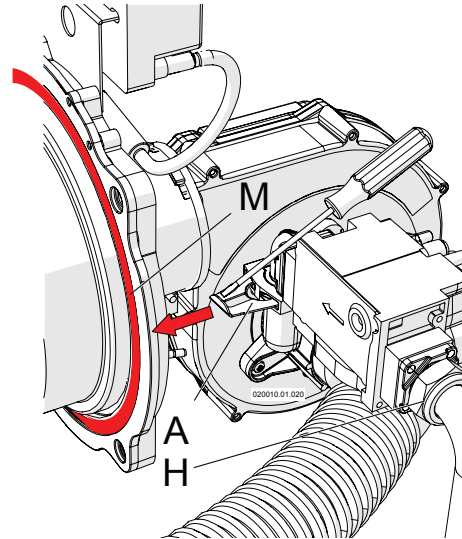


Figure 17-4 - Gas valve disassembly

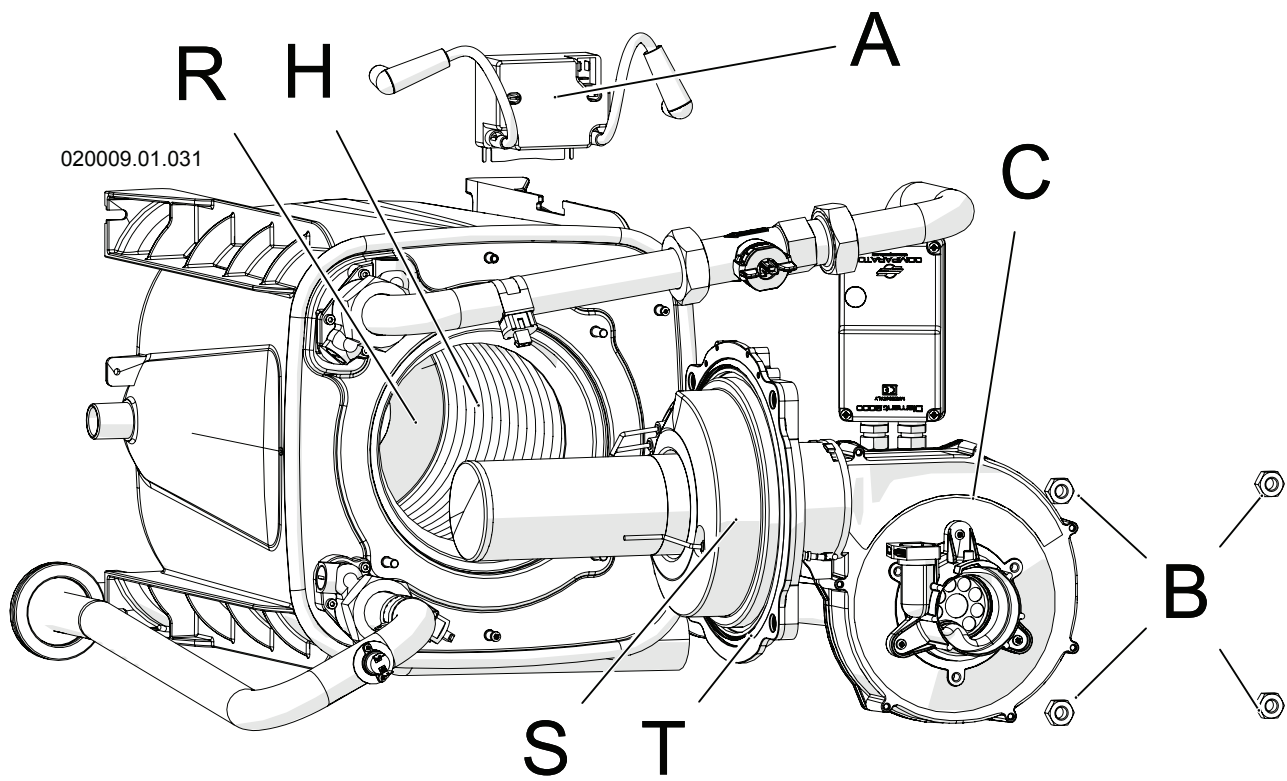


Figure 17-5 - Disassembling the burner fan unit

GASKET

BURNER UNIT

020009.01.032

⚠ ATTENTION !!! The gasket ensures combustion chamber seal. If the gasket is damaged, do **NOT** reuse it. It must be replaced along with the burner unit. To replace it, consult the manufacturer.

17 - MAINTENANCE

17.4.1 - Thermal insulations

Thermal insulations must be checked every year and replaced if they are cracked or damaged. See Figures below where the thermal insulations (items "C" and "E") are shown already disassembled from heat exchanger and burner.

For replacement information see the spare parts section.

- A = Fixing screw
- B = Washer
- C = Thermal Insulation
- D = Stainless steel tube
- E = Thermal Insulation
- F = White thermal insulation
- G = Burner
- H = Gasket
- L = Ignition electrodes
- M = Screws
- N = Detection Electrode
- Q = White thermal insulation
- R = Gasket
- S = Gasket

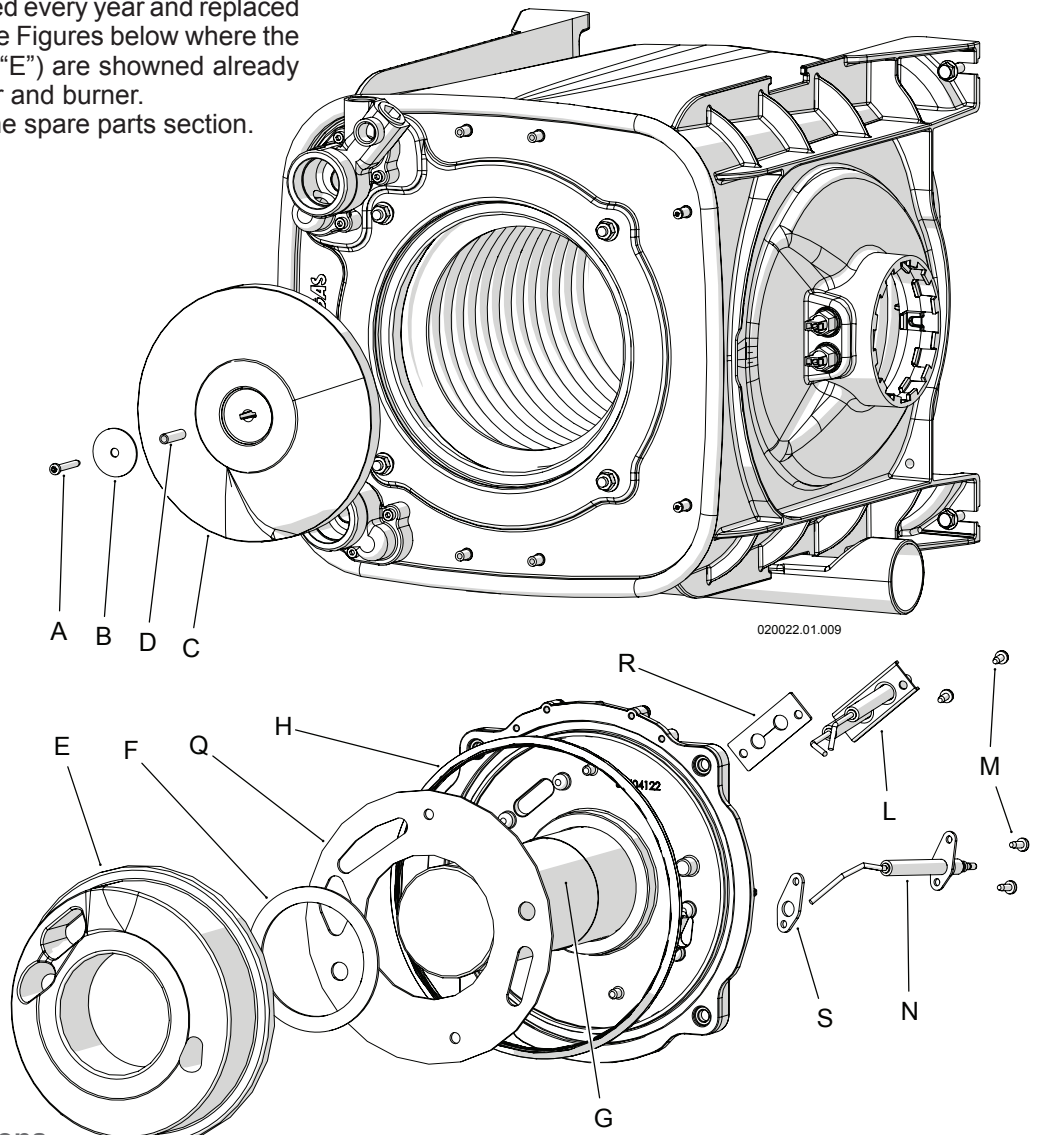
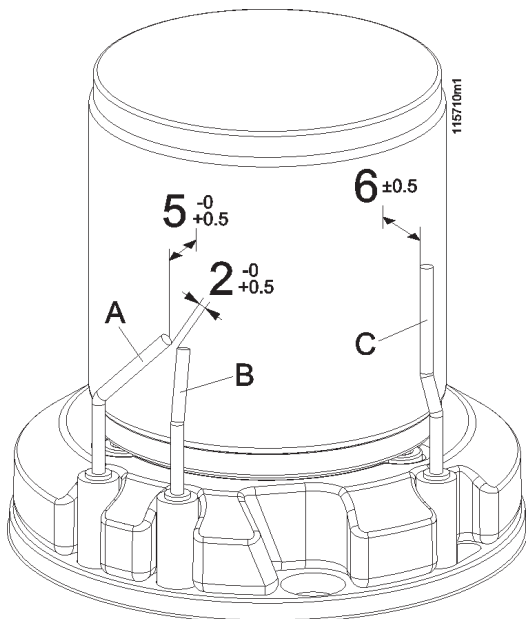


Figure 17-6 - Thermal insulations



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

Figure 17-7 - Positioning electrodes on the burner

17.5 - Positioning the ignition and ionisation electrodes properly

For the appliance to work well, it is essential for the electrodes to be positioned properly (refer to figure 17-7):

- 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 17-7.

17 - MAINTENANCE

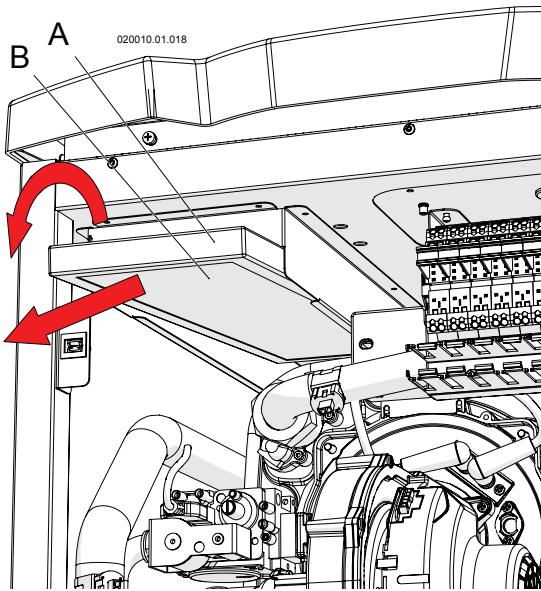


Figure 17-8 - Air intake filter disassembly

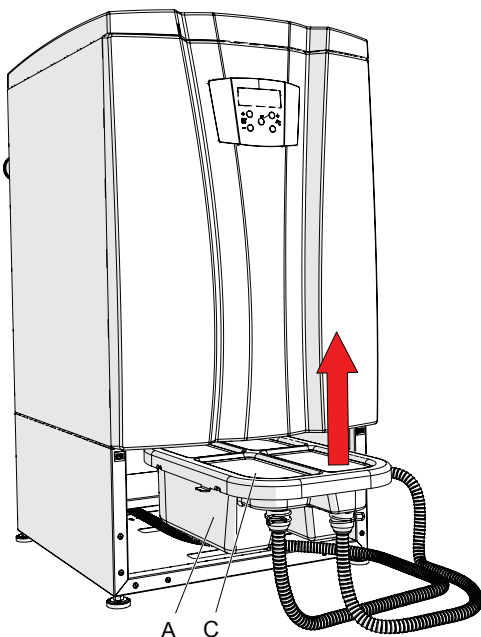
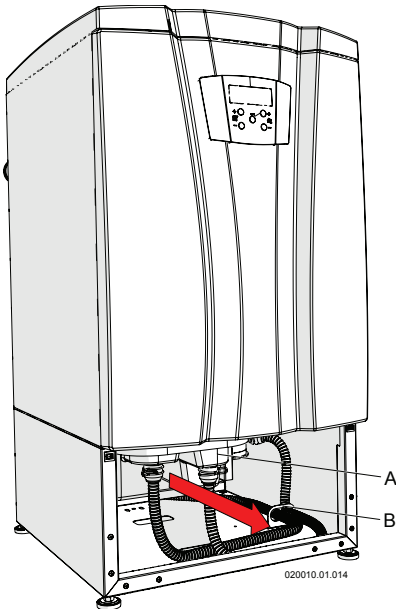


Figure 17-9 - Disassembling and opening the condensate neutraliser box

17.6 - Cleaning the air intake filter

The air filter must be cleaned for the appliance to work properly. Refer to figure 17-8 and proceed as follows:

- 1.- access the inner components of the appliance by following section 17.2;
- 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.

17.7 - 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 15.1.2.

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 12-1). 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 neutraliser, proceed as follows:

1. Follow what is shown in section 17.2 to remove covering "E" in figure 17-1;
2. Extract box "A" (figure 17-9);



ATTENTION !!! 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 17-9) 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;



ATTENTION !!! 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.



ATTENTION !!! Follow figure 17-9 carefully to but box "A" back in the right position. **After the above maintenance, restore the liquid level in the siphon as per section 15.1.2.**

17 - MAINTENANCE

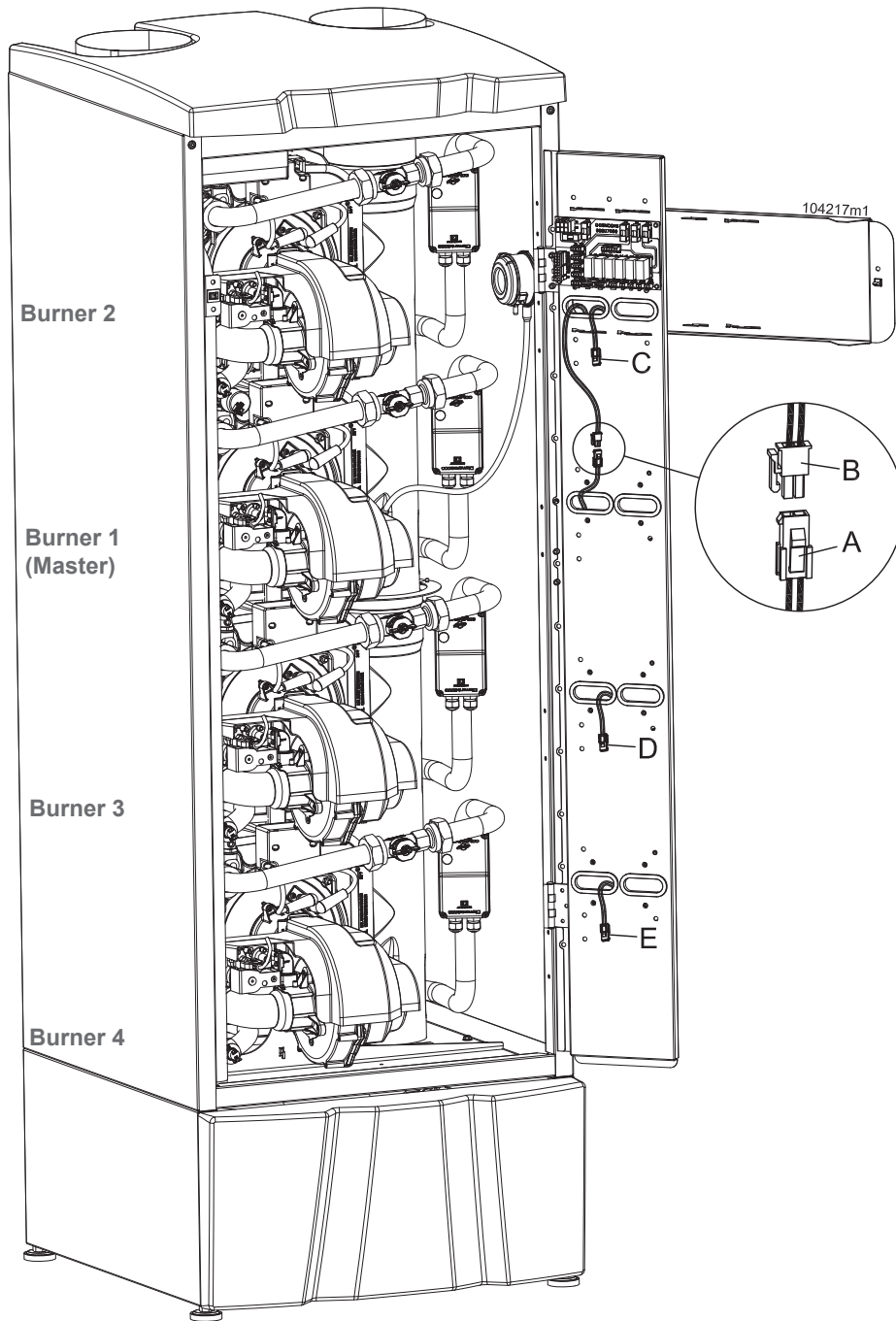
17.8 - Connecting the Display to the other burners

In 100T to 280T appliances, being multi-burners, the display in figure 16-1 is always connected directly to "Burner 1 (Master)". All the parameters that can be consulted on the display (sections 16.14, 16.15 and 19) 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 17-10):

1. Disconnect power to the appliance;

2. Follow what is described in section 17.2 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", "D" or "E", depending on which burner you wish to view or edit, considering that: terminal "C" is for "Burner 2"; terminal "D" is for "Burner 3" and terminal "E" is for "Burner 4"
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 16.14, 16.15 and 19.
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

D = Connector for Burner 3 dialogue (Only in 180T, 210T and 280T models)

E = Connector for Burner 4 dialogue (Only in 280T models)

Figure 17-10 Connecting the display in the other burners

17 - MAINTENANCE

17.9 - How to move a control board

100T to 280T 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 17-10)

1. Turn off the main switch and disconnect power;
2. access the inner components following what is described in section 17.2;
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 17-11 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 circuiting 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 19 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;

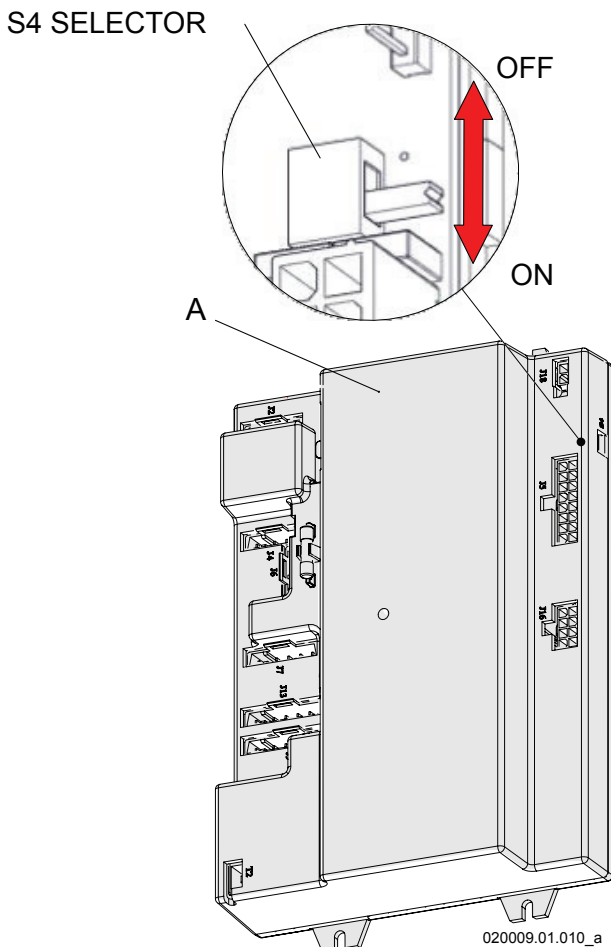
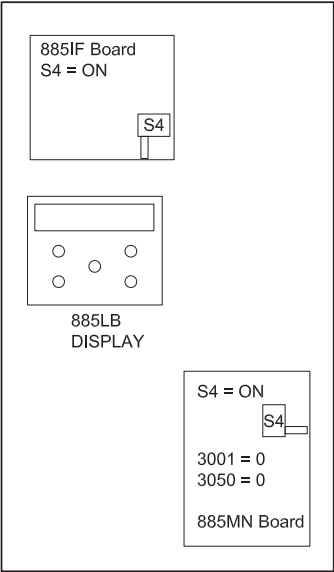
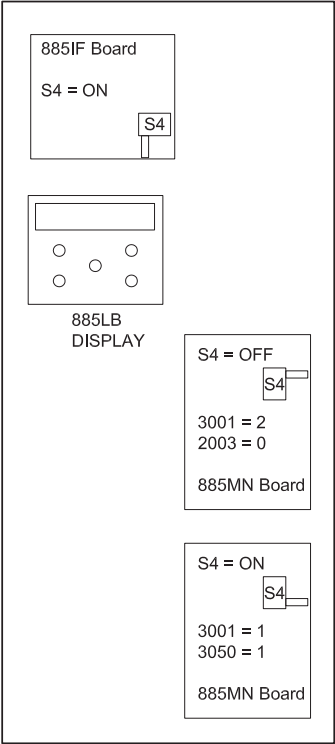


Figure 17-11 - Command board

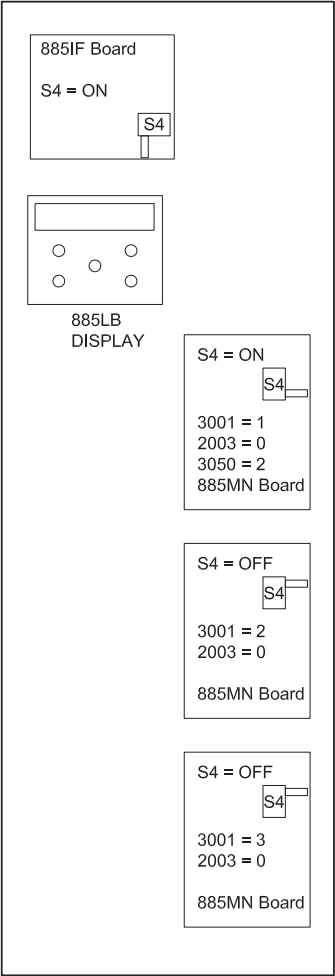
Models
60T-70T



Models
100T-115T-140T



Models
180T-210T



Models
280T

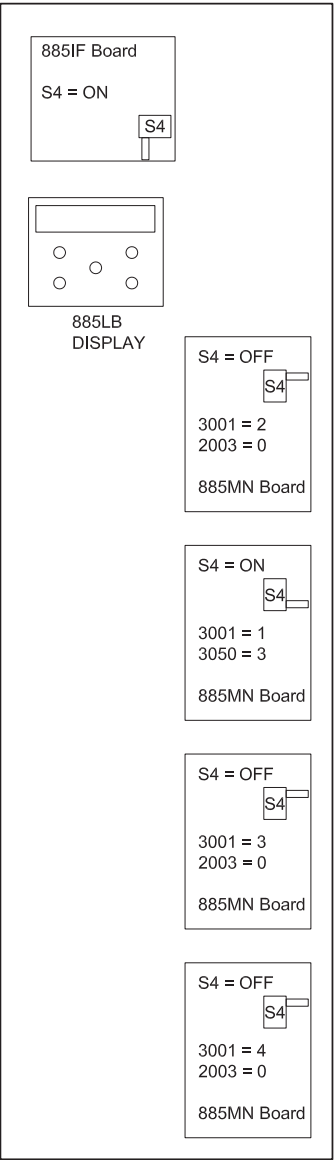


Figure 17-12 Setting parameters 3001, 3050 and selectors S4

17 - MAINTENANCE

17.10 - Emptying the appliance

- 1.- generate a heating demand by increasing the domestic hot water and heating temperature (also close any room thermostat bridges in the boiler version);
- 2.- wait for the burner to ignite (in the multi-burner versions, wait for all the burners to ignite) (make sure as many corresponding "L" icons in figure 16-1 as burners are on);
- 3.- switch off the appliance. This way, any motorised valves stay open);
- 4.- close the system loading cock provided for by the installer;
- 5.- connect a flexible rubber hose to the drain cocks "38" in figures 3-3, 3-5 and 3-7, and direct it to the drain in a sink or the like;
- 6.- wait for the water inside the appliance to cool to below about 40°C;
- 7.- open the drain cocks slowly;
- 8.- open the heating element bleed valves. Start from the higher heating elements and continue with the lower ones.
- 9.- once all the water has been drained, close the bleed valves on the heating elements and the drain cocks provided for by the installer.



ATTENTION!!! Recovering and/or reusing the water leaving the heating circuit for any purpose is prohibited, as it could be polluted.

17.11 - 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;



ATTENTION!!! 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 16.15);
- 3.- set the parameter to the following value:
 - a) **L 0 L** to force the burner, or all the burners, to minimum output heat;
 - b) **19 n** to force the burner, or all the burners, to ignition output heat;
 - a) **H 19 H** 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 **OFF** and press the RESET key.



ATTENTION!!! 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).

The same procedure above can also be applied to 100T to 280T model multi-burner appliances but consider that only one burner can be forced at a time, moving the display from one burner to another, as described in section 17.8.

17.12 - Checking the ionisation current

At any operating state, even during maximum and minimum output heat checks as per section 17.11, it is possible to see

the ionisation current value on parameter **1008** in the "user menu" (section 16.14). This value must be between 4 and 7 uA (microamperes).

Being that parameter **1008** on multi-burner appliances (models from 100T to 280T) corresponds to Burner 1 (Master), in order to check the other burners, you must refer to section 17.8.

17.13 - Checking combustion performance

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

To this end, do exactly what is described in section 15.8 and, along with the output heat, check combustion performance, which must be greater than 96%.

17 - MAINTENANCE

17.14 - Temperature and water measurement probes

There are various temperature sensors on the exchanger body. The electrical resistance between the two sensor contacts must match what is shown in figure 17-13.

The temperature probes are: 1001, 1002, 1006 and 1007

17.15 - External temperature probe

The 1004 external temperature sensor (see section 13.1.4) comes standard. The electrical resistance between the two sensor contacts must match what is shown in figure 17-14.

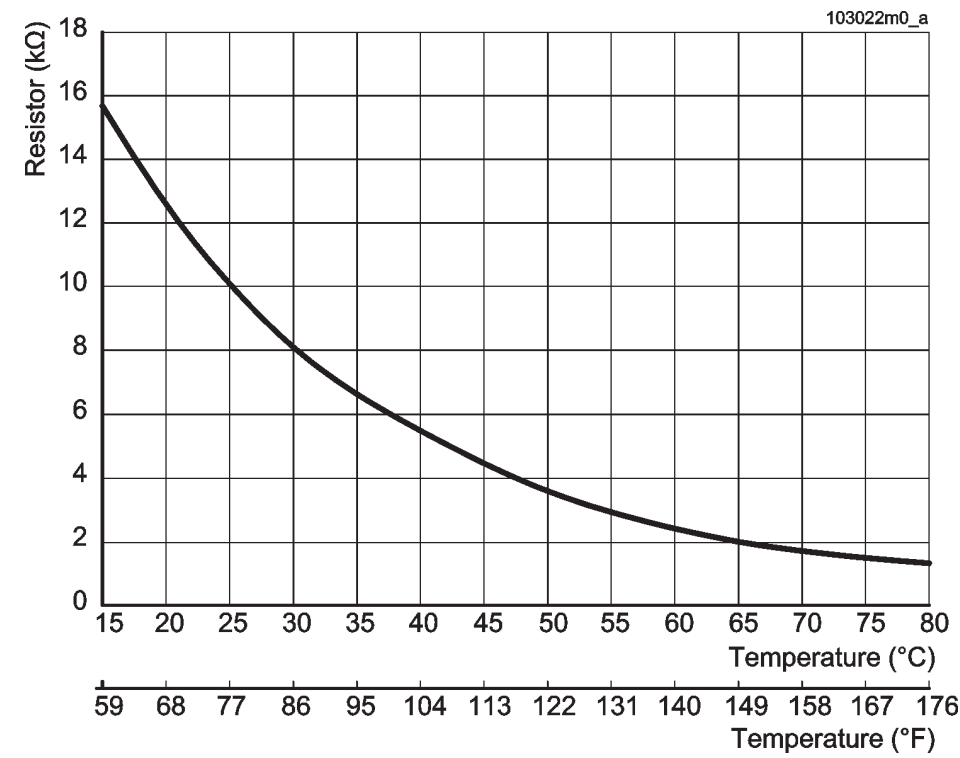


Figure 17-13 - Water sensor curve

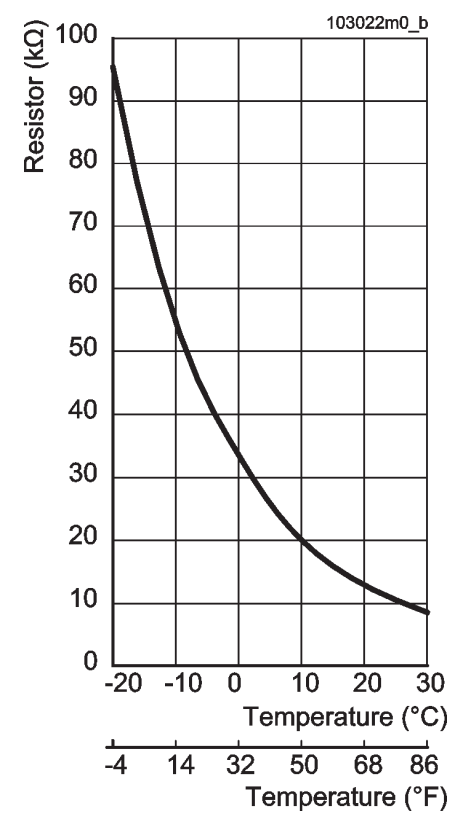


Figure 17-14 - External temperature sensor curve

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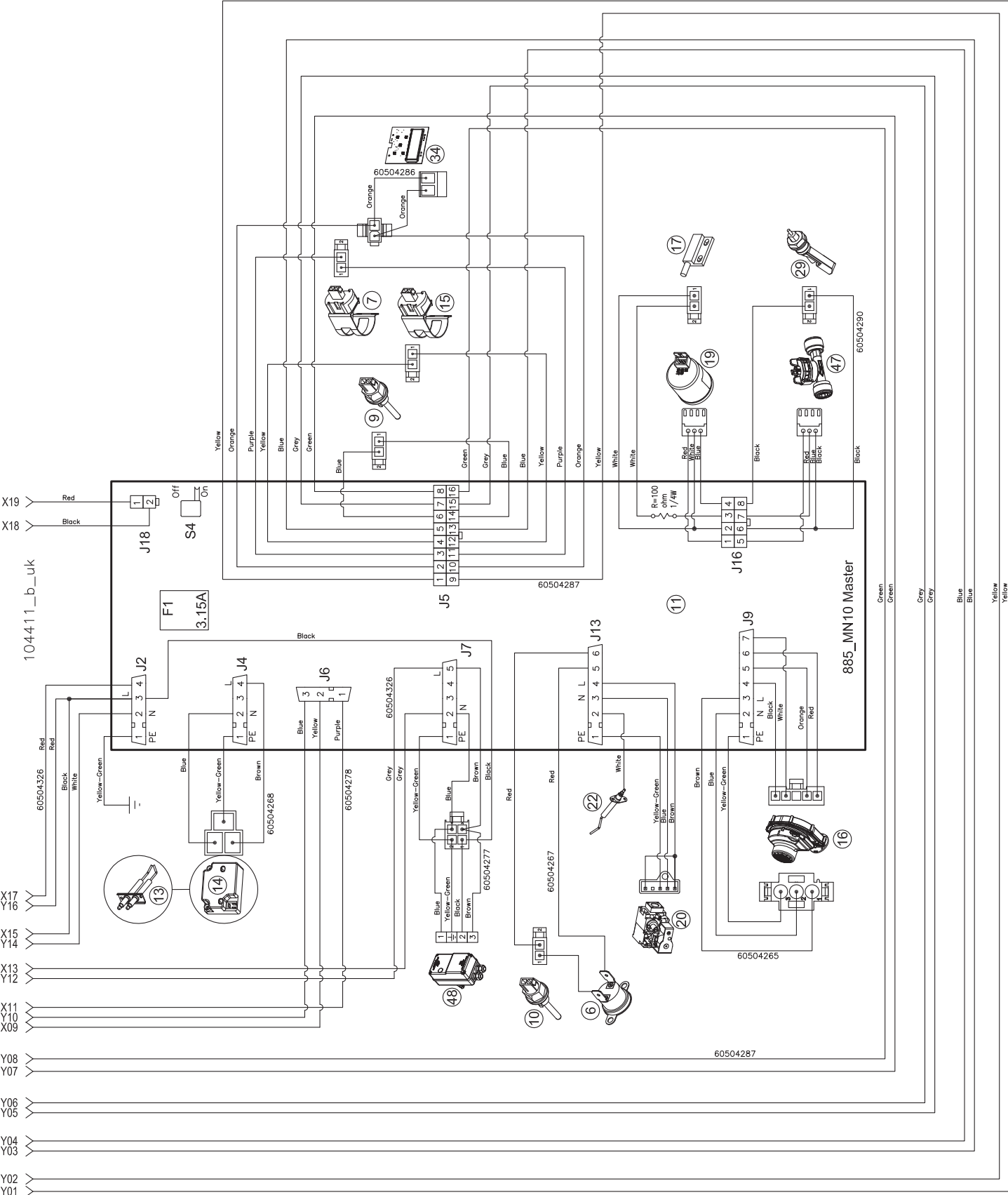
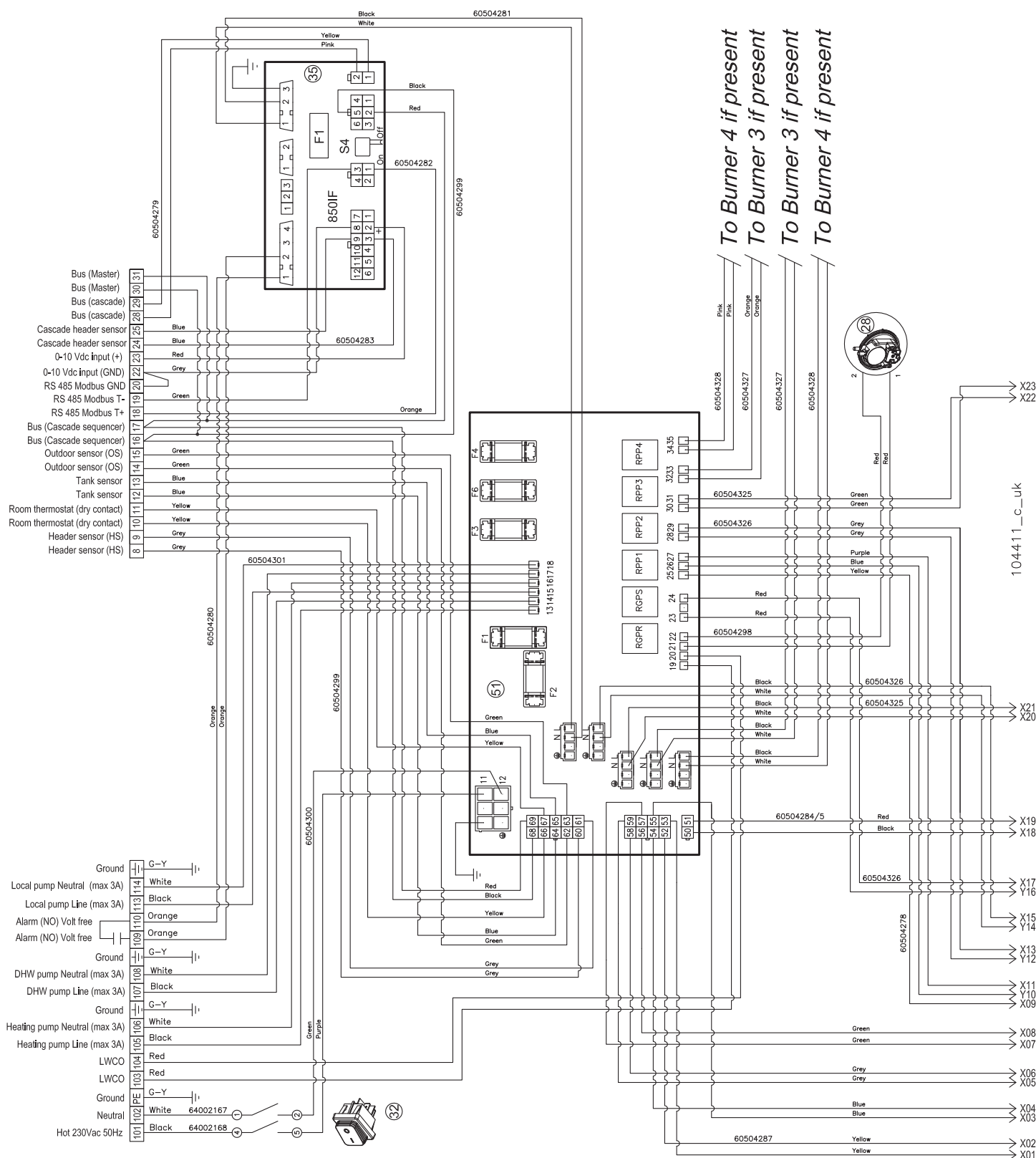
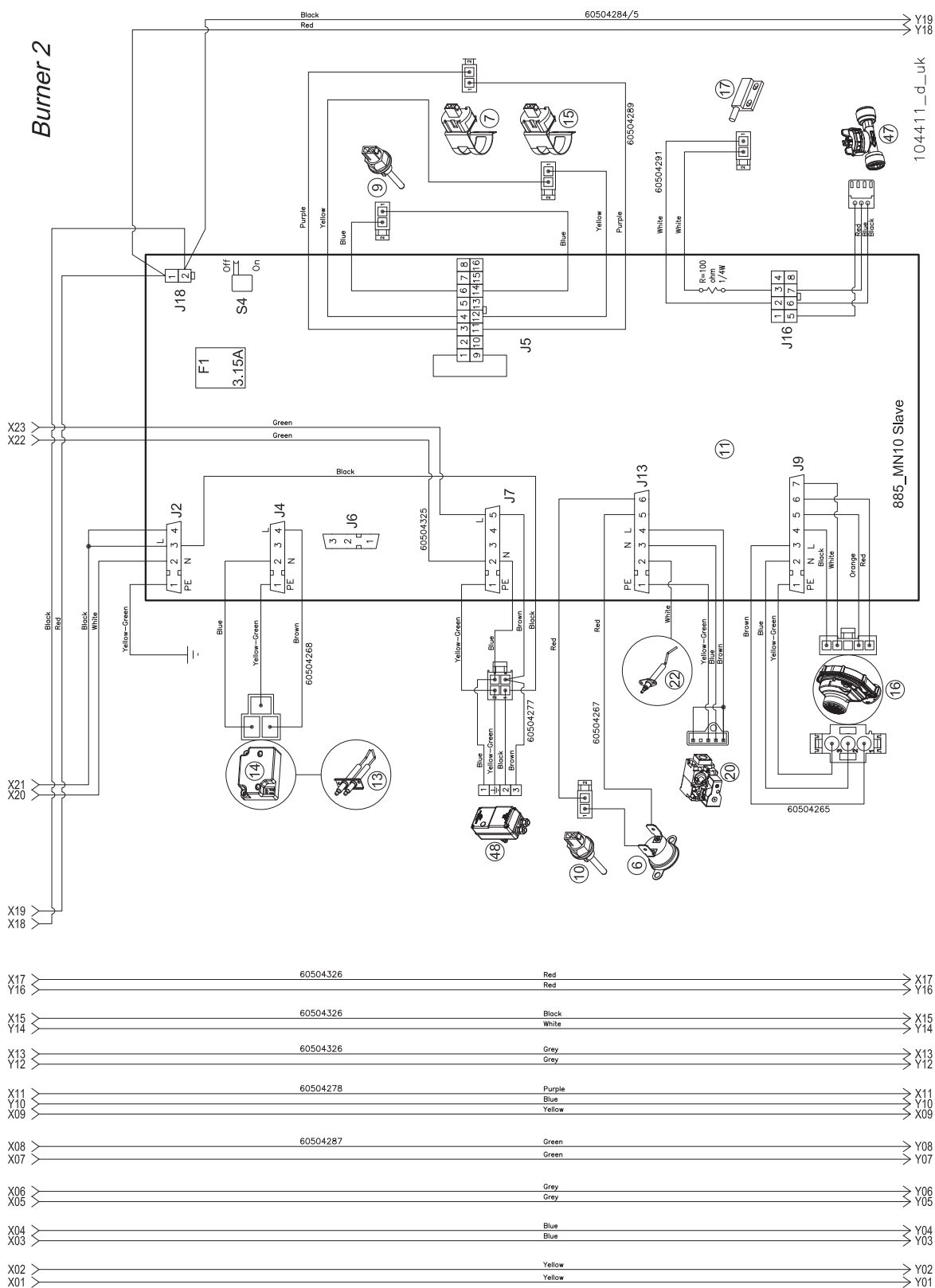


Figure 17-15 - Multi-line wiring diagram part 2 - continued from the previous page

17.17 - 100T, 115T, 140T, 180T 210T and 280T models multi-line wiring diagram



17 - MAINTENANCE



Continues

Figure 17-16 - Multi-line wiring diagram part 2 - continues on the following page

17 - MAINTENANCE

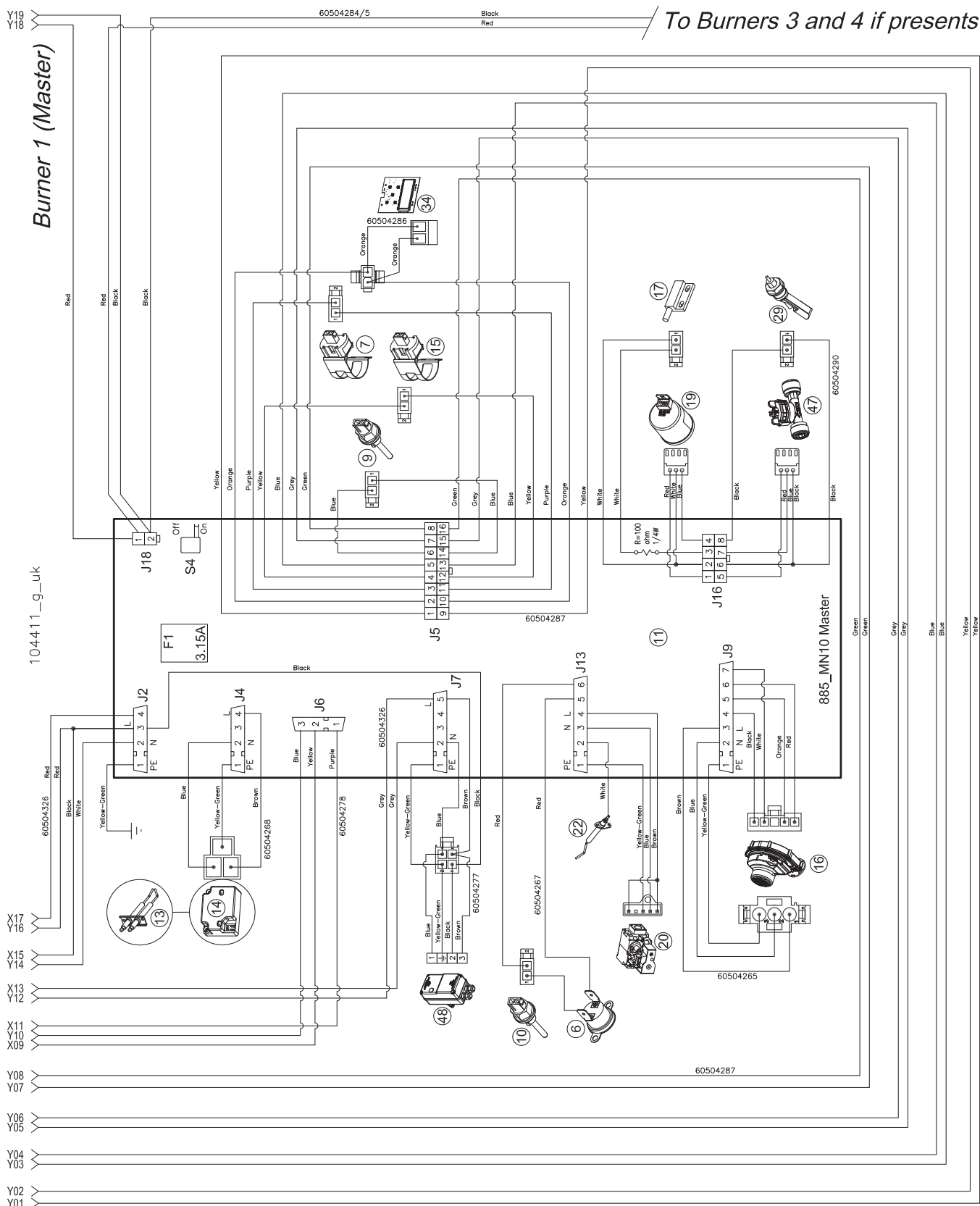


Figure 17-16 - Multi-line wiring diagram part 3 - continued from the previous page

17 - MAINTENANCE

Figures 17-15 and 17-16 wiring diagram key

- 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
- 47 - Water flow rate sensor
- 48 - Motorised two-way valve (on request)
- 51 - Connection diagrams
 - Fuse - F1 5x20 10A
 - Fuse - F2 5x20 10A
 - Fuse - F3 5x20 3A
 - Fuse - F4 5x20 3A
 - Fuse - F6 5x20 3A
- RGPR - Heating circuit pump relay
- RGPS - Domestic hot water circuit pump relay
- RPP1 - Burner 1 (MASTER) main circuit pump relay
- RPP2 - Burner 2 main circuit pump relay
- RPP3 - Burner 3 main circuit pump relay
- RPP4 - Burner 4 main circuit pump relay

18 - TECHNICAL FEATURES

18.1 - TECHNICAL FEATURES MYDENS

| TECHNICAL FEATURES MYDENS | | UM | 60T | 70T | 100T |
|---|-----|------|---------------------------|------------|------------|
| Destination country | | | UK; IE | UK; IE | UK; IE |
| Type (Flue exhaust/air intake type) | | | B23; C43 ; C53 ; C63; C83 | | |
| Category | | | I12H3P | I12H3P | I12H3P |
| CE-type Certificate (PIN) | | | 0476CR1272 | 0476CR1272 | 0476CR1272 |
| Range Rated Certificate | | | APPROVED | APPROVED | APPROVED |
| Maximum heating input heat "Q" | | kW | 57,8 | 69,9 | 99,0 |
| Minimum heating input heat | | kW | 12,0 | 14,7 | 12,0 |
| Maximum output heat (80/60) "P" | | kW | 55,8 | 67,9 | 95,6 |
| Efficiency at 100% load (80/60) | | % | 97 | 97 | 97 |
| Minimum output heat (80/60) | | kW | 11,5 | 14,1 | 11,5 |
| Efficiency at minimum output heat (80/60) | | % | 96 | 96 | 96 |
| Maximum output heat (50/30) | | kW | 61,2 | 74,0 | 104,7 |
| Efficiency at maximum output heat (50/30) | | % | 106 | 106 | 106 |
| Minimum output heat (50/30) | | kW | 12,8 | 15,6 | 12,8 |
| Efficiency at minimum output heat (50/30) | | % | 107 | 106 | 107 |
| Efficiency at 30% load (80/60) | | % | 106 | 106 | 106 |
| Chimney loss burner on (80/60) | | % | 1 | 1 | 1 |
| Chimney loss burner on at minimum output heat | | % | 0,5 | 0,5 | 0,5 |
| Chimney loss burner off | | % | 0,1 | 0,1 | 0,1 |
| Casing loss burner on | | % | 0,1 | 0,1 | 0,1 |
| Casing loss burner off | | % | 0,05 | 0,05 | 0,05 |
| Loss at no load | | % | 0,05 | 0,05 | 0,05 |
| Gas flow rate | G20 | m³/h | 6,11 | 7,40 | 10,47 |
| | G25 | m³/h | 7,11 | 8,61 | 12,17 |
| | G30 | kg/h | 4,55 | 5,52 | 7,80 |
| | G31 | kg/h | 4,49 | 5,43 | 7,68 |
| Gas supply pressure | G20 | mbar | 20 | 20 | 20 |
| | G25 | mbar | 25 | 25 | 25 |
| | G30 | mbar | 30 | 30 | 30 |
| | G31 | mbar | 37 | 37 | 37 |
| Gas supply minimum pressure | G20 | mbar | 10 | 10 | 10 |
| | G25 | mbar | 10 | 10 | 10 |
| | G30 | mbar | 10 | 10 | 10 |
| | G31 | mbar | 10 | 10 | 10 |
| Gas supply maximum pressure | G20 | mbar | 45 | 45 | 45 |
| | G25 | mbar | 45 | 45 | 45 |
| | G30 | mbar | 45 | 45 | 45 |
| | G31 | mbar | 45 | 45 | 45 |
| Main exchanger water content | | lt | 6,34 | 7,57 | 12,68 |
| Minimum operating water flow rate with motorised valve | | l/h | 1620 | 1620 | 1620 |
| Minimum operating water flow rate without motorised valve | | l/h | 1620 | 1620 | 3240 |
| D.H.W with storage tank adjustment range | | °C | 40 - 60 | 40 - 60 | 40 - 60 |
| Maximum temperature for safety intervention | | °C | 95 | 95 | 95 |
| Heating maximum temperature | | °C | 80 | 80 | 80 |
| Heating minimum temperature | | °C | 20 | 20 | 20 |
| "PMS" heating maximum pressure | | bar | 11 | 11 | 11 |
| Heating minimum 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 | 110 | 150 | 220 |
| Degree of electrical protection | | | IP20 | IP20 | IP20 |

18 - TECHNICAL FEATURES

18.1 - TECHNICAL FEATURES MYDENS

| 115T | 140T | 180T | 210T | 280T |
|---------------------------|------------|------------|------------|------------|
| UK; IE | UK; IE | UK; IE | UK; IE | UK; IE |
| B23; C43 ; C53 ; C63; C83 | | | | |
| I12H3P | I12H3P | I12H3P | I12H3P | I12H3P |
| 0476CR1272 | 0476CR1272 | 0476CR1272 | 0476CR1272 | 0476CR1272 |
| APPROVED | APPROVED | APPROVED | APPROVED | APPROVED |
| 115,6 | 140,0 | 173,4 | 210,0 | 280,0 |
| 12,0 | 14,7 | 14,7 | 14,7 | 14,7 |
| 111,7 | 135,8 | 168,2 | 203,7 | 271,6 |
| 97 | 97 | 97 | 97 | 97 |
| 11,5 | 14,1 | 14,1 | 14,1 | 14,1 |
| 96 | 96 | 96 | 96 | 96 |
| 122,3 | 148,0 | 183,3 | 222,0 | 296,0 |
| 106 | 106 | 106 | 106 | 106 |
| 12,8 | 15,6 | 15,6 | 15,6 | 15,6 |
| 106 | 106 | 106 | 106 | 106 |
| 106 | 106 | 106 | 106 | 106 |
| 1 | 1 | 1 | 1 | 1 |
| 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| 0,1 | 0,1 | 0,1 | 0,1 | 0,1 |
| 0,05 | 0,05 | 0,05 | 0,05 | 0,05 |
| 0,05 | 0,05 | 0,05 | 0,05 | 0,05 |
| 12,22 | 14,80 | 18,30 | 22,20 | 29,61 |
| 14,22 | 17,22 | 21,32 | 25,83 | 34,43 |
| 9,11 | 11,03 | 13,66 | 16,55 | 22,06 |
| 8,97 | 10,87 | 13,50 | 16,30 | 21,73 |
| 20 | 20 | 20 | 20 | 20 |
| 25 | 25 | 25 | 25 | 25 |
| 30 | 30 | 30 | 30 | 30 |
| 37 | 37 | 37 | 37 | 37 |
| 10 | 10 | 10 | 10 | 10 |
| 10 | 10 | 10 | 10 | 10 |
| 10 | 10 | 10 | 10 | 10 |
| 10 | 10 | 10 | 10 | 10 |
| 45 | 45 | 45 | 45 | 45 |
| 45 | 45 | 45 | 45 | 45 |
| 45 | 45 | 45 | 45 | 45 |
| 45 | 45 | 45 | 45 | 45 |
| 12,68 | 15,14 | 22,70 | 22,71 | 30,28 |
| 1620 | 1620 | 1620 | 1620 | 1620 |
| 3240 | 3240 | 4860 | 4860 | 6480 |
| 40 - 60 | 40 - 60 | 40 - 60 | 40 - 60 | 40 - 60 |
| 95 | 95 | 95 | 95 | 95 |
| 80 | 80 | 80 | 80 | 80 |
| 20 | 20 | 20 | 20 | 20 |
| 11 | 11 | 11 | 11 | 11 |
| 1 | 1 | 1 | 1 | 1 |
| 230 | 230 | 230 | 230 | 230 |
| 50 | 50 | 50 | 50 | 50 |
| 220 | 300 | 430 | 430 | 590 |
| IP20 | IP20 | IP20 | IP20 | IP20 |

18 - TECHNICAL FEATURES

18.1 - TECHNICAL FEATURES MYDENS

| TECHNICAL FEATURES MYDENS | | UM | 60T | 70T | 100T |
|---|-----|------|-------------|-------------|-------------|
| Burner electrical power | | W | 110 | 150 | 220 |
| Electrical power absorbed by the pump | | W | N.A. | N.A. | N.A. |
| Air intake and flue exhaust duct diameter (split) | | mm | 80 | 80 | 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 | 15 | 15 | 15 |
| Weighted NOx (0% O ₂) (EN 483 class 5) | G20 | ppm | 15 | 15 | 15 |
| CO ₂ (%) at minimum / maximum output heat | G20 | % | 8,5 / 8,7 | 8,5 / 8,7 | 8,5 / 8,7 |
| | G25 | % | 8,3 / 8,8 | 8,3 / 8,8 | 8,3 / 8,8 |
| | G30 | % | 10,1 / 10,6 | 10,1 / 10,6 | 10,1 / 10,6 |
| | G31 | % | 9,8 / 10,2 | 9,8 / 10,2 | 9,8 / 10,2 |
| O ₂ (%) at minimum / maximum output heat | G20 | % | 5,8 / 4,9 | 5,8 / 4,9 | 5,8 / 4,9 |
| | G25 | % | 5,8 / 4,9 | 5,8 / 4,9 | 5,8 / 4,9 |
| | G30 | % | 5,9 / 5,1 | 5,9 / 5,1 | 5,9 / 5,1 |
| | 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 boiler outlet | | °C | 90 | 90 | 90 |
| Minimum flue gas temperature at boiler outlet | | °C | 30 | 30 | 30 |
| Δt temperature fumes/Return (at 100% of the load) (80/60) | | °C | 16 | 17 | 16 |
| Δt temperature fumes/Return (at 30% of the load) (37/30) | | °C | 1 | 1 | 1 |
| Flue gas mass flow rate | | kg/h | 95 | 115 | 163 |
| Flue gas mass flow rate at minimum output heat | | kg/h | 20,7 | 25,4 | 20,7 |
| 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 | 92 | 92 | 92 |
| Max. admissible vacuum in the flue exhaust/intake system | | Pa | 50 | 50 | 50 |
| Maximum condensate flow rate | | l/h | 7,2 | 8,7 | 12,0 |
| Condensate average degree of acidity | | PH | 4 | 4 | 4 |
| Operating ambient temperature | | °C | 0 ; + 50 | 0 ; + 50 | 0 ; + 50 |
| Boiler weight (empty) | | kg | 96 | 98 | 142 |

18 - TECHNICAL FEATURES

18.1 - TECHNICAL FEATURES MYDENS

| 115T | 140T | 180T | 210T | 280T |
|-------------|-------------|-------------|-------------|-------------|
| 220 | 300 | 430 | 430 | 591 |
| N.A. | N.A. | N.A. | N.A. | N.A. |
| 110 | 110 | 160 | 160 | 160 |
| 10 | 10 | 10 | 10 | 10 |
| 10 | 10 | 10 | 10 | 10 |
| 4 | 4 | 4 | 4 | 4 |
| 15 | 15 | 15 | 15 | 15 |
| 15 | 15 | 15 | 15 | 15 |
| 8,5 / 8,7 | 8,5 / 8,7 | 8,5 / 8,7 | 8,5 / 8,7 | 8,5 / 8,7 |
| 8,3 / 8,8 | 8,3 / 8,8 | 8,3 / 8,8 | 8,3 / 8,8 | 8,3 / 8,8 |
| 10,1 / 10,6 | 10,1 / 10,6 | 10,1 / 10,6 | 10,1 / 10,6 | 10,1 / 10,6 |
| 9,8 / 10,2 | 9,8 / 10,2 | 9,8 / 10,2 | 9,8 / 10,2 | 9,8 / 10,2 |
| 5,8 / 4,9 | 5,8 / 4,9 | 5,8 / 4,9 | 5,8 / 4,9 | 5,8 / 4,9 |
| 5,8 / 4,9 | 5,8 / 4,9 | 5,8 / 4,9 | 5,8 / 4,9 | 5,8 / 4,9 |
| 5,9 / 5,1 | 5,9 / 5,1 | 5,9 / 5,1 | 5,9 / 5,1 | 5,9 / 5,1 |
| 6,0 / 5,4 | 6,0 / 5,4 | 6,0 / 5,4 | 6,0 / 5,4 | 6,0 / 5,4 |
| 10 | 10 | 10 | 10 | 10 |
| 90 | 90 | 90 | 90 | 90 |
| 30 | 30 | 30 | 30 | 30 |
| 16 | 17 | 17 | 17 | 17 |
| 1 | 1 | 1 | 1 | 1 |
| 190 | 230 | 284 | 345 | 460 |
| 20,7 | 25,4 | 25,4 | 25,4 | 25,4 |
| 110 | 110 | 110 | 110 | 110 |
| 40 | 40 | 40 | 40 | 40 |
| 0,9 | 0,9 | 0,9 | 0,9 | 0,9 |
| 92 | 92 | 92 | 92 | 92 |
| 50 | 50 | 50 | 50 | 50 |
| 14,4 | 17,4 | 21,5 | 26,1 | 34,8 |
| 4 | 4 | 4 | 4 | 4 |
| 0 ; + 50 | 0 ; + 50 | 0 ; + 50 | 0 ; + 50 | 0 ; + 50 |
| 142 | 147 | 211 | 211 | 249 |

19 - FORCED MENU

| | | | | Boiler parameters | | |
|-------------|---|--|---------------|--|--|--|
| Ref. | Parameter description | Adjustment range | Default value | Individual burner (mod. 60T and 70T) | Burner 1 (Master) (mod. 100T, 115T, 140T, 180T, 210T and 280T) | Burners from 2 to 4 (mod. 100T, 115T, 140T, 180T, 210T and 280T) |
| 3001 | Burner operation address | 0 = Not in cascade 1 = Burner 1 (Master), 2 to 4 = Burner from 2 to 4 (slave burners) | 2 | 0 | 1 | from 2 to 4 |
| 3002 | Fan adjustment range | from 0 to 4 | 0 | 60 = 0 70 = 2 | 100 and 115 = 0 140, 180, 210 and 280 = 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 = storage tank with thermostat; 3 = N/A; 4 = N/A; 5 = N/A | 0 | 0 = only heating; 1 = hot water storage tank; | 0 = only heating; 1 = hot water storage tank; | 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 | 82°C | 82°C | 82°C |
| 3016 | Climatic adjustment: heating supply minimum temperature | from 20°C to 90°C | 20°C | 20°C | 20°C | 20°C |
| 3017 | Supply maximum temperature (this parameter takes priority with respect to parameter 3015) | from 20°C to 90°C | 82°C | 82°C | 82°C | 82°C |
| 3018 | Minimum supply temperature | from 20°C to 90°C | 32°C | 32°C | 32°C | 32°C |
| 3020 | Water flow rate sensor type | 0 = N/A; 1 = DN8; 2 = DN 10; 3 = DN 15; 4 = DN 20; 5 = DN 25 | 3 | 4 | 4 | 4 |
| 3022 | Water minimum pressure | from 0 to 5 bar | 1 | 1 | 1 | 1 |
| 3035 | Minimum water flow rate | from 0 to 100 l/min | 27 | 27 | 27 | 27 |
| 3050 | Slave burner number | from 0 to 3 | 3 | 3 | 100, 115 and 140 = 1 210 = 2 280 = 3 | 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 17-11 and 17-12) | On or Off | On | On | On | Off |

N/A = Not Applicable

19 - FORCED MENU

| Water heater parameters | | | |
|--|--|---|-------------------|
| Individual burner (mod. 60T and 70T) | Burner 1 (Master) (mod. 100T, 115T, 140T, 180T, 210T and 280T) | Burners from 2 to 4 (mod. 100T, 115T, 140T, 180T, 210T and 280T) | Customised values |
| 0 | 1 | from 2 to 4 | |
| 60 = 0 70 = 2 | 100 and 115 = 0 140, 180, 210 and 280 = 2 | | |
| C | C | C | |
| 1 | 1 | 0 | |
| 0 | 4 | 4 | |
| 48 | 48 | 48 | |
| Enab | Enab | dISA | |
| SEnS | SEnS | SEnS | |
| 10 | 10 | 10 | |
| 10 | 10 | 10 | |
| 0 | 0 | 0 | |
| 0 = only heating; 1 = hot water storage tank; | 0 for instantaneous domestic hot water; 1 per hot water storage tank. | 0 | |
| Enab | Enab | Enab | |
| N/A | N/A | N/A | |
| N/A | N/A | N/A | |
| 82°C | 82°C | 82°C | |
| 32°C | 32°C | 32°C | |
| 4 | 4 | 4 | |
| 1 | 1 | 1 | |
| 27 | 27 | 27 | |
| 3 | 100, 115 and 140 = 1 210 = 2 280 = 3 | 3 | |
| 1 | 1 | 1 | |
| 1 | 1 | 1 | |
| PVC | PVC | PVC | |
| US | US | US | |
| On | On | Off | |



ATTENTION!!! 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.



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




ATTENTION!!! In the event of the multi-burner appliances (100T to 280T 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 17.8



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.

20 - 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 - 5</div> <div> -</div> | Hold down at the same time for a time in seconds, indicated by the number, the RESET and - keys |
| <div> -</div> <div> -</div> | Press and release the - key |
| <div> +</div> <div> +</div> | Press and release the + key |

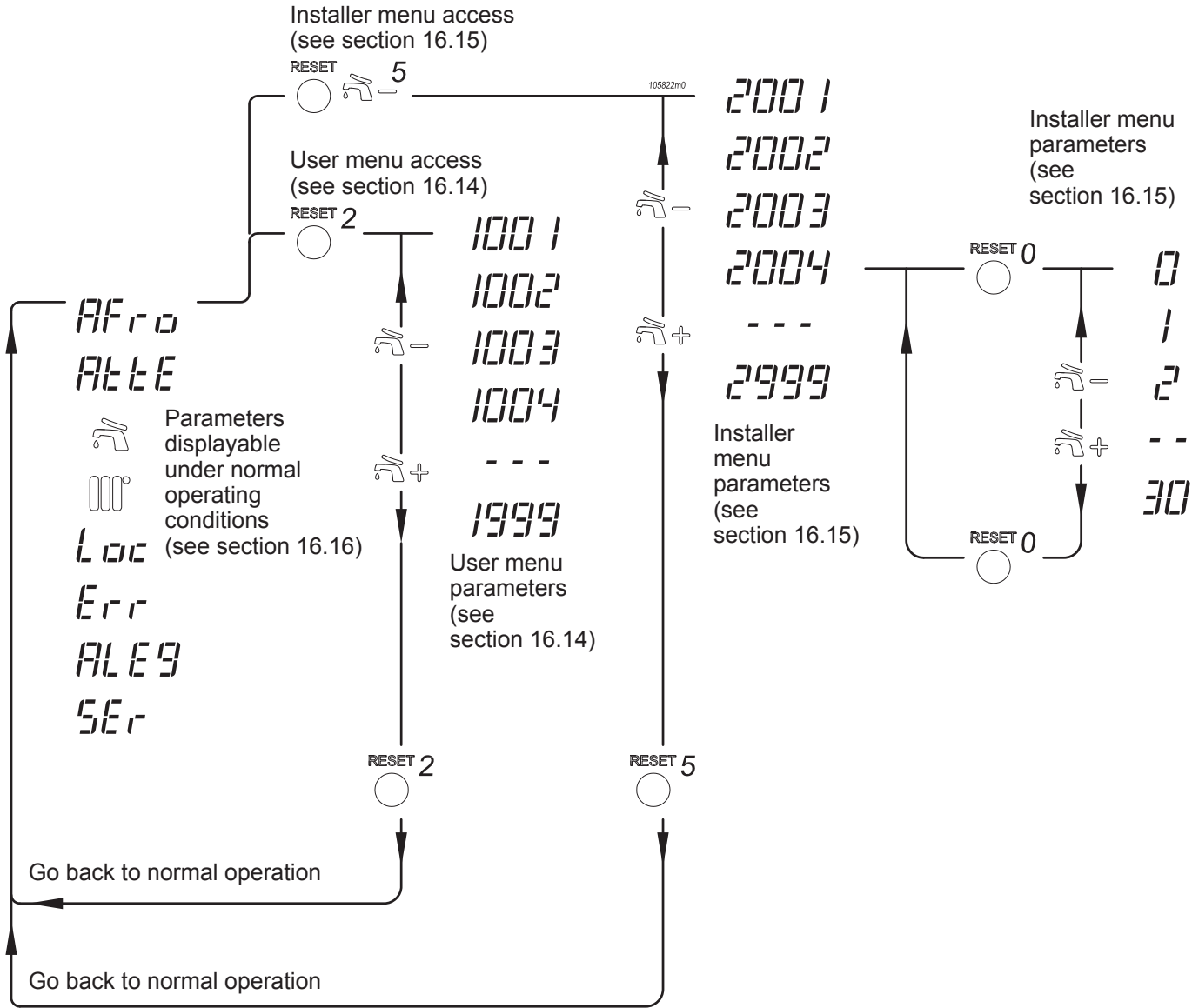
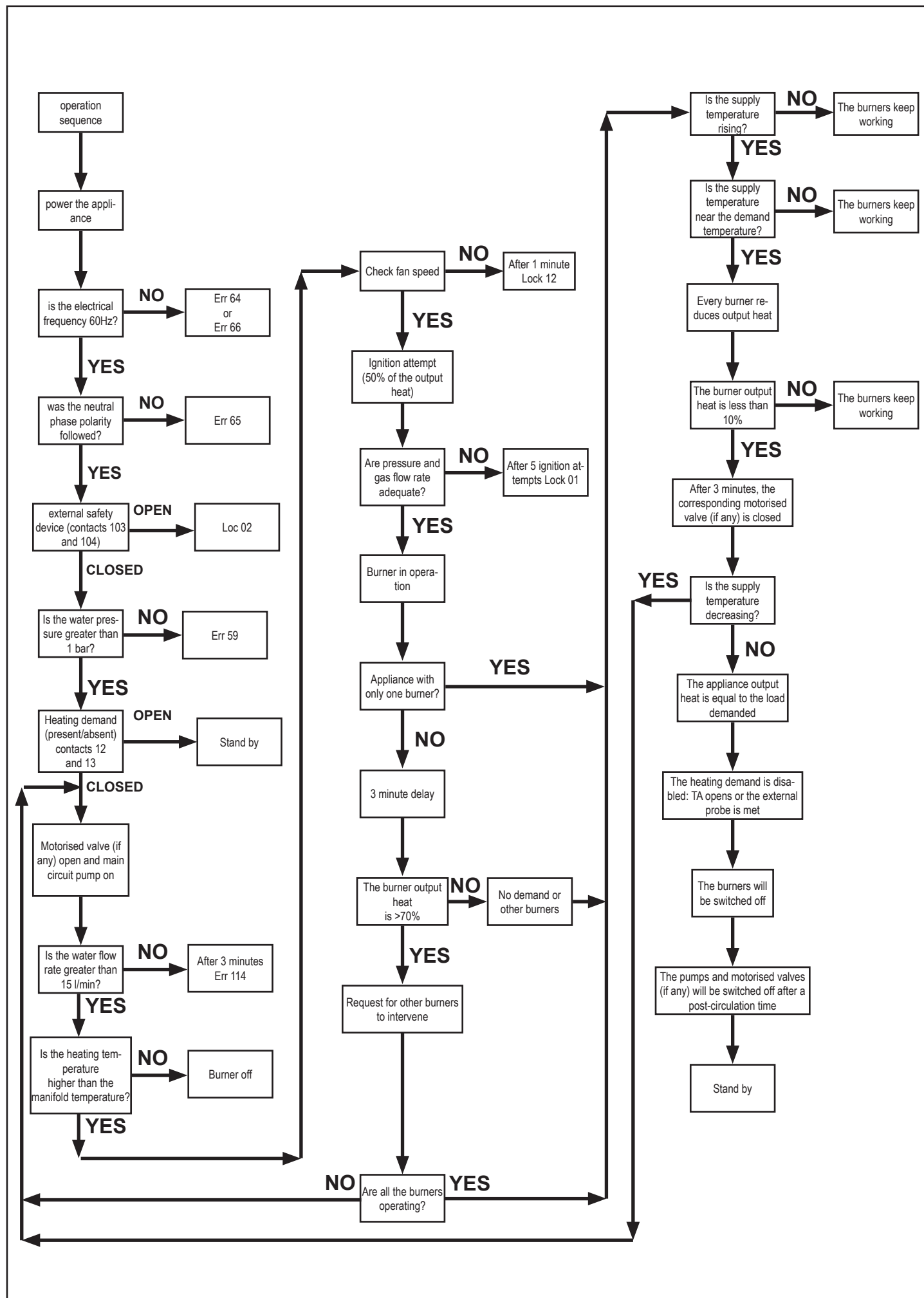


Figure 20-1 - Command menu diagram

21 - BOILER OPERATION SEQUENCE



22 - CE DECLARATION OF CONFORMITY

The undersigned company, **CSOSMOGAS S.r.L.**, with registered office in via L. Da Vinci no. 16 - 47014 Meldola (FC) ITALY,

DECLARES

under its own responsibility that the product:

| | |
|-------------|-------|
| SERIAL NO. | ----- |
| MODEL | ----- |
| MANUFACTURE | ----- |

subject of this declaration, is compliant with the model described in the **CE** type Test Certificate, issued by the notified body Kiwa Cermet Italia S.p.A., whose references are shown in the table in the TECHNICAL FEATURES section under “CE-type certificate (PIN)” and fulfils the requirements of the following Directives: Gas Appliances, (**2009/142/EC**), Performance, (**92/42/EEC** modified by **EU Reg. 813/2013**), Low Voltage, (**2014/35/EU**), Electromagnetic Compatibility, (**2014/30/EU**).

Product surveillance is done by the notified body according to form “C”.

(The warranty number is the same as the serial number)

This declaration is issued as established by the aforementioned Directives.

Meldola (CFC) ITALY, (Date of manufacture).



Arturo Alessandrini
Sole Project Manager

23 - ErP PRODUCT FICHE MYDENS

| | | | | |
|---|----------|------|----------|------|
| The name or brand of the supplier | | | COSMOGAS | |
| Reference of the model given by the supplier | | | MYDENS | |
| | | | 60T | 70T |
| Condensing boiler | | | YES | YES |
| Low temperature boiler | | | NO | NO |
| B1 Boiler type | | | NO | NO |
| Cogeneration space heater | | | NO | NO |
| Combination heater | | | NO | NO |
| Equipped with supplementary heater | | | NO | NO |
| Energy efficiency class | | | A | A |
| Item | Symbol | Unit | | |
| Rated heat output | Pn | kW | 56 | 68 |
| Seasonal space heating energy efficiency | η_s | % | 91 | 91 |
| Useful heat output at rated heat output and high-temperature regime (*) | P4 | kW | 55,8 | 67,9 |
| Useful efficiency at rated heat output and high-temperature regime (*) | η_4 | % | 87,3 | 87,3 |
| Useful heat output at 30 % of rated heat output and low-temperature regime (**) | P1 | kW | 16,7 | 20,4 |
| Useful efficiency at 30 % of rated heat output and low-temperature regime (**) | η_1 | % | 95,8 | 95,8 |

Auxiliary electricity consumption

| | | | | |
|-----------------|-------|----|-------|-------|
| At full load | elmax | kW | 0,14 | 0,14 |
| At part load | elmin | kW | 0,06 | 0,06 |
| In standby mode | Psb | kW | 0,005 | 0,005 |

Other items

| | | | | |
|-----------------------------------|-------|--------|-----|-----|
| Standby heat loss | Pstby | kW | 0,1 | 0,1 |
| Ignition burner power consumption | Pign | kW | 0 | 0 |
| Annual energy consumption | QHE | GJ | 104 | 130 |
| Sound power level, indoors | LWA | dB | 70 | 70 |
| Emissions of nitrogen oxides | NOx | mg/kWh | 20 | 20 |

For combination heaters

| | | | | |
|---------------------------------|-------------|-----|-----|-----|
| Declared load profile | | | N/A | N/A |
| Water heating energy efficiency | η_{wh} | % | N/A | N/A |
| Daily electricity consumption | Qelec | kWh | N/A | N/A |
| Annual electricity consumption | AEC | kWh | N/A | N/A |
| Daily fuel consumption | Qfuel | kWh | N/A | N/A |
| Annual fuel consumption | AFC | GJ | N/A | N/A |

According commission delegated regulation (EU) No 811/2013 and No 813/2013.

N/A = Not applicable.

(*) High-temperature regime means 60 °C return temperature at heater inlet and 80 °C feed temperature at heater outlet.

(**) Low temperature means for condensing boilers 30 °C, for low-temperature boilers 37 °C and for other heaters 50 °C return temperature (at heater inlet).

24 - ErP PRODUCT FICHE MYDENS

| COSMOGAS | | | | | |
|----------|------|------|------|------|------|
| MYDENS | | | | | |
| 100T | 115T | 140T | 180T | 210T | 280T |
| YES | YES | YES | YES | YES | YES |
| NO | NO | NO | NO | NO | NO |
| NO | NO | NO | NO | NO | NO |
| NO | NO | NO | NO | NO | NO |
| NO | NO | NO | NO | NO | NO |
| NO | NO | NO | NO | NO | NO |
| - | - | - | - | - | - |

| | | | | | |
|------|-------|-------|-------|-------|-------|
| 96 | 112 | 136 | 168 | 204 | 272 |
| 91 | 91 | 91 | 91 | 91 | 91 |
| 95,6 | 111,7 | 135,8 | 168,2 | 203,7 | 271,6 |
| 87,3 | 87,3 | 87,3 | 87,3 | 87,3 | 87,3 |
| 28,7 | 33,5 | 40,7 | 50,5 | 61,1 | 81,5 |
| 95,8 | 95,8 | 95,8 | 95,8 | 95,8 | 95,8 |

| | | | | | |
|------|------|------|-------|-------|------|
| 0,28 | 0,28 | 0,28 | 0,42 | 0,42 | 0,56 |
| 0,06 | 0,06 | 0,06 | 0,06 | 0,06 | 0,06 |
| 0,01 | 0,01 | 0,01 | 0,015 | 0,015 | 0,02 |

| | | | | | |
|-----|-----|-----|-----|-----|-----|
| 0,2 | 0,2 | 0,2 | 0,3 | 0,3 | 0,4 |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 169 | 195 | 237 | 288 | 345 | 452 |
| 70 | 70 | 70 | 70 | 70 | 70 |
| 20 | 20 | 20 | 20 | 20 | 20 |

| | | | | | |
|-----|-----|-----|-----|-----|-----|
| N/A | N/A | N/A | N/A | N/A | N/A |
| N/A | N/A | N/A | N/A | N/A | N/A |
| N/A | N/A | N/A | N/A | N/A | N/A |
| N/A | N/A | N/A | N/A | N/A | N/A |
| N/A | N/A | N/A | N/A | N/A | N/A |
| N/A | N/A | N/A | N/A | N/A | N/A |

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