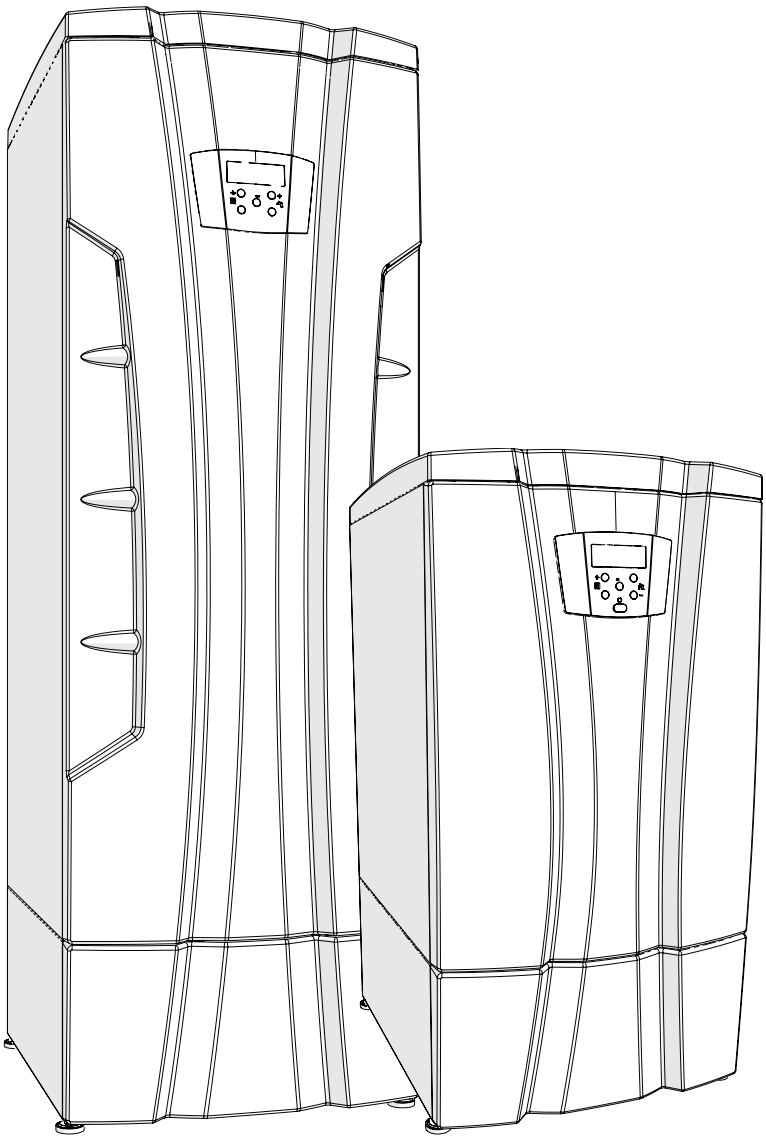
COSMOGAS®



INSTALLATION, USE AND MAINTENANCE MANUAL

GAS CONDENSING
FREE-STANDING BOILER

MYDENS

GAS CONDENSING
FREE-STANDING HOT WATER HEATER

AGUADENS

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

62403578 - R03 14-07-2021_UK

⚠ 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 Competent Person for routine maintenance.

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

Carbon Monoxide.
Every year deaths and serious injuries occur due to carbon monoxide poisoning. 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.

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

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

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

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

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

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

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

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

Correct Use:
This heater must only be used for the purpose for which it has been expressly designed: Heating of water for closed circuit systems for central heating.
Do not use this appliance if any part has been under water. Immediately call a competent person to inspect the appliance and to replace any part of the control system and any gas control, which has been under water.
Ensure the heater and its controls are protected from dripping or spraying water during normal operation or service.

Only use the heater in the combinations and with the accessories and spares listed in this manual.
For safety and environmental reasons, the packing materials must be properly disposed of. Any replaced part or packaging should never be left within the reach of children.

CAUTION!!! **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 be installed on a non-combustible surface.

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

Installation, modifications

- ☞ Seal the adjustment devices after every calibration.
- ☞ In agreement with the provisions for use, the user must keep the installation in good working order and guarantee reliable and safe operation of the appliance.
- ☞ We also highlight the importance of an annual scheduled maintenance contract with a professionally qualified technician.
- ☞ The end user must have maintenance performed on the appliance only by competent person in accordance with this manual and in full compliance with both local and national standards.
- ☞ Before performing any cleaning or maintenance, disconnect the appliance from the mains power supply.
- ☞ After any cleaning or maintenance, before reconnecting the power supply, make sure that all internal parts are properly dry.
- ☞ This appliance is not intended for use by persons (including children) with reduced physical and sensory conditions or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- ☞ This manual is an integral and essential part of the product and must be kept carefully by the user, for possible future consultation. If the appliance must be transferred or if you should move and leave the unit to another user, always ensure that this manual remains with the new user and/or installer.

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

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

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

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

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

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

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

The manufacturer declines all liability, contractual or otherwise (warranty included), for any damage to people, animals property or this same appliance, caused by:
a) - incorrect installation;
b) - failure to comply with this or any other instruction provided by the manufacturer;
c) - failure to comply with the applicable local and/or national regulations in force;
d) - incorrect use of this appliance
e) - inadequate or incorrect service
f) - inadequate or incorrect maintenance.

CONTENTS

CONTENTS

CONTENTS

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 - Presentation

Congratulations! You have purchased one of the best products on the market.
Each individual part is proudly designed, manufactured, tested and assembled within the COSMOGAS facilities, thus guaranteeing the best quality control.

2.2 - Overview of 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 valves and carbon steel manifold

“60T” = Free-standing boiler with maximum heat input of 60 kW;
“70T” = Free-standing boiler with maximum heat input of 69.9 kW;
“100T” = Free-standing boiler with maximum heat input of 100 kW;
“115T” = Free-standing boiler with maximum heat input of 115 kW;
“140T” = Free-standing boiler with maximum heat input of 140 kW;
“180T” = Free-standing boiler with maximum heat input of 180 kW;
“210T” = Free-standing boiler with maximum heat input of 210 kW;
“280T” = Free-standing boiler with maximum heat input of 280 kW;

“MYDENS” = Internal gas condensing boiler with premixed burner with low emissions of pollutants.
“AGUADENS” = Internal gas condensing hot water heater with premixed burner with low emissions of pollutants.

(*) The AGUADENS models have a stainless steel manifold fitted as standard.

2.3 - Accessories

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

Quantity No.	Description		Figure
N° 1	GAS CONVERSION KIT NATURAL GAS-LPG 60T, 100T AND 115T.		
	GAS CONVERSION KIT NATURAL GAS-LPG 70T, 140T, 180T, 210T AND 280T.		
N° 1	SENSOR 10K D6X45 L=2500 T		
N° 1	EXTERNAL SENSOR		
N° 4	ADJUSTABLE FEET		
N° 1	10KG SACK OF GRANULATE CONDENSATE NEUTRALISER.		
N° 1	REDUCTION 1P NPT - 1P GAS	Only in models 60T, 70T, 100T, 115T and 140T	
	REDUCTION 1P1/4 NPT - 1P1/4 GAS	Only in models 180T, 210T and 280T	
N° 2	REDUCTION 2P NPT - 1P1/2 GAS	Only in models 60T, 70T, 100T, 115T and 140T	
N° 2	FLANGE EN 1092-1-13 DN65 PN16 NPT	Only in models 180T, 210T and 280T	

2.4 - Manufacturer

COSMOGAS srl
Via L. da Vinci 16
47014 - Meldola (FC) Italy
Tel. (+39) 0543 498383
Fax. (+39) 0543 498393
www.cosmogas.com
info@cosmogas.com

2.5 - Meaning of symbols used

WARNING!
Danger of electric shocks. If these warnings are not heeded it can jeopardise correct operation of the boiler or cause serious injury or damage to people, animals or things.

WARNING!
Generic danger. Failure to comply with these warnings may jeopardise the working order of the appliance or cause serious damage or injury to persons, animals or things.

☞ Important indication symbol

2.6 - Maintenance

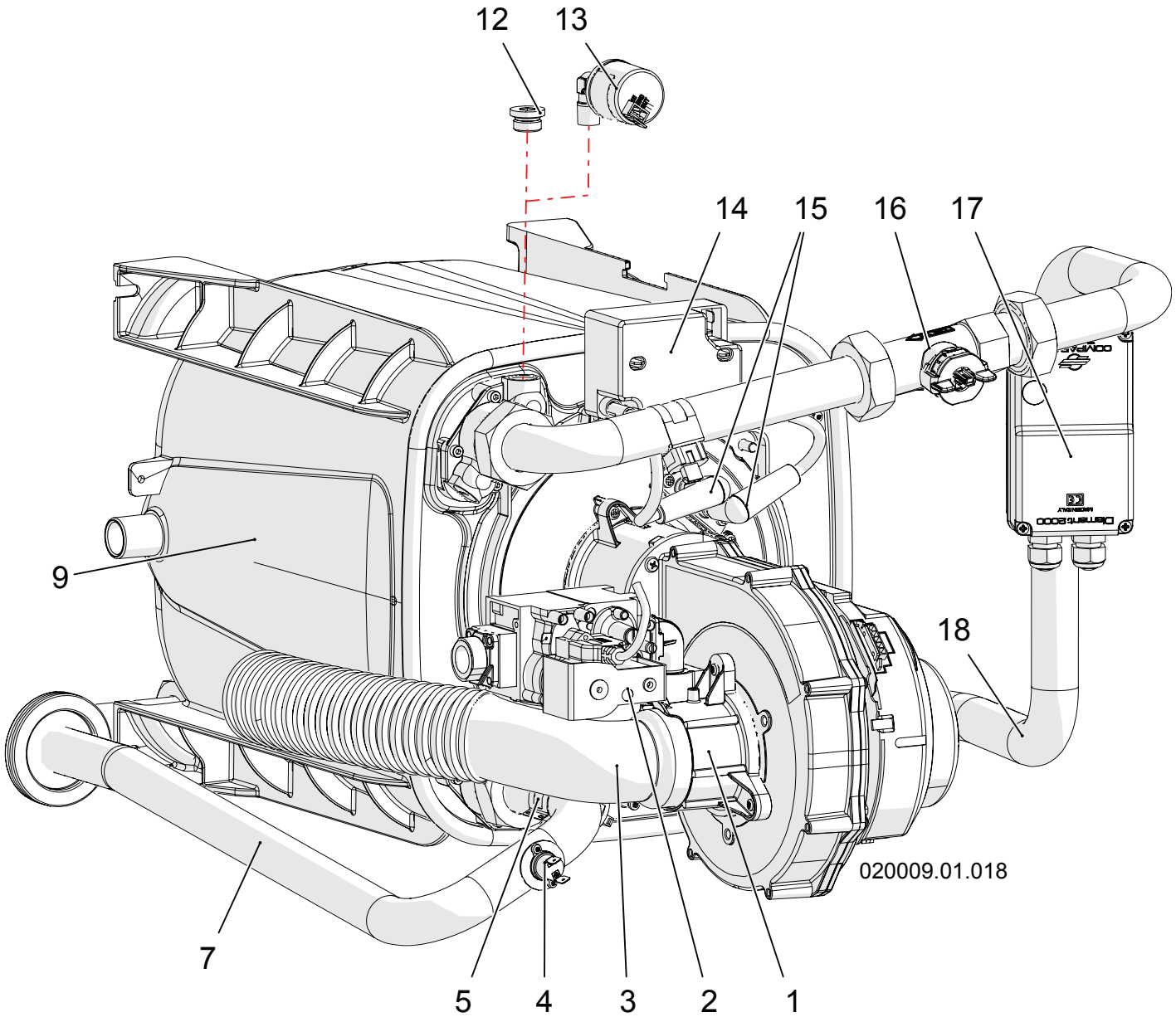
A regular annual maintenance check on the appliance is advised for the following reasons:

- to maintain high efficiency and reduce fuel consumption;
- to achieve a high level of operating safety;
- to maintain a high level of environmental combustion compatibility;

Offer your customer a scheduled maintenance contract.

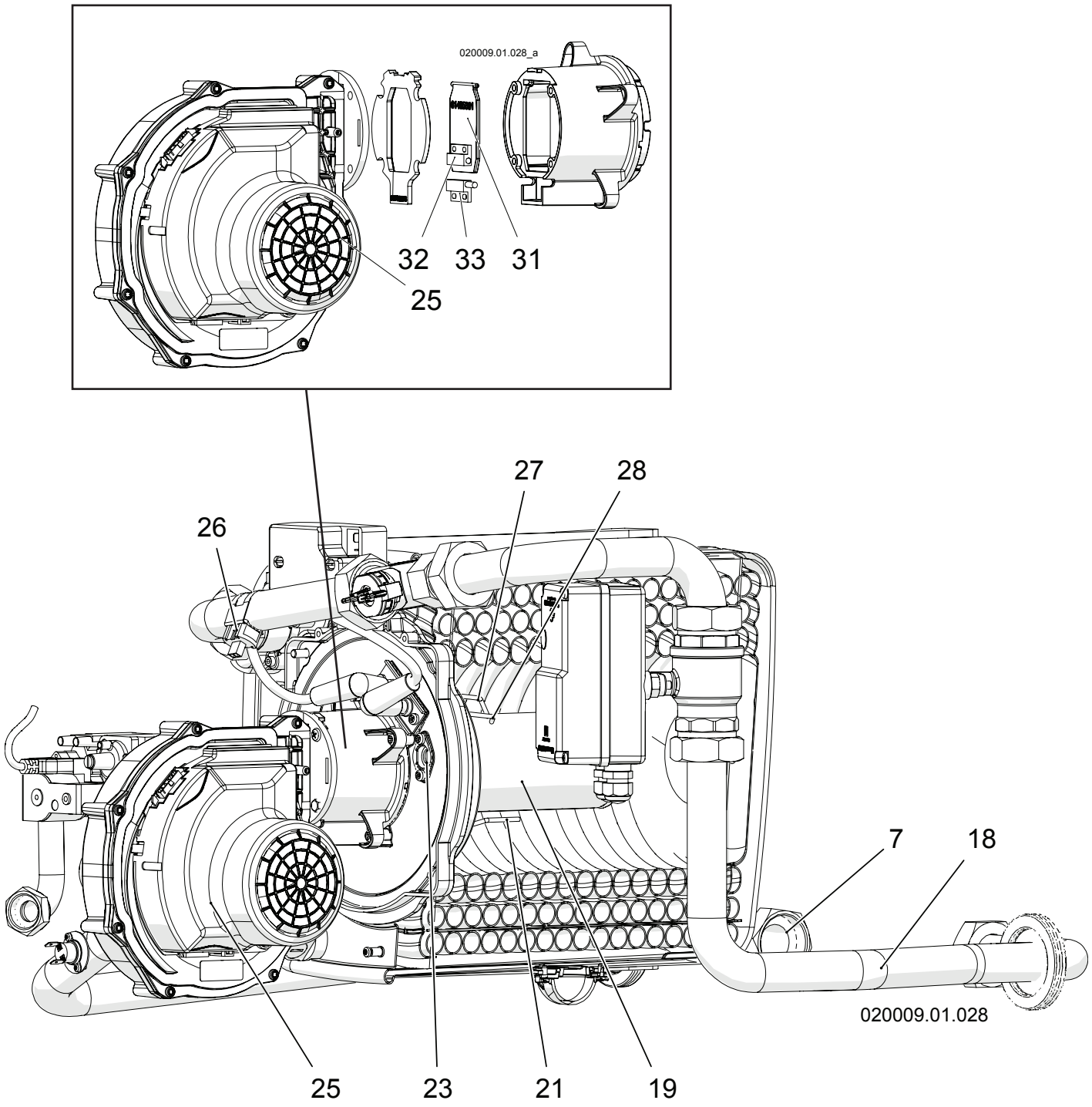
2.7 - Disposal

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



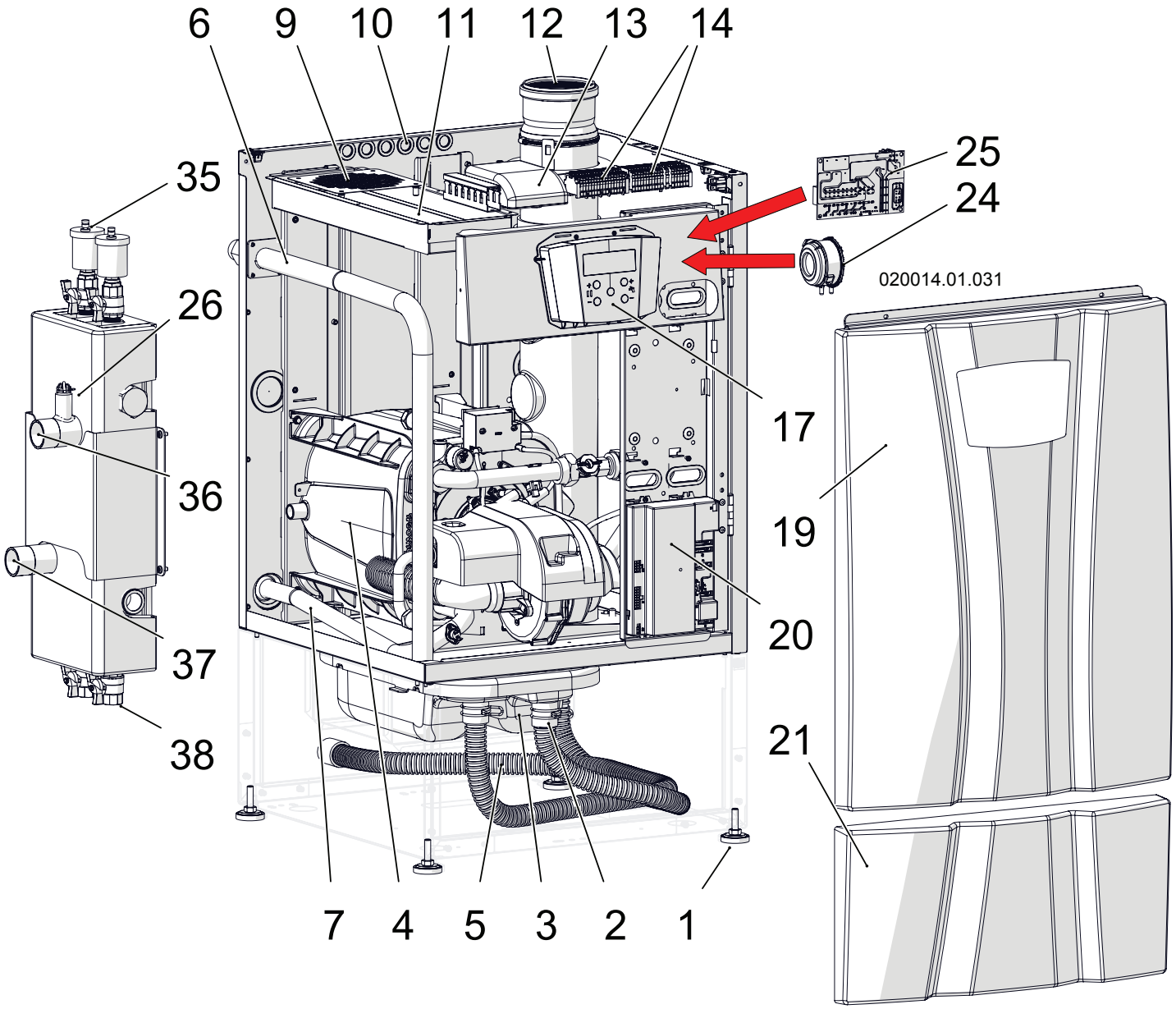
1 - Air/gas mixing group
2 - Gas valve
3 - Air inlet manifold
4 - Hot water safety thermostat
5 - Hot water temperature sensor
6 - ----------
7 - Hot water outlet pipe
8 - ----------
9 - Heat exchanger
10 - ----------
11 - ----------
12 - Stopper (not present)
13 - Water pressure sensor (present in burner 1 MASTER)
14 - Sparks generator
15 - Ignition cables
16 - Water flow rate gauge
17 - 2-way motorised valve (on request)
18 - Water inlet pipe
39 - ----------

Figure 3-1 - Internal components of models 60T, 70T, 100T, 115T, 140T, 180T, 210T and 280T



19 - Burner
20 - ----------
21 - Detection electrode
22 - ----------
23 - Burner pilot light
24 - ----------
25 - Fan
26 - Water inlet temperature sensor
27 - LH ignition electrode
28 - RH ignition electrode
29 - ----------
30 - ----------
31 - Flue gases check valve
32 - Check valve magnet
33 - Check valve sensor

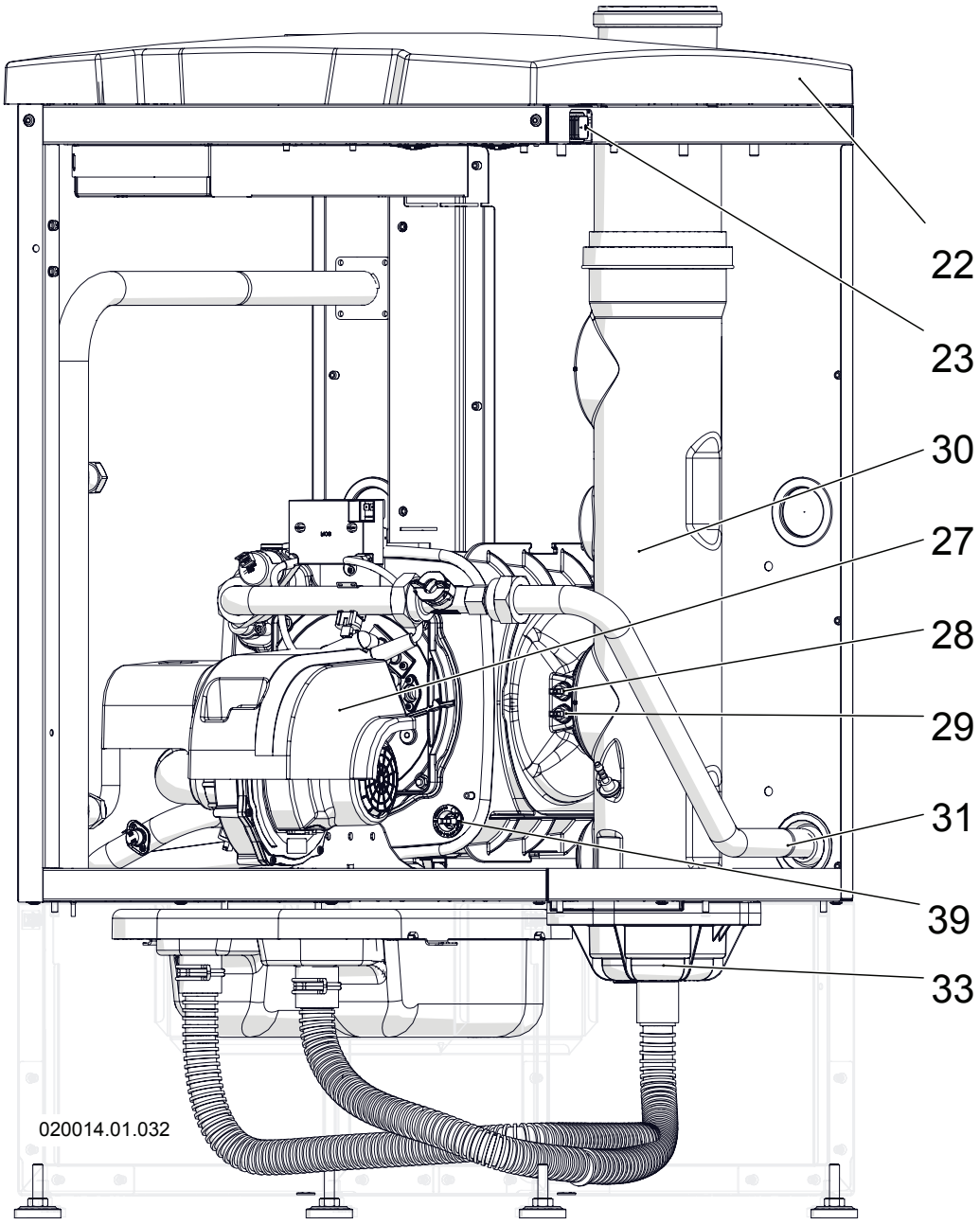
Figure 3-2 - Internal components of models 60T, 70T, 100T, 115T, 140T, 180T, 210T and 280T



1 - Adjustable feet
2 - Exhaust gases condensate outlet pipe
3 - Condensate neutraliser
4 - Burner “1” (MASTER)
5 - Condensate outlet pipe
6 - Gas inlet pipe
7 - Hot water outlet pipe
8 - ----------
9 - Air intake
10 - Passage of electrical wires
11 - Air intake filter
12 - Exhaust gases outlet
13 - Board 885 IF (on request)
14 - Electrical connections
15 - ----------
16 - ----------
17 - Control panel
18 - ----------
19 - Top front casing
20 - “Burner 1” command and control board
21 - Bottom front casing
24 - Pressure switch against outlet blockage
25 - Electrical connections board
26 - Water outlet manifold temperature sensor
35 - Air vent valve
36 - Water outlet
37 - Water inlet
38 - Drain valve

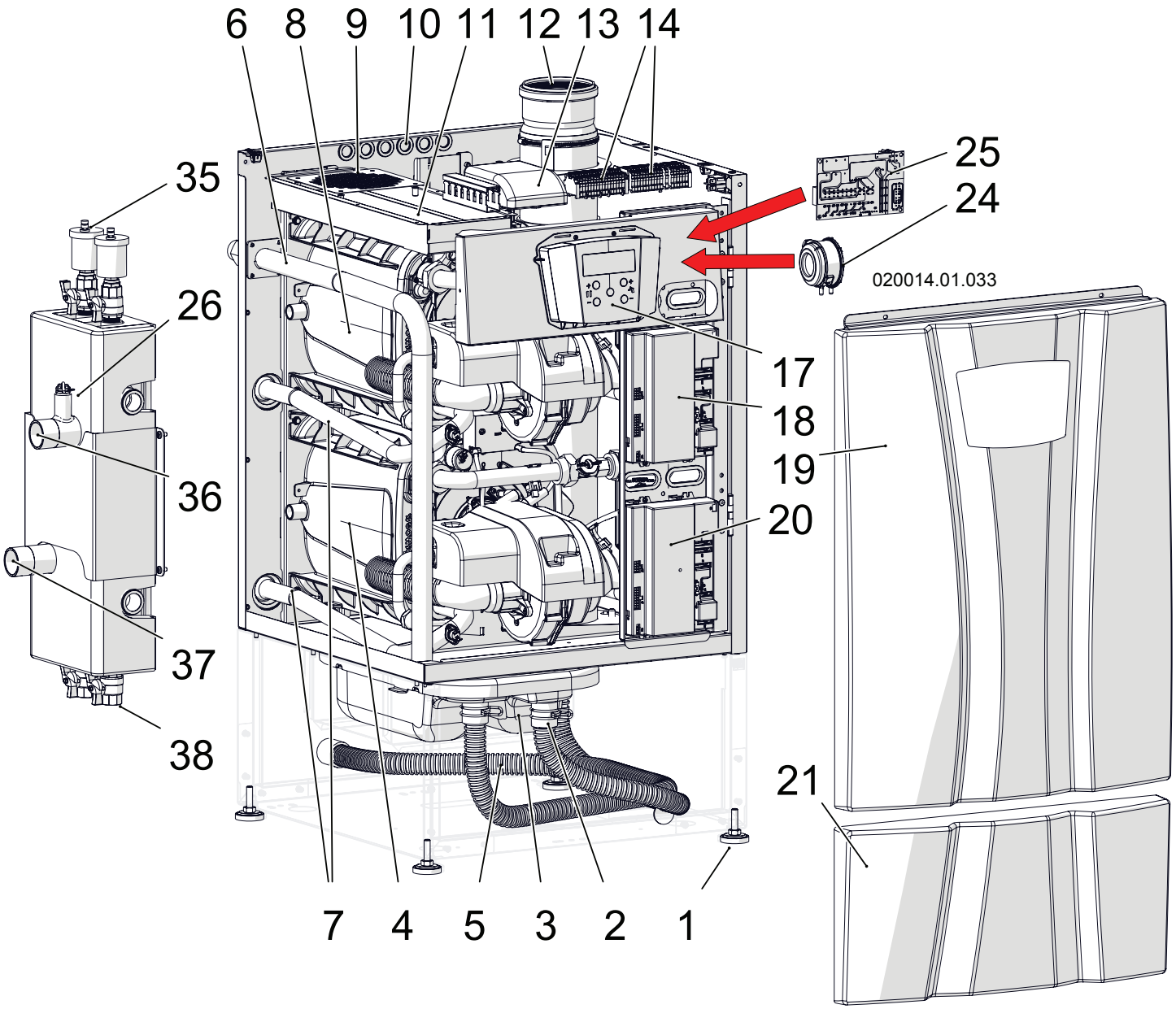
Figure 3-3 - Internal components of models 60T and 70T

BURNER 1
(Master)



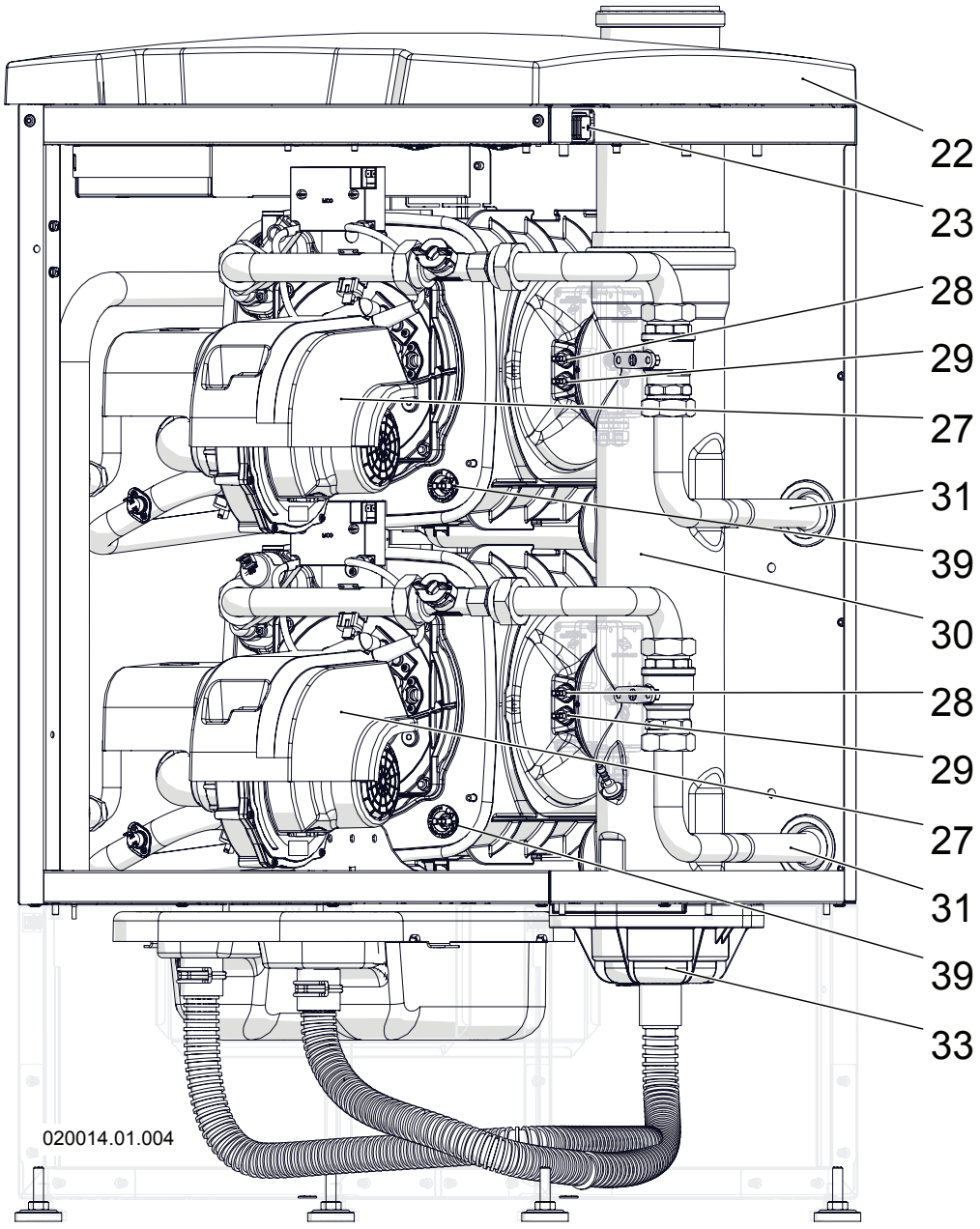
22 - Top cover
23 - General ON/OFF switch
27 - Fan cover
28 - Exhaust gases temperature safety fuse (red connector)
29 - Exhaust gases temperature sensor (blue connector) (1006)
30 - Exhaust gases outlet manifold
31 - Water inlet pipe
32 - ----------
33 - Condensate level sensor
34 - ----------
39 - Primary heat exchanger temperature fuse

Figure 3-4 - Internal components of models 60T and 70T



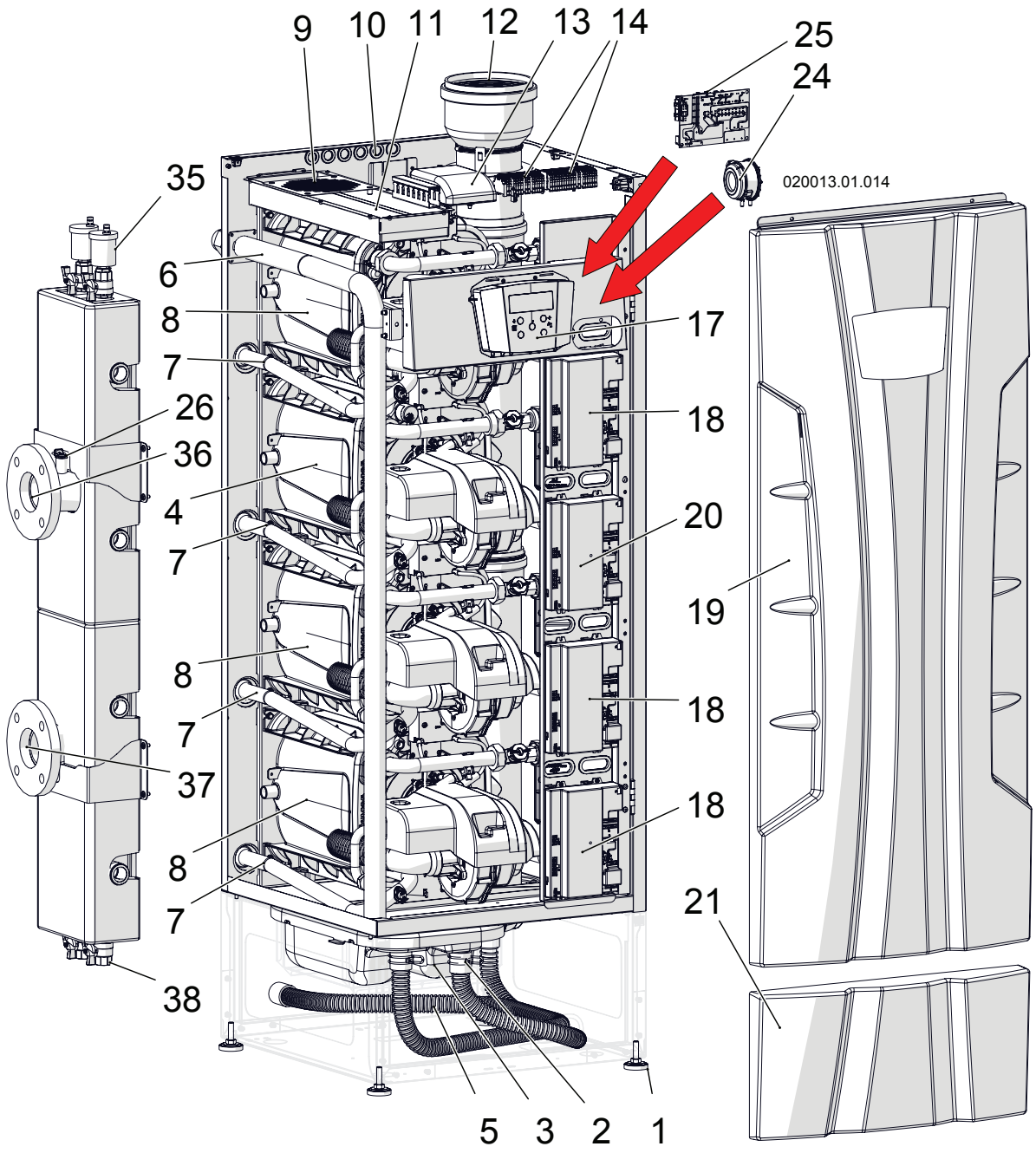
1 - Adjustable feet
2 - Exhaust gases condensate outlet pipe
3 - Condensate neutraliser
4 - Burner “1” (MASTER)
5 - Condensate outlet pipe
6 - Gas inlet pipe
7 - Hot water outlet pipe
8 - Burner “2” (SLAVE)
9 - Air intake
10 - Passage of electrical wires
11 - Air intake filter
12 - Exhaust gases outlet
13 - Board 885 IF (on request)
14 - Electrical connections
15 - ----------
16 - ----------
17 - Control panel
18 - “Burner 2” command and control board
19 - Top front casing
20 - “Burner 1” command and control board
21 - Bottom front casing
24 - Pressure switch against outlet blockage
25 - Electrical connections board
26 - Water outlet manifold temperature sensor
35 - Air vent valve
36 - Water outlet
37 - Water inlet
38 - Drain valve

Figure 3-5 - Internal components of models 100T, 115T and 140T



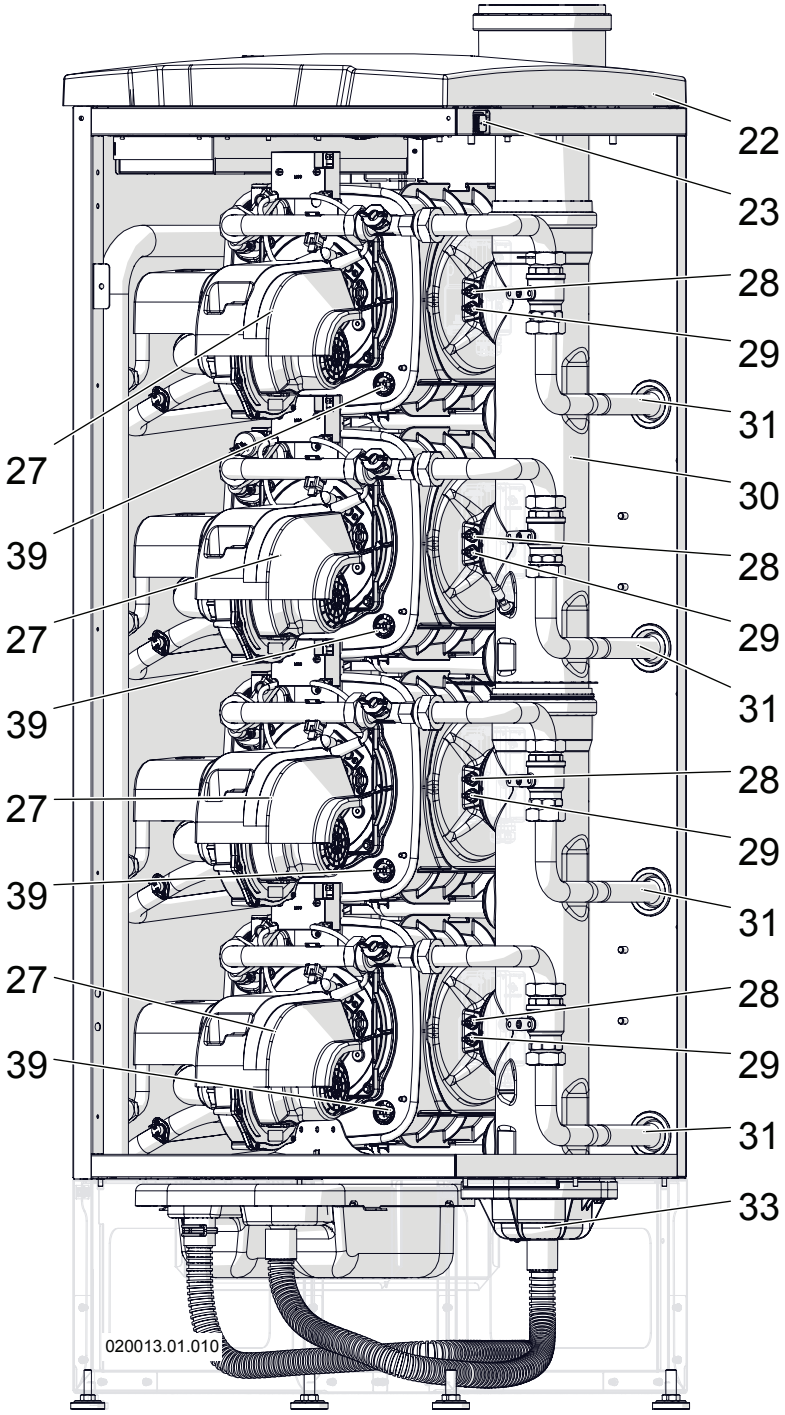
22 - Top cover
23 - General ON/OFF switch
27 - Fan cover
28 - Exhaust gases temperature safety fuse (red connector)
29 - Exhaust gases temperature sensor (blue connector) (1006)
30 - Exhaust gases outlet manifold
31 - Water inlet pipe
32 - ----------
33 - Condensate level sensor
34 - ----------
39 - Primary heat exchanger temperature fuse

Figure 3-6 - Internal components of models 100T, 115T and 140T



1 - Adjustable feet
2 - Exhaust gases condensate outlet pipe
3 - Condensate neutraliser
4 - Burner “1” (MASTER)
5 - Condensate outlet pipe
6 - Gas inlet pipe
7 - Hot water outlet pipe
8 - Burner “2”-”3”-”4” (SLAVE)
9 - Air intake
10 - Passage of electrical wires
11 - Air intake filter
12 - Exhaust gases outlet
13 - Board 885 IF (on request)
14 - Electrical connections
15 - ----------
16 - ----------
17 - Control panel
18 - Burner “2”-”3”-”4” command and control board
19 - Top front casing
20 - “Burner 1” command and control board
21 - Bottom front casing
24 - Pressure switch against outlet blockage
25 - Electrical connections board
26 - Water outlet manifold temperature sensor
35 - Air vent valve
36 - Water outlet
37 - Water inlet
38 - Drain valve

Figure 3-7 - Internal components of models 180T, 210T and 280T



22 - Top cover
23 - General ON/OFF switch
27 - Fan cover
28 - Exhaust gases temperature safety fuse (red connector)
29 - Exhaust gases temperature sensor (blue connector) (1006)
30 - Exhaust gases outlet manifold
31 - Water inlet pipe
32 - ----------
33 - Condensate level sensor
34 - ----------
39 - Primary heat exchanger temperature fuse

Figure 3-8 - Internal components of models 180T, 210T and 280T

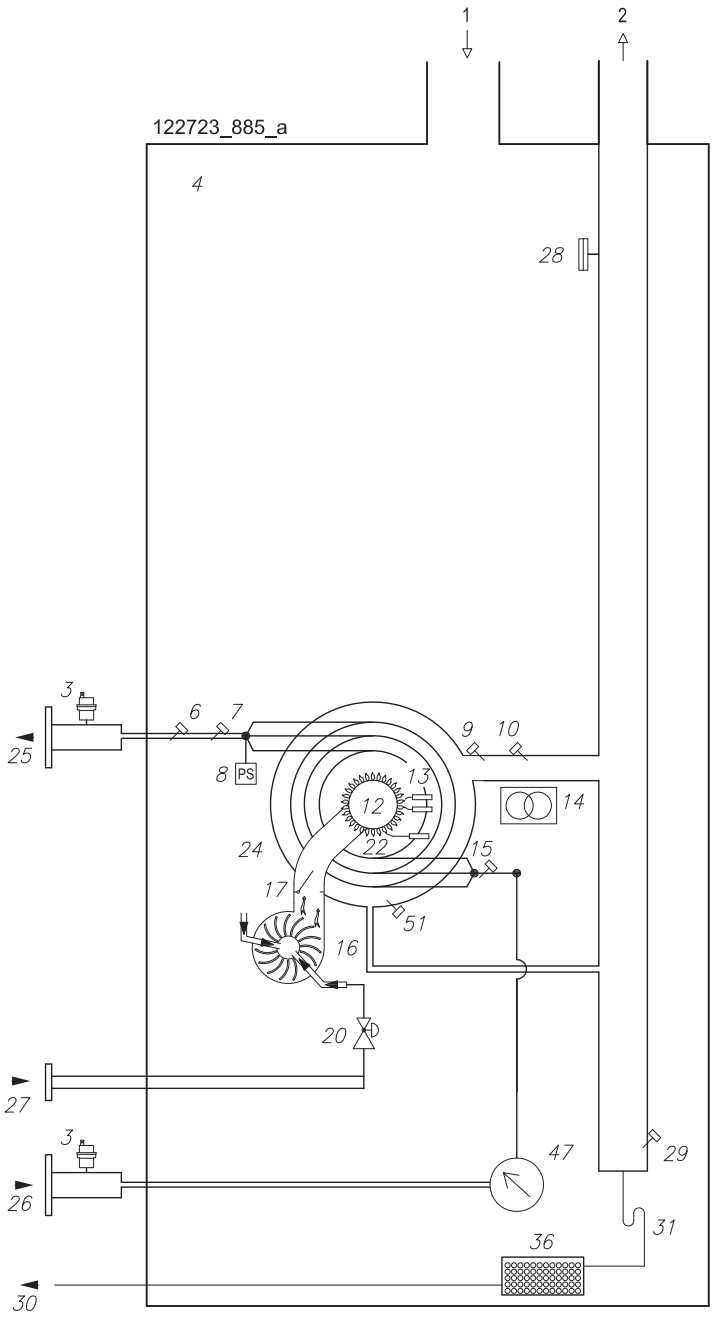


Figure 4-1 Key:
1 - Air intake
2 - Exhaust gases outlet
3 - Air vent valve
4 - Sealed chamber
6 - Water outlet temperature safety thermostat
7 - Water outlet temperature sensor
8 - Water pressure gauge
9 - Exhaust gases temperature sensor
10 - Exhaust gases temperature safety fuse
12 - Pre-mixed burner
13 - Ignition electrodes
14 - Sparks generator
15 - Water inlet temperature sensor
16 - Fan
17 - Back flue preventer valve
20 - Gas valve
22 - Detection electrode
24 - VRC heat exchanger
25 - Water outlet
26 - Water inlet
27 - Gas inlet
28 - Pressure switch against outlet blockage
29 - Condensate level sensor
30 - Condensate outlet
31 - Condensate outlet siphon
36 - Condensate neutraliser
47 - Water flow rate gauge
51 - Primary heat exchanger temperature fuse

Figure 4-1 - Plumbing operating diagram for models 60T and 70T

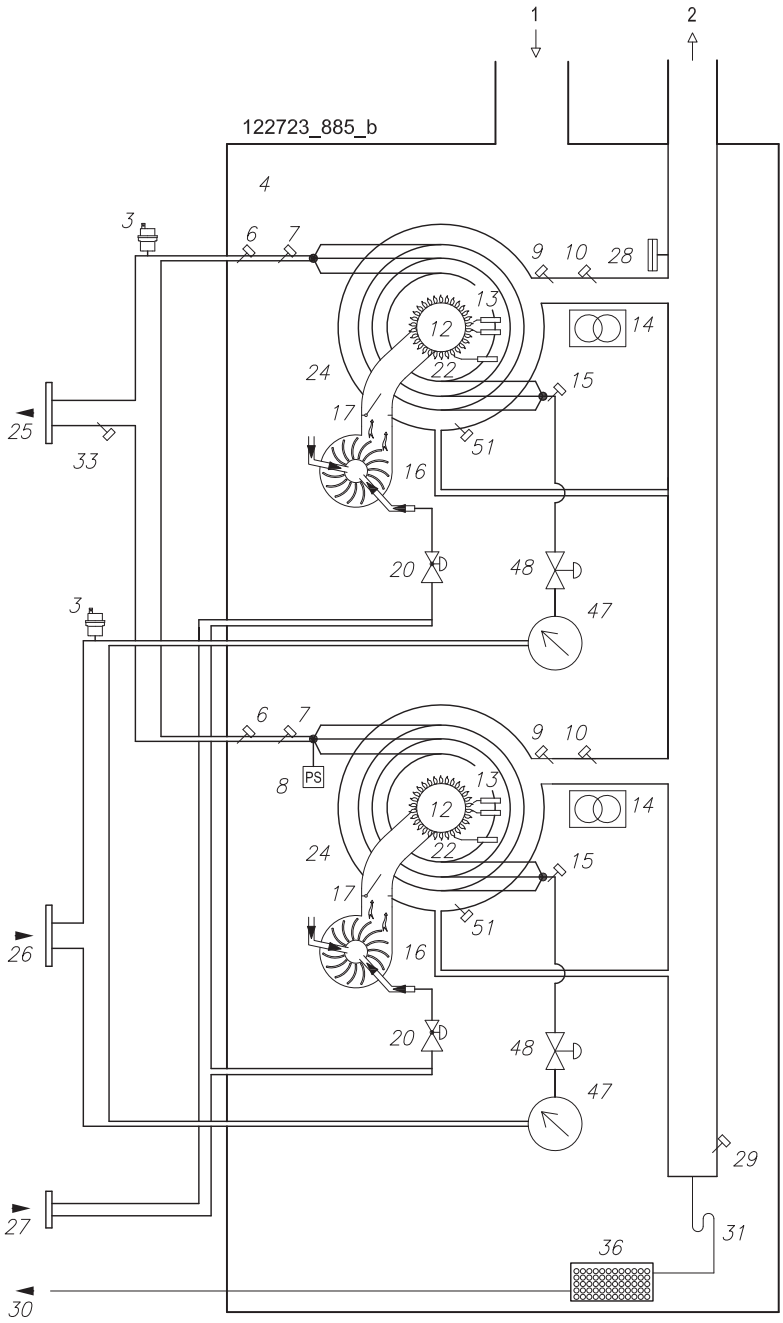


Figure 4-2 Key:
1 - Air intake
2 - Exhaust gases outlet
3 - Air vent valve
4 - Sealed chamber
6 - Water outlet temperature safety thermostat
7 - Water outlet temperature sensor
8 - Water pressure gauge
9 - Exhaust gases temperature sensor
10 - Exhaust gases temperature safety fuse
12 - Pre-mixed burner
13 - Ignition electrodes
14 - Sparks generator
15 - Water inlet temperature sensor
16 - Fan
17 - Back flue preventer valve
20 - Gas valve
22 - Detection electrode
24 - VRC heat exchanger
25 - Water outlet
26 - Water inlet
27 - Gas inlet
28 - Pressure switch against outlet blockage
29 - Condensate level sensor
30 - Condensate outlet
31 - Condensate outlet siphon
33 - Manifold outlet temperature sensor
36 - Condensate neutraliser
47 - Water flow rate gauge
48 - 2-way motorised valve (on request)
51 - Primary heat exchanger temperature fuse

Figure 4-2 - Hydraulic operating diagram for models 100T, 115T and 140T

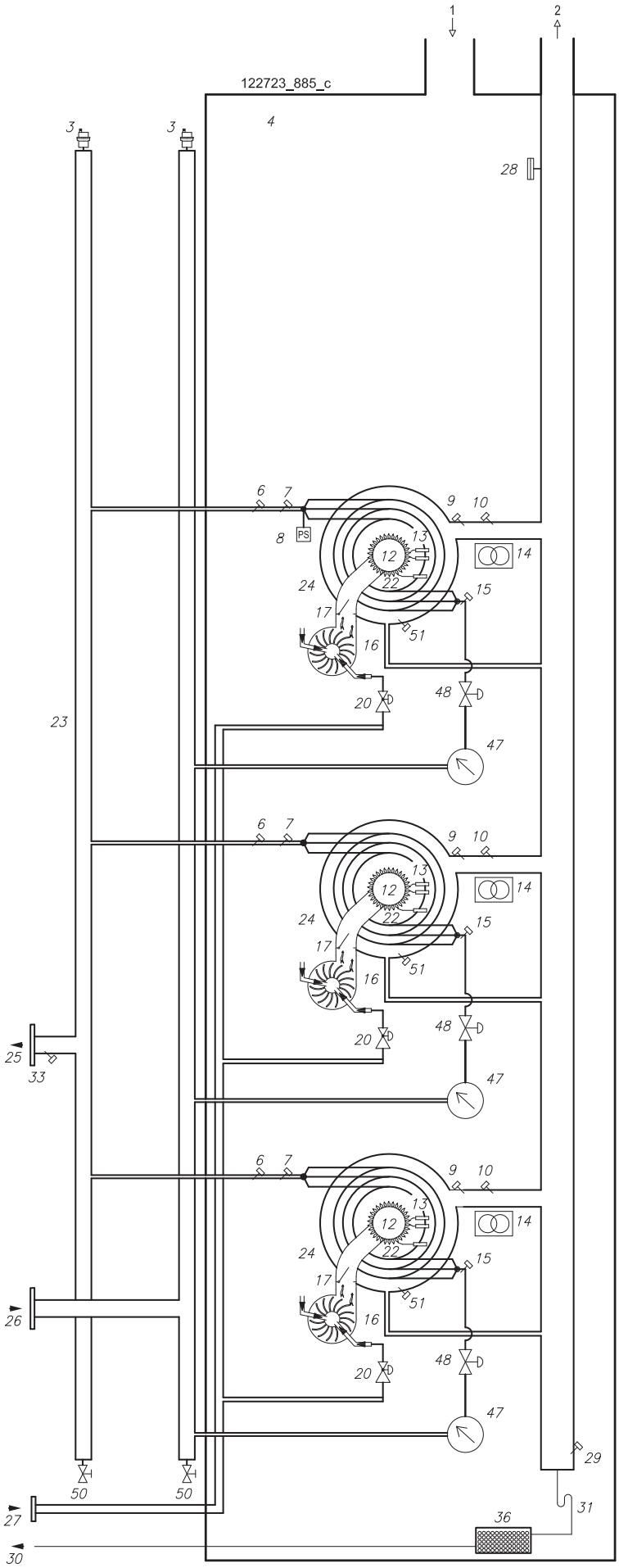


Figure 4-3 Key:
1 - Air intake
2 - Exhaust gases outlet
3 - Air vent valve
4 - Sealed chamber
6 - Water outlet temperature safety thermostat
7 - Water outlet temperature sensor
8 - Water pressure gauge
9 - Exhaust gases temperature sensor
10 - Exhaust gases temperature safety fuse
12 - Pre-mixed burner
13 - Ignition electrodes
14 - Sparks generator
15 - Water inlet temperature sensor
16 - Fan
17 - Back flue preventer valve
20 - Gas valve
22 - Detection electrode
23 - Inlet and outlet manifold
24 - VRC heat exchanger
25 - Water outlet
26 - Water inlet
27 - Gas inlet
28 - Pressure switch against outlet blockage
29 - Condensate level sensor
30 - Condensate outlet
31 - Condensate outlet siphon
33 - Manifold outlet temperature sensor
36 - Condensate neutraliser
47 - Water flow rate gauge
48 - 2-way motorised valve (on request)
50 - Drain valves
51 - Primary heat exchanger temperature fuse

Figure 4-3 - Hydraulic operating diagram for models 180T and 210T

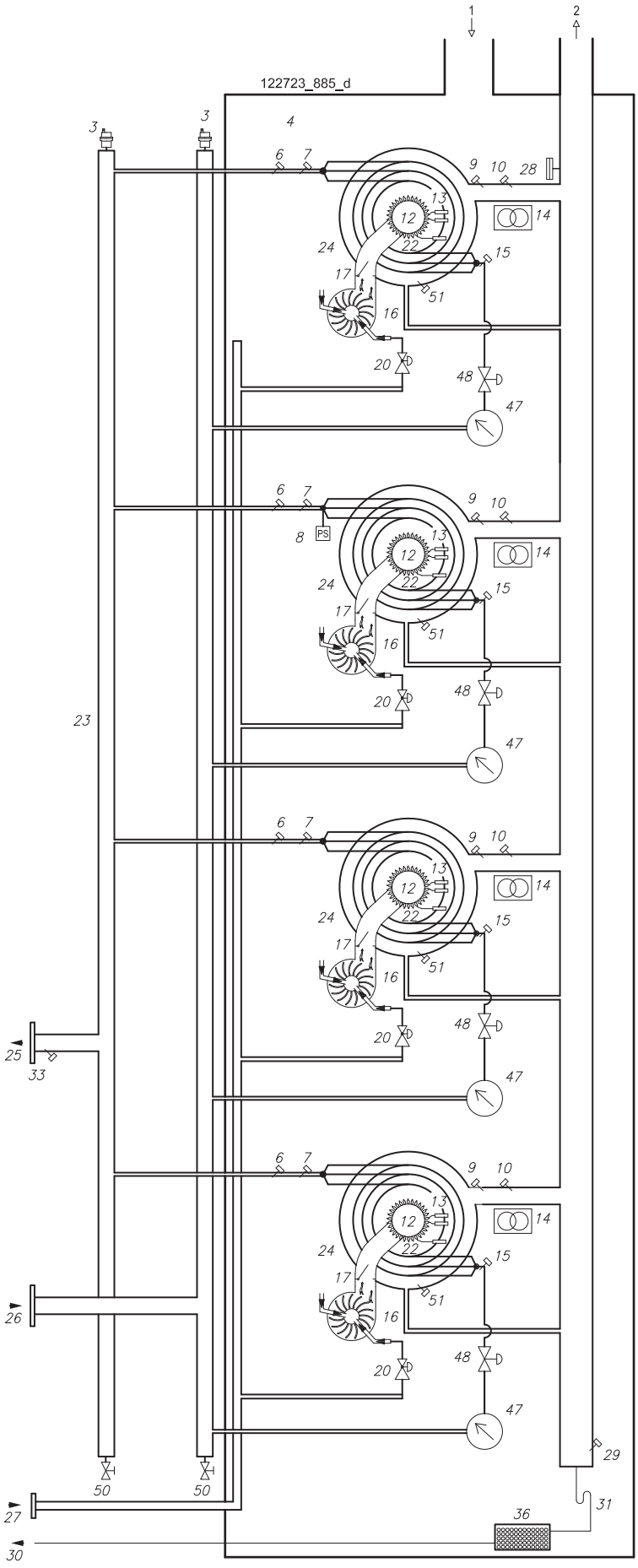


Figure 4-4 Key:
1 - Air intake
2 - Exhaust gases outlet
3 - Air vent valve
4 - Sealed chamber
6 - Water outlet temperature safety thermostat
7 - Water outlet temperature sensor
8 - Water pressure gauge
9 - Exhaust gases temperature sensor
10 - Exhaust gases temperature safety fuse
12 - Pre-mixed burner
13 - Ignition electrodes
14 - Sparks generator
15 - Water inlet temperature sensor
16 - Fan
17 - Back flue preventer valve
20 - Gas valve
22 - Detection electrode
23 - Inlet and outlet manifold
24 - VRC heat exchanger
25 - Water outlet
26 - Water inlet
27 - Gas inlet
28 - Pressure switch against outlet blockage
29 - Condensate level sensor
30 - Condensate outlet
31 - Condensate outlet siphon
33 - Manifold outlet temperature sensor
36 - Condensate neutraliser
47 - Water flow rate gauge
48 - 2-way motorised valve (on request)
50 - Drain valves
51 - Primary heat exchanger temperature fuse

Figure 4-4 - Hydraulic operating diagram for model 280T

4.1 - Operation and intended use

4.1.1 - MYDENS boiler operation and intended use

The MYDENS product is a gas condensing boiler, designed for the production of central heating. It can also be used for the production of domestic hot water but must be connected to an appropriate storage tank (see figure 10-2). Any other use is forbidden.
The maximum power for domestic hot water service is always guaranteed in that the boiler gives priority to that service. Follow the procedure given in section 17.6 to adjust the domestic hot water temperature
The central heating system can be made with heating elements operating in a temperature range of 30°C to 80°C
The boiler can be connected to a room thermostat, an external sensor or a 0-10 VDC analogue input.
This boiler must be connected to a central heating and domestic hot water production system with power demanded that is compatible with the characteristics of the boiler itself.

4.1.2 - AGUADENS hot water heater operation and intended use

The AGUADENS product is a condensing gas boiler which must be connected to a storage tank for the production of domestic hot water (see figure 11-1).
Any other use is forbidden.

4.1.3 - Wide modulation range and maximum efficiency

Depending on the load demanded by the system, the boiler's management program can gradually switch on each individual heating element at minimum power (see figure 4-5). After which, if the load demanded by the system increases, all the heating elements gradually increase the power delivered. In this way modulated power from a minimum of 14 kW to a maximum that corresponds to the architecture of the boiler can be obtained (figure 4-5 shows a 280T module with 4 heating elements), with consequent maintaining of maximum efficiency throughout the whole range of modulation.
When the boiler is connected to an external sensor, it always works at maximum efficiency (see section 17.9).

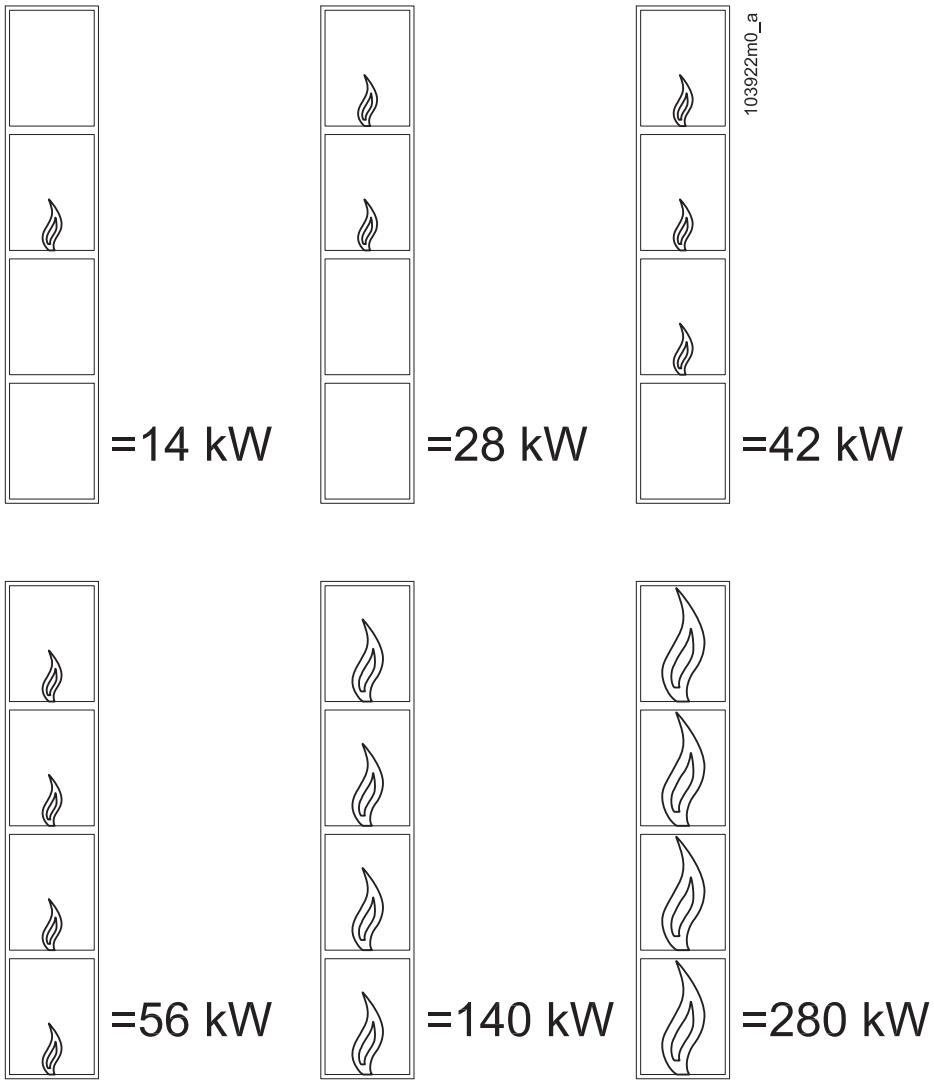


Figure 4-5 - Modulation of model 280T boiler

This system allows the delivery temperature to be managed automatically depending on the outdoor temperature. An example of this in operation is shown in the form of a graph in figure 4-6. The graph shows an example in which the delivery and return temperatures are 55°C and 43°C respectively, and the outdoor temperature is 0°C. The external sensor commands modulation of the boiler, gradually reducing the delivery temperature and optimising efficiency. Efficiency changes from 97% when the outdoor temperature is -15°C to 105.8% with outdoor temperature of 0°C and up to 109% with outdoor temperature of 20°C.

4.1.4 - Primary circuit pump

The boiler is expressly manufactured without an internal pump in order to give the installer the option of being able to connect any pump, even a modulating one. In figures 10-1 and 10-2 the primary circuit pump is detail “36”. When choosing this pump the designer must check the system features as well as the details in section 10.11.

4.1.5 - Central heating circuit pump

The central heating circuit pump, detail “19” in figures 10-1 and 10-2, is not supplied to give the installer the option of being able to connect any pump, even a modulating one. When choosing this pump the designer must check the features of the system.

4.1.6 - Domestic hot water circuit pump

The domestic hot water circuit pump, detail “28” in figure 10-2 and detail “36” in figure 11-1, is not supplied to give the installer the option of being able to connect any pump, even a modulating one. When choosing this pump the designer must check the features of the system.

4.1.7 - Hydraulic separator

If the system must be served by a water flow rate that is higher than the pump can deliver, a hydraulic separator must be inserted between the boiler and the system (see figures 10-1 and 10-2, detail “20”).

4.1.8 - MYDENS boiler production of domestic hot water

For the production of domestic hot water a storage tank must be connected following the diagram in figure 10-2.
The temperature of the domestic hot water is adjusted following the procedure in section 17.6.

4.1.9 - Types of system

The following types of system can be set up with this appliance:
- System solely for central heating (see figure 10-1)
- System solely for the production of domestic hot water (see figure 11-1)
- System for central heating and the production of domestic hot water (see figure 10-2)

4.2 - Precautions for installation

For the boiler to work well, respect the following directions:

☞ This appliance must be connected to a central heating system and if need be to a domestic hot water distribution network, compatible with the features, performance and power of the appliance itself.

☞ Check figures 7-1 and 7-2 regarding minimum distances to be observed for installation and future maintenance.

4.3 - Anti-Legionella

MYDENS (when connected to a storage tank) and AGUADENS appliances do not have anti- legionella protection:
It will be the responsibility of the installer to keep the temperature of the storage tank at not less than 60°C to ensure disinfection or else to use equivalent systems.

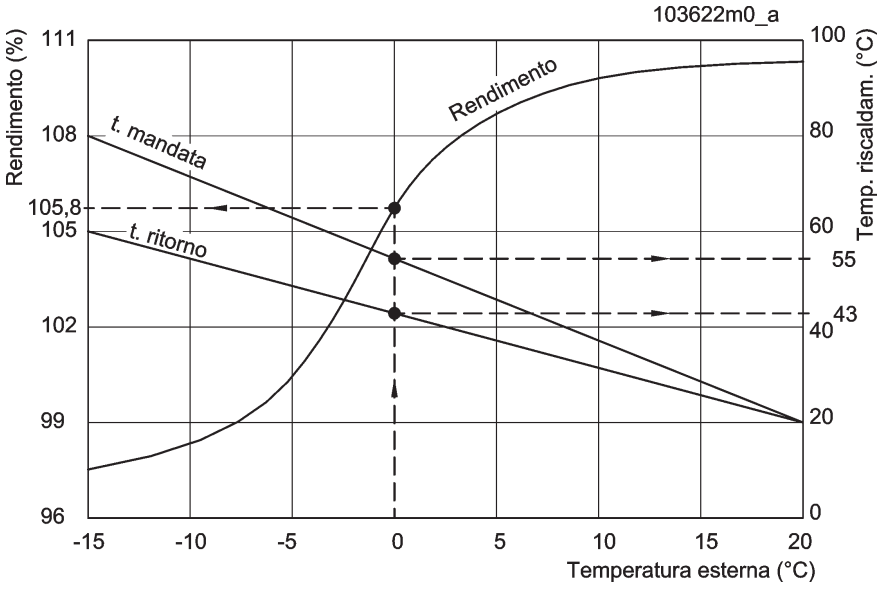


Figure 4-6 - Example of diagram of efficiency / delivery and return temperature / outdoor temperature, for a home, in a very cold area and a system with radiators.

5.1 - Selection of place of installation

WARNING! Do not store any inflammable material in the boiler's immediate vicinity.

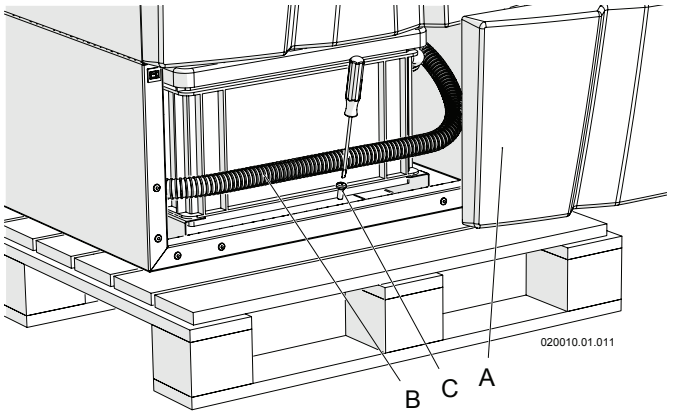
WARNING! Do not install the boiler on carpet.

WARNING! The boiler must be installed in a room in which there is a supply of air for ventilation and combustion, regardless of whether it is taken from outside (sealed combustion) or from inside (combustion in ventilated room).

WARNING! Inadequate ventilation of the boiler can cause elevated air temperatures.

WARNING! Make sure that the intake and outlet openings are the right size and that there are no obstructions and blockages. If the problem cannot be resolved, do not start up the boiler. Please keep in mind these restrictions and the risks they may cause to the operator.

WARNING! Liquified Petroleum Gas (LPG) - The installation needs particular attention: LPG boilers must not be installed in trenches, cellars or similar rooms in which the gas, which is heavier than air, could hang. LPG powered boilers must not be installed in places below floor level or basements. If these remarks are not respected, explosions could result and cause serious injury to people, death or enormous material damage.



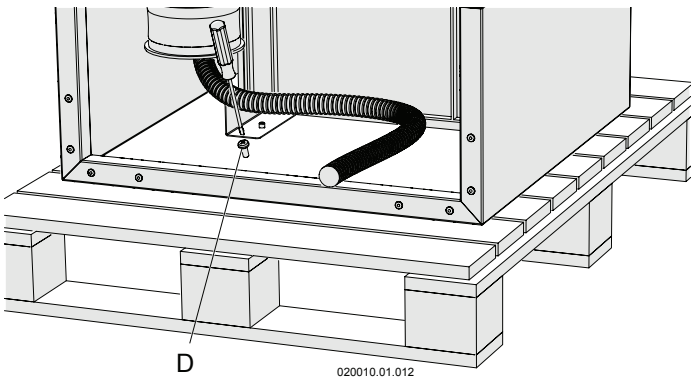


Figure 5-1 - Undoing transport pallet screws

WARNING! If installed in rooms with a thin floor, a resonating noise could be generated. The installation of noise-reduction elements is required.

WARNING! Do not let too much dust accumulate on the boiler.

WARNING! The boiler must only be installed on a solid floor, which takes its weight and is level.

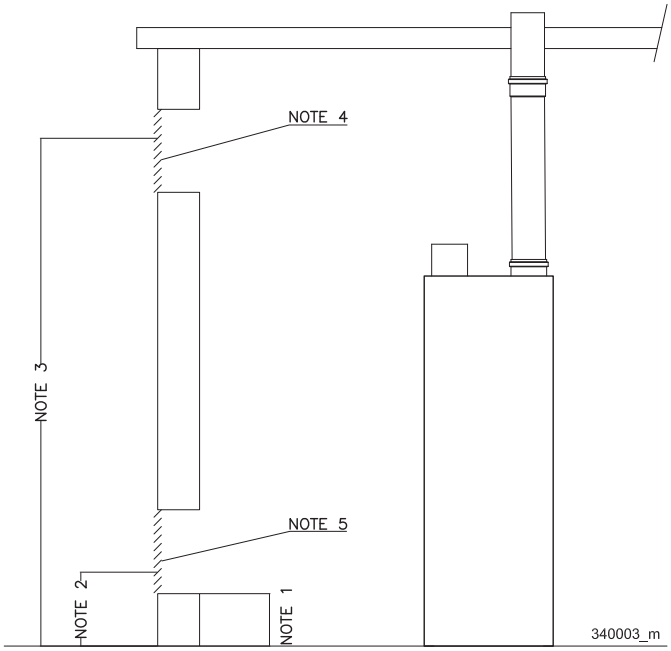
☞ Before installing the appliance, the central heating system and, if necessary, the domestic hot water system must be washed thoroughly in order to remove any residues or impurities which could compromise the working order of the boiler.

☞ This boiler is not designed to be installed in the open air, it must not be exposed to temperatures below 0.5°C or above 50°C. Choose a place inside the building or somewhere sheltered from weather such as rain, wind, sun and, above all, frost.

☞ The minimum return temperature is 20°C. Lower return temperatures are not acceptable by the appliance.

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

Choose the room and suitable position for installation, taking into account the following factors:
- connection to smoke outlet/air intake ducts;
- connection to gas adduction duct;
- connection of the water supply;
- connection to the central heating system;
- connection to domestic hot water system (where present);
- electric connection;
- connection to outlet for condensate produced by the boiler;
- electric connection of the room thermostat;
- connection to safety valve outlet;
- connection to the outdoor temperature sensor (where applicable);
- room ventilation.



NOTE 1: For LPG installations, ventilation must be be within 250 mm from floor level.
NOTE 2: At least 20% of low-level ventilation allowance to be below 1000 mm from floor level.
NOTE 3: At least 20% of high-level ventilation allowance to be above 85% of maximum room height.
NOTE 4: Operation <50% of time = 2cm^2/kW (total net input);
Operation 50 - 75% of time = 3 cm^2/kW (total net input);
Operation >75% of time = 4 cm^2/kW (total net input).
NOTE 5: Operation <50% of time = 4 cm^2/kW (total net input);
Operation 50 - 75% of time = 5 cm^2/kW (total net input);
Operation >75% of time = 6 cm^2/kW (total net input).

Figure 5-2 Example of ventilation

5.1.1 - Requirements for correct ventilation

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

Low level ventilation shall be provided as low as practicable and be within 1 m of the plant room floor for natural gas installations and within 250 mm of the floor for LPG installations.
Further guidance on ventilation provision including the use of mechanical ventilation systems can be found within IGEM/ UP/10 Edition 4.

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

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

5.1.2 - Preventing contamination of combustion air

Do not locate extractor and/or exhaust gases outlet terminals in rooms where the combustion air may be contaminated.

WARNING! Contaminated fuel air can damage the boiler.
Make sure that the combustion air does not contain any of the following contaminating agents:

Products that might contaminate the fuel air:

- Chlorinated waxes/cleaners;
- Products with a high content of ammonia or other chemical agents (products for beauty salons);
- Chlorine-based swimming pool chemical;
- Calcium chloride used for thawing;
- Sodium chloride used for water softening;
- Refrigerant leaks (refrigeration cycle machines such as heat pumps and air conditioners);
- Paint or varnish removers;
- Hydrochloric acid/muriatic acid;
- Cements and glues;
- Antistatic fabric softeners used in clothes dryers;
- Chlorine-type bleaches, detergents and cleaning solvents found in household laundry rooms;
- Adhesives used to fasten building products and other similar products;

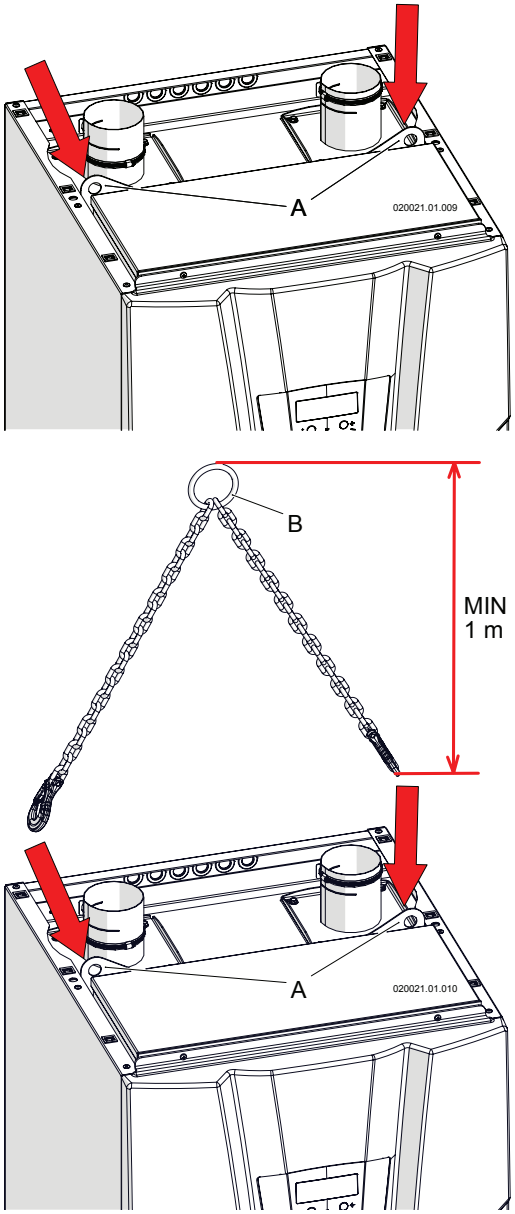


Figure 6-1 - Lifting system

6.1 - Setup

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

6.1.1 - Moving the boiler

WARNING! Use trolleys suitable for the type of boiler to move it. Not doing this could cause serious harm.

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

To remove the boiler from the pallet, undo the front (detail “C” in figure 5-1) and rear (detail “D” in figure 5-1) fixing screws.

6.1.2 - Opening the package

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

6.1.3 - Lifting the boiler

For convenience during installation, a rod is provided (detail “A” in figure 6-1) which enables the boiler to be lifted.

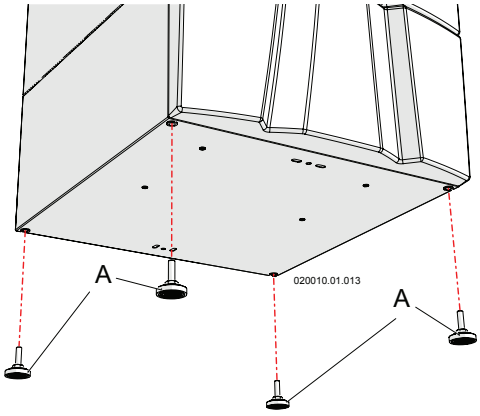
☞ remove the top cover as in section 18.2;

☞ hook lifting cables, “B” in figure 6-1, onto the rod, “A” in figure 6-1 and lift the heating unit;

WARNING! The cables and lifting system must be suitable for the purpose envisaged. In particular, they must be able to bear the weight of the boiler which you can check in section 19.

☞ install the adjustable feet “A” to make the boiler level as shown in figure 6-2.

Once the boiler is in the correct position the lifting cables (detail “B” in figure 6-1) must be removed before the top cover is put on.



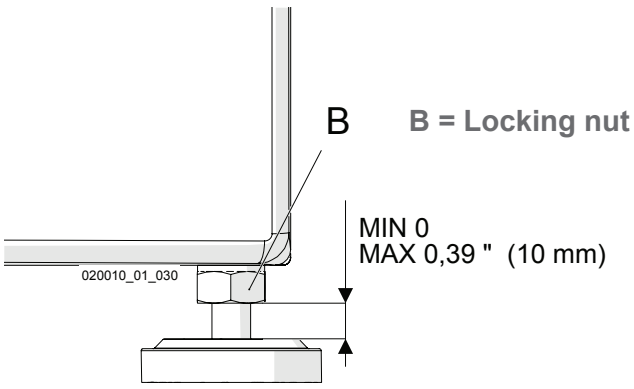


Figure 6-2 - Feet to make it level

7.1 - Dimensions and minimum distances to be observed

For both installation and maintenance, it is necessary to leave free spaces around the boiler, as shown in figures 7-1 and 7-2. The dimensions and connection centre space distances for the boilers are shown in figures 8-1, 8-2, 9-1 and 9-2.

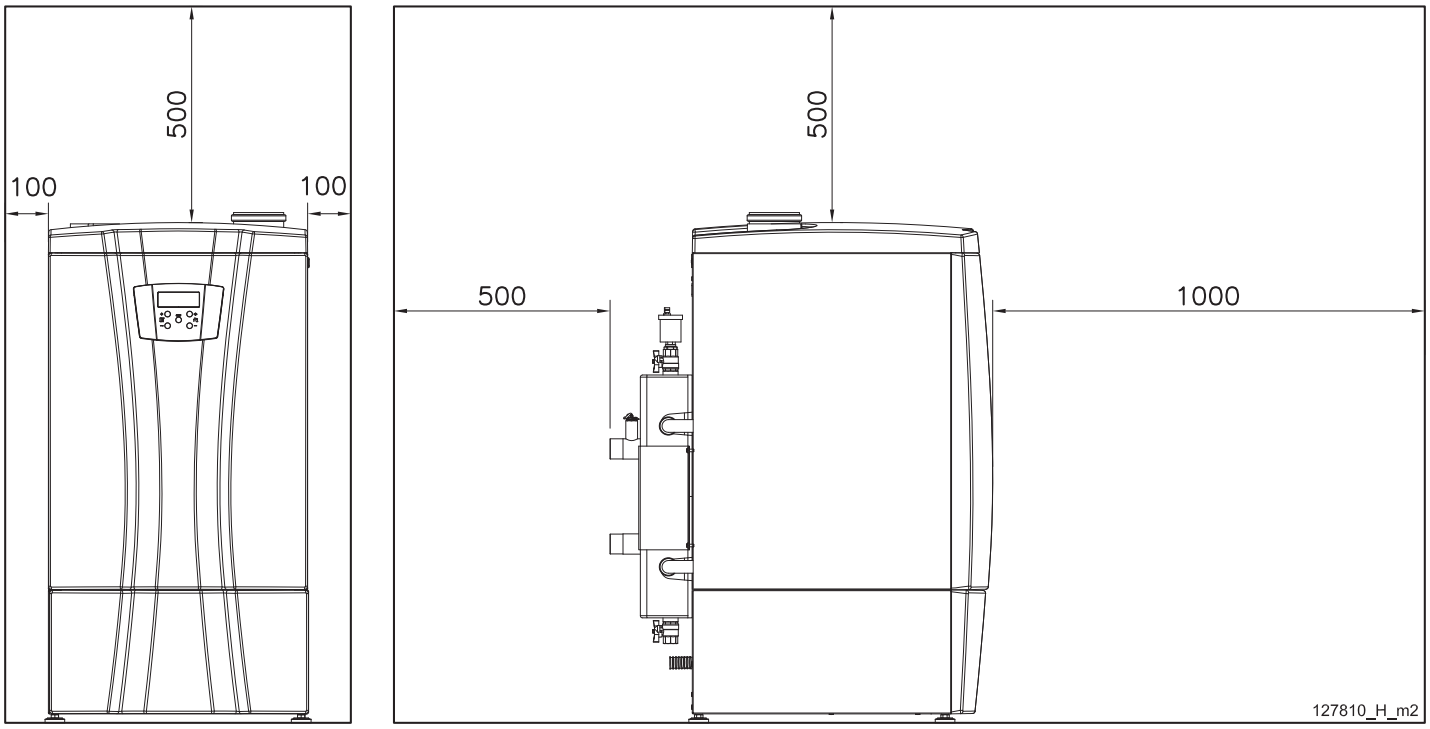


Figure 7-1 - Minimum distances to be observed for models 60T, 70T, 100T, 115T and 140T

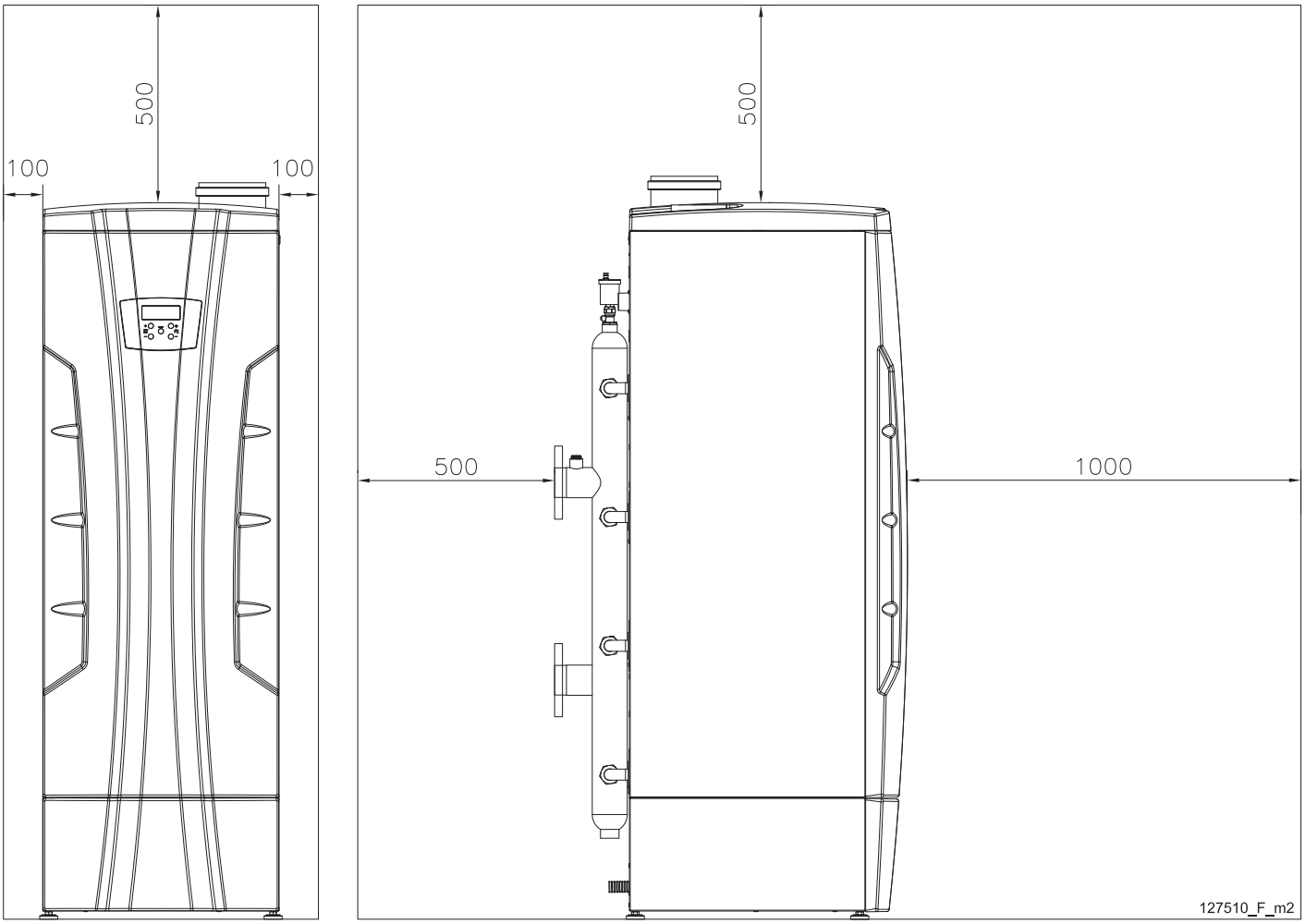


Figure 7-2 - Minimum distances to be observed for models 180T, 210T and 280T

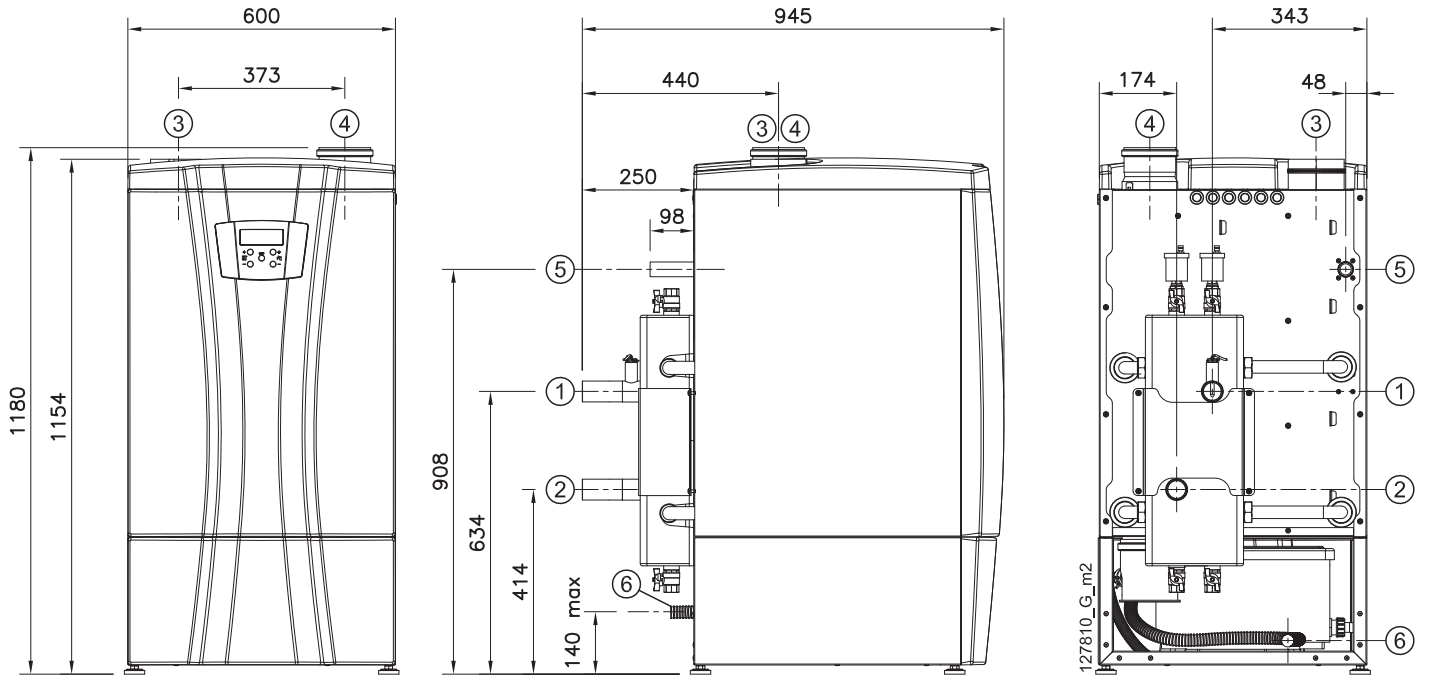


Figure 8-1 - Dimensions and centre space distances of attachments for models 60T, 70T, 100T, 115T and 140T (References in figure 8-3)

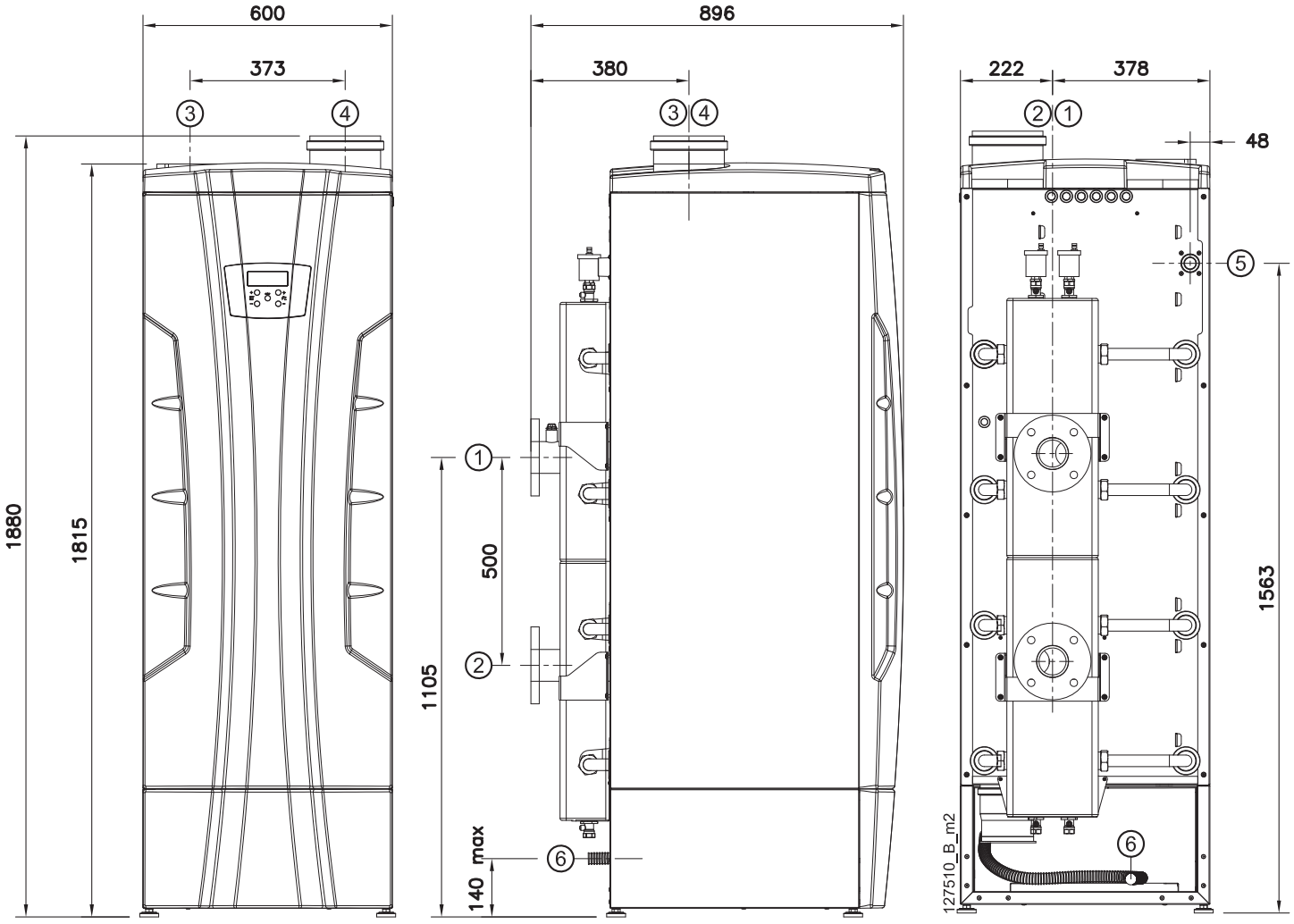


Figure 8-2 - Dimensions and centre space distances of attachments for models 180T, 210T and 280T (References in figure 8-3)

MODEL	① DELIVERY	② RETURN	③ AIR INTAKE	④ FLUE GAS OUTLET	⑤ GAS	⑥ CONDENSATE OUTLET
60T	1”1/2 *	1”1/2 *	136 mm **	110 mm	1”	28 mm
70T	1”1/2 *	1”1/2 *	136 mm **	110 mm	1”	28 mm
100T	1”1/2 *	1”1/2 *	136 mm **	110 mm	1”	28 mm
115T	1”1/2 *	1”1/2 *	136 mm **	110 mm	1”	28 mm
140T	1”1/2 *	1”1/2 *	136 mm **	110 mm	1”	28 mm
180T	DN65 PN16 *	DN65 PN16 *	136 mm **	160 mm	1”1/4	28 mm
210T	DN65 PN16 *	DN65 PN16 *	136 mm **	160 mm	1”1/4	28 mm
280T	DN65 PN16 *	DN65 PN16 *	136 mm **	160 mm	1”1/4	28 mm

* Connections and flanges are not factory fitted;
** Air intake in room, do not obstruct and do not add any connection;

Figure 8-3 - Table of diameters of connections in figures 8-1 and 8-2

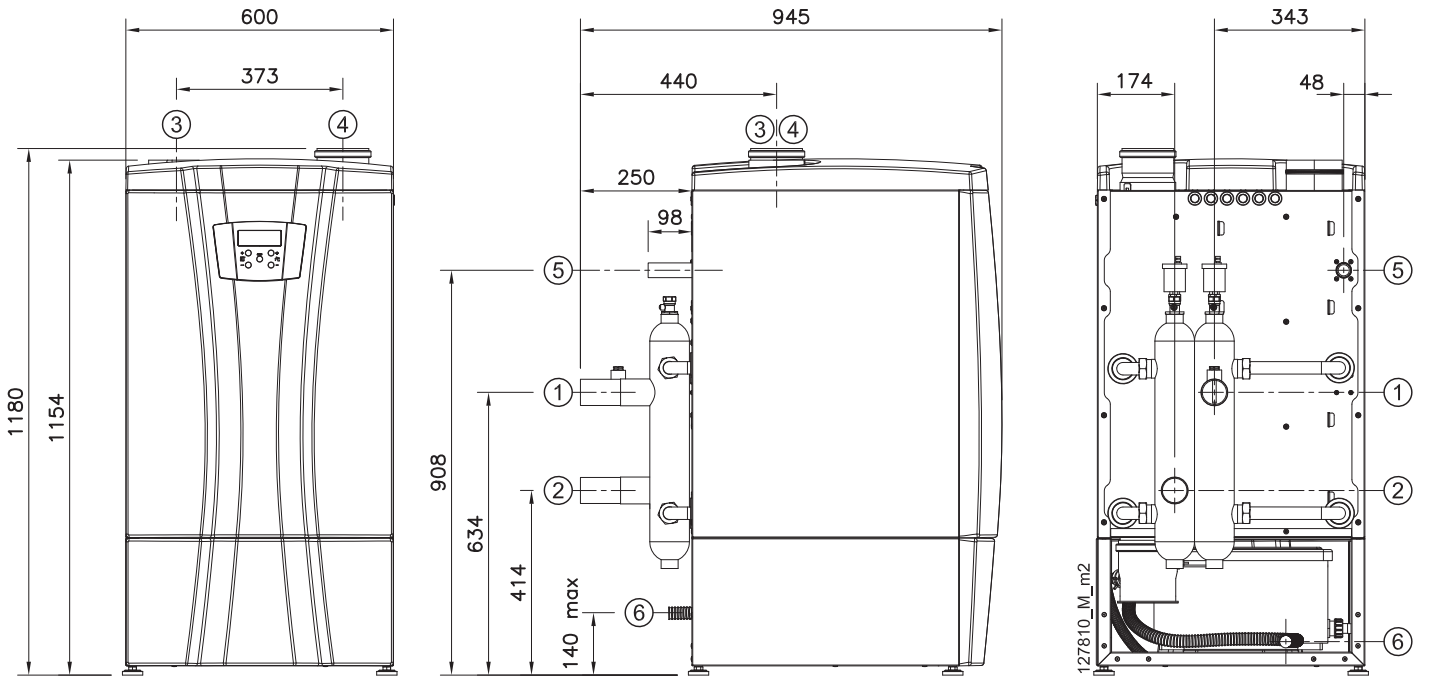


Figure 9-1 - Dimensions and centre space distances of attachments for models 60T, 70T, 100T, 115T and 140T (References in figure 9-3)

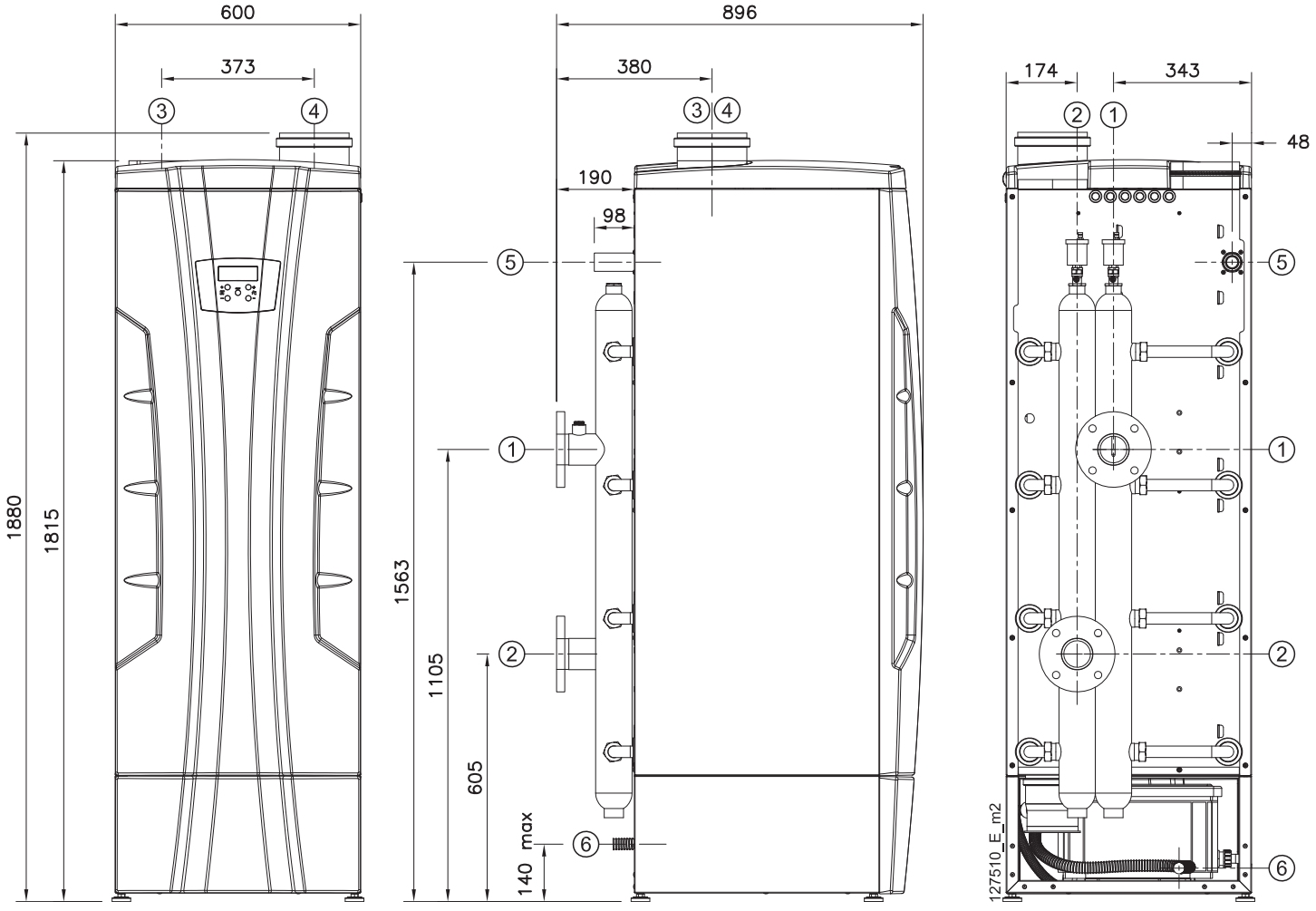


Figure 9-2 - Dimensions and centre space distances of attachments for models 180T, 210T and 280T (References in figure 9-3)

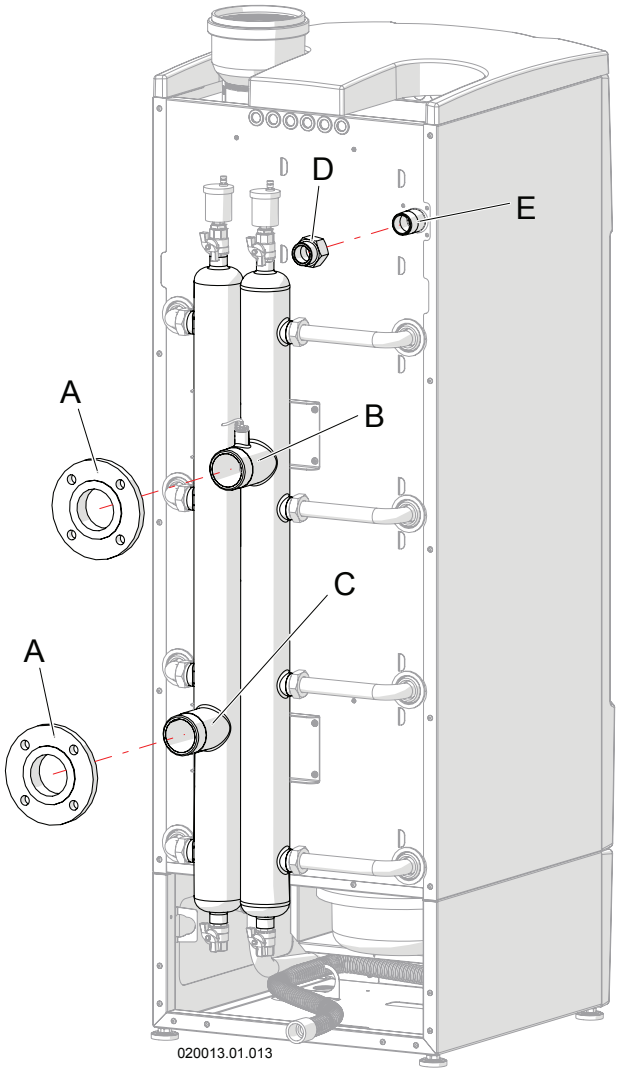
MODEL	① WATER OUTLET	② WATER INLET	③ AIR INTAKE	④ FLUE GAS OUTLET	⑤ GAS	⑥ CONDENSATE OUTLET
60T	1”1/2 *	1”1/2 *	136 mm **	110 mm	1”	28 mm
70T	1”1/2 *	1”1/2 *	136 mm **	110 mm	1”	28 mm
100T	1”1/2 *	1”1/2 *	136 mm **	110 mm	1”	28 mm
115T	1”1/2 *	1”1/2 *	136 mm **	110 mm	1”	28 mm
140T	1”1/2 *	1”1/2 *	136 mm **	110 mm	1”	28 mm
180T	DN65 PN16 *	DN65 PN16 *	136 mm **	160 mm	1”1/4	28 mm
210T	DN65 PN16 *	DN65 PN16 *	136 mm **	160 mm	1”1/4	28 mm
280T	DN65 PN16 *	DN65 PN16 *	136 mm **	160 mm	1”1/4	28 mm

* Connections and flanges are not factory fitted;
** Air intake in room, do not obstruct and do not add any connection;

Figure 9-3 - Table of diameters of connections in figures 9-1 and 9-2

WARNING! The hot water outlet, cold water inlet and gas connections are threaded with NPT pitch <u>they are not in inches</u> and the flanges “A” and connections “D” in figure 9-4, supplied with the boiler, must be used and must be assembled on the manifold as shown in the figure.

A = Flange supplied;
B = Hot water outlet;
C = Cold water inlet;
D = Connections supplied;
E = Gas input connection;



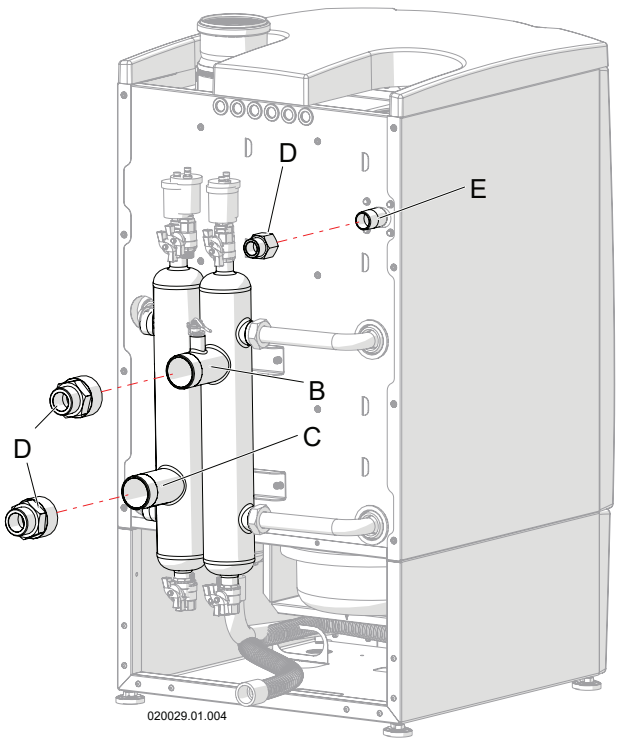


Figure 9-4 - Assembly of flanges and reductions on threaded connections for hot water outlet, cold water inlet and gas

10.1 - MYDENS boiler plumbing and gas connections

WARNING! Before installing the appliance, the central heating system and, if necessary, the domestic hot water system must be washed thoroughly in order to remove any residues or impurities which could compromise the working order of the boiler.

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

Gas connection

Connecting to the gas must be made to the relative attachment with a rigid metal pipe. The capacity of the gas meter must be adequate for the simultaneous use of all the gas boilers connected to it. Connect the boiler to the gas, as required by the regulations in force. The diameter of the gas pipe that comes out of the boiler, is not a determining factor when choosing the diameter of the pipe between the boiler and the meter; it must be chosen according to its length and to head losses.

WARNING! It is recommended that a gas isolation valve should be installed immediately before the boiler, in order to allow the gas supply to be interrupted.

WARNING! Do not power the appliance with gases other than those specified.

10.2 - MYDENS boiler safety valve (responsibility of the installer)

The boiler is supplied with no safety valve against too high pressure, so that the installer is able to choose the valve that suits the system's operating pressure (check the operating pressure of the boiler in the technical data section). The installation must be carried out in such a way as to allow the user to check it has intervened when the valve is opened. The safety valve outlet (responsibility of the installer) must be orientated in such a way as to avoid danger for people if it intervenes.

WARNING! If you do not route the safety valve, it might cause harm to people, animals or things if it has to intervene.

10.3 - Examples of installation of MYDENS boiler

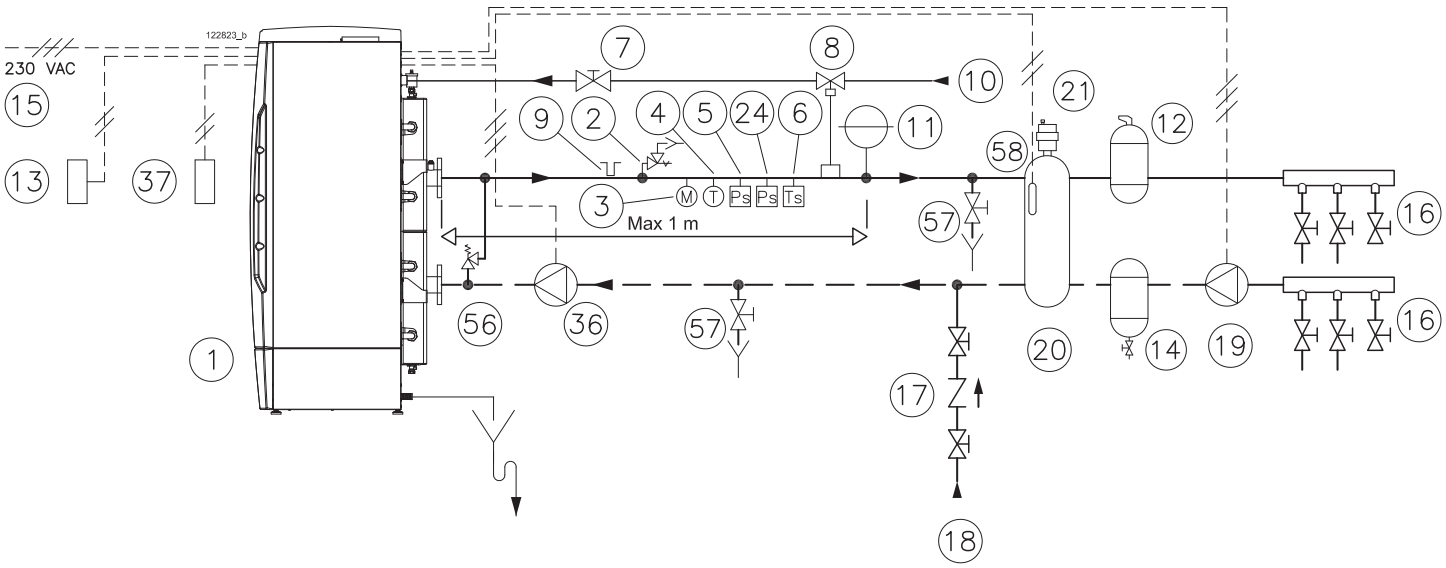


Figure 10-1 - MYDENS boiler example of connection diagram

Figure 10-1 KEY

1 MYDENS boiler model 60T-280T
2 INAIL safety valve
3 INAIL pressure gauge
4 INAIL thermometer
5 INAIL maximum safety pressure switch
6 INAIL safety thermostat
7 Gas valve
8 INAIL Gas isolation valve
9 INAIL basin
10 Gas inlet
11 Expansion tank
12 Microbubble separator
13 External sensor
14 Filter
15 Electric power supply
16 Low or high temperature heating system
17 System load assembly
18 Cold DHW
19 Central heating circuit pump
20 Hydraulic separator
21 Air vent valve
23 ----------
24 INAIL minimum safety pressure switch
36 Primary circuit pump
37 Room thermostat or equivalent system
56 Balancing valve (necessary if there is in the boiler the motorised valve, detail "17" in figure 3-1 and pump "36" is **NOT** the modulating type)
57 - Drain valve
58 - Manifold sensor

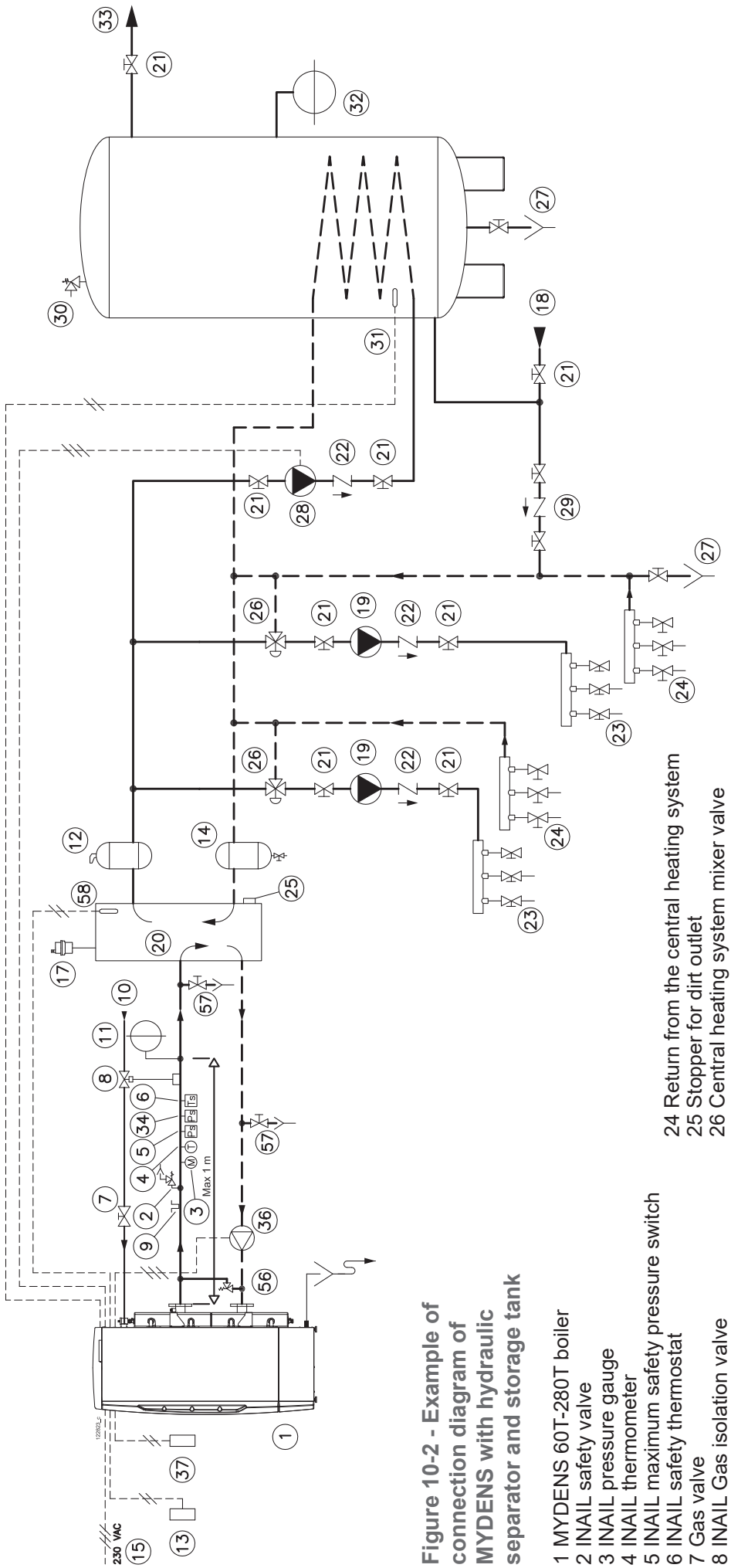


Figure 10-2 - Example of connection diagram of MYDENS with hydraulic separator and storage tank

1 MYDENS 60T-280T boiler
2 INAIL safety valve
3 INAIL pressure gauge
4 INAIL thermometer
5 INAIL maximum safety pressure switch
6 INAIL safety thermostat
7 Gas valve
8 INAIL Gas isolation valve
9 INAIL basin
10 Gas inlet
11 Expansion tank
12 Microbubble separator
13 External sensor
14 Filter
15 Electric power supply
16 ---------
17 Air vent valve
18 Cold DHW
19 Central heating circuit pump
20 Hydraulic separator
21 Isolation valve
22 Check valve
23 Delivery to the central heating system
24 Return from the central heating system
25 Stopper for dirt outlet
26 Central heating system mixer valve
27 System outlet
28 Storage tank load pump
29 System load assembly
30 Storage tank safety valve
31 Storage tank temperature sensor
32 Domestic hot water circuit expansion tank
33 Domestic hot water outlet
34 INAIL minimum safety pressure switch
36 Primary circuit pump
37 Room thermostat or equivalent system
56 Balancing valve (necessary if there is in the boiler the motorised valve, detail "17" in figure 3-1 and pump "36" is **NOT** the modulating type)
57 - Drain valve
58 - Manifold sensor

10.4 - Safety relief valve

WARNING! It is mandatory to install a safety relief valve against overpressure to protect the appliance and the system, see Figure 10-3.

The appliance is supplied as standard **without** the safety relief valve, to allow the installer to choose the type of valve with the most suitable intervention pressure for the system. The installer must take into account that the valve intervention pressure cannot be higher than the maximum allowable pressure of the appliance. This value can be found in the table in section 9.

WARNING! Isolation devices must not be installed between the appliance and the safety valve.

WARNING! It is forbidden to obstruct the opening of the safety drain valve with any object.

WARNING! The safety drain valve must be oriented or conveyed in such a way as not to create danger situations to people or things in case of intervention.

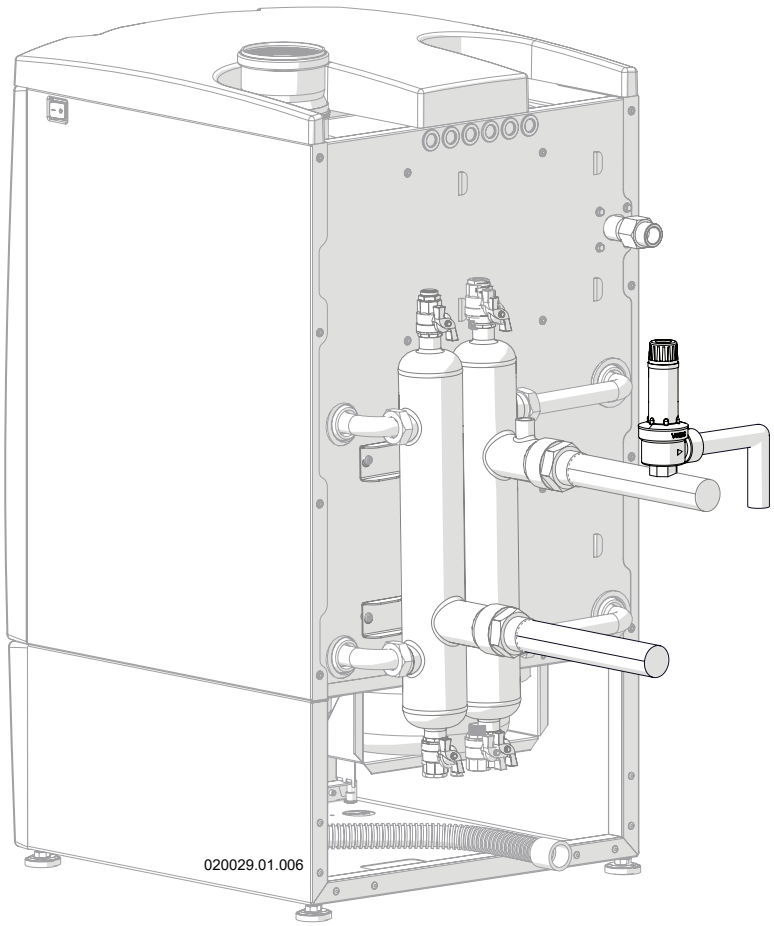


Figure 10-3 - Safety rellief valve

10.5 - Connection of expansion tank

WARNING! The boiler has no expansion tank. Provide the system with an expansion tank of a suitable size, as laid out in national and local installation regulations.

10.6 - Delivery and return

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

WARNING! The system after the appliance must be made with materials that resist temperatures up to 97°C and pressure of 11 bar. Otherwise (e.g. with plastic piping), the system must be fitted with the relevant protection and safety devices.

Before connecting the plumbing, wash the system thoroughly to eliminate any waste (hemp, radiators casting sand, etc.), which could damage the appliance. This must also be performed if the appliance is replaced.
In figures 8-1 and 8-2 you can check the positioning of the delivery and return connections.

☞ Install a metal mesh filter on the return pipe with passage of 1 mm^2 in order to trap any system residues before they return to the boiler.

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

10.7 - MYDENS boiler water supply

WARNING! The connection of the system (and therefore the boiler) to the water mains must be completed with the insertion between them of a device that prevents backflows to the drinking water system, as required by the anti-pollution safety regulations in force.

10.7.1 - Recommendations on characteristics of water in the system

Filling the central heating system is an extremely delicate operation that should not be underestimated, either in cases of just replacing the heat generator or in when a new appliance is installed. Incorrect assessment of the characteristics of the system's water can lead, in some cases, to damage to the system and heating unit. A system is almost never perfectly sealed; sometimes there may be water leaks and oxygen can also get in; both these phenomena cause damage.
Among the parameters that can have a negative impact on the lifetime of a system, the following are the main ones:
- The simultaneous presence of different metals (copper, brass, steel and aluminium) which, in an aqueous environment, give rise to galvanic corrosion.
- The presence of free oxygen, due to air infiltration which may occur near to joints or seals, constitutes a typical corrosive agent, particularly active at temperatures between 50 and 70° C.
- Water leakage, which leads to frequent refills, can cause corrosion or limescale, depending on the type of water available for the fillings. In all cases all of the leaks (and relative refills) must be kept under control, especially when an automatic filling system is installed. In this case it is definitely recommended that a meter be installed which can indicate the quantity of water replenished.

Natural or added impurities in the water. A lot of drinking water can contain concentrations, which may be significant, of chlorides and sulphates that can increase the speed of corrosion of metallic surfaces. Other undesirable components could have been introduced into the system before or during installation (building materials, metallic chips, shavings, grease, deposits and dirt in general). Residues from welding can also cause corrosion, both in new systems and after modifications and repairs. In old systems planned to work with radiators, characterised by pipework with a very large diameter, the water content of the system is significant and fosters the formation of dirt and deposits.
Dirt and Limescale The presence of black deposits (magnetite) indicates that there is limited corrosion, however, the high specific weight of this oxide can cause blockages that are hard to remove, especially in the hottest areas. Limescale is due to the hardness of the water, or to the presence of calcium and magnesium salts. Calcium, in the form of calcium carbonate, is deposited in the hottest areas of the system. Magnetite often contributes to consolidating the limescale. On the other hand, iron oxide (the water has a reddish colour) is an indicator of corrosion from oxygen.
Frequent leaks. Where there are frequent leaks the hydrogen and/or air accumulate on the top part of the heat exchanger and radiators, preventing full exchange of heat. When the electrolytic corrosion process has begun, the water level in the system is lowered, gases accumulate in the top part of the heat exchanger and radiators. The presence of air is caused by the fact that the system might not be perfectly sealed. A slow drop in system pressure due to a leak is often difficult to find, especially when the leak is minimal (in winter leaks from radiator valves sometimes are not visible because they are dried by the heat produced by the radiator or boiler). These micro-leaks do, however, allow air to get into the system. The main points that micro-leaks can develop are at the joints and, in particular, on the intake side of the pump (air vent valve, seals with O-rings, fill valves). In these cases, to avoid damage, the system must be protected with a suitable corrosion inhibitor.

10.7.2 - For correct operation of the system make sure that:

1) the system has no leaks or at least the most obvious leaks have been repaired;
2) if there is an automatic filling system, a litre counter must have been installed so as to know the exact quantity of any leaks;
3) filling the system and refilling is done with softened water so as to reduce its overall hardness. The water **must** also be conditioned in order to keep the pH within the threshold set so as to avoid corrosion;
4) Both on new systems and system replacements there must be efficient systems to get rid of air and impurities; filters, micro-impurity separators and micro air bubble separators;
5) Avoid discharging water from the system during normal maintenance operations, even if it is apparently insignificant quantities: for example when cleaning filters, equip the system with the relevant isolation valves up and down stream from the filter itself;
6) Always carry out an analysis of the system water before opening communication between a new boiler and the system, to establish whether the chemical and physical properties of the water indicate the need to carry out complete emptying of the system, the use of the water already in the system or chemical washing of the system, using mains water with the addition of a detergent, when there is a suspicion that

the system may be dirty or particularly blocked up, and the subsequent refilling 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 50 ppm to 150 ppm $CaCO_3$;
- 7 < pH < 9 *

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

* In case of aluminum radiators, the pH must be between 7 and 8.

10.7.3 Water treatment in domestic heating systems

The water in domestic heating systems must always be treated both when the boiler is replaced and when it is a new system. All the treatment systems and chemical conditioning processes required must be set up during the planning stage, based on the characteristics of the unrefined water, in order to obtain water with the following characteristics:
- Appearance: clear, colourless and with no foam;
- pH: from 7 to 9 * ;
- Hardness from 50 ppm to 150 ppm $CaCO_3$;
- Conditioners: present within the concentrations laid down by the *supplier.*

If the water characteristics are unknown, there is a very high probability of running into problems such as the following:

a. LIMESCALE

In a system containing 1000 litres of water at 300 ppm, 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

As a rule corrosion is fostered by the presence of oxygen, by contact between different metals, or by the presence of chlorides.

c. DEPOSITS

These are insoluble organic and inorganic substances: DIRT, RESIDUES FROM WORK.

* In case of aluminum radiators, the pH must be between 7 and 8.

10.8 - MYDENS boiler heat circuit outlet

In order to avoid constantly refilling with water and the resultant introduction of oxygen and limescale, it is advisable to limit as much as possible any work of draining the heating circuit.

10.9 - MYDENS boiler low-temperature systems (or underfloor heating)

WARNING! If the boiler is installed in an underfloor system made with plastic piping, all of the necessary precautions must be taken against corrosion due to oxygen in the water:
make sure that the system is made with plastic pipes with oxygen permeability not exceeding 0.1 g/m3 at 40°C. Should the pipe not meet these characteristics, the radiant panel circuit must be isolated from the boiler, via a plate heat exchanger suitable for resisting the corrosion generated by the oxygen dissolved in the water.

10.10 - Manifold sensor

The manifold sensor (detail 26 in figures 3-3, 3-5 and 3-7), is fitted at the factory onto the boiler manifold. However, this position may not be correct in certain systems with a hydraulic separator or a plate heat exchanger (see figures 10-1 and 10-2). It is therefore recommended that the sensor be removed from the boiler manifold to the hydraulic separator as shown in figures 10-1 and 10-2, at detail 58.

WARNING! For correct operation of the system the manifold sensor must be located at a point on the hydraulic separator/plate heat exchanger where it can detect the correct delivery temperature and can be influenced by the temperature of the secondary circuit water flow

10.11 - MYDENS boiler characteristic curve of head losses

MYDENS model boilers do not have a circulation pump. For the size of the pumps to be used, the designer must consider the system's hydraulic resistances and the hydraulic resistances of the boiler itself. For this purpose the hydraulic resistance of the boiler is shown in figure 10-4 in the form of a graph.

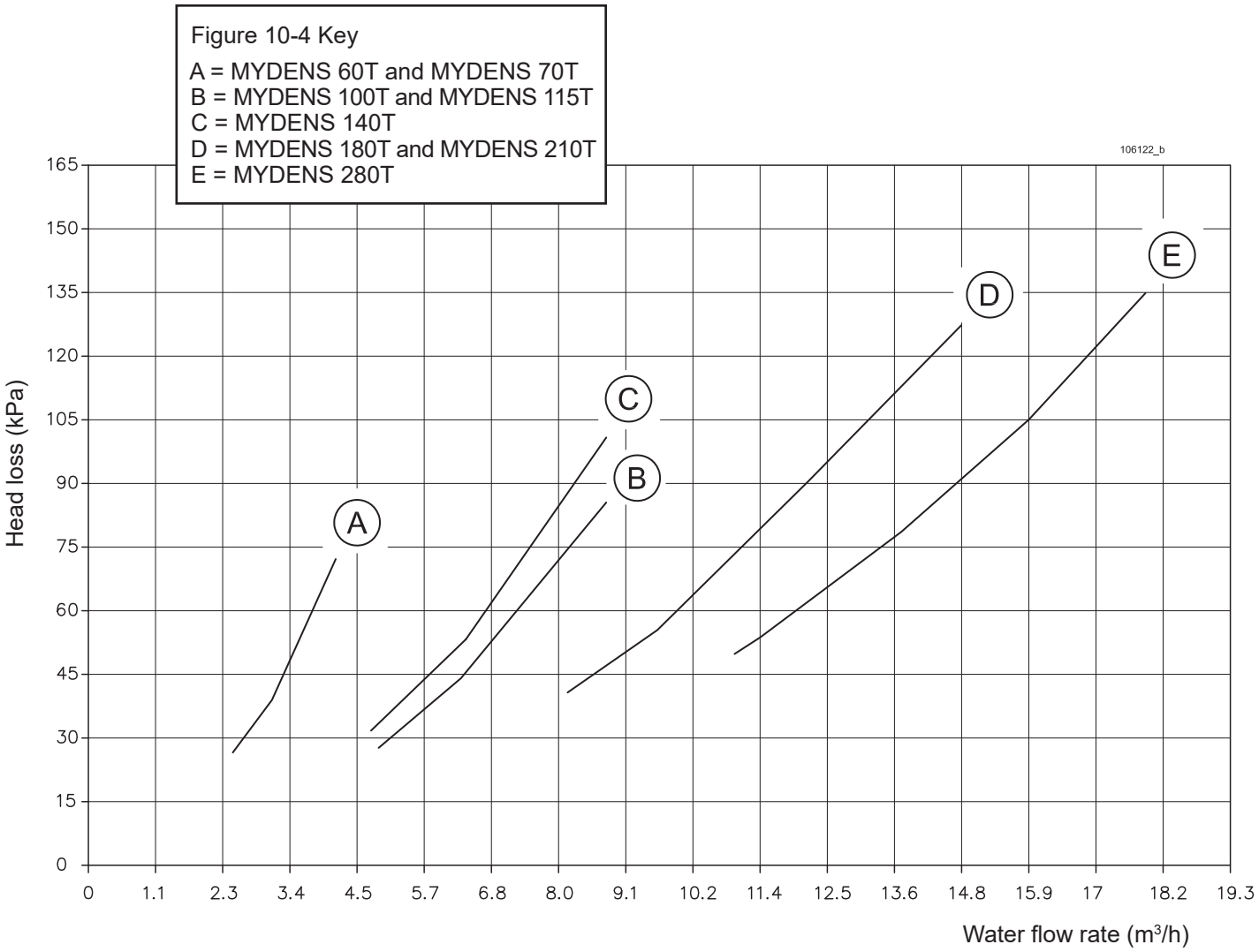


Figure 10-4 - Hydraulic resistances of MYDENS models "60T-280T"

11.1 - AGUADENS hot water heater plumbing and gas connections

WARNING! Use trolleys suitable for the type of boiler to move it. Not doing this could cause serious harm.

To identify the position of the connections, see figures 9-1 and 9-2.

Gas connection

Connecting to the gas must be made to the relative attachment with a rigid metal pipe. The capacity of the gas meter must be adequate for the simultaneous use of all the gas boilers connected to it. Connect the boiler to the gas, as required by the regulations in force. The diameter of the gas pipe that comes out of the boiler, is not a determining factor when choosing the diameter of the pipe between the boiler and the meter; it must be chosen according to its length and to head losses.

WARNING! It is recommended that a gas isolation valve should be installed immediately before the boiler, in order to allow the gas supply to be interrupted.

WARNING! Do not power the appliance with gases other than those specified.

11.2 - AGUADENS hot water heater safety valve (responsibility of the installer)

The boiler is supplied with no safety valve against too high pressure, so that the installer is able to choose the valve that suits the system's operating pressure (check the operating pressure of the boiler in the technical data section). The installation must be carried out in such a way as to allow the user to check it has intervened when the valve is opened. The safety valve outlet (responsibility of the installer) must be orientated in such a way as to avoid danger for people if it intervenes.

WARNING! If you do not route the safety valve, it might cause harm to people, animals or things if it has to intervene.

11.3 - AGUADENS hot water heater examples of installation

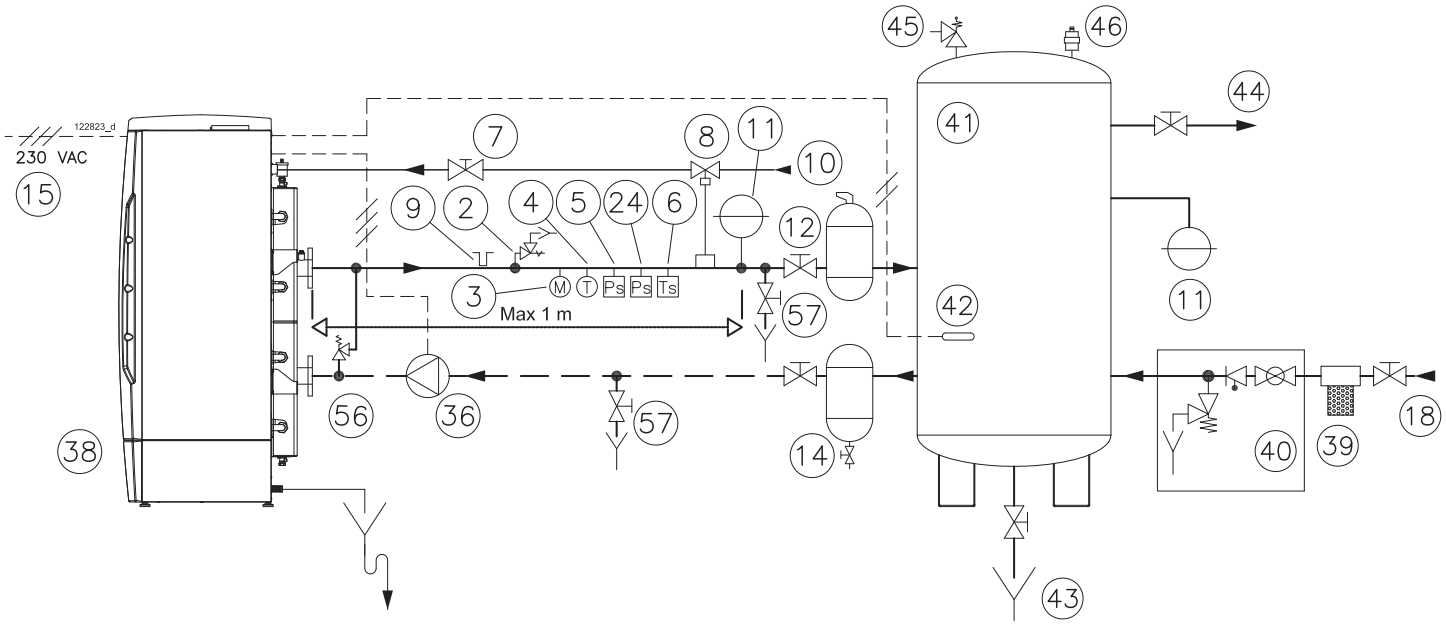


Figure 11-1 - AGUADENS example of connection diagram

2 INAIL safety valve
3 INAIL pressure gauge
4 INAIL thermometer
5 INAIL maximum safety pressure switch
6 INAIL safety thermostat
7 Gas valve
8 INAIL Gas isolation valve
9 INAIL basin
10 Gas inlet
11 Expansion tank
12 Microbubble separator
14 Filter
15 Electric power supply
18 Cold DHW
23 ----------
24 INAIL minimum safety pressure switch
36 DHW circuit pump
38 AGUADENS model 60T-280T hot water heater
39 Polyphosphate salts softener
40 Hydraulic safety unit (EN 1487)
41 Storage tank
42 Storage tank probe
43 Storage tank outlet valve
44 DHW outlet
45 Storage tank safety valve
46 Storage tank air vent valve
56 Balancing valve (necessary if there is in the boiler the motorised valve, detail "17" in figure 3-1 and pump "36" is **NOT** the modulating type)
57 - Drain valve

11.4 - Safety relief valve

WARNING! It is mandatory to install a safety relief valve against overpressure to protect the appliance and the system, see Figure 11-2.

The appliance is supplied as standard **without** the safety relief valve, to allow the installer to choose the type of valve with the most suitable intervention pressure for the system. The installer must take into account that the valve intervention pressure cannot be higher than the maximum allowable pressure of the appliance. This value can be found in the table in section 9.

WARNING! Isolation devices must not be installed between the appliance and the safety valve.

WARNING! It is forbidden to obstruct the opening of the safety drain valve with any object.

WARNING! The safety drain valve must be oriented or conveyed in such a way as not to create danger situations to people or things in case of intervention.

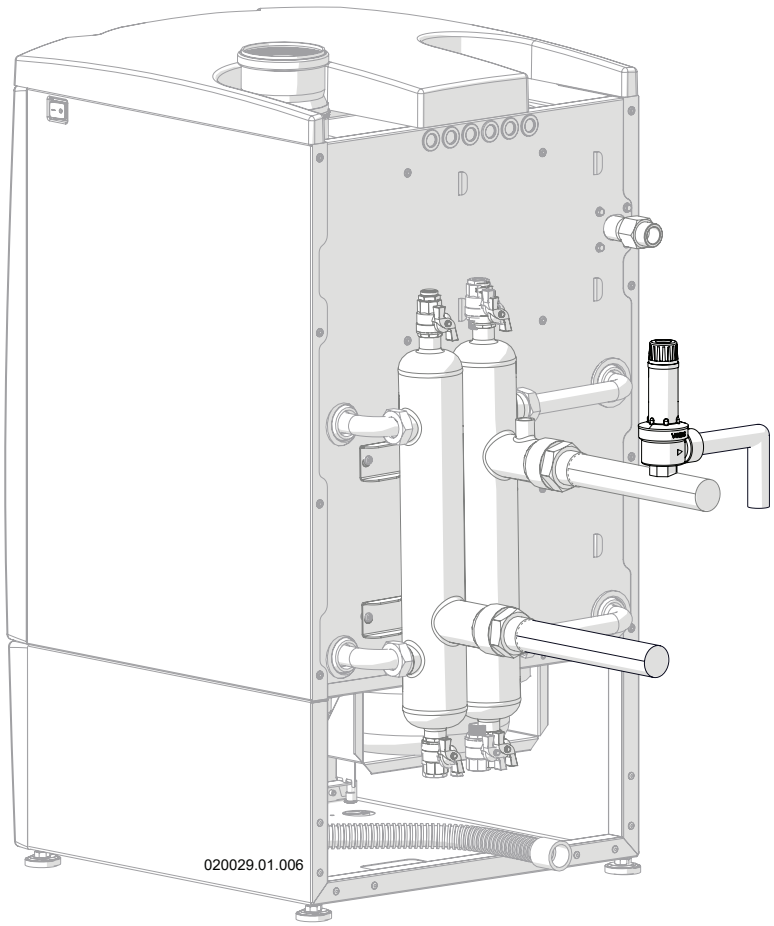


Figure 11-2 - Safety rellief valve

11.5 - Expansion tank

Set up a thermal expansion control system such as an expansion tank. Make sure that the expansion tank is the right size for the volume of water contained in the hot water heater and the system (see section 19 heading “Water content in primary heat exchanger”), also taking into account the temperature and working pressure.

WARNING! The boiler has no expansion tank. Provide the system with an expansion tank for domestic hot water circuits of a suitable size, as laid out in national and local installation regulations. Underestimating the size of the expansion tank can cause the safety valve to intervene.

The expansion tank must be installed as shown in figure 11-1 or according to recognised planning methods. Refer to the expansion tank manufacturer’s instructions for further details about installation.

11.6 - Circulation pump

This hot water heater must always be linked to a storage tank of a size of not less than 1 litre per kW of power installed. A domestic hot water circulation pump must be installed to fill the storage tank. The hydraulic resistance of the hot water heater is shown in the form of a graph in figure 11-3.

For the correct sizing of the pump, the designer must take into account the resistance of the hot water heater, the resistance of the storage tank and the resistance of the connection system. For the electrical collection refer to figure 13-6.

If the pump selected has absorption of more than 3 A, insert a support relay between the hot water heater and the pump.

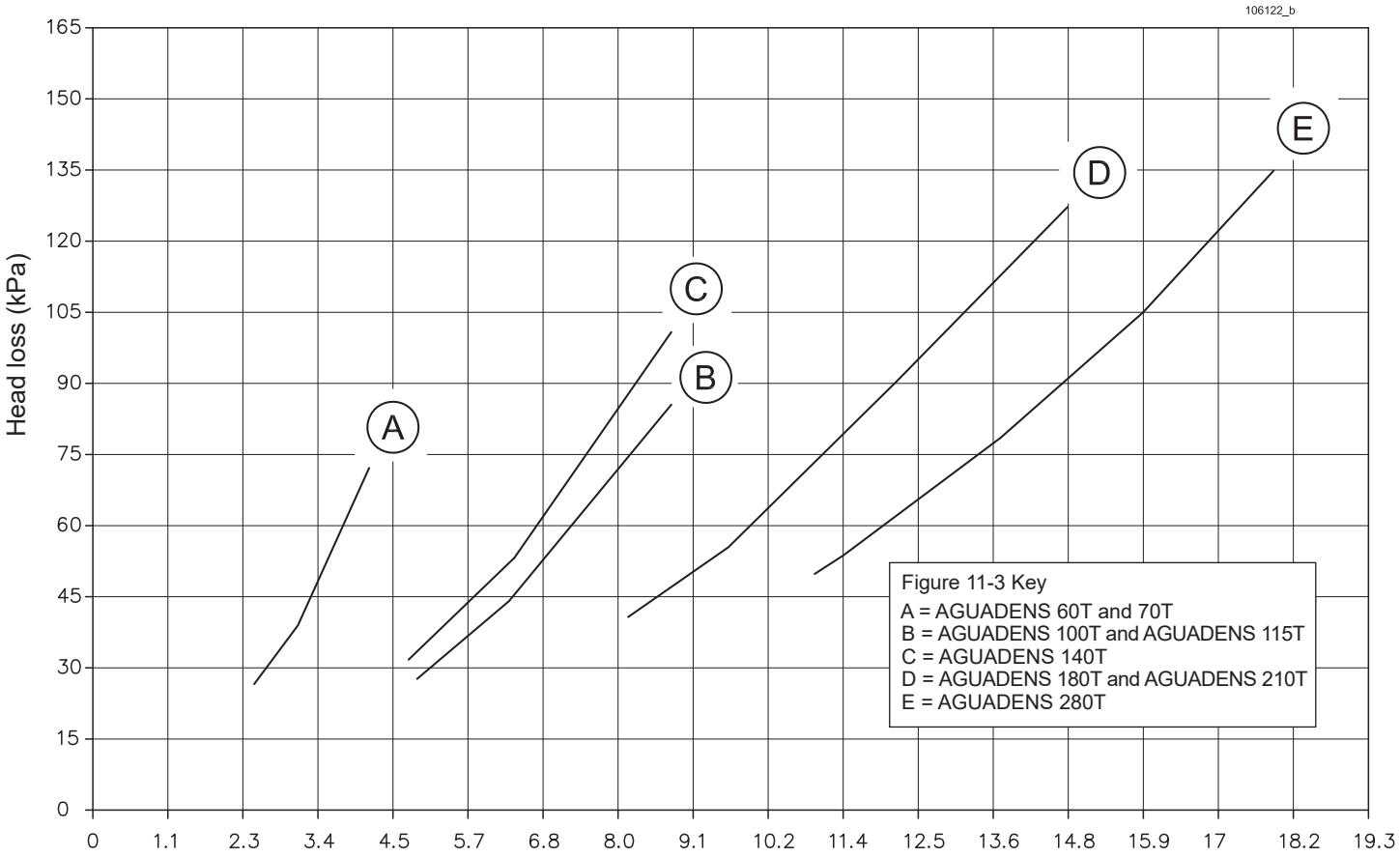


Figure 11-3 - Hydraulic resistances of AGUADENS models “60T-280T”

11.7 - Minimum flow rate to the water heater

Size the pump, the pipes and any device needed by the system using a recognised planning method to guarantee the water heater a flow of water that avoids limescale formation.

The minimum water flow rate must be chosen according to the desired water temperature and according to the hardness of the water. Figure 11-4 summarizes these parameters.

WARNING! It is the installer's responsibility to ensure that the minimum water flow rate to the hot water heater is never lower than that shown in the table in figure 11-4.

11.8 - Precautions against scalds

WARNING! This hot water heater can supply water at a temperature of up to 80°C. When you are using the water heated by the hot water heater you must take care to avoid scalds.

Some domestic appliances such as automatic dishwashers and washing machines may require the water temperature to be increased. Setting the hot water heater to provide water at the higher temperature demanded by these domestic appliances does lead to the risk of scalds. To avoid this hazard, safety devices to reduce the water temperature and prevent the risk of scalds must be installed upstream from the users of the domestic hot water.

11.9 - Water quality

WARNING! If the hot water heater has to work at a maximum temperature of 60°C, size the pump to obtain a minimum flow rate as shown in the Figure 5-11.

WARNING! If the water heater must work at temperatures higher than 60 ° C, the hardness of the water must be less than 15 ° F (150 mg / l) and the water flow rate must be at the maximum value indicated in Figure 11-4

WARNING! The water must not be softened to values lower than 5°F (50 mg/l). At these values it becomes acidic and can corrode parts of the hot water heater, shortening its life.

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

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

WARNING! The domestic hot water circuit must be made with materials resistant to temperatures of at least 95°C and a pressure of 10 bar. Otherwise (e.g. with plastic piping), the system must be fitted with the relevant protection and safety devices.

WATER HARDNESS (°f)	MAXIMUM WATER TEMPERATURE (°C)	WATER HEATER MINIMUM/MAXIMUM FLOW RATE depending on the hardness and maximum water temperature (for model indicated in m^3/h)			
		60T 70T	100T 115T 140T	180T 210T	280T
21	60	2,5/4,5	5,4/9	9,1/13,5	10,8/18
24	60	2,9/4,5	6,1/9	10,4/13,5	12,4/18
27	60	3,2/4,5	6,9/9	11,8/13,5	13,1/18
30	60	3,6/4,5	7,8/9	12,8/13,5	14,8/18
33	60	4,0/4,5	8,6/9	13,1/13,5	16,4/18
Max 15	80	4,0/4,5	8,6/9	13,1/13,5	16,4/18

Figure 11-4 - Table of minimum/maximum flow values inside the water heater in function of the water hardness and the water temperature

12.1 - Condensate outlet

The boiler has inside it a siphon system and condensate neutraliser to evacuate condensates (see figures 3-3, 3-5 and 3-7, details “2” and “3”) and prevent combustion products from escaping, the end of which meets duct “5” in figures 3-3, 3-5 and 3-7. This end must be funnelled into another anti-odour siphon (responsibility of the installer) so as to prevent bad smells from coming back into the room.
In particular, the condensate outlet system must:

- ☞ be performed with a pipe with an internal diameter equal to or greater than 13 mm;
- ☞ be installed in such a way as to prevent the liquid from freezing; therefore pay attention to any external sections. It is prohibited to drain into gutters or rainwater drainpipes;
- ☞ slope continuously towards the drain point; avoid high points, which could pressurise the pipe;

Figure 12-2 shows how a condensate disposal system must be created downstream from the boiler.

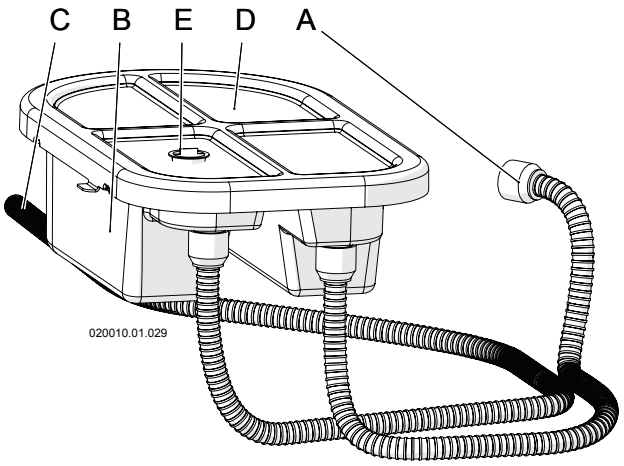


Figure 12-1 - Condensate neutraliser

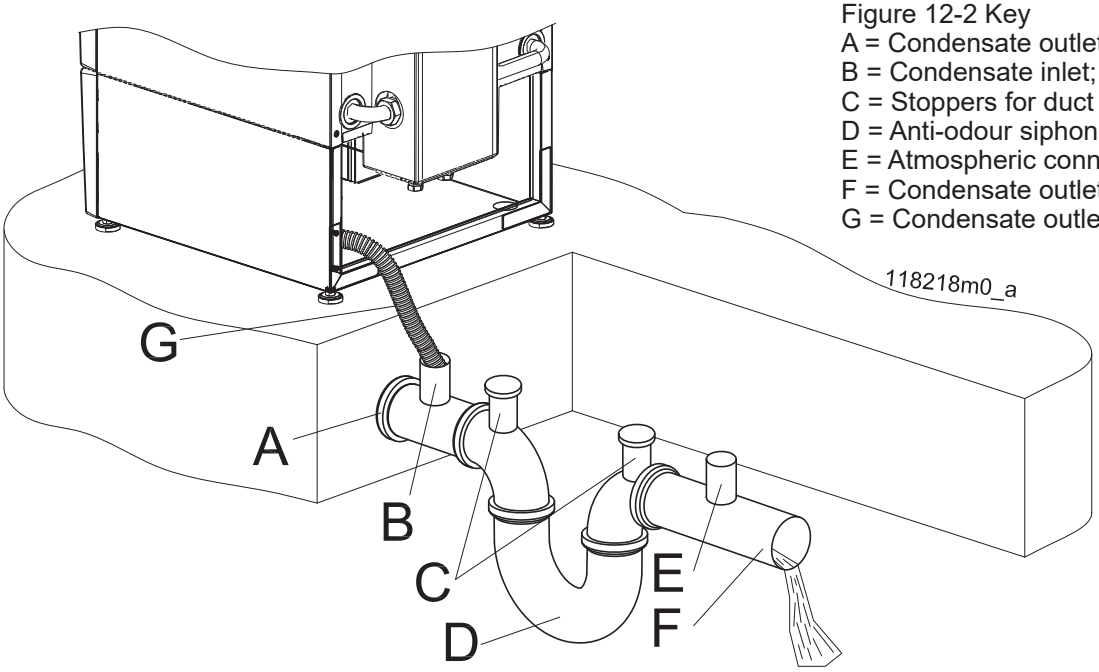


Figure 12-2 Key
A = Condensate outlet duct start stopper;
B = Condensate inlet;
C = Stoppers for duct inspection;
D = Anti-odour siphon system;
E = Atmospheric connection (duct vent);
F = Condensate outlet;
G = Condensate outlet pipe;

Figure 12-2 - Condensate outlet

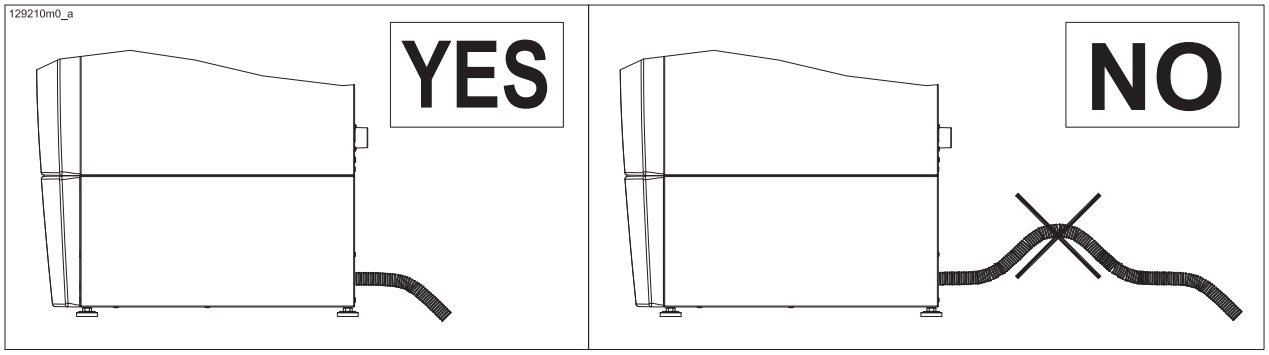


Figure 12-3 - Correct installation of condensate outlet pipe

13.1 - Electrical connections: details

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

WARNING! During maintenance label all the cables being examined before disconnecting them.

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

This fundamental safety requirement must be met. If in doubt, request a thorough check of the electrical system by a professionally qualified technician.

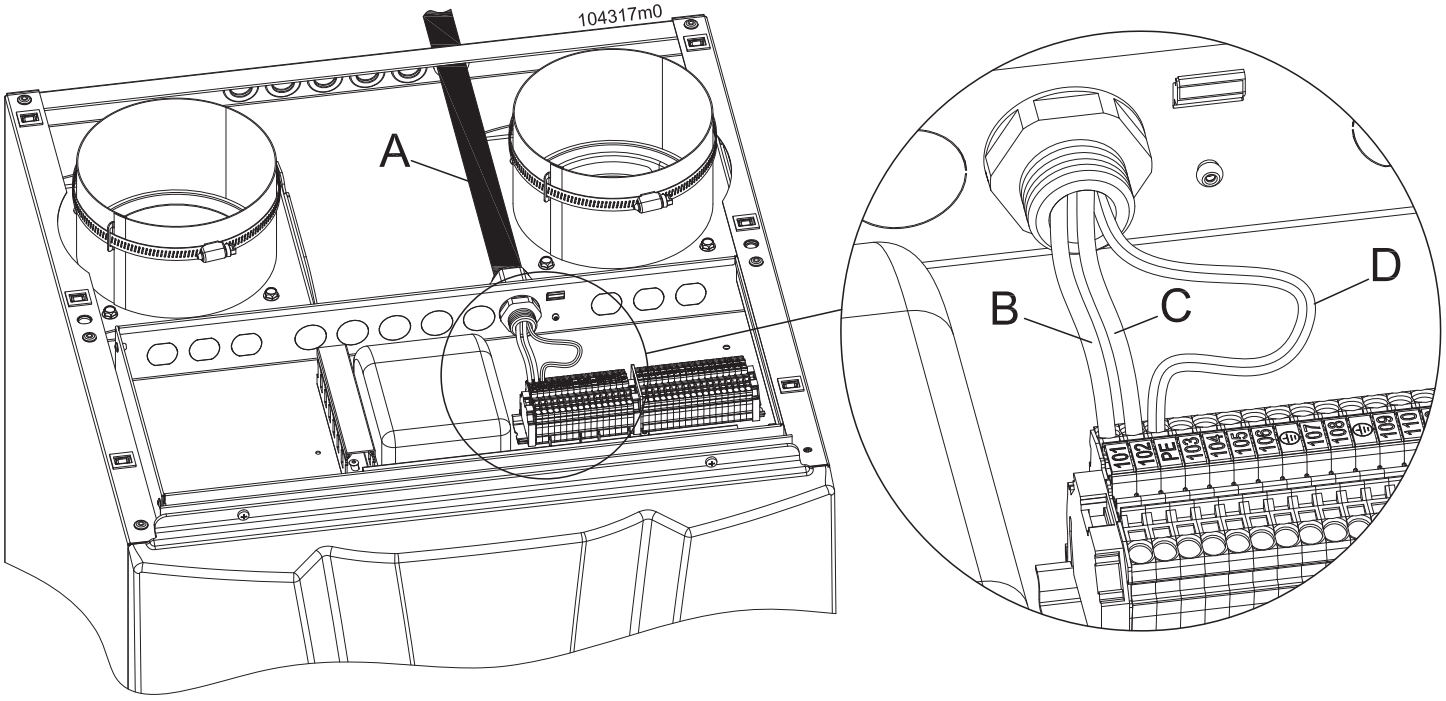
- ☞ Have a professionally qualified electrician make sure that the electrical system is appropriate to the electrical power required by the appliance, shown on the plate.
- ☞ The appliance must be connected to the electrical mains through a fixed connection or through an unswitched plug connection. The use of adapters, power strips, extension cords, etc. is not allowed.
- ☞ The appliance must be connected to the electrical mains with a double insulated three-core cable or equivalent with appropriate cross-section.
- ☞ For connection to mains electricity, a two-pole switch must be installed near the appliance with a contact opening distance of at least 3 mm, as envisioned by the applicable standards in force.
- ☞ Respect the polarity between the neutral and phase wires when connecting the appliance.
- ☞ Make sure that the water, central heating and gas system pipes are not used as earths for the electrical or telephone system. This piping is not suitable for this purpose; serious corrosion damage would occur in a very short time to the appliance, piping and radiators.

WARNING! The boiler has no protection against the effects of lightning strikes.

13.1.1 - Connecting power supply cable

To connect the power supply cable proceed as follows (refer to Figure 13-1):

1.- use a triple-pole dual insulation cable
2.- access the electrical connections terminals following the relevant instructions in section 18.2;
3.- lay the power supply cable through the cable gland next to contacts “101”, “102” and “PE”;
6.- remove the sheathing from the cable, taking care to keep the earth wire (yellow/green) 20 mm longer than the other two;
7.- connect the yellow-green cable to the earth terminal (“PE”);
8.- connect the brown cable (Live) to terminal “101”
9.- Connect the blue cable (Neutral) to terminal “102”



KEY

A = Electric cables sheath;
B = Line;
C = Neutral;
D = Earth.

Figure 13-1 – Electrical connections

13.1.2 – Choosing the room thermostat/ chronothermostat

The boiler is set up to operate with any room thermostat or chronothermostat which has the contact to which the cables from the boiler can be connected, with the following features:
- open/closed (ON/OFF);
- potential-free (not powered);
- closing, when there is a request for heat;
- 24VAC, 1A.

13.1.3 - Connecting the room thermostat/ chronothermostat

Install the room thermostat in a place in the house where the temperature is most typical for the home and in an area that is **not** vulnerable to sudden temperature changes, away from windows or doors which open directly to the outside (see figure 13-2).
Proceed as follows to connect the room thermostat cable (refer to figures 13-4 and 13-5):
1.- Use a two-pole cable, with a minimum cross-section of 1.5 mm2, from the boiler to the room thermostat/ chronothermostat. The maximum length allowed is 100 metres. Use a shielded cable with shield earthing;
2.- Remove the casing from the boiler, following the relevant instructions in section 18.2;
3.- Lay the electric cable through the fairlead near contacts “10” and “11”;
4.- Use a free fairlead, not used by other wires;
5.- Strip the cable;
6.- Connect the two ends of the cable to terminals “10” and “11” (see figures 13-4 and 13-5).

WARNING! As the room thermostat/ chronothermostat cables are subjected to a very low safety voltage (24 VDC), they must flow in ducts other than those supplying 230 VAC power.

13.1.4 - Installing the outdoor temperature sensor

Install the outdoor temperature sensor outside the building on a wall facing NORTH or NORTH-EAST, at a height of between 2 metres and 2.5 metres from the ground. For buildings with several floors, it must be installed at about half way up the second floor. Do not install it above windows, doors or ventilation outlets or directly below balconies or gutters. Do not plaster over the outdoor temperature sensor. Do not install the sensor on walls without eaves, i.e. where not protected from rain.
Where the sensor is installed on a wall that has yet to be plastered, it must be installed with a suitable thickness or be removed before plastering.
Proceed as follows to connect the outdoor temperature sensor cable:
1.- Lay a two-pole electric cable with a minimum cross-section of 1.5 mm², which goes from the boiler to the outdoor temperature sensor. The maximum length allowed is 100 metres. Use a shielded cable with shield earthing.

WARNING! As the cables are subjected to a very low safety voltage (24 VDC), they must flow in wires different from the 230 VAC power supplies.

2.- Connect the two-pole cable to terminals “14” and “15” in figures 13-4 and 13-5;
3.- Connect the bipolar cable to the ends of the outdoor temperature sensor.

Set the boiler to learn from the outdoor temperature sensor as follows:
4.- Go into the “installer menu” as described in section 17.15 and set parameter 2003 = 1.

To confirm that the external sensor has been enabled, the icon shows on the display.
Proceed with the steps given in section 17.9.1 to set the correct adjustment values for the supply temperature, according to the outdoor temperature.

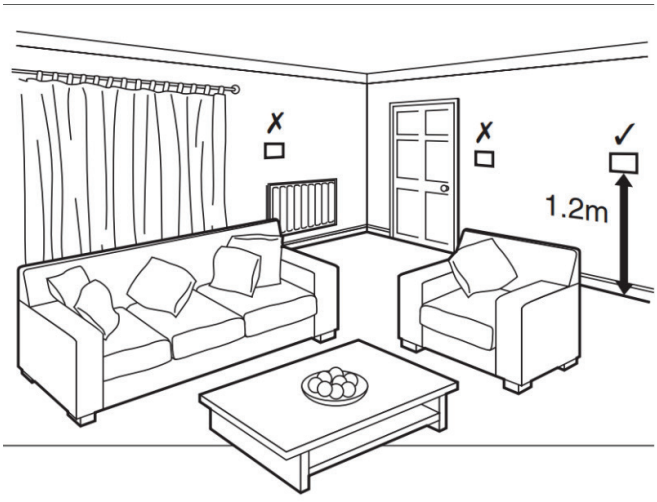


Figure 13-2 – Correct positioning of the room thermostat/chronothermostat

13.1.5 - Connection board 885 IF

Board 885 IF is supplied for all models (see detail “13” in figures 3-3, 3-5 and 3-7).
The board enables:
1.- control of boilers via 0-10 Vdc analogue signal;
2.- control of boilers via digital signal by MODBUS communication;
3.- cascade connection of boilers up to a number of 8 units (see section 13.4)

0-10 Vdc type dialogue

Board 885 IF allows the boiler to be controlled through 0-10 Vdc dialogue proceeding as shown below:
1.- Install the board as required by the instructions provided;
2.- Go into the “installer menu” as described in section 17.15 and set parameter 2003 = 4;
3.- Now the boiler can be controlled via the 0-10 Vdc signal according to the rules shown in figure 13-3;

MODBUS type dialogue

Board 885 IF allows the boiler to be controlled through MODBUS dialogue proceeding as shown in the instructions supplied on request:

13.1.6 - Alarm contact

The alarm contact solely reflects the status of burner 1 (Master). In the event of one of the burners 2, 3 or 4 being blocked, it is not detected by the alarm contact.

13.2 - Connecting MYDENS boiler to storage tank

The MYDENS model boiler must be connected to a storage tank to produce domestic hot water.
The hydraulic connections must be made as per figure 10-2 or similar.
Proceed as follows for the electrical connections (refer to figures 13-4 and 13-5):
1.- Disconnect the electric power supply from the boiler;
2.- Lay a two-pole electric cable with a minimum cross-section of 1.5 mm², which goes 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 sensor;
4.- Insert the temperature sensor probe inside the storage tank sample point (see figure 10-2, detail “31”).
5.- Set parameter 3012 to value “1” (see section 20)
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 from a range of between 40°C and 60°C.

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

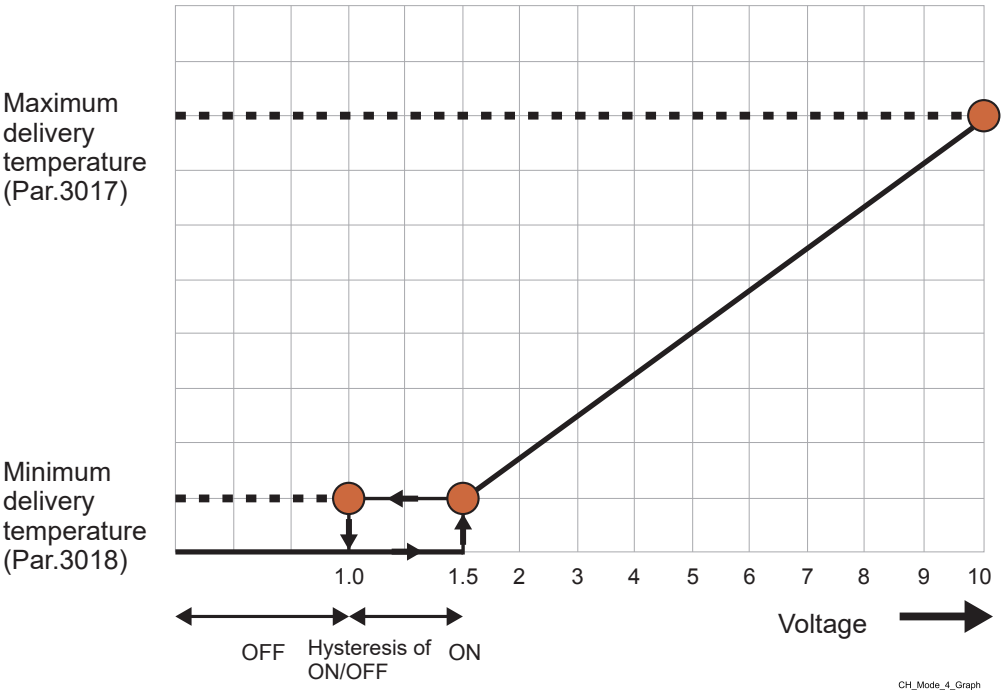


Figure 13-3 – Operating rules for 0-10 VDC analogue input

13.2.1 - Precedence to production of DHW

The boiler leaves the factory set with total precedence given to the production of domestic hot water. This means that the boiler operates in DHW mode until it reaches the temperature demanded by the storage tank connected. Because of this the aforementioned setting could lead to a cooling of the environment to be heated. Once the DHW demand has been satisfied, the boiler automatically goes back to working for the central heating circuit.

13.3 - Connecting AGUADENS hot water heater to storage tank

The AGUADENS model appliance must be connected to a storage tank.

The hydraulic connections must be made as per figure 11-1.

Proceed as follows for the electric connections (refer to figure 13-6):

1.- Disconnect the electric power supply from the boiler;

2.- Access the electric terminals for connection;

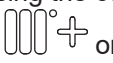
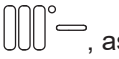
3. - Disconnect the manifold temperature sensor from terminals “8” and “9”;

4.- Use the storage tank sensor which is supplied with the hot water heater and connect it to terminals “8” and “9”.

Lay a two-pole electric cable with a minimum cross-section of 1.5 mm², which goes from the hot water heater to the storage tank temperature sensor and connect it to the hot water heater on terminals “8” and “9” (Manifold temperature sensor);

5.- Connect the other end of the cable to the storage tank temperature sensor;

6.- Insert the temperature sensor probe inside the storage tank sample point (see figure 11-1, detail “42”).

The temperature of the water stored inside the storage tank can be selected by the user from a range of between 40°C and 80°C, using the commands to adjust the central heating temperature  or  , as shown in section 17.5.

WARNING! A hot water temperature exceeding 51°C may cause permanent injury/damage to persons, animals and objects. In particular, protect children, the elderly and people with disabilities against any possible risks of scalds, by inserting devices that limit the usage temperature of the DHW to users.

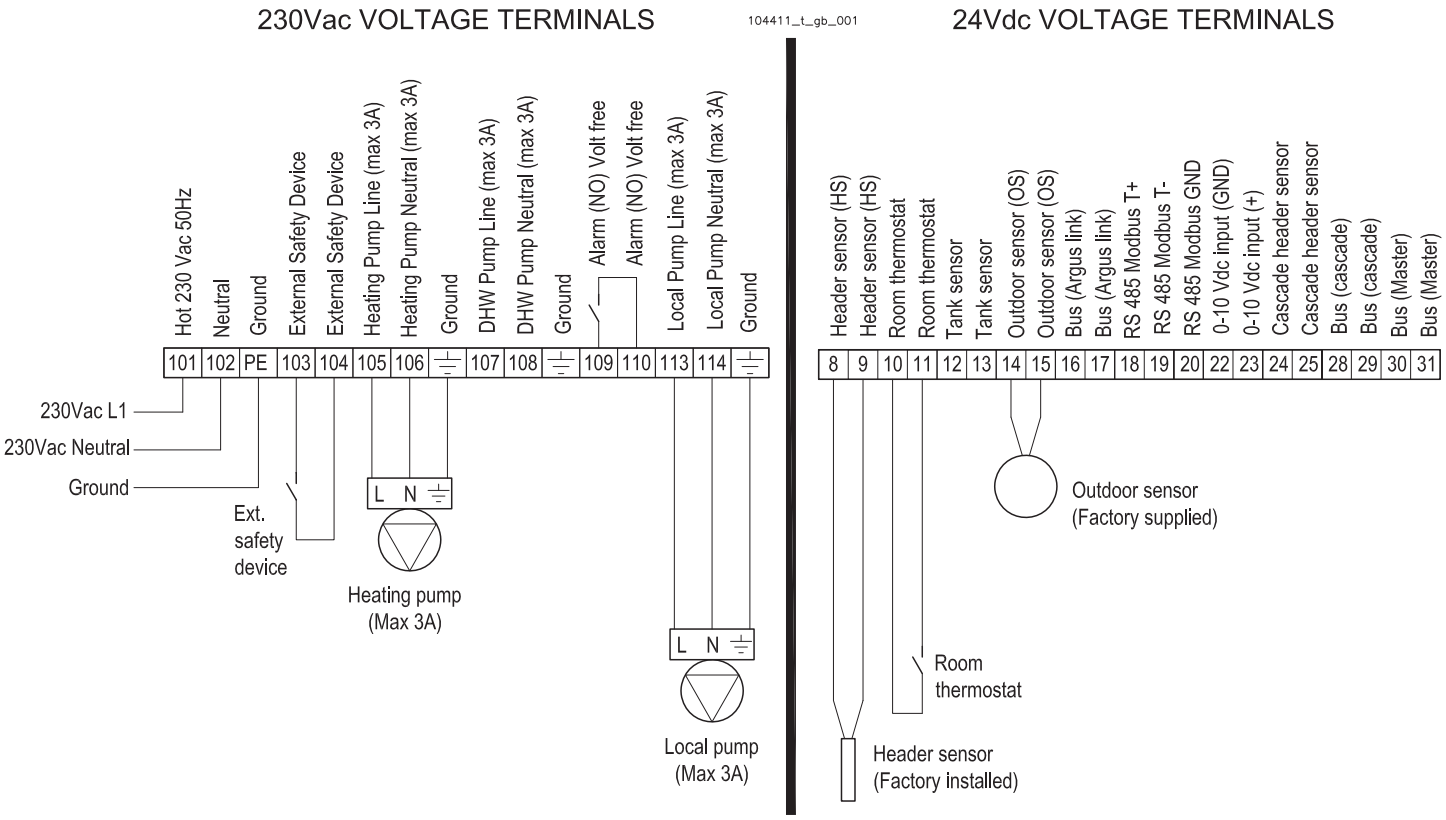


Figure 13-4 - MYDENS boiler electrical connections (Example of system shown in figure 10-1)

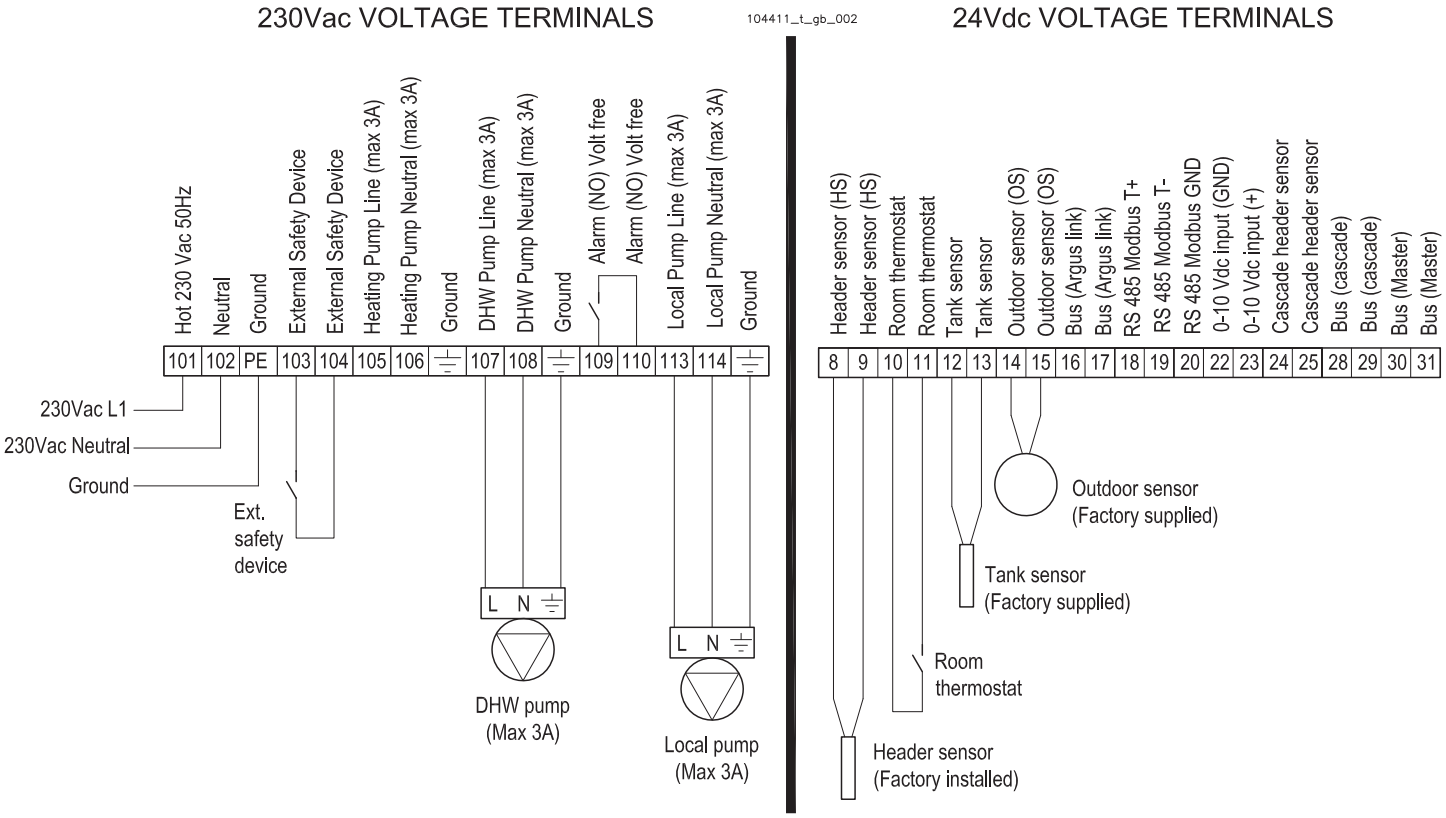


Figure 13-5 - MYDENS boiler electrical connections (Example of system shown in figure 10-2)

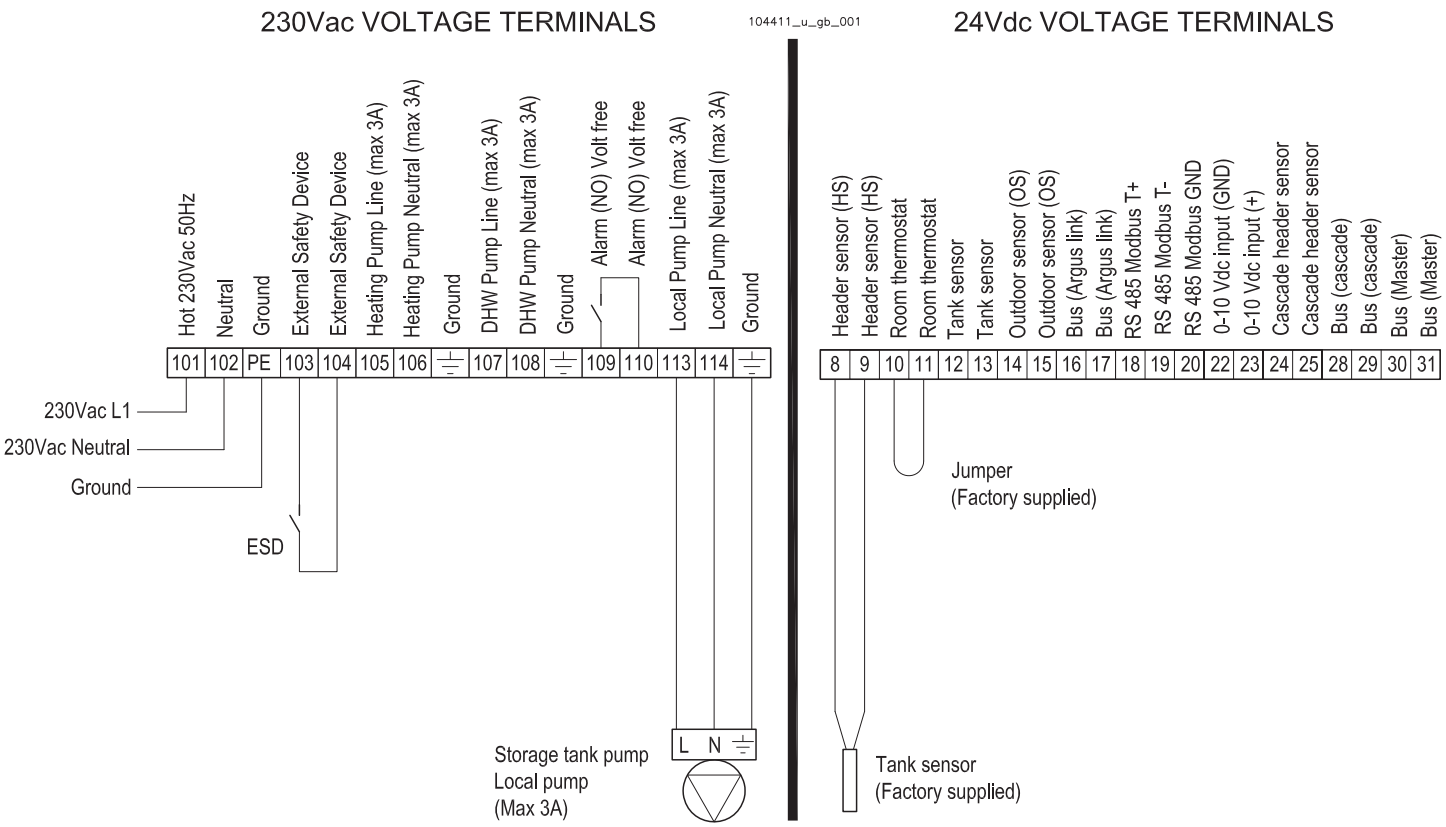


Figure 13-6 – AGUADENS hot water heater electrical connections (Example of system shown in figure 11-1)

13.4 - Cascading appliances

Cascading appliances as shown in the diagrams in figures 13-7 (MYDENS) and 13-8 (AGUADENS).
It is necessary to first install the 885 IF board (detail “13” in figures 3-3, 3-5 and 3-7) in each appliance and acquire the cascade command 885 HC (see figures 13-7 and 13-8).
A maximum of 8 appliances can be cascaded (examples with 4 are shown in figures 13-7 and 13-8).
Follow the 885 HC command manual for the instructions on how to cascade appliances.

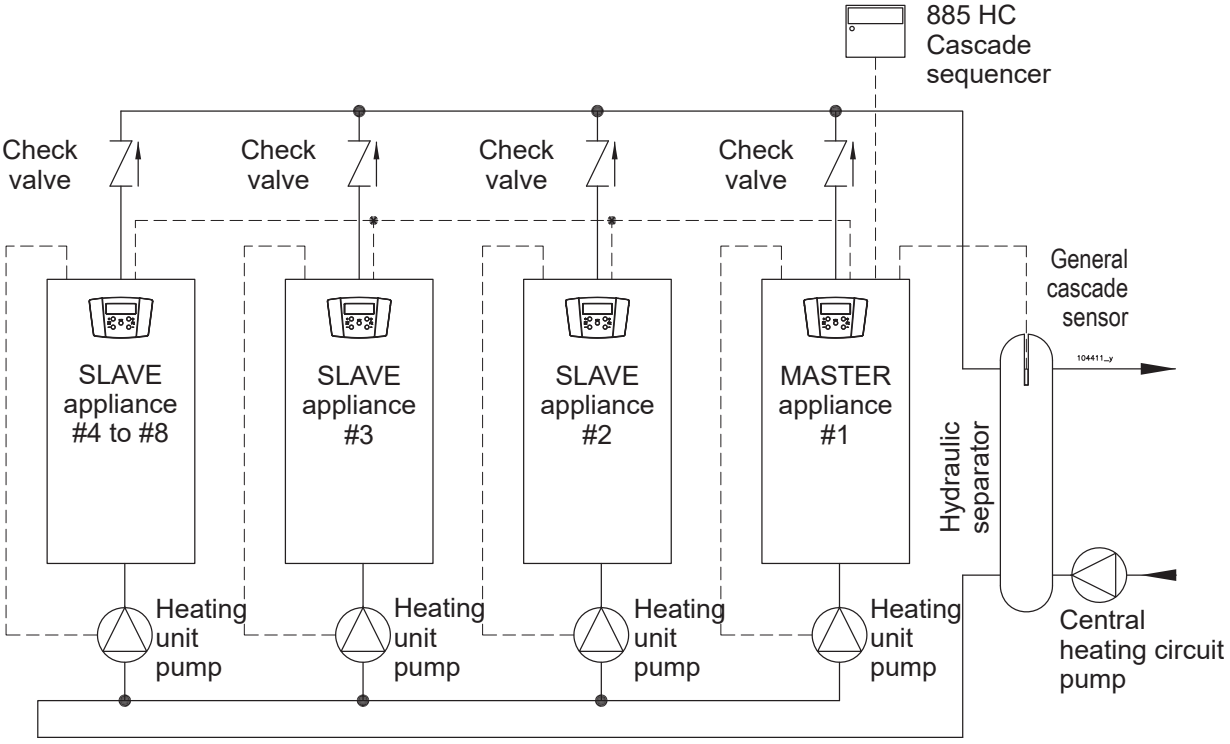


Figure 13-7 – Concept diagram: cascading MYDENS appliances

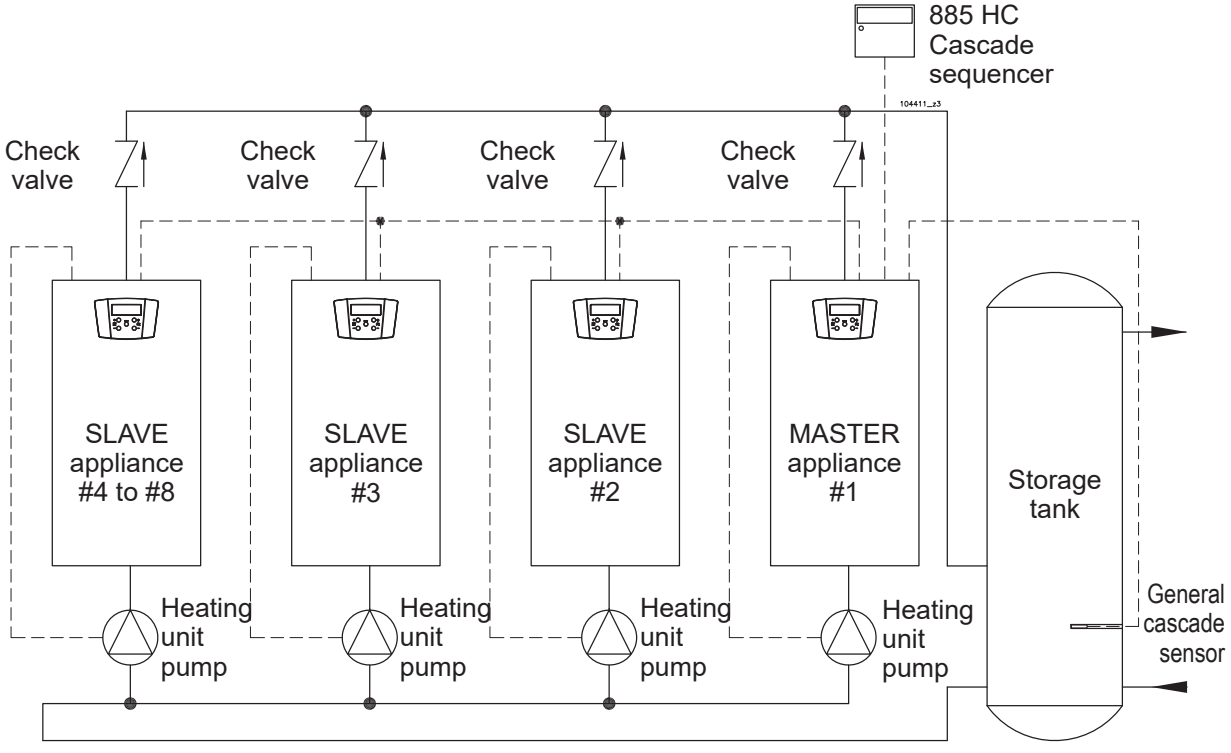


Figure 13-8 – Concept diagram: cascading AGUADENS appliances

14.1 - Burned gas exhaust and combustion agent air intake pipe

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

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

WARNING! The flue gases emitted by this boiler can reach 90°C in some circumstances. Therefore plastic flue gas outlet ducts capable of resisting this temperature must be used.

WARNING! This appliance is a "condensing" boiler. Use AISI 316L stainless steel materials or polypropylene plastic materials to make the flue gas exhaust so as to prevent corrosion due to the acidity of the condensate.

It is recommended that exhaust and intake ducts supplied by the manufacturer of the appliance itself. Other types of ducts, if used, must be approved for such intended use.
The types of outlet for which the appliance is approved are given in the technical features table at the end of the manual under the heading "type" and on the data plate on the boiler, also under the heading "type".
The symbols used to define the type of exhaust are given below:

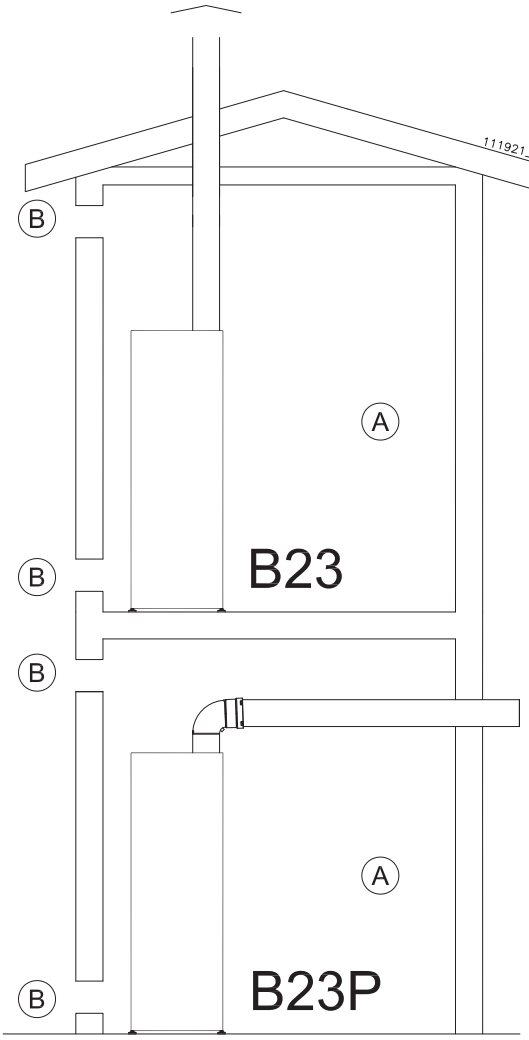
- B23 and B23P, intake in room and flue gas outlet through wall or roof.

WARNING! The boiler is to be installed with outlet type B23 or B23P and will therefore take in air for combustion from the room in which it is located. Therefore, all precautions must be taken regarding ventilation of the rooms as prescribed by the national and/or local regulations.

During operation, especially in winter, because of the high efficiency, it is possible for a condensation plume to form at the boiler's flue gas outlet. This is a natural phenomenon and is not a cause for concern. It is the water vapour in the flue gas which condenses when it comes into contact with the outside air.

14.1.1 - Type of intake/exhaust B23 and B23P

In the event of B23 type combustion air intake/flue exhaust, it is essential that sufficient allowances for combustion air are made. The combustion air shall be taken from outside either through natural or mechanical means.
The location of the air intake should be away from sources of pollution such as industrial air extraction systems, swimming pool ventilation systems and cleaning chemicals such as laundry discharges. Further details on ventilation requirements and allowances can be found in sections 5.1.1 and 5.1.2.



Key Figure 14-1
A = Plant room;
B = Ventilation openings;

Figure 14-1 – Exhaust/intake systems

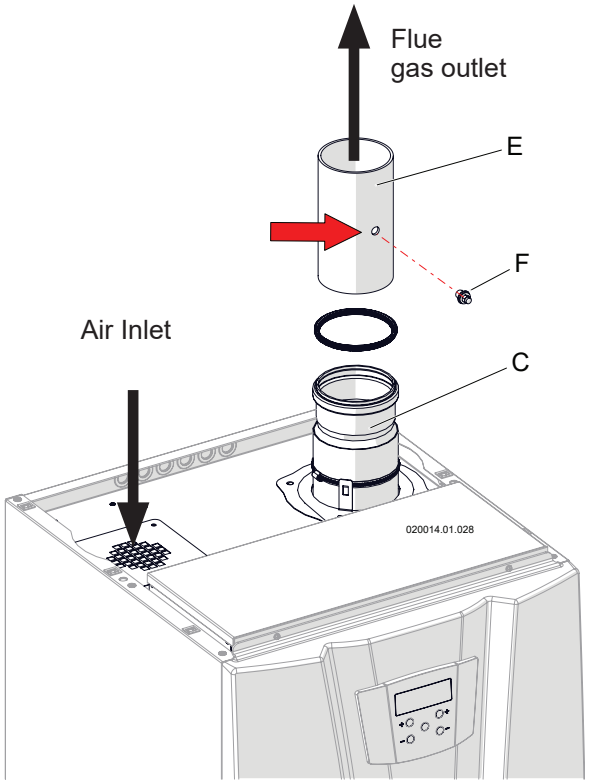


Figure 14-2 – Installing the split system

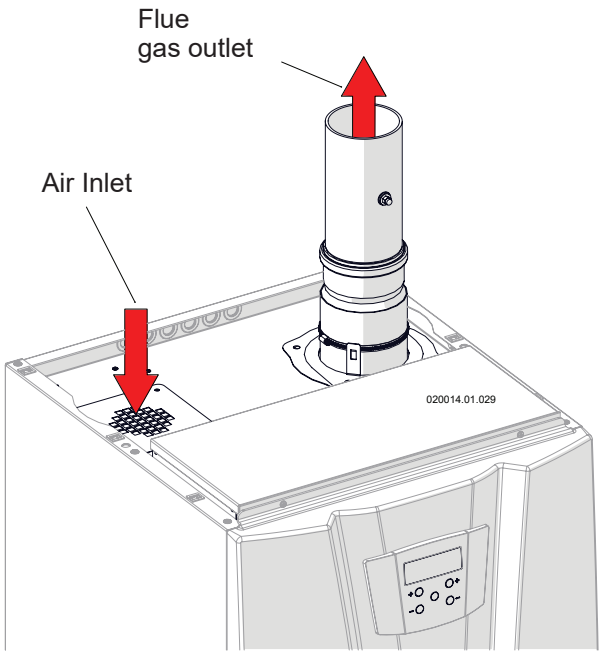


Figure 14-3 - Assembled system

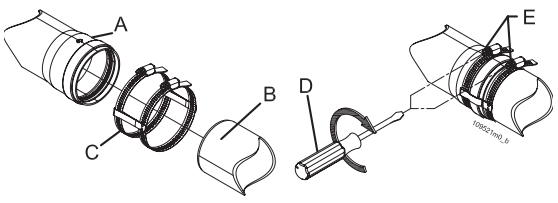


Figure 14-4 – Fixing the exhaust and intake pipes

14.1.2 - Split system

The boiler is supplied as standard with the joint to connect the flue gas outlet. For installation proceed as shown in figure 14-2.

1.- insert pipe “E” into reducer “C” taking care that the gasket provided is in the correct position;

☞ Polypropylene pipes, more resistant to the formation of condensate, must be installed.

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

☞ The horizontal sections must always have a slope of at least 2% towards condensate outlet devices.

☞ The boiler is already provided with a condensate collector that must be connected to an outlet pipe (see section 12).

WARNING! This condensate outlet is designed to drain away all of the liquid produced by a single appliance. If more than one boiler is installed, each boiler should be provided with its own condensate outlet.

The flue gas exhaust/air intake system can be extended up to a maximum distance as indicated in section 19. Each 90° bend has a loss equivalent to that reported in section 19.

WARNING! The flue gas outlet terminal must be correctly protected against the effects of the wind.

WARNING! Mechanically secure the joints between the various component elements of the exhaust and intake pipe, through the use of fixing systems or equivalent systems. See figure 14-4.

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

WARNING! The outlet duct must be suitably supported by rigid rods positioned not more than 1 m from each other. The rods must be fastened to rigid walls that can take the weight of the duct itself.

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

TABLE OF EQUIVALENT LENGTH COMPONENTS			
CODE	DESCRIPTION	UM = equivalent linear meters	
		60T-140T	180T-280T
62617344	TUBO 1m Ø110	1,0	/
62617345	CURVA 45° Ø110	2,2	/
62617346	CURVA 90° Ø110	4,0	/
62617289	TUBO 1m Ø160	/	1,0
62617297	CURVA 45° Ø160	/	2,2
62617298	CURVA 90° Ø160	/	4,0

15.1 - Installation of external cover for models 60T - 70T - 100T - 115T - 140T

WARNING:

the small parts of this kit will have the following references:

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

WARNING:

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

For installation of the external cover, proceed as follows:

1.- Loosen, with the relevant spanner, the boiler's adjustable feet "T" (figure 15-1), insert rod "H" and retighten the adjustable feet "T" (figures 15-2 and 15-3). Repeat the same procedure on the opposite side.

2.- Remove the boiler's upper and lower front covers "F" and the top cover "U", as shown in figure 15-4.

3.- Insert the lower framework "J" (figure 15-5) and attach it to rod "H" with the relative screws "A" in correspondence with the holes that are present (figure 15-6).

4.- Replace the boiler's upper and lower front covers "F" (figure 15-7). Then adjust the adjustable feet "I" of the lower framework "J" to regulate the boiler's stability on the surface it is installed on (figure 15-8).

5.- Insert the four tubes "K" in correspondence with the pins present on the lower framework "J" using a rubber mallet (figures 15-9 and 15-10).

6.- Insert the upper framework "G" of the external cover using a rubber mallet (figure 15-11).

7.- Insert the upper fixing rods "Q" (figures 15-12 and 15-13). Then put in screw "A" with nut "E" for fastening the rods to the boiler (figure 15-14) and screw "B" for fastening the rods to the framework of the external cover (figure 15-15).

8.- Attach the cover (AB), using screws "C", to the framework of the external cover, as shown in figure 15-16.

9.- Put on the covers (AA) and (AC) in the direction shown in figure 15-19 and fasten them to the structure with screws "C"; first removing the pre-cut discs present (figures 15-17 and 15-18). It is also possible, depending on the type of electrical and condensate removal system in the place the boiler is installed, to remove if necessary the pre-cut sections "X" and "Y" on the metal sheet (AC) shown in figure 15-19.

10.- Fix the two anti-rain grills "R" and the metal plates "S" to the covers previously assembled; using screws "B" (figure 15-20).

11.- Fix the metal plates "V", with screws "B", onto the back of the external cover, as shown in figure 15-21.

12.- Put on the side covers (AD), attaching them to the structure with screws "C" (figure 15-22).

13.- Position the top cover (AE) as shown in figure 15-23 and fix it to the upper framework "G" using screws "B" (figure 15-24), in correspondence with the holes present.

14.- Attach, using screws "D", the shelter for the electrical connections "L", for the intake "M" and for the outlet "N" (or "P") to the top cover (figures 15-25 and 15-26); remembering to insert gaskets "O" and "W" as shown in figure 15-25.

WARNING:

- If you have a flue gas outlet 110 mm in diameter, use outlet covers "N" in figure 15-25.
- If you have a flue gas outlet 80 mm in diameter, use outlet covers "P" in figure 15-25.

15.- Put on the front cover (AN) as shown in figure 15-27 and 15-28. Attach it to the structure by tightening locks "Z" with a flat-head screwdriver (figure 15-29).

16.- Finally, attach metal sheets (AR) and (AS), using screws "B", to the lower framework "J"; as shown in figures 15-30 and 15-31.

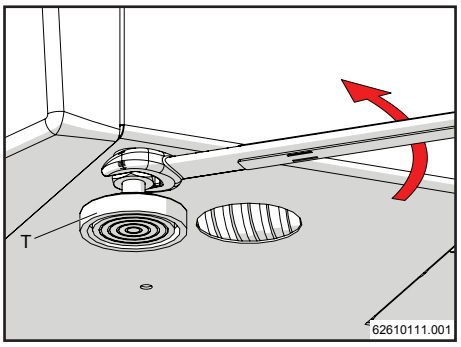


Figure 15-1

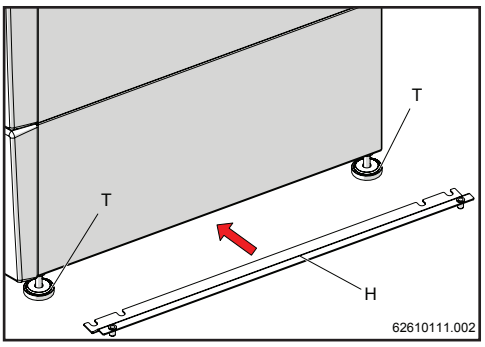


Figure 15-2

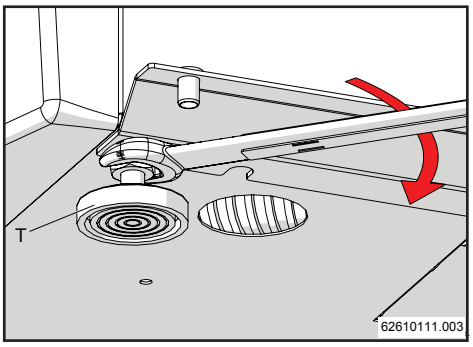


Figure 15-3

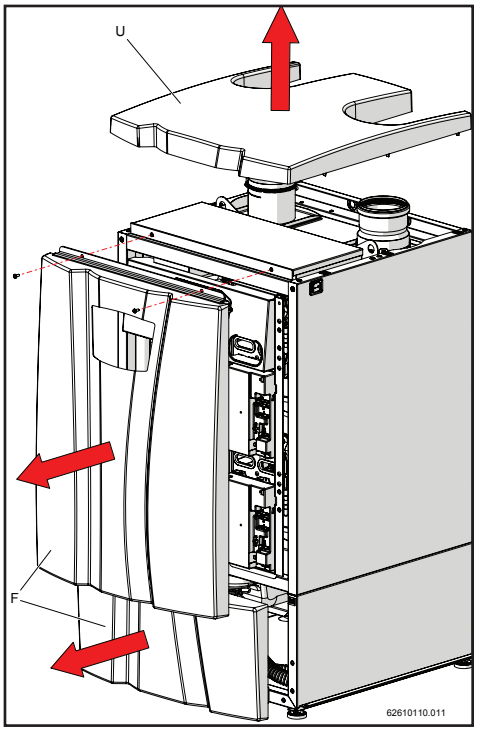


Figure 15-4

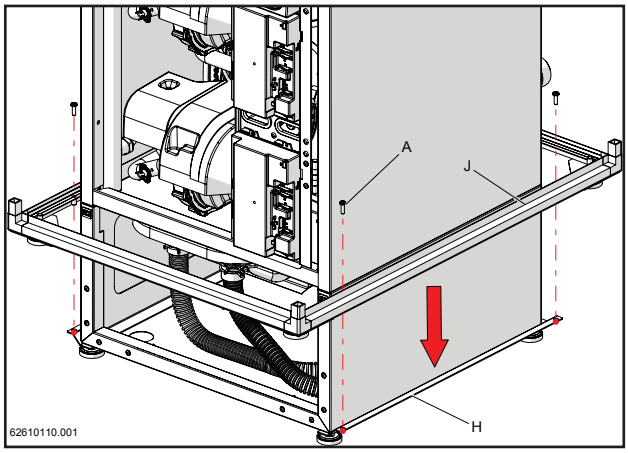


Figure 15-5

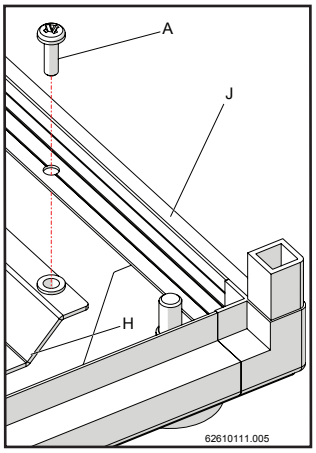


Figure 15-6

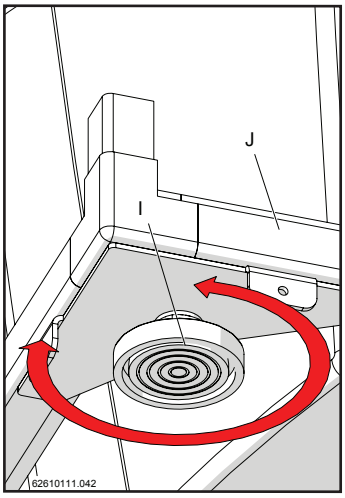


Figure 15-8

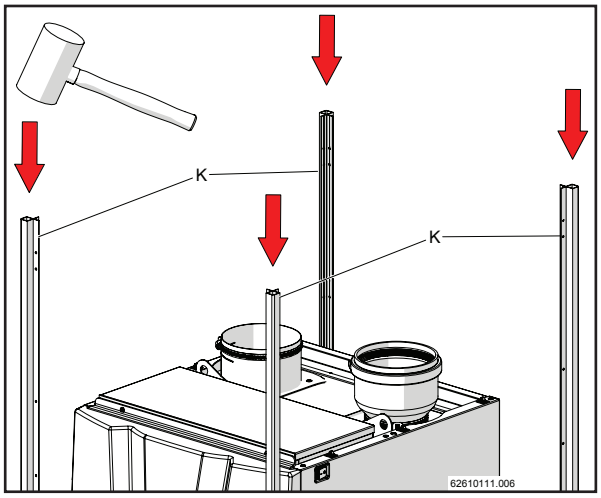


Figure 15-9

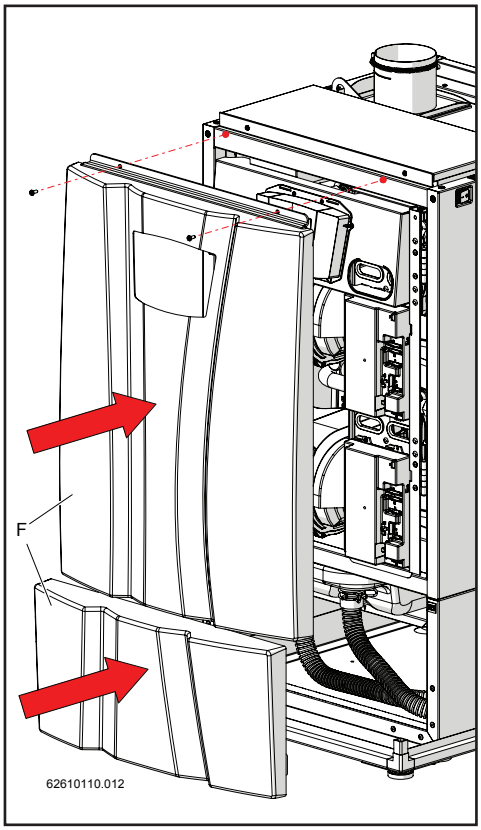


Figure 15-7

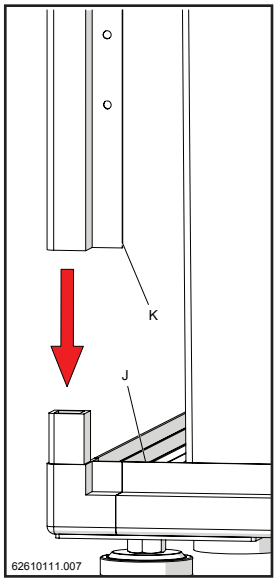


Figure 15-10

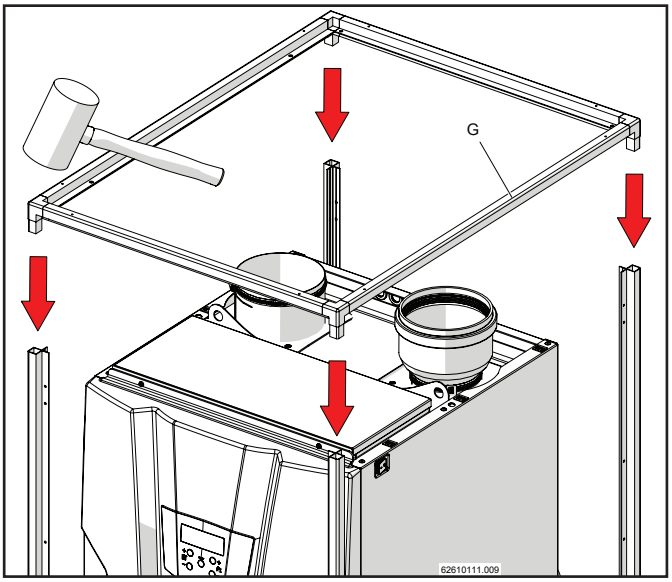


Figure 15-11

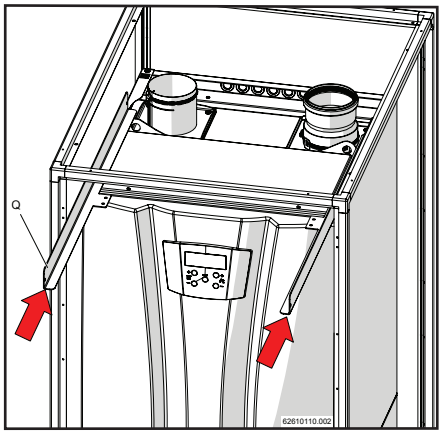


Figure 15-12

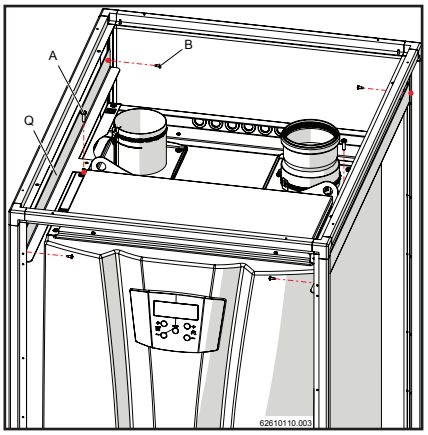


Figure 15-13

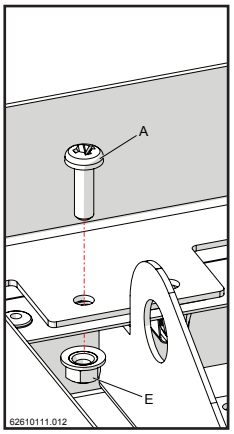


Figure 15-14

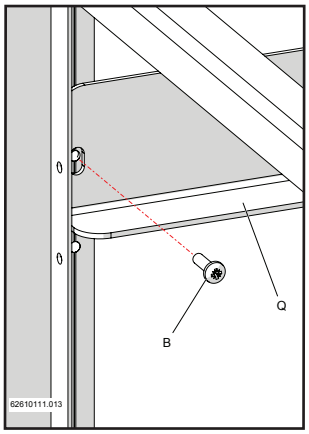


Figure 15-15

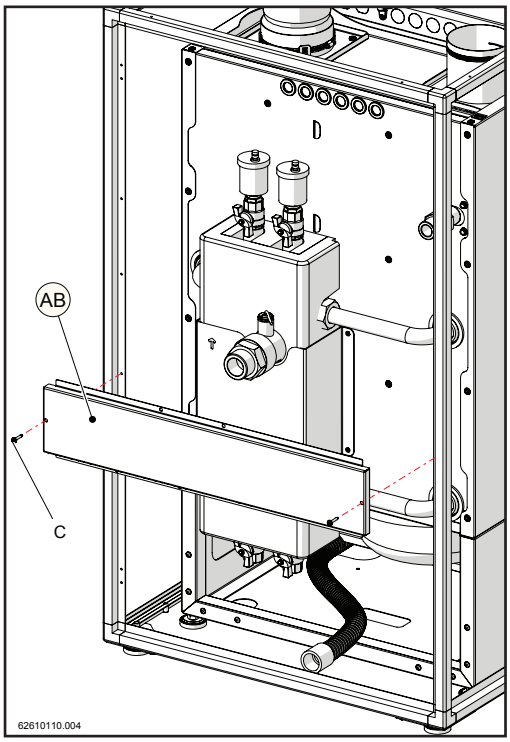


Figure 15-16

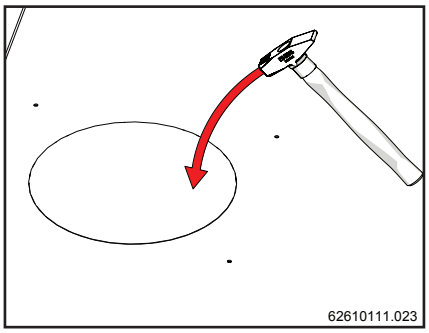


Figure 15-17

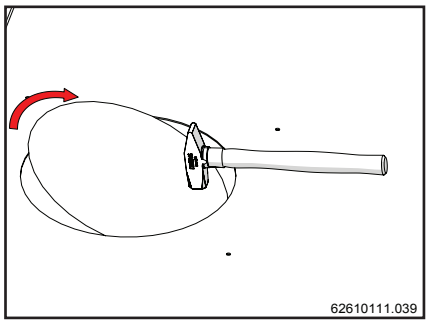


Figure 15-18

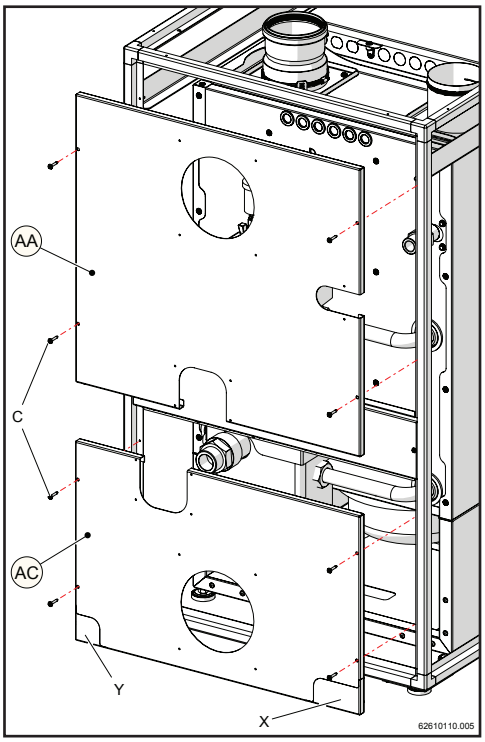


Figure 15-19

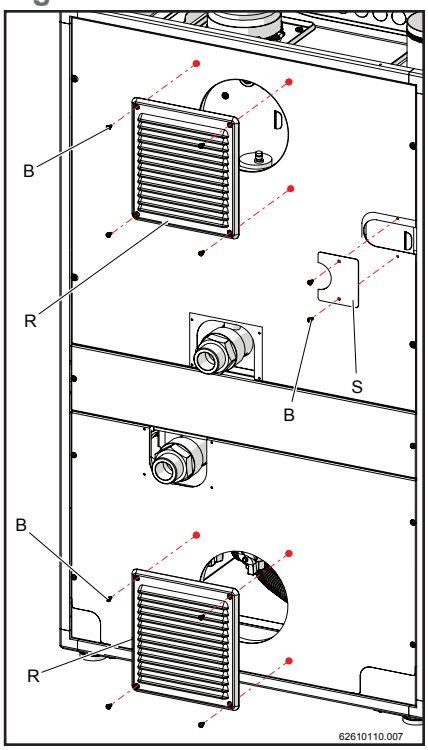


Figure 15-20

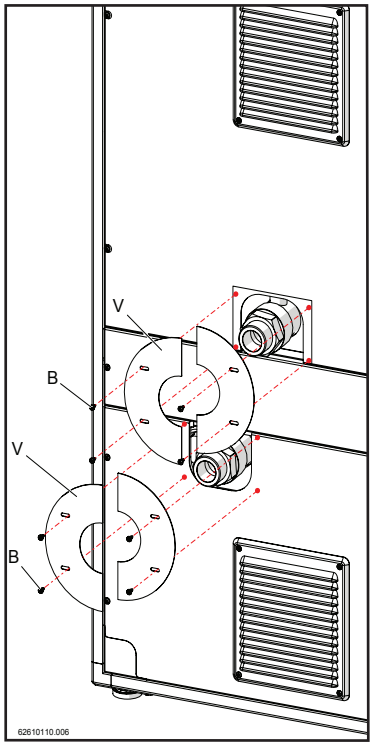


Figure 15-21

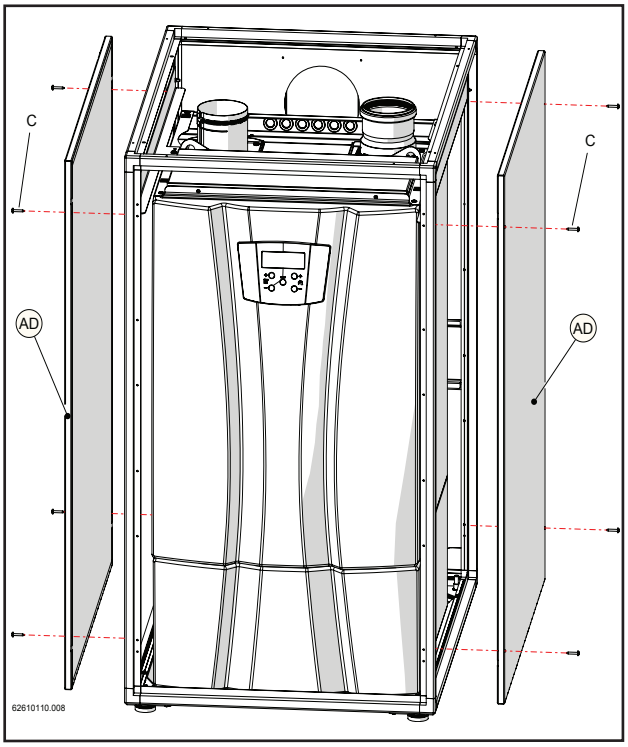


Figure 15-22

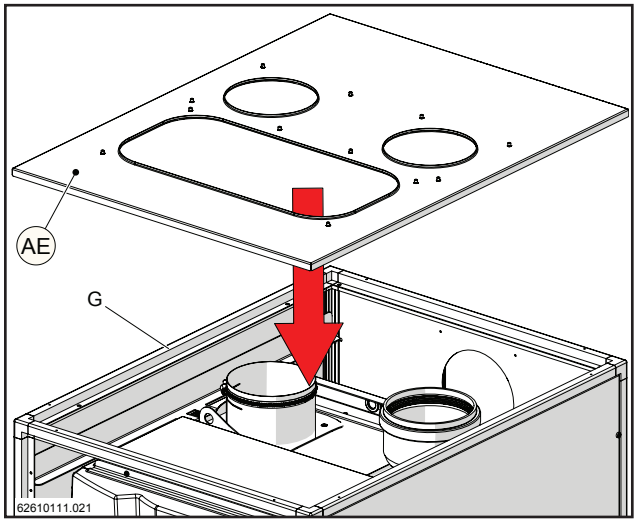


Figure 15-23

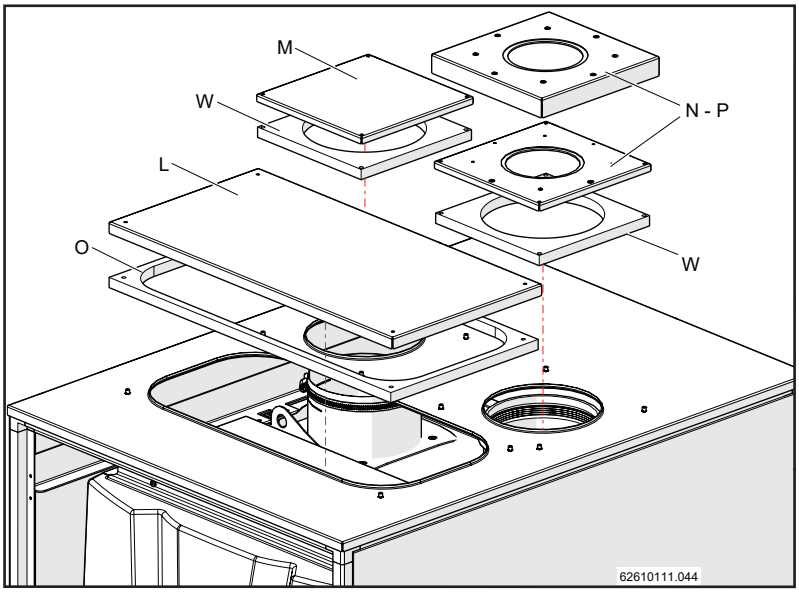


Figure 15-25

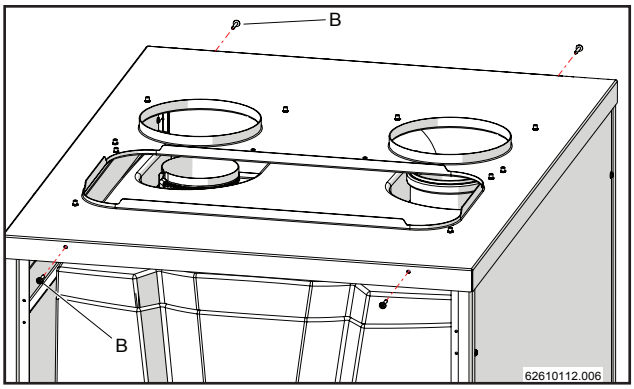


Figure 15-24

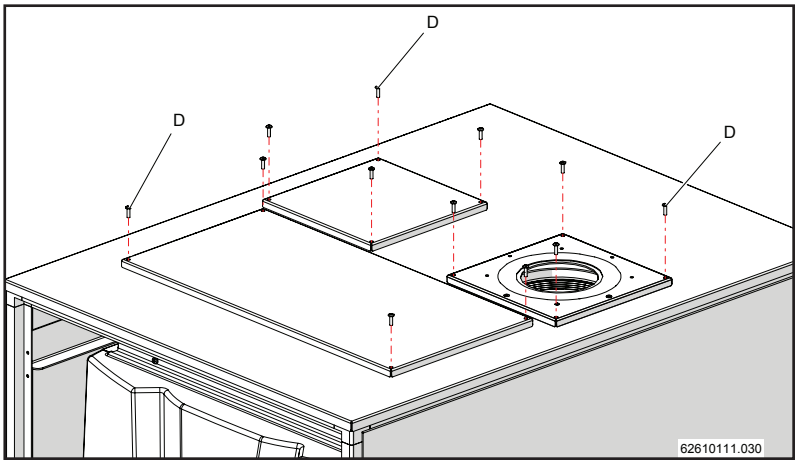


Figure 15-26

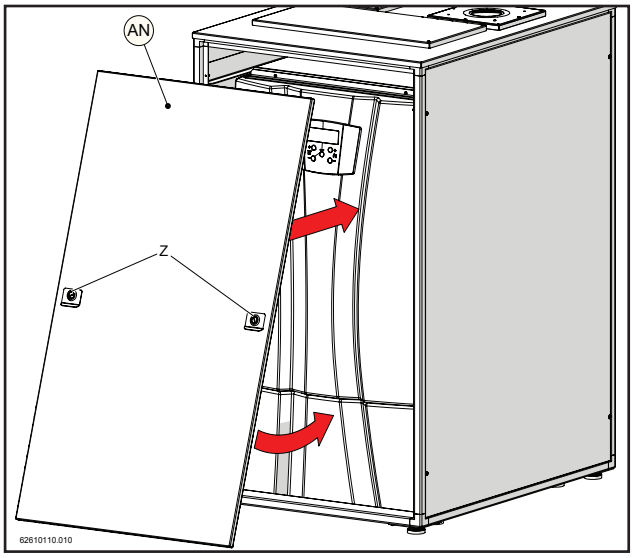


Figure 15-27

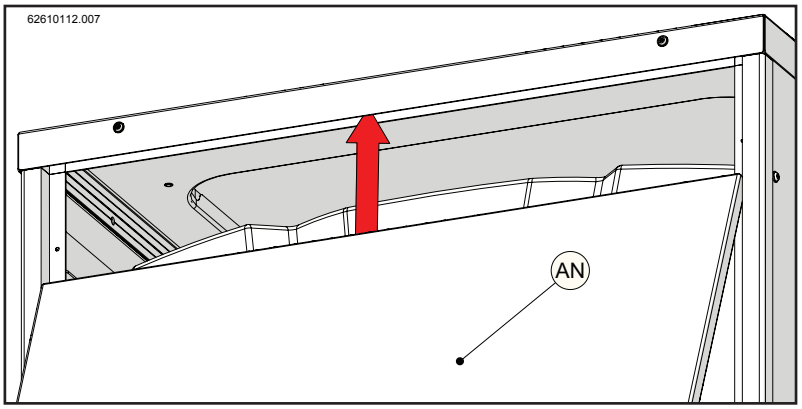


Figure 15-28

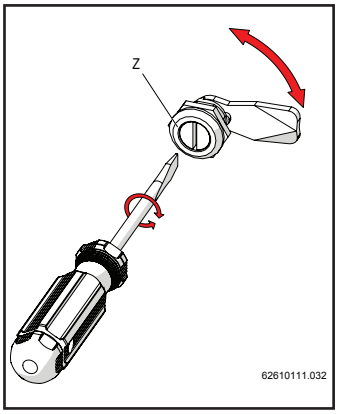


Figure 15-29

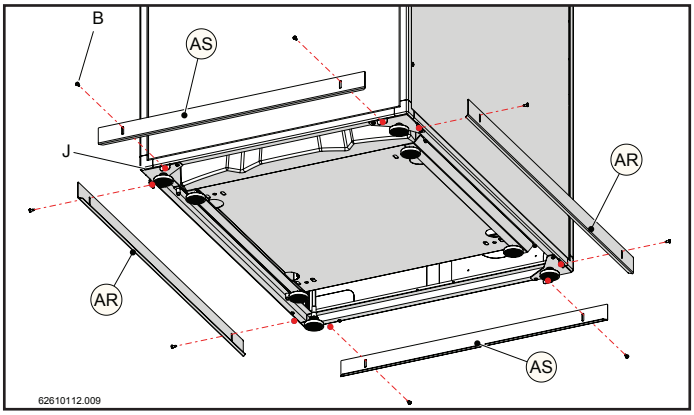


Figure 15-30

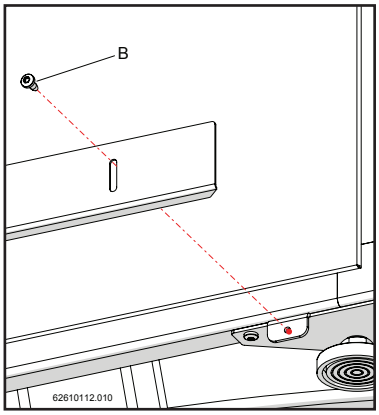


Figure 15-31

15.2 - Installation of external cover for models 180T - 210T - 280T

WARNING:

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

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

WARNING:

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

For installation of the external cover, proceed as follows:

1.- Loosen, with the relevant spanner, the boiler's adjustable feet "T" (figure 15-32), insert rod "H" and retighten the adjustable feet "T" (figures 15-33 and 15-34). Repeat the same procedure on the opposite side.

2.- Remove the boiler's upper and lower front covers "F" and the top cover "U", as shown in figure 15-35.

3.- Insert the lower framework "J" (figure 15-36) and attach it to rod "H" with the relative screws "A" in correspondence with the holes that are present (figure 15-37).

4.- Replace the boiler's upper and lower front covers "F" (figure 15-38). Then adjust the adjustable feet "I" of the lower framework "J" to regulate the boiler's stability on the surface it is installed on (figure 15-39).

5.- Insert the four tubes "K" in correspondence with the pins present on the lower framework "J" using a rubber mallet (figures 15-40 and 15-41).

6.- Insert the upper framework "G" of the external cover using a rubber mallet (figure 15-42).

7.- Insert the upper fixing rods "Q" (figures 15-43 and 15-44). Then put in screw "A" with nut "E" for fastening the rods to the boiler (figure 15-45) and screw "B" for fastening the rods to the framework of the external cover (figure 15-46).

8.- Insert in the direction shown in figure 15-47, the bolts "V" (not supplied at present in the kit) for plumbing.

9.- Position metal sheets (AA) and (AB) (figure 15-50) in the direction shown in figure 15-48. Then attach them to the framework of the external cover with screws "B" (figure 15-49).

10.- Insert metal sheets (AC) and (AD) in figure 15-54 respectively in front of (figure 15-51) and behind (figure 15-52) the previously assembled metal sheets in the direction shown by the arrows. Then put in screws "B" as in figure 15-53.

WARNING: **the metal sheets (AC) and (AD) include holes of different diameters (see figure 15-54). For correct assembly, position them in the ways described in point 10.**

11.- Remove the pre-cut discs from covers (AG) and (AH) as shown in figures 15-55 and 15-56 and, depending on the type of electrical and condensate removal system in the place where the boiler is installed, it is possible to remove the pre-cut sections "X" and "Y" on the cover (AG) shown in figure 15-57 if necessary.

12.- Put on the covers (AF) and (AG) as shown in figure 15-57 and fasten them to the structure with screws "C" (figure 15-58). Then attach the anti-rain grill "R" to the cover (AG) using screws "B", as shown in figure 15-58.

13.- Put on the cover (AH) in the direction shown in figure 15-59 and fasten it to the structure with screws "C" (figure 15-60). Then attach anti-rain grill "R" and metal sheet "S" (removing the pre-cut section, as shown in figure 15-61); attaching both with screws "B" (figure 15-60).

14.- Put on the side covers (AM) (first) and (AL) (next), attaching them to the structure with screws "C" (figure 15-62).

15.- Position the top cover (AE) on the upper framework "G" and attach it using screws "B" in correspondence with the holes (figures 15-63 and 15-64).

16.- Attach the shelter for the electrical connections "L", for the intake "M" and for the outlet "N" (or "P") to the top cover using screws "D" (figures 15-65 and 15-66); remembering to insert gaskets "O" and "W" as shown in figure 15-65.

WARNING:

- If you have a flue gas outlet 160 mm in diameter, use outlet covers "N" in figure 15-65.
- If you have a flue gas outlet 110 mm in diameter, use outlet covers "P" in figure 15-65.

17.- Put on the front covers (AP) (first) and (AN) (next) as shown in figure 15-67 and 15-68. Attach them to the structure by tightening locks "Z" with a flat-head screwdriver (figure 15-69).

18.- Finally, attach metal sheets (AR) and (AS), using screws "B", to the lower framework "J"; as shown in figures 15-70 and 15-71.

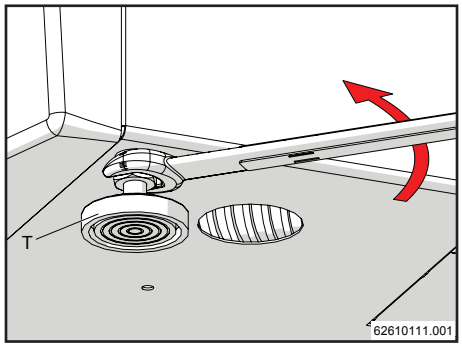


Figure 15-32

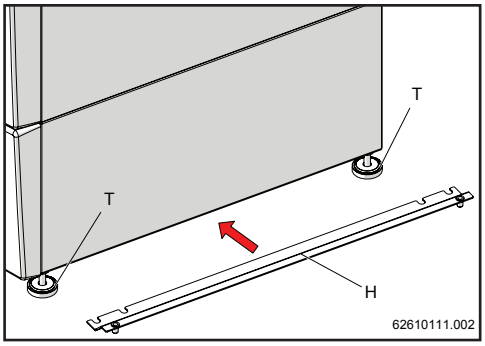


Figure 15-33

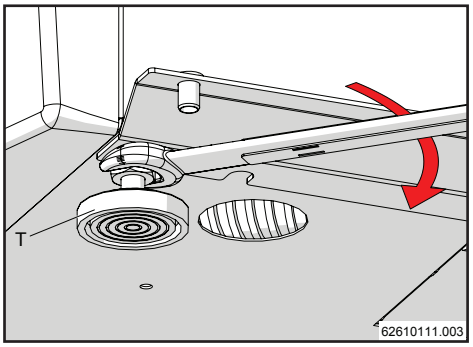


Figure 15-34

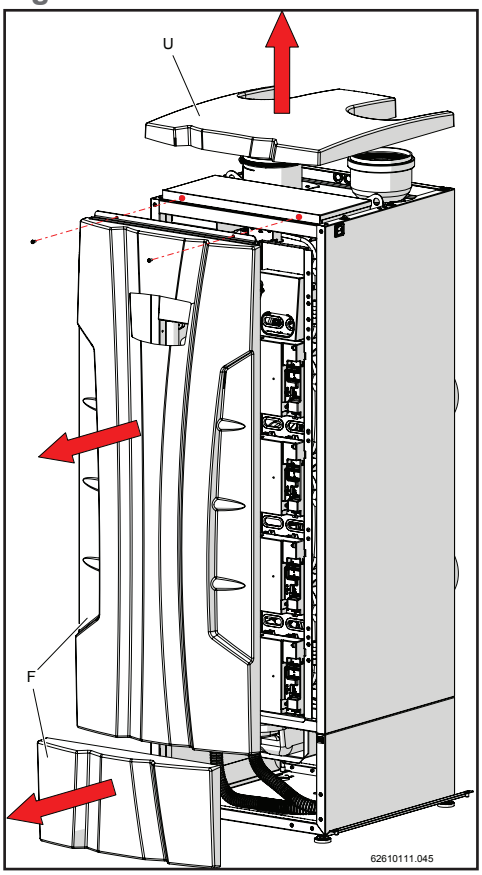


Figure 15-35

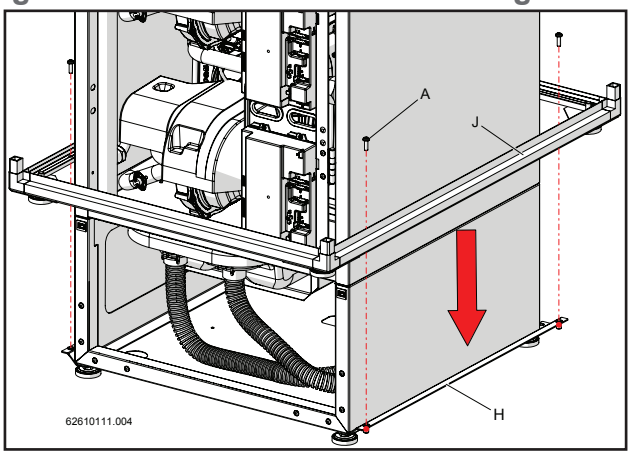


Figure 15-36

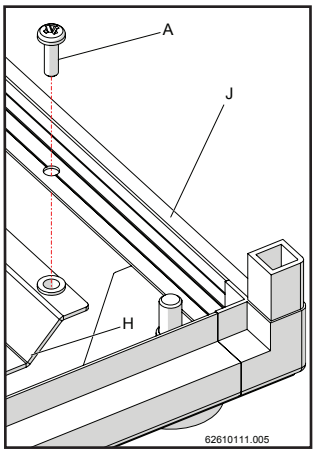


Figure 15-37

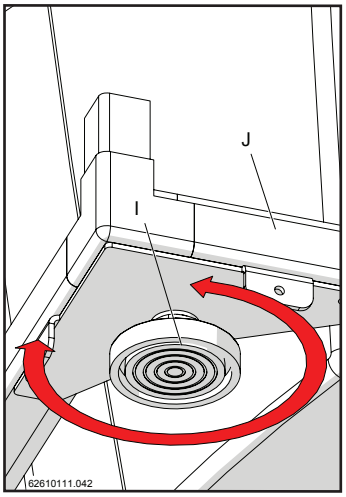


Figure 15-39

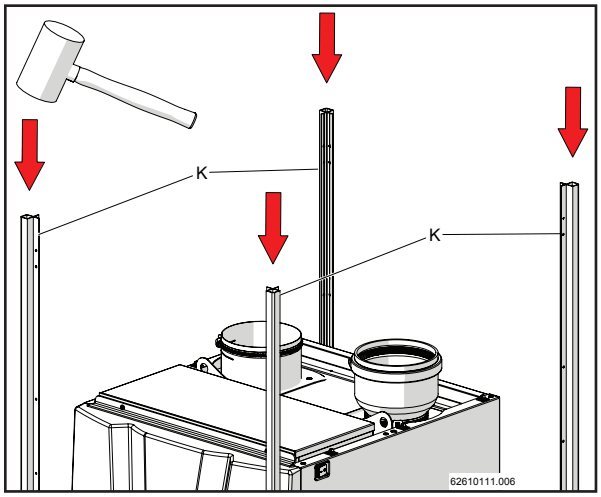


Figure 15-40

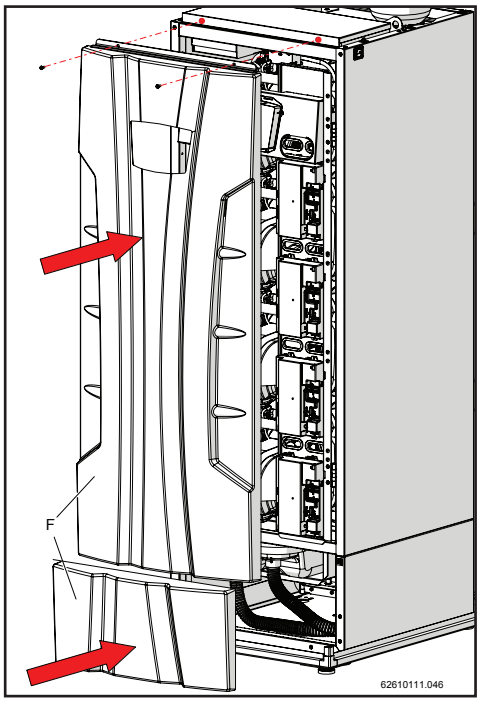


Figure 15-38

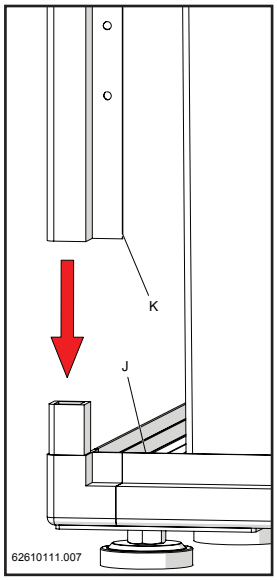


Figure 15-41

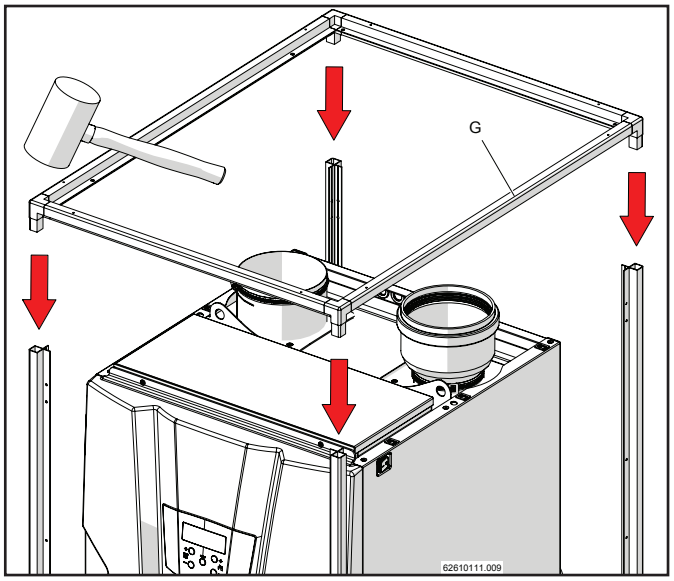


Figure 15-42

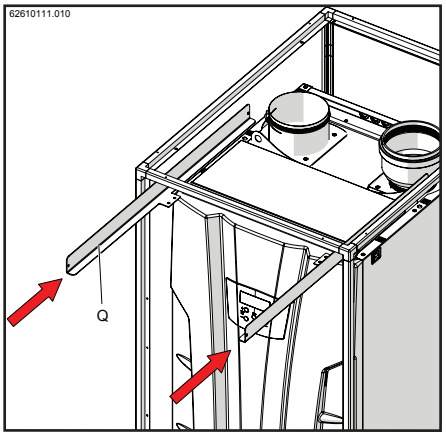


Figure 15-43

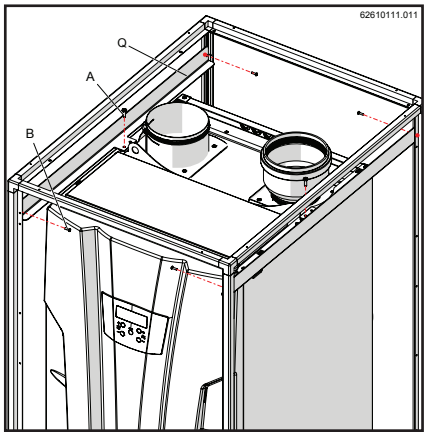


Figure 15-44

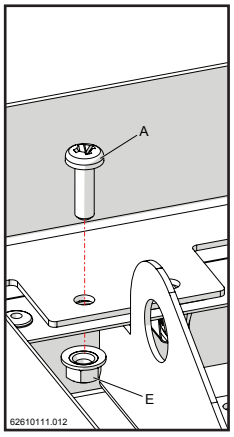


Figure 15-45

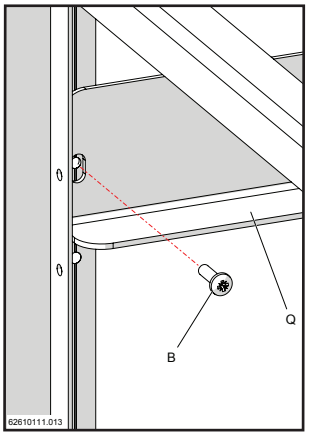


Figure 15-46

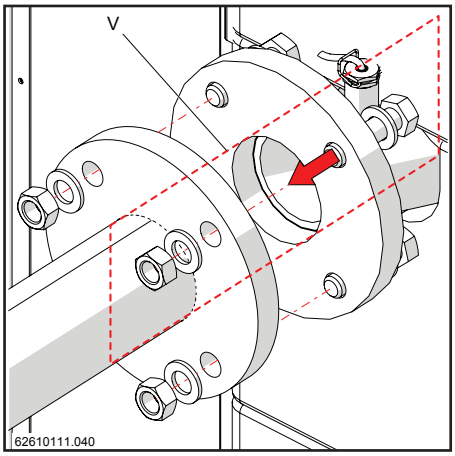


Figure 15-47

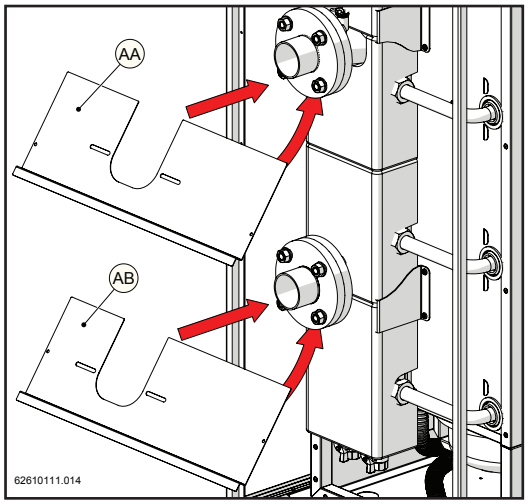


Figure 15-48

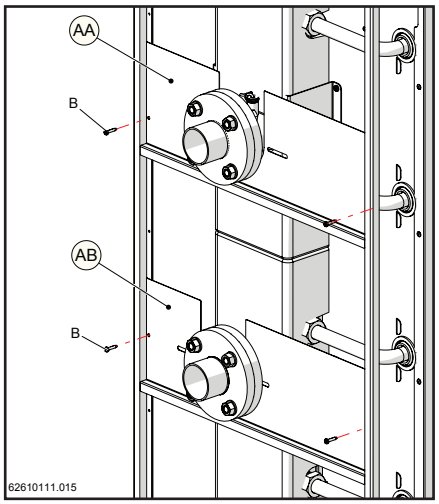


Figure 15-49

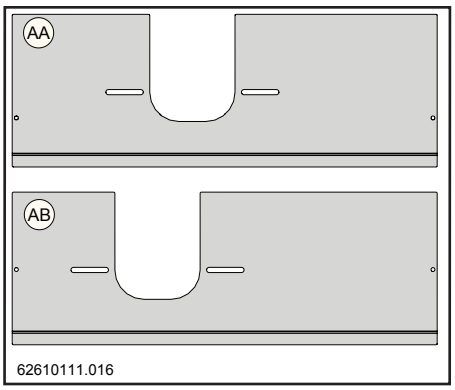


Figure 15-50

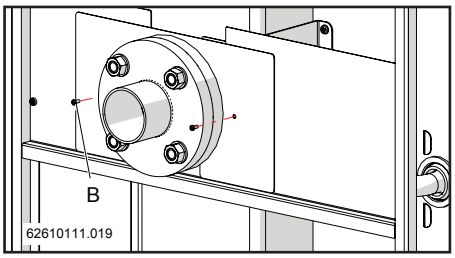


Figure 15-53

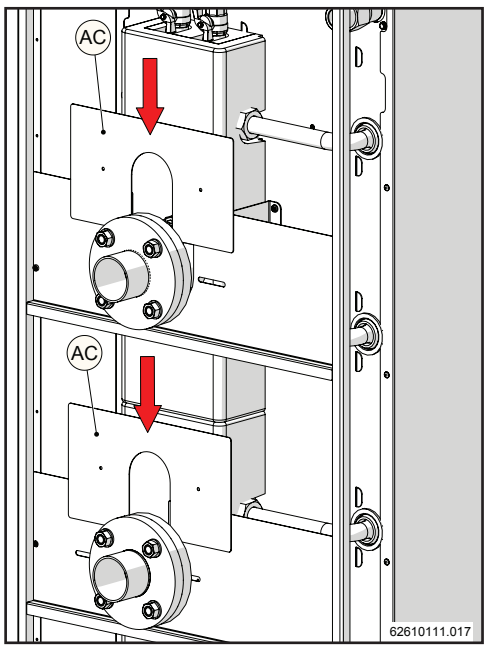


Figure 15-51

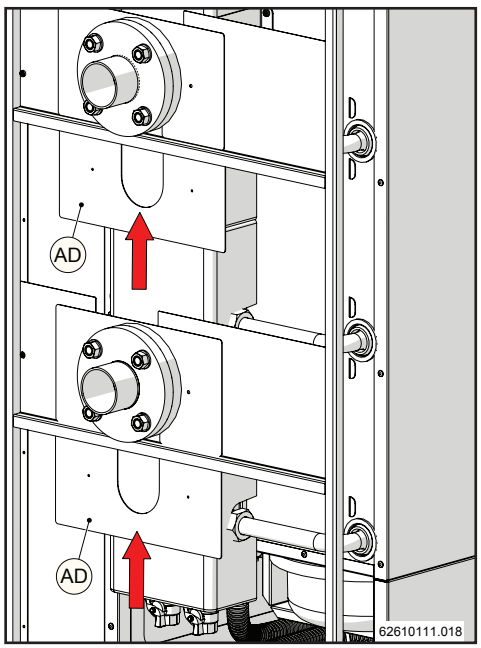


Figure 15-52

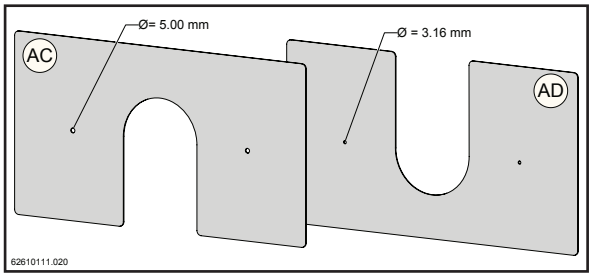


Figure 15-54

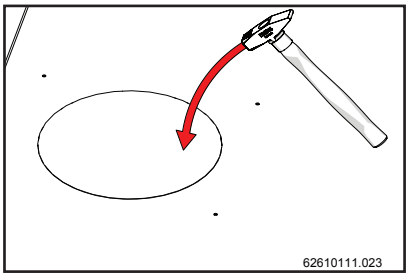


Figure 15-55

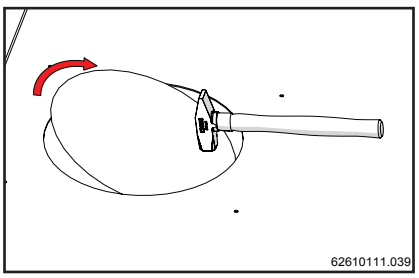


Figure 15-56

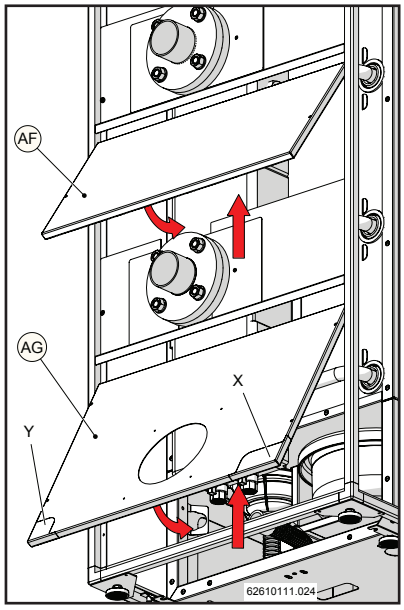


Figure 15-57

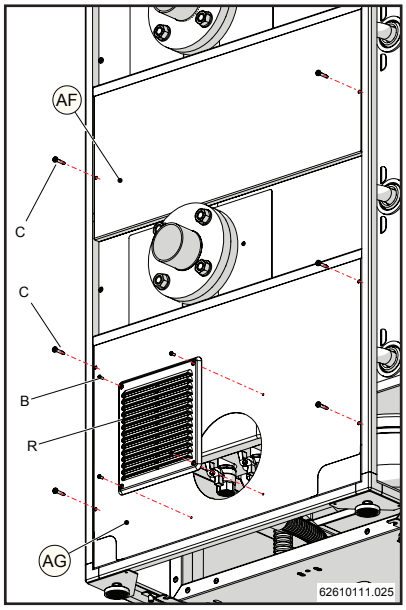


Figure 15-58

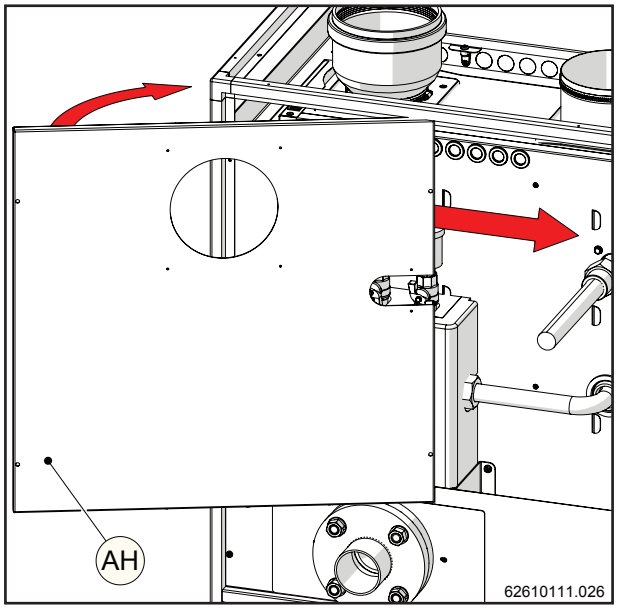


Figure 15-59

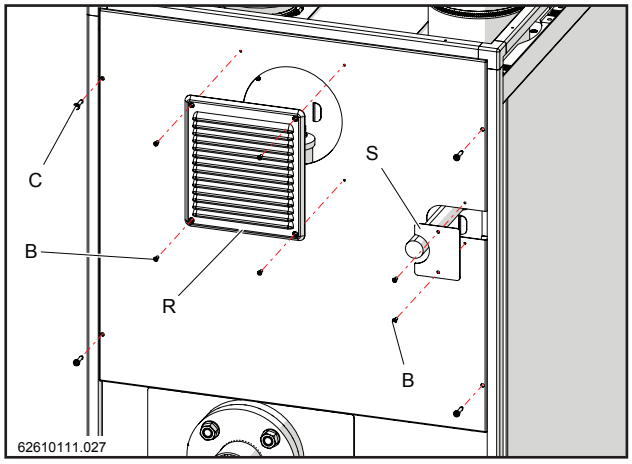


Figure 15-60

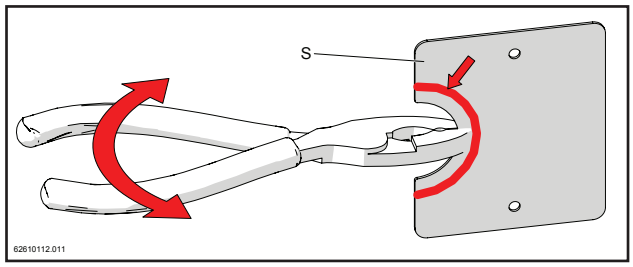


Figure 15-61

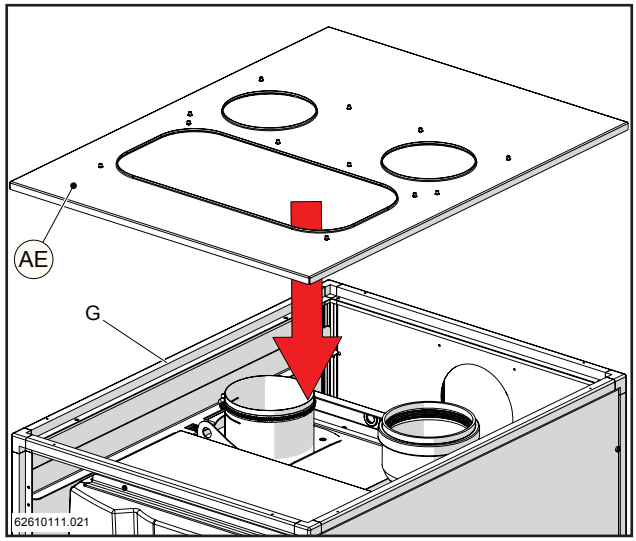


Figure 15-63

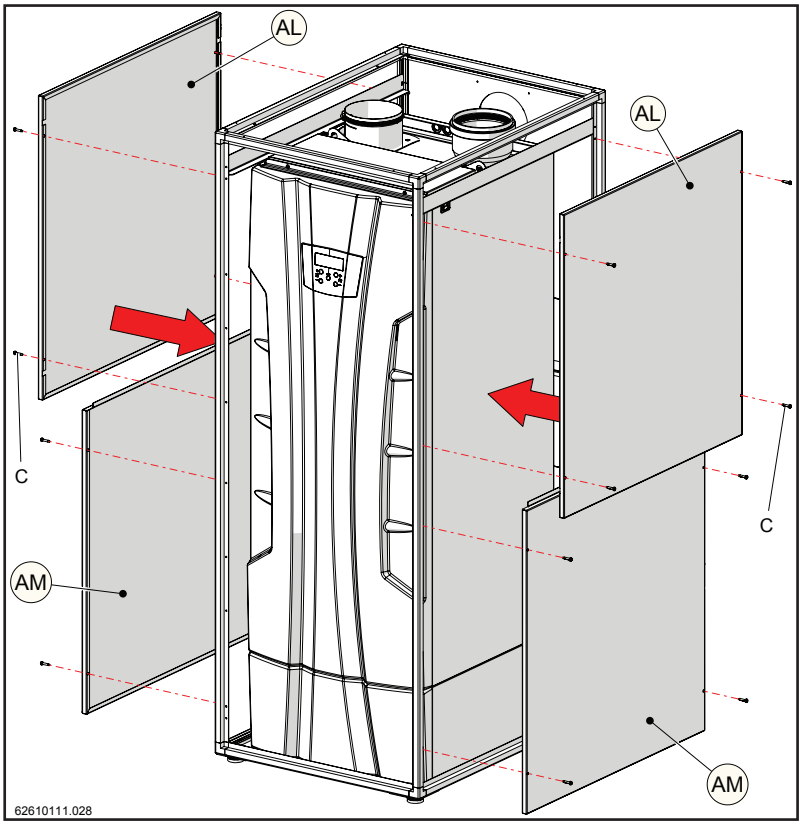


Figure 15-62

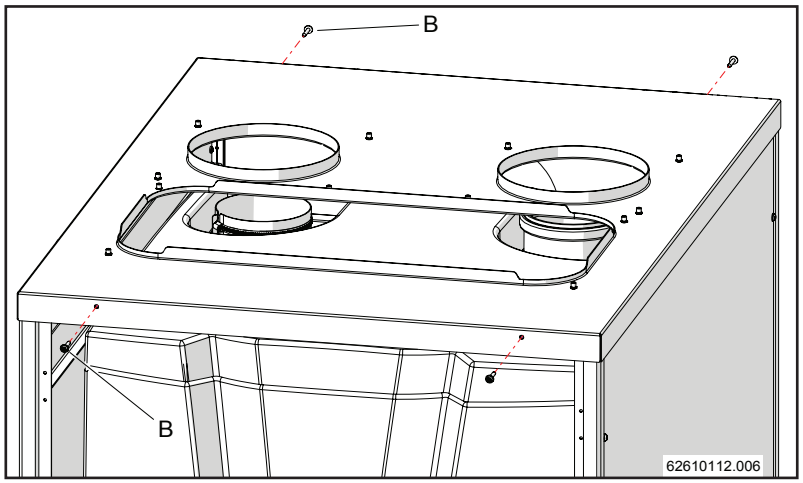


Figure 15-64

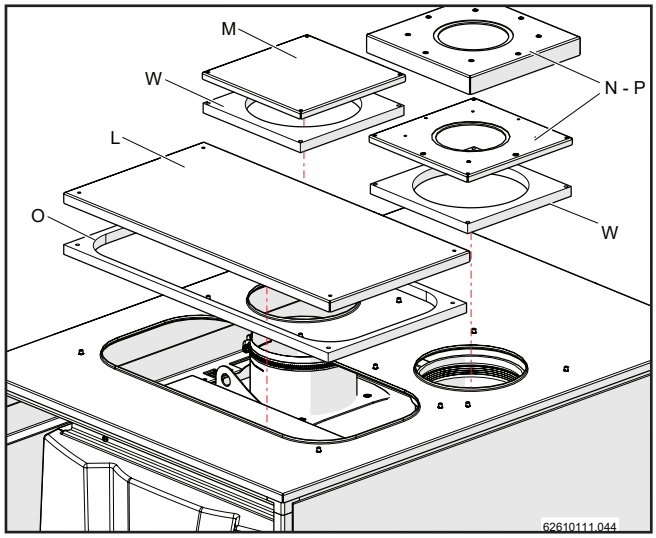


Figure 15-65

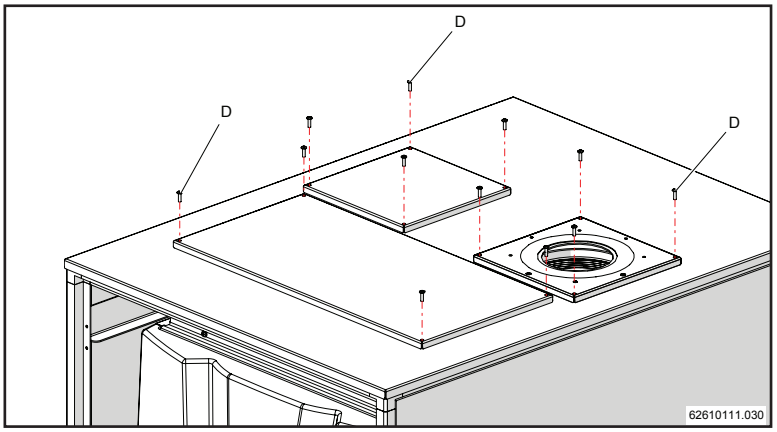


Figure 15-66

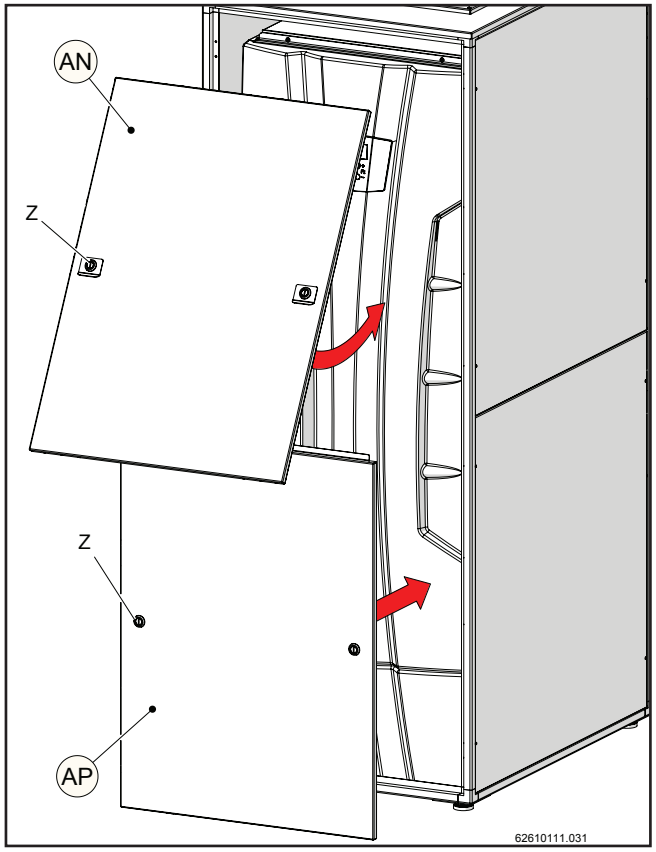


Figure 15-67

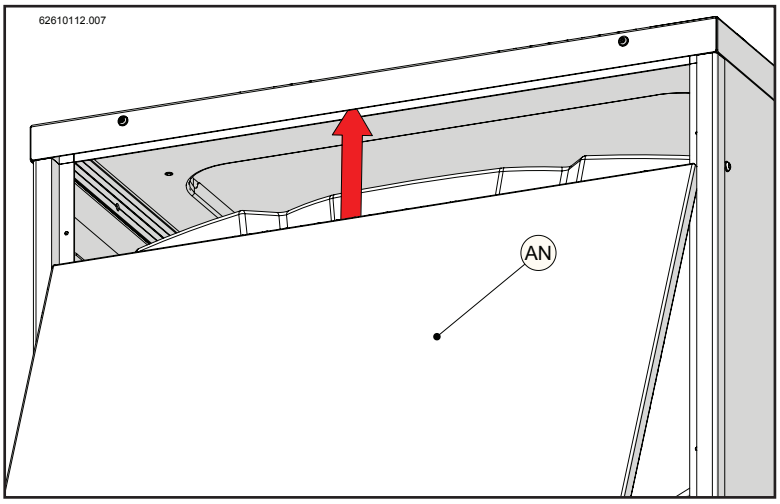


Figure 15-68

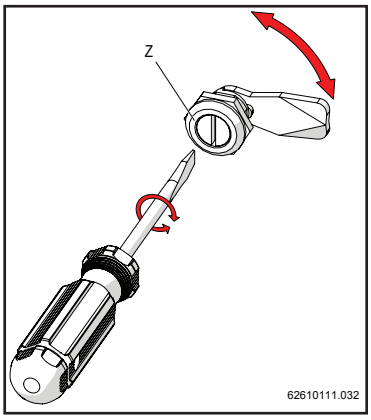


Figure 15-69

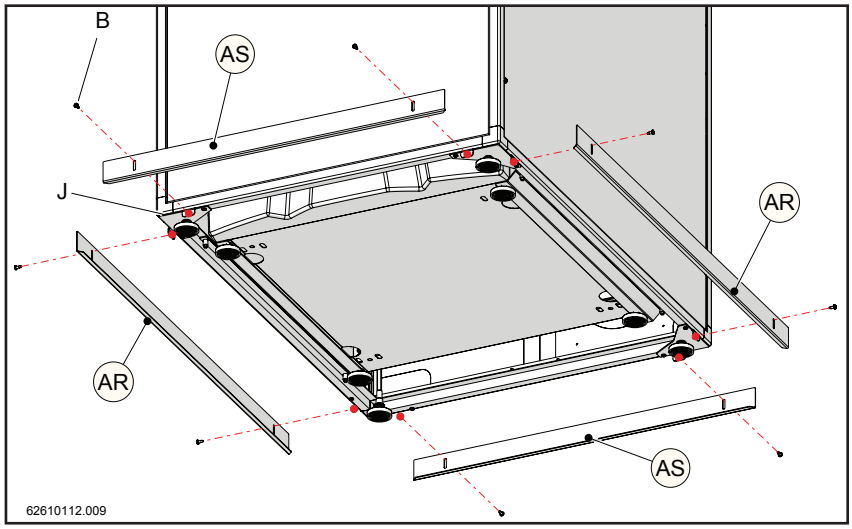


Figure 15-70

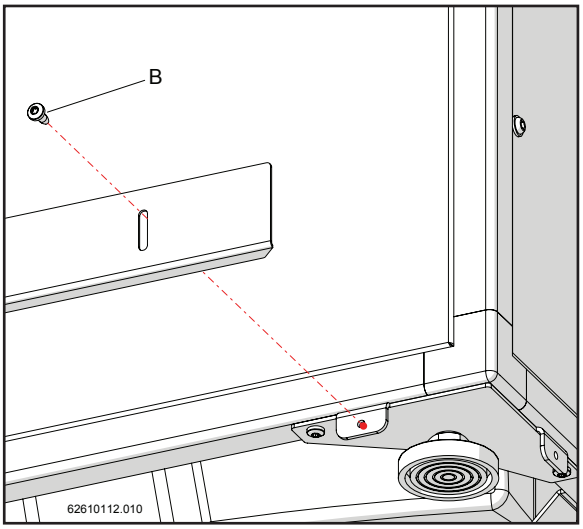


Figure 15-71

16.1 - Start-up

Before starting up the boiler, the following operations must be carried out.

16.1.1 - Instructions to the user

Instruct the user on correct use of the boiler and the whole system in general. In particular:

- ☞ Hand over the installation and use manual and all the documentation contained in the package to the user.
- ☞ Instruct the user on any special measures for discharging burned gases, informing them that they must not be modified.
- ☞ Inform the user of the water pressure check that needs to be done on the system and the steps required to fill it and vent the air.
- ☞ Inform the user regarding the correct temperature, control unit/room thermostat and radiator settings for saving energy.

16.1.2 - Filling the condensate outlet siphon

The siphon found inside the boiler must be filled with water to create the shutter that can prevent flue gases from escaping from pipe “5” in figures 3-3, 3-5 and 3-7.
Proceed as follows to do this:
(refer to figure 16-1)

1.- undo and remove stopper “F” shown in the figure;
2.- insert a rubber tube into hole “S” and at the other end of the tube position a funnel;
3.- slowly pour about 5 litres of water through the funnel;
4.- reassemble everything in reverse order.

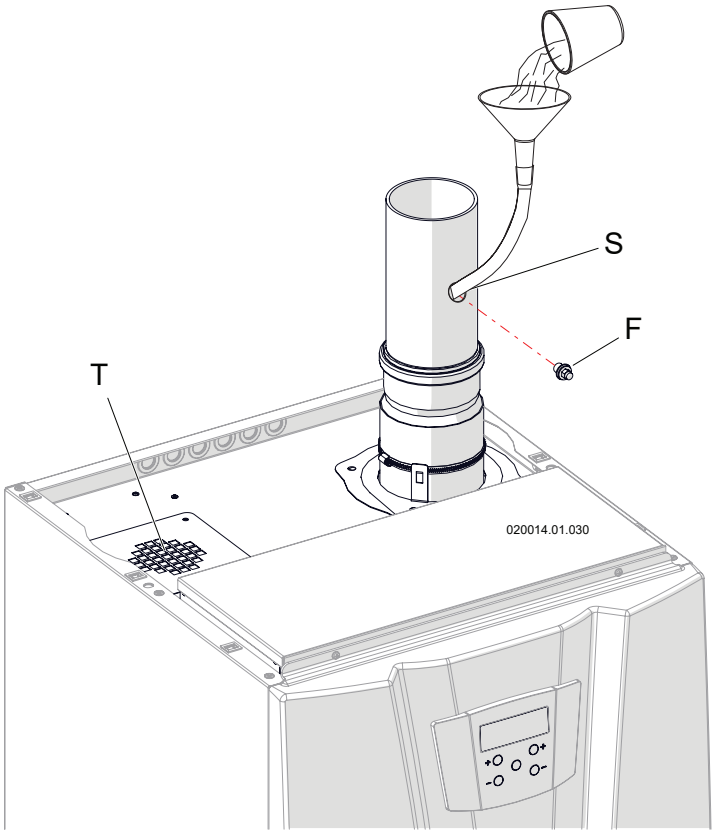


Figure 16-1 – Filling the condensate outlet siphon

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

⚠ WARNING! Once the boiler is back on, check that no exhaust gases are escaping from stopper “F”.

16.1.3 - Filling the central heating system

If the message Err 59 appears on the display when the boiler is powered electrically, this means that the system must be filled. Proceed as follows:

- ☞ only use clean water from the mains.

⚠ WARNING! The addition of chemical substances such as anti-freeze must be performed in compliance with the product instructions. In all cases, these substances must not be introduced directly inside the boiler.

⚠ WARNING! in the case of the AGUADENS range of hot water heaters the addition of chemical substances such as antifreeze is strictly forbidden. Failure to observe this rule could cause serious damage to people’s health or even death.

1.- open the air vent valve (detail “35” in figure 3-3, 3-5, 3-7)
2.- open the filling device provided by the installer upstream from the appliance and fill the system until the pressure gauge reads a pressure of 1.5 bar, showing this on the display (detail “M” in figure 17-1) (on the display the message Err 59 will disappear); if you want to increase the filling pressure level you must set parameter 3022 to the desired value (see section 20);
2.- Make sure there are no water leaks from the fittings;
3.- Reclose the filling device provided by the installer upstream from the appliance;
4.- Bleed the heating elements;
5.- Check the pressure on the boiler display again (detail “M” in figure 17-1). If it has dropped, fill up to 1.5 bar again (or up to the value set).

16.2 - General recommendations regarding the gas supply

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

- ☞ That it is powered by the type of fuel for which it is set up.
- ☞ That the gas supply pressure (with the boiler on and off) falls between the maximum and minimum values shown in the table in section 19.
- ☞ That the gas adduction system has all the safety and checking devices expected by national and local regulations in force.
- ☞ That the flue gas outlet terminal and the combustion agent air intake terminal are free from any obstruction.
- ☞ That the flue gas outlet terminal and the combustion agent air intake terminal are located outside the building.
- ☞ That the condensate outlet is connected.

WARNING! Do not power the appliance with gases other than those specified.

WARNING! Check that the gas and supply pressure are those for which the boiler has been adjusted.

The boiler is provided with the relevant gas conversion kit.

- ☞ Before installation, clean the inside of the gas supply pipe thoroughly;
- ☞ Install a shut-off valve on the gas supply pipe;
- ☞ To prevent damage to the appliance gas control unit, run a leak test at a pressure not exceeding 50 mbar;
- ☞ If the gas system must be inspected at pressures over 50 mbar, turn the valve located immediately before the boiler, to isolate it from the system.

In figures 8-1, 8-2, 9-1 and 9-2 you can check the position of the gas connection. The sections of tubing making up the gas adduction system must always ensure a supply of gas that is sufficient to cover the maximum demand.

WARNING! If you smell gas:

A - Do not turn on any electrical device, including a telephone, or any item that could cause sparks;

B - Immediately open doors and windows to create a draught that can quickly clear the gas from the room;

C - From another room, or from a neighbour's property, immediately call a professionally qualified technician or the gas supply company. Call the Fire Service if the former are not available.

16.3 - Type of gas for which the appliance is set.

On the right side of the boiler there is a label stating the type and supply pressure of the gas for which the boiler is set. The boiler may have one of the following two types of wording:

2H-G20-20mbar NATURAL GAS

This means that the boiler is set to operate with G20 gas (methane) of group H of the second family, at a supply pressure of 20 mbar.

3P-G31-37mbar LPG

This means that the boiler is set to operate with G31 gas (propane, also known as LPG) of group P of the third family, at a supply pressure of 37 mbar.

16.4 - Conversion of boiler models 60T and 70T from one type of gas to another

WARNING! Read these instructions carefully before making the gas change:

- **The installation, calibration or modification of the gas boiler must be carried out by specialised people, in compliance with the law;**
- **Check and be certain that the type of gas which is powering the appliance is compatible with the adjustment kit in your possession;**
- **Do not supply the boiler with a type of gas other than those anticipated.**

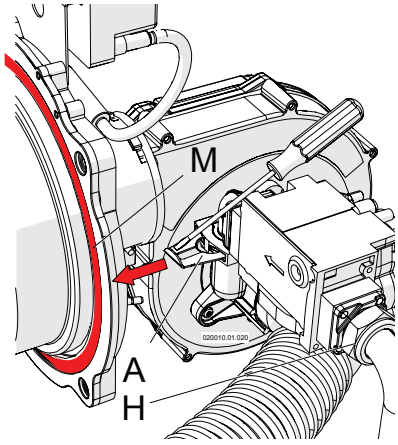


Figure 16-2 – Removing the gas valve

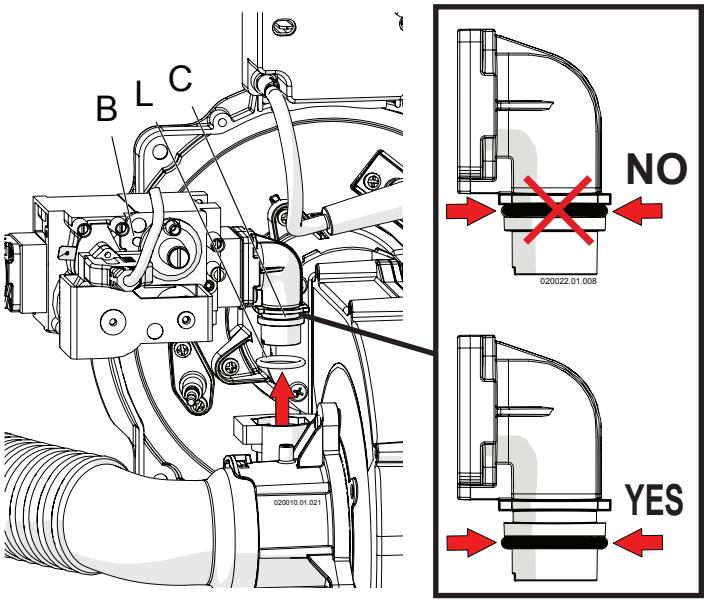


Figure 16-3 - Raising gas valve

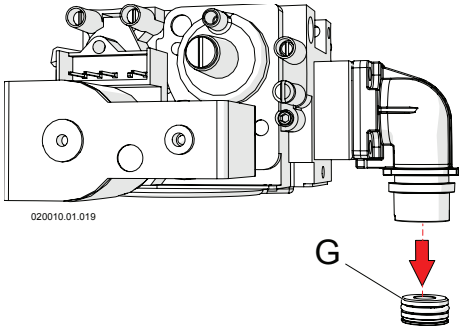


Figure 16-4 – Replacing the gas nozzle

Contents:

The kit (supplied as standard with the boiler) is made up of
- label certifying the new type of gas, a gas nozzle for each burner and an instruction sheet;

To carry out the change of gas, proceed as follows:

1 - Turn off the boiler by moving the main switch to OFF (detail "T" in figure 17-1);
2 - Turn off the gas supply valve;
3. - Open the boiler casing as shown in section 18.2;
4 - Undo junction "H" in figure 16-2;
5 - With the aid of a screwdriver, remove fork "A" in figure 16-2;
6 - Remove the gas valve with junction "C" as in figure 16-3 (paying attention to the OR "L" in figure 16-3);
7 - Replace nozzle "G" in figure 16-4 with the one in the kit, checking it corresponds in diameter to that shown in table 16-8;
8 - Replace the gas valve paying attention to the correct position of the OR "L" in figure 16-3 and to the joint gasket "H" in figure 16-2;
9 - Replace fork "A" in the locking housing;
10 - Tighten joint "H" in figure 16-2;
11 - Open the gas supply valve;
12 - Check that there are no leaks from joint "H" in figure 16-2;

WARNING! Test the gas seal using a soap and water solution only. The use of naked flames is prohibited.

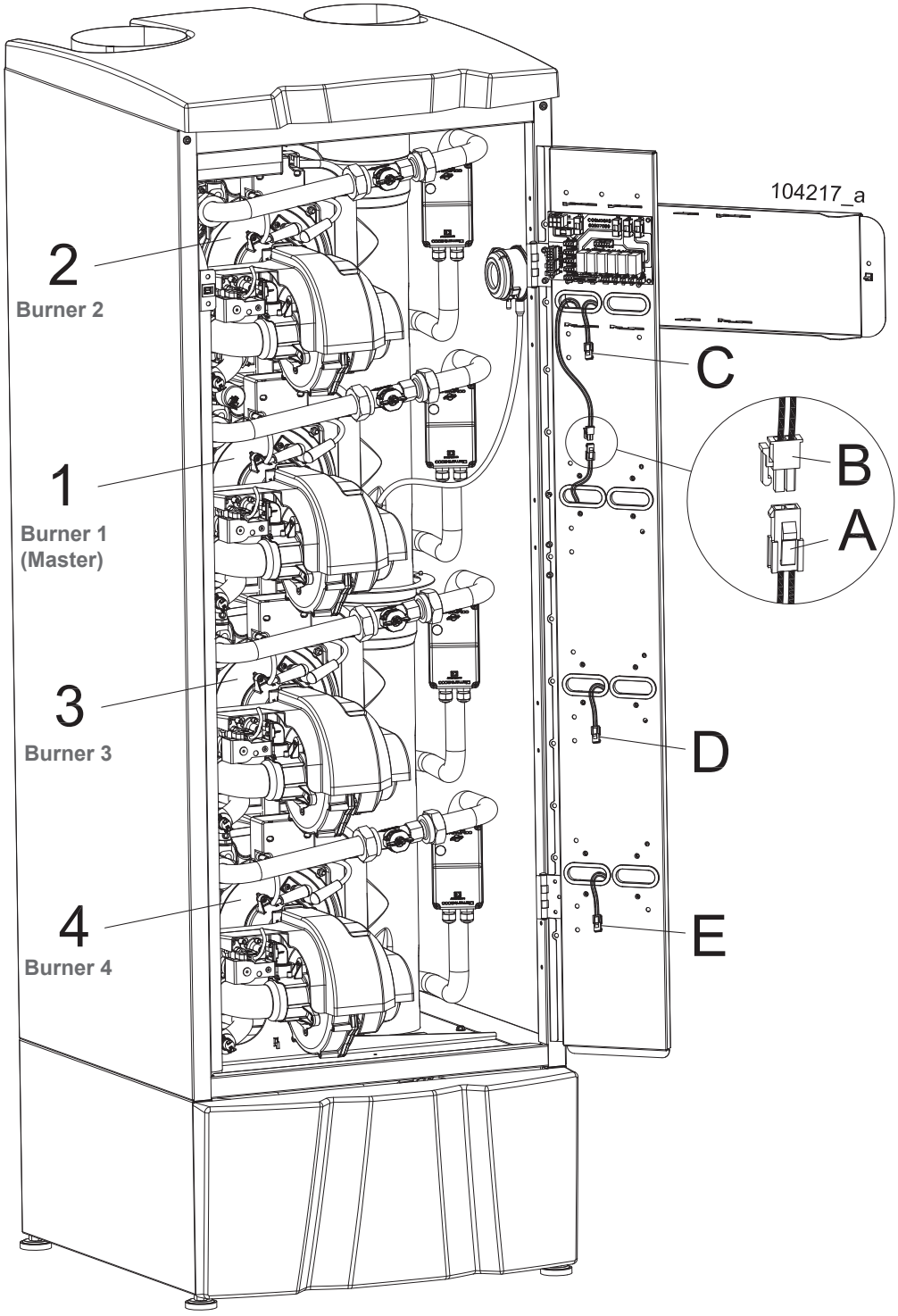
13 - Turn on the boiler by moving the main switch to ON (detail "T" in figure 17-1);
14 - Completely undo screw "E" in figure 16-6 in an anticlockwise direction;
15 - Check gas pressure by following section 16.7, the minimum pressure must not be less than 10 mbar while the maximum must not exceed 45 mbar;
16 - Check and adjust the CO2 following the procedure in section 16.8 and checking the value in figure 16-8;

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

17.- Check the boiler's power by following section 16.9;
18.- apply the adhesive data plate (see figure 16-7) to the right-hand side of the boiler, in place of the label that identified the old setting status, to certify the boiler's new setting status, as follows: apply label "B" if the boiler has been converted from methane to LPG; apply label "A" if the boiler has been converted from LPG to methane.

WARNING! If you smell gas:

A - Do not turn on any electrical device, including a telephone, or any item that could cause sparks;
B - Immediately open doors and windows to create a draught that can quickly clear the gas from the room;
C - From another room, or from a neighbour's property, immediately call a professionally qualified technician or the gas supply company. Call the Fire Service if the former are not available.



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 16-5 - Burners position

16.5 - Conversion of boiler models 100T to 280T from one type of gas to another

Boilers 100T to 280T are multi-burner models, this means that the gas type conversion must be done on each burner.

WARNING! Read these instructions carefully before making the gas change:

- **The installation, calibration or modification of the gas boiler must be carried out by specialised people, in compliance with the law;**
- **Check and be certain that the type of gas which is powering the appliance is compatible with the adjustment kit in your possession;**
- **Do not supply the boiler with a type of gas other than those anticipated.**

Contents:

The kit (supplied as standard with the boiler) is made up of
- label certifying the new type of gas;
- a gas nozzle for each burner;
- an instruction sheet;

To carry out the change of gas, proceed as follows:

1 - Carry out the conversion in “Burner 1” (MASTER). See figure 16-5 to identify “Burner 1” (MASTER);

2 - Carry out the conversion in “Burner 1” (MASTER) following points 1 to 16 of section 16.4;

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

3 - Carry out the conversion in “Burner 2” following points 1 to 16 of section 16.4;

After converting “Burner 2”, continue with “Burner 3” (if present) as shown below:

4 - Carry out the conversion in “Burner 3” following points 1 to 16 of section 16.4;

After converting “Burner 3”, continue with “Burner 4” (if present) as shown below:

5 - Carry out the conversion in “Burner 4” following points 1 to 16 of section 16.4;

After converting all the Burners continue as shown below:

6 - Check the gas inlet pressure as shown in section 16.7;

7 - Check the boiler power as shown in section 16.9;

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

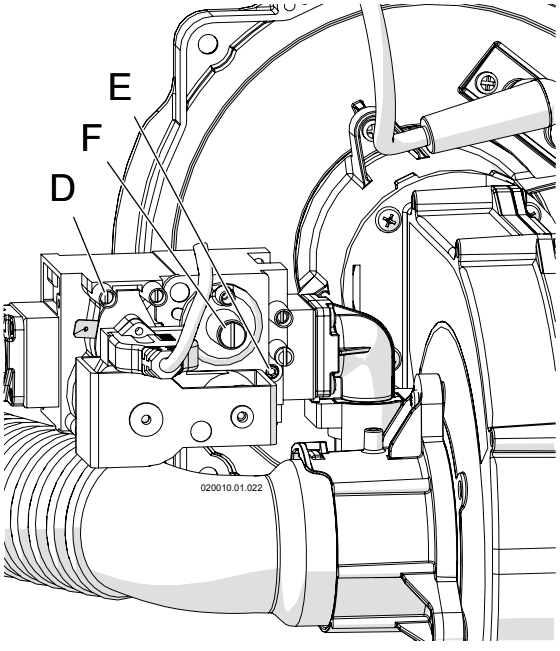
8.- apply the adhesive data plate (see figure 16-7) to the right-hand side of the boiler, in place of the label that identified the old setting status, to certify the boiler’s new setting status, as follows: apply label “B” if the boiler has been converted to G31; apply label “A” if the boiler has been converted to G20.

WARNING! If you smell gas:

A - Do not turn on any electrical device, including a telephone, or any item that could cause sparks;

B - Immediately open doors and windows to create a draught that can quickly clear the gas from the room;

C - From another room, or from a neighbour’s property, immediately call a professionally qualified technician or the gas supply company. Call the Fire Service if the former are not available.



D - Gas inlet tapping point.
E - CO2 regulation screw.
F - Factory regulation screw (do not touch).

Figure 16-6 – Gas valve

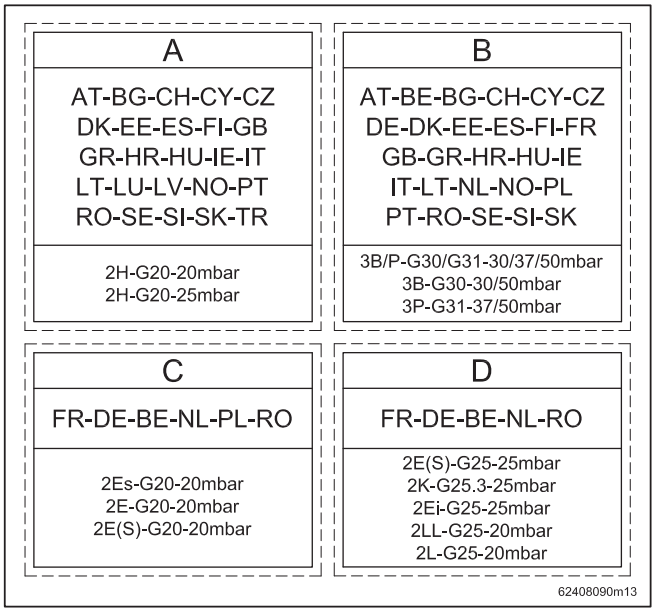


Figure 16-7 – Labels certifying the new boiler status

	U.M.	60T	70T	100T	115T	140T	180T 210T	280T
Rated gas supply pressure G20/G31	mbar	20/37						
Minimum gas supply pressure G20/G31	mbar	10						
Maximum gas supply pressure G20/G31	mbar	45						
Methane gas nozzle diameter (G20)	mm	8.9	9.5	8.9	8.9	9.5	9.5	9.5
LPG gas nozzle diameter (G31)	mm	6.2	6.4	6.2	6.2	6.4	6.4	6.4
CO2 Methane gas (G20) at maximum power	%	from 8.4 to 9.0						
CO2 Methane gas (G20) at minimum power	%	from 8.4 to 8.6						
O2 Methane gas (G20) at maximum power	%	from 5.2 to 5.6						
O2 Methane gas (G20) at minimum power	%	from 5.7 to 5.9						
CO2 LPG gas (G31) at maximum power	%	from 9.9 to 10.5						
CO2 LPG gas (G31) at minimum power	%	from 9.7 to 9.9						
O2 LPG gas (G31) at maximum power	%	from 5.2 to 5.6						
O2 LPG gas (G31) at minimum power	%	from 5.9 to 6.1						

Figure 16-8 - Operating settings for the different gases

16.6 - Ignition

16.6.1 - MYDENS boiler ignition

1.- Open the gas valve;
2.- connect the boiler to the electricity and set the general switch to ON (detail “T” in figure 17-1);
3.- The boiler ignites only when the temperature requested by the room thermostat is higher than the present delivery temperature. Adjust the desired temperature for the heating service using the + and − keys. If the outdoor sensor is connected (see section 13.1.4), check that the temperature calculated (see section 17.14, parameter 10 12 or parameter 1 107 for appliances from 115T to 280T) is higher than the present heat exchanger temperature and the outdoor temperature (see section 17.14 parameter 1004) is lower than the outdoor temperature for switching off the central heating (see section 17.15 parameter 2020);
4.- If the boiler is connected to a storage tank (see section 13.2) press keys + and − to select the desired domestic hot water temperature.
5.- If the display indicates a low water pressure error (see section 17.16.2), repeat the operation to bleed the air.

16.6.2 - AGUADENS hot water heater ignition

1.- Open the gas valve;
2.- connect the boiler to the electricity and set the general switch to ON (detail “T” in figure 17-1);
3.- The boiler ignites only when the temperature set is higher than the present input temperature. Adjust the desired temperature for the input using the + and − keys.
4.- If the display indicates a low water pressure error (see section 17.16.2), repeat the operation to bleed the air.

16.7 - Controlling the supply gas pressure and any adjustments

The gas supply pressure must match that shown in the table in section 19. Proceed as follows to verify the pressure:
1.- Close the gas valve;
2.- access the boiler’s internal parts by following the procedure described in section 18.2;
3.- loosen tapping point “D” (see Figure 16-6);
4.- connect a pressure gauge with a resolution of at least 0.1 mbar (1 mmH2O) to it, for models from 100T to 280T you can use any of the valves present;
5.- turn on the gas valve;
6.- check that the pressure does not exceed 45 mbar;
7.- position the general switch to ON (detail “T” in figure 17-1) and trigger a demand for heating by pressing key + up to the maximum value, check that the temperature set is higher than the output temperature and that the system is in the right conditions to disperse the heat generated;
8.- Set parameter 2200 at H IGH (in models 60T and 70T use parameter 20 10). Now the burners will operate at maximum power for 20 minutes;
9.- with the boiler at maximum capacity, check that the gas supply pressure does not fall below the value shown in Figure 16-8. If the pressure is lower, do not try to make any adjustments to the boiler, instead you must act upstream from it to restore the correct pressure and flow of gas.

WARNING! Do not touch screws “E” and “F” in figure 16-10, these are factory set for the correct flow of gas and the correct output pressure.

After verifying the gas pressure is correct:
1.- Reset parameter 2200 to OFF (in models 60T and 70T use parameter 20 10);
2.- turn off the gas valve;
3.- disconnect the pressure gauge and reclose the tapping point “D”;
4.- check for any possible gas leaks from tapping point “D” (figure 16-6);

☞ Do not force the screws to close the tapping points in order to avoid damaging the gas valve.

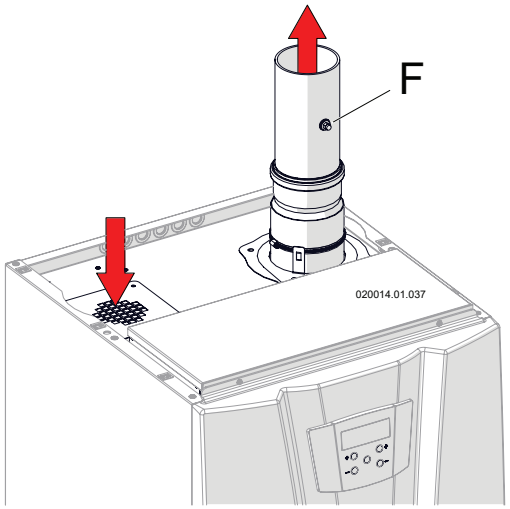
WARNING! Test the gas seal using a leak detection fluid. The use of naked flames is prohibited.

16.8 - Controlling the level of CO2 and any adjustments

Table 16-8 shows the correct values of CO2 for a boiler working in normal conditions, at an altitude of less than 1000 metres. A different value from the one shown can cause malfunctions. A combustion analysis must be carried out to check and make any necessary adjustment to this value. Proceed as follows:

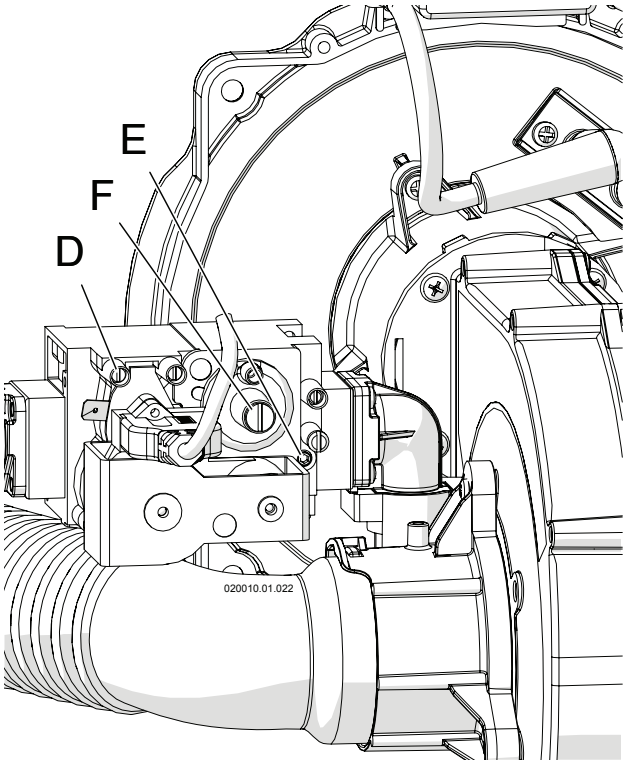
16.8.1 - Check the CO2 content and make any necessary adjustment on boiler models 60T and 70T

WARNING! If during this procedure a CO value of more than 1000 ppm is detected, turn off the boiler and contact the dealer.



F - Taking combustion analysis

Figure 16-9 - Taking combustion analysis



D - Gas inlet tapping point.
E - CO2 regulation screw.
F - Factory regulation screw (do not touch).

Figure 16-10 – Gas valve

1.- The flue system must contain a purpose provided test point for the analysis of combustion products. The test point should be located as close to the appliance as is possible (see figure 16-9, part “F”).
2.- Turn on the boiler and open the link between terminals “10” and “11”;
3.- Make sure that the temperature demanded is higher than that of the boiler/hot water heater;
4.- Go into the installer menu (see section 17.15) and set parameter 20 10 to H IGH. Now the boiler will operate at maximum power for 20 minutes;
5.- Wait two or three minutes for the CO2 to stabilise;
6.- Insert the sensor to read the value of CO2 in point “F” shown in figure 16-9;
7.- Compare the value of CO2 detected with that shown in table 16-8; make sure you read the value for the type of gas being used. If the value of CO2 is not that shown in table 16-8, you must correct it using screw “E” in figure 16-10. Using a 2.5 mm six-sided spanner (turn the screw clockwise to reduce the value of CO2 and anticlockwise to increase it), make small turns, always waiting for the CO2 value to stabilise before continuing with further movements, until you reach the desired value.
8.- Once you have reached the correct value of CO2 as in table 16-8, seal the screw with red paint or a similar system to discourage any tampering with it.
9.- Set parameter 20 10 at LO. The boiler will now operate at minimum power for 20 minutes.
10.- Wait two or three minutes for the CO2 to stabilise;
11.- Compare the reading for the value of CO2 with that shown in table 16-8, make sure you read the value for the type of gas being used. The value of CO2 must fall within the values shown, if that is not the case you must turn off the boiler and contact the manufacturer.
12.- Set parameter 20 10 to OFF to return the boiler to normal operation.
13.- Close the combustion analysis hole in figure 16-9, with a suitable stopper “F” as shown in the manufacturer’s instructions for the outlet pipe.

WARNING! Once stopper “F” is in position with the boiler at maximum power, check there are no leaks of exhaust gases.

16.8.2 - Check the CO2 content and make any necessary adjustment on boiler models 100T to 280T

WARNING! If during this procedure a CO value of more than 1000 ppm is detected, turn off the boiler and contact the manufacturer.

1.- The flue system must contain a purpose provided test point for the analysis of combustion products. The test point should be located as close to the appliance as is possible (see Figure 16-9, part “F”).
2.- Turn on the boiler and open the link between terminals “10” and “11”;
3.- Make sure that the temperature demanded is higher than that of the boiler/hot water heater;
4.- Go into the installer menu (see section 17.15 and set parameter 2201 to HIGH. Now the MASTER burner will operate at maximum power for 20 minutes;
5.- Wait two or three minutes for the CO2 to stabilise;
6.- Insert the sensor to read the value of CO2 in point “F” shown in figure 16-9;
7.- Compare the value of CO2 detected with that shown in table 16-8; make sure you read the value for the type of gas being used. If the value of CO2 is not as shown in table 16-8, you must correct it using screw “E” in figure 16-10. Using a 2.5 mm six-sided spanner (turn the screw clockwise to reduce the value of CO2, or anticlockwise to increase it), make small turns, always waiting for the value to stabilise before continuing with further movements, until you reach the desired value.
8.- Once you have reached the correct value of CO2 as in table 16-8, seal the screw with red paint or a similar system to discourage any tampering with it.
9.- Set parameter 2201 to LO. Now the MASTER burner will operate at minimum power for 20 minutes.
10.- Wait two or three minutes for the CO2 to stabilise;
11.- Compare the reading for the value of CO2 with that shown in table 16-8, make sure you read the value for the type of gas being used. The value of CO2 must fall within the values shown, if that is not the case you must turn off the boiler and contact the manufacturer.

WARNING! The CO2 reading at minimum power could be influenced by the chimney draught. This is deduced when the CO2 value is rather low compared to the value at high power. In this event it is necessary to take the CO2 reading by removing the flue gas sensor from the corresponding burner and inserting the analyser sensor into the hole

12.- Set parameter 2201 to OFF;
13.- Work on the remaining burners, repeating the steps from point “3” to point “11”, bearing in mind that parameter 2202 acts on burner 2, 2203 on burner 3 and 2204 on burner 4.
14.- Close the combustion analysis hole in figure 14-2, with a suitable stopper “F” as shown in the manufacturer’s instructions for the outlet pipe.

WARNING! Once stopper “F” is in position with the boiler at maximum power, check there are no leaks of exhaust gases that could cause damage.

16.9 - Check boiler power

The boiler’s air/gas mixture ratio is set at the factory. The gas pressure at the burner is controlled indirectly by the fan. The only way to check the boiler’s power is to act directly on the gas meter. Proceed as follows:

1. Turn on the boiler by moving the general switch (detail “T” in figure 17-1) to ON and launch a heating request by setting the requested temperature to the maximum using key , making sure that the system is capable of dispersing all the heat generated.
2. For models 60T and 70T, set parameter 2010 to HIGH. For the other models set parameter 2200 to HIGH, now the boiler will operate at maximum power for 20 minutes.
3. Measure the gas flow rate at the meter. The value obtained must be compared with the value given in section 19 under the heading “Gas flow rate” with a tolerance of +/- 10%.
4. If the gas flow rate is lower, check:
   a) That there are no obstructions in the air intake and flue gas outlet ducts;
   b) That the lengths of the air intake and flue gas outlet ducts correspond with what is shown in section 19;
   c) That the air intake filter (detail “11” in figures 3-3, 3-5 and 3-7) is clean;
5. If the gas flow rate falls within this margin, set parameter 2200 to OFF. In boiler models 60T and 70T, set parameter 2010 to OFF to return the boiler to normal operation;
6. If the gas flow rate is higher, repeat the process described in section 16.9.

16.10 - Minimum water flow rate

The boiler has a system to protect against low water flow rate. The water flow rate gauge (detail “16” in figure 3-1) constantly measures the flow rate on each heat exchanger. If the flow rate falls below the value of the “Minimum operating water flow rate” described in section 19, the boiler will turn off automatically and, after three minutes, if the flow rate does not go up, the relative error will appear on the display.

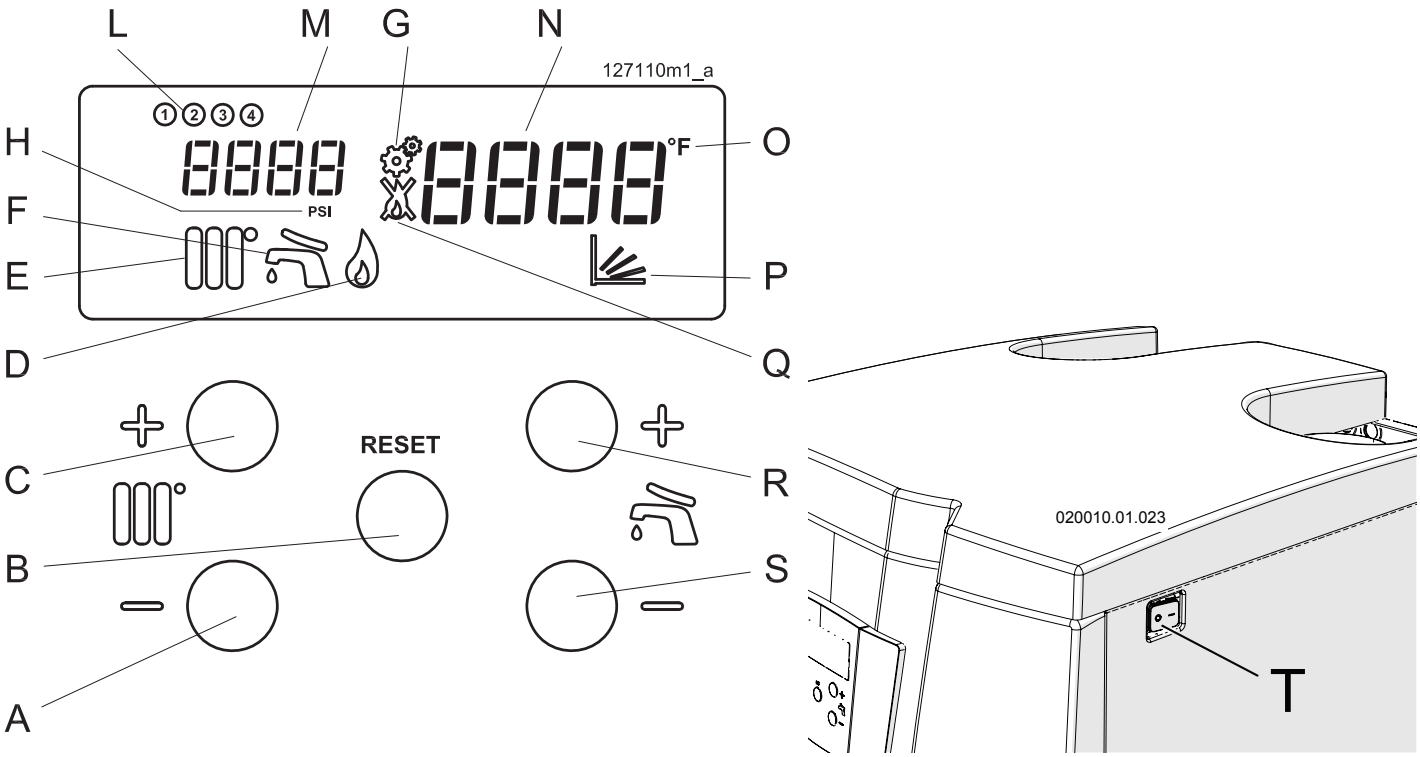


Figure 17-1 – Control board

FIGURE 17-1 KEY

A - Button to reduce water temperature
B - Multifunctional button Reset button and button to enter "user menu" and "installer menu"
C - Button to increase water temperature
D - Burner status
Icon off = burner off
Icon on = burner on
E - Heating or domestic hot water service status:
Icon off = Service off
Icon on = Service active but not in operation
Flashing icon = Service active and in operation
F - Domestic hot water service with puffer status:
Icon off = Service off
Icon on = Service active but not in operation
Flashing icon = Service active and in operation
G - Icon to enter "installer menu"
H - Unit of measurement of pressure displayed
L - Burner unit indicator
① = Burner 1 (master)
② = Burner 2
② = Burner 3
② = Burner 4
M - Water pressure or indicator of different parameters within the different menus
N - Temperature of the central heating or domestic hot water or indicator of the values assumed by the various parameters
O - Unit of measurement of the temperature displayed
P - Central heating service adjusted by the external sensor
R - Key for increasing the temperature of the domestic hot water with puffer and for scrolling through and changing the value of the parameters
R - Key for reducing the temperature of the domestic hot water with puffer and for scrolling through and changing the value of the parameters
T - On/off switch

17.1 - Water pressure check

17.1.1 - MYDENS boiler checking water pressure

If the pressure inside the central heating circuit falls below 0.5 bar, viewer "N" in figure 17-1 shows Err 59 to indicate that it is necessary to restore correct pressure. To do this, proceed as follows:

1.- Open the device provided by the installer upstream of the appliance in order to fill the system;
2.- Check the pressure on display "M" in figure 17-1; it must reach a pressure of 1.5 bar (the Err 59 message must disappear);
3. - Close the filling device provided by the installer upstream from the appliance.

WARNING! During normal operation the device provided by the installer upstream from the appliance for filling the system must always stay in the closed position.
If the pressure drops over time, restore the correct value. This operation may have to be repeated several times in the first month of operation to remove any air bubbles in the system.

17.1.2 - AGUADENS hot water heater checking system pressure

If the pressure in the circuit falls below minimum pressure, the appliance turns off automatically and display "N" in figure 17-1 shows Err 59 (see section 17.16.2) to indicate that the correct pressure must be restored. As the hot water heater is installed in an open circuit, the mains supply pressure must be checked or any pressure reducer installed upstream must be adjusted. When the value is re-established Err 59 disappears from the display.

17.2 - General information

The boiler leaves the factory set with standard parameters. However, it is possible to consult or make a series of modifications to the parameters via the “user menu” (section 17.14) and the “installer menu” (section 17.15). During operation, the display shows the boiler operating status as well as other information as indicated in section 17.16 (Diagnostics).

17.3 - Display

During normal operation further parameters can be consulted via the “User menu” (see section 17.14), useful for understanding how the boiler operates and for checking the last lockouts or errors that occurred.
After 5 minutes of normal operation, the display goes off completely to save energy. Just press any button to turn it back on. In the event of an anomaly, the display comes back on automatically. This function can be modified by following section 17.13 (Energy saving).

17.4 - Ignition and switch-off procedure

To turn on the boiler, do the following:
1.- Open the gas valve;
2.- Power the boiler electrically;

3.- If the display shows Err 65, that indicates that live and neutral polarity has not been observed (call customer support to resolve the problem without trying to take any action yourself).
4.- Adjust the domestic hot water (where present) temperature and the central heating temperature as per sections 17.5, 17.6 and 17.7 respectively.

The command and control equipment will switch the burner on. If the boiler does not ignite with 3 minutes, it will automatically try five times to ignite again. If it still will not ignite, it is locked out and the display will show Loc 1 together with the icon , and the icon for the corresponding burner ① ② ③ ④ will flash. Press the RESET button to restore normal operating conditions. The boiler will automatically attempt to ignite again.

WARNING! If shutdown due to lockout occurs frequently, contact a qualified technician to restore normal operating conditions.
Once the boiler has started up correctly it will continue to operate for the service required.
To turn off the boiler, do the following:
1.- Use switch “T” in figure 17-1 to remove electrical voltage;
2.- turn off the gas valve;

17.5 - AGUADENS hot water heater adjusting the temperature

To adjust the temperature use keys or (see figure 17-1). When the keys are pressed the display, detail “N” in figure 17-1, shows the temperature requested. The temperature of instant domestic hot water can be set to between 20°C and 80°C.

WARNING! A domestic hot water temperature of more than 51°C can cause scalds. Children, the disabled and the elderly are at high risk of scalds. Check the temperature of the water before getting into the bath or shower.

17.6 - MYDENS boiler adjusting the domestic hot water

If the boiler is installed to perform a dual function (central heating and the production of domestic hot water), the domestic hot water temperature can be adjusted using keys and (see figure 17-1). When the keys are pressed the display, detail “N” in figure 17-1, shows the DHW temperature requested. The temperature can be set to between 40°C and 60°C.

WARNING! A domestic hot water temperature of more than 51°C can cause scalds. Children, the disabled and the elderly are at high risk of scalds. Check the temperature of the water before getting into the bath or shower.

17.7 - MYDENS boiler adjusting the central heating

The boiler’s central heating temperature can be adjusted using buttons or (see figure 17-1). The room thermostat turns on the circulation pumps so as to satisfy the requirements for heating.

17.8 - Thermostatic adjustment of central heating

The boiler is factory set with parameter 2003 at 0, i.e. the boiler supplies hot water to the central heating system at a temperature adjusted using the or keys. Any room thermostat enables or disables the central heating function to adjust the temperature in the rooms. To make full use of the boiler efficiency, adjust the central heating temperature to a value that is just sufficient to obtain the desired temperature in the rooms. If the season gets colder, progressively increase the value of the central heating temperature. Proceed in reverse order when the season goes towards warmer temperatures.

17.9 - Climate control

Via the “Installer menu” adjust parameter 2003 to 1. The central heating delivery temperature is related to the outdoor temperature sensor according to the algorithm in figure 17-2. To adapt the calculation line to the various homes/climatic conditions, all adjustment parameters must be set according to the following sections.

17.9.1 - Climate control: setting the parameters

Via the “Installer menu” (see section 17.15), set:

- 2020 = “Heating off outdoor temperature”, adjustable to between 0°C and 35°C. When the outdoor temperature reaches the value set under this parameter, the central heating is switched off automatically. The central heating switches back on automatically when the outdoor temperature drops back to below this value. The recommended start value is 22°C.
- 2021 = the “Projected outdoor temperature (winter)”, adjustable to between -20°C and 5°C. This is the outdoor temperature used to define the heat input required by the system. The recommended start value for a typical home is -5°C;
- 2022 = the “Delivery temperature corresponding to projected outdoor temperature (winter)”, adjustable to between 0°C and 80°C. The delivery temperature assumes the value set under this parameter when the outdoor temperature corresponds to that set under parameter 2021. The recommended start values are: 40°C for low-temperature systems (underfloor heating); 70°C for high-temperature systems (radiators);
- 2023 = “Outside spring temperature”, adjustable to between 0°C and 30°C. This is the outdoor temperature at which the central heating is to reach the minimum supply temperature. The recommended start value is 18°C;
- 2024 = the “Delivery temperature corresponding to projected outdoor spring temperature”, adjustable to between 0°C and 40°C. The delivery temperature assumes the value set under this parameter when the outdoor temperature corresponds to that set under parameter 2023. The recommended start values are: 30°C for low-temperature systems (underfloor heating); 42°C for high-temperature systems (radiators);
- It is also possible to set the minimum and maximum central heating temperatures using the respective parameters 3016 and 3015 in section 20.

If, for any reason, the central heating service does not correspond to the load, use parameters 2022 (Delivery temperature corresponding to outdoor projected temperature (winter)) to increase or lower the temperature calculated and match the desired room temperature.

17.9.2 - Climate control: switching the central heating service on and off

The climate control service is completely automatic, including switch-off at the end of the season and switch-on at the start of the next season via parameter 2020. When the outside temperature rises above the value set under this parameter, the central heating switches off automatically. When the outside temperature drops back below the value set under this parameter, the central heating service switches back on automatically.

17.10 - Time settings for the various functions

To protect the lifespan of the appliance, improve comfort, and increase energy savings, timers have been introduced during operation. These time settings are as follows:

- Pump post-circulation: every time the room thermostat determines the end of the central heating service, the pump continues to operate for 4 minutes;
- Pump anti-block function: every 24 hours, the central 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 it ignites again.

17.11 - Pump anti-blocking

During the summer, the pump switches on once every 24 hours for 15 seconds in order to prevent any deposits from blocking it. The diverter valve and the storage tank pump (if present) are activated at the same time for the same reason.

17.12 - Anti-freeze protection

WARNING!

For the anti-freeze protection to be effective, the appliance must be left with the electrical power supply and gas supply present and the two services (domestic hot water and central heating) in the OFF position.

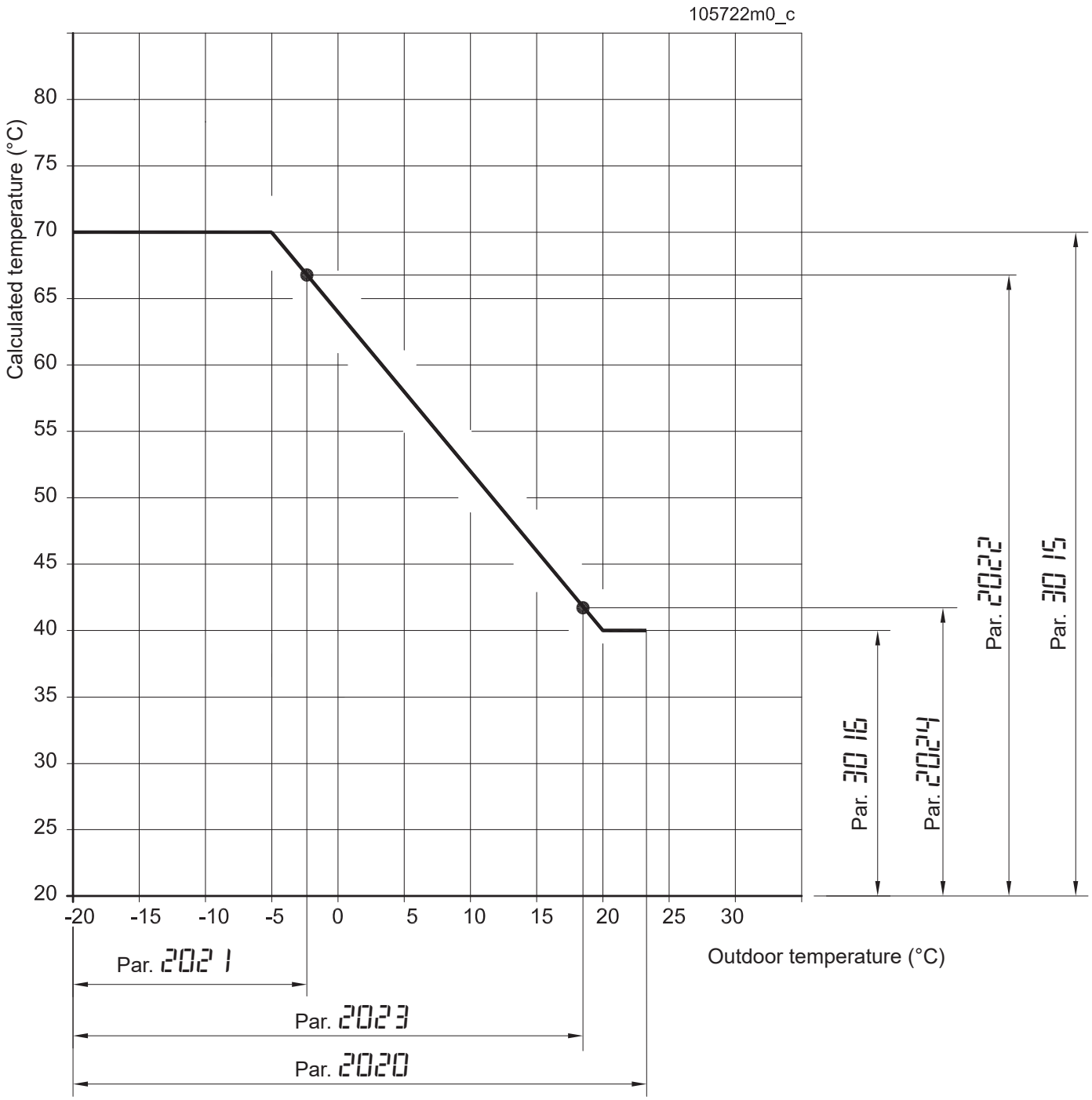
WARNING!

The anti-freeze protection service offered by the boiler cannot guarantee anti-freeze protection of the central heating system, the domestic hot water system or the building itself, or a part of the same.

The central heating pump starts automatically when the boiler temperature reaches 10°C. If the temperature drops further to below 5°C, the burner also ignites to protect the boiler from the effects of freezing.
If the boiler is not used for a long period of time (over a year), empty it following the procedure in section 18.10.

17.13 - Energy Saving

To reduce energy consumption by the display (Figure 17-1), 5 minutes after the last operation carried out it will automatically turn off. This function can be deactivated or the time can be changed using parameter 2100 that is in the “installer menu” (section 17.15). If you set the parameter at 0, the display will remain constantly on.



Par. 2020 = outdoor temperature for heating switch-off

Par. 2021 = projected outdoor temperature (winter)

Par. 2022 = delivery temperature corresponding to projected outdoor temperature (winter)

Par. 2023 = Outdoor spring temperature

Par. 2024 = delivery temperature corresponding to projected outdoor spring temperature

Par. 3016 = Minimum delivery temperature

Par. 3015 = Maximum delivery temperature

Figure 17-2 - Graph of climate control

17.14 - “User menu”

Press the RESET button for 2 seconds to enter the “user menu”. Viewer “M” in figure 17-1 begins to show parameter 1001 to indicate the change of mode to the user.

Using buttons + and − it is possible to scroll through the parameters contained in the menu.
To exit the menu just press the RESET button for 2 seconds again.

If no button is pressed for more than 60 seconds, the menu is exited automatically.
For models from 100T to 280T, all the parameters indicated as “Burner 1” refer to the boiler’s Master Burner, to display these parameters for the other burners, connect the display to the burner in question as shown in section 18.8.
The following parameters can be examined in this menu:

Parameter	Description of parameter	U.M.
1001	Burner 1 - Water output temperature	°C
1002	Puffer tank temperature (if present)	°C
1004	Outdoor temperature (visible when an outdoor 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 - Status of primary circuit pump and motorised valve	ON/OFF
1010	Status of heating circuit pump	ON/OFF
1011	Status of domestic hot water circuit	ON/OFF
1012	Heating setpoint calculated (with external sensor enabled) (only for models 60T and 70T. For other models see Parameter 1107)	°C
1040	Burner 1 - Present rotation speed of fan	revs/min
1041	Burner 1 - Rotation speed of fan at ignition	revs/min
1042	Burner 1 - Rotation speed of fan with minimum power	revs/min
1043	Burner 1 - Rotation speed of fan with maximum power	revs/min
1051	Burner 1 - Last lockout (Loc) recorded (see section 17.16.1) **	/
1052	Burner 1 - Last error (Err) recorded (see section 17.16.2) **	/
1053	Burner 1 - Number of times that the burner flame has gone out	n°
1055	Burner 1 - Number of failed ignitions of burner	n°
1056	Burner 1 - Number of hours worked	h x 10
1057	Burner 1 - Number of hours worked on domestic hot water with puffer tank	h x 10
1059	* Time interval between the last two lockouts (Loc)	1: value in minutes; 2: value in hours; 3: value in days; 4: value in weeks;
1060	* Time interval between the last two errors (Err)	
1062	Burner 1 - Water flow rate	l/min
1101	Multi-burner: Number of burners on	n°
1102	Multi-burner: Manifold temperature	°C
1103	Multi-burner: Number of burners locked out (Loc)	n°
1104	Multi-burner: Number of burners showing Error (Err)	n°
1106	Multi-burner: Boiler in emergency mode	Yes/Not
1107	Multi-burner: Heating setpoint calculated (only mod 100T, 115T, 140T, 210T and 280T) (for other models see Parameter 1012)	°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:
E.g. If it shows 1:29, it means 29 minutes;
E.g. If it shows 2:12, it means 12 hours;
E.g. If it shows 3:15, it means 15 days;
E.g. If it shows 4:26, it means 26 weeks.

** If the number 255 is displayed it means that there has been no lockout or error.

17.15 - “Installer menu”

WARNING! Changing these parameters could cause boiler and therefore system malfunctions. For this reason only a technician with the awareness and in-depth knowledge of the boiler can change them.

The boiler’s command and control board makes available to the technician this menu of parameters, for analysis of operation and adaptation of the boiler to the system.
To go into the “installer menu”, proceed as follows:

1.- hold down the RESET button and — together for 5 seconds until parameter 2001 is displayed. The symbol appears in the centre of the display, to indicate entry into the “installer menu”.
2.- within the menu it is possible to scroll through the parameters using buttons + and —;
3.- once the parameter concerned is displayed you can change it in this way:
   a.- press the RESET button to enter into the parameter (viewer “N” in figure 17-1 will start to flash);
   b.- Edit the value of the parameter using the + and — keys;
   c.- Press the RESET key to confirm the change and go back to the list of parameters;
4.- To exit the “installer menu” hold down the RESET button for 5 seconds until symbol disappears from the display.

If no button is pressed for more than 60 seconds, the menu is exited automatically. Any change to the data that is not confirmed with the RESET button will be lost.
For models from 100T to 280T the parameters indicated as “Burner 1” refer only to Burner 1 (Master). To display or change these parameters for the other burners, connect the display to the burner in question as shown in section 18.8.

WARNING! Any variations made to the parameters must be noted in the “Customised values” column in the following table, in order to facilitate any future replacements of the command and control board.

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

Parameter	Description of parameter	U.M.	Setting range	MYDENS factory value	AGUA-DENS factory value	Cus-tomised values
2001	Central heating minimum power level	%	From 1 to 50	1	1	
2002	Central heating maximum power level	%	From 1 to 100	100	100	
2003	Central heating operating mode	nn	0 = Room Thermostat 1 = External sensor with room thermostat 2 = External sensor room thermostat off reduces 2027 3 = Constant heating room thermostat off reduces 2027 4 = 0-10 Volt input 5 = N/A	00	00	
2004	Waiting time after maximum differential	secs	From 10 to 30	30	30	
2005	Post circulation heating pump	secs	From 10 to 260	240	240	
2010	Burner 1 - Burner forcings	/	Off = No forcing Low = Minimum power Ign = Ignition power High = Maximum power	OFF	OFF	
2011	Forcing of primary circuit pump and 2-way motorised valve (Burner 1)	/	On or Off	OFF	OFF	
2012	Forcing of heating circuit pump	/	On or Off	OFF	OFF	
2013	Forcing of domestic hot water circuit pump	/	On or Off	OFF	OFF	
2014	Test icons on display. Pressing the RESET button turns on all the icons on the display. Pressing the RESET but-ton again returns the display to normal operation	/	/	/	/	
2020	Climate control: outdoor temperature for heating switch-off	°C	From 0 to 35	21	N/A	
2021	Climate control: project outdoor temperature (winter)	°C	From -20 to 5	-4	N/A	
2022	Climate control: delivery temperature corresponding to project outdoor temperature (winter)	°C	From 0 to 80	80	N/A	
2023	Climate control: spring project outdoor temperature	°C	From 0 to 30	21	N/A	
2024	Climate control: delivery temperature corresponding to spring outdoor temperature	°C	From 0 to 40	40	N/A	

2027	Night-time 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	secs	From 10 to 900	180	180	
2043	Burner 1 - Protection against frequent ignitions: temperature differential	°C	From 0 to 20	16	5	
2062	Post circulation domestic hot water pump	secs	From 10 to 255	240	240	
2063	Maximum time priority DHW	min	From 1 to 60	30	N/A	/
2067	Priority production of DHW	/	0 = Priority lasts the time set at parameter 2063; 1 = OFF, the domestic hot water does not have priority over central heating; 2 = ON, the domestic hot water always has priority over central heating;	2	N/A	
2100	Energy saving display	min	From 0 to 30 = delay in switching 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	secs	from 1 to 900	15	15	
2104	Multi-burner: switch-off delay	secs	from 1 to 900	15	15	
2105	Multi-burner: delta temp. burner ignition	°C	from 0 to 20	5	5	
2106	Multi-burner: delta temp. burner switch-off	°C	from 0 to 20	5	5	
2107	Multi-burner: maximum increase in temp. compared to that calculated	°C	from 0 to 20	10	4	
2108	Multi-burner: maximum reduction in temp. compared to that calculated	°C	from 0 to 20	20	4	
2109	Multi-burner: Next burner ignition	%	from 1 to 100	70	70	
2110	Multi-burner: Next burner switch-off	%	from 1 to 100	10	10	
2111	Multi-burner: Burner rotation	gg	from 0 to 9	6	6	
2113	Multi-burner: Modulation start-up delay	min	from 0 to 60	0	0	
2114	Burner 1: Primary circuit pump switch-off time	secs	from 0 to 255	240	240	
2200	Forcing: All 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

17.16 - Diagnostics

During normal operation of the boiler, viewer “N” in figure 17-1 continuously shows the boiler’s work status, by means of the following indications:

Parameter	Description of parameter	Display on screen “N” in Figure 17-1
AFra	Anti-frost function on	Boiler temperature (°C)
	DHW with puffer operation status	Temperature of DHW (°C)
	Operation status of central heating or instant DHW	Output temperature (°C)

17.16.1 - Diagnostics: lockouts “Loc”

Lockout	Lockout description	Checks	Solutions
Loc 1	No detection of flame after five successive attempts to ignite.	A - Gas supply pressure (see section 16.7); B - Sparks on ignition electrodes (see section 18.5); C - Correct gas pressure and CO2 value (see sections 16.7 and 16.8); D - Electric power supply of 230 Vac to gas valve; E - Electrical resistance of the two coils of the gas valve of 0.88 Kohm and 6.59 Kohm F - If the burner comes on and goes off at the end of the ignition attempt, check: that the ionisation current is at a value of more than 4 (follow the procedure in section 18.12)	A - If the pressure is not correct it must be reset working upstream of the boiler; B - Check and correct the electrodes position (section 18.5); C - Get rid of any blockage in the air intake and flue gas outlet ducts; D - If the power supplied to the gas valve is not at 230 Vac replace the control board; E - If the resistance does not correspond, replace the gas valve; F - If the ionisation current does not correspond, check the CO2 as shown in section 16.8. Check the good order of the detection electrode and if necessary replace it and check the good order of the cable connecting the detection electrode and if necessary replace it.
Loc 2 (*)	Gas valve not supplied during ignition attempts	A - Check intervention of delivery safety thermostat; B - Check intervention of exhaust gases safety fuse;	⚠**WARNING! If the exhaust gases temperature safety fuse intervenes, before replacing it, contact the boiler manufacturer in order to avoid serious damage to the heat exchanger.**
Loc 3	Gas valve loses electric power supply during operation	Check the good order of the electrical connections between gas valve and control board;	A - If the electrical connections are interrupted, reset them; B - If the connections are in good order try to replace the gas valve or the control board;
Loc 4	Gas valve relay doesn’t close	Check the good order of the electrical connections between gas valve and control board;	A - If the electrical connections are interrupted, reset them; B - If the connections are in good order try to replace the gas valve or the control board;
Loc 5 (*)	Gas valve circuit	A - Check intervention of delivery safety thermostat; B - Check intervention of exhaust gases safety fuse;	⚠**WARNING! If the exhaust gases temperature safety fuse intervenes, before replacing it, contact the boiler manufacturer in order to avoid serious damage to the heat 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	Error of lockout for over 20 hours	Press the RESET button to see the type of error (Err) and then proceed;	
Loc 12	Fan error	A- Check power supply to fan 230 Vac; B - Check the PWM connection to the fan;	A - If the power supply is not correct, replace the control board; B - If there is no PWM fan dialogue, replace the control board; C - Try to replace the fan;
Loc 13	Software error inside control board		Replace the command and control board.
Loc 14	Software error inside control board		Replace the command and control board.
Loc 15	Software error inside control board		Replace the command and control board.
Loc 16	Software error inside control board		Replace the command and control board.
Loc 17	Software error inside control board		Replace the command and control board.
Loc 18	Software error inside control board		Replace the command and control board.
Loc 19	Software error inside control board		Replace the command and control board.

Loc 20	Flame lost three times	Check: that the ionisation current is at a value of more than 4 (follow the procedure in section 18.12) Check that the flue gas exhaust is properly protected against obstructions caused by gusts of wind	If the ionisation current is not over 4, check the CO2 (see section 16.8) and restore it to the correct value. Check the ionisation spark plug and replace it if necessary. Check the integrity of the ionisation current electric circuit cables. If the flue gas outlet is positioned on a vertical wall it must be protected by an anti-wind grill; if the flue gas outlet is positioned on the roof, check that it isn't in a area where there is flowback, and that any anti-wind chimney that may be provided is really effective.
Loc 21	Software error inside control board		Replace the command and control board.
Loc 22	Software error inside control board		Replace the command and control board.
Loc 23	Software error inside control board		Replace the command and control board.
Loc 24	Software error inside control board		Replace the command and control board.
Loc 25 (*)	Gas valve circuit	A - Check intervention of central heating delivery safety thermostat; B - Check intervention of exhaust gases temperature safety fuse;	⚠**WARNING! If the exhaust gases temperature safety fuse intervenes, before replacing it, contact the boiler manufacturer in order to avoid serious damage to the heat exchanger.**
Loc 26	Software error inside control board		Replace the command and control board.
Loc 27	Flame present with gas valve closed		Replace the gas valve
Loc 28	Flame present with gas valve closed		Replace the gas valve
Loc 29 (*)	Flue gas outlet pressure switch circuit or external safety devices	A - Check the connection to the external safety device; B - Check intervention of exhaust gases differential pressure switch; C - Check for any possible blockage of flue gas outlet;	A - Check external safety devices connected to terminals 103 and 104. B - Check the pressure switch against the flue gas outlet blockage and if necessary replace it. C - Get rid of any possible blockages of flue gas outlet.
Loc 30	Software error inside control board		Replace the command and control board.
Loc 31	Flame lost three times	A - Check detection electrode; B - Check that the flue gas outlet is suitably protected from blockages caused by gusts of wind. C - Check for any possible recirculation of exhaust gases	A - Try to replace detection electrode. B - Check and if necessary get rid of any blockage in the air intake and exhaust gases outlet ducts. C - Look for the cause of the exhaust gases recirculation
Loc 32	Software error inside control board		Replace the command and control board.
Loc 33	Software error inside control board		Replace the command and control board.
Loc 34	Software error inside control board		Replace the command and control board.
Loc 35	Software error inside control board		Replace the command and control board.
Loc 36	Software error inside control board		Replace the command and control board.
Loc 37	Software error inside control board		Replace the command and control board.
Loc 38	The flue gas sensor does not increase in temperature when the burner ignites	a - Check that the flue gas sensor meets the requirement of section 18.14. b - Check that the flue gas sensor (parameter 1006) increases in temperature when the burner ignites.	a - If the flue gas sensor does not meet the requirements of section 18.14, it must be replaced. b - If the temperature does not increase, replace the exhaust gas temperature sensor or the command and control board.

(*) = This error locks out all the burners

17.16.2 - Diagnostics: errors “Err”

Error	Error description	Checks	Solutions
Err 0	A sensor is outside the field of measurement	Check that all the temperature sensors are in a plausible field of measurement	Replace the sensor that is not in the correct temperature field or replace the main board
Err 45	Software error inside control board		Replace the command and control board.
Err 46	Software error inside control board		Replace the command and control board.
Err 47	Software error inside control board		Replace the command and control board.
Err 48	Software error inside control board		Replace the command and control board.
Err 49	Software error inside control board		Replace the command and control board.
Err 50	Software error inside control board		Replace the command and control board.
Err 51	Software error inside control board		Replace the command and control board.
Err 52	Software error inside control board		Replace the command and control board.
Err 53	Software error inside control board		Replace the command and control board.
Err 54	Flame heard at a time when it shouldn’t be there		Replace the command and control board.
Err 55	Low water pressure error	Check the status of the pressure gauge	Replace the pressure gauge.
Err 56	Low water pressure error	Check the status of the pressure gauge	Replace the pressure gauge.
Err 57	Low water pressure error	Check the status of the pressure gauge	Replace the pressure gauge.
Err 58	Low water pressure error	Check the status of the pressure gauge	Replace the pressure gauge.
Err 59 (*)	Low water pressure error	Check the system’s pressure and if necessary increase it.	If the pressure detected is higher than that in parameter 3022, replace the pressure gauge.
Err 60	Exhaust gases high temperature error	A - Check the combustion efficiency of the burner the error is flagged up against, efficiency must be above that required by regulations. B - Check that the exhaust gases temperature sensor’s resistance matches the graph in section 18.14.	A - If the efficiency is lower than that required by regulations, try to clean the exhaust gases side and water side of the heat exchanger. B - If the sensor doesn’t match it must be replaced.
Err 61	Return temperature higher than delivery temperature	Check that the electrical resistance of the return sensor matches the graph in section 18.14.	If the sensor does not match, it must be replaced.
Err 62 (*)	Error in condensate level sensor	A - Check that the condensate outlet duct is not blocked; B - Check the status of the condensate neutraliser;	A - Clear the condensate outlet duct of any blockages; B - Replace the product contained in the condensate neutraliser;
Err 64	Error in frequency signal or error in WD communication	A - Check the frequency of the signal. It must be between 48 and 52 Hz. B - Check the earthing and that neutral is at 0 volt	A - If the frequency doesn’t fall between the values, ask the electricity supplier. Otherwise, try to replace the control board. B - If the neutral isn’t at zero, the correct electric power supply must be restored. If the neutral is at 0 Volt, try to replace the control board.
Err 65	Inverted polarity between live and neutral.	Check the correct polarity between live and neutral.	Invert the polarity between live and neutral.
Err 66	Frequency signal error	A - Check the frequency of the signal. It must be between 48 and 52 Hz. B - Check the earthing and that neutral is at 0 volt	A - If the frequency doesn’t fall between the values, ask the electricity supplier. Otherwise, try to replace the control board. B - If the neutral isn’t at zero, the correct electric power supply must be restored. If the neutral is at 0 Volt, try to replace the control board.

Err 67	Earthing error	Check the boiler is correctly earthed.	Restore the correct earthing to the boiler.
Err 68	Communication watch-dog error		Replace the command and control board.
Err 72	Delivery sensor open Exchanger malfunction	Check that the electrical resistance of the sensor matches the graph in section 18.14. Check that the primary heat exchanger temperature fuse has not intervened.	If the sensor does not match, it must be replaced. If the primary heat exchanger temperature fuse has intervened (the contact is open), the exchanger must be replaced
Err 73	Return sensor open	Check that the electrical resistance of the sensor matches the graph in section 18.14.	If the sensor does not match, it must be replaced.
Err 76	DHW sensor open	Check that the electrical resistance of the sensor matches the graph in section 18.14.	If the sensor does not match, it must be replaced.
Err 80	Delivery sensor short circuit	Check that the electrical resistance of the sensor matches the graph in section 18.14.	If the sensor does not match, it must be replaced.
Err 81	Return sensor short circuit	Check that the electrical resistance of the sensor matches the graph in section 18.14.	If the sensor does not match, it must be replaced.
Err 84	DHW sensor short circuit	Check that the electrical resistance of the sensor matches the graph in section 18.14.	If the sensor does not match, it must be replaced.
Err 86	Flue gases sensor short circuit	Check that the electrical resistance of the sensor matches the graph in section 18.14.	If the sensor does not match, it must be replaced.
Err 87	RESET button error	RESET button pressed too many times in 60 seconds	
Err 93	Boiler selection error	Check list of parameters 3000 (section 20)	
Err 107	Software error inside control board		Replace the command and control board.
Err 108	Software error inside control board		Replace the command and control board.
Err 109	Error at burners 2, 3 or 4	When burner 1 (MASTER) goes into general lockout, it turns off burners 2, 3 and 4, triggering error 109	Resolve error at burner 1 (Master).
Err 110	Flapper valve not open error		A - Check and if necessary get rid of any blockage in the air intake and flue gas outlet ducts; B - Check the flapper valve (detail 31 figure 3-2)
Err 111	Flapper valve not closed error		Check the flapper valve (detail 31 figure 3-2)
Err 112	Error relating to flapper inlet	Check that parameter 3005 is set at 0 or 4	If parameter 3005 is 0 or 4, replace the command and control board.
Err 113	Software error inside control board		Replace the command and control board.
Err 114	Water flow rate too low	Check the flow rate at the burner (parameter 1062), it must be greater than parameter 3035.	A - Increase the water flow rate at the system; B - Check and if necessary get rid of any blockage in the system.
Err 115	Master board error		Reset using parameter 3013.
Err 116 (*)	Communication error	A - BUS communication interrupted B - A burner is deprived of electric power supply	A - Check the BUS connection. B - Reset the electric power supply to all the burn-ers
NO CONN	Microprocessor lockout	A - Check that the wires of the pressure gauge haven't short-circuited B - Check that the wires of the flow rate gauge haven't short-circuited C - Check that the display is connected to the MASTER	A - If it hasn't short-circuited replace the pressure gauge (or disconnect it using menu 3000). B - If it hasn't short-circuited replace the flow rate gauge (or disconnect it using menu 3000). C - If the display is not connected to the MASTER the words "NO-CONN" appear D - If none of the above cases apply, replace the control board and/or the display.

(*) = This error locks out all the burners

18.1 - General recommendations

This section must be brought to the user's attention by the installer, highlighting the tasks required to maintain correct operation of the system;
The installer must also inform the user that lack of care and maintenance of this boiler could cause malfunctions.

A regular annual maintenance check on the system is advised for the following reasons:
- to maintain high efficiency of the boiler and therefore save fuel;
- to maintain a high level of safety;
- to maintain the high level of combustion environmental compatibility;

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

WARNING! Before any maintenance work, disconnect the appliance from the electrical power supply, using the relevant switch nearby.

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

The operations to be carried out at each maintenance check are shown in the box below.

MAINTENANCE PROTOCOL

- Check there are no gas leaks
(See section 18.1.1);
- Check good order of air intake and flue gas outlet system (Follow section 18.1.2);
- Check the correct pressure of the water in the system
(See section 18.1.3);
- Check the ignition and detection electrodes
(See section 18.1.4);
- Cleaning the burner and the primary heat exchanger, flue gas side and checking good order of heat insulation devices
(Follow section 18.4)
- Clean air intake filter
(Follow section 18.6)
- Clean condensate outlet system
(Follow section 18.7).
- Check the appliance efficiency
(See section 18.13);

18.1.1 - Gas leak check

1. - Check for no gas leaks in the system;
2. - Check for any gas leaks using a gas leak detector (with bubble or similar), or equivalent system, carefully checking the whole gas pipe from the meter to the boiler.

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

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

1. - Check whether the air intake and flue gas outlet ducts have any blockages, signs of corrosion, physical damage, water marks or signs of rust.
2. - Make sure the externally assembled intake grids and flue exhaust outlets do not have any residue and are clean.

18.1.3 - Checking the system water pressure

1. - Check that the system is full of water and pressurised as reported in section 19 "Technical data".
2. - Check for leaks in the hydraulic connections.

WARNING! Remove any leaks from the system or the appliance. Continuously adding new water leads to increased minerals that reduce the cross-section of the passage, decreasing heat exchange and causing the heat exchangers to overheat. All of this leads to failures and reduces the appliance life.

18.1.4 - Checking the ignition and detection electrodes

1. - Remove the burner fan unit (as shown in section 18.3).
2. - Clean any material build-up from the electrodes.
3. - Make sure the electrodes are in the correct position as shown in section 18.5.

18.2 - Dismantling of cover and access to internal components

WARNING! If there is an external cover, take it off as shown in section 15

To dismantle the cover, proceed as follows (refer to Figure 18-1):

1.- Lift lid “A”;
2.- Undo screws “B”;
3.- Remove the front casing “C”;
4.- Remove the lower casing “E”;
5.- Open panel “D” by undoing the fixing screw located on the left and turning it as in the figure.
6.- Undo screw “G”;
7.- Lift lid “F”;

18.3 - Dismantling the burner fan assembly

To dismantle the burner fan assembly, proceed as follows:
1 - turn off the gas adduction valve and the electric power supply;
2.- access the boiler’s internal parts by following the procedure described in section 18.2;
3.- dismantle the sparks generator “A” in Figure 18-2 by undoing screws “D” in Figure 18-2 and disconnecting it from the ignition spark plugs.
4.- dismantle air manifold “A” in Figure 18-3 by turning it clockwise and then taking it out leftwards;
5.- undo junction “H” in figure 18-4, paying attention to the gasket in the joint;
6.- with the help of a flat-head screwdriver, remove spring “A” in Figure 18-4;
7.- remove the electric plug from the gas valve;
8.- remove the gas valve by lifting it upwards, taking care with O-ring “L” (see figure 18-4);
9.- Undo the four nuts “B” in Figure 18-5;
10.- take out the fan/burner assembly (detail “C” in Figure 18-5).

Reassembly of fan/burner assembly

To reassemble the burner/fan assembly work backwards through the steps to dismantle it and bear in mind the following precautions:
a - replace gasket “M” in Figure 18-4 taking care to clean the housing of this gasket thoroughly, as well as the bracket housing.
b - check the status of the gasket on junction “H” and of O-ring “L” in Figure 18-4. If they are spoilt, replace them.
c - Once everything is put back together, turn on the gas supply and carry out a seal test on junction “H” in Figure 18-4.

WARNING! Test the gas seal using a leak detection fluid. The use of naked flames is prohibited.

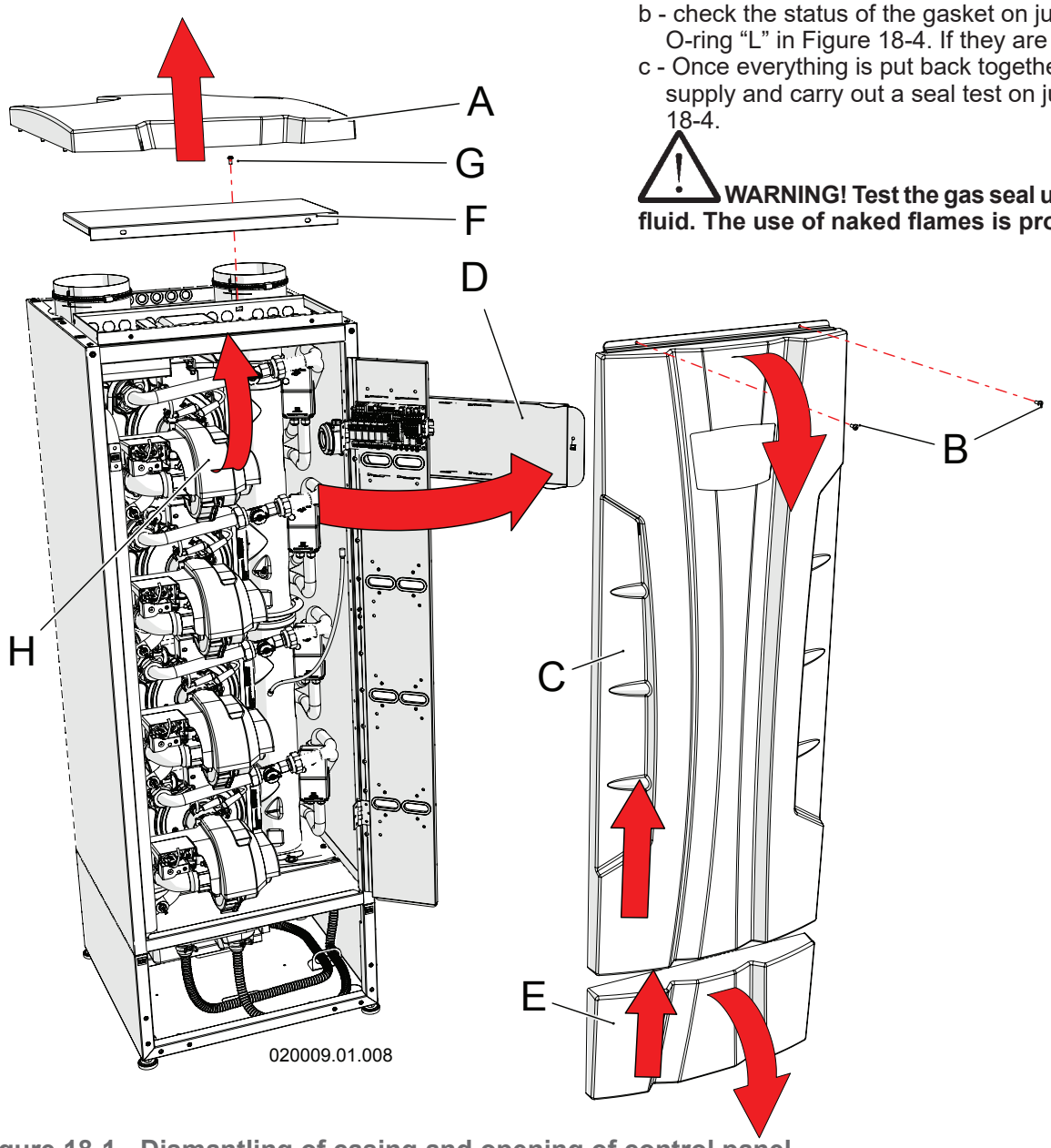


Figure 18-1 - Dismantling of casing and opening of control panel

18.4 - Cleaning the burner and the primary heat exchanger, flue gas side

For correct cleaning of the burner and the heat exchanger body (flue gas side), proceed as follows (refer to Figure 18-5 unless otherwise advised):

1.- access the boiler's internal parts by following the procedure described in section 18.2;
2.- dismantle the burner fan assembly by following section 18.3;
4.- Pass a cylindrical brush with nylon bristles into the combustion chamber "H"

WARNING! DO NOT use a metal brush. Only use a brush with bristles made of nylon or a similar material.

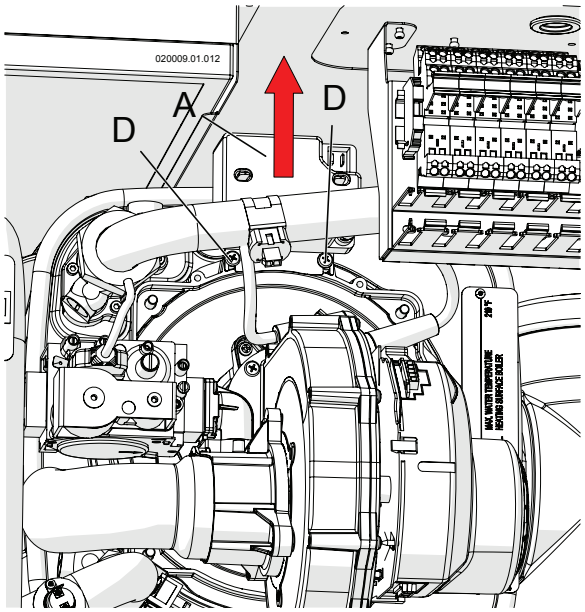


Figure 18-2 - Dismantling sparks generator

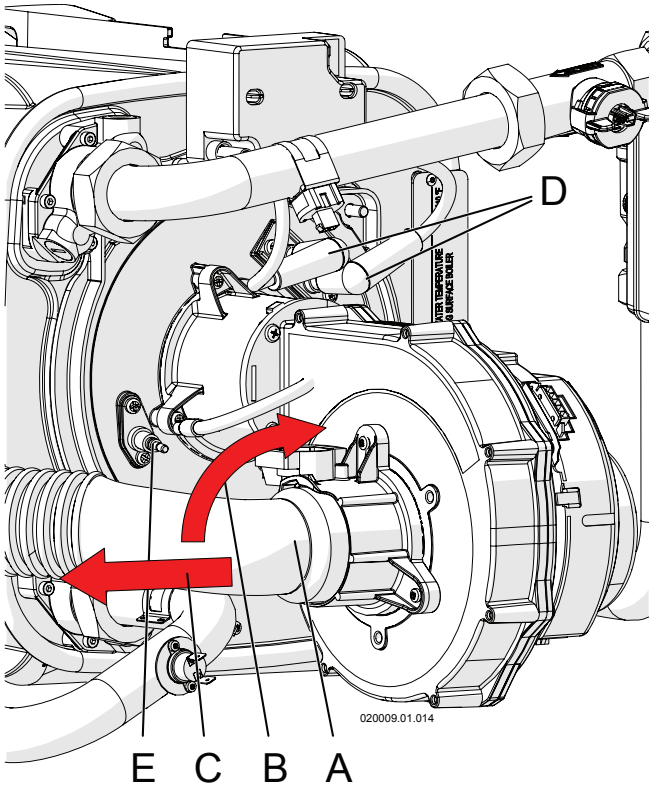
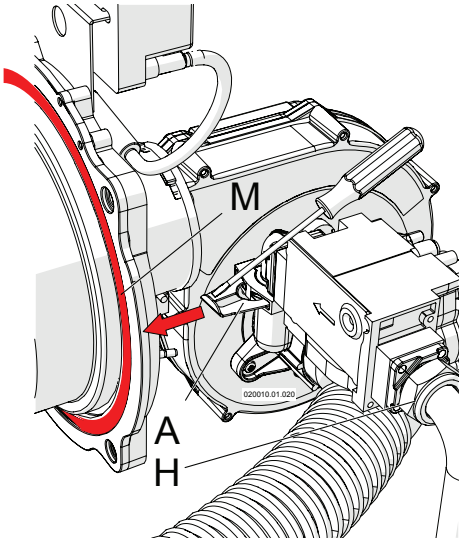


Figure 18-3 – Removing the air manifold

5.- using an extractor, suck up the unburnt residue found inside the combustion chamber "H";
6.- with the same extractor, clean the surface of the burner and around the electrodes;
7.- reassemble the parts in reverse order;
8.- turn on the gas valve;
9.- restore the electric power supply.
10.- check that there are no gas leaks between the joints that were removed;

WARNING! Test the gas seal using a leak detection fluid. The use of naked flames is prohibited.

WARNING! Whenever the burner or primary heat exchanger is cleaned the good order of the heat insulation devices "R" and "S" must be checked (see figure 18-5). If necessary, replace them together with gasket "T" in the burner (see figure 18-5).



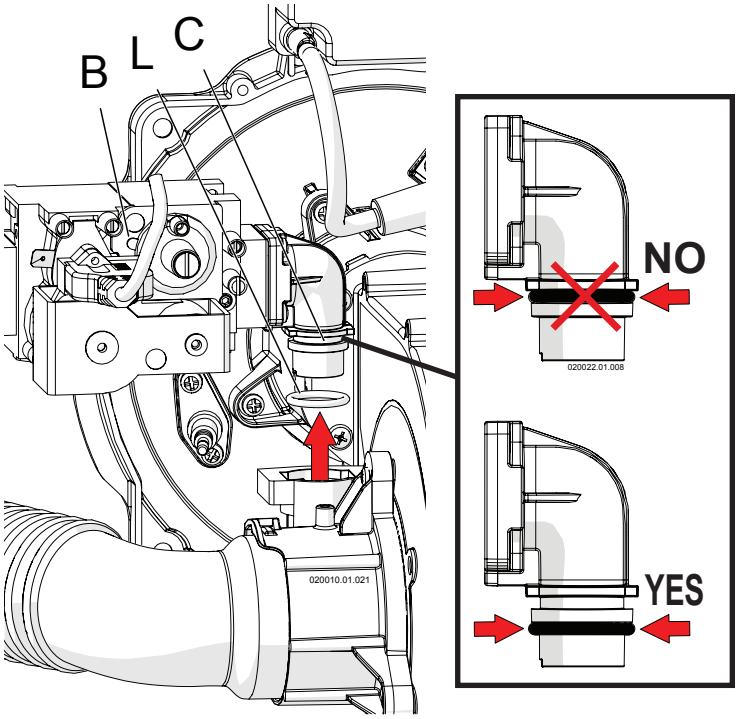


Figure 18-4 – Removing the gas valve

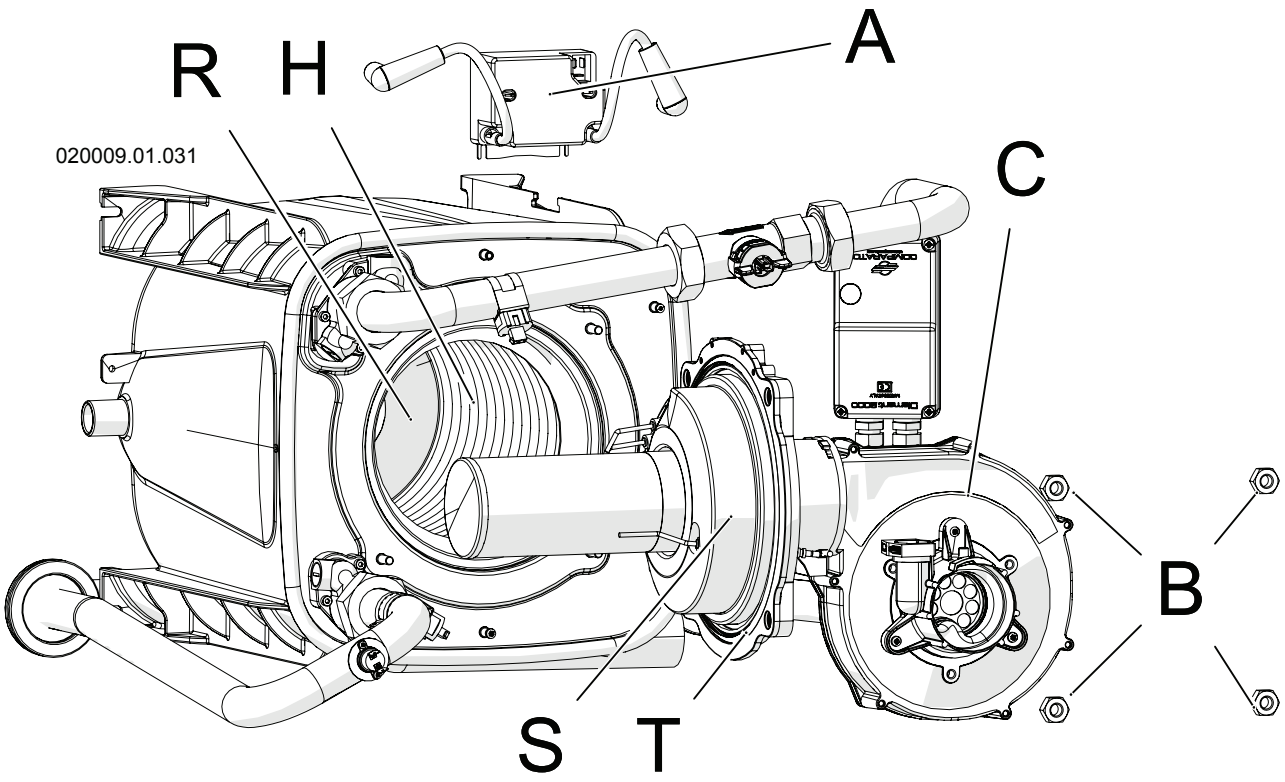
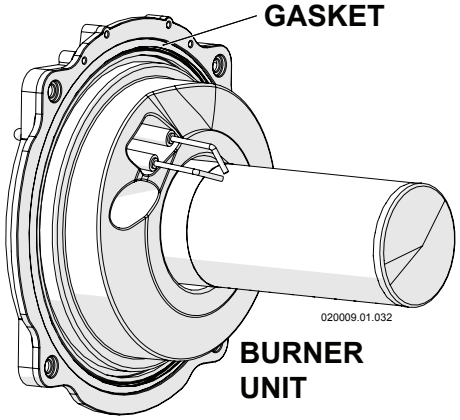


Figure 18-5 - Dismantling fan burner assembly



WARNING! The gasket ensures the combustion chamber is sealed. If the gasket is damaged DO NOT reuse it, it must be replaced along with the burner unit. Consult the manufacturer for information on replacing it.

18.4.1 - Heat insulation devices

The heat insulation devices must be checked once a year and replaced if broken or damaged. See figure 18-6 in which the heat insulation devices (details “C” and “E”) are shown disassembled from the heat exchanger and burner.
To replace them, refer the to instructions provided with the spare part.

A = Fixing screw
B = Washer
C = Heat insulation device
E = Heat insulation device
E = White heat insulation device
G = Burner
H = Gasket
L = Ignition electrodes
M = Screws
N = Detection electrode
Q = White heat insulation device
R = Gasket
S = Gasket

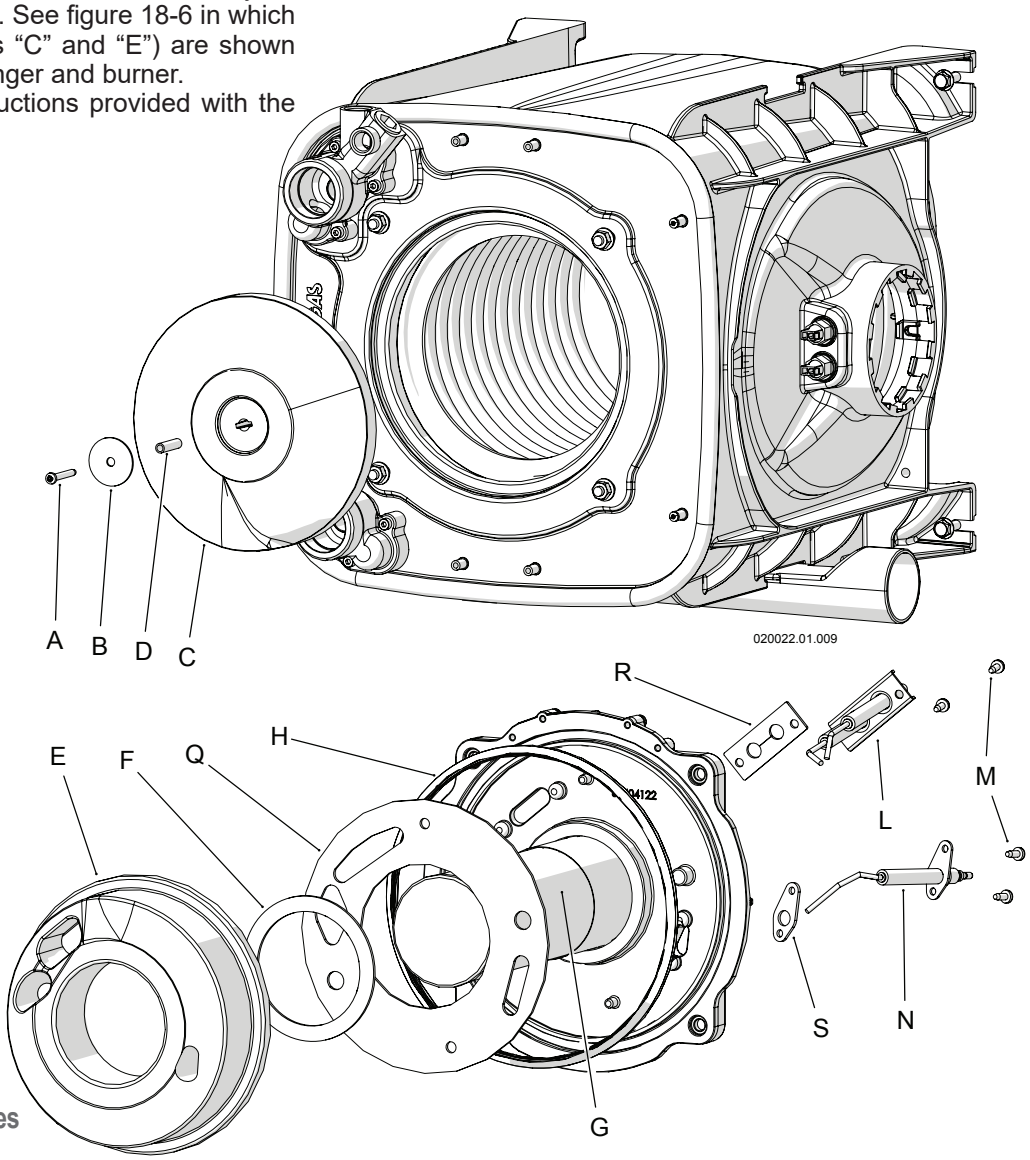
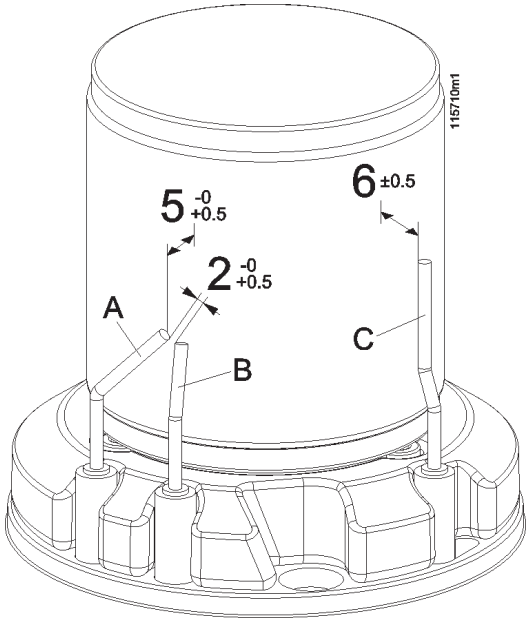


Figure 18-6 - Heat insulation devices



A = Left-hand ignition electrode
B = Right-hand ignition electrode
C = Detection electrode

Figure 18-7 - Position of electrodes on the burner

18.5 - Correct positioning of ignition and ionisation electrodes

For the appliance to work well, the electrodes must be positioned correctly (refer to figure 18-7):
- the distance between ignition electrodes “A” and “B” must be between 2.0 and 2.5 mm;
- the distance of ignition electrodes “A” and “B” from the surface of the burner must be between 5 and 5.5 mm;
- the distance of ionisation electrode “C” from the surface of the burner must be between 5.5 and 6.5 mm.

For accurate location of the electrodes it is good to use sliding callipers to respect the tolerances given in Figure 18-7.

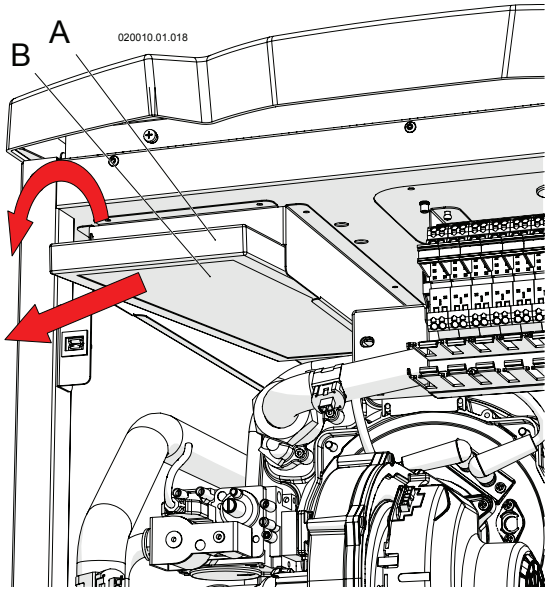


Figure 18-8 - Dismantling air intake filter

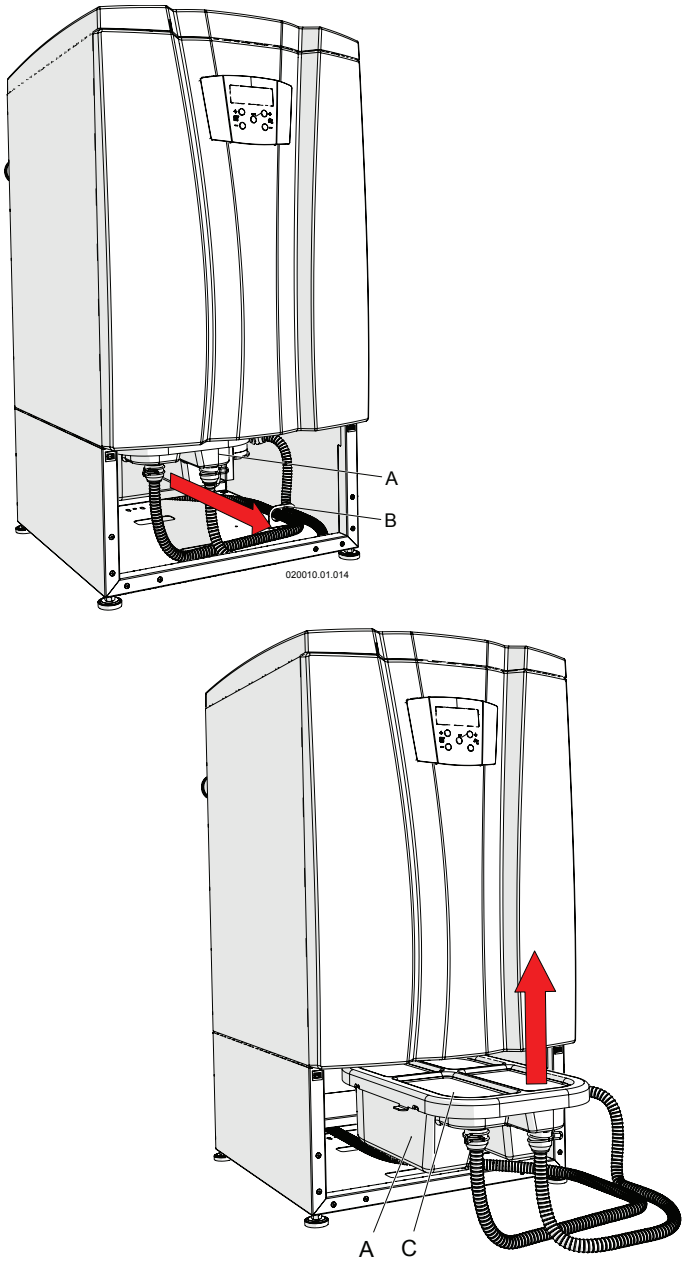


Figure 18-9 - Dismantling and opening condensate neutraliser box

18.6 - Cleaning of air intake filter

The air filter must be cleaned in order for the boiler to work correctly. Refer to figure 18-8 and proceed as follows:

1. - access the boiler's internal parts by following the procedure described in section 18.2;
2. - pull out filter detail "A" as shown in the figure;
3.- clean the filter with compressed air until its surface is clean again;
4.- reassemble the filter and the boiler's casing.

18.7 - Maintenance and cleaning of condensate outlet system

During boiler maintenance the condensate outlet pipe (detail "5" in figures 3-3, 3-5 and 3-7) is taken apart and cleaned of any residues. Refit the cleaned pipe and **restore the level of liquid in the siphon as shown in section 16.1.2.**

Check the level of pH every three months for the first year. Special litmus papers or a special electronic instrument that gives a more precise reading can be used to carry out the test (access the box via stopper "E" in figure 12-1). The frequency of these checks can then be reduced to every six months or year depending on how they are controlled by the local regulations in force. The neutralising contents of the box must be replaced when the level of pH falls below the level required by the regulations in force. The permitted acidity level goes from pH 5.5 to 9.5.

To replace the neutralising agent, do the following:

1. Follow the steps of section 18.2 to take off cover "E" in figure 18-1;
2. Remove box "A" (Figure 18-9);

WARNING! When the box is taken out, be careful to hold it at an angle so as to prevent any leaks of liquid that might cause damage.

3. Open cover "C" (Figure 18-9) upwards;
4. Check the good order of the box;
5. Check the good order of the neutralising material and if necessary add some or replace it;
6. Fill with fresh water until the water begins to flow out of the outlet;
7. Replace the box in the correct position;

WARNING! The neutralisation box is filled with water to prevent exhaust gas from escaping while the unit is in operation.

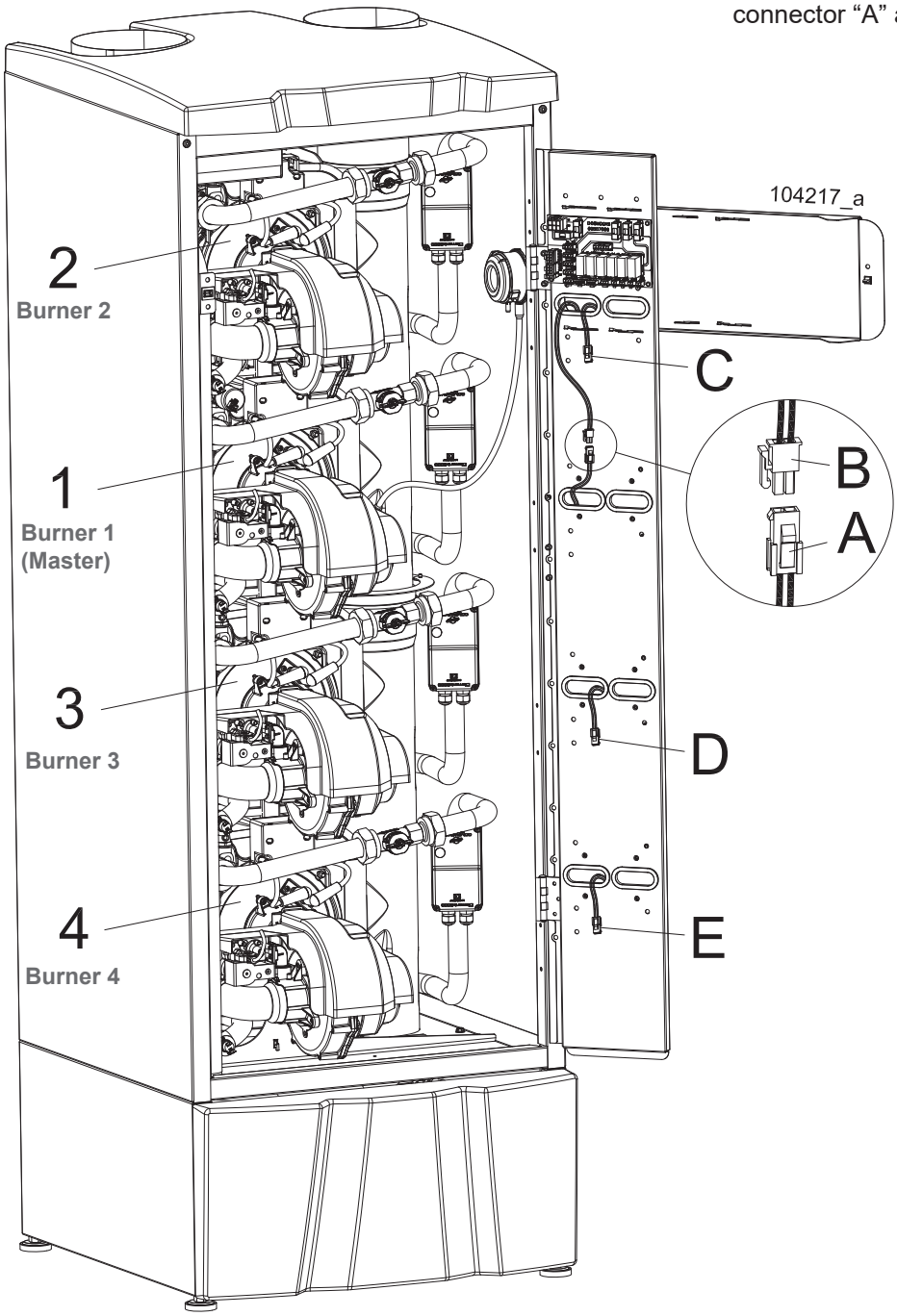
8. Turn on the gas supply;
9. Restore the boiler's electric power supply;

WARNING! Carefully follow figure 18-9 to replace the box "A" in the correct position. After the maintenance described above, restore the level of liquid in the siphon as shown in section 16.1.2.

18.8 - Connection of Display to other burners

In boilers from 100T to 280T, which are multi-burner, the display shown in figure 17-1, is always directly connected to “Burner 1 (Master)”. All the parameters that can be consulted on the display (sections 17.14, 17.15 and 20), that refer to Burner 1 (Master) exclusively concern that burner. If you want to see/change the same parameters for the other burners, you must move the connection of the display from “Burner 1 (Master)” to the burner to be displayed/changed; proceed as follows: (refer to Figure 18-10):

1. Disconnect the electric power supply from the boiler;
2. Follow the steps of section 18.2 to access the internal 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 want to examine or change, considering this: 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 one to be checked, restore voltage to the boiler and turn it on;
6. Now the display shows all the information relating to the burner connected. Make any consultation or change following the steps in sections 17.14, 17.15 and 20.
7. Once the check is completed, reconnect connector “B” to connector “A” as it was before.



A = Connector for dialogue Burner 1 (Master)
B = Connector from display
C = Connector for dialogue Burner 2
D = Connector for dialogue Burner 3 (Only in models 180T, 210T and 280T)
E = Connector for dialogue Burner 4 (Only in model 280T)

Figure 18-10 Connection of display in other burners

18.9 - How to move a control board

Boiler models from 100T to 280T are set up to be managed by a control board (Burner 1 Master). All the devices are connected to this board: room thermostat, external sensor, pump commands, external safety devices, and all internal safety devices: condensate level sensor, exhaust gases differential pressure switch, etc.

If the Burner 1 control board has an error, the boiler stops working. If the technician does not have the parts to replace the board, he can temporarily replace it with the board from one of the other burners present on the boiler, in order to restart it. To do this, proceed as follows:

(refer to Figure 18-10 unless advised otherwise)

1. Turn off the general switch and disconnect the electric power supply;
2. Follow the steps of section 18.2 to access the internal components;
3. Disconnect connector “B” (the connector that comes from the display) from connector “A” (the connector that comes from “Burner 1 (Master)”);
4. Disconnect all the other connectors from Burner 1 (Master)’s control board;
5. Remove the control board of Burner 1 (Master) from the boiler;
6. Follow points 3 to 5 to remove the control board from the burner located lowest down;
7. Fit the board in place of that of Burner 1 (Master);
8. Restore all the connections to the new Burner 1 (Master) board;
9. Move selector switch “S4” as shown in figure 18-11, from the OFF position to the new ON position;
10. Take great care with the connectors of the board that’s been removed. They must be isolated to avoid short circuits and damage;
11. Isolate each of these connections electrically;
12. Replace the boiler casing;
13. Reconnect the electric power supply and turn on the boiler’s general switch;
14. Access the forced menu, follow the steps of section 20 and set all the parameters as shown in the “Burner 1 (Master)” column. Parameter 3050 must be reduced by one unit compared to the previous status, because the boiler now has one Slave Burner fewer.
15. Interrupt the electric power supply;
16. Reconnect the boiler’s electric power supply. Now Burner 1’s new control board is controlling the boiler.

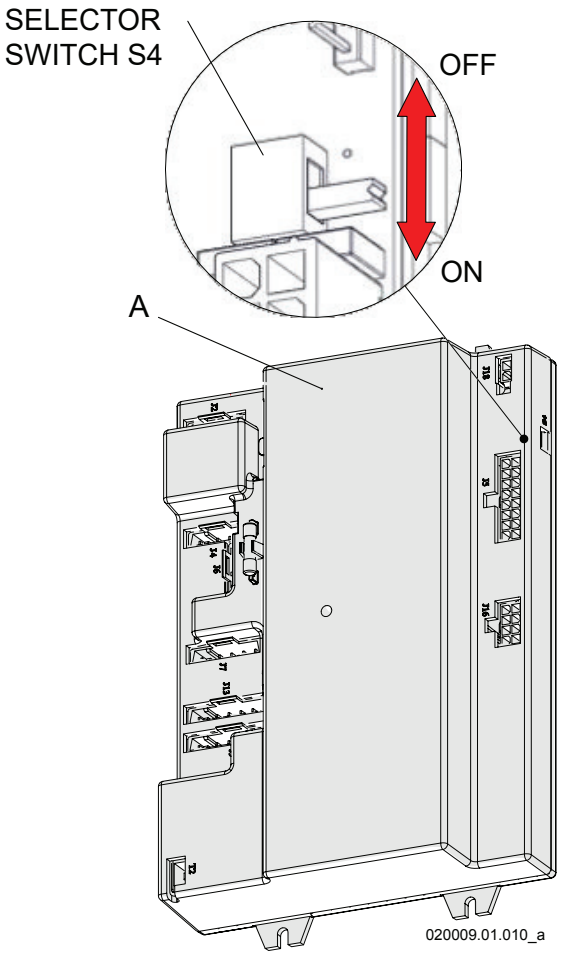


Figure 18-11 - Command board

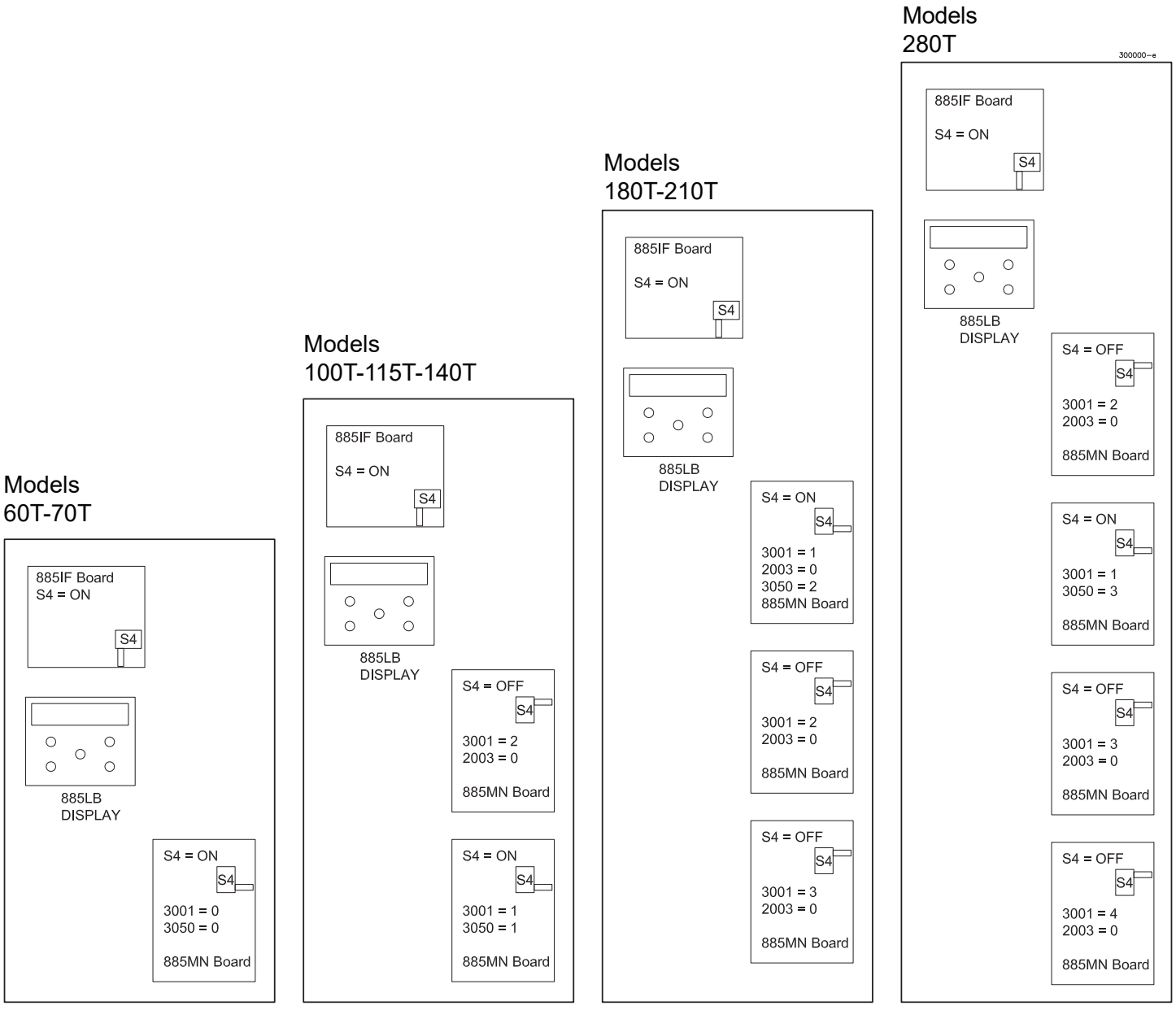


Figure 18-12 Setting parameters 3001, 3050 and selectors S4

18.10 - Emptying the boiler

1.- generate a request for heat by increasing the domestic hot water and central heating temperature (in the MYDENS version, if necessary also close the room thermostat link;
2.- wait for the burner to come on (in multi-burner versions wait for all the burners to come on (see corresponding icons “L” in figure 17-1 which all come on when all burners are on);
3.- switch the appliance off. In this way any motorised valves present stay on);
4.- close the system fill valve provided by the installer;
5.- connect a flexible rubber hose to the drain valves “38” in Figures 3-3, 3-5 and 3-7 and use it for draining into a sink drain or similar;
6.- wait for the water inside the boiler to cool to below approx. 40°C;
7.- slowly open the drain valves;
8.- Open the air vent valves of the heating elements. Start from the highest central heating elements and continue with the lowest.
9.- Once all of the water has been evacuated, close all of the heating element vent valves and drain valves.

WARNING! Do not salvage and/or reuse the water evacuated from the central heating circuit for any purpose as it could be polluted.

18.11 - Minimum and maximum power

Operation can be forced at minimum maximum or ignition power, proceed as follows:
1.- make sure that the heat generated by the boiler can be dispersed by the system;

WARNING! When forcing the delivery temperature, it automatically sets itself at 93°C to dispose of as much of the heat generated by the boiler as possible. Check whether the system can support this temperature.

2.- access parameter 20 10 (2200 for multi-burner models) located in the “installer menu” (see section 17.15);
3.- set the parameter at the following value:

a) Lo to force the burner, or all the burners, at minimum power;

b) 19n to force the burner, or all the burners, at ignition power;

c) H 19h to force the burner, or all the burners, at maximum power;

4.- To end forcing, return parameter 20 10 (2200 for multi-burner models) to the OFF value and press the RESET button.

WARNING! If during forcing, the power supplied by the boiler is much higher than the power absorbed by the system, the boiler switches off continuously to reach the maximum temperature allowed (93°C).

The same procedure as above can also be applied to multi-burner boilers models from 100T to 280T but it must be borne in mind that only one burner can be forced at a time, moving the display from one burner to another, as described in section 18.8.

18.12 - Checking the ionisation current

In any state of operation, even during minimum and maximum power checks as described in section 18.11, it is possible to consult the value of the ionisation current on parameter 1008 that appears in the “user menu” (section 17.14). This value must be between 4 and 7 uA (microampere).

Since parameter 1008, on multi-burner boilers (models from 100T to 280T) relates to Burner 1 (Master), you must refer to section 18.8 to do the check on the other burners.

18.13 - Checking combustion efficiency

According to national laws on gas appliances, it is necessary to periodically check the combustion efficiency;
To do this, operate exactly as stated in section 16.8 and check, along with the power, the combustion efficiency, which must be over the regulatory requirements.

18.14 - Water temperature measurement sensors

Various temperature sensors are positioned on the heat exchanger body. The electrical resistance between the two sensor contacts must correspond to figure 18-13.

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

18.15 - Outdoor temperature sensor

The outdoor temperature sensor 1004 (see section 13.1.4) is fitted as standard. The electrical resistance between the two sensor contacts must correspond to that shown in figure 18-14.

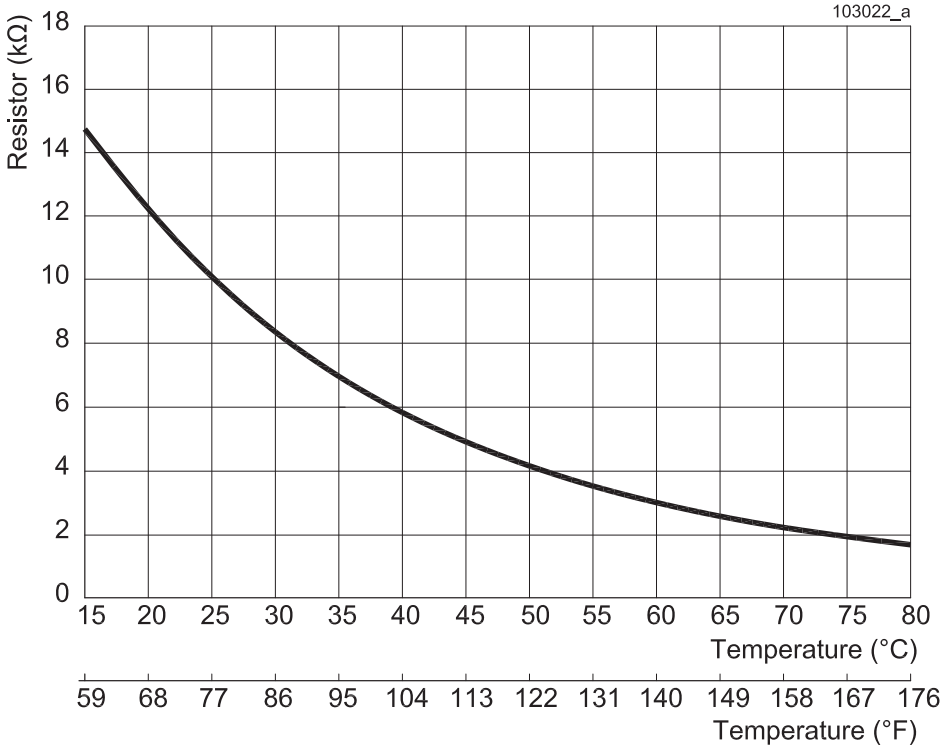


Figure 18-13 - Water sensors curve

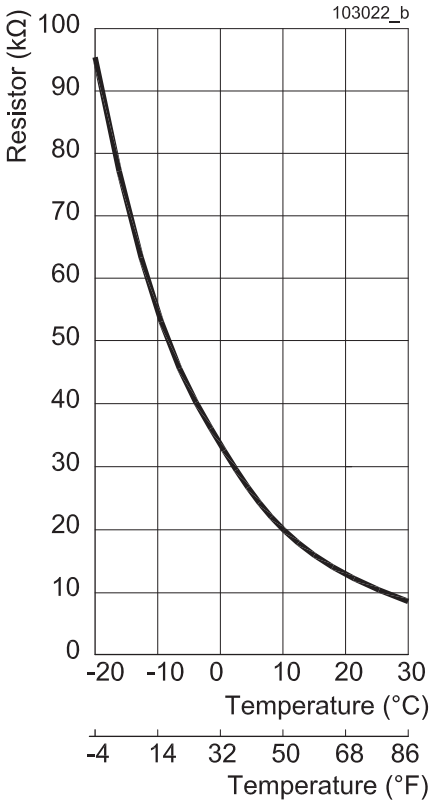


Figure 18-14 - Outdoor temperature sensor curve

18.16 - Multi-wire wiring diagram for models 60T and 70T

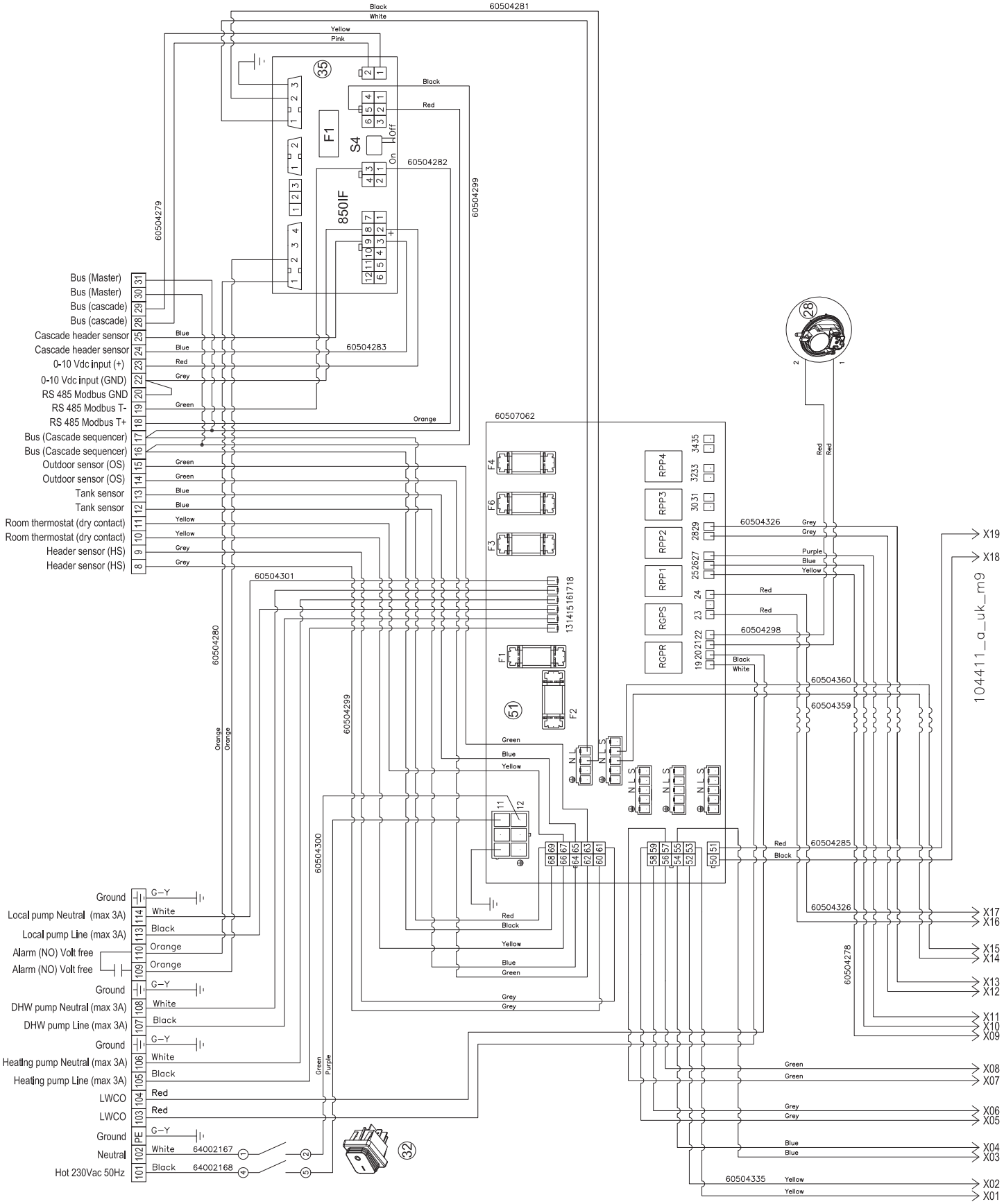


Figure 18-15 - Multi-wire wiring diagram part 1 - continues on next page

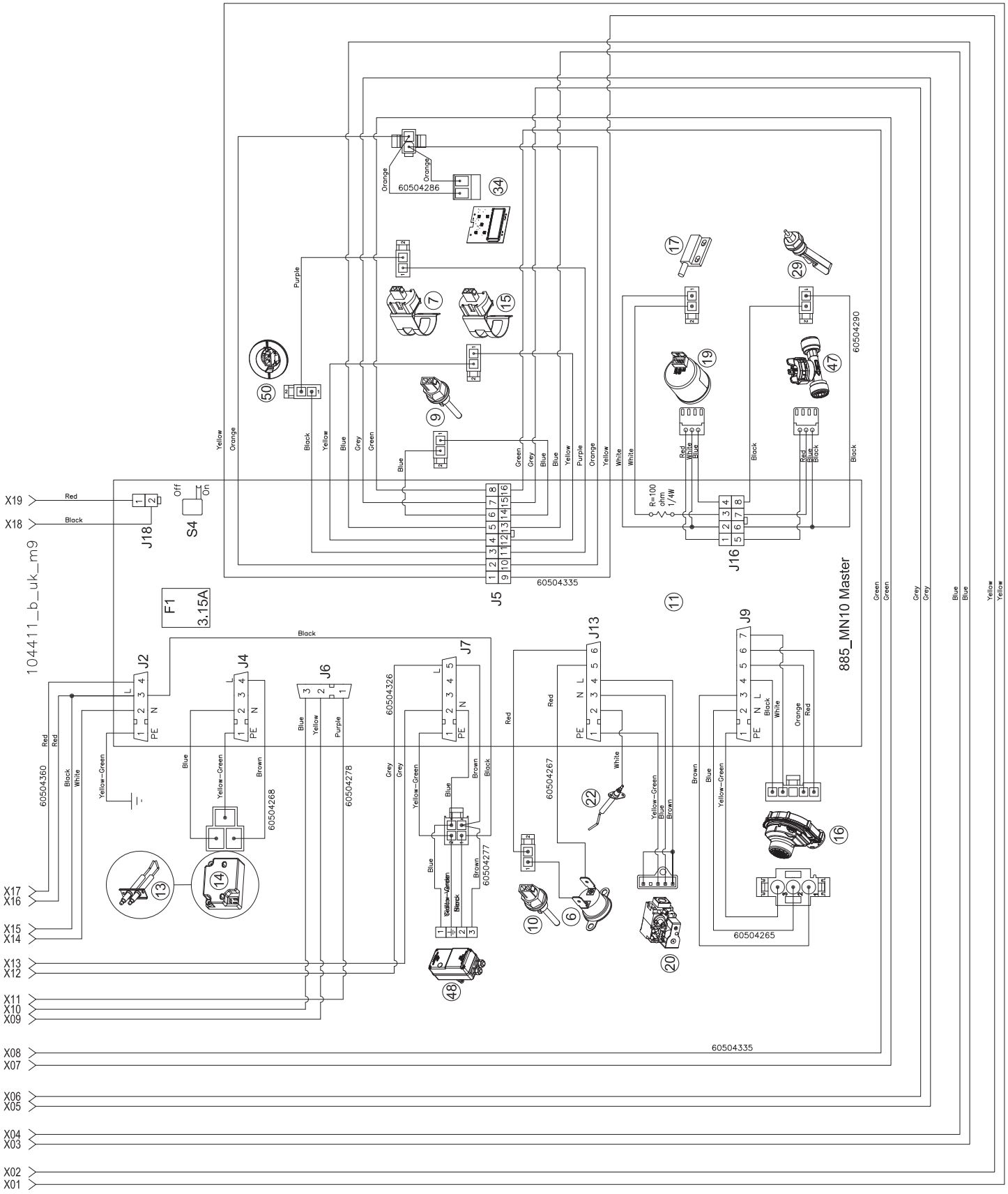


Figure 18-15 - Multi-wire wiring diagram part 2 - continued from previous page

18.17 - Multi-wire wiring diagram for models 100T, 115T, 140T, 180T, 210T and 280T

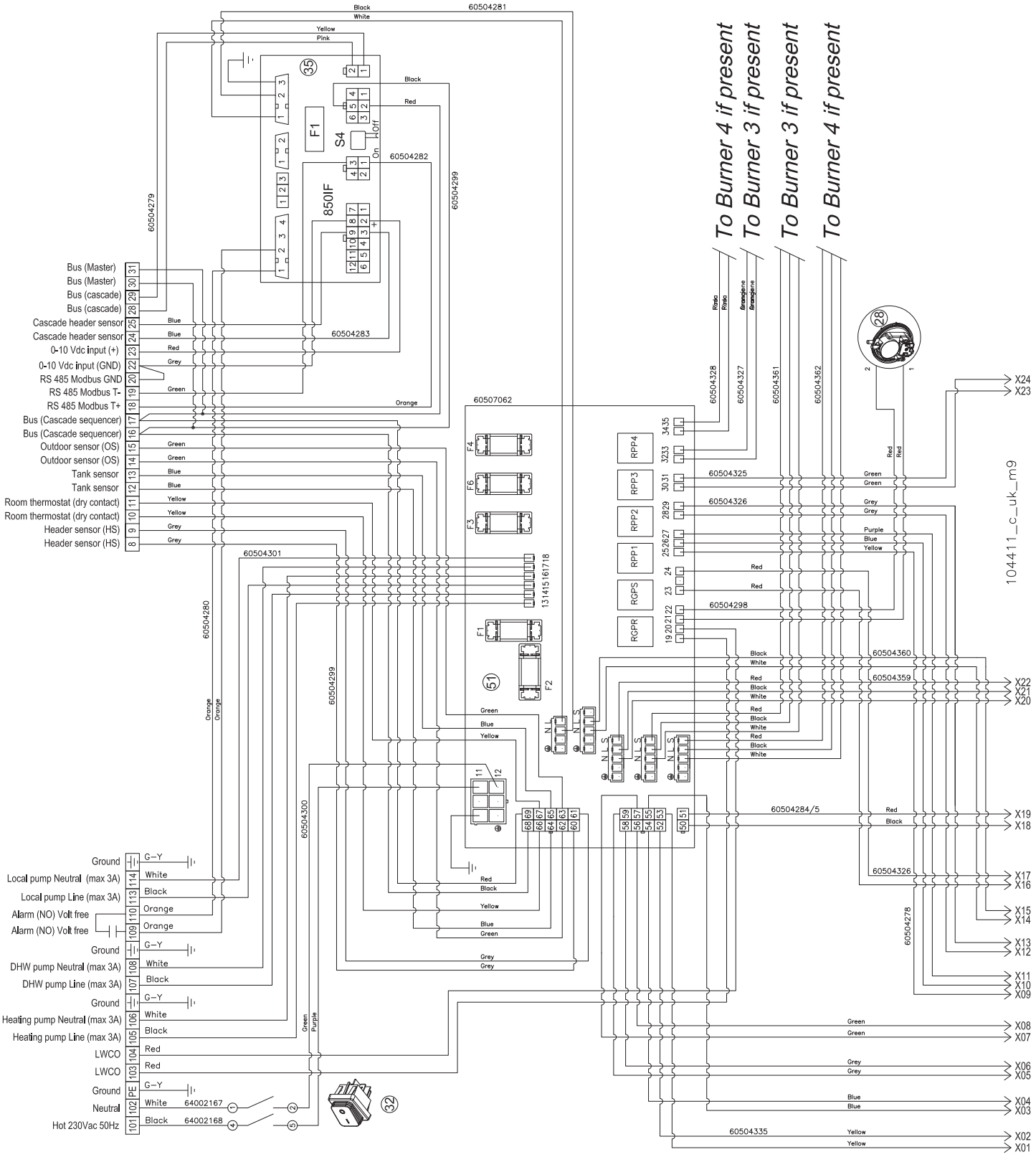
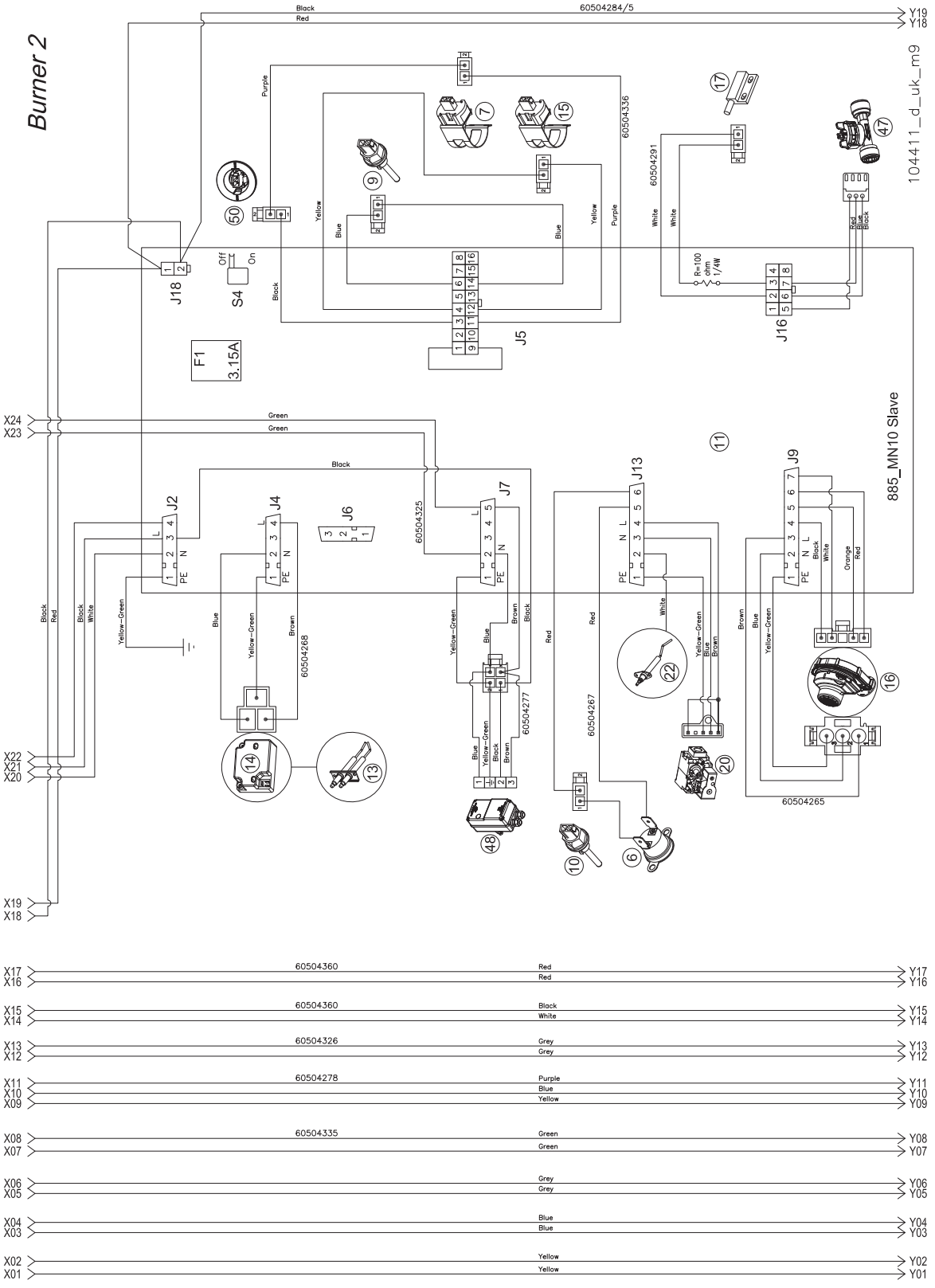


Figure 18-16 - Multi-wire wiring diagram part 1 - continues on next page



Continues

Figure 18-16 - Multi-wire wiring diagram part 2 - continues on next page

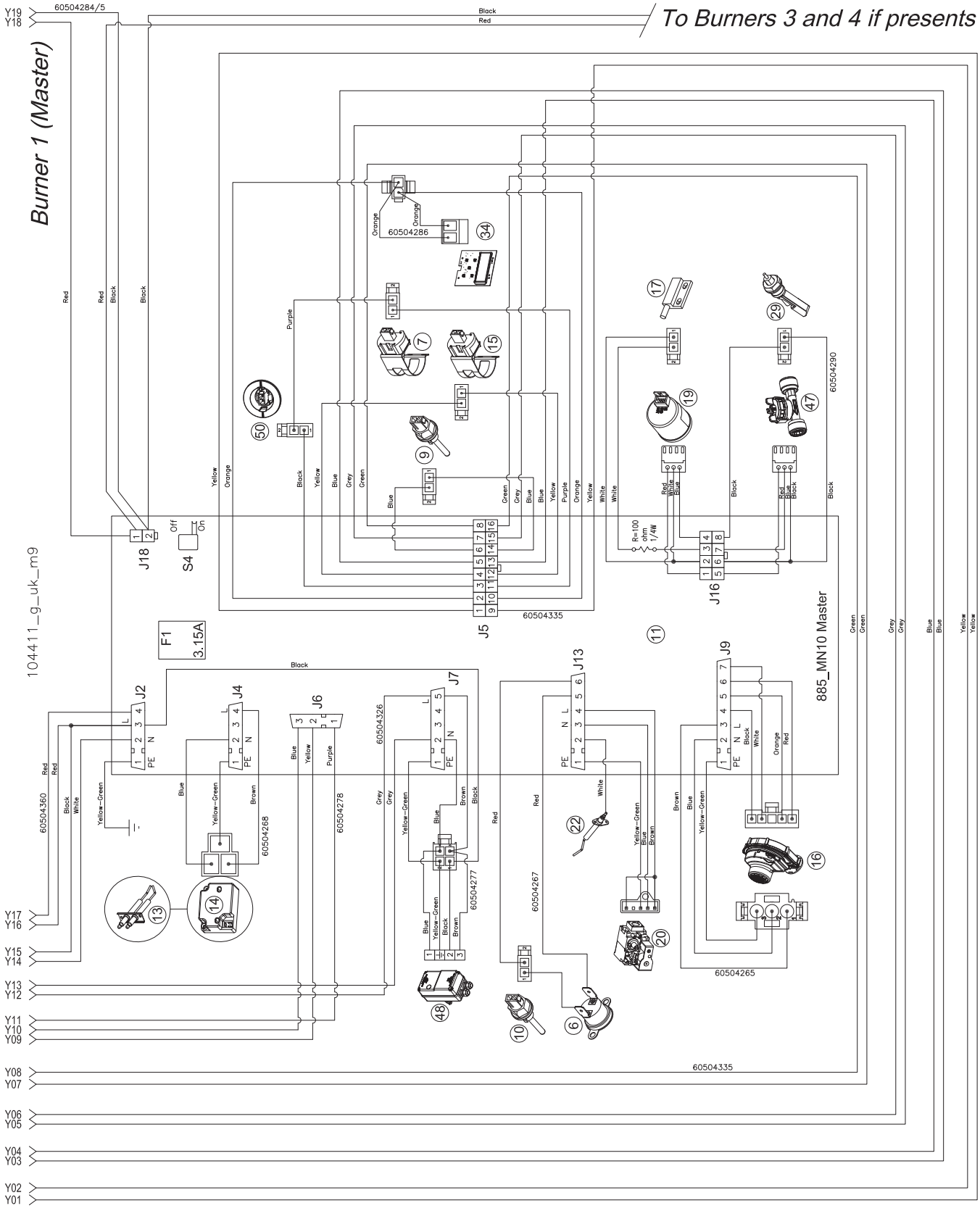


Figure 18-16 - Multi-wire wiring diagram part 3 - continued from previous page

Key to wiring diagrams figures 18-15 and 18-16

6 - Water outlet safety thermostat
7 - Water outlet temperature sensor
9 - Exhaust gases temperature sensor
10 - Exhaust gases temperature safety fuse
11 - Command and control board
  Fuse - F1 5x20 3A
13 - Ignition electrodes
14 - Sparks generator
15 - Water inlet temperature sensor
16 - PWM modulating fan
17 - Back flue preventer valve (flapper valve)
19 - Water pressure gauge
20 - Gas valve
22 - Detection electrode
28 - Exhaust gases differential pressure switch
29 - Condensate level sensor
32 - General ON/OFF switch
34 - Display
35 - Board 885 IF (on request)
  Fuse - F1 5x20 3A
47 - Water flow rate sensor
48 - 2-way motorised valve (on request)
50 - Primary heat exchanger temperature fuse
51 - Electrical connections board
  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 - Primary circuit pump relay burner 1 (MASTER)
RPP2 - Primary circuit pump relay burner 2
RPP3 - Primary circuit pump relay burner 3
RPP4 - Primary circuit pump relay burner 4

19 - TECHNICAL DATA

19.1 - MYDENS TECHNICAL DATA

MYDENS TECHNICAL DATA		UM	60T	70T	100T
Type (Type of flue gas exhaust/air intake)			B23 ; B3P		
Category			II2H3P	II2H3P	II2H3P
EU type approval certificate (PIN)			0476CR1272	0476CR1272	0476CR1272
Range Rated Boiler			APPROVED	APPROVED	APPROVED
Central heating max. heat input “Qn” PCI (PCS)		kW	57.8 (64.2)	69.9 (77.6)	99.0 (109.9)
Central heating min. heat input PCI (PCS)		kW	12.0 (13.3)	14.7 (16.3)	12.0 (13.3)
Central heating max. useful output power (80/60) “Pn”		kW	55.8	67.9	96.2
Efficiency at 100% load (80/60) PCI (PCS)		%	96.8 (87.2)	96.9 (87.3)	97.2 (87.5)
Min. useful output power (80/60)		kW	11.5	14.1	11.5
Efficiency at min. useful output power (80/60)		%	95.9 (86.4)	96.2 (86.7)	95.9 (86.4)
Central heating max. useful output power (50/30)		kW	60.7	73.5	104.0
Efficiency at central heating max. useful output power (50/30) PCI (PCS)		%	105.0 (94.6)	105.1 (94.7)	105.0 (94.6)
Min. useful output power (50/30)		kW	12.8	15.6	12.8
Efficiency at min. useful output power (50/30) PCI (PCS)		%	106.6 (96.0)	106.3 (95.8)	106.6 (96.0)
Efficiency at 30% of the load PCI (PCS)		%	106.3 (95.7)	106.4 (95.8)	108.0 (97.3)
Losses at the chimney, burner ON (80/60)		%	1	1	1
Losses at the chimney, burner OFF		%	0.1	0.1	0.1
Losses at the casing, burner ON (80/60)		%	0.1	0.1	0.1
Losses at the casing, burner OFF		%	0.05	0.05	0.05
Gas flow rate	G20	m^3/h	6.11	7.39	10.47
	G31	kg/h	4.49	5.43	7.68
Gas supply pressure	G20	mbar	20	20	20
	G31	mbar	37	37	37
Gas supply minimum pressure	G20	mbar	10	10	10
	G31	mbar	10	10	10
Gas supply maximum pressure	G20	mbar	45	45	45
	G31	mbar	45	45	45
Primary heat exchanger water content		l	4.6	5.7	9.2
Minimum operating water flow rate with motorised valves		l/h	/	/	2400
Minimum operating water flow rate without motorised valves		l/h	2400	2700	4800
DHW adjustment range with storage tank		°C	40 - 60	40 - 60	40 - 60
Maximum temperature for safety intervention		°C	95	95	95
Maximum central heating temperature		°C	80	80	80
Minimum central heating temperature		°C	20	20	20
Maximum central heating pressure “PMS”		bar	11	11	11
Minimum central heating 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
Electrical protection rating			IP21	IP21	IP21

19 - TECHNICAL DATA

19.1 - MYDENS TECHNICAL DATA

115T	140T	180T	210T	280T
B23 ; B3P				
II2H3P	II2H3P	II2H3P	II2H3P	II2H3P
0476CR1272	0476CR1272	0476CR1272	0476CR1272	0476CR1272
APPROVED	APPROVED	APPROVED	APPROVED	APPROVED
115.6 (128.3)	140.0 (155.4)	173.4 (192.5)	210.0 (233.1)	280.0 (310.8)
12.0 (13.3)	14.7 (16.3)	14.7 (16.3)	14.7 (16.3)	14.7 (16.3)
112.6	135.6	170.1	205.4	274.2
97.4 (87.7)	96.9 (87.3)	98.1 (88.3)	97.8 (88.1)	97.9 (88.2)
11.5	14.1	14.1	14.1	14.1
95.9 (86.4)	96.2 (86.7)	96.2 (86.7)	96.2 (86.7)	96.2 (86.7)
121.4	147.1	182.2	220.7	294.3
105.0 (94.6)	105.1 (94.7)	105.1 (94.7)	105.1 (94.7)	105.1 (94.7)
12.8	15.6	15.6	15.6	15.6
106.6 (96.0)	106.3 (95.8)	106.3 (95.8)	106.3 (95.8)	106.3 (95.8)
107.5 (96.8)	107.0 (96.4)	108.0 (97.3)	106.8 (96.2)	108.8 (98.0)
1	1	1	1	1
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
12.22	14.80	18.30	22.20	29.61
8.97	10.87	13.50	16.30	21.73
20	20	20	20	20
37	37	37	37	37
10	10	10	10	10
10	10	10	10	10
45	45	45	45	45
45	45	45	45	45
9.2	11.4	17.1	17.1	22.8
2400	2700	2700	2700	2700
4800	5400	8100	10800	10800
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
IP21	IP21	IP21	IP21	IP21

19 - TECHNICAL DATA

19.1 - MYDENS TECHNICAL DATA

MYDENS TECHNICAL DATA		UM	60T	70T	100T
Burner electrical power		W	110	150	220
Air intake and flue gas exhaust pipe diameter (split)		mm	110	110	110
Max. length of flue gas outlet duct (split)		m	10	10	10
Air intake pipe max. length (split)		m	10	10	10
Equivalent length of a bend		m	4	4	4
Weighted CO (0% O2)	G20	ppm	30	27	30
Weighted NOx (0% O2) (Class 6 EN 15502) PCS	G20	mg/kWh	34	34	34
CO2 (%) at minimum/maximum power	G20	%	8.5 / 8.7	8.5 / 8.7	8.5 / 8.7
	G31	%	9.8 / 10.2	9.8 / 10.2	9.8 / 10.2
O2 (%) at minimum/maximum power	G20	%	5.8 / 5.4	5.8 / 5.4	5.8 / 5.4
	G31	%	6.0 / 5.4	6.0 / 5.4	6.0 / 5.4
Maximum recirculation of flue gas permitted in windy conditions		%	10	10	10
Maximum flue gas temperature at boiler outlet		°C	80	80	80
Minimum flue gas temperature at boiler outlet		°C	30	30	30
Δt fumes temperature/Return (at 100% of the load) (80/60)		°C	20	24	20
Δt fumes temperature/Return (at 30% of the load) (37/30)		°C	7	7	7
Maximum CO in exhaust fumes		ppm	250	250	250
Mass flow of fumes at maximum power		g/s	27.1	32.9	46.6
Mass flow of fumes at minimum power		g/s	5.8	7.1	5.8
Hydraulic head available at outlet		Pa	110	110	110
Maximum temperature of the combustion agent air		°C	40	40	40
Maximum CO2 content in the combustion agent air		%	0.9	0.9	0.9
Maximum fumes temperature for overheating		°C	95	95	95
Max. negative pressure allowed in the flue gas exhaust/air intake system		Pa	110	110	110
Condensate maximum flow rate		l/h	7.3	8.8	12.4
Condensate average acidity		pH	4	4	4
Operating room temperature		°C	0.5 ; + 50	0.5 ; + 50	0.5 ; + 50
Boiler weight (empty)		kg	96	98	142

19 - TECHNICAL DATA

19.1 - MYDENS TECHNICAL DATA

115T	140T	180T	210T	280T
220	300	430	430	590
110	110	160	160	160
10	10	10	10	10
10	10	10	10	10
4	4	4	4	4
30	27	27	27	27
34	34	34	34	34
8.5 / 8.7	8.5 / 8.7	8.5 / 8.7	8.5 / 8.7	8.5 / 8.7
9.8 / 10.2	9.8 / 10.2	9.8 / 10.2	9.8 / 10.2	9.8 / 10.2
5.8 / 5.4	5.8 / 5.4	5.8 / 5.4	5.8 / 5.4	5.8 / 5.4
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
80	80	80	80	80
30	30	30	30	30
20	24	24	24	24
7	7	7	7	7
250	250	250	250	250
54.4	65.8	81.6	98.7	131.7
5.8	7.1	7.1	7.1	7.1
110	110	110	110	110
40	40	40	40	40
0.9	0.9	0.9	0.9	0.9
95	95	95	95	95
110	110	110	110	110
14.5	17.6	21.8	26.3	35.1
4	4	4	4	4
0.5 ; + 50	0.5 ; + 50	0.5 ; + 50	0.5 ; + 50	0.5 ; + 50
142	147	211	211	249

19 - TECHNICAL DATA

19.2 - AGUADENS TECHNICAL DATA

AGUADENS TECHNICAL DATA		UM	60T	70T	100T
Type (Type of flue gas exhaust/air intake)			B23 ; B23P		
Category			II2H3P	II2H3P	II2H3P
EU type approval certificate (PIN)			0476CR1272	0476CR1272	0476CR1272
Max. heat input “Qn” PCI (PCS)		kW	57.8 (64.2)	69.9 (77.6)	99.0 (109.9)
Min. heat input “Qm” PCI (PCS)		kW	12.0 (13.3)	14.7 (16.3)	12.0 (13.3)
Max. useful output power (50/30) “Pn”		kW	60.7	73.5	104.0
Efficiency at max. useful output power (50/30) PCI (PCS)		%	105.0 (94.6)	105.1 (94.7)	105.0 (94.6)
Min. useful output power (50/30) “Pm”		kW	12.8	15.6	12.8
Efficiency at min. useful output power (50/30) PCI (PCS)		%	106.6 (96.0)	106.3 (95.8)	106.6 (96.0)
Gas flow rate	G20	m^3/h	6.11	7.39	10.47
	G31	kg/h	4.49	5.43	7.68
Gas supply pressure	G20	mbar	20	20	20
	G31	mbar	37	37	37
Gas supply minimum pressure	G20	mbar	10	10	10
	G31	mbar	10	10	10
Gas supply maximum pressure	G20	mbar	45	45	45
	G31	mbar	45	45	45
Primary heat exchanger water content		l	4.6	5.7	9.2
Minimum operating water flow rate with motorised valves		l/h	/	/	2400
Minimum operating water flow rate without motorised valves		l/h	2400	2700	4800
Instant DHW production (dt 30°C)		l/min	29.2	35.3	50.0
Instant DHW adjustment range		°C	20 - 60	20 - 60	20 - 60
Maximum temperature for safety intervention		°C	95	95	95
Maximum pressure “PMS”		bar	11	11	11
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
Electrical protection rating			IP21	IP21	IP21

19.2 - AGUADENS TECHNICAL DATA

115T	140T	180T	210T	280T
B23 ; B23P				
II2H3P	II2H3P	II2H3P	II2H3P	II2H3P
0476CR1272	0476CR1272	0476CR1272	0476CR1272	0476CR1272
115.6 (128.3)	140.0 (155.4)	173.4 (192.5)	210.0 (233.1)	280.0 (310.8)
12.0 (13.3)	14.7 (16.3)	14.7 (16.3)	14.7 (16.3)	14.7 (16.3)
121.4	147.1	182.2	220.7	294.3
105.0 (94.6)	105.1 (94.7)	105.1 (94.7)	105.1 (94.7)	105.1 (94.7)
12.8	15.6	15.6	15.6	15.6
106.6 (96.0)	106.3 (95.8)	106.3 (95.8)	106.3 (95.8)	106.3 (95.8)
12.22	14.80	18.30	22.20	29.61
8.97	10.87	13.50	16.30	21.73
20	20	20	20	20
37	37	37	37	37
10	10	10	10	10
10	10	10	10	10
45	45	45	45	45
45	45	45	45	45
9.2	11.4	17.1	17.1	32.8
2400	2700	2700	2700	2700
4800	5400	8100	10800	10800
58.4	70.7	87.5	106.0	141.4
20 - 60	20 - 60	20 - 60	20 - 60	20 - 60
95	95	95	95	95
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
IP21	IP21	IP21	IP21	IP21

19.2 - AGUADENS TECHNICAL DATA

AGUADENS TECHNICAL DATA		UM	60T	70T	100T
Burner electrical power		W	110	150	220
Air intake and flue gas exhaust pipe diameter (split)		mm	110	110	110
Max. length of flue gas outlet duct (split)		m	10	10	10
Air intake pipe max. length (split)		m	10	10	10
Equivalent length of a bend		m	4	4	4
Weighted CO (0% O2)	G20	ppm	30	27	30
Weighted NOx (0% O2) (EN 26:2015) PCS	G20	mg/kWh	34	34	34
CO2 (%) at minimum/maximum power	G20	%	8.5 / 8.7	8.5 / 8.7	8.5 / 8.7
	G31	%	9.8 / 10.2	9.8 / 10.2	9.8 / 10.2
O2 (%) at minimum/maximum power	G20	%	5.8 / 5.4	5.8 / 5.4	5.8 / 5.4
	G31	%	6.0 / 5.4	6.0 / 5.4	6.0 / 5.4
Maximum recirculation of flue gas permitted in windy conditions		%	10	10	10
Maximum flue gas temperature at boiler outlet		°C	80	80	80
Minimum flue gas temperature at boiler outlet		°C	30	30	30
Mass flow of fumes at maximum power		g/s	27.1	32.9	46.6
Mass flow of fumes at minimum power		g/s	5.8	7.1	5.8
Hydraulic head available at outlet		Pa	110	110	110
Maximum temperature of the combustion agent air		°C	40	40	40
Maximum CO2 content in the combustion agent air		%	0.9	0.9	0.9
Maximum fumes temperature for overheating		°C	95	95	95
Max. negative pressure allowed in the flue gas exhaust/air intake system		Pa	110	110	110
Condensate maximum flow rate		l/h	7.3	8.8	12.4
Condensate average acidity		pH	4	4	4
Operating room temperature		°C	0.5 ; + 50	0.5 ; + 50	0.5 ; + 50
Boiler weight (empty)		kg	96	98	142

19.2 - AGUADENS TECHNICAL DATA

115T	140T	180T	210T	280T
220	300	430	430	590
110	110	160	160	160
10	10	10	10	10
10	10	10	10	10
4	4	4	4	4
30	27	27	27	27
34	34	34	34	34
8.5 / 8.7	8.5 / 8.7	8.5 / 8.7	8.5 / 8.7	8.5 / 8.7
9.8 / 10.2	9.8 / 10.2	9.8 / 10.2	9.8 / 10.2	9.8 / 10.2
5.8 / 5.4	5.8 / 5.4	5.8 / 5.4	5.8 / 5.4	5.8 / 5.4
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
80	80	80	80	80
30	30	30	30	30
54.4	65.8	81.6	98.7	131.7
5.8	7.1	7.1	7.1	7.1
110	110	110	110	110
40	40	40	40	40
0.9	0.9	0.9	0.9	0.9
95	95	95	95	95
110	110	110	110	110
14.5	17.6	21.8	26.3	35.1
4	4	4	4	4
0.5 ; + 50	0.5 ; + 50	0.5 ; + 50	0.5 ; + 50	0.5 ; + 50
142	147	211	211	249

20 - FORCED MENU

				MYDENS boiler parameters		
Ref.	Parameter description	Adjustment field	Factory value	Single burner (mod. 60T and 70T)	Burner 1 (Master) (mod. 100T, 115T, 140T, 180T, 210T and 280T)	Burners 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 = Burners 2 to 4 (slave burners)	2	1	1	from 2 to 4
3002	Fan adjustment field	from 0 to 4	0	60 = 0 70 = 2	100 and 115 = 0 140, 180, 210 and 280 = 2	
3003	Unit of measurement of display	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	Exhaust gases type sensor	SEnS = Sensor; StCH = Switch	SEnS	SEnS	SEnS	SEnS
3009	Type of external sensor	10 = 10kohms; 12 = 12kohms;	10	10	10	10
3010	Type of other sensors	10 = 10kohms; 12 = 12kohms;	10	10	10	10
3011	pump mode	0 = primary c pump; 1 = N/A; 2 = N/A; 3 = N/A;	0	0	0	0
3012	DHW operation mode	0 = only central heating; 1 = storage tank with puffer; 2 = storage tank with thermostat; 3 = N/A; 4 = N/A; 5 = N/A	0	0 = only central heating; 1 = storage tank with puffer;	0 = only central heating; 1 = storage tank with puffer;	0
3013	Reset Err 115	EnAb = Enabled; dISA = Disabled	Enab	Enab	Enab	Enab
3015	Climate control: maximum central heating delivery temperature (this parameter is overwritten by parameter 3017)	from 20°C to 90°C	82°C	82°C	82°C	82°C
3016	Climate control: minimum central heating delivery temperature	from 20°C to 90°C	20°C	20°C	20°C	20°C
3017	Maximum delivery temperature (this parameter takes priority over parameter 3015)	from 20°C to 90°C	82°C	82°C	82°C	82°C
3018	Minimum delivery temperature	from 20°C to 90°C	20°C	20°C	20°C	20°C
3020	Type of water flow rate sensor	0 = N/A; 1 = DN8; 2 = DN 10; 3 = DN 15; 4 = DN 20; 5 = DN 25	4	4	4	4
3022	Minimum water pressure	from 0 to 5 bar	1	1	1	1
3035	Minimum water flow rate	from 0 to 100 l/min	45	60 = 40 70 = 45	100 and 115 = 40 140, 180, 210 and 280 = 45	100 and 115 = 40 140, 180, 210 and 280 = 45
3050	Number of slave burners	from 0 to 3	3	0	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
" S 4 " switch	"S4" Switch Position (see fig 18-11 and 18-12)	On or Off	On	On	On	Off

N/A = Not Applicable

20 - FORCED MENU

AGUADENS hot water heater parameters			
Single burner (mod. 60T and 70T)	Burner 1 (Master) (mod. 100T, 115T, 140T, 180T, 210T and 280T)	Burners 2 to 4 (mod. 100T, 115T, 140T, 180T, 210T and 280T)	Customised values
1	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 central heating; 1 = storage tank with puffer;	0 for instant DHW; 1 for puffer tank.	0	
Enab	Enab	Enab	
N/A	N/A	N/A	
N/A	N/A	N/A	
82°C	82°C	82°C	
20°C	20°C	20°C	
4	4	4	
1	1	1	
60 = 40 70 = 45	100 and 115 = 40 140, 180, 210 and 280 = 45	100 and 115 = 40 140, 180, 210 and 280 = 45	
0	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	

WARNING! Changing these parameters could cause boiler and therefore system malfunctions. For this reason only a professionally qualified technician with awareness and in-depth knowledge of the boiler can change them.

WARNING! By going into the forced menu the boiler may start working; paying no regard to this may cause harm to people, animals or things.

WARNING! If it is a multi-burner boiler (models from 100T to 280T) the display is always connected to burner 1 (MASTER); to set the parameters in the other burners you need to connect the display to them as shown in section 18.8.

The forced menu allows the boiler to be set according to the system to be provided. Setting is done by adjusting the parameters available (shown in the table).
To access the forced menu, proceed as follows:
1 - Turn off electricity to the boiler by moving the main switch to OFF;

2.- Hold down both the RESET and the  button and move the main switch to ON;
3.- Wait for the display to show the word “INIT” or the parameters 3000.

4. - Using buttons  and  scroll through the list of parameters 3000;

5.- Browse the menu with buttons  and  .
Once the parameter is selected, press the RESET button to make it possible to change it using buttons  and  ;
6.- Press the RESET button to save the changes;
7.- Wait for 10 seconds;
8 - Turn off electricity to the boiler;
9.- Turn electricity to the boiler back on to exit the forced menu and return to normal operation.

21 - COMMAND MENU DIAGRAM

Symbol	Description
RESET 0	Press and release RESET button
RESET 2	Hold down RESET button for 2 seconds
RESET 5	Hold down RESET button for 5 seconds
RESET 5	At the same time, hold down, for the number of seconds shown by the number, the two buttons RESET and
	Press and release button
	Press and release button

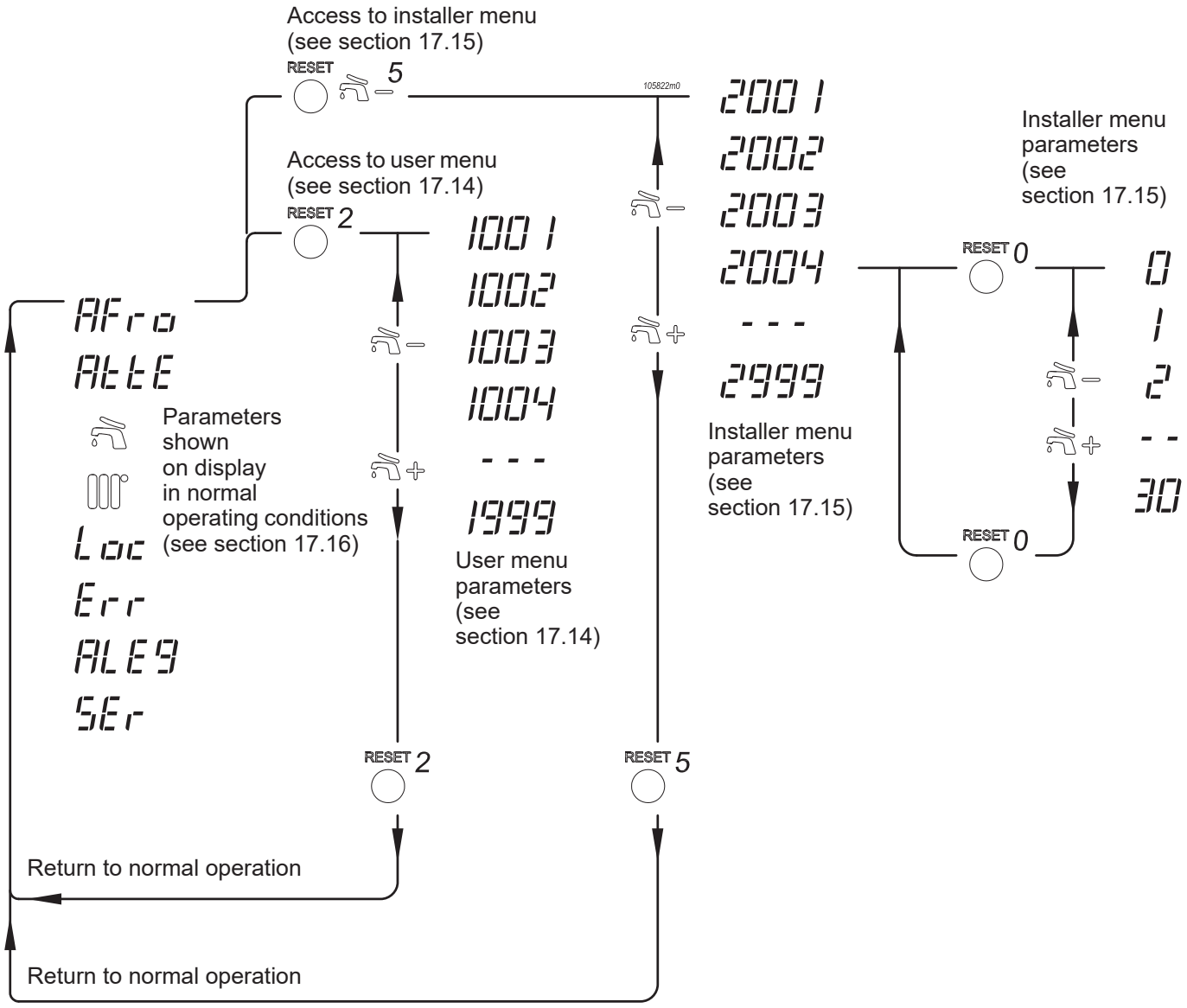


Figure 21-1 - Command menu diagram

22 - MYDENS PRODUCT FICHE

Name or brand of the supplier			COSMOGAS	
Supplier's model number			MYDENS	
			60T	70T
Condensing boiler			YES	YES
Low-temperature boiler			NO	NO
B1 boiler			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	ηs	%	91	91
Useful output power at rated heat output in high-temperature regime (*)	P4	kW	55.8	67.9
Useful efficiency at rated heat output in high-temperature regime (*)	η4	%	87.2	87.3
Useful output power at 30% of rated heat input in low-temperature regime (**)	P1	kW	18.4	22.3
Useful efficiency at 30% of rated heat input in low-temperature regime (**)	η1	%	95.7	95.8
Auxiliary electricity consumption				
At full load	elmax	kW	0.060	0.070
At partial load	elmin	kW	0.018	0.020
In standby mode	Psb	kW	0.005	0.005
Other factors				
Standby heat loss	Pstby	kW	0.050	0.060
Ignition burner power consumption	Pign	kW	N/A	N/A
Annual energy consumption	QHE	GJ	107	130
Sound power level, indoors/outdoors	LWA	dB	70	70
Emissions of nitrogen oxides	NOx	mg/kWh	34	34
Domestic hot water parameters				
Declared load profile			N/A	N/A
DHW production efficiency	ηwh	%	N/A	N/A
Daily consumption of electrical energy	Qelec	kWh	N/A	N/A
Annual consumption of electrical energy	AEC	kWh	N/A	N/A
Daily consumption of fuel	Qfuel	kWh	N/A	N/A
Annual consumption of fuel	AFC	GJ	N/A	N/A

According to Regulations (EU) no. 811/2013 and no. 813/2013.
N/A = Not applicable.
(*) High-temperature regime means 60°C return temperature and 80°C supply temperature.
(**) Low-temperature regime for condensing boilers means 30°C, for low-temperature boilers, 37°C, and for other appliances, 50°C return temperature

22 - MYDENS PRODUCT FICHE

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	113	136	170	205	274
92	92	92	92	91	92
96.2	112.6	135.6	170.1	205.4	274.2
87.8	87.8	87.9	88.4	88.3	89.0
32.1	37.3	44.9	56.2	67.3	91.4
96.6	97.0	96.6	97.0	95.9	96.8

0.095	0.110	0.140	0.180	0.210	0.280
0.030	0.035	0.040	0.050	0.060	0.080
0.007	0.008	0.010	0.012	0.015	0.020

0.095	0.100	0.120	0.150	0.180	0.240
N/A	N/A	N/A	N/A	N/A	N/A
169	194	235	288	346	450
70	70	70	70	70	70
34	34	34	34	34	34

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

23 - AGUADENS PRODUCT FICHE

(a) Name or brand of supplier			COSMOGAS	
(b) Supplier's identifying model number			AGUADENS	
			60T	70T
(c) Declared load profile			XXL (1)	XXL (1)
(d) Class of energy efficiency			A	A
(e) Domestic hot water production efficiency	ηwh	%	85.3	85.6
(f) Daily consumption of electrical energy	Qelec	kWh	0.180	0.190
(f) Annual consumption of electrical energy	AEC	kWh	39	42
(f) Daily consumption of fuel	Qfuel	kWh	28.316	28.172
(f) Annual consumption of fuel	AFC	GJ	22	22
(g) Other load profile			-	-
(g) Domestic hot water production efficiency*		%	-	-
(g) Daily consumption of electrical energy *		kWh	-	-
(g) Annual consumption of electrical energy *		kWh	-	-
(g) Daily consumption of fuel *		kWh	-	-
(g) Annual consumption of fuel *		GJ	-	-
(h) Water heater thermostat temperature adjustment		°C	60	60
(i) Level of sound power inside	LWA	dB	70	70
(j) The water heater can only operate during slack times			NO	NO
(k) any eventual specific precautions to take during assembly, installation or maintenance of the water heater.			Read the instructions for the installation, use and maintenance of the product.	
(l) Smart control factor			N/A	N/A
Emissions of nitrogen oxides	NOx	mg/kWh	34	34

In agreement with European Ruling (EU) No 812/2013 and No 814/2013;

(1) with MULTITANK 200 storage tank;
(2) with MULTITANK 300 storage tank;
(3) with MULTITANK 800 storage tank;

* Related to other load profile (g);

N/A = Not Applicable;

23 - AGUADENS PRODUCT FICHE

COSMOGAS					
AGUADENS					
100T	115T	140T	180T	210T	280T
3XL (2)	3XL (2)	3XL (2)	3XL (2)	4XL (3)	4XL (3)
-	-	-	-	-	-
84.1	83.6	83.1	83.8	83.5	83.2
0.350	0.370	0.360	0.390	0.510	0.540
77	81	79	85	112	118
54.734	55.012	55.356	54.812	110.778	111.111
43	43	44	43	88	88
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
60	60	60	60	60	60
70	70	70	70	70	70
NO	NO	NO	NO	NO	NO
Read the instructions for the installation, use and maintenance of the product.					
N/A	N/A	N/A	N/A	N/A	N/A
34	34	34	34	34	34

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

DECLARES

under its own responsibility that the central heating boiler:

SERIAL No.	
MODEL	
PRODUCTION DATA	

subject of this declaration is in compliance with the **EU** Type Test Certificate, issued by the notified body n° 0476 (Kiwa Cermet Italia SpA), whose data (PIN) are given in the table shown in the “Technical Data” section of this manual and fulfils the requirements of the EU Regulation on Gas Appliances, (**2016/426/EU**) and the Efficiency Directive, (**92/42/EEC** modified by Reg. **EU 813/2013**) applying the standards **EN 15502-1:2012+A1:2015** and **EN 15502-2-1+A1:2016** and the Low Voltage Directive (**2014/35/UE**) applying the standards **EN 60335-1:2012+A11:2014** and **EN 60335-2-102:2016** and the Electro Magnetic Compatibility Directive (**2014/30/UE**) applying the standards **EN 55014-1:2019** ed **EN 55014-2:2016**, Energy labeling regulation (**2017/1369/UE**), Eco-friendly design directive (**2009/125/CE**), Directive on the use of dangerous substances (**2011/65/UE**).
Monitoring of the product was carried out by the notified body No. 0476 according to form C2.

This declaration is issued as stipulated by the aforementioned directives.

The serial number corrisponde to the warranty number.

Meldola (FC) ITALY.

Alessandrini Arturo
CEO

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

DECLARES

under its own responsibility that the instantaneous water heater:

SERIAL No.	
MODEL	
PRODUCTION DATA	

subject of this declaration is in compliance with the **EU** Type Test Certificate, issued by the notified body n° 0476 (Kiwa Cermet Italia SpA), whose data (PIN) are given in the table shown in the “Technical Data” section of this manual and fulfils the requirements of the EU Regulation on Gas Appliances, (**2016/426/EU**) and the **UE 814/2013** regulation applying the standard **EN 26:2015** and the Low Voltage Directive (**2014/35/UE**) applying the standards **EN 60335-1:2012+A11:2014** and **EN 60335-2-102:2016** and the Electro Magnetic Compatibility Directive (**2014/30/UE**) applying the standards **EN 55014-1:2019** ed **EN 55014-2:2016**, Energy labeling regulation (**2017/1369/UE**), Eco-friendly design directive (**2009/125/CE**), Directive on the use of dangerous substances (**2011/65/UE**).
Monitoring of the product was carried out by the notified body No. 0476 according to form C2.

This declaration is issued as stipulated by the aforementioned directives.

The serial number corrisponde to the warranty number.

Meldola (FC) ITALY.

Alessandrini Arturo
CEO

COSMOGAS s.r.l.
Via L. da Vinci 16 - 47014
MELDOLA (FC) ITALY
info@cosmogas.com
www.cosmogas.com