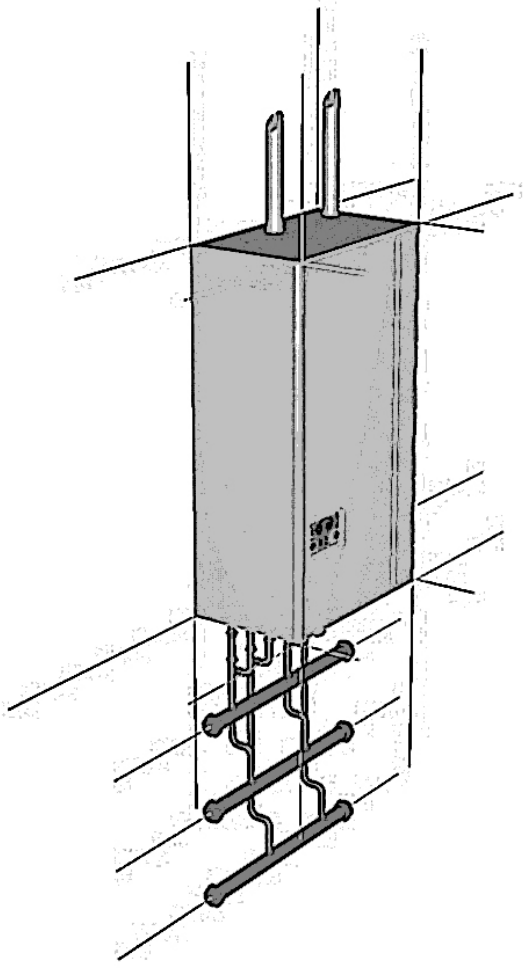
D-LBR571 rev.B 15 MCM SDC 006

CALDARIA CONDENSING 100

Instruction manual.
Installation and use



UNI EN ISO 9001:2000
UNI EN ISO 14001:2004

CE

DVGW

CLASSE V
UNI EN 297

★★★★
92/42/CEE

Contents

1 Introduction

1.1 Introduction and referenced European laws

Dear Customer,

Congratulations for your choice and thank you for the trust you place in our products.
With your purchase you have chosen a technology which is the best combination of energy saving and functionality, compliant with the strictest European safety standards.

We kindly ask you to read the content of this manual carefully, as you will find useful advice and directions which will help you operate the boiler effectively and efficiently, increasing its lifespan and your comfort.
We also ask you to preserve these instructions and make them available, when required, to the technician or installer, to ensure easier and correct boiler installation, operation and maintenance.

For the realization of this product Robur SpA follows these European and Italian laws and standards:

COUNCIL DIRECTIVE 92/42/EEC of 21 May 1992 on efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels.
PROJECT CIG E.01.08.929.0 – Gas fired condensing heating appliances with nominal heat input more than 35 kW.
D.P.R. 412 of 26 August 1993 and **D.P.R. 551** of 21 December 1999 – These Italian laws specify the requirements for the projecting, working and maintenance for rational use of energy.
D.M. 12.04.1996 –Technical standard for fire prevention and for the projecting, working and maintenance for hot-water boilers fired with gaseous fuels.
R COLLECTION (ISPESL) – Italian safety standard for hot-water boilers plants with temperature not exceeding 110° C.
UNI 10845 – Italian standard for flue gas venting system for hot-water boilers fired with gaseous fuels.

The company Robur S.p.A. has the certification UNI EN ISO 9001/2000.

CALDARIA CONDENSING 100 has:

CE European conformity mark (from the directive 92/42/CEE) issued from the German homologater DVGW

The higher energetic efficiency class (from the directive 92/42/CEE) shown with the symbol ★★★★;
The better class for NOx emissions (the fifth for the EN 297).

1.2 Warnings

INSTALLATION In order to ensure safety and correct operation, the installation shall always take place in full compliance with the applicable Law and with the instructions provided by the Manufacturer, and will always be carried out by professionally qualified technical personnel only. The equipment shall be installed in a suitable area, and connected to the heating system in accordance with the applicable Law.

WARRANTY Full warranty assistance will be ensured only if the appliance is commissioned by Robur Spa commissioning engineers, please see Terms and Conditions for full details.
The Manufacturer disclaims any and all responsibility resulting from damage due to tampering, improper use or mistakes made during equipment installation, operation and maintenance. In the event of failure or breakdown, isolate the equipment and do not try to repair it.

START UP The boiler shall be switched on for the first time by approved Corgy registered only. During start-up, the engineer shall complete the commissioning certificate and leave you a copy, thus starting the warranty period, whose conditions are specified in the Terms and Conditions available on request.

INSTALLATION AND USER MANUAL This manual shall be read carefully, in order to use the boiler correctly and safely, and shall always be kept safely.

2 Technical features

2.1 Dimensions

CALDARIA CONDENSING 100 is a wall-mounted, modular, condensing, pre-mixed and blown thermal assembly, consisting of two thermal element installed in series.
The useful power of each thermal element reaches 48.5 kW (100%, 50°C-30°C) and is modulating from 30% to 100%.

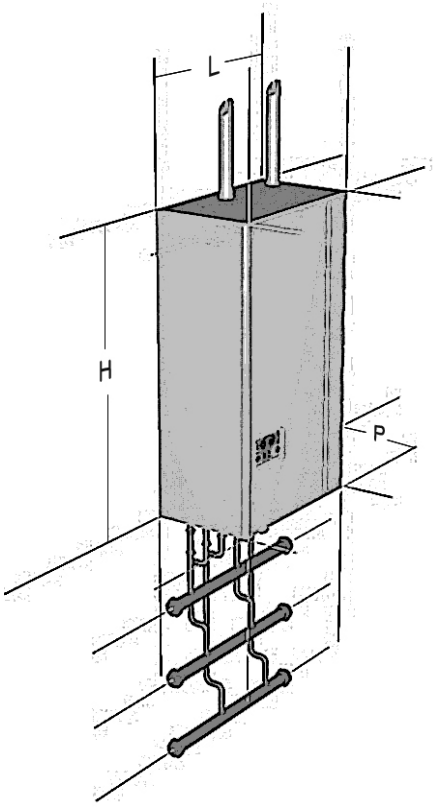


Figure 1

L – Width	600 mm
H – Height	1000 mm
P – Depth	380 mm
Water pipe (in)	1”
Water pipe (out)	1”
Gas pipe	¾”
Condensate pipe	18 mm

The efficiency of each generator reaches 108.7% in relation to the lower heating power of methane gas (Hi); thanks to the low temperatures of flue gas, an integrated flue gas collector entirely in plastic can be used, having a 50mm diameter and a glass-shaped connection, which can reach a height of 30 metres.

Caldaria Condensing 100 thermal assembly series is a great achievement as regards management, cost-effectiveness, reliability, and flexibility. Indeed, thanks to the last-generation electronic management, modularity and versatility that for more than ten years have characterised Caldaria Condensing 100 products, this assembly can be rapidly connected to any type of heating system and system for the production of sanitary hot water with accumulation, simultaneously managing three different systems operating at three different temperatures.

Caldaria Condensing 100 is fitted with an electronic management system, making it possible to combine several thermal assemblies in cascade, to create thermal stations which can reach an installed power exceeding 3000 kW.

Individual thermal units can be installed in cascade, besides applying the traditional ignition rotation, by means of a variable load factor, so that when the first unit reaches a certain power percentage (e.g. 30%), the following units start already, all with the same load factor.
This makes it possible to divide supplied power onto several heat exchangers with a power/exchange surface which is particularly useful to exploit latent condensation heat.

2.2 Main advantages

Total pre-mixing blown air burner
Condensing exchanger with efficiency until 108.7% (see Figure 2);
Power from 16 to 100 kW
Possibility to manage 60 thermal units (burners) in series
Flue gas maximum temperature 80°C
Plastic flue gas collector (self-extinguishing PPS) (see par. 3.5 ”Flue gas system “)
Ø 50mm flue gas exhaust for each thermal unit (see fig. **8**)

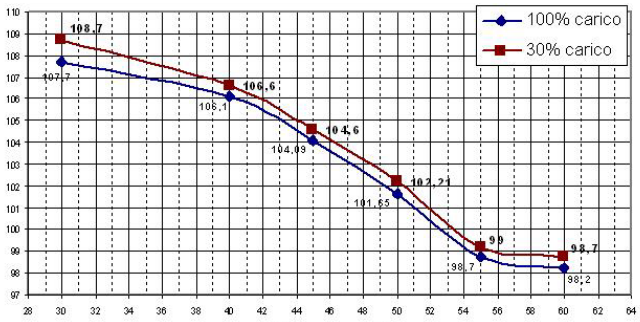


Figure 2

Flue pipe until 30 meters
Standard condensate discharge system in the boiler
Fast connection of water, condensate and gas (optional) collectors, with right and left outlet
Various thermal modules and the Master control station
Standard outside temperature regulation
Modulating and modular regulation of the power of individual thermal units;
Automatic inversion (adjustable time interval) of the burners' ignition order
Selection of the burner's cascade ignition criterion (power %)
Management of sanitary function and circuits at different temperatures, with or without operation priority;
Important safety devices, like a water differential pressure switch to control flux minimum flux for each unit

2.3 Construction details

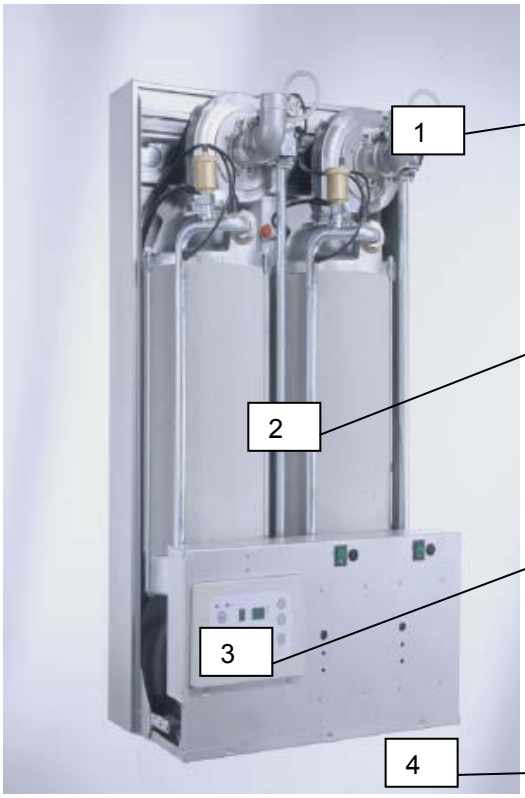


Figure 3 :Caldaria Condensing 100

1 Pre-mixing unit consisting of a modulating gas valve integrated with a high-head fan. The system ensures a constant mixing ratio in all operating conditions, and flue gas discharge through a plastic (PP) exhaust pipe, up to 30 linear metres long.

2 High-efficiency burnt 50 kW heat exchanger fitted with bi-metal corrugated internal coil:
water side: copper
flue gas side: stainless steel
The micro-flame burner is located high, at the centre of the exchanger, and is a grid-type, with one single ignition electrode

3 Digital control panel. The panel includes several adjustment functions and is equipped with a double display, which, depending on the circumstances, shows either the operation status or the error codes related to the most common failures

4 The Master/Slaves adjustment system is located behind the front panel. It consists of a master control unit that manages two Slave-type control units. Each slave card controls the operation and of the individual unit to which it is connected. The Master card can manage up to 60 Slave cards and is set for tele-management, temperature regulation, and remote control.

Caldaria Condensing 100 thermal assemblies have two thermal units inside the metal cabinet, respectively. Each thermal unit is connected to the hydraulic system and the gas supply in parallel to the others and consists of the following main components:
Heat exchanger
Pre-mixing assembly
Control and management slave card
Safety kit
50 mm polypropylene flue gas pipe
Each Caldaria Condensing 100 series may be combined, in series, with other similar generators, to create modular thermal station where the various thermal units are managed by one single Master card, which can be installed on any of the thermal assemblies making up the station.
It is necessary to install in each unit a two way valve or a pump. For more information see par. 3.7 and the section 4.

3 Installer instruction

3.1 Packing and product identification

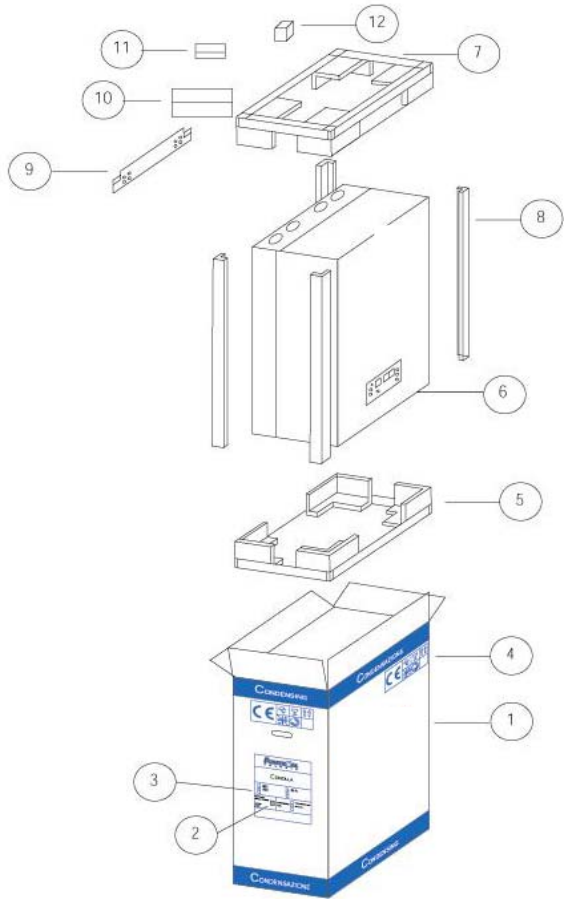


Figure 4

Caldaria Condensing 100 series heat generators are supplied on pallets, packed and protected with strapped cardboard.

It is important immediately to check for product integrity and correspondence with the order.
Product features are specified on the outer part of the packing: model, power, version, and fuel type.
Should the product not match with the order, immediately contact the point of sale where the product was purchased.

NUM.	DESCRIPTION
1	Packing
2	Product plate
3	Information about model/gas type
4	Information about EC mark/symbols
5	Lower support structure in polystyrene
6	Boiler
7	Upper support structure in polystyrene
8	Polystyrene angulars
9	Wall fixing plate
10	Envelope with warranty and manual
11	Envelope with dowels
12	Box with external probe (only in the models 100 Master)

The product rating plate includes the following data:
Product name
Registration number
Product identification code
Efficiency as per Directive EEC92/42
Gas type and feed pressures
CE certificate No.
Data on power supply
Primary circuit maximum pressure and temperature
Thermal power
Efficiency values
Hourly condensate production

CONDENSING THERMAL MODULES

serial number	07070584
code	RIC135001
0085	★★★★

category: II2H3+	type: B23, C63
PIN:	0085AQ0713
single phase power supply	230V 50Hz 169W
gas type:	natural gas/ LPG
gas pressure:	20mbar / 37mbar
nomina heat input Hs (kW):	50
nominal heat input Hi (kW):	45
primary water circulation: (°C):	forced
maximum temperature primary water (°C):	80
primary water pressure (bar):	max 6 min 0.5
heat output load 100% 80-60°C:	98.2%
heat output load 100% 50-30°C:	107.7%
heat output load 30% 80-60°C:	98.7%
heat output load 30% 50-3°C:	108.7%:
maximum condensate production (kg/h)	7.2

Figure 5

3.2 Mounting

3.2.1 Installation room

Caldaria Condensing 100 thermal assemblies shall be installed in accordance with the most recent applicable standards and technical regulations on thermal stations and condensing boilers, as with any other applicable provision.

3.2.2 Wall mounting

WARNING: Thermal assemblies Caldaria Condensing 100 series could be installed outdoor.

3.2.2 Wall mounting

The boiler must be installed on a solid masonry wall by means of hooks supplied together with the boiler, inside the packing (see Figure 4).
In particular, use the 4 expansion fixings (2 for each side) to fix the boiler plate to the wall (see Figure 6).
The boiler should be installed at a height ensuring that its upper part cannot be reached with your hands.

WARNING: Thermal assemblies Caldaria Condensing 100 series could be installed outdoor.

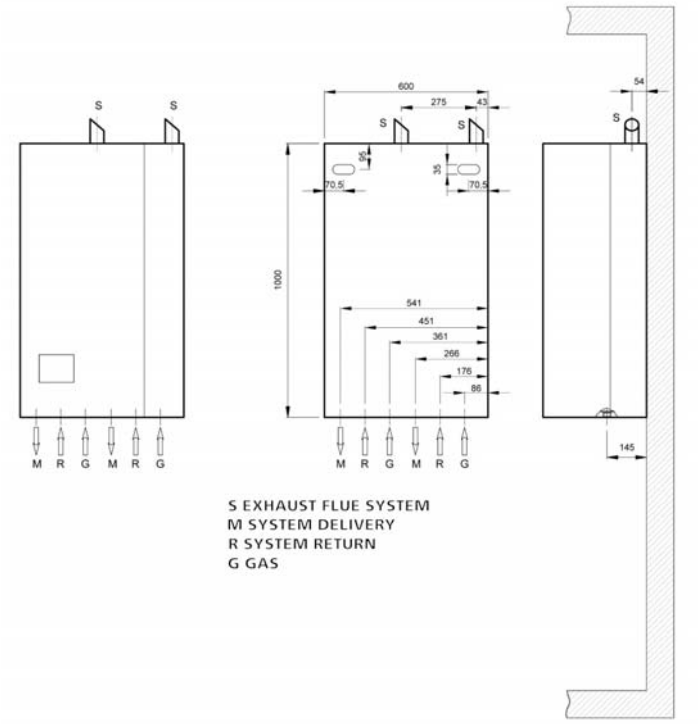


Figure 6

3.3 System cleaning

This preventive measure is absolutely required whenever a heat generator needs to be replaced in existing systems, but it is in any case recommended also on new systems, in order to remove any waste, dirt, working residues, etc.
To clean the system, if the old generator is still present in the system, it is advisable to:
- Add a descaling additive, such as FERNOX Superfloc 2%, to the system water;
- Have the system operate with the operating generator for approximately 7 days;
- Discharge the system's dirty water and wash once or several times using clean water. If the system is very dirty, repeat the last procedure one more time.

If the old generator is not present or available, use a pump to circulate the water + additive through the system for about 10 days and perform a final washing as described in the previous paragraph.
At the end of cleaning operations, before installing boiler Caldaria Condensing 100, it is advisable to add protection fluid FERNOX MB-1 AT 4% to the system water.

3.4 Gas system

The boiler is prepared for the gas type shown on the data plate that is inside the shell. It's important to verify the real match between available gas type and the type required by the boiler.
If your gas is a LPG it's important to verify the regulation of the pressure on the gas line.
The gas change procedure is shown in par. 7.1 "Gas change – Methane-LPG conversion"

3.5 Flue gas system

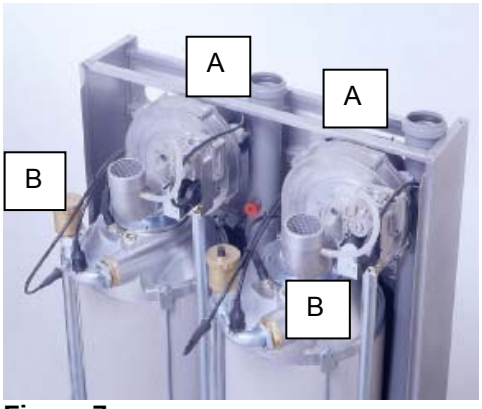


Figure 7

Each heat generator (unit) inside thermal assemblies Caldaria Condensing 100 has been validated equipped with a self-extinguishing polypropylene flue gas exhaust system (letter A in Figure 7) with glass-shaped connections.

As for the air supply system, since thermal assemblies Caldaria Condensing 100 have been validated as type B or type C assemblies, air can be taken directly from the boiler room through specific vacuum pipes (letter B in Figure 7).

In any case the air supply system has to be made in compliance with the applicable standards.

3.5.1 Pipe maximum length

Each 50 mm exhaust pipe maximum equivalent length is 30 metres with a maximum 4-metre flow resistance for each 90° bend.

3.5.2 Installation of one single thermal assembly with flue gas exhaust pipe running inside a cavity for pipe routing (open chamber operation)

For this type of operation, it should be checked that the cavity's size complies with the applicable standards (see par. 3.6).

Figure 8 shows the cavity's minimum size for the routing of two flue gas exhaust pipes.

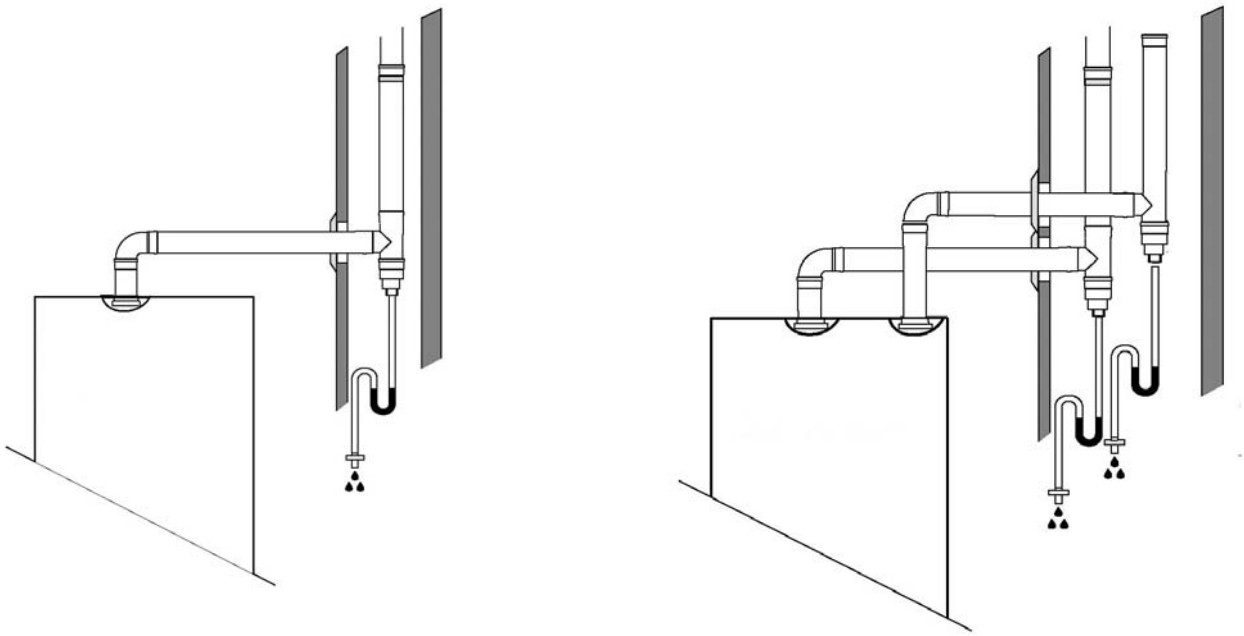
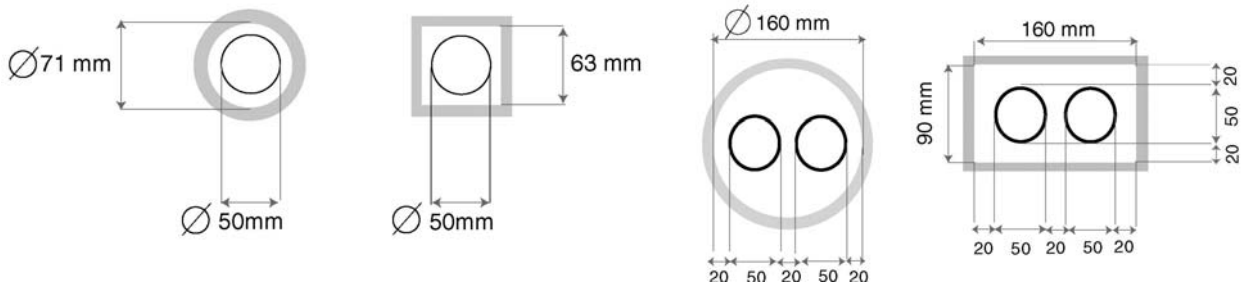


Figure 8



Should it be necessary to extend the vertical or the horizontal section of the discharge piping to over 4 metres, create a siphon for condensate drainage at the foot of the pipe. The siphon's useful length must be at least 30 cm. (see par. 3.6).

3.5.3 Connection to a flue gas manifold

The flue gas venting system for two or more Caldaria Condensing 100 installed in series can be realized with the installation of a polypropylene manifold (it's optional) with a diameter of 125 mm, with male/female connections.
The collector was conceived to collect the flue gas from the two 50mm pipes of a Caldaria Condensing 100, each of which contains a flue gas non-return device.
If you want to use the collector when several thermal assemblies are installed in series, the minimum distance required between the assemblies (150 mm) (see Figure 9) must be complied with.
In this way, the male end of one of the two collectors will connect more easily to the female connection of the nearby collector.

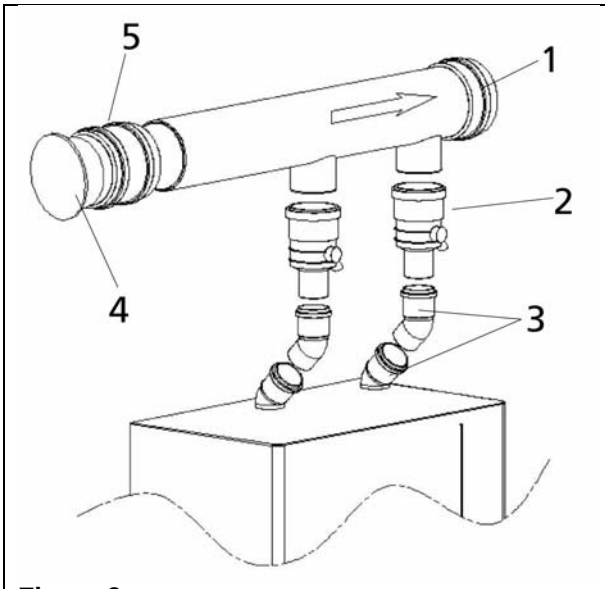


Figure 9

1	DN125 manifold
2	Non-return device (Clapet)
3	45° bend
4	DN125 Tap
5	DN125 joint

3.6 Condensate discharge

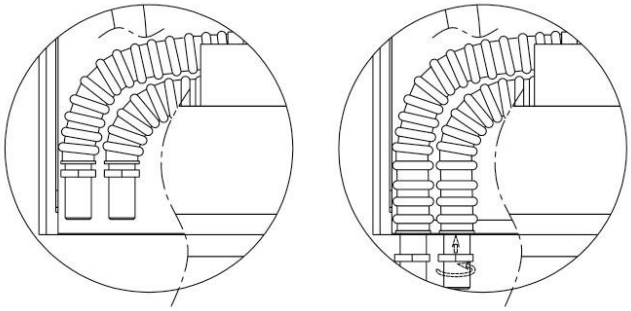


Figure 10

CALDARIA CONDENSING 100 allow the condensate discharge using the two little pipes shown in Figure 10. In the packing these pipes are in the shell (as indicated in Figure 10) so, first of all, it's necessary to extract them by using the two holes and then fix them with the two screwed rings.

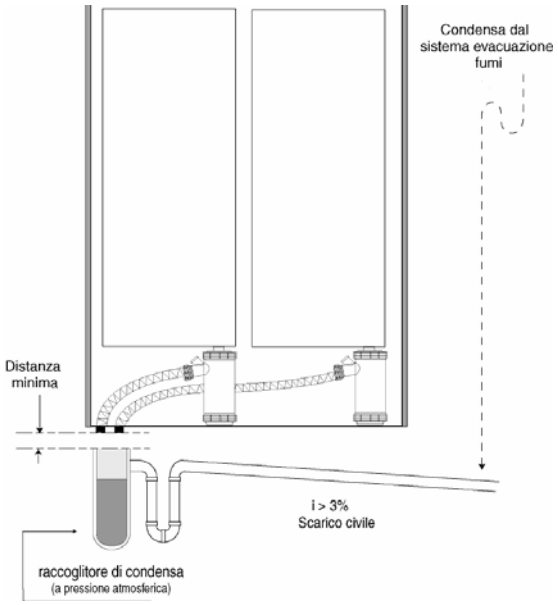


Figure 11

The condensate water produced by thermal assembly Caldaria Condensing 100 during its normal operation shall be discharged at atmospheric pressure, i.e. by dripping into a siphon-shaped container (
) connected as described in the following procedure:

- Create a drip pan under the condensate discharge system (see position on the installation template);
- Connect the drip pan to the sewage system by means of a siphon.
- Insert a neutraliser if required by the applicable law.

The drip pan shall be created and installed in accordance with the applicable technical standards (see par. 1.1).

It is advisable to use plastic pipes (PP) to create the condensate discharge system. Never use copper pipes, as the condensate would rapidly damage them.

3.6.1 Siphon along the discharge piping

Should it be necessary to extend the vertical or the horizontal section of the discharge piping to over 4 metres, create a siphon for condensate drainage at the foot of the pipe. The siphon's useful length must be at least 30 cm (see Figure 12). The siphon discharge shall then be connected to the sewage system.

Condensate maximum production (50°C-30°C)
100% : …….....14,4 Kg / h

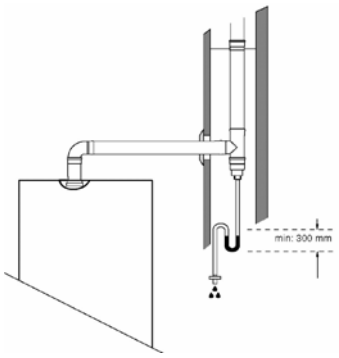


Figure 12

3.7 Hydraulic connection

In Figure 6 at page 7 there are the hydraulic connections for Caldaria Condensing 100. The connection sizes are:

Gas	***3/4"*** (G in **Figure 6**)
System delivery	***1"*** (M in **Figure 6**)
System return	***1"*** (R in **Figure 6**)

To create the hydraulic connection, two kits are available:
the first one can be used for the installation of one Caldaria Condensing 100;
the second one is designed for the battery installation of maximum four Caldaria Condensing 100 (in this case the system has a power of 400 kW). It is necessary to complete the connection to the hydraulic set using a two way valve or a pump (see also par. 4).

In the following pictures is shown the kit for a Caldaria Condensing 100 composed by the following items:

N°1 gas collector Ø45 mm
N°1 delivery collector. Ø45 mm
N°1 Return collector. Ø45 mm
Each collector is fitted with 2 branch pipe, at whose ends are two 1' taps for delivery and return collectors, and two ¾' taps for the gas collector. In **Figure 13** we have a connection using the two way valve kit and in Figure 14 a connection using the pump.

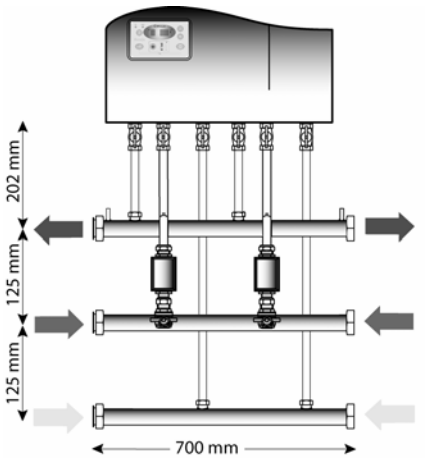


Figure 13

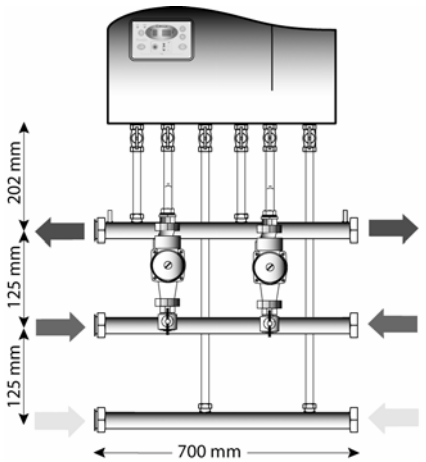


Figure 14

In
Figure 15 and
Figure 16 is shown the kit for two Caldaria Condensing 100 composed by the following items :
N°1 gas collector Ø3”
N°1 delivery collector Ø3”
N°1return collector Ø3”
The collectors arrive until 400 kW in an installation of four Caldaria Condensing 100. Each collector is fitted with 2 branch pipe, at whose ends are two 1' taps for delivery and return collectors, and two ¾' taps for the gas collector.
In this case it is also possible to complete the connections using a two way valve kit (see Figure 15) or using a pump kit (see Figure 16).

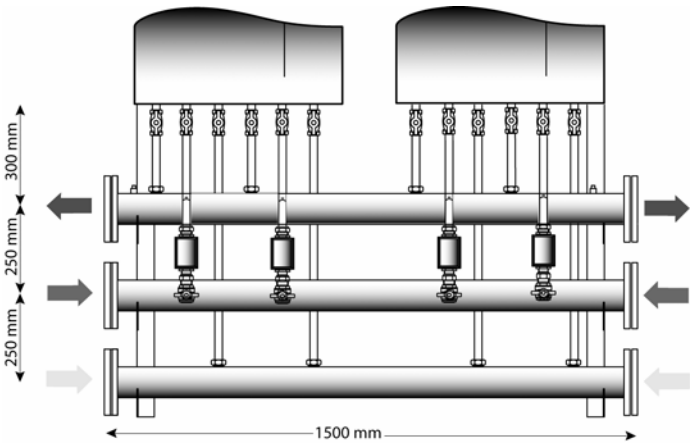


Figure 15

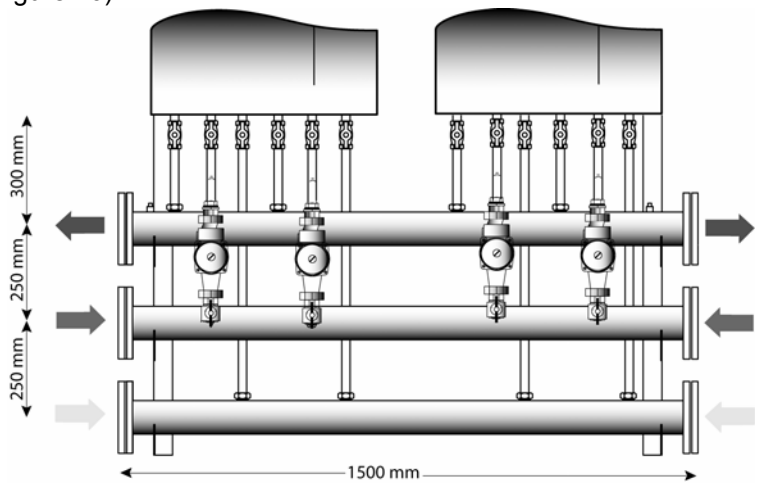


Figure 16

3.7.1 Operating pressure

The maximum operating pressure is 6 bar, its minimum operating pressure is 0.5 bar. Each unit has a safety valve at 5.5 bar

3.7.2 Filling and emptying

The boiler should be filled connecting the water network to any system point.
The boiler should be emptied using the relevant valves in the relevant system points.

4 Installation drawings

A plant scheme must be fit for the technical boiler features: so it’s possible to utilize in the better way boiler’s efficiency and to keep the plant in good conditions for a long time. The figures below show some possible solutions for Caldaria Condensing 100 installations schemes.
In the following schemes we can use a connection with a pump for each unit or a connection with a two way valve for unit. In the first case the unit pump supplies the adequate flow for each unit and the system pumps are dimensioned for the pressure drops of the system. Figure 17 shows a 150 kW installation with a pump for each unit. In Figure 18 it is shown a similar system with a header.

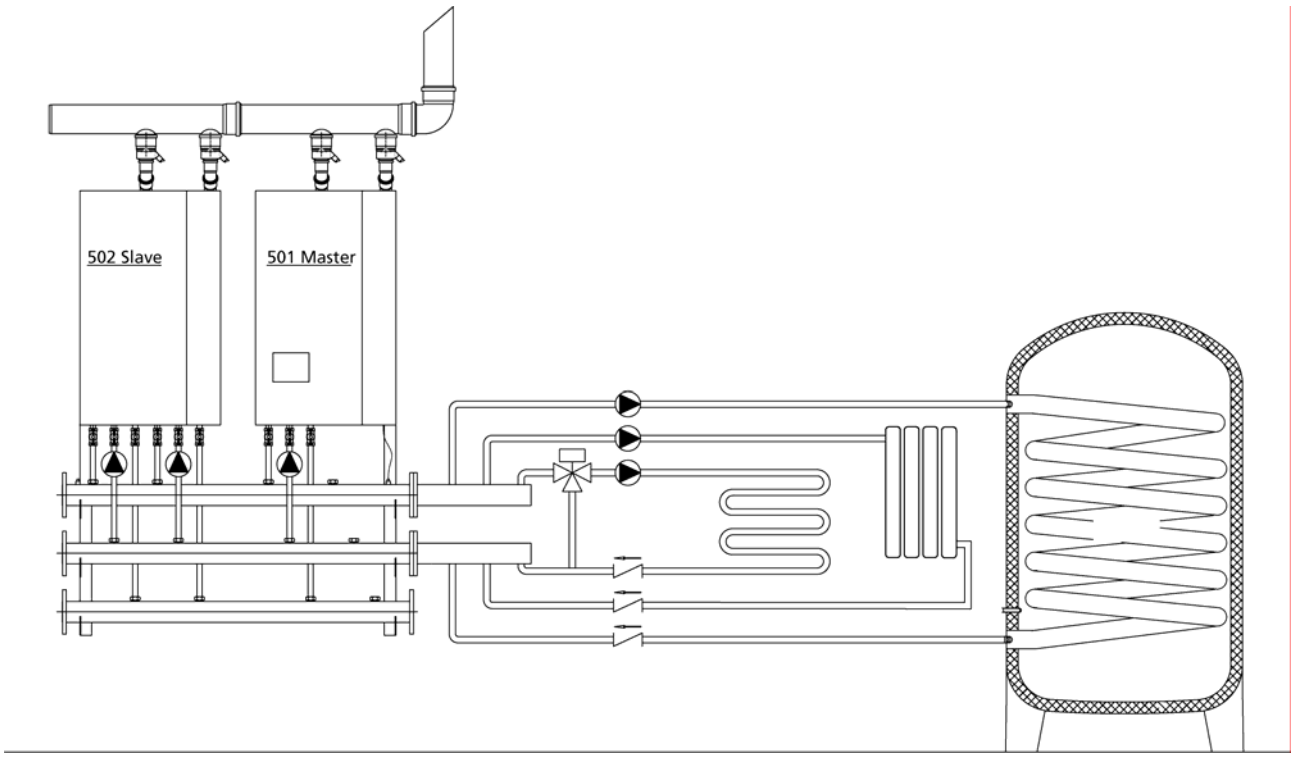


Figure 17

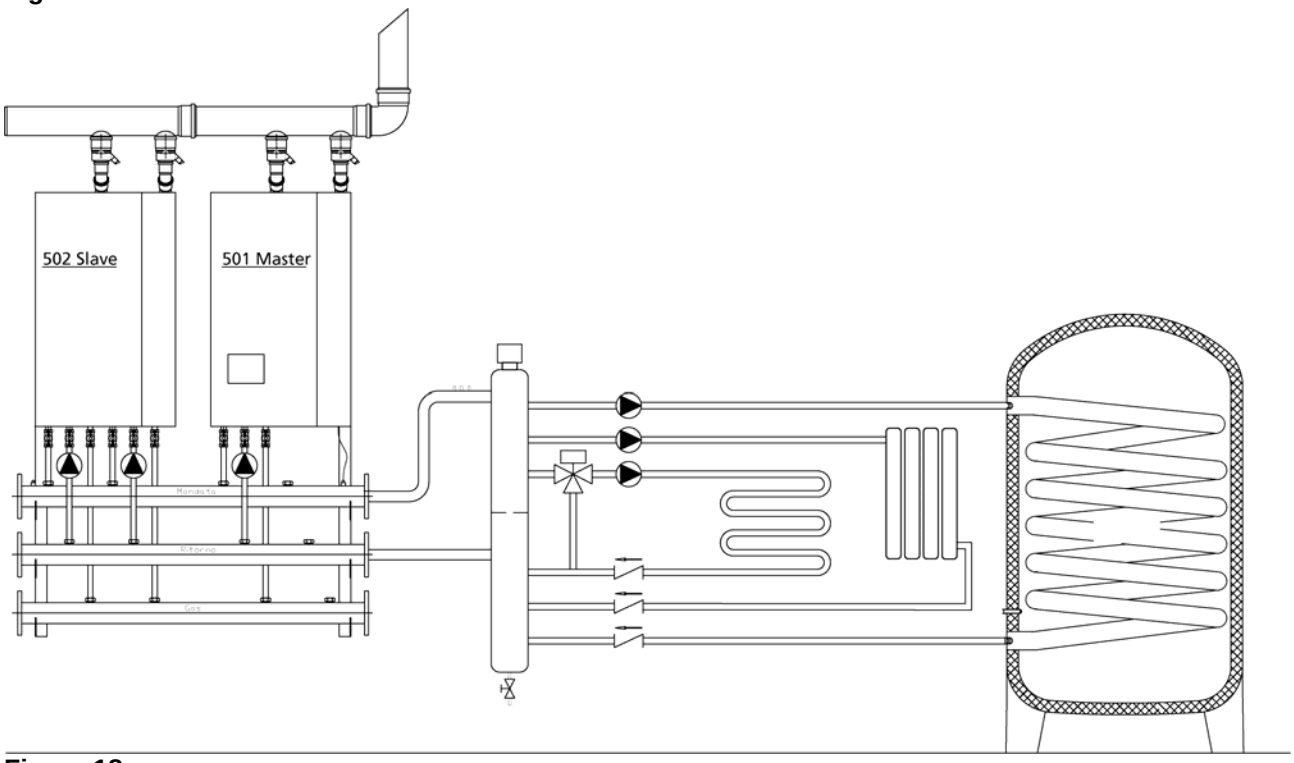


Figure 18

In Figure 19 and in Figure 20 we have two schemes with a two way valve for each unit. In the system shown in Figure 19 it is necessary to calculate the three pumps (for high temperature, low temperature and sanitary hot water) to guarantee in any case an adequate flow for each circuit and for each unit. The choice of an adequate pump is easier when we have a header between the units and the system as shown in Figure 20. In this case the pump between the header and the units supplies only the adequate flow for the units and the header.

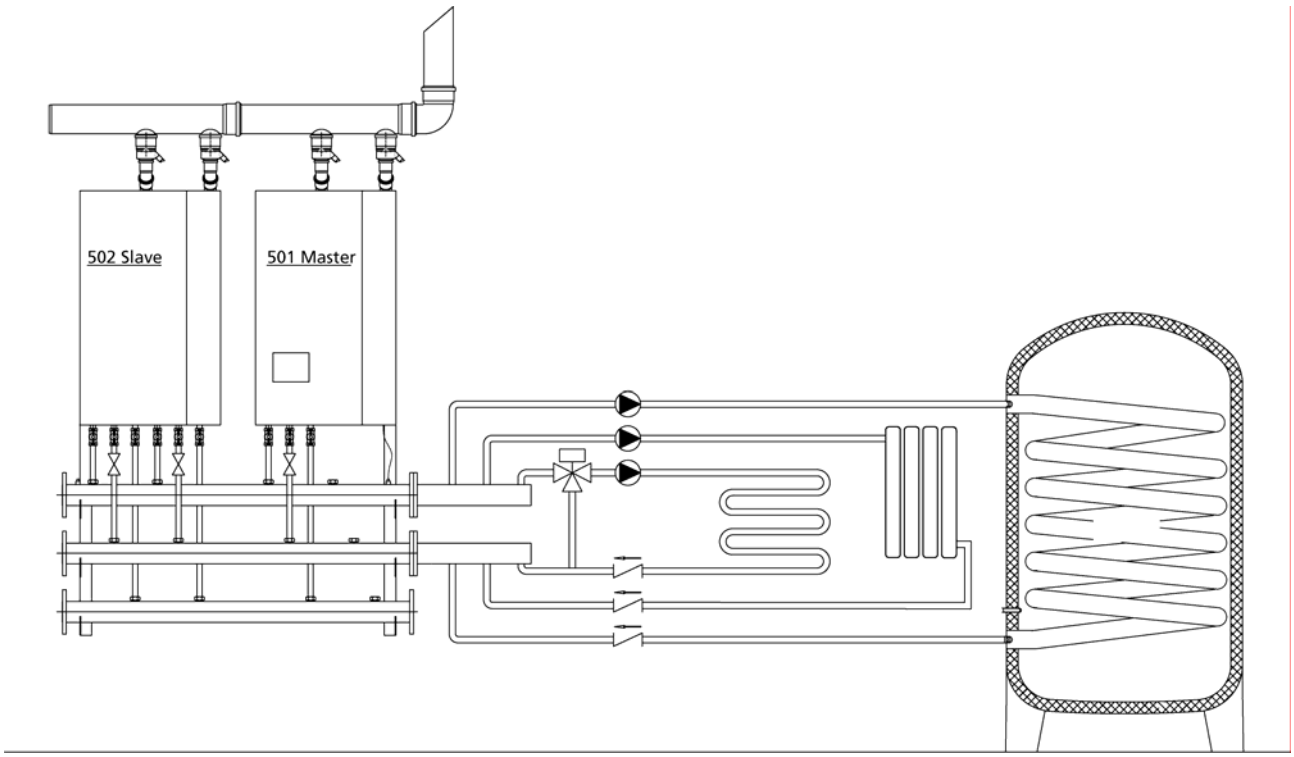


Figure 19

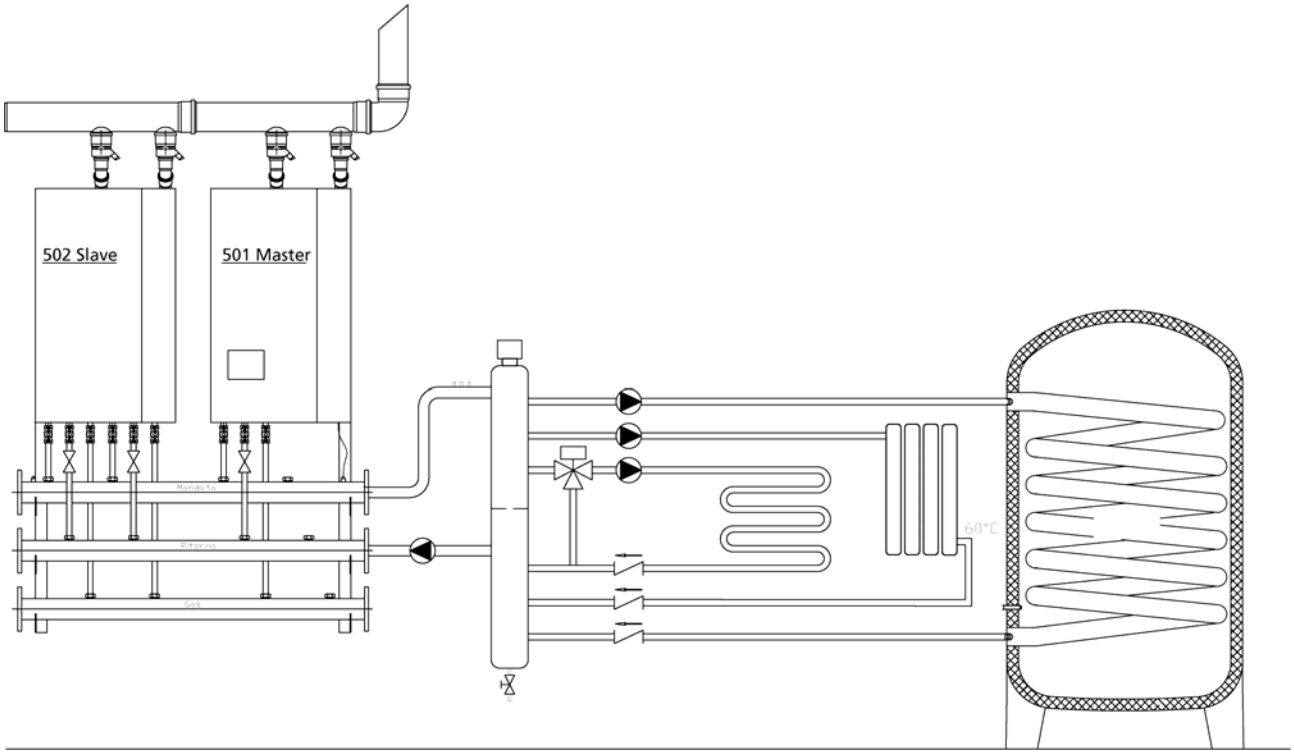


Figure 20

To help the designer choose the correct pump, Figure 21 shows the curve of flow resistance values inside the boiler (for a Caldaria Condensing 100)
In the case of an installation in series the designer could use the curve flow shown on Figure 22, where there is the pressure drop curve for a general installation with n burners: changing the n value (n=1, 2, 3….) the designer could obtain different flow resistance value.

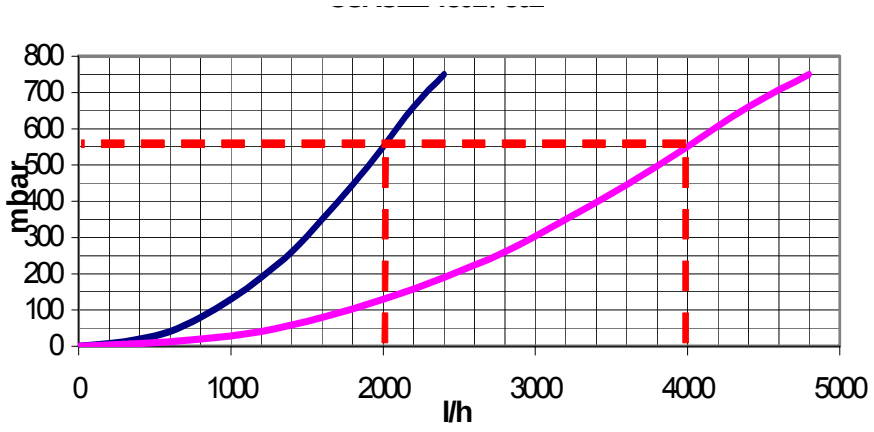


Figure 21

For example if we have one Caldaria Condensing 100 master and two Caldaria Condensing 100 slave connected (with a total power of 300 kW) on the x we have a flow rate of 2000 x 6 =12000 l/h (12 m^3/h) and the correspondent value for the pressure drop.

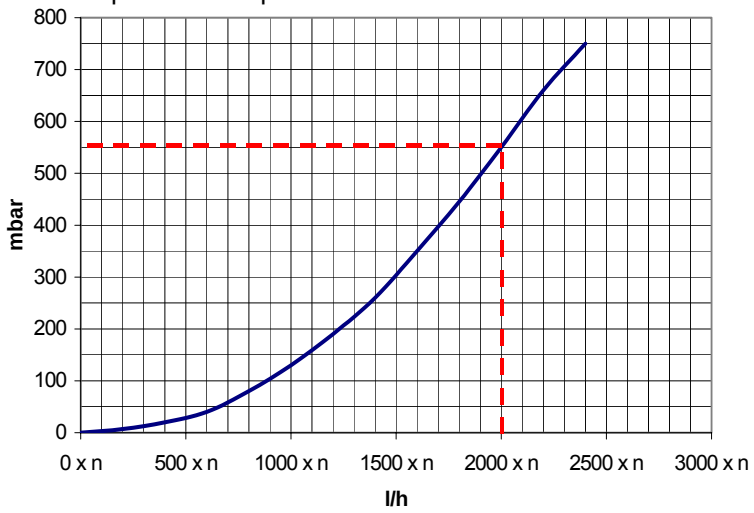


Figure 22

We have to remember that the pump has to supply 2000 l/h with a pressure drop of 6 meters. To assure a correct performance of the pump, it is necessary to use a pump with a curve flow/pressure-drop as plate as possible.

5 Power supply system

5.1 Power supply

The electrical drawing of the Caldaria Condensing 100 series thermal assembly is shown in detail in chapter 11.
Some important electrical features of the thermal assembly are specified on the appliance's rating plate. (Figure 5)

Boiler installation requires the connection to a 230 v - 50 Hz mains. The connection should be made in full compliance with the applicable electrical standards.
However, it is always advisable to install a magneto thermal differential switch along the boiler's power supply line.
In Figure 23 is shown the terminal block of the master board. In Figure 24 is shown an example of an electrical connection of some external device.

5.2 Warnings

Always check the effectiveness of the earthing of the electrical system to which the thermal assembly is going to be connected. Indeed, should the earthing be inefficient, the correct operation of the ignition/detection electrode might be affected.

Warnings

- 230 V voltage cables must be separated from the 24 V ones using independent PVC conduits.
- Before connecting external electrical components (regulators, electrical valves, outside temperature probes, etc.) to the thermal assembly, make sure that their electrical features (voltage, absorption, pickup voltage) are compatible with the available inputs and outputs.
- Never switch off the boiler during its normal operation (when the burner is on), suddenly cutting off the power supply by means of the on-off button. This may cause an anomalous overheating of the primary exchanger. To switch off the boiler (during the heating stage) use an environment thermostat or a remote control
- To connect external devices, use the adequate relays (see the electrical schema at pag. 34). In this way it is possible to use the external devices also in emergency mode (see par 5.3.9)
- Do not touch electrical appliances with wet or humid body parts.
- Do not expose the appliance to the elements (rain, sun, wind, etc.).
- Do not pull the electrical cables.
- Do not let the appliance be operated by non-expert people. Should the power supply cable break, switch off the thermal assembly. To replace it, contact qualified personnel.

5.3 Electrical connections

5.3.1 5.3.1 Connection to temperature regulation devices

Caldaria Condensing 100 series thermal assemblies are fitted with a very versatile control and management system, which can manage up to three independent circuits operating at different temperatures.

5.3.2 Antifreeze protection

The thermal assembly's management electronics includes an antifreeze function. When the delivery temperature drops below a minimum limit (programmable), the burners switch on at minimum power, as set in the operation parameters. The antifreeze function is activate also when the external probe is not connected. The parameter 14 (high temperature zone Ch1) and the parameter 22 (low temperature zone Ch2) are by default in climatic mode. If you wan to disconnect the external probe, it is necessary to change the value of the parameters 14 and 22. Only a Robur authorized Technical Support Service can operate this parameter variation.

5.3.3 Pump connection

Caldaria Condensing 100 series regulation system includes the simultaneous management of up to three circulators.
Therefore, if it is necessary to use a general pump to assure the circulation (P3 in Figure 24) and there is a low temperature circuit, the pump of this circuit (P4 in Figure 24) will be managed directly by a room thermostat .This operation is carried out by setting the parameter n° 34.
The pumps shall be installed using an adequate relay/commutator, (see also par. 5.2)
With this device we can supply pumps directly from the electrical system, not using the fusible present in the board.

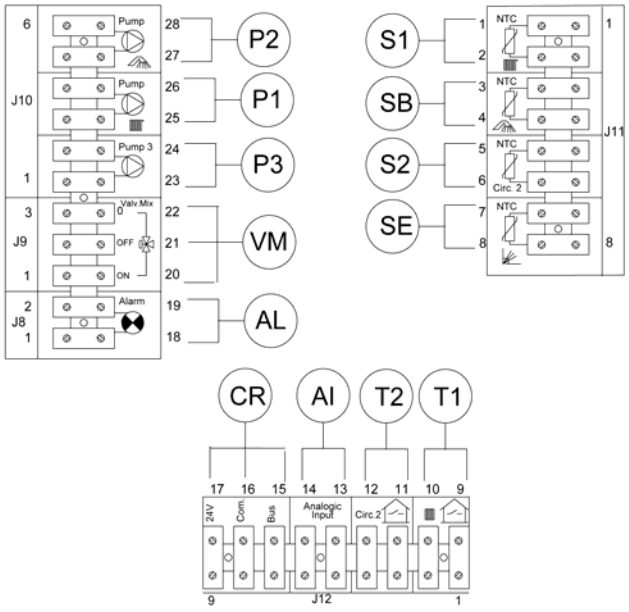


Figure 23

Code	N. Jumper	Description
S1	J11 (1-2)	Flow temperature probe (High)
SB	J11 (3-4)	Sanitary temperature probe
S2	J11 (5-6)	Flow temperature probe (Low)
SE	J11 (7-8)	External temperature probe
T1	J12 (9-10)	Room thermostat (High)
T2	J12 (11-12)	Room thermostat (Low)
AI	J12 (13-14)	Analogical device 0-10V
CR	J12 (15-17)	Remote control
AL	J8 (18-19)	Alarm device
VM	J9 (20-22)	Mixing valve
P3	J10 (23-24)	Low temperature circuit pump
P1	J10 (25-26)	High temp. circuit pump
P2	J10 (27-28)	Sanitary pump

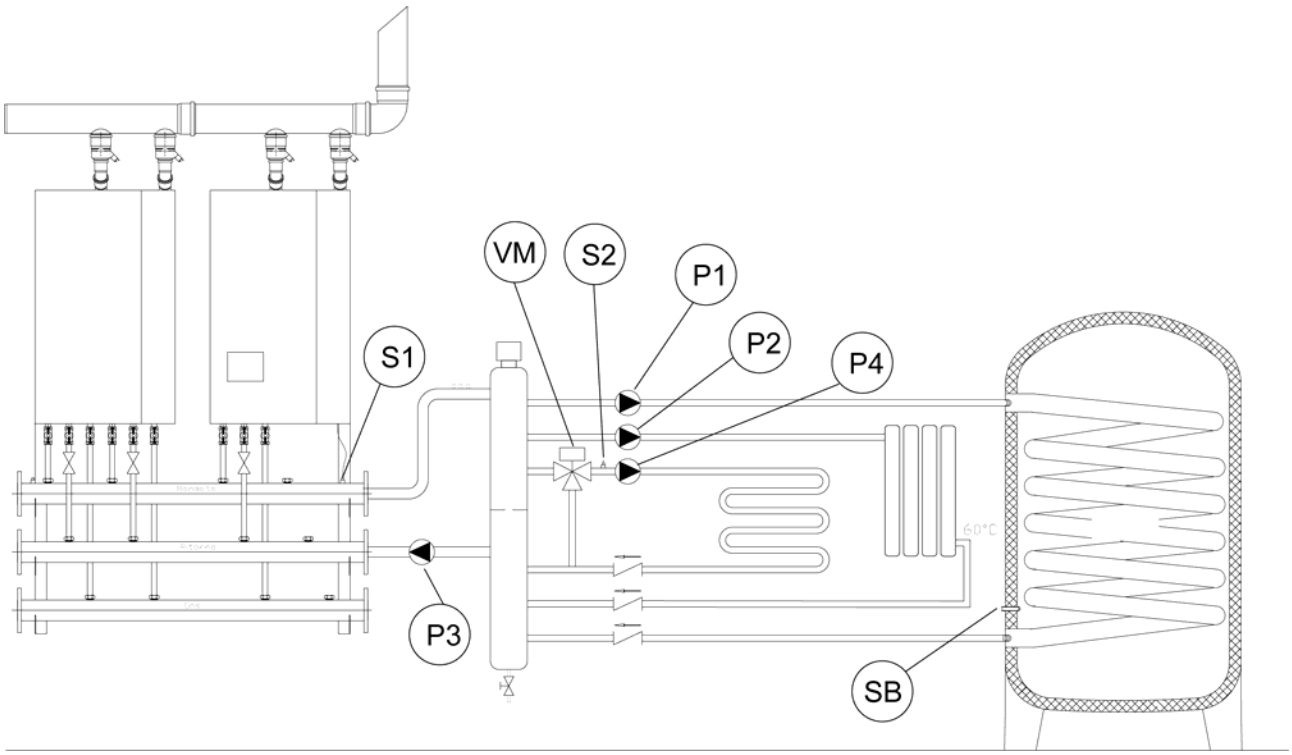


Figure 24

5.3.4 Room Thermostat connection (on/off))

Connect the high temperature system's environment thermostat to terminals no. 9 and 10 (Figure 23).
The low temperature system's thermostat shall be connected to terminals no. 11 and 12 (Figure 23).

5.3.5 External probe connection

If outside temperature regulation is to be used, the outside probe (optional) needs to be connected to terminals no. 7 and 8 (Figure 23).
The outside probe shall be installed on an outer wall, North or North/East, at a minimum height of 2.5 metres, away from windows, door, and ventilation grids.

Never install the probe in a position exposed to the sun. If it is necessary to modify the climatic curve set, please contact a Robur Technical Support Service.

5.3.6 Connection of an external regulation 0-10v

It is possible to use the terminals n. 13 and n. 14 (Figure 23) for an external power or set-point regulation. The input signal is a DC voltage with a range of 0-10 V. It is important to connect the positive input to the terminal n. 13.

5.3.7 Connection of an alarm device

A 220 V clear contact block output on the boiler's terminal strip allows to connect an outside sound or visual alarm device, capable of highlighting any technical anomalies.
The alarm device must be connected to terminals no. 18 and 19 (Figure 23)

5.3.8 Connection of a remote control

If the remote control is to be used, it must be connected to terminals no. 15, 16, and 17 (Figure 23).

5.3.9 Emergency mode

Caldaria Condensing 100 series electronic management system includes an operation mode called "Emergency" mode, which can be activated in case of malfunctioning of the Master card.
Indeed, to ensure continuous operation of the thermal assembly, the master card can be disabled in such a way as to have the system operate at a default delivery temperature set by the Manufacturer.
To enable the "Emergency" function, carry out the following procedure:
a. Disconnect the 4-pole connector J14 from the Master card (see Figure 25);
b. Set all four J17 switches located on each Slave of the thermal assembly on the Off position (Figure 26);
c. Supply all system circulators with mains current, using the appropriate switches;
d. terminal X1 or terminal X2 which are part of the cabling of the J14 connector disconnected in point a) of this procedure must be connected to a 24V ac power supply (see Figure 27).

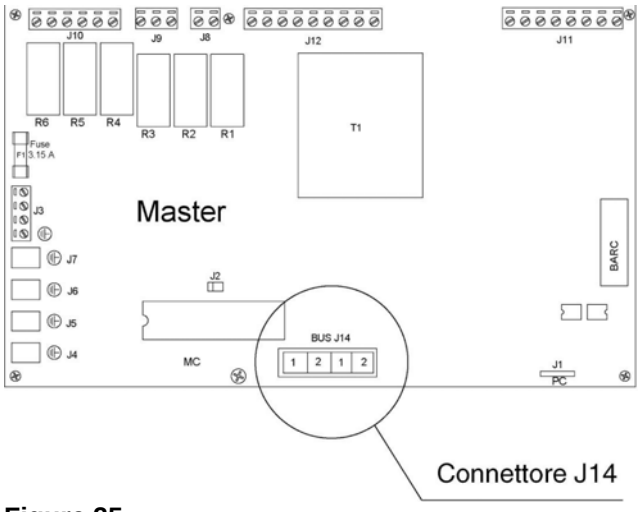


Figure 25

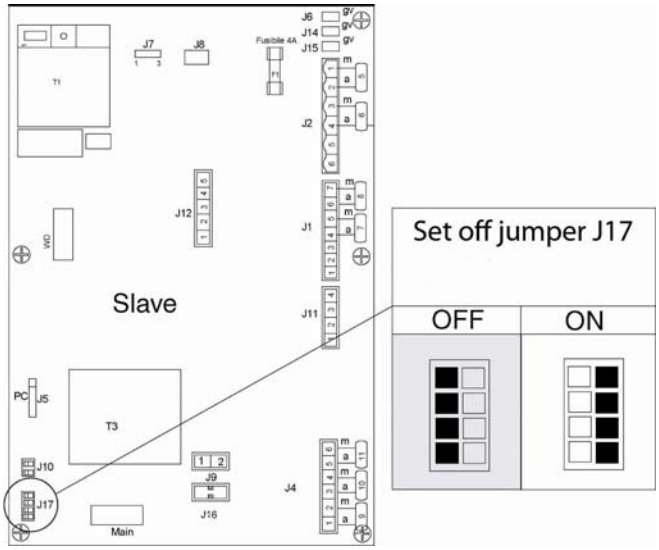


Figure 26

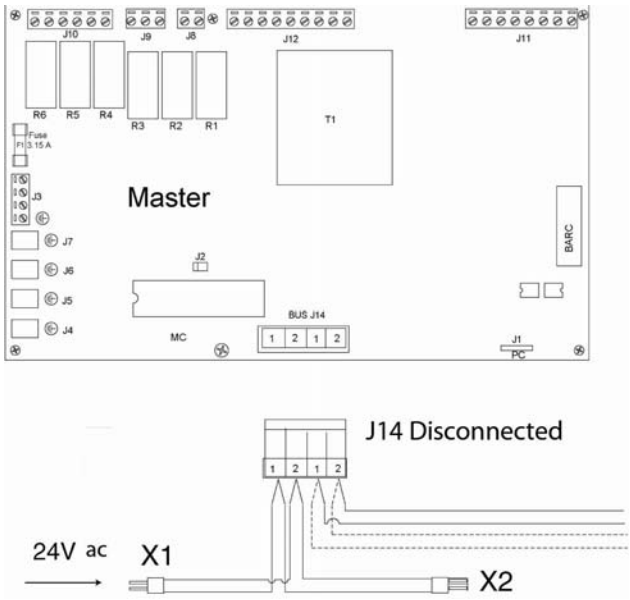


Figure 27

Warning: if several Caldaria Condensing 100 are installed in series, one of the two terminals (X1 or X2) or both may be connected to the adjacent thermal group or groups. If this is the case, supply the free terminal with 24 V, (see par. 5.3.10).

5.3.10 Battery installation

On of the many functions included in Caldaria Condensing 100 electronics allows for the installation of several modules in series, to create thermal assemblies having an overall power exceeding 75 kW.
This type of system requires on single Caldaria Condensing 100 series equipped with a Master control unit, while all other Caldaria Condensing 100 will have no control unit.
The cabling of some electronic components present on the system should be carried out as illustrated in Figure 28.
The setting of the electronic components is explained in chapter 7.2

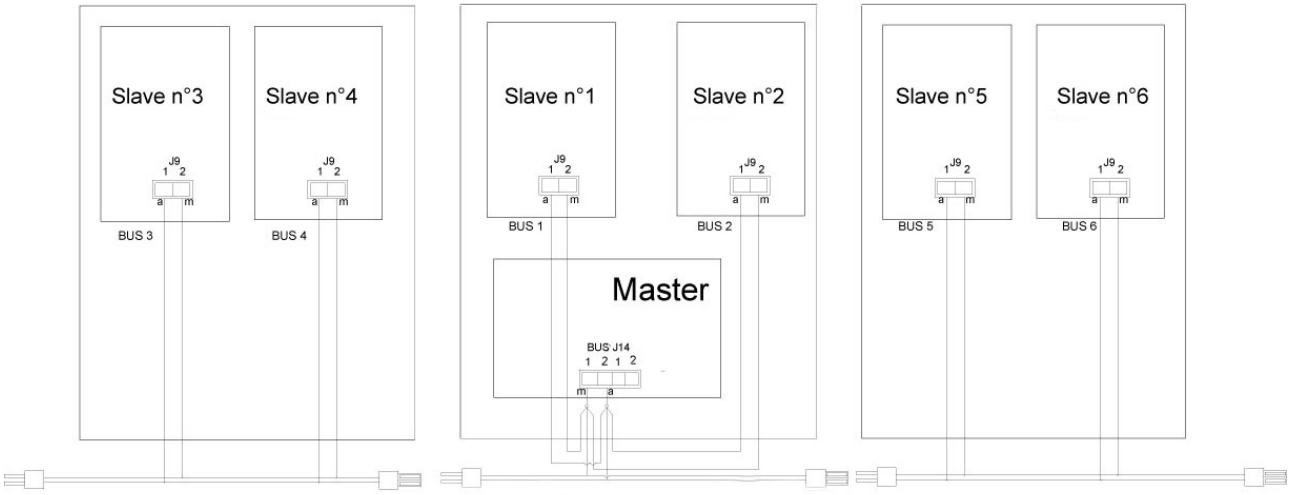


Figure 28

6 Regulation

6.1 Digital control panel: keys description

Caldaria Condensing 100 digital Master control panel (Figure 29) is located in the front, low and left, of the boiler's shell.
The panel includes several adjustment functions and is equipped with a double display, which, depending on the circumstances, shows either the operation status or the error codes related to the most common failures.

Each key has a particular meaning, because there are many use modes.

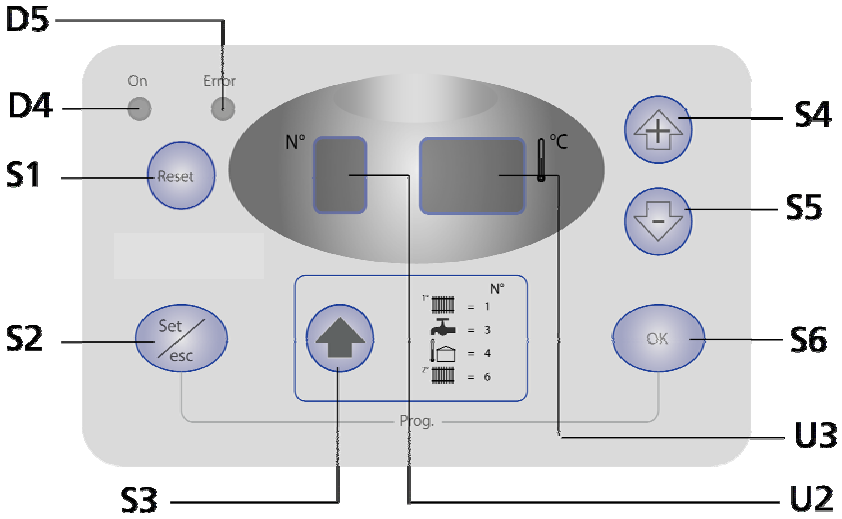


Figure 29

KEY	LEGEND	KEY DESCRIPTION
S1	Reset	It is necessary to unblock the electronic board after a permanent block
S2	Set / esc	It is necessary to enter into parameters and monitor mode for the singles units
S3	Arrow	It is necessary to display the functioning state of master circuits
S4	Increment	It is necessary to increase a value
S5	Decrement	It is necessary to decrease a value
S6	Prog/OK	It is necessary to store a value
U2	Luminous display	Display information about boiler condition
U3	Luminous display	Display information about boiler condition
D4	Green led	If lighted, it indicates that the system has power supply
D5	Red led	If lighted, it indicates an anomaly

6.2 Display during normal operation

The red led, D5, is turned on in case of anomalies which imply the permanent block-out on any unit (only the Mater or Slave reset button will restore normal functioning).
The green led, D4, shows power on. The 3 7 segment displays shall visualize:
:

SYSTEM STATUS	DISPLAY
No demand from the heating and sanitary circuit (figures on the right display the T1 e.g. T1=30°C)	0 30
Demand from circuit N°1 or simultaneous functioning the 1° and 2°. (figures on the right display the T1 e.g. T1=80°C)	1. 80
Demand from sanitary circuit or simultaneous functioning. (figures on the right display the T1 e.g. T1=80°C) the dot after the first figure must be flashing	1. 80
Demand from 2° circuit (figures on the right display the T1 e.g. T1=80°C)	1'80
Antifreeze function is active or external probe is disconnected (see also par 5.3.2)	F 80

6.2.1 Functioning values display

Press S3 (arrow) to step forward from functioning display and to visualize the following value (below listed values shall be displayed in succession by pressing the S3 button).

POS.	DISPLAYED VALUE	DISPLAY
1	Flow Temperature High T1 (e.g. T1=80°C)	1. 80
2	Sanitary Temperature T3	3. 50
3	Outdoor temperature T4	4. 7
4	Flow Temperature Low T6	6. 50
5	1° circuit room thermostat open or close (e.g. Ta1 close - oF - ; Ta1 open - on)	K. oF K. on
6	2° circuit room thermostat open or close (e.g. Ta2 close - oF - ; Ta2 open - on)	L. oF L. on
7	Analogical Input 0-10V (e.g.. 5.5V; 10V)	7. 5.5 7.10
8	Mixing valve status e.g. close	8 _[
9	Main pump status (e.g. pump not functioning; e.g. pump functioning)	P 1.0 P 1.1
10	Sanitary circuit pump status (e.g. pump not functioning; e.g. pump functioning)	P 2.0 P 2.1
11	Secondary pump status (e.g. pump not functioning; e.g. pump functioning)	P 3.0 P 3.1

6.3 User's parameter change

From "Functioning values display" the following users' parameters can be modified:
Setpoint high temperature circuit
Setpoint sanitary circuit
Setpoint low temperature circuit

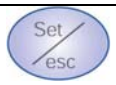
By pressing S3  (SET/ESC), on the values display respectively:
T_flow_system_high. (pos.1);
T_dhw (pos.2);
T_flow_system_low. (pos.4).

Follow the procedures below to modify one of the three parameters above:

Press S2 

: according to the relative functioning value. the set point value will flash on the last two digits
If the value does not need to be changed, press S2 (SET/ESC) to return the display mode. If the value needs to be modified, press S4 (+) and S5 (-) until the desired value will be displayed. Press S6 (Progr./OK) to store the value. Said value will stop lashing and after 3 seconded the display mode will be restored.

In the following table is shown the procedure to change the setpoint of the low temperature circuit from 50° to 40°

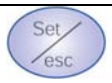
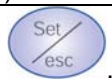
	PROCEDURE	DISPLAY
1	E.g. installation running with T_flow_system_high at 80°C	0 80
2	Press S3  (arrow), to access into the display mode, press again till the value detected from T_flow_system_low is displayed (e.g. fig.8, 50°C).	6. 50
3	Press S2  (Set/esc)	6 · 5 0 ·
4	Press S5  till the set point returns to 40°C	6 · 4 0 ·
5	Press S6  (Progr/OK) to store the value.	**6. 40**
6	After 3 sec. the display returns to the parameters display mode and the T6 is displayed	**6. 40**

If no procedures are carried out for 10 seconds after that S2 (SET/ESC) has been pressed (to modify the set point of the corresponding parameters to the one displayed), the boards returns to “functioning values display” mode
If after pressing + or – the buttons aren’t used for a period of one minute the display also returns to “functioning values display” mode. When this happened the new setting will not be stored.

6.4 Monitor mode
Press S2 (SET/ESC) for 5 seconds to access the “monitor” mode.

6.4 Monitor mode

Press S2  (SET/ESC) for 5 seconds to access the “monitor” mode.
This mode will allow to check the functioning values of the single unit of the system. (address from 1 to 60).
Procedures to follow to enter the “monitor” mode.

POS.	OPERATION	DISPLAY
1	The installation is running with T1 at 80°C	1. 80
2	Press S2  (SET/ESC), for 5 sec. the display shall indicate that it is possible to read the functioning value on address 1 unit	U 01
3	Press S4 (+)  and S5 (-)  to read the values of the desired unit E.g. unit19.	U 19
4	Use S3 (arrow)  to display both the first functioning value of the selected unit and the sequence of all the values that can be displayed. E.g.. value n°1 (flow probe temperature 70°C)	1 70
5	To exit “monitor” mode, press S2 (SET/ESC)  . If no procedures are carried out for 5 minutes, the boards automatically returns to “functioning display”	1. 80

Trough S3 S3  (arrow) the following values can be displayed for each unit::

POS.	VALUE	DISPLAY
1	Flow probe (e.g. 70°C)	1 70
2	Return probe (e.g. 50°C)	2 50
3	Flue probe (e.g. 60°C)	5 60
4	Ionization current (index from 0 to 99) E.g. Ionization current index 44	[44
5	PWM signal for fan (%). If PWM=100% , 99 value is displayed (e.g. 66%)	7 66
6	Contact Open or Close by flux switch E.g. open contact	F. on F. oF
7	Unit pump on/off E.g. pump on E.g. pump off	8. on 8. oF
8	Max ionization current (index from 0 to 99) in a start attempt E.g. Max ionization current index 80	1 80
9	Unit functioning hours (from 0 to 9999 hours) E.g. fig. 8050 hours	H 80. H 50

7 Assistance

To complete the start-up of the boiler, the following operations are necessary:

1. Verification of the installation;
2. Gas verification and, if it is necessary, gas change (see par 7.1);
3. Combustion analysis ;
4. Slave board setting (see par. 7.2).

7.1 Gas change – Methane-LPG conversion

7.1.1 Introduction

The boiler has a configuration for methane. It is possible to change this configuration only using the transformation kit supplied by ROBUR S.p.A.. The following operations must be carried out only by the authorized Service Technician. To transform from methane to LPG the diaphragm (Figure 30) has to be used.

Figure 30

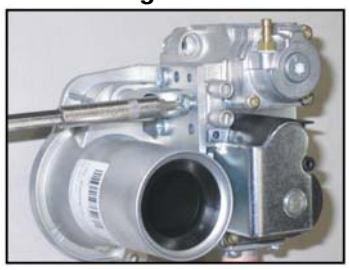


Figure 31

1 =.Methane with flue gas system's overall length below 15 metres
2 = Methane with flue gas system's overall length over 15 metres
3 = LPG with flue gas system's overall length below 15 metres
4 = LPG with flue gas system's overall length over 15 metres

7.1.2 Operating instruction

1. Shut any electric supply.
2. Close the gas valve.
3. Unscrew the two screws to remove the frontal panel.
4. Remove the 3 screw from the gas valve (Figure 31).
5. Disconnect the venturi from the valve. At this moment it is possible to see the nozzle hole with the gasket (Figure 32).
6. To change from methane to LPG insert the diaphragm Ø 6.5 (or Ø 6.75) into the nozzle hole. Attention! Do not remove the gasket (Figure 33 and Figure 34). If using the Ø 6.5 diaphragm the unit doesn't start, then install the Ø 6.75 diaphragm.

Note: to change from LPG to methane, remove the diaphragm present into the hole.

7. Reassemble the gas valve and the venturi. Switch on the general supply. (**Attention**! Be sure there is not request from any room thermostat). Open the gas supply.
8. Change the parameter n.36 as below indicated:

Figure 32

Figure 33

1 =.Methane with flue gas system's overall length below 15 metres
2 = Methane with flue gas system's overall length over 15 metres
3 = LPG with flue gas system's overall length below 15 metres
4 = LPG with flue gas system's overall length over 15 metres

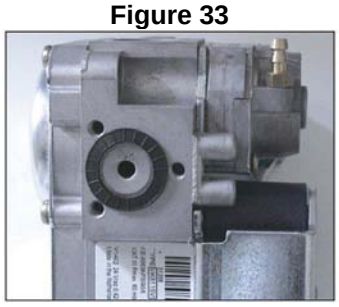


Figure 34

7.1.3 Gas valve regulation

To adjust the gas valve, follow this procedure:

1. Put the flue sensor into the flue system. (Figure 35)
2. Rotate the Venturi gas regulation screw (throttle) with two turns on the left as shown in Figure 36.
3. Make sure that there is a request from at least one of the two room thermostat. If you have problems with the thermal assembly ignition rotate on the right the regulation screw, only one turn at time.
4. Give the maximum power to the boiler by using the digital control panel: you have to press at the same time S2 key (SET/ESC) and S4 key (+) just for 5 sec. Then it's possible to indicate the maximum fan speed by using the S4 key (par. n°15). All the system fans will work with this selected speed. On the first digit on the left it's shown the selected speed. H = maximum speed. Other two digit will show the water flow temperature (example T1=80°C).
5. Regulate the combustion acting on throttle (Figure 36) until you arrive to the nominal CO2 value shown in the below table. NOTE. To increase the gas flow rotate on the left while to decrease the gas flow rotate on the right.
6. Let the boiler arrive to the maximum power and then change, if it's necessary, the Venturi regulation.
7. Let the boiler arrive to the minimum power by using S5 key (-).
8. On left of the display it will appear a "L" (Low= minimum power); act on the gas regulation screw Offset (see Figure 37) to arrive to the values present in the below table.

NOTE. To increase the gas flow rotate on the right while to decrease the gas flow rotate on the left.

Figure 35

Figure 36

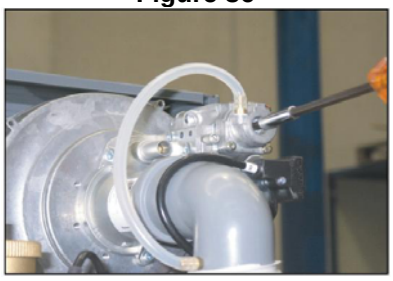


Figure 37

MODEL	GAS	MAX POWER	MIN POWER
Condensing 100	Methane	CO_2 = 9.2 – 9.4%	CO_2 = 8.3 – 8.5%
	LPG	CO_2 = 10.2 – 10.4%	CO_2 = 8.6 – 8.9%
Condensing 100 (serial number 312670001)	Methane	CO_2 = 9.0%	
	LPG	CO_2 = 10.4%	

7.2 Slave boards setting

Each slave (one for each burner) needs to be properly configured so that the Master board shall detect their right sequence. First of all slave boards needs to be divided into blocks; the system can manage until 15 blocks made of 4 slaves each.

Ex. If 5 slaves are connected to one Master, we have 2 blocks: the first is made of 4 salves and the second of one slave.

As a consequence, complete the following procedure to fulfil the address configuration:

1. Locate the slave position inside each block (ex. position1,2,3 or 4).
2. Locate the block the slave is related to (ex. Block n°1, n°2……till block n°15)
3. Supply each Caldaria Condensing 100 series composing the battery.

As indicated in Figure 38, to set block address we refer to the jumper J17, while for the slaves (singles burners) we refer to the jumper J10.

Figure 38

Refer to Table 1 to see the possible combinations of the jumpers J10 that characterize the four slaves (n 1, 2, 3 and 4) of the same block. Table 2, shows the possible combinations of the jumpers (J17). In Table 2 we have the settings for the maximum (15) number of block. In Figure 39 it is shown a configuration with seven units.

JUMPER J10		SLAVE ADDRESS
1	2	
OFF	OFF	1
OFF	ON	2
ON	OFF	3
ON	ON	4

Table 1

NOTE:
The address for Caldaria Condensing 100 Master unit is n°1 and n°2 and the block is n.1.
The address for Caldaria Condensing 100 Slave unit is n°3 and n°4 and the block is n.1.

JUMPER J17				BLOCK (PACK)
1	2	3	4	
OFF	OFF	OFF	OFF	Emergency
OFF	OFF	OFF	ON	1° block
OFF	OFF	ON	OFF	2° block
OFF	OFF	ON	ON	3° block
OFF	ON	OFF	OFF	4° block
OFF	ON	OFF	ON	5° block
OFF	ON	ON	OFF	6° block
OFF	ON	ON	ON	7° block
ON	OFF	OFF	OFF	8° block
ON	OFF	OFF	ON	9° block
ON	OFF	ON	OFF	10° block
OFF	OFF	ON	ON	11° block
ON	ON	OFF	OFF	12° block
ON	ON	OFF	ON	13° block
ON	ON	ON	OFF	14° block
ON	ON	ON	ON	15° block

Table 2

7.2.1 Example of configuration of a battery with seven burner in cascade

In case two blocks are present in an installation having a battery of seven burners (i.e. seven slaves): the first is made of 4 burners and the second is made of 3. As a consequence, two blocks need to be configured, respectively with address 1 and 2 and with relative burners, to the first block with address 1,2,3 and 4, and to the second block with address 1,2 and 3 (see Figure 39)

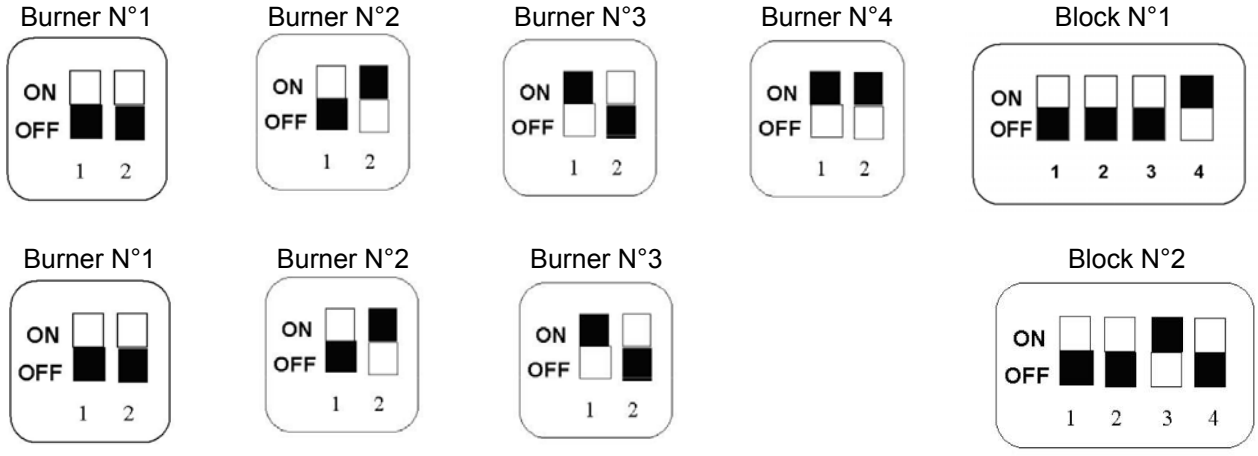


Figure 39

8 Safety devices

All the functions of the thermal module are electrically controlled. Any anomaly causes the lock out of the single thermal element and the automatic shut down of the gas valve.

The following devices are installed on the water circuit:

- 5.5 bar safety valve
- Auto reset safety thermostat for each thermal element
- Safety water differential pressure switch for each thermal element
- Temperature probe on each thermal element flow and return. Probes are managed by an electronics homologated for safety performances and with a double processor technology. Such device allows

to continually control both flow temperature and the Dt between flow and return of the battery element.
- Modulating flow temperature regulation for both single elements and the whole battery

The following devices are installed on the combustion circuit:
- Gas electro valve in B+C class for each thermal element, with gas flux pneumatic compensation according to the inlet air flow (air/gas 1:1 ratio)
- Ionization electrode for continuous flame detection
- Flue pipes temperature control for each thermal element

Both protection interventions and gas valve shut-off occur, on each thermal element, when the following situations take place,
- Flame extinguishing
- Exchange circuit overheat
- Flue high temperature
- Air flow reduction

9 Parameter list

N°	Description	Lower limit	Upper limit	Default value	Specification
1	**Setpoint_T_CH_High**	**10°C**	**T_CH_High_Limit**	**Par.17**	Setpoint_t_ch_high : Wanted water temperature for high system when CH_mode_high is 0. Max wanted water temperature for high system when in other modes.
2	**Set value for DHW**	**10°C**	**T_DHW_Limit**	**Par.8**	T3set DHW: Detection value for hot water request.
3	**Set value CH-mode 2nd circuit (max value in climatic regulation at the minimum outside temperature)**	**10**	**T_CH_Low_Limit**	**Par.23**	T6 set CH 2nd Detection and modulation value for hot water request.
	1ST LEVEL PASSWORD (ON THE MASTER AND ON THE COMPUTER)				
6	**Dhw_type**	0	6	**0**	0 = No DHW service 1 = Instant with NTC sensor 2 = Storage heater with NTC sensor 5 = Instant with flow switch 6 = Storage heater with thermostat
7	**P_dhw_max**	1	255	**230**	Setting the max fan speed for dhw-mode.
8	**T_Dhw_limit**	10°C	T_Dhw_max	**60**	This is the maximum set value in Sanitary mode
9	**Dhw_priority**	0	2	**0**	Central heating when: 0 = T_Flow_high >(Setpoint_T_Ch_high – Dhw_&_ch_hyst) 1 = T_Flow_high >(Setpoint_tank + T_tank_extra – Dhw_&_ch_hyst) 2 = Only sanitary circuit
10	**T_tank_extra**	0°C	50°C	**30**	Temperature of the primary circuit during sanitary production. This value has to be added to the sanitary set-point to obtain the setpoint of primary circuit. Ex: 50°C+30°C=80°C
11	**T_tank_hyst_up**	0°C	20°C	**1**	Upper DHW differential . Ex.:50°C+1°C=51°C
12	**T_tank_hyst_down**	0°C	20°C	**5**	Lower DHW differential Ex.:50°C-5°C=45°C
13	**Max number of burners active on DHW mode**	1	60	**max (60)**	Limit of burners that can start on dhw mode
14	**CH_type_high**	0	3	**1**	0 = Fixed temperature 1 = Climate with outside sensor 2 = 0-10 Vdc for heat output 3 = 0-10 Vdc for temperature
15	**P_ch_max**	1	255	**230**	Setting the max fan speed for CH-mode.

16	**CH_Priority**	0	2	**0**	0 = No priority between circuits 1 = Priority to the high temperature circuit 2 = Priority to the low temperature circuit
17	**T_ch_high_limit**	10°C	T_CH_High_max -10°C	**80**	This is the maximum set value in CH-mode
18	**T_ch_high_foot**	10°C	Setpoint_t_ch_high	**50**	This is the minimum set value in CH-mode (at maximum outside temperature). It limits the Param 1 : Setpoint_t_ch_high
19	**CH_high_mod_hyst_on**	0°C	20°C	**7**	Burner is switched on when T_flow_high < Setpoint_ch_high – CH_high_mod_hyst_on. Ex.: 80°C-7°C=73°C
20	**CH_high_mod_hyst_off**	0°C	20°C	**3**	Burner is switched off when T_flow_high > Setpoint_ch_high + CH_high_mod_hyst_off Ex.: 80°C+1°C=81°C
21	**Attenuation_high**	0°C	70°C	**0**	The Tset is decreased with the attenuation function, only if High Temperature thermostat input is open. 0 = The system is turned off after thermostat opening 1…n = The set-point is decreased of 1…n°C
22	**CH_type_low**	0	3	**1**	Selection of heat request for 2nd CH circuit 0 = Fixed temperature 1 = Climate with outside sensor 2 = 0-10 Vdc for heat output 3 = 0-10 Vdc for temperature
23	**T_ch_low_limit**	10°C	T_CH_low_max -10	**50**	This is the maximum set value in CH-mode. Ex.:between 10°C÷70°C. Limited by T_CH_low_max-10
24	**T_ch_low_foot**	10°C	Setpoint_t_ch_low	**25**	This is the minimum set value in CH-mode (at maximum outside temperature). It limits the Param 3 : Setpoint_t_ch_low
25	**Attenuation_low**	0°C	70°C	**0**	The Tset is decreased with the attenuation function, only if Low temp. thermostat input is open. 0 = The system is turned off after thermostat opening 1…n = The set-point is decreased of 1…n°C
26	**CH_low_mod_hyst_on Diff_acc_CH2**	0°C	20°C	**5**	Burner is switched on when T_flow_low < Setpoint_ch_low – CH_low_mod_hyst_on
27	**CH_low_mod_hyst_off**	0°C	20°C	**3**	Burner is switched off when T_flow_low > Setpoint_ch_low + CH_low_mod_hyst_off

28	**Mixing_valve_step_open_period**	0 sec	255 sec	**5**	The period that the mixing_valve completely closed -> open
29	**Mixing_valve_step_closed_period**	0 sec	255 sec	**7**	Period that the mixing_valve completely open ->closed
30	**Mixing_valve_interval period**	0 sec	255 sec	**5**	Period that the mixing_valve is still
31	**Mixing_p_hysteresys**	0 sec	30°C	**2**	
32	**Mixing_max_still_hys**	0 sec	30°C	**2**	
33	**Power_control_mode**	0	1	**1**	Selected mode for distributing power over individual burners
34	**3rd_Pump**	0	1	**1**	If this parameter is 1 the 3rd_pump is used as the low temperature system pump. If it is 0 it is used as the system pump.
35	**T4 frost protection**	-30°C	15°C	**3**	Temperature for starting frost protection on T4. If T4<= this value or T1 <= 5°C then the pump start (•). If after 10 minutes T1 is not over 5°C -> one burner starts at the maximum power until T1>= 20°C. If after 10 minutes T4 is still under this value -> then pump (•) run until T4 > this value.
36	**Gas Type**	1	7	**5**	1 = NG with flue gas duct < 15m 2 = NG with flue gas duct > 15m 3 = LPG with flue gas duct < 15m 4 = LPG with flue gas duct > 15m 5 = Town Gas 6 = Gas F 7 = Gas G
37	**T_out_min**	-20°C	30°C	**0**	Minimum outside temperature (gives maximum set value). High-limited by T_out_max
38	**T_out_max**	0°C	30°C	**18**	Maximum outside temperature (gives minimum set value). Low-limited by T_out_min. after this value the system disconnect the heating function
39	**T_out_correct**	-30° C	30° C	**0**	Correction on outside temperature
40	**P.reduce emergency**	10°C	80°C	**70°C**	
41	**Parameter reset**	0	1	**0**	1 = Reset slaves to factory default. Setting the value of "1" all the default values are restored EXCEPT GAS TYPE NUMBER , par.42 and par.43 settings

42	**Flow switch present on the slaves**	0	1	**1**	0 = The slave check not for the flow switch
43	**Protocol**	0	1	**1**	0= Echo protocol 1= Argus link (new protocol)

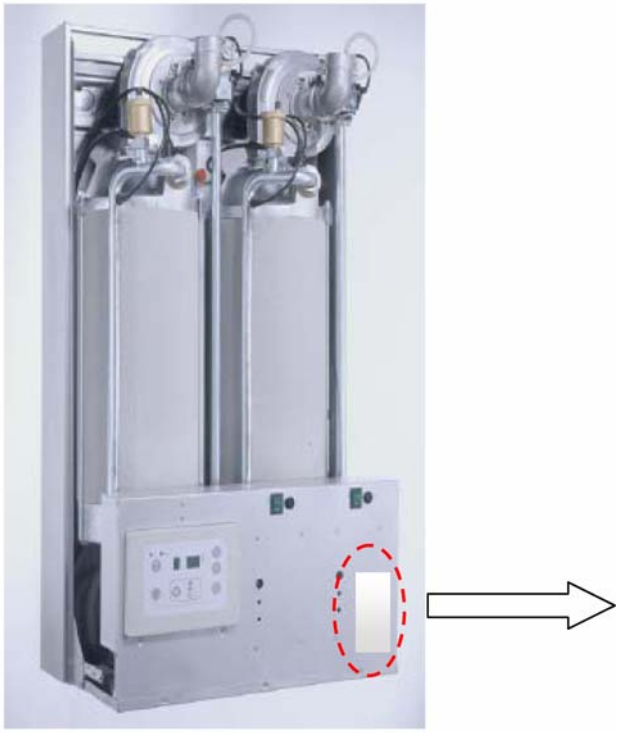


Figure 40

A label with the default parameter is situated in the front of command panel (see Figure 40). With this label the authorized Service can restore easily the default parameter of the boiler.

SOLO PER ASSISTENZA TECNICA ONLY FOR SERVICE					
LISTA PARAMETRI / PARAMETERS LIST					(46.82)
1	Temp. CH1	70			
2	Temp.san / DHW Temp.	50			
3	Temp. CH2	40			
6	Modalità san. / DHW mode	0			
7	Pot. max san/DHW max power	230			
8	Max Temp. san./DHW	60			
9	Priorità san./DHW priority	0			
10	T plus bollitore/T plus tank	30			
11	Diff. on san./DHW on hyst.	1			
12	Diff. off san./DHW off hyst.	5			
13	max bruc.san./max DHW burn.	60			
14	Regolaz.CH1/CH1 regulation	1			
15	Max vel. ventil./max fan speed	230			
16	Priorità riscald./CH priority	0			
17	Temp. max CH1	80			
18	Temp. min CH1	50			
19	Diff. on CH1/CH1 on hyst.	7			
20	Diff. off CH1/CH1 off hyst.	3			
21	Attenuaz.CH1/CH1attenuation	0			
22	Regolaz.CH2/CH2 regulation	1			
23	Temp. max CH2	50			
24	Temp. min CH2	25			
25	Attenuaz.CH2/CH2attenuation	0			
26	Diff. on CH2/CH2 on hyst.	5			
27	Diff. off CH2/CH2 off hyst.	3			
28	t (tempo/time) ON valv, mix	5			
29	t (tempo/time) OFF valv, mix	7			
30	Δt stop valv, mix	5			
31	Diff.on-off/on-off hyst, valv mix	2			
32	Diff.stop/stop hyst. valv mix	2			
33	Controllo potenz/power control	1			
34	Modalità pompa/pump mode	0	**1**		
35	Antigelo/frost protection	3			
36	Tipo gas/gas type	1			
37	Temp. esterna/external min	0			
38	Temp. esterna/external max	18			
39	CorrezioneT_{ext} / T_{ext} correction	0			
40	T emergenza/emergency T	70			
41	⚠ Reset param. ⚠	0			
42	Pressostato/flow switch	1			
43	Protocollo/communication type	1			
note Set = parametri di fabbrica/factory's parameters					

10 Error list

In the following tables are listed the Caldaria Condensing 100 series errors. If the error is a type “A” the “RESET” button needs to be pressed after eliminating the reason for the failure. If it is an error type “E”, the boiler will go back to normal operation, with no need to press the “RESET” button, once the reason for the failure has been eliminated.

10.1 Master board error

ERROR	DESCRIPTION
A16	Internal error
A18	Internal error
A20	Internal error

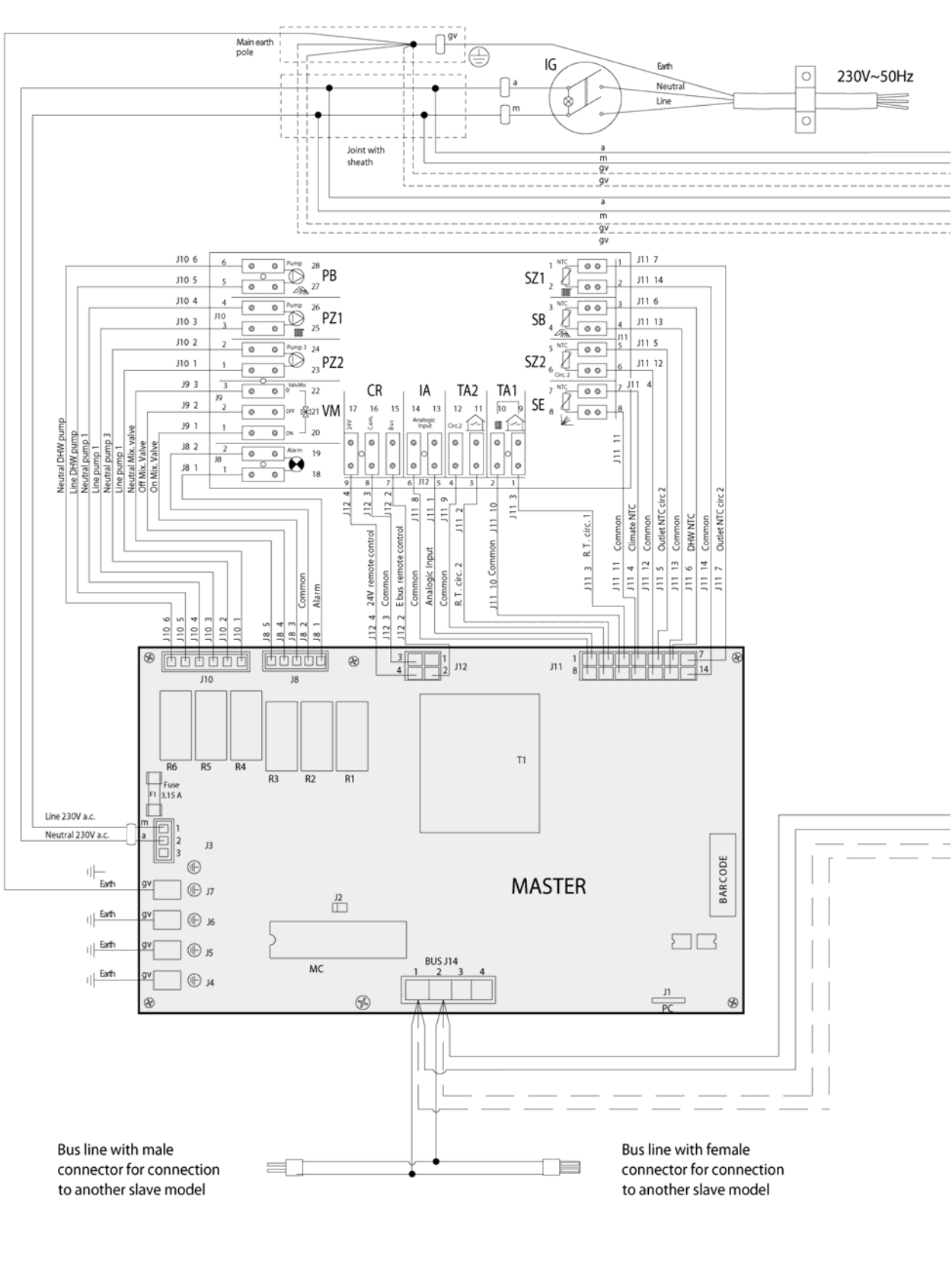
ERROR	DESCRIPTION
E02	Flow probe open
E04	Tank probe open
E18	Flow probe shorted
E20	Tank probe shorted
E23	Internal error
E24	Internal error
E25	Internal error
E26	Internal error
E32	No_slaves_present
E34	50hz_error

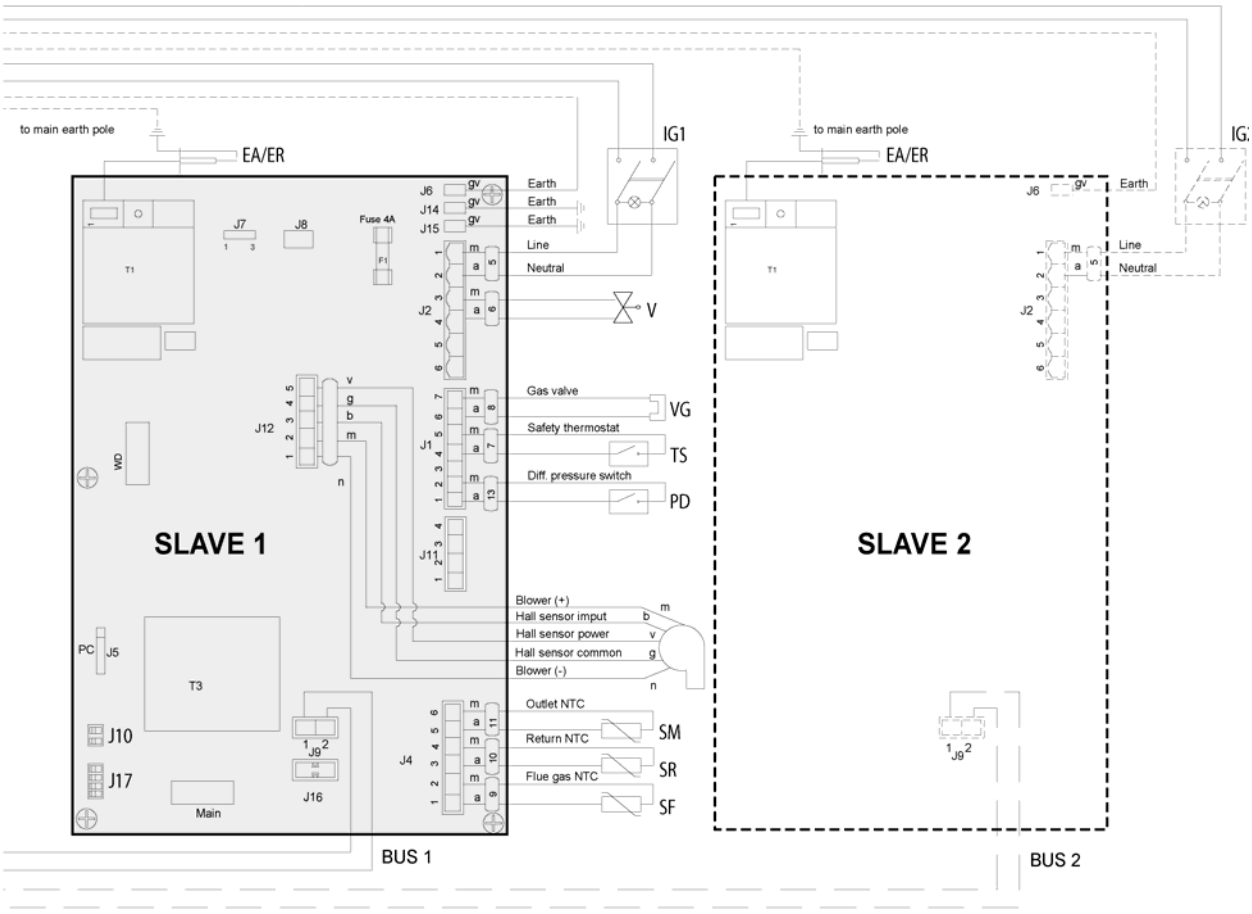
10.2 Slave board error

ERROR	DESCRIPTION
A01	Five unsuccessful ignitions attempts
A02	Several unsuccessful attempts for flame ionization problems
A04	Limit thermostat cut off water side (>90°C)
A05	Gas valve coil cut off. Gas valve connector false contact. Defective gas valve connector. Limit thermostat intervention (>90°C) while burner was on.
A06	Missing or poor grounding
A07	Internal hardware error
A08	Internal hardware error
A09	50hz_error
A10	Internal hardware error
A11	Internal software error
A12	Internal hardware error
A16	The contact ot limit thermostat is open with burner off
A17	Flow sensor error for excessive limit temperature
A18	Return sensor error for exceeding the limit temperature
A19	The flue sensor intervened for over temperature >80°C.(In this case the fan operates at max speed)
A20	Flame out too late after closing gas valve
A21	Internal error
A22	The slave had a type “E” error for more than 24 hours
A23	Internal error of the clock
A24	Fan error.
A25	Internal error

ERROR	DESCRIPTION
E33	Live and neutral reversed error (ni)
E34	Reset button error. It has been pressed more than 7 times in a 30 min interval
E35	Low water flow or low system pressure (<0.5 bar)
E36	Internal error
E37	Flame detection error
E38	Shorted flue gas sensor
E39	Flue sensor with open contact
E40	50 hz error
E41	Internal error
E42	Shorted flow sensor error
E43	Open flow sensor error
E44	Shorted return sensor error
E45	Open return sensor error
E46	Flow sensor error above max_flow_temperature
E47	Return sensor error above max_return_temperature
E48	Flue sensor error above max_flue_gas_temperature (in this error the fan is on at full speed).
E49	Missing or poor grounding

11 Electrical wiring diagram





PB - DHW pump
PZ1 - Pump in zone 1 (high temperatur e)
PZ2 - Pump in zone 2 (low temperatur e)
VM - Mixing valve
CR - Remote control (accessory)
IA - Analogue input
SB - DHW probe
SZ1 - Probe in zone 1
SZ2 - Probe in zone 2
SE - Outside probe
TA1 - Room thermostat in zone 1 (high temperature)
TA2 - Room thermostat in zone 2 (low temperatur e)

SYSTEM

VG - Gas valve
TS - Safety thermostat
PD - Water differential pressure switch
SM - Outlet pr obe
SR - Retur n pr obe
SF - Flue gas pr obe
EA/ER - Ignition/detection electrode
V - Two-way valve
IG - Main boiler switch
IG1 - FIRST heating unit switch
IG2 - SECOND heating unit switch
J10/J17 - Microswitches for setting the address

HEA TING UNIT

Technical data

CALDARIA CONDENSING		**100**
Gas category		II2H3+
Boiler type (EN 297)		B 23 (C 63,C63$_X$)
Burners x nominal heat input (Hs)		2 x 50
Max/min water pressure	Bar	6 / 0.5
Power supply	V	230 V
Nominal heat input (HS)	kW	16 ÷100
Nominal heat input (Hi)	kW	14.4 ÷89.9
Nominal heat output 100% (80 - 60° C)	kW	88.30
Nominal heat output 100% (50 - 30° C)	kW	96.80
Nominal heat output 100% (60 - 40° C)	kW	95.40
Max. condensate production - 100% (50 - 30° C) G20 gas	Kg/h	14.4
Efficiency (Hi) (Directive 92/42/CEE)		
Efficiency at full load (80 - 60° C)	%	98.2
Efficiency at full load (50 - 30° C)	%	107.7
Efficiency at full load Tm = 50° C (60 - 40° C)	%	106.1
Efficiency at reduced load 30% (80 - 60° C)	%	98.7
Efficiency at reduced load 30% (50 - 30° C)	%	108.7
Efficiency at reduced load 30% Tm = 50° C (60 - 40° C)	%	106.6
Combustion efficiency (80 - 60° C ; Ta = 20° C)	%	98.7
Energy lost with burner ON (80 - 60° C) **Pf**	%	1.3
Energy lost with burner OFF (80 - 60° C) **Pubs**	%	0.1
Energy lost by the shell (Tm = 70° C)	%	0.5
Flue temperature	° C	Temp. return + 2.5° C (max 80° C)
Heating temperature regulation (min / max)	° C	20 ÷ 80
Gas consumption (G20) (min / nominal)	m^3/h	1.52 ÷ 9.53
Pollutants in exhaust gas		
Carbon monoxide CO (0% O_2) (P min ÷ P max)	*ppm*	10 ÷ 80
Nitrogen oxide Kn_{ox} class (ref EN 297)		5
Power supply data		
Power supply	V	230
Frequency	Hz	50
Maximum electrical power	W	333
Weight and dimensions		
Height	mm	1000
Width	mm	600
Depth	mm	380
Empty weight	kg	90
Manifolds diameters		
Flow water pipe	in	1” M
Inlet gas pipe	in	¾” M
Water return pipe	in	G ¾” M
Flue manifold	n°/mm	2x50
Condensate pipe	mm	18

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