caring for the environment

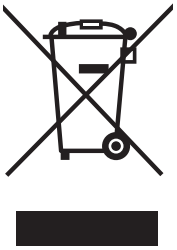
Installation, use and maintenance manual

Caldaria Condensing+ export

Outdoor condensing boiler
for heating medium and large buildings
and production of domestic hot water with a buffer tank

Powered by natural gas/LPG

DISPOSAL
The appliance and all its accessories must be disposed of separately in accordance with the regulations in force.



Use of the WEEE symbol (Waste Electrical and Electronic Equipment) indicates that this product cannot be disposed of as household waste. Proper disposal of this product helps to prevent potential negative consequences for the environment and human health.

Revision: G
Code: D-LBR875EN

TABLE OF CONTENTS

I INTRODUCTION

Installation, use and maintenance manual

This Manual is an integral part of the Caldaria Condensing+ export appliance and must be handed to the end user together with the appliance.

I.1 RECIPIENTS

This Manual is intended for:
- ► End user, for appropriate and safe use of the appliance.
- ► Qualified installer, for correct appliance installation.
- ► Planner, for specific information on the appliance.

II SYMBOLS AND DEFINITIONS

II.1 KEY TO SYMBOLS

DANGER

WARNING

NOTE

PROCEDURE

REFERENCE (to other document)

II.2 TERMS AND DEFINITIONS

DHW = domestic hot water.
Appliance/Unit = equivalent terms, both used to refer to the Caldaria Condensing+ export.
Boiler/External module = equivalent terms, both used to designate the part of the appliance to be installed outside the room to be heated.
TAC = Technical Assistance Centre authorised by Robur.
Remote control = optional control device with chronothermostat function.
External request = generic control device (e.g. thermostat, timer or any other system) equipped with a voltage-free NO contact and used as control to start/stop the Caldaria Condensing+ export unit.
First start-up = appliance commissioning operation which may only and exclusively be carried out by a TAC.

III WARNINGS

III.1 GENERAL AND SAFETY WARNINGS

Installer's qualifications

Installation must exclusively be performed by a qualified firm and by skilled personnel, with specific knowledge on heating, electrical systems and gas appliances, in compliance with the laws in force in the Country of installation.

Declaration of conformity

Upon completing installation, the installing firm shall issue to the owner/client the appliance's workmanlike conformity declaration, according to national/local regulations in force and the manufacturer's instructions/ provisions.

Packing

Packing items (plastic bags, polystyrene foam, nails, etc.) must be kept out of the reach of children, as they are potentially dangerous.

Misuse

The appliance must only be used for the purposes for which it has been designed. Any other use is deemed hazardous. Incorrect use may affect operation, duration and safety of the appliance. Adhere to the manufacturer's instructions.

Use of the appliance by children

The appliance can be used by children over 8 years old, and by people with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, only if they are under surveillance or after they have received instructions regarding safe use of the appliance and understanding the dangers inherent in it. Children should not play with the appliance.

Hazardous situations

- ■ Do not start the appliance in hazardous conditions, such as: gas smell, problems with the plumbing/electrical/gas system, parts of the appliance under water or damaged, malfunctioning, disabling or bypassing control and safety devices.
- ■ In case of danger, request intervention by qualified personnel.
- ■ In case of danger, switch off the electrical power and gas supplies only if this can be done in total safety.

Gas component tightness

- ■ Before performing any operation on gas ducting compo-

nents, close the gas valve.
- Upon completing any procedure, perform the tightness test according to regulations in force.

Gas smell

If you smell gas:
- Do not use electrical devices such as telephones, multimeters or other equipment that may cause sparks next to the appliance.
- Shut off the gas supply by turning the valve off.
- Switch off the power supply via the external disconnect switch in the power supply electrical panel.
- Use a telephone away from the appliance to ask for intervention from qualified personnel.

Poisoning
- Ensure the flue gas ducts are tight and compliant with the regulations in force.
- Upon completing any procedure, ensure the tightness of the components.

Moving parts

The appliance contains moving parts.
- Do not remove guards during operation, and in any case prior to disconnecting the power supply.

Burn hazard

The appliance contains very hot parts.
- Do not open the appliance and do not touch internal components before the appliance has cooled down.
- Do not touch the flue gas exhaust before it has cooled down.

Electrocution hazard
- Disconnect the electrical power supply before any operation on appliance components.
- For electrical connections exclusively use compliant components and according to the specifications provided by the manufacturer.
- Ensure the appliance cannot be accidentally switched back on.

Earthing

Electrical safety depends on effective earthing system, correctly connected to the appliance and installed according to the regulations in force.

Distance from combustible or flammable materials
- Do not deposit flammable materials (paper, diluents, paints, etc.) near the appliance.

Limescale and corrosion

Depending on the chemical/physical properties of the system water, limescale or corrosion may damage the appliance.
- Check system sealing.
- Avoid frequent top-ups.

Acid flue gas condensate
- Discharge the acid condensate of combustion flue gas in compliance with current exhaust regulations.

Switching the appliance off

Disconnecting the power supply while the appliance is running may cause permanent damage to internal components.
- Except in the event of danger, do not disconnect the power supply to switch off the appliance, but always and exclusively act through the provided control device.

In the event of failure

Operations on internal components and repairs may exclusively be carried out by a TAC, using only original spare parts.
- In the event of failure of the appliance and/or breakage of any component, do not attempt to repair and/or restore and immediately contact the TAC.

Routine maintenance

Proper maintenance assures the efficiency and good operation of the appliance over time.
- Maintenance must be performed according to the manufacturer's instructions (see Chapter 7 *p. 50*) and in compliance with current regulations.
- Appliance maintenance and repairs may only be entrusted to firms legally authorised to work on gas appliances and systems.
- Enter into a maintenance contract with an authorised specialised firm for routine maintenance and for servicing in case of need.
- Use only original parts.

Decommissioning and disposal

If the appliance is to be disposed of, contact the manufacturer for its disposal.

Keep the Manual

This Installation, use and maintenance manual must always accompany the appliance and must be handed to the new owner or installer in the event of sale or removal.

III.2 COMPLIANCE

III.2.1 EU directives and standards

The appliance is certified in accordance with European regulation GAR 426/2016/EU and meet the essential requirements of the following Directives:
- ► Efficiency Directive 92/42/EEC and subsequent modifications and additions.
- ► 2016/426/EU "Gas Appliances Regulation" as amended and added.
- ► 2014/30/EC "Electromagnetic Compatibility Directive" as amended and added.
- ► 2014/35/EC "Low Voltage Directive" as amended and added.
- ► 811/2013/EU "Energy-Related Products regulation" as amended and added.
- ► 813/2013/EU "Ecodesign requirements regulation" as amended and added.

Furthermore, they comply with the requirements of the follow-

ing standards:
► EN 15502 Gas-fired central heating boilers.

III.2.2 Other applicable provisions and standards

The design, installation, operation and maintenance of the systems shall be carried out in compliance with current applicable regulations, depending on the Country and location, and in accordance with the manufacturer's instructions. In particular, regulations regarding the following shall be complied with:
► Gas systems and equipment.
► Electrical systems and equipment.
► Heating systems employing condensing boilers.
► Environmental protection and combustion products exhaust.
► Fire safety and prevention.
► Any other applicable law, standard and regulation.

III.3 EXCLUSIONS OF LIABILITY AND WARRANTY

Any contractual or extra-contractual liability of the manufacturer for any damage caused by incorrect installation and/or improper use and/or failure to comply with regulations and with the manufacturer's directions/instructions shall be disclaimed.

In particular, the warranty on the appliance may be rendered void by the following conditions:

- Incorrect installation.
- Misuse.
- Failure to comply with the manufacturer's indications on installation, use and maintenance.
- Alteration or modification of the product or any part thereof.
- Extreme operational conditions or however outside of the operational ranges set forth by the manufacturer.
- Damages caused by external agents such as salts, chlorine, sulphur or other chemical substances contained in the installation water or present in the air of the installation site.
- Abnormal actions transmitted to the appliance by the system or installation (mechanical stresses, pressure, vibrations, thermal expansion, electrical surges...).
- Accidental damages or due to force majeure.

1 FEATURES AND TECHNICAL DATA

1.1 FEATURES

1.1.1 Operation

The Caldaria Condensing+ export units have been designed and built to meet the needs of space heating. These boilers (external modules) can also be installed outdoors.
Part of the boiler casing is in sheet metal and part in ABS, but it is anyway approved to withstand atmospheric agents with particular attention to the mechanical action of the UV rays of the sun.
The operation of the appliance is managed by one of the following controls:

- ► an external request (chronothermostat, room thermostat or other operating request)
- ► the remote control (optional OCDS006) to be installed inside the heated room
- ► the cascade controller (optional ODSP039)

When the heat supply is requested, the electronic board starts the system water pump, the blower and then the burner.
When the burner starts up, the flame detector checks that the burner has ignited; in the event of a lack of flame, the electronic control unit retries ignition several times and if this fails, it stops the appliance and displays the lock-out. The reset is manual.
In the event of abnormal overheating of the delivery, the boiler is switched off. The limit thermostat has manual reset.

1.1.2 Mechanical and thermo-hydraulic components

- ► Integrated spiral single tube stainless steel heat exchanger.
- ► Premix modulating burner with 1:9 ratio (1:18 for Caldaria 100.2).
- ► Automatic air vent valve.
- ► High efficiency modulating water pump.
- ► System drain tap.
- ► Water temperature probes.
- ► Condensate drain siphon.
- ► Check valve (only for Caldaria 100.2).

In the Caldaria 100.2 the above components are double.

1.1.3 Control and safety devices

- ► Gas solenoid valve.
- ► Flue safety thermal fuse.
- ► Safety thermostat.

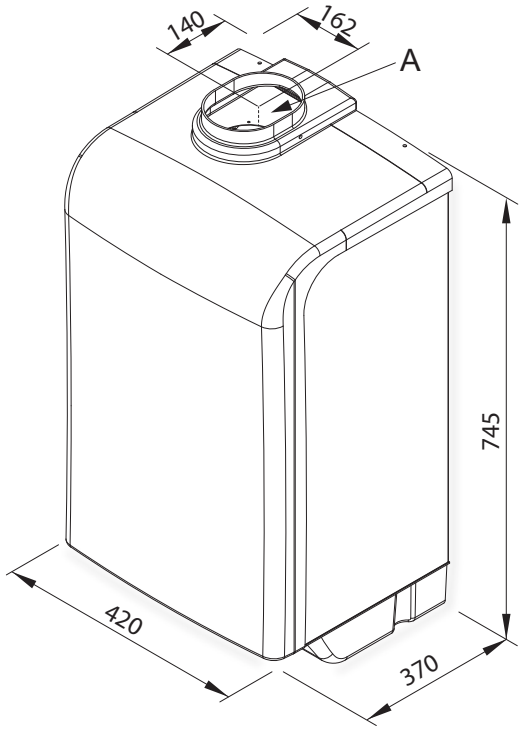
In the Caldaria 100.2 the above components are double.

- ► Safety valve.
- ► Water differential pressure switch.
- ► Expansion tank.

1.2 DIMENSIONS

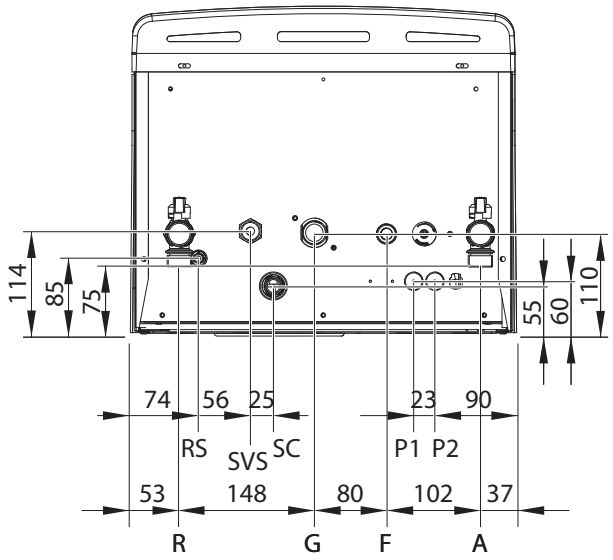
1.2.1 Caldaria 35

Figure 1.1 *Caldaria 35 dimensions*



A Flue gas outlet Ø 80 mm

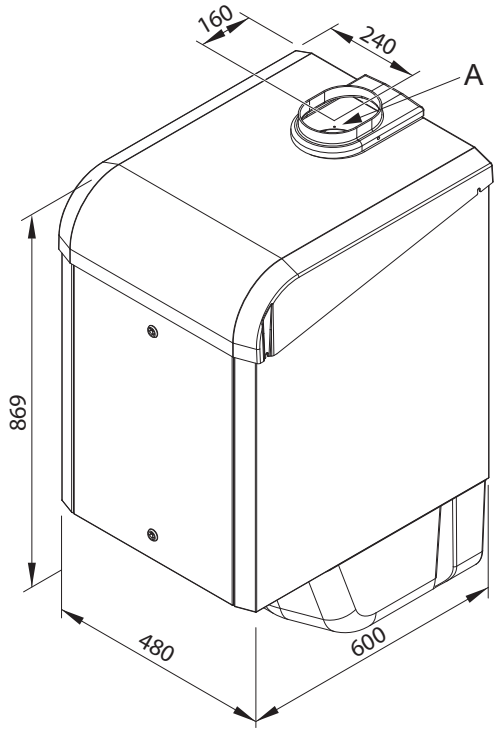
Figure 1.2 *Caldaria 35 hydraulic connections (bottom view)*



A Outlet Ø 3/4" M
F System filling Ø 1/2" M
G Gas Ø 3/4" M
R Inlet Ø 3/4" M
P1/P2 Cable glands Ø 2,7 mm
RS System drain tap Ø 10 mm M
SC Condensate drain Ø 25 mm M
SVS Safety valve drain Ø 1/2" M

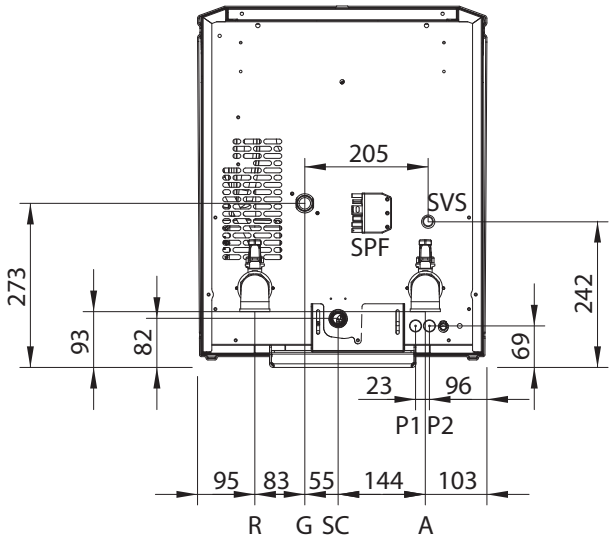
1.2.2 Caldaria 55.1

Figure 1.3 *Caldaria 55.1 dimensions*



A Flue gas outlet Ø 80 mm

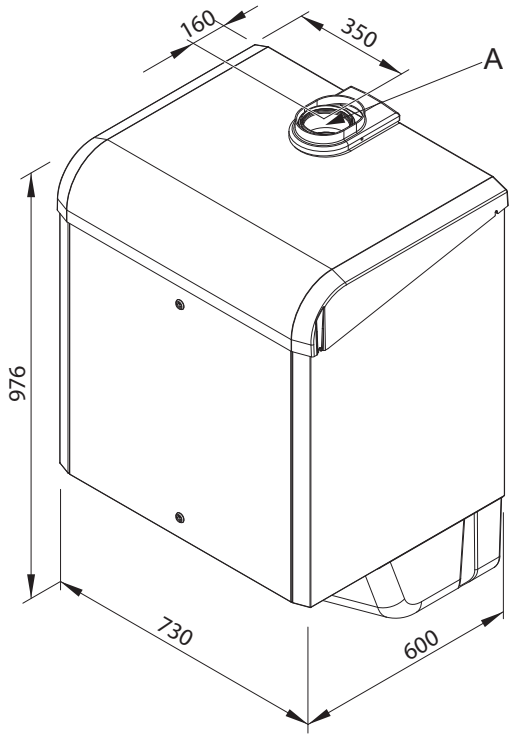
Figure 1.4 *Caldaria 55.1 hydraulic connections (bottom view)*



A Outlet Ø 1 1/4" M
G Gas Ø 3/4" M
R Inlet Ø 1 1/4" M
P1/P2 Cable glands Ø 2,7 mm
SC Condensate drain Ø 25 mm M
SPF Female socket
SVS Safety valve drain Ø 19 mm M

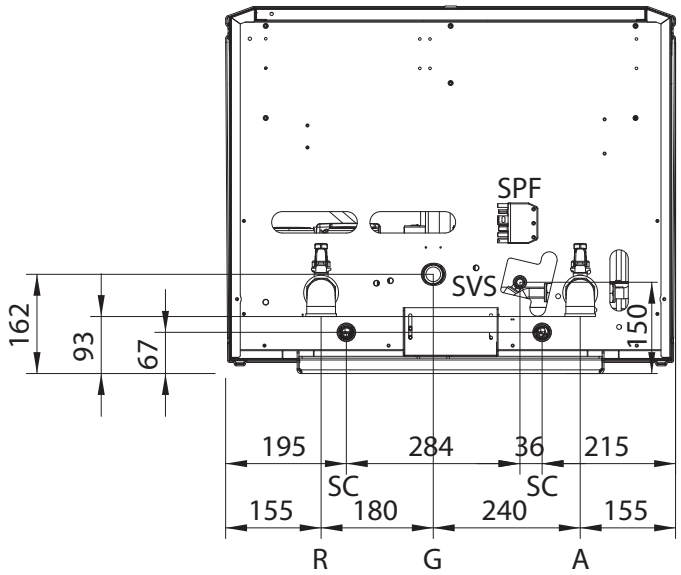
1.2.3 Caldaria 100.2

Figure 1.5 *Caldaria 100.2 dimensions*



A Flue gas outlet Ø 100 mm

Figure 1.6 *Caldaria 100.2 hydraulic connections (bottom view)*

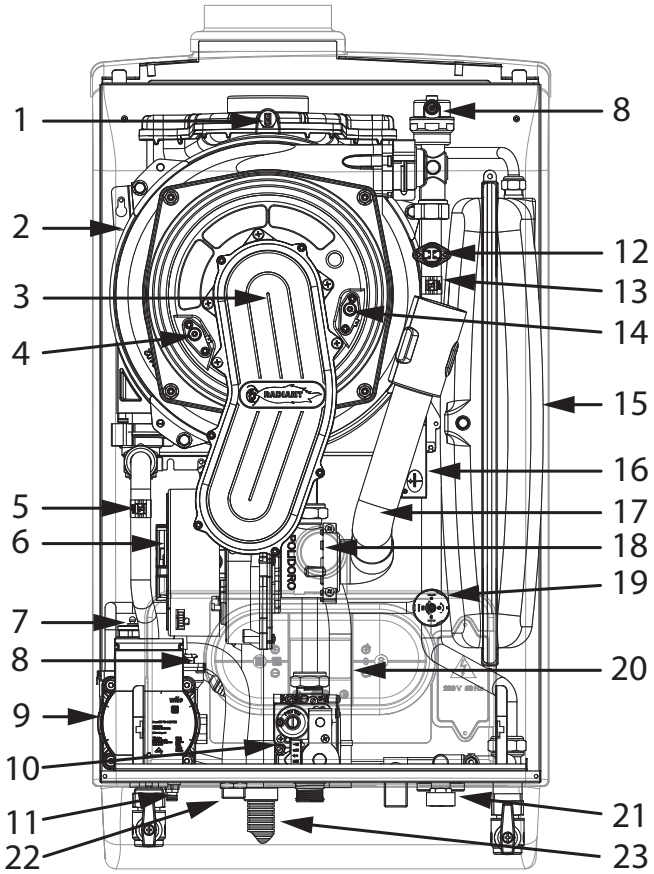


A Outlet Ø 1 1/4" M
G Gas Ø 1" M
R Inlet Ø 1 1/4" M
SC Condensate drain Ø 25 mm M
SPF Female socket
SVS Safety valve drain Ø 19 mm M

1.3 COMPONENTS

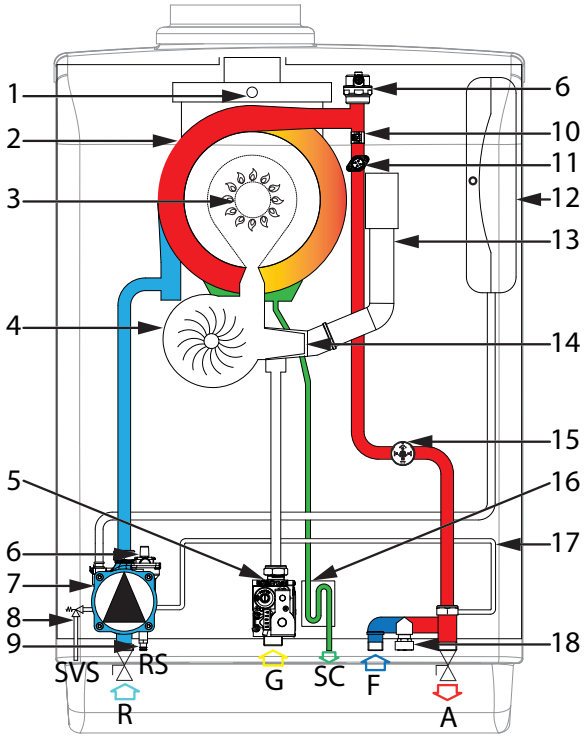
1.3.1 Caldaria 35

Figure 1.7 *Caldaria 35 internal components*



1 Flue safety thermal fuse
2 Heat exchanger
3 Burner unit
4 Flame detector
5 Heating return probe
6 Combustion blower
7 Safety valve
8 Automatic air vent valve
9 Modulating water pump
10 Gas valve
11 System drain tap
12 Safety thermostat
13 Heating delivery probe
14 Ignition electrode
15 Expansion tank
16 Ignition transformer
17 Air intake pipe
18 Venturi
19 Water pressure switch
20 Condensate drain siphon
21 System filling tap
22 Safety valve drain
23 Condensate drain

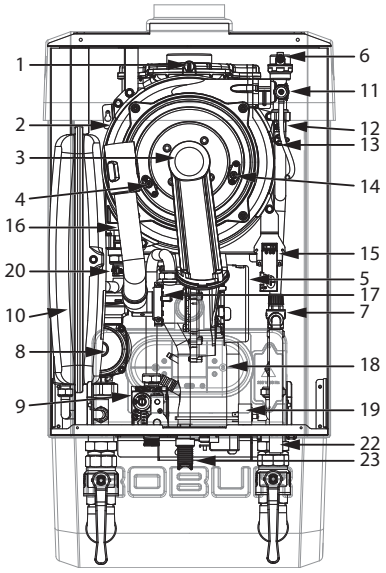
Figure 1.8 *Internal hydraulic plan of Caldaria 35*

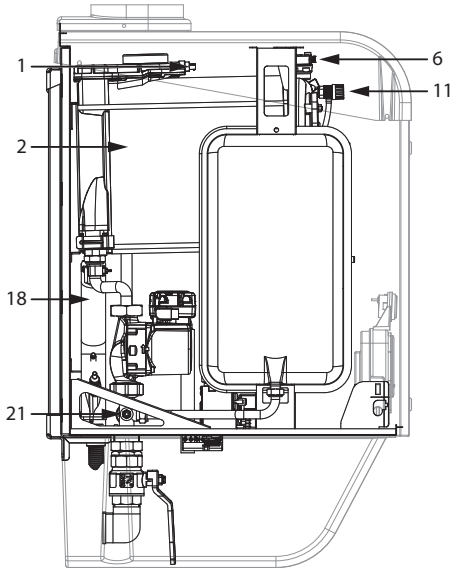


A	Outlet Ø 3/4" M
F	System filling Ø 1/2" M
G	Gas inlet Ø 3/4" M
R	Inlet Ø 3/4" M
RS	System drain tap Ø 10 mm M
SC	Condensate drain Ø 25 mm M
SVS	Safety valve drain Ø 1/2" M
1	Flue safety thermal fuse
2	Heat exchanger
3	Burner unit
4	Combustion blower
5	Gas valve
6	Automatic air vent valve
7	Modulating water pump
8	Safety valve
9	System drain tap
10	Heating delivery probe
11	Safety thermostat
12	Expansion tank
13	Air intake pipe
14	Venturi
15	Water pressure switch
16	Condensate drain siphon
17	Bypass
18	System filling tap

1.3.2 Caldaria 55.1

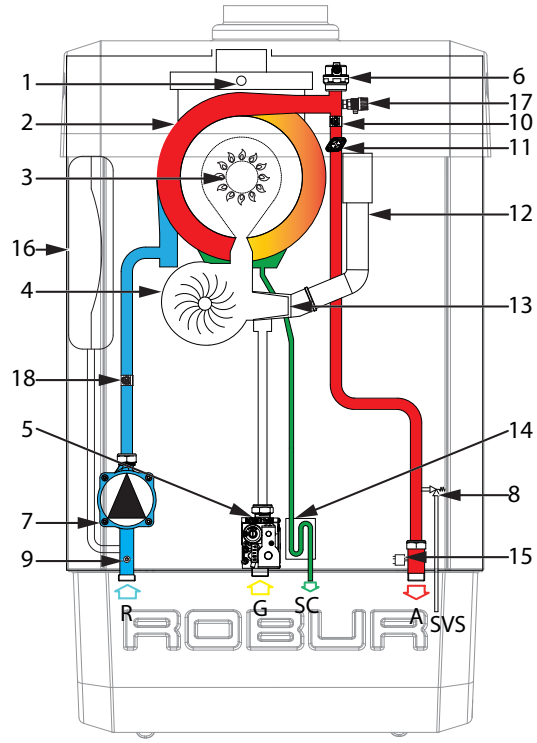
Figure 1.9 *Caldaria 55.1 internal components*





1	Flue safety thermal fuse
2	Heat exchanger
3	Burner unit
4	Flame detector
5	Combustion blower
6	Automatic air vent valve
7	Safety valve
8	Modulating water pump
9	Gas valve
10	Expansion tank
11	Manual air vent tap
12	Heating delivery probe
13	Safety thermostat
14	Ignition electrode
15	Ignition transformer
16	Air intake pipe
17	Venturi
18	Condensate drain siphon
19	Water pressure switch
20	Heating return probe
21	System drain tap
22	Safety valve drain
23	Condensate drain

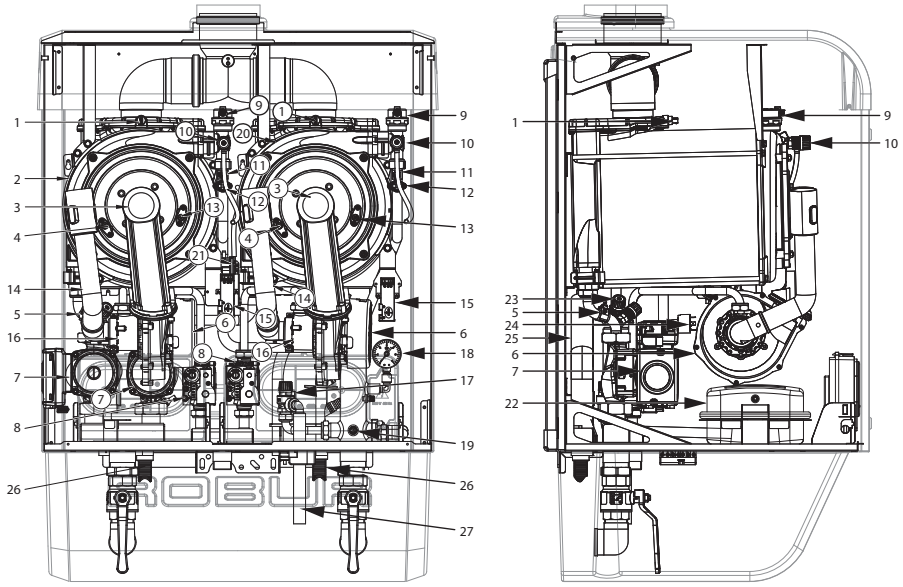
Figure 1.10 *Internal hydraulic plan of Caldaria 55.1*



A	Outlet Ø 1 1/4" M
G	Gas Ø 3/4" M
R	Inlet Ø 1 1/4" M
SC	Condensate drain Ø 25 mm M
SVS	Safety valve drain Ø 19 mm M
1	Flue safety thermal fuse
2	Heat exchanger
3	Burner unit
4	Combustion blower
5	Gas valve
6	Automatic air vent valve
7	Modulating water pump
8	Safety valve
9	System drain tap
10	Heating delivery probe
11	Safety thermostat
12	Air intake pipe
13	Venturi
14	Condensate drain siphon
15	Water pressure switch
16	Expansion tank
17	Manual air vent tap
18	Heating return probe

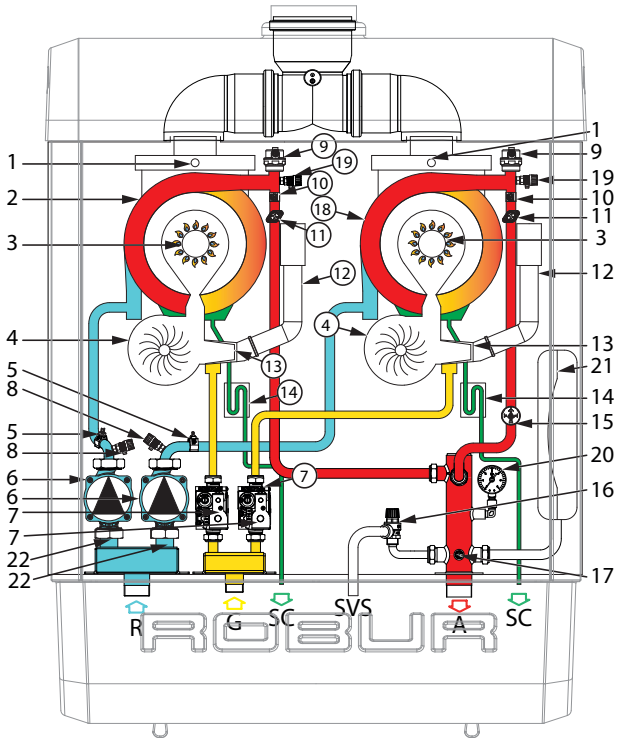
1.3.3 Caldaria 100.2

Figure 1.11 *Caldaria 100.2 internal components*



1	Flue safety thermal fuse
2	Slave unit heat exchanger
3	Burner unit
4	Flame detector
5	Heating return probe
6	Combustion blower
7	Modulating water pump
8	Gas valve
9	Automatic air vent valve
10	Manual air vent tap
11	Heating delivery probe
12	Safety thermostat
13	Ignition electrode
14	Air intake pipe
15	Ignition transformer
16	Venturi
17	Safety valve
18	Pressure gauge
19	Manifold probe
20	Master unit heat exchanger
21	Air pressure switch
22	Expansion tank
23	System drain tap
24	Water pressure switch
25	Condensate drain siphon
26	Condensate drain
27	Safety valve drain

Figure 1.12 *Internal hydraulic plan of Caldaria 100.2*



A	Outlet Ø 1 1/4" M
G	Gas Ø 1" M
R	Inlet Ø 1 1/4" M
SC	Condensate drain Ø 25 mm M
SVS	Safety valve drain Ø 19 mm M
1	Flue safety thermal fuse
2	Slave unit heat exchanger
3	Burner unit
4	Combustion blower
5	Heating return probe
6	Modulating water pump
7	Gas valve
8	System drain tap
9	Automatic air vent valve
10	Heating delivery probe
11	Safety thermostat
12	Air intake pipe
13	Venturi
14	Condensate drain siphon
15	Water pressure switch
16	Safety valve
17	Manifold probe
18	Master unit heat exchanger
19	Manual air vent tap
20	Pressure gauge
21	Expansion tank
22	Check valve

1.4 TECHNICAL DATA

Table 1.1 *Technical data*

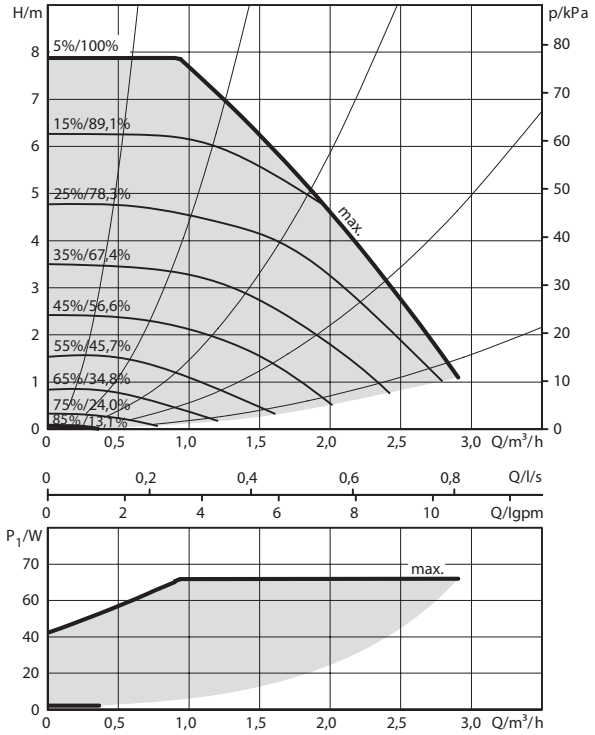
				Caldaria 35	Caldaria 55.1	Caldaria 100.2
Heating operation						
seasonal space heating energy efficiency class (ErP)			-	A		-
Heat input	nominal (1013 mbar - 15 °C)		kW	34,0	50,0	99,8
	minimum		kW	4,1	5,0	
Operating point 80/60	Nominal heat input	effective power	kW	33,4	49,2	98,1
		efficiency	%	98,1	98,4	98,3
Operating point 50/30	Nominal heat input	efficiency	%	106,4	106,8	
Operating point Tr = 30 °C	Heat input 30%	efficiency	%	108,6	108,8	
Operating point Tr = 47 °C	Heat input 30%	efficiency	%	102,1	102,8	
Heat losses	to casing in operation		%	0,25	0,10	0,47
	to flue in operation		%	2,40	2,10	
	with burner off		%	0,03	0,05	0,03
Hot water outlet temperature	maximum		°C	90		
Outdoor temperature (dry bulb)	maximum		°C	60		
	minimum		°C	-25		
Electrical specifications						
Power supply	voltage		V	230		
	type		-	single-phase		
	frequency		Hz	50		
Electrical power absorption	nominal		kW	0,13	0,24	0,48
Degree of protection	IP		-	X5D		
Installation data						
Gas consumption	G20 natural gas (nominal)		m^3/h	3,60	5,29	10,58
	G25 (nominal)		m^3/h	4,18	6,15	12,31
	G25.3 (nominal)		m^3/h	4,09	6,01	12,03
	G30 (nominal)		kg/h	2,68	3,94	7,89
	G31 (nominal)		kg/h	2,64	3,88	7,77
Water fitting	type		-	M		
	thread		"	3/4	1 1/4	
Gas connection	type		-	M		
	thread		"	3/4		1

				Caldaria 35	Caldaria 55.1	Caldaria 100.2
Flue gas exhaust	diameter (Ø)		mm	80		100
	residual head		Pa	91	100	
NO_x emission class			-	6		
Water pump data	Residual pressure head at nominal flow rate	boiler only	m w.c.	4,8	5,1	
	nominal flow at the maximum available head		l/h	1400	2150	4300
type of installation			-	B23P, B33		
maximum equivalent length of exhaust duct			m	15	14	8
maximum water pressure in operation			bar	3,0		
maximum flow rate of flue gas condensate			l/h	3,4	5,0	10,0
water content inside the appliance			l	6	9	18
expansion tank volume			l	8		10
Dimensions	width		mm	420	480	730
	depth		mm	370	600	
	height		mm	745	869	976
Weight	in operation		kg	44	54	90

1.4.1 Water pump characteristic curves

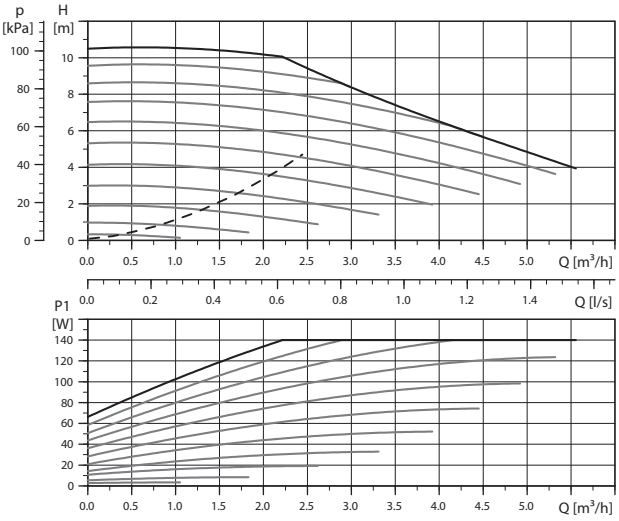
1.4.1.1 Caldaria 35

Figure 1.13 *Water pump characteristic curves*



1.4.1.2 Caldaria 55.1 and 100.2

Figure 1.14 *Water pump characteristic curves*



In Caldaria 100.2 there are 2 circulators.

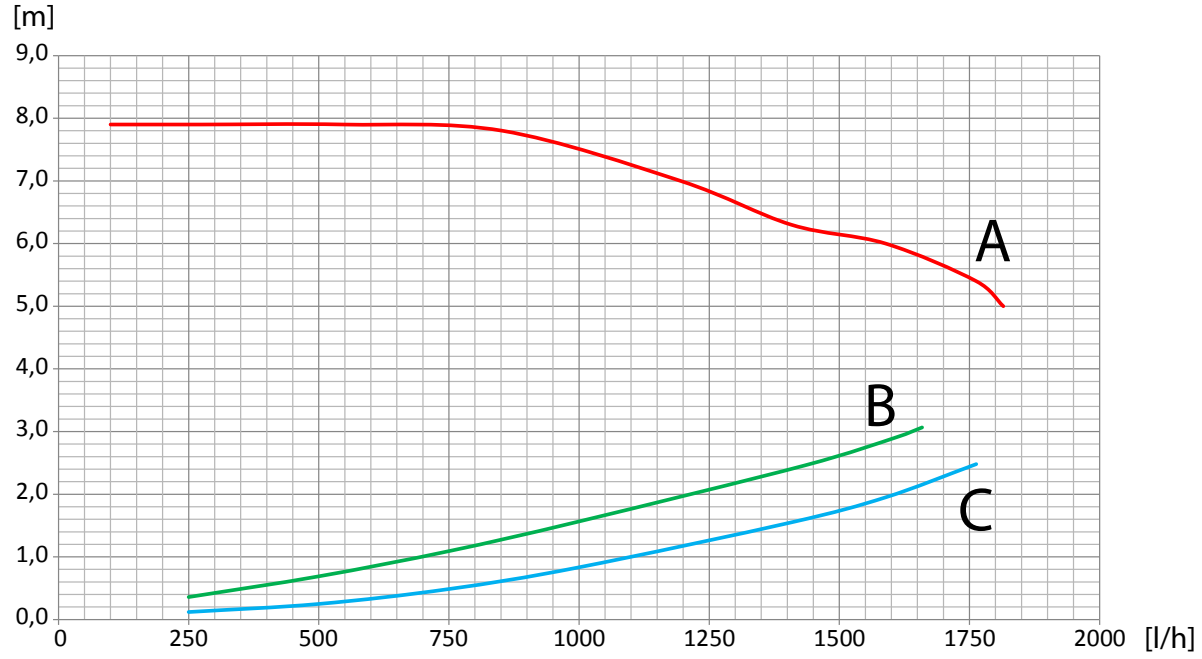
1.4.2 Pressure drops and residual head

Table 1.2 *Nominal flow rate and residual head*

				Caldaria 35	Caldaria 55.1	Caldaria 100.2
Installation data						
Water pump data	nominal flow at the maximum available head		l/h	1400	2150	4300
	Residual pressure head at nominal flow rate	boiler only	m w.c.	4,8	5,1	

1.4.2.1 Caldaria 35

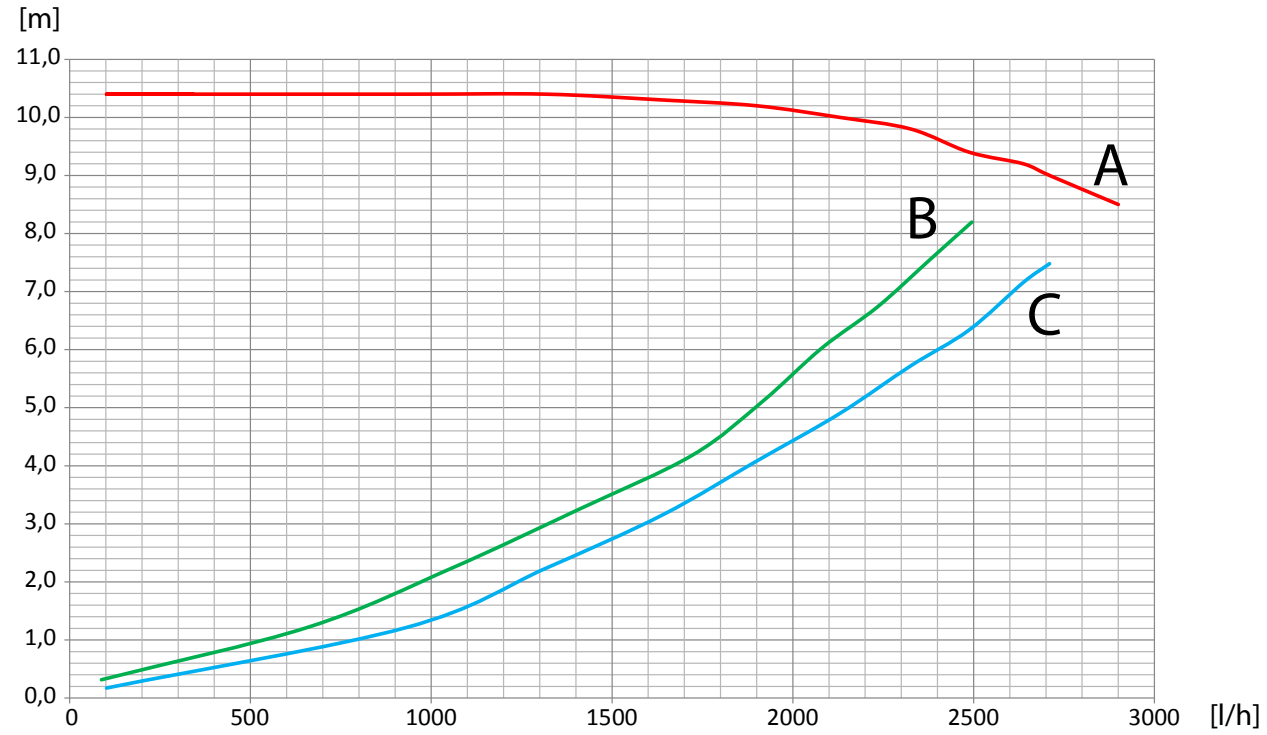
Figure 1.15 *Available head and pressure drop of Caldaria 35*



A Pump characteristic curve
B Boiler pressure drop with 35,5% glycol water
C Boiler pressure drop with no glycol in water

1.4.2.2 Caldaria 55.1

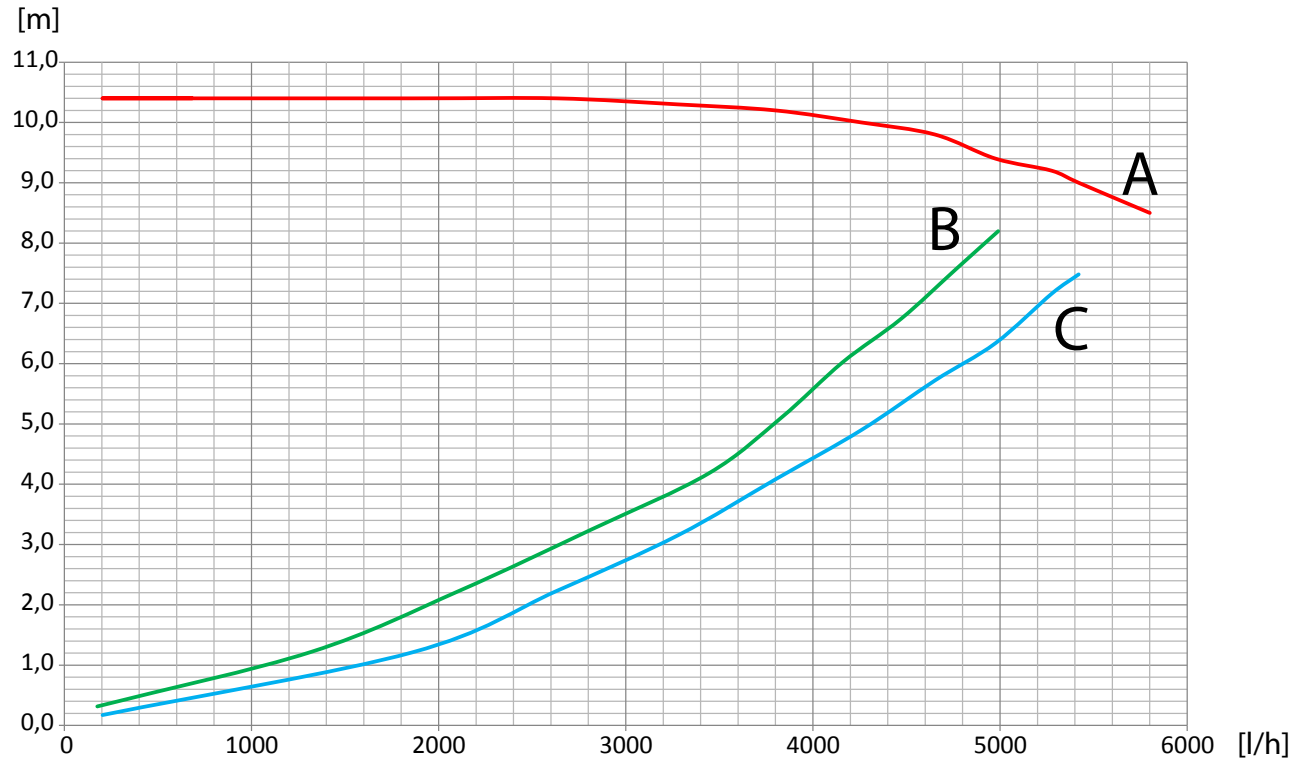
Figure 1.16 *Available head and pressure drop of Caldaria 55.1*



A Pump characteristic curve
B Boiler pressure drop with 35,5% glycol water
C Boiler pressure drop with no glycol in water

1.4.2.3 Caldaria 100.2

Figure 1.17 *Available head and pressure drop of Caldaria 100.2*

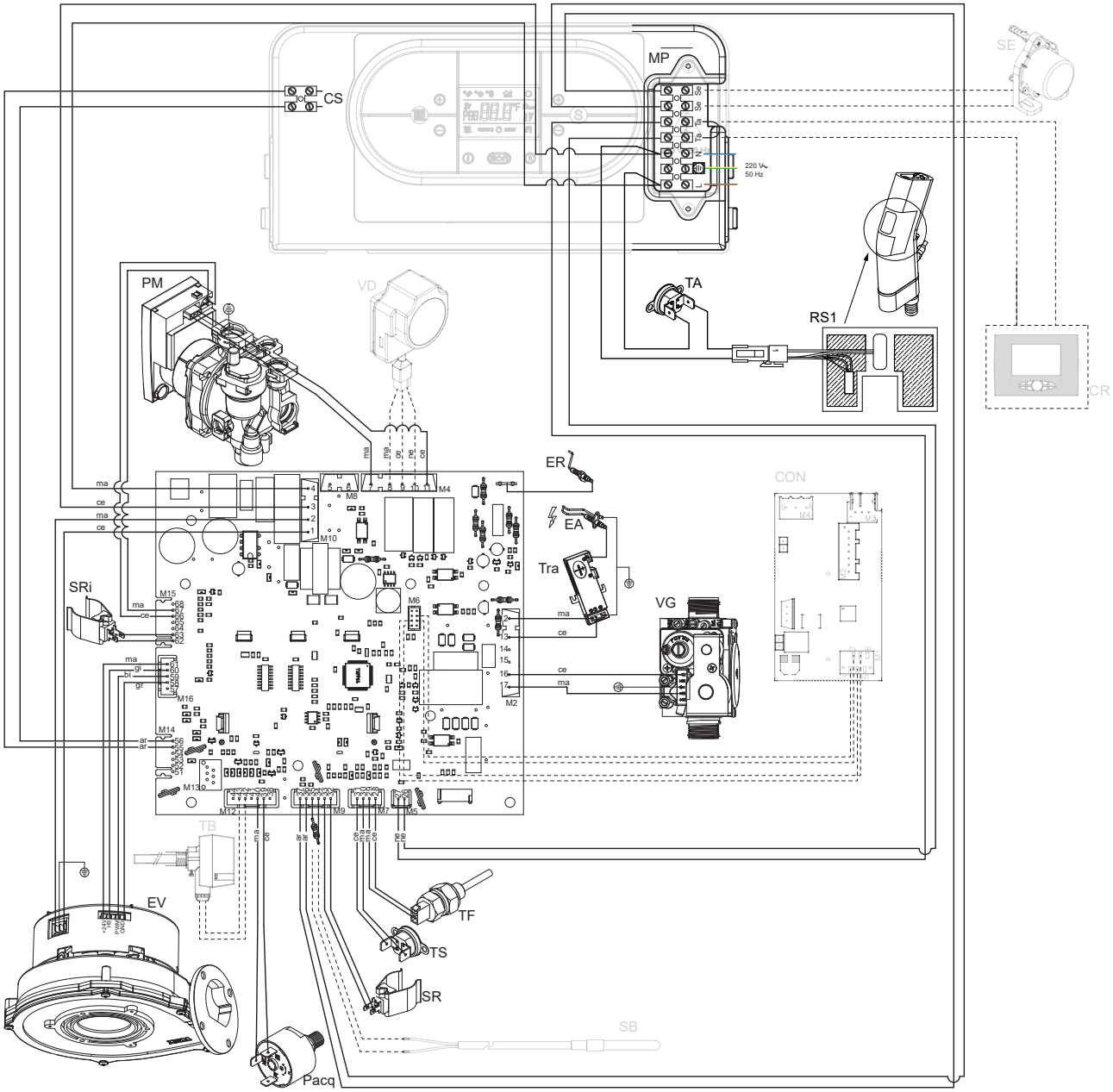


A Pump characteristic curve
B Boiler pressure drop with 35,5% glycol water
C Boiler pressure drop with no glycol in water

1.5 ELECTRICAL WIRING DIAGRAM

1.5.1 Caldaria 35

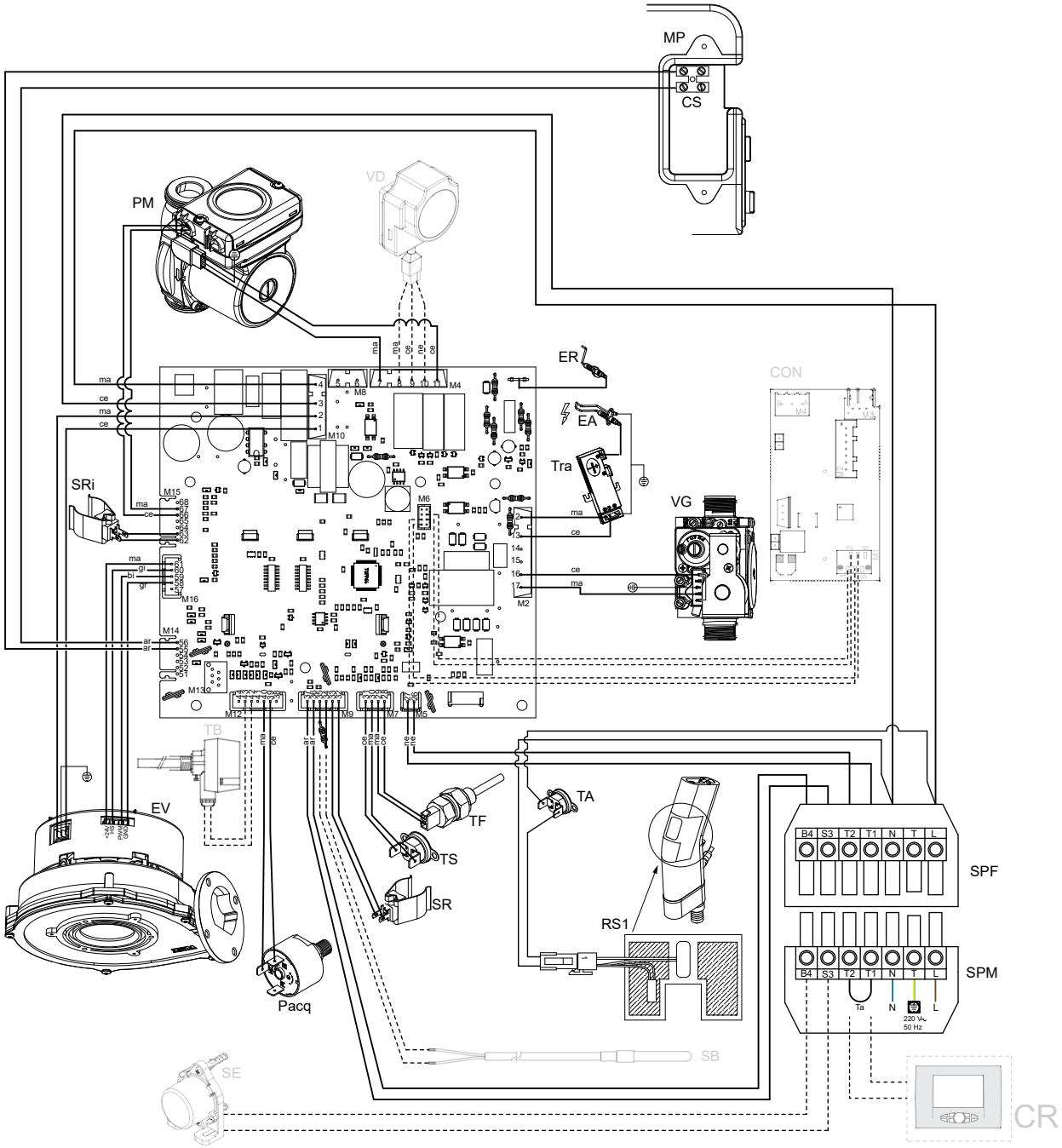
Figure 1.18 *Caldaria 35 electrical connections diagram*



CON	OT/Modbus interface (optional ODSP040)	RS1	Heating resistance of condensate drain siphon	Ta	Connector for optional room thermostat
CR	Remote control (optional OCDS006)	SB	DHW buffer tank probe (optional OSND011)	Tra	Ignition transformer
CS	Standby contact	SE	Outdoor probe (optional OSND009)	VD	Buffer tank diverter valve for DHW charging
EA	Ignition electrode	SR	Heating delivery probe	VG	Gas valve
ER	Flame detector	SRi	Heating return probe	ar	Orange
EV	Blower	Se	Connector for optional outdoor temperature probe	bi	White
L	Line			ce	Light blue
MP	Control panel terminal block	TA	Antifreeze thermostat	gi	Yellow
N	Neutral	TB	DHW thermostat (alternative to SB probe)	gr	Grey
PM	Modulating water pump	TF	Flue gas thermofuse	ma	Brown
Pacq	Water pressure switch	TS	Safety thermostat	ne	Black

1.5.2 Caldaria 55.1

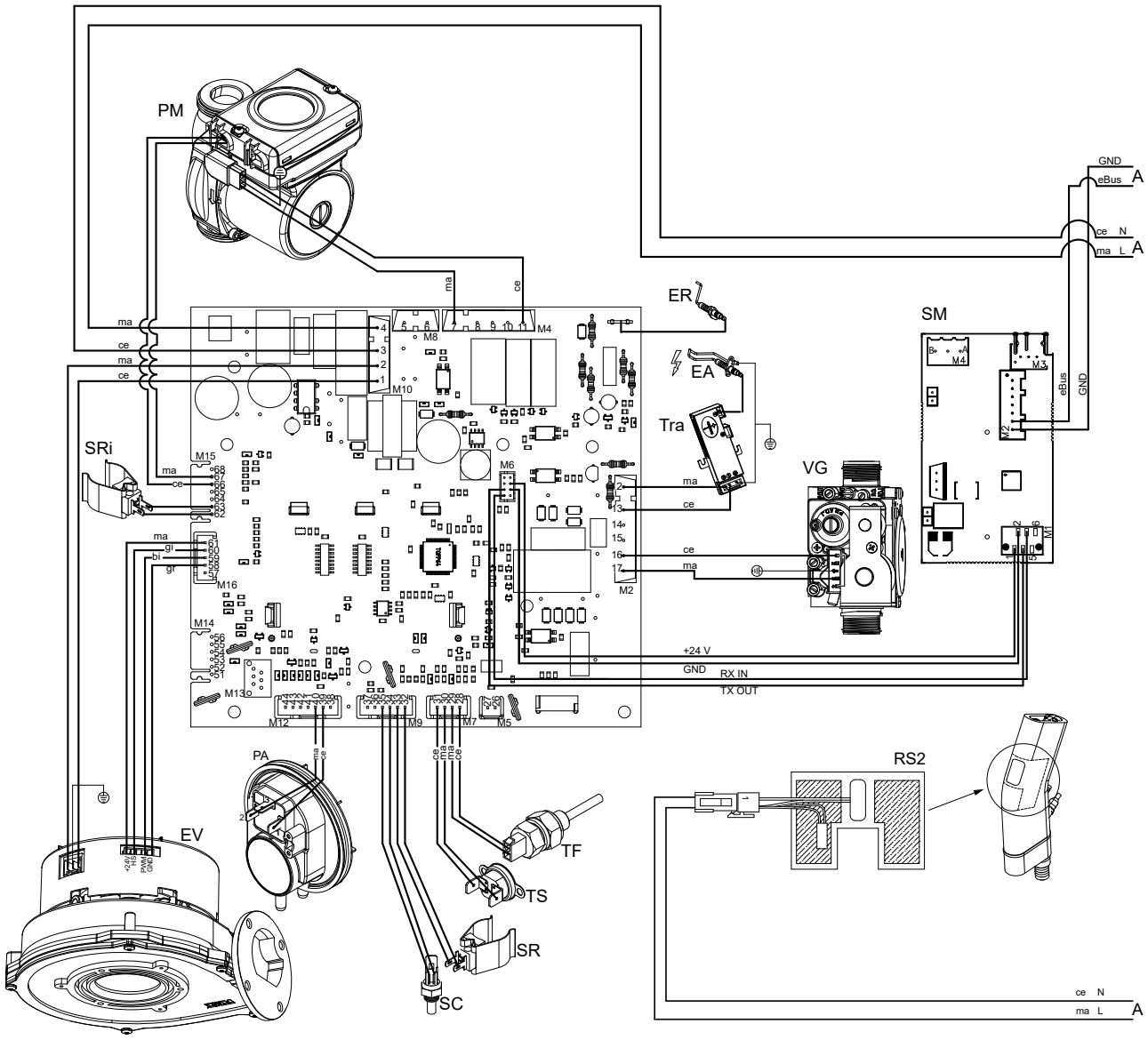
Figure 1.19 *Caldaria 55.1 electrical connections diagram*



CON	OT/Modbus interface (optional ODSP040)	SB	DHW buffer tank probe (optional OSND011)	Ta	Connector for optional room thermostat
CR	Remote control (optional OCDS006)	SE	Outdoor probe (optional OSND009)	Tra	Ignition transformer
CS	Standby contact	SPF	Female socket	VD	Buffer tank diverter valve for DHW charging
EA	Ignition electrode	SPM	Male plug	VG	Gas valve
ER	Flame detector	SR	Heating delivery probe	ar	Orange
EV	Blower	SRi	Heating return probe	bi	White
L	Line	Se	Connector for optional outdoor temperature probe	ce	Light blue
MP	Control panel terminal block	TA	Antifreeze thermostat	gi	Yellow
N	Neutral	TB	DHW thermostat (alternative to SB probe)	gr	Grey
PM	Modulating water pump	TF	Flue gas thermofuse	ma	Brown
Pacq	Water pressure switch	TS	Safety thermostat	ne	Black
RS1	Heating resistance of condensate drain siphon				

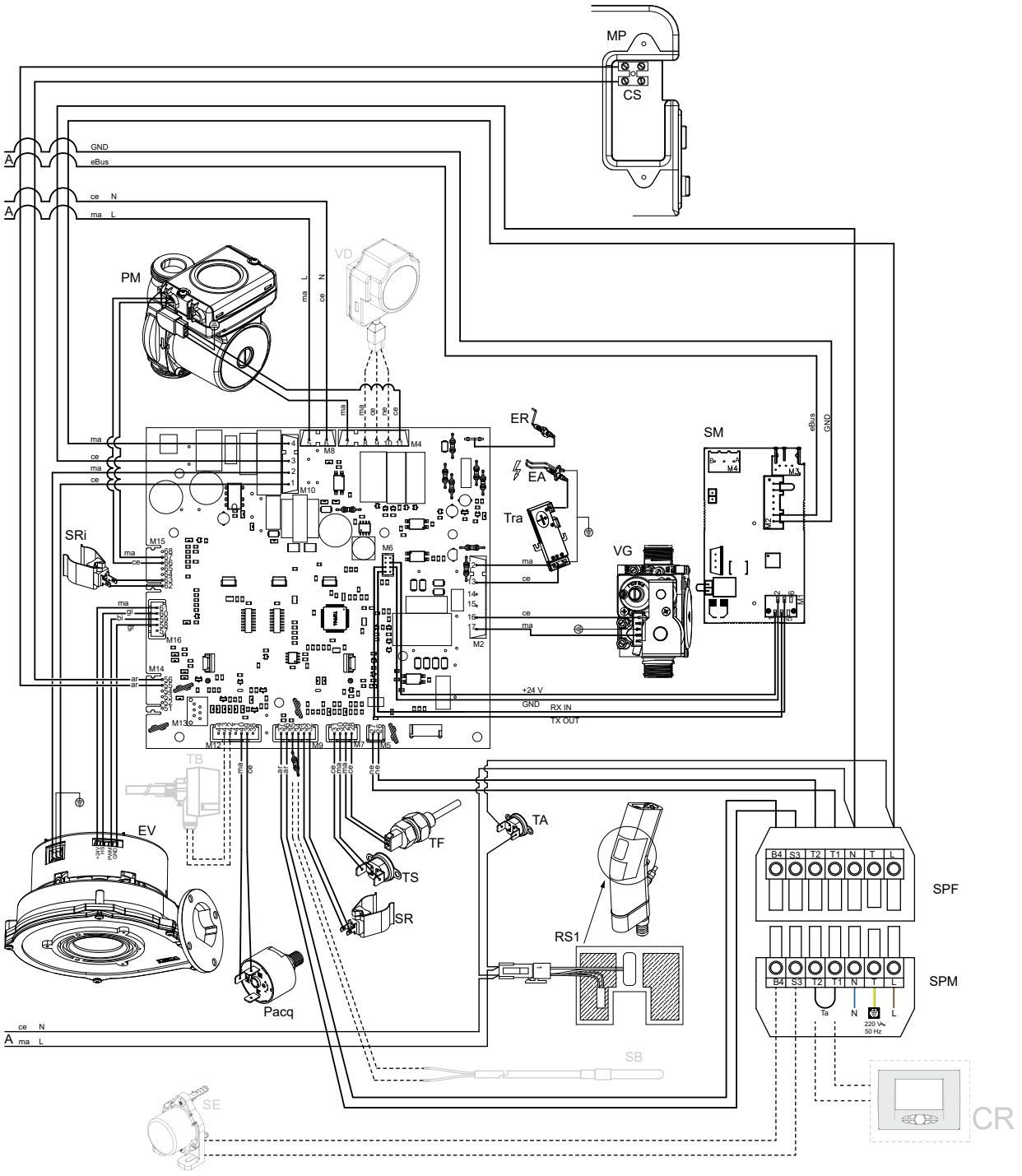
1.5.3 Caldaria 100.2

Figure 1.20 *Caldaria 100.2 electrical connections diagram - slave board*



A	Connection to master board		of the slave module	ar	Orange
EA	Ignition electrode	SC	Manifold probe	bi	White
ER	Flame detector	SM	OT/Modbus interface	ce	Light blue
EV	Blower	SR	Heating delivery probe	gi	Yellow
L	Line	SRi	Heating return probe	gr	Grey
N	Neutral	TF	Flue gas thermofuse	ma	Brown
PA	Air pressure switch	TS	Safety thermostat	ne	Black
PM	Modulating water pump	Tra	Ignition transformer		
RS2	Heating resistance of condensate drain siphon	VG	Gas valve		

Figure 1.21 *Caldaria 100.2 electrical connections diagram - master board*



•	Connection to slave board	SB	DHW buffer tank probe (optional OSND011)	TS	Safety thermostat
CR	Remote control (optional OCDS006)	SE	Outdoor probe (optional OSND009)	Ta	Connector for optional room thermostat
CS	Standby contact	SM	OT/Modbus interface	Tra	Ignition transformer
EA	Ignition electrode	SPF	Female socket	VD	Buffer tank diverter valve for DHW charging
ER	Flame detector	SPM	Male plug	VG	Gas valve
EV	Blower	SR	Heating delivery probe	ar	Orange
L	Line	SRi	Heating return probe	bi	White
MP	Control panel terminal block	Se	Connector for optional outdoor temperature probe	ce	Light blue
N	Neutral			gi	Yellow
PM	Modulating water pump	TA	Antifreeze thermostat	gr	Grey
Pacq	Water pressure switch	TB	DHW thermostat (alternative to SB probe)	ma	Brown
RS1	Heating resistance of condensate drain siphon	TF	Flue gas thermofuse	ne	Black

2 TRANSPORT AND POSITIONING

2.1 WARNINGS

Damage from transport or installation

The manufacturer shall not be liable for any damage during appliance transport and installation.

On-site inspection

- Upon arrival at the site, ensure there is no transport damage on packing or boiler panels.
- After removing the packing materials, ensure the appliance is intact and complete.

Packing

- Only remove the packing after placing the appliance on site.
- Do not leave parts of the packing within the reach of children (plastic, polystyrene, nails...) since they are potentially dangerous.

Weight

- The lifting equipment must be suitable for the load.
- Do not stand under suspended loads.

2.2 INSTALLATION KIT

2.2.1 Caldaria 35

The installation kit supplied with the boiler includes:
- ► 1 Caldaria 35 condensing boiler.
- ► 1 boiler installation jig in cardboard.
- ► 1 Ø 60/80 mm flanged socket (resting on the flue gas outlet of the boiler).
- ► 1 gasket of the flanged socket.
- ► 4 screws for fixing the flanged socket.
- ► 1 rain cover.
- ► 1 boiler support bracket.
- ► 3 wall plugs for fixing the boiler.
- ► 2 corner ball valves complete with gaskets (boiler side) (Ø 3/4" F boiler side, Ø 3/4" M system side).
- ► 1 flexible condensate drain hose.

2.2.2 Caldaria 55.1

The installation kit supplied with the boiler includes:
- ► 1 Caldaria 55.1 condensing boiler.
- ► 1 triangle key for opening the front panel.
- ► 1 boiler installation jig in cardboard.
- ► 1 Ø 60/80 mm flanged socket (resting on the flue gas outlet of the boiler).
- ► 1 gasket of the flanged socket.
- ► 4 screws for fixing the flanged socket.
- ► 1 rain cover.
- ► 1 boiler fixing frame.
- ► 3 wall plugs for fixing the boiler.
- ► 1 flexible condensate drain hose.
- ► 1 lower bracket for tilting the boiler.
- ► 2 shut-off ball valves Ø 1 1/4".
- ► 2 elbows Ø 1 1/4" M/F.
- ► 2 reductions from Ø 1 1/4" F to Ø 1" M.
- ► 2 reductions from Ø 1 1/4" F to Ø 1" F.
- ► 2 gaskets for fittings.
- ► 1 instruction sheet for fitting assembly.

2.2.3 Caldaria 100.2

The installation kit supplied with the boiler includes:
- ► 1 Caldaria 100.2 condensing boiler.
- ► 1 triangle key for opening the front panel.
- ► 1 boiler installation jig in cardboard.
- ► 1 rain cover.
- ► 1 boiler fixing frame.
- ► 3 wall plugs for fixing the boiler.
- ► 2 flexible condensate drain hoses.
- ► 1 lower bracket for tilting the boiler.
- ► 2 shut-off ball valves Ø 1 1/4".
- ► 2 elbows Ø 1 1/4" M/F.
- ► 2 reductions from Ø 1 1/2" F to Ø 1 1/4" M.
- ► 2 gaskets for fittings.
- ► 1 instruction sheet for fitting assembly.

2.3 HANDLING

Handling and lifting

- ► Always handle the appliance in its packing, as delivered by the factory.
- ► Comply with safety regulations at the installation site.

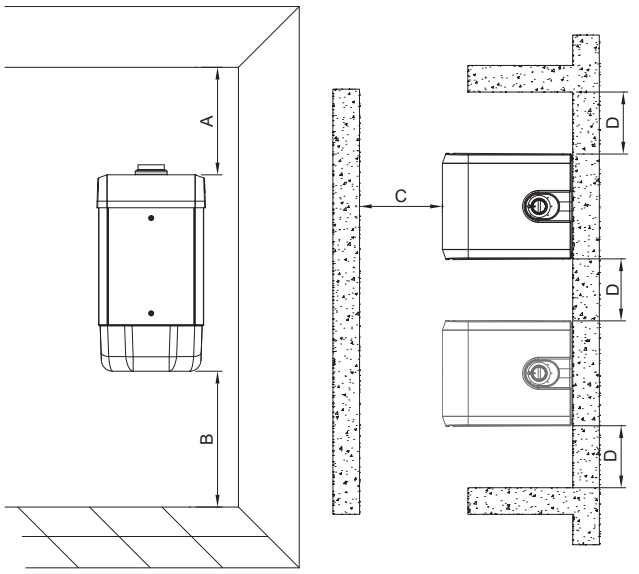
In the event of handling with forklift or pallet truck, comply with the handling instructions shown on the packing.

2.4 MINIMUM CLEARANCE DISTANCES

Keep the appliance away from combustible or flammable materials or components, in compliance with applicable regulations.

In order to allow periodic maintenance of the boiler, the installation must take place outside, respecting the distances indicated in Figure 2.1 *p. 21* and in any case **at a height not exceeding 3 metres from a walking surface to ensure correct maintenance in safety**.

Figure 2.1 *Minimum clearance distances*



A > 250 mm
B 0,5 ÷ 3 m
C > 1 m
D > 200 mm

3 HEATING ENGINEER

3.1 WARNINGS

3.1.1 General warnings

Read the warnings in Chapter III.1 *p. 4*, providing important information on regulations and on safety.

Compliance with installation standards

Installation must comply with applicable regulations in force, based on the installation Country and site, in matters of safety, design, implementation and maintenance of:

- heating systems
- gas systems
- flue gas exhaust
- flue gas condensate drain

Installation must also comply with the manufacturer's provisions.

3.2 BOILER INSTALLATION

To facilitate assembly, the boiler is equipped with a jig and a frame (Caldaria 55.1 and Caldaria 100.2), that allow to prepare in advance the connections to the pipes with the possibility of installing the boiler when the masonry work is complete.
Follow the instructions below for installation.

3.2.1 Caldaria 35

1. Fix the mounting jig of the external module to the installation wall, matching, if already present, the Ø 80 mm hole for the passage of water pipes and electrical cables with the shape of the relative hole (Ø 80 mm) indicated on the jig. At this point, in correspondence with the relative shapes of the holes indicated on the jig, trace the following points for drilling on the wall: 2 fixing holes (Ø 10 mm) and 1 lower hole (moved to the right) Ø 10 mm.
2. Remove the mounting jig from the wall and drill the holes marked out in the previous point: for the 2 upper holes (Ø 10 mm) for fixing the support bracket and the one for the frame of the external module, a depth of 90 mm is sufficient; the hole (Ø 80 mm) must be drilled for the entire thickness of the wall.
3. Insert a plastic pipe through the wall into the hole (Ø 80 mm), cut to size.
4. Position the support bracket of the external module in correspondence with the upper holes made (Ø 10 mm, depth 90 mm) and secure it with the supplied wall plugs.
5. Lift the boiler and hook it to the support bracket.
6. Secure the boiler permanently to the wall, fastening the rear panel by means of the third wall plug supplied.
7. Make the hydraulic and electrical connections as specified in the relevant paragraphs.

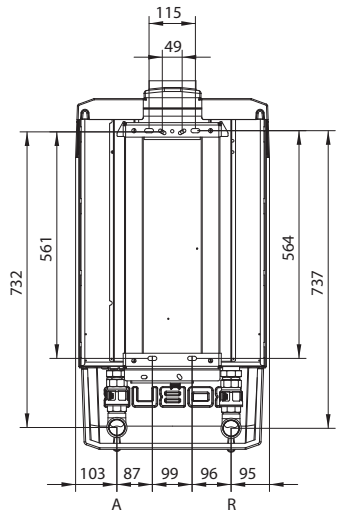
3.2.2 Caldaria 55.1 and 100.2

1. Using a spirit level, fix the jig to the wall where the boiler is to be installed and mark the points for inserting the wall plugs and the points of the system's delivery and return connections (Figure 3.1 *p. 22* for Caldaria 55.1 and 3.2 *p. 22* for Caldaria 100.2)..
2. Drill the holes and fix the frame to the wall (Figure 3.3 *p. 22*).
3. Hang the boiler using the slots on the frame (Figure 3.3 *p. 22*).

In order to avoid condensation stagnation inside the boiler, it is necessary to tilt the boiler outwards by 1÷1.5° (Figure 3.4 *p. 22*).

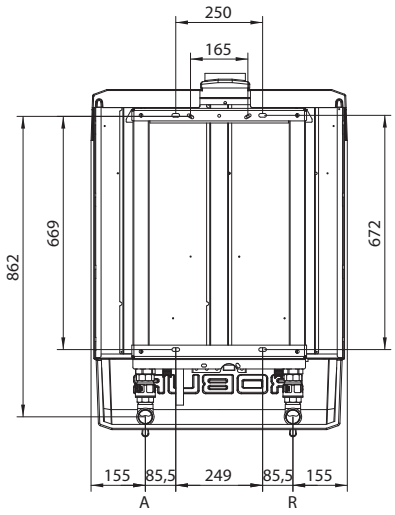
4. Unscrew the fixing screws of the lower bracket ensuring the free sliding of the bracket with respect to the boiler (Figure 3.4 *p. 22*).
5. Tilt the boiler about 1÷1.5° vertically (Figure 3.4 *p. 22*). To lock the boiler position, tighten the fixing screws of the lower bracket.
6. Make sure that the boiler is firmly fixed to the wall.
7. Fit the hydraulic connections as detailed in the included instruction sheets.
8. Make the hydraulic and electrical connections as specified in the relevant paragraphs.
9. Mount the fitting cover.

Figure 3.1 *Caldaria 55.1 mounting jig*



A Outlet Ø 1 1/4" M R Inlet Ø 1 1/4" M

Figure 3.2 *Caldaria 100.2 mounting jig*



A Outlet Ø 1 1/4" M R Inlet Ø 1 1/4" M

Figure 3.3 *Installation of the wall frame and of the boiler*

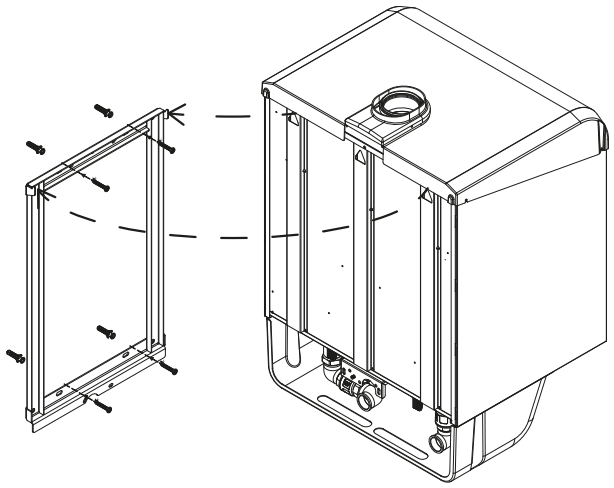
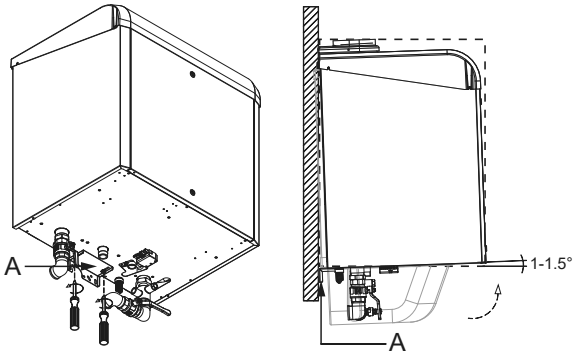


Figure 3.4 *Detail of the inclination of the boiler*



A Lower bracket

3.3 HYDRAULIC CONNECTIONS

The hydraulic installer must make the hydraulic connection circuit to the heating system.
To facilitate the connection to the system, the boiler is standard supplied with a kit of hydraulic fittings, located under the fitting cover.
The installer must provide for the construction of a suitably sized hydraulic connection circuit, taking into account:

A. of the following indications:
- Use pipes for heating/cooling systems, protected from weathering and freezing, insulated for thermal dispersion.
- Sizing of the pipes, according to the supplied water pump, must grant the nominal water flow required for the correct operation of the heating system.
- When using glycol water, take this into account when selecting the pipe material and calculating the additional pressure drop generated by the presence of glycol (Table 3.1 *p. 23*).

B. of the residual head and pressure drop data reported in Paragraph 1.4.2 *p. 13*.

3.3.1 System connections

Connect the water pipes between the boiler and the system as detailed below.

For the calculation of the total water content to be loaded in the system it is necessary to add the water content of the boiler (Table 1.1 *p. 12*) and of the distribution terminals to the water content in the pipes and in other elements that make up the system (tanks, hydraulic separators, etc.).

In order to ensure correct operation of the unit and avoid freezing of the water during the winter periods (with possible damage to the unit and the system), it is necessary to add antifreeze glycol to the water in a quantity proportional to the minimum winter temperatures of the installation site (see Table 3.1 *p. 23*).

When producing DHW by DHW buffer tank, use propylene glycol only.

The use of toxic antifreeze fluids is forbidden.

Connect the outlet of the boiler safety valve (Paragraph 1.3 *p. 9*) to a suitable drain. The manufacturer is not liable for any damage caused by the opening of the safety valve in the event of system overpressure.

Table 3.1 *Correction factor for pressure drop*

		Low roughness pipes (copper, stainless steel and plastic)	Medium roughness pipes (black and galvanized steel)
% of antifreeze glycol	Protection temperature (°C)	Correction factor for pressure drop	Correction factor for pressure drop
15%	-5	1,06	1,08
20%	-8	1,08	1,11
25%	-12	1,10	1,15
30%	-15	1,12	1,19

3.3.1.1 Caldaria 35

Connect the water pipes between the boiler and the system as follows:

- ► Fit the corner ball valves supplied with the boiler on the inlet and outlet connections of the boiler, after removing the fitting cover. Position the gaskets supplied between the water connections of the boiler and the Ø 3/4" F connections of the valves.
- ► Connect the hydraulic pipes of the system to the corner ball valves of the boiler (Ø 3/4" M), placing appropriate gaskets on each one and taking care to avoid the entry of foreign bodies.
- ► Then connect the heating system terminals to the hydraulic pipe coming from the boiler.
- ► Fill the hydraulic circuit with water. The air in the circuit and pipes will be vented by the venting devices located in the upper parts of the system.

3.3.1.2 Caldaria 55.1 and 100.2

Connect the water pipes between the boiler and the system as follows:

- ► Fit the hydronic fitting kit supplied with the boiler on the outlet and inlet connections, following the relevant instruction sheet.
- ► Connect the hydraulic pipes of the system to the water outlet and inlet connections of the boiler (Ø 1 1/4" M), placing appropriate gaskets on each connection and taking care to avoid the entry of foreign bodies.
- ► Then connect the heating system terminals to the hydraulic pipe coming from the boiler.
- ► Fill the hydraulic circuit with water. The air in the circuit and pipes will be vented by the venting devices located in the upper parts of the system.

3.3.2 System filling

Proceed with the filling of the system as follows.

At the first power supply and each time the power supply is restored, an automatic system venting cycle is activated. The display will show the code F33 for the entire duration of the cycle (5 minutes for the first power supply, 2 minutes for the following ones).

3.3.2.1 Caldaria 35

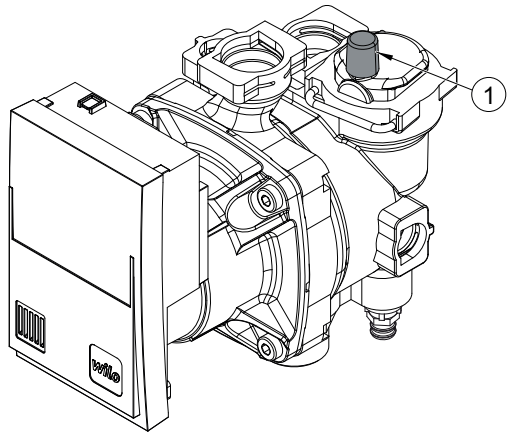
On the Caldaria 35 it is possible to fill the system directly through the filling tap, provided that the water supply is connected to the boiler system filling connection (Ø 1/2" M), as shown in Figure 1.2 *p. 8*. If this is not the case, a suitable filling tap must be provided on the system itself.

1. Slightly loosen the cap of the jolly valve on the circulator (detail 1, Figure 3.5 *p. 24*) to let the air out of the system.
2. Slightly loosen the cap of the jolly valve placed on the top of the condensing block (Figure 3.7 *p. 24*) to release the air from the top of the boiler.
3. Open the system filling tap (Figure 3.6 *p. 24* if the water supply has been connected to the boiler system filling connection) and let all the air out.
4. Check with pressure gauge (Figure 3.6 *p. 24*) that system pressure reaches 1,2 bar (Figure 3.8 *p. 24*).
5. Open the automatic air vent valves on the system, if any, and check the air venting process.
6. Make sure that the unit is energized.
7. Send an operating request to the unit for a few seconds. The water pump will be immediately activated.
8. Remove the request before the burner is activated. The water pump will continue to circulate the water for the post-circulation time.
9. If, after the above operations, a decrease in system water pressure is observed, open again the system filling tap until the system pressure reaches 1,2 bar.
10. Repeat steps 7, 8 and 9 until the pressure has stabilised (at least 1,2 bar).
11. After the operation, make sure that the system filling tap (detail R, Figure 3.6 *p. 24*) is tightly closed.

Once the filling operation has been completed, remember to close the cap of the jolly valve on the circulation pump and on the condensing block, to avoid water leaks.

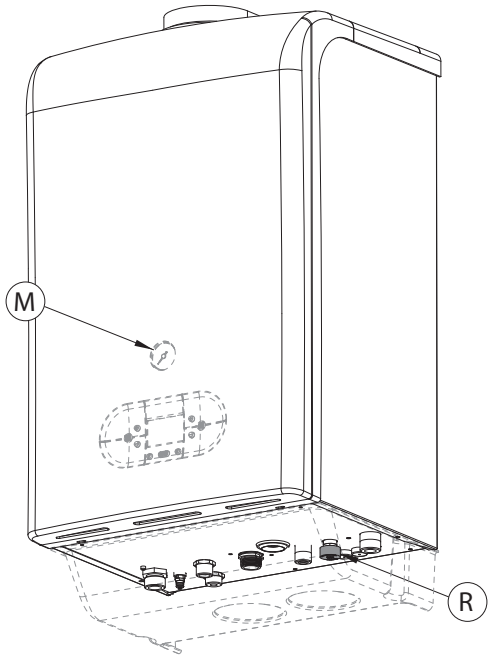
To start the water pump only, with the boiler powered, press the key (Figure 6.1 *p. 48*): the symbol will appear on the display; after a few seconds turn off the boiler by pressing the key again (the symbol will appear on the display). The water pump will remain in operation for a few minutes. Repeat the operation several times until the pressure of the circuit remains unchanged.

Figure 3.5 *Cap of the jolly valve on ciculating pump*



1 Cap of the jolly valve

Figure 3.6 *Pressure gauge and system filling tap*



M Pressure gauge
R System filling tap

Figure 3.7 *Cap of the jolly valve on condensing block*

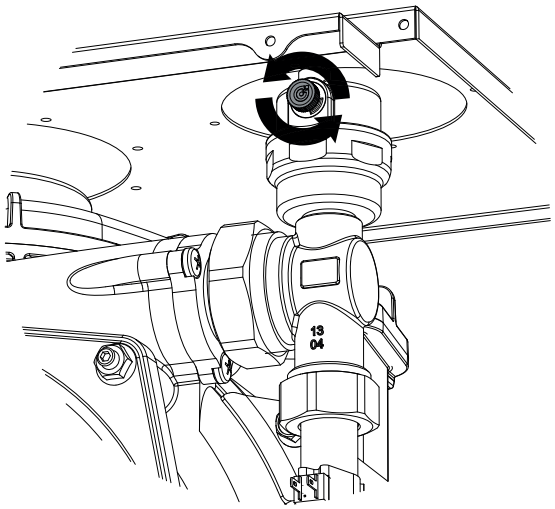


Figure 3.8 *Pressure gauge*

3.3.2.2 Caldaria 55.1 and 100.2

Figure 3.9 *p. 25*

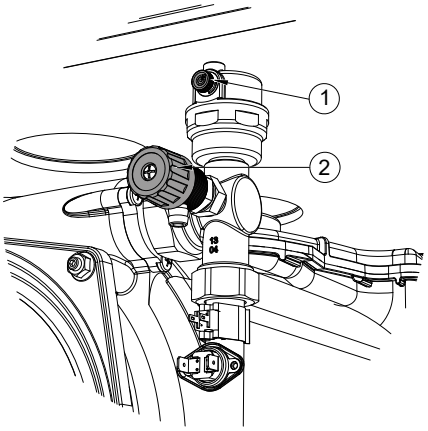
1. Slightly loosen the cap of the jolly valve located at the top of the condensing block (detail 1, Figure 3.9 *p. 25*) to let the air out from the highest point of the boiler.
2. Check that the air vent valves in the system are not blocked.
3. Connect a rubber hose to the drain tap (detail 2, Figure 3.9 *p. 25*).
4. Open the drain tap (detail 2, Figure 3.9 *p. 25*) counterclockwise.
5. Open the system filling tap (to be provided on the system) and let all the air out. Close it when the air is all out, replaced by a constant water flow.
6. Operations 1 to 5 are to be carried out on both condensation blocks of the Caldaria 100.2 model.
7. Pressurize the hydraulic system, making sure that the water pressure indicated by the pressure gauge is not less than 1,5 bar.
8. Make sure that the unit is energized.
9. Send an operating request to the unit for a few seconds. The water pump will be immediately activated.
10. Remove the request before the burner is activated. The water pump will continue to circulate the water for the post-circulation time.
11. If, after the above operations, a decrease in system water pressure is observed, open again the system filling tap until the system pressure reaches 1,5 bar.
12. Repeat items 9, 10, 11 until the pressure has stabilised (at least 1,5 bar).
13. After the operation, close the filling tap.

Once the filling operation has been completed, close the cap of the jolly valve on the condensing block, to avoid

water leaks.

To start the water pump only, with the boiler powered, press the key (Figure 6.1 *p. 48*): the symbol will appear on the display; after a few seconds turn off the boiler by pressing the key again (the symbol will appear on the display). The water pump will remain in operation for a few minutes. Repeat the operation several times until the pressure of the circuit remains unchanged.

Figure 3.9 *Air-vent valve*



1 Cap of the jolly valve
2 Tap

3.3.3 System water characteristics

Responsibility of the user/operator/installer

The installer, operator and user must assure system water quality (Table 3.2 *p. 25*). Failure to comply with the manufacturer's guidelines may affect operation, integrity and life of the appliance, voiding the warranty.

In order to avoid any scale or deposits on the primary exchanger, the water in the system must be treated in accordance with the applicable standards. This treatment is absolutely essential in cases where there are frequent episodes of water supply or partial or total emptying of the system.

The filling and top-up water bring some amount of calcium into the system. This is attached to the hot parts including the heat exchanger, thus creating pressure drops and thermal insulation on the active parts. This can lead to damage.
If the filling and top-up water of the system is outside the values indicated below, it must be softened and/or chemically treated. Additives may also be added to keep the calcium in solution. Hardness should be checked regularly and recorded on the system logbook.
The choice of the type of treatment must be made according to the characteristics of the water to be treated, the type of plant and the limits of purity required.
Adhere to the chemical-physical parameters in Table 3.2 *p. 25* and the regulations on water treatment for residential and industrial heating systems.

Table 3.2 *Chemical and physical parameters of water*

Acidity	7 < pH < 8,5	
Conductivity	< 400	µS/cm (at 25°C)
Chlorides	< 125	mg/l
Iron	< 0,5	mg/l
Copper	< 0,1	mg/l

3.3.4 Condensate drain siphon filling

When switching on for the first time, the condensate siphon must be filled to prevent the combustion gases from backflowing through the siphon.
It is advisable, after the first few months of operation of the appliance, to clean the siphon, which collects also any deposits resulting from the first passage of the condensate inside the components of the boiler. These deposits could cause the siphon itself to malfunction.

3.3.5 Condensate drain and neutralisation

The provided condensate drain hose must be connected to a suitable collection and disposal system in accordance with the applicable regulations in force.
It will be the responsibility of the designer and/or the installer and/or the person in charge of the system, depending on the power of the system and intended use of the building, to assess the adoption of systems for the neutralization of acid condensate.
The system must be designed in such a way as to prevent condensation from freezing. Before commissioning the appliance, check that the condensate is drained correctly.
To do this, disconnect the hose from the siphon outlet and pour water into it, making sure that it is correctly and completely drained from the downstream drainage system.

The connection of the discharge to the sewerage system should be made at atmospheric pressure, i.e. by dripping into a siphoned container connected to the sewerage system.

3.4 COMBUSTION PRODUCTS EXHAUST

Installation types

For this type of boiler the flue gas exhaust configuration B23P, B33 can be used.

3.4.1 Flue gas exhaust connection

- Caldaria 35: Ø 80 mm
- Caldaria 55.1: Ø 80 mm
- Caldaria 100.2: Ø 100 mm

on the upper side of the boiler (Paragraph 1.2 *p. 7*).
The Caldaria 100.2 model is already equipped with chamfer and seal for Ø 100 mm male pipe.
The rain cover, supplied, must be mounted on the flue gas exhaust pipe to protect the internal components of the boiler (detail E, Figure 3.10 *p. 26*).
The combustion air is drawn from the outside of the casing by means of special louvres located in the lower part of the casing.

3.4.1.1 Flanged socket (Caldaria 35 and 55.1)

The Caldaria 35 and Caldaria 55.1 are supplied with a flanged socket (60/80 mm), complete with a socket for flue gas analysis, which must be connected to the combustion chamber after positioning the gasket, supplied. When the boiler arrives at the building site, the flanged socket is resting on the flue outlet of

the combustion chamber, but it is not fixed, and cannot therefore be used if it is not correctly positioned and fixed.

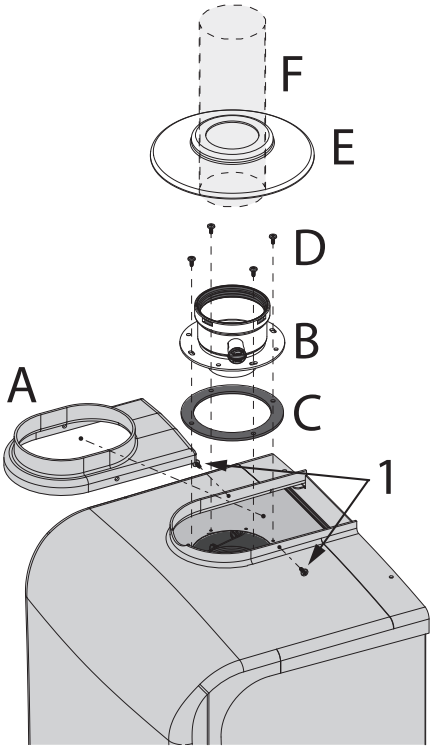
Mounting the flanged socket (Ø 60/80 mm)

1. Remove flange A from the upper casing by unscrewing the two side screws 1.
2. Remove the flanged socket B resting on the flue gas outlet of the combustion chamber.
3. Check that the gasket G is correctly positioned on the combustion chamber (Figure 3.11 *p. 26*).
4. Position the silicone gasket of the flanged socket C at the appropriate holes for the fixing screws.
5. Poistion the flanged socket B over the gasket C and secure the assembly with the appropriate fixing screws D.
6. Replace the flange A on the upper casing and fix it with the side screws 1.
7. Place the rain cover E on the flue gas exhaust pipe F (not supplied).
8. Insert the flue gas exhaust pipe F (not supplied) into the flanged socket B, so that the rain cover E remains outside the boiler casing, protecting flange A.

It is important to check the correct positioning of the gasket G positioned on the combustion chamber (Figure 3.11 *p. 26*).

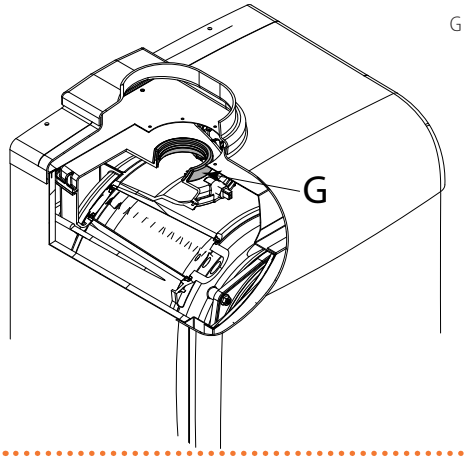
Incorrect positioning of the gasket G can compromise the correct discharge of the flue gas outside and consequently damage the appliance.

Figure 3.10 *Mounting the flanged socket (Ø 60/80 mm)*



1	Flange fastening screws		socket
A	Flange	E	Rain cover
B	Flanged socket Ø 60/80 mm	F	Flue gas exhaust pipe (not supplied)
C	Gasket of the flanged socket		
D	Fixing screws of the flanged		

Figure 3.11 *Correct gasket positioning*



G Gasket

3.4.2 How to realize the flue gas exhaust

In case of flue gas discharge in correspondence of the boiler, connect to the flue gas connection provided on the upper part of the casing the special rainproof terminal, available as an option (code OTRM031 for Caldaria 35 and Caldaria 55.1, code OTRM009 for Caldaria 100.2).

It is not recommended to install the flue terminal near the boiler if it is close to a wall. This condition could cause condensation to form on the terminal and on the wall that would fall on the boiler.

To avoid this type of problem, it is recommended to take the flue terminal beyond the roof of the building as shown in Figure 3.12 *p. 26* or to carry out the flue exhaust horizontally as shown in Figure 3.13 *p. 27*, respecting the indications given in Paragraph 3.4.3 *p. 27*.

Figure 3.12 *Roof vertical flue gas exhaust*

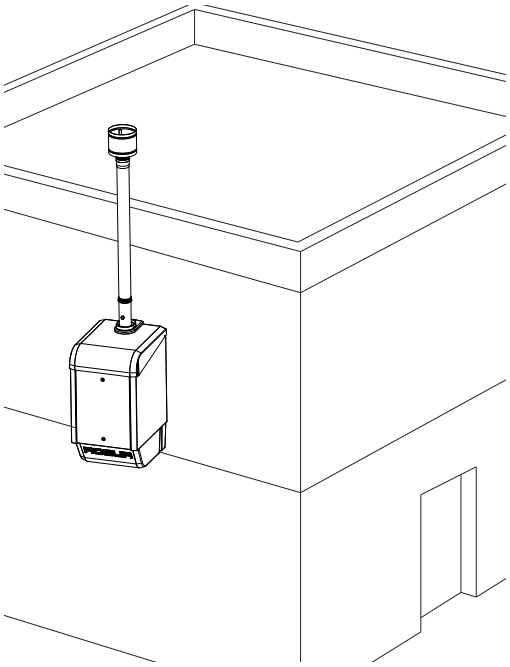
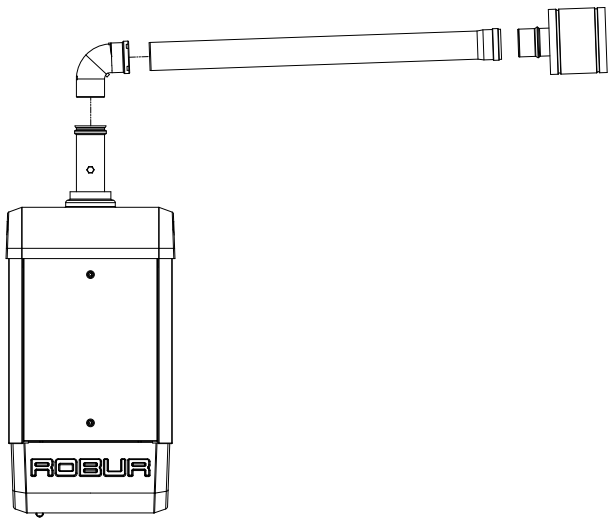


Figure 3.13 *Horizontal flue gas exhaust*

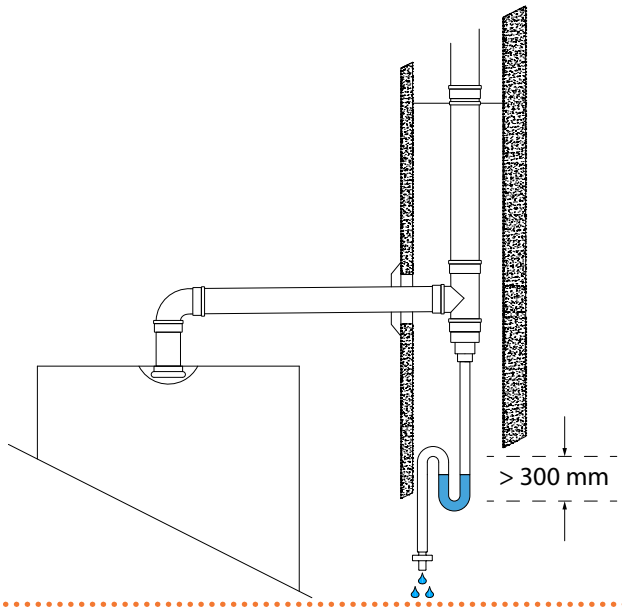


3.4.3 Possible flue

In case of extension of the duct, follow the instructions below:

- Use ducts and terminals suitable for forced draft condensing appliances.
- The residual head is detailed in Table 3.3 *p. 27*.
- The horizontal sections for flue gas exhaust must always be mounted on a slope towards the appliance (3° slope = 5 mm per metre of pipe). In this case, check that any condensation residues coming from the terminal do not fall on objects or material that could be damaged.
- For vertical ducts longer than 1,5 m, a curve and a Tee (Figure 3.14 *p. 27*) for condensate collection and drainage must be provided. The condensate must then be evacuated in accordance with the regulations in force, at the same time as that coming from inside the boiler.

Figure 3.14 *Flue gas condensate drain*



The connection of the discharge to the sewerage system must be made at atmospheric pressure, i.e. by dripping into a siphoned container connected to the sewerage system.

3.4.3.1 Maximum exhaust pipe length

Table 3.3 *Characteristics of flue gas exhaust*

			Caldaria 35	Caldaria 55.1	Caldaria 100.2
Installation data					
Flue gas exhaust	residual head	Pa	91	100	
	diameter (Ø)	mm	80		100
maximum equivalent length of exhaust duct		m	15	14	8

The maximum exhaust length (or equivalent linear length) is obtained by adding the length of the linear duct to the equivalent length of each additional curve.
The equivalent lengths of linear ducts and curves are given in Table 3.4 *p. 27*.

Table 3.4 *Pressure drop of flue pipes*

	Equivalent length (m)	Pressure drop (Pa)
Caldaria 35		
extension pipe Ø 80 mm, length 1000 mm	1	5,8
elbow 90° Ø 80 mm	1,5	8,7
elbow 45° Ø 80 mm	1,2	7,0
T connector Ø 80 mm	3	17,4
Caldaria 55.1		
extension pipe Ø 80 mm, length 1000 mm	1	7,0
elbow 90° Ø 80 mm	2,5	17,5
elbow 45° Ø 80 mm	1,4	7,8
T connector Ø 80 mm	3	21,0
Caldaria 100.2		
extension pipe Ø 100 mm, length 1000 mm	1,6	8,0
elbow 90° Ø 100 mm	3	24,0
elbow 45° Ø 100 mm	1,6	11,0
T connector Ø 100 mm	3	24,0

3.5 PUMP ANTIFREEZE AND ANTI-LOCK FUNCTION

Heating antifreeze function

If the outlet water temperature detected by the water temperature probe inside the boiler falls below the activation value of the antifreeze function (default 12 °C, settable for Caldaria 35 and Caldaria 55.1 via parameter P31) the control board starts the circulation pump and the burner ignition at minimum power.
When the outlet water temperature reaches 30 °C or the inlet water temperature reaches 20 °C (antifreeze temperature OFF) the control board will turn off the burner.

DHW antifreeze function

If the water temperature detected by the DHW buffer tank probe falls below +4 °C (antifreeze temperature ON) the control board starts the circulation pump and the burner ignition at minimum power.
When the water temperature of the DHW buffer tank reaches 8 °C the control board will turn off the burner.

Electrical and gas continuity

The antifreeze function is only effective if the power and gas supplies are assured. Otherwise, antifreeze fluid in the system water might be required.

Pump anti-lock function

In order to prevent the water pump from locking, the boiler is equipped with an anti-lock function which, every 24 hours of inactivity, operates the water pump for 30 seconds.

Electrical continuity

The pump anti-lock function is only effective if the power supply is guaranteed.

3.6 FUEL GAS SUPPLY

3.6.1 Gas connection

- ► Caldaria 35: 3/4" M
- ► Caldaria 55.1: 3/4" M
- ► Caldaria 100.2: 1" M

on the bottom of the boiler (Paragraph 1.2 *p. 7*).

- ► Install an anti-vibration connection between the appliance and the gas piping.

3.6.2 Mandatory shut-off valve

- ► Provide a gas shut-off valve (manual) on the gas supply line, next to the appliance, in a visible and easy accessible position, to exclude it when required.
- ► Perform connection in compliance with applicable regulations.

3.6.3 Gas pipes sizing

The gas pipes must not cause excessive pressure drops and, consequently, insufficient gas pressure for the appliance.

3.6.4 Supply gas pressure

This appliance is equipped for a maximum gas supply pressure of 50 mbar.

The appliance's gas supply pressure, both static and dynamic, must comply with Table 3.5 *p. 28*, with tolerance ± 15%.

Non compliant gas pressure may damage the appliance and be hazardous.

Table 3.5 *Network gas pressure*

Product category	Country of destination	Gas supply pressure [mbar]							
		G20	G25	G25.1 (1)	G25.3	G2.350 (1)	G27 (1)	G30	G31
$II_{2H3B/P}$	AL, BG, CY, CZ, DK, EE, FI, GR, HR, IT, LT, MK, NO, RO, SE, SI, SK, TR	20						30	
	AT, CH	20						50	
	HU	25						30	
$II_{2H3B/P}$	HU	25						30	
$II_{2HS3B/P}$				25					
II_{2H3P}	AL, BE, BG, CH, CZ, ES, FR, GB, GR, HR, IE, IT, LT, NL, MK, PL, PT, SI, SK, TR	20							37
	AT, BE, CH, CZ, DE, ES, FR, GB, HU, NL, SK	20							50
	AT, CZ, DE, NL, RO	20							30
$II_{2ELL3B/P}$	DE	20	20					50	
II_{2Esi3P}	FR	20	25						37
$II_{2E(R)3P}$	BE	20							37
$II_{2E(S)3P}$		20							37
II_{2E3P}	LU	20							50
$II_{2E3B/P}$	DE, PL, RO	20						30	
$II_{2ELwLs3B/P}$	PL					13	20		
$II_{2ELwLs3P}$						13	20		
$II_{2L3B/P}$	RO		20					30	
II_{2L3P}	FR		25						37
	RO		20						37
II_{2EK3P}	NL	20			25				30
$II_{2EK3B/P}$		20			25				30
I_{2EK}		20			25				
I_{2ELL}	DE	20	20						
$I_{2E(S)}$	BE	20							
$I_{2E(R)}$		20							
I_{2Esi}	FR	20	25						
I_{2H}	AL, AT, BG, CH, CY, CZ, DK, EE, ES, FI, GB, GR, HR, IE, IT, LT, LV, MK, NO, PT, RO, SE, SI, SK, TR	20							
	FR	20							
	HU	25							
I_{2L}	FR		25						
	RO		20						
I_{2E}	DE, PL, RO	20							

The appliance gas supply pressure, both static and dynamic, must comply with the values in the Table, with a tolerance of ± 15%.
1 Gas not available for Caldaia 35 Tech, Caldaia 35 Tech ACS, Caldaria 35, AY 35.

Product category	Country of destination	Gas supply pressure [mbar]							
		G20	G25	G25.1 (1)	G25.3	G2.350 (1)	G27 (1)	G30	G31
$I_{3B/P}$	AL, AT, BG, BE, CY, CZ, DE, DK, EE, FI, FR, GB, GR, HR, HU, IT, LT, MT, NL, NO, RO, SE, SI, TR							30	
	PL							37	
	AT, CH, DE, SK, CY, CZ							50	
	FR							50	
I_{3P}	AT, BE, CH, CZ, DE, ES, FR, GB, HU, IS, NL, SK								50
	AL, BE, BG, CH, CZ, ES, FR, GB, GR, HR, IE, IT, LT, NL, LV, MK, PL, PT, SI, SK, TR								37
	AT, CZ, DE, NL, RO								30

The appliance gas supply pressure, both static and dynamic, must comply with the values in the Table, with a tolerance of ± 15%.
1 Gas not available for Caldaia 35 Tech, Caldaia 35 Tech ACS, Caldaria 35, AY 35.

Before proceeding with the construction of the system, the installer must:
- ► Check that the gas used corresponds to that for which the appliance has been designed (see nameplate).
- ► Check that the flow rate of the gas meter is such as to ensure the simultaneous use of all the devices connected to it.

Although it is normal for the inlet pressure to decrease during the operation of the appliance, it is important to check that there are no excessive fluctuations in the inlet pressure. In order to limit the extent of these variations, it is necessary to appropriately define the diameter of the gas inlet pipe to be adopted based on the length and pressure drop of the pipe itself, from the gas meter to the boiler.

If fluctuations in the gas distribution pressure happen, it is advisable to insert a special pressure stabiliser upstream of the gas inlet to the boiler. In case of LPG supply, all necessary precautions must be taken to avoid freezing of the combustible gas in case of very low external temperatures.

If it is necessary to change the type of gas supply to the boiler, contact the TAC that will make the necessary changes.

Under no circumstances shall the installer be authorised to carry out such operations.

3.6.5 Vertical pipes and condensate

- ► If needed, vertical gas pipes must be fitted with siphon and discharge of the condensate that may form inside the pipe.
- ► If needed, insulate the piping.

3.6.6 LPG pressure reducers

With LPG the following must be installed:
- ► A first stage pressure reducer, close to the liquid gas tank.
- ► A second stage pressure reducer, close to the appliance.

4 ELECTRICAL INSTALLER

Do not power and/or start the boiler before filling the hydraulic system, as this may damage the internal hydraulic components.

4.1 WARNINGS

Read the warnings in Chapter III *p. 4*, providing important information on regulations and on safety.

Compliance with installation standards

Installation must comply with applicable regulations in force, based on the installation Country and site, in matters of safety, design, implementation and maintenance of electrical systems.

Installation must also comply with the manufacturer's provisions.

Live components

- ■ After placing the appliance in the final position, and prior to making electrical connections, ensure not to work on live components.

Earthing

- ■ The appliance must be connected to an effective earthing system, installed in compliance with regulations in force.
- ■ It is forbidden to use gas pipes as earthing.

Cable segregation

Keep power cables physically separate from signal ones.

Do not use the power supply switch to turn the appliance on/off

- ■ Never use the external isolation switch to turn the appliance on and off, since it may be damaged in the long run (occasional blackouts are tolerated).
- ■ To turn the appliance on and off, exclusively use the suitably provided control device.

The cables inside the boiler must be routed through the P1 and P2 cable glands (Paragraph 1.2 *p. 7*). To do this, make a hole in the cable gland, slightly smaller than the cable, so that the air does not pass through.

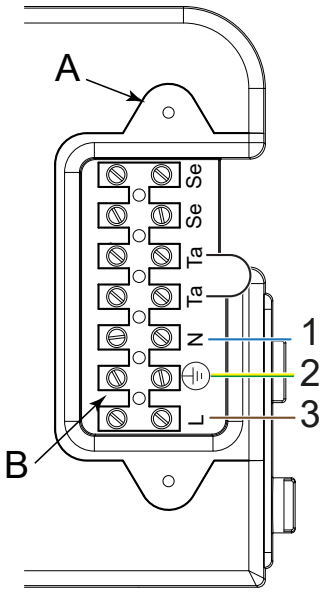
4.2 ELECTRICAL POWER SUPPLY

4.2.1 Caldaria 35

How to connect the power supply

1. Remove the fitting cover, the ABS casing and the front panel (Paragraph 5.2 *p. 34*).
2. Unscrew the two screws and remove the terminal block cover plate (Figure 4.1 *p. 30*).
3. Perform connections as shown in Figure 4.1 *p. 30*.
4. The ground wire to the terminal marked with the ground symbol.
5. The neutral cable to the terminal marked with the letter N.
6. The line cable to the terminal marked with the letter L.

Figure 4.1 *Caldaia 35 power supply*



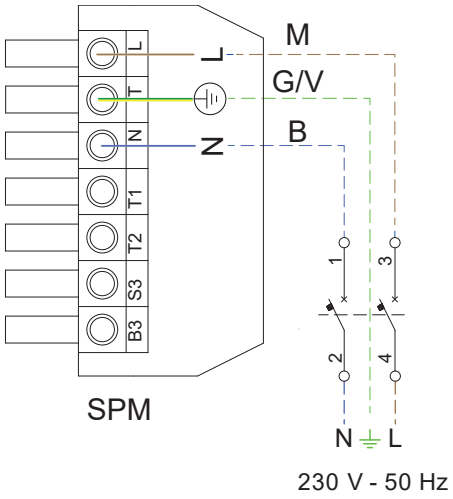
A	Plate	2	Yellow/Green
B	Terminal block	3	Line
1	Neutral		

4.2.2 Caldaria 55.1 and 100.2

How to connect the power supply

1. Remove the boiler front panel and the fitting cover (Paragraph 5.2 *p. 34*).
2. Disconnect the male plug from the female socket and make the connections as shown in Figure 4.2 *p. 30*, using a cable suitable for the maximum power consumption declared on the nameplate and in any case not less than 3x1 mm².
3. After the operation, reconnect the male plug to the female socket and then reassemble the fitting cover and the front panel.

Figure 4.2 *Caldaia 55.1 and 100.2 power supply*



SPM	Male plug	G/V	Yellow/Green
B	Blue	M	Brown

4.3 CONTROL DEVICE

The Caldaria Condensing+ export is supplied as standard with an electrical bridge mounted on the Ta-Ta terminals (Caldaria 35) or on the T1-T2 terminals (Caldaria 55.1 and Caldaria 100.2), which must be removed when the chosen control device is connected.
The following Table 4.1 *p. 30* summarizes the features associated with the different control devices.

Table 4.1 *Available features depending on controls*

Control devices	Description
External request	Heating at fixed water temperature, based on the parameters set on the control panel onboard the boiler. Activation/deactivation based on external request, connected to the Ta-Ta terminals (Caldaria 35) or T1-T2 terminals (Caldaria 55.1 and Caldaria 100.2).
Room thermostat	Heating at fixed water temperature, based on the parameters set on the control panel onboard the boiler. Activation/deactivation based on the air temperature detected by the room thermostat and its settings.
OCDS006 remote control	Heating at fixed water temperature, based on the time programming set on the remote control. Diagnostics and error reset. Activation/deactivation based on the air temperature detected by the remote control and its settings.
Cascade controller ODSP039 (combined with OT/Modbus interface ODSP040, except Caldaria 100.2)	Programmed on/off switching of the generation system for space heating and DHW production. Control with the same controller of up to 8 boilers in cascade, each of which must be equipped with its own OT/Modbus interface (except for the Caldaria 100.2, which already has the card onboard). Heating at variable water temperature, based on the controller settings. Possibility to manage temperature probes, mixing valves and deliveries on the system. Buffer tank DHW production management with diverter valve or through delivery, also split between two DHW buffer tanks, with relevant temperature probes and recirculation management. Diagnostics and error reset.

Additional optionals can be associated with each of the above devices to achieve more complete and complex control functionality.
For example, it is possible to combine the OSND009 outdoor

probe with the OCDS006 remote control to obtain the variable temperature heating service according to the climate curve settings, based on the time schedule set on the remote control.

Table 4.2 *Additional features available (regardless of the control device used)*

Control devices	Description
Outdoor probe OSND009	It allows to detect the outdoor temperature and, by setting the climatic curve, to obtain a variable delivery temperature, according to the outdoor temperature. The parameters of the climatic curve are set on the control panel of the boiler or on the cascade controller ODSP039.
DHW buffer tank probe OSND011	It allows managing the temperature in the remote DHW buffer tank, activating and deactivating the DHW request accordingly. The parameters of the DHW service are set on the control panel of the boiler or on the cascade controller ODSP039. This device is an alternative to the use of a simple DHW buffer tank thermostat (described below).
DHW buffer tank thermostat	Allows to activate/deactivate the DHW request based on the temperature measured in the remote DHW buffer tank and the thermostat settings. The parameters of the DHW service are set on the control panel of the boiler or on the cascade controller ODSP039. This device is an alternative to the use of the DHW buffer tank probe OSND011 (described above).
OT/Modbus interface ODSP040	Required for interfacing with the ODSP039 cascade controller. On the Caldaria 100.2 is already supplied.

4.3.1 Thermostat/chronothermostat location

Install the thermostat/chronothermostat according to the following guidelines:

- ► Place it inside the heated room, in an area that is representative of the room temperature, at about 1,5 m from the floor, protected from draughts, direct exposure to sunlight, influence by direct heating sources (lamps, hot air flows, etc.).
- ► Avoid installation on walls bordering the outside, to avoid distortion on the detected temperature and therefore affect system operation. Otherwise, shield the control system by placing a sheet of insulating material (cork, polystyrene or other) between it and the wall.

By following the above guidelines, unwanted starting and stopping of the system can be avoided and optimal comfort in the heated space can be guaranteed.

4.3.2 Connection of external request/room thermostat/OCDS006 remote control

To make the electrical connections of the room thermostat (TA) or of the remote control (optional OCDS006) or of an external request, proceed as described below.

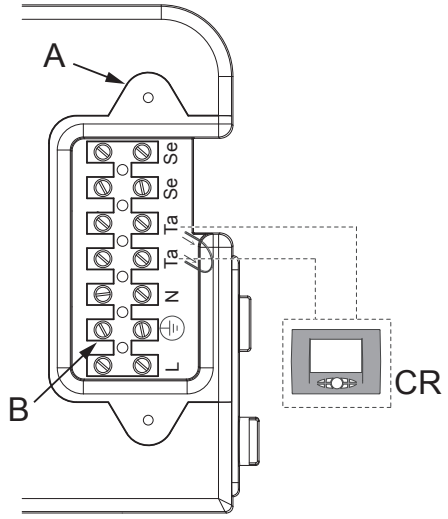
The remote control is electrically connected to the boiler by means of two non-polarized conductors through which it receives the power supply necessary for its operation and carries out communication between the two devices.

Use a cable with a cross-section between 0,5 and 1,5 mm^2, with a maximum length of 50 metres.

4.3.2.1 Caldaria 35

Remove the electrical bridge on the Ta-Ta contacts and then connect the two non-polarized conductors on the Ta-Ta contacts (Figura 4.3 *p. 31*).
After the operation, reassemble the plate A, the front panel, the ABS casing and the fitting cover.

Figure 4.3 *Connection of external request/room thermostat/OCDS006 remote control to Caldaria 35*

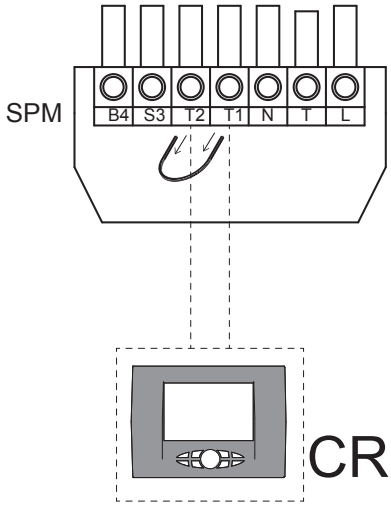


A Plate on the boiler electrical panel
B Terminal block
CR External request/room thermostat/OCDS006 remote control

4.3.2.2 Caldaria 55.1 and 100.2

Remove the electrical bridge on the TA contacts (T1-T2) of the male plug (SPM) and then connect the two non-polarized conductors on the T1-T2 contacts (Figure 4.4 *p. 32*).

Figure 4.4 *Connection of external request/room thermostat/OCDS006 remote control to Caldaria 55.1 and 100.2*



CR External request/room thermostat/OCDS006 remote control
SPM Male plug

4.3.3 Connection of cascade controller ODSP039

Refer to the documentation supplied with the ODSP039 cascade controller.

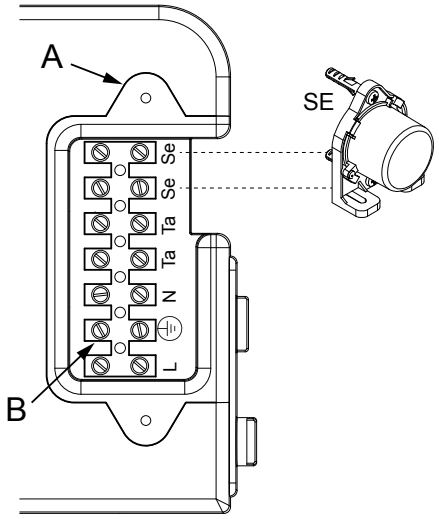
4.3.4 Connection of OSND009 outdoor probe

The OSND009 outdoor probe must be connected as described below.
The cable may not be longer than 30 metres.

4.3.4.1 Caldaria 35

Connect the probe to the Se-Se terminals of the MP terminal block (Figure 4.5 *p. 32*).

Figure 4.5 *Connection of OSND009 outdoor probe to Caldaria 35*

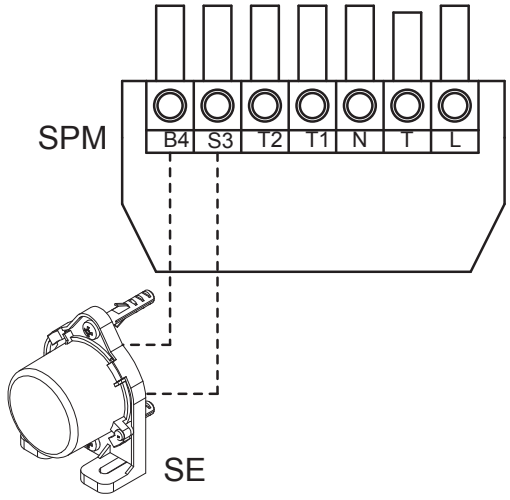


A Plate
B Terminal block
SE Outdoor probe OSND009

4.3.4.2 Caldaria 55.1 and 100.2

Connect the probe to terminals B3-S3 of the male plug (SPM) (Figure 4.6 *p. 32*).

Figure 4.6 *Connection of OSND009 outdoor probe to Caldaria 55.1 and 100.2*



SE Outdoor probe OSND009
SPM Male plug

4.3.5 Connection of OT/Modbus interface

Refer to the documentation supplied with the ODSP040 OT/Modbus interface.

4.4 DHW PRODUCTION

The Caldaria Condensing+ export appliances can manage autonomously the production of buffer tank DHW, through the control of an external 3-way diverter valve directly connected to the boiler itself that feeds the coil of a DHW buffer tank.
To control the temperature in the DHW buffer tank, a temperature probe, available as OSND011 optional, can be used, or alternatively a thermostat in the DHW buffer tank, appropriately set. These devices must also be connected directly to the boiler.
The parameters for DHW production management will be set directly on the control panel on the appliance.

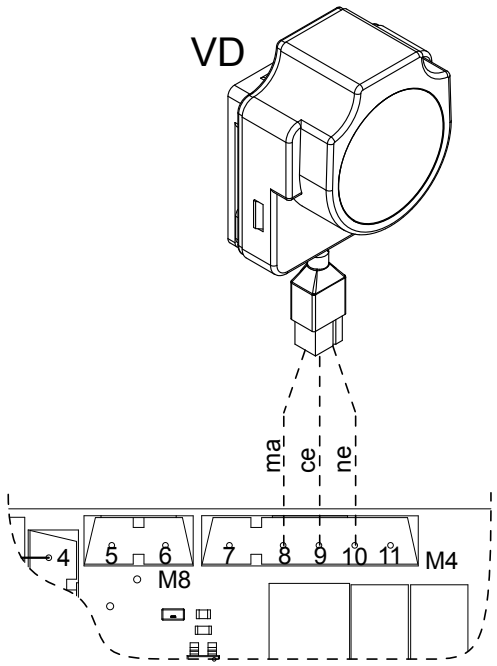
4.4.1 Connection of DHW diverter valve

The DHW diverter valve must be connected to terminals 8-9-10 (connector M4) of the electronic board (master board for Caldaria 100.2) (Figure 4.7 *p. 33*).

- ► neutral (common) on contact 9
- ► phase (DHW position) on contact 8
- ► phase (heating position) on contact 10

The valve is powered at 230 V AC directly from the electronic board of the boiler.
The valve must be of the type with supply (neutral) always present and position piloted by the phase present on the contact corresponding to the position to be taken.
The default position is for DHW (phase on contact 8), and is changed when there is a heating request (phase on contact 10).
The maximum applicable resistive load is 2 A.
The cable may not be longer than 50 metres, with a minimum cable cross-section of 0,5 mm^2.

Figure 4.7 *Connection of DHW diverter valve*



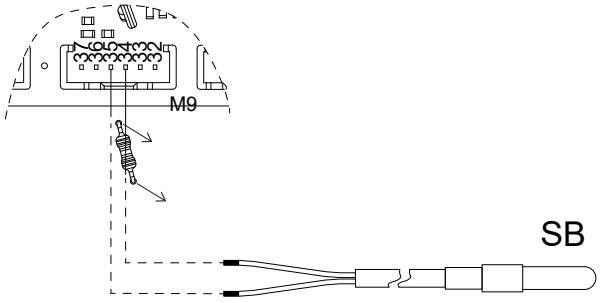
VD Buffer tank diverter valve for DHW charging
M4 connector:
8 phase (DHW position)
9 neutral (common)
10 phase (heating position)

4.4.2 Connection of OSND011 DHW buffer tank probe

The SB buffer tank probe (optional OSND011) must be connected to terminals 34-35 of the electronic board (master board for Caldaria 100.2), removing the electric resistance fitted as standard (Figure 4.8 *p. 33*).
The DHW buffer tank probe must be used as an alternative to the DHW buffer tank thermostat (Paragraph 4.4.3 *p. 33*).
The supplied cable length is 3 meters.
If a longer length is required, a 2x0,75 mm² shielded cable with a maximum length of 50 metres must be used.

For further information, refer to the documentation supplied with the DHW buffer tank probe OSND011.

Figure 4.8 *Connection of OSND011 DHW buffer tank probe*

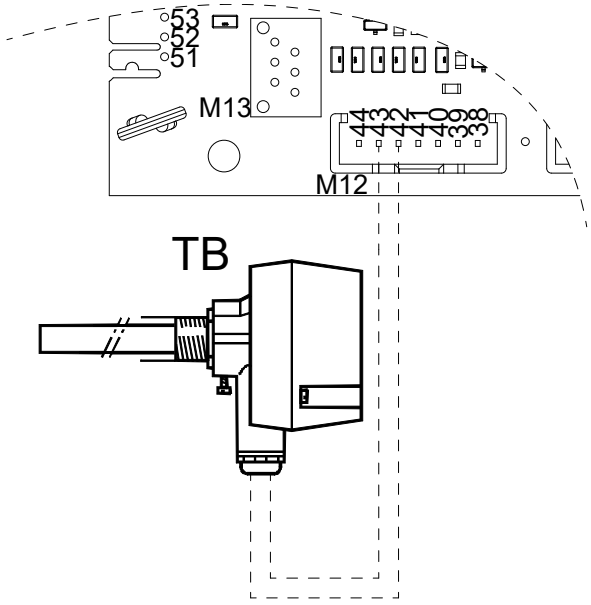


SB DHW buffer tank probe OSND011

4.4.3 Connection of DHW buffer tank thermostat

The TB DHW buffer tank thermostat must be connected to terminals 42-43 (connector M12) of the electronic board (master board for Caldaria 100.2) (Figure 4.9 *p. 33*).
The DHW buffer tank thermostat must be used as an alternative to the DHW buffer tank probe (Paragraph 4.4.2 *p. 33*).
The cable may not be longer than 50 metres, with a minimum cable cross-section of 0,5 mm².

Figure 4.9 *Connection of DHW buffer tank thermostat*



TB DHW thermostat (alternative to DHW buffer tank probe)

4.5 OPERATION VIA CENTRALISED EXTERNAL REQUEST

The appliance's operation can also be controlled via a centralized external request. This request, activated for example by a programmable timer or another system, can be used for the centralised activation or deactivation of specific services, even on several boilers.
This feature does not replace the external request control detailed in Paragraph 4.3 *p. 30* but is additional. The purpose of the external request is to manage the switching on and off of the individual boiler, typically based on the temperature in the reference room.
The purpose of centralized external request is instead to have a generic enable signal for specific services on all boilers connected to it. In the absence of the signal (CS contact open) the boilers will be enabled for the operation of the specific service (and will be activated or not based on the settings of the specific control device). In the presence of the signal (CS contact closed) the boilers will be disabled on the specific service, whatever the environmental conditions.
When closing the CS contact, one of the following functions can be excluded:

- DHW request (Caldaria 35 and Caldaria 55.1 only): if the value of parameter P01 is set to 0 and the value of parameter P17 is set to 1 (Paragraph 5.4 *p. 36*), when closing the CS contact the activation request for DHW is disabled.
- DHW buffer tank charging: if the value of parameter P01 is set to 2 or 3 (Caldaria 35 and Caldaria 55.1) or 0 (Caldaria 100.2) (Paragraph 5.4 *p. 36*), when the CS contact is closed, DHW buffer tank charging is disabled.
- Heating request: If the value of parameter P01 is set to 5 (Caldaria 35 and Caldaria 55.1) or 1 (Caldaria 100.2) (Paragraph 5.4 *p. 36*), when closing the CS contact the activation request for heating is disabled.

For the electrical connection of the centralized external request,

follow the instructions below:
- For Caldaria 35: connect the centralized external request to the CS terminal block on the left side of the control panel (Figure 1.18 *p. 16*).
- For Caldaria 55.1 and Caldaria 100.2: connect the centralized external request to the CS terminal block located inside the MP panel terminal block (Figures 1.19 *p. 17* and 1.20 *p. 18*).

Use a 2x0,5 mm² cable with a maximum length of 50 metres to connect the CS contact.

In the case of centralized management of several boilers, each request must be connected through the interposition of a relay.

For further information on the operation and use of boilers in this mode, please contact the Robur technical service.

5 FIRST START-UP

First start-up entails checking/setting up the combustion parameters and may exclusively be carried out by a Robur TAC. NEITHER the user NOR the installation technician is authorised to perform such operations, under penalty of voiding the warranty.

5.1 PRELIMINARY CHECKS

5.1.1 Preliminary checks for first start-up

Upon completing installation, before contacting the TAC the installer must check:
- Water, electrical and gas systems suitable for the required capacities and equipped with all safety and control devices required by the regulations in force.
- Absence of leaks in the water and gas systems.
- Type of gas for which the appliance is designed (natural gas or LPG).
- Supply gas pressure complying with the values of Table 3.5 *p. 28*.
- Power supply mains complying with the appliance's rating plate data.
- Appliance correctly installed, according to the manufacturer's provisions.
- System installed in a workmanlike manner, according to national and local regulations.

5.1.2 Abnormal or hazardous installation situations

Should any abnormal or hazardous installation situations be found, the TAC shall not perform first start-up and the appliance shall not be commissioned.
These situations may be:
- Failed compliance with minimum clearances.
- Insufficient distance from combustible or flammable materials.
- Conditions that do not warrant access and maintenance in safety.
- Appliance switched on/off with the main switch, instead of the provided control device.
- Appliance defects or faults caused during transport or installation.
- Gas smell.
- Non-compliant mains gas pressure.
- Non-compliant flue gas exhaust.
- All situations that may involve operation abnormalities or are potentially hazardous.

5.1.3 Non-compliant system and corrective actions

Should the TAC find any non conformities, the user/installer is bound to perform any corrective procedures required by the TAC.
After performing the remedial actions (the installer's responsibility), if the TAC deems that safety and conformity conditions are in place, first start-up may be effected.

5.2 HOW TO ACCESS THE BOILER

For all control and maintenance operations it is necessary to remove one or more boiler panels, as described below.

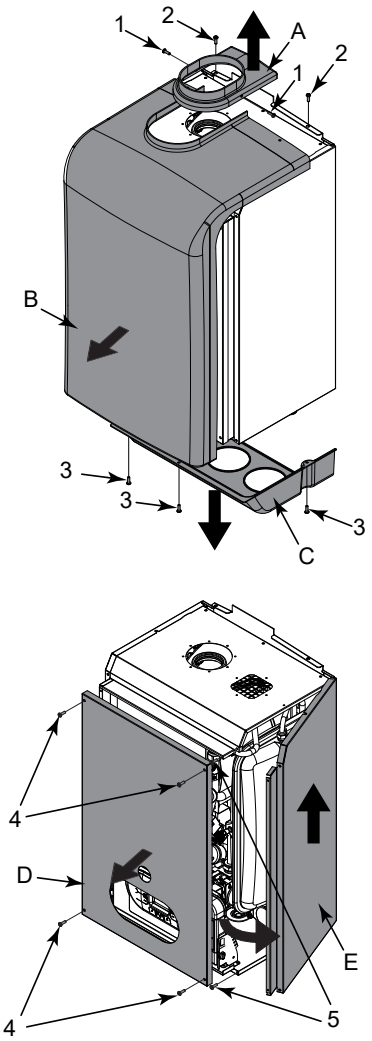
5.2.1 Caldaria 35

Remove the front panel of the boiler as follows:
1. Remove the fastening screws 1 located on the side of the casing flange, and lift it up as shown in Figure 5.1 *p. 35*.
2. Remove the fastening screws 2 located on the upper and lower side of the casing, grasp the ABS casing and pull it out towards you.
3. Remove the fixing screws 3 on the lower side of the boiler and remove the fitting cover.

To work on the front side of the boiler, proceed as follows:
1. Remove the fastening screws 4 located in front of the front panel.
2. Grab the front panel and pull it out towards you.

To work on the side panels of the boiler, proceed as follows:
1. Remove the fastening screws 5 located in the front edge of the side panel.
2. Grab the base of the panel and, after moving it sideways, pull it out by lifting it up.

Figure 5.1 *Accessing the boiler*



A	ABS casing flange	1	Flange fastening screws
B	ABS casing	2	Casing fastening screws
C	Fitting cover	3	Fitting cover fastening screws
D	Front panel	4	Front panel fastening screws
E	Side panel	5	Lateral panel fastening screws

5.2.2 Caldaria 55.1 and 100.2

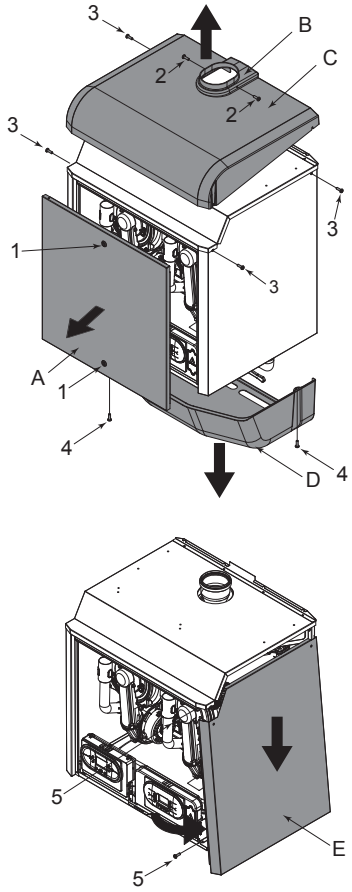
To work on the front side of the boiler (Figure 5.2 *p. 35*):

1. Open locks 1 with a triangle key.
2. Pull out the front panel A. The panel is fixed to the boiler body with a metal chain.

To work on the right and lower side of the boiler:

1. Remove the fastening screws 2 located on the side of the casing flange B, and lift it up.
2. Remove the fixing screws 3 on the side of ABS cover C and pull it out.
3. Remove the fixing screws 4 placed under the boiler and extract the fitting cover D.
4. Remove the fixing screws 5 located in the front and bottom edge of the side panel E.
5. Grab the base of panel E and, after moving it downwards, rotate it outwards and remove it.

Figure 5.2 *Accessing the boiler*



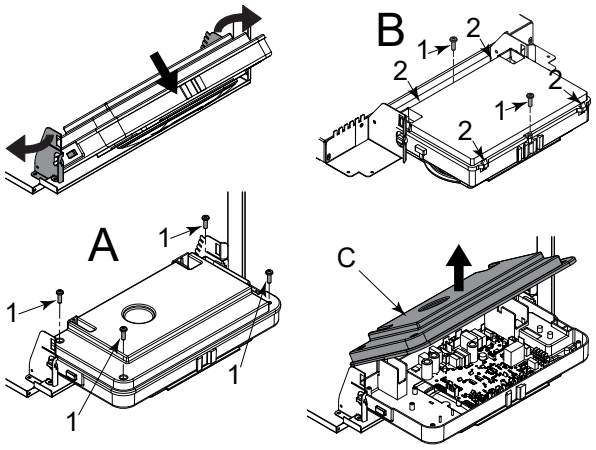
1	Front panel fastening screws	A	Front panel
2	Flange fastening screws	B	Flange
3	Cover fixing screws	C	Cover
4	Fitting cover fastening screws	D	Fitting cover
5	Lateral panel fastening screws	E	Side panel

5.3 HOW TO ACCESS THE CONTROL PANEL

To work on the internal electrical connections of the control panel, proceed as follows (Figure 5.3 *p. 36*):

1. Simultaneously grab the control panel support brackets by widening them and turn the panel upside down by rotating it towards you and down.
2. Unscrew the four fixing screws 1.
3. In case of slave control panel (Figure 5.3 *p. 36*), disconnect the four hooks 2.
4. Remove the C casing upwards.

Figure 5.3 *Accessing the control panel*



1 Cover fixing screws
2 Hooks (only on slave panel)
A Master control panel
B Slave control panel
C Cover

5.4 ELECTRONIC BOARD PARAMETERS SETTING

Before commissioning the operation of the device to the user, the operating parameters must be set or simply checked.

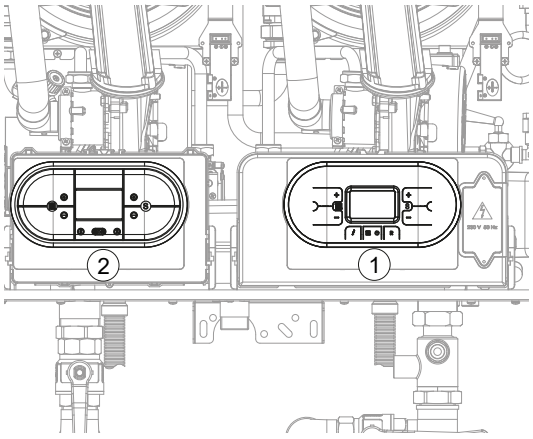
To access the parameters menu and adjust the value of the desired parameter, follow the procedure described below (refer to Figure 5.5 *p. 36*):

1. Press key to select the OFF mode, displayed with the symbol.
2. Hold at the same time the and keys and wait until on the display appears the symbol with the message 'P00', and release the and keys.
3. Use the keys and of the space heating circuit to select the parameter to be edited.
4. Use the keys and of the DHW circuit to change the value of the parameter.
5. Press the key to confirm and wait for the display to stop blinking, to make the adjustment effective.
6. To exit the parameter menu, hold down the and keys simultaneously and wait for the symbol to appear on the display.

Only for Caldaria 100.2

All parameters must be set/modified from the master control panel.
Parameters P00, P10, P11, P12, P13 and P14 must also be set/modified from the slave control panel (Figure 5.4 *p. 36*).
In order for the changes made to the master control panel to become operative also in the slave control panel, it is necessary to power cycle the boiler and wait about 30 seconds until the symbol appears on the display.

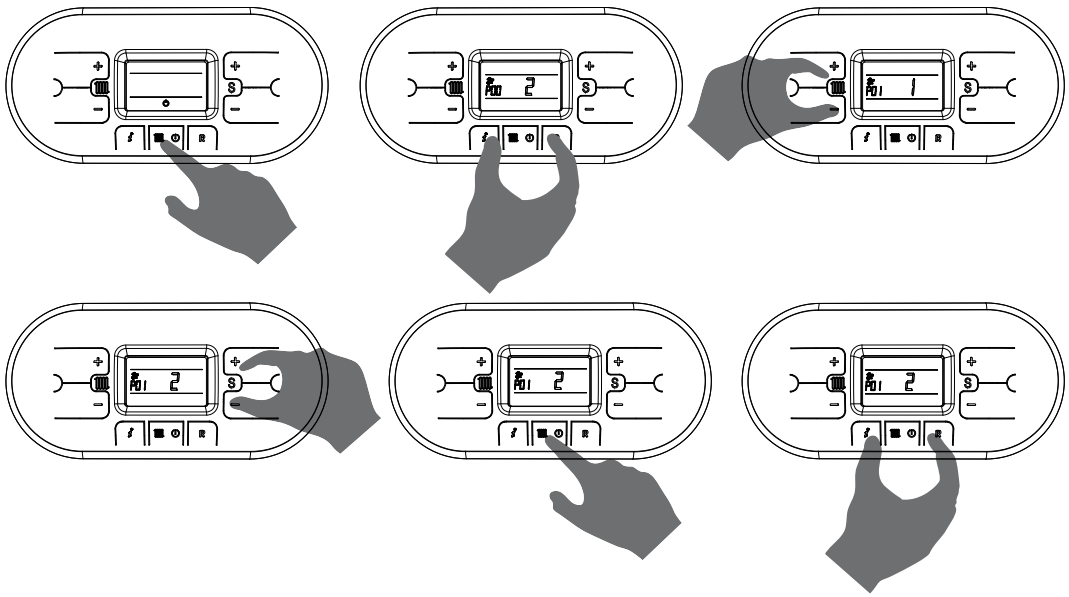
Figure 5.4 *Caldaria 100.2 - Control panels position*



1 Master control panel
2 Slave control panel

The operating parameters are shown in the following Tables and are visible on the internal display of the boiler.

Figure 5.5 *Access and setting of boiler parameters*



5.4.1 Caldaria 35

The parameters and their values refer to the firmware L224G.

Table 5.1 *Caldaria 35 electronic board parameters*

Parameter	Description	Range	Default	Setting
P00	**Boiler model selection**	0 ÷ 10	9	9 = Caldaria 35
P01 (1) (2)	**Boiler type selection**	0 ÷ 5	5	0 = heating and buffer tank DHW (with DHW function controlled by cascade controller ODSP039) 1 = do not use 2 = heating and buffer tank DHW 3 = heating and buffer tank DHW (DHW setpoint increased by 7 °C) 4 = do not use 5 = heating only
P02	**Gas type selection** WARNING: before changing the parameter value, read the instructions in Paragraph 5.6 *p. 46*.	0 ÷ 1	0	0 = G20, G25, G25.3 1 = LPG, G30, G31
P03	**Heating temperature setting**	0 ÷ 1	0	0 = standard (30÷80 °C) 1 = reduced (25÷45 °C)
P04	**Heating run-up** It is possible to set the time, during the start-up phase, that the boiler takes to reach the maximum set power (for the space heating service).	0 ÷ 4	3	0 = disabled 1 = 50 s 2 = 100 s 3 = 200 s 4 = 400 s
P05	**Anti-water hammer function** Enabling this function delays the DHW contact, for a time equal to the set value, during the activation in DHW mode.	0 ÷ 20	2	0 = disabled Value in seconds
P06	**DHW position holding function** By enabling this function it is possible to keep the DHW diverter valve in the DHW position for a time equal to the DHW post-circulation (parameter P09), in order to exploit this heat as well.	0 ÷ 1	0	0 = disabled 1 = enabled
P07	**Heating timing** You can set the minimum time in which the burner is kept off once the heating temperature has achieved the setpoint.	0 ÷ 90	36	Value in multiples of 5 s (default 36 x 5 = 180 s)
P08	**Post-circulation heating timing** It is possible to set the operating time of the pump, in heating mode, after the main burner has been switched off due to the intervention of the room thermostat.	0 ÷ 90	36	Value in multiples of 5 s (default 36 x 5 = 180 s)
P09	**Post-circulation DHW timing** It is possible to set the operating time of the pump, for the DHW service, after the setpoint in the DHW buffer tank has been reached.	0 ÷ 90	24	Value in multiples of 5 s (default 24 x 5 = 120 s)
P10	**Minimum blower speed adjustment for DHW** It is possible to set the minimum speed of the blower for the DHW service, which corresponds to the minimum power of the burner during a DHW request (see Figure 5.7 *p. 44*). The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	45 ÷ P11	--	Value in hertz (1 Hz = 30 RPM)
P11	**Maximum blower speed adjustment for DHW** It is possible to set the maximum speed of the blower for the DHW service, which corresponds to the maximum power of the burner during a DHW request (see Figure 5.7 *p. 44*). The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	P10 ÷ 203	--	Value in hertz (1 Hz = 30 RPM)
P12	**Minimum blower speed adjustment for heating** It is possible to set the minimum speed of the blower for the heating service, which corresponds to the minimum power of the burner during a heating request (see Figure 5.7 *p. 44*). The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	45 ÷ P13	--	Value in hertz (1 Hz = 30 RPM)
P13	**Maximum blower speed adjustment for heating** It is possible to set the maximum speed of the blower for the heating service, which corresponds to the maximum power of the burner during a heating request (see Figure 5.7 *p. 44*). The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	P12 ÷ 203	--	Value in hertz (1 Hz = 30 RPM)
P14	**Starting step adjustment** It is possible to set the blower speed during the start-up phases. The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	P10 ÷ 203	--	Value in hertz (1 Hz = 30 RPM)
P15 (1)	**Legionella function** WARNING: burn hazard. See Paragraph 5.8 *p. 47*.	0 ÷ 1	1	0 = disabled 1 = enabled

P16	**Setting the climate curve (only with outdoor probe OSND009 connected)** The OSND009 outdoor temperature probe may be connected and acts by automatically changing the outlet temperature according to the measured outdoor temperature. The extent of the correction depends on the set heating control value Kd (Figure 5.6 *p. 43*). The choice of the curve is determined by the maximum outlet temperature Tm and the minimum outdoor temperature Te, taking into account the degree of insulation of the building. The values of the outlet temperatures Tm refer to standard systems 30-80 °C or floor systems 25-45 °C. The type of system can be set using parameter P03.	0 ÷ 30	25	The numbering of the value corresponds to the 'Kd' curves of the graph (Figure 5.6 *p. 43*)
P17	**Centralized control function via CS contact** By enabling this parameter you can deactivate specific services when closing the CS contact (Paragraph 4.5 *p. 33*).	0 ÷ 1	0	0 = disabled 1 = enabled
P18	**0-10 V industrial bus drive enable** The 0-10 V industrial bus input can be enabled or disabled to set burner power or delivery temperature via the external bus.	0 ÷ 2	0	0 = disabled 1 = temperature control mode 2 = power control mode
P19	**Min heating setpoint** It is possible to set the minimum user-adjustable heating temperature.	20 ÷ 40	30	Value in °C
P20	**Max heating setpoint** It is possible to set the maximum user-adjustable heating temperature.	40 ÷ 90	80	Value in °C
P21 (1)	**Maximum setpoint for DHW** It is possible to set the maximum user-adjustable DHW temperature.	45 ÷ 75	60	Value in °C
P22	**Δt delivery-return setpoint** It is possible to set the temperature difference between delivery and return.	0 10 ÷ 40	20	0 = disabled Value in °C
P23	**Modulating pump minimum speed** It is possible to set the minimum speed value of the modulating pump during a request for space heating operation.	50 ÷ 70	60	Value in percentage
P24	**Modulating pump maximum speed** It is possible to set the maximum speed value of the modulating pump during a request for space heating operation.	70 ÷ 100	100	Value in percentage
P25 (1)	**DHW buffer tank setpoint differential** It is possible to set the differential value with respect to the DHW setpoint at which the DHW buffer tank charge is activated. For example, with the DHW setpoint at 50 °C and the parameter value at 5 °C, DHW buffer tank recharging starts at 45 °C (50-5) and stops when the storage reaches the DHW setpoint. The parameter is only active if the buffer tank probe OSND011 is connected.	3 ÷ 9	9	Value in °C
P26 (3)	**Modbus address** Not used	-	1	Do not change
P27 (3)	**Modbus communication baud rate** Not used	-	0	Do not change
P28 (3)	**Modbus mode** Not used	-	2	Do not change
P29	**Post-circulation heating Δt** It is possible to set the temperature difference from the main burner shut down due to the room thermostat, below which the pump is deactivated for the heating service.	0 ÷ 25	0	Value in °C
P30	**Post-circulation DHW Δt** It is possible to set the temperature difference from the deactivation of the DHW request to the pump deactivation for the DHW service.	0 ÷ 25	10	Value in °C
P31	**Heating antifreeze temperature setting** It is possible to set the temperature of the water in the heating system at which the antifreeze protection is activated.	5 ÷ 12	12	Value in °C
P32	**Flowmeter enable** Not used	-	0	Do not change
P33	**Minimum water flow setting** Not used	-	28	Do not change
P34	**Activation of the auxiliary relay on the SVZ additional board** Not used	-	0	Do not change
P35	**Water flow control enable during start-up** It allows the verification, at each switch on, of the correct operation of the circulator.	0 ÷ 1	1	0 = disabled 1 = enabled
P36	**Functionality of telephone contact** Not used	0 ÷ 2	0	Do not change

1. In presence of cascade controller ODSP039 (optional), if DHW production is managed by the controller itself, parameter P01 must be set to value 0. Parameters P15, P21, P25 will be inhibited as they are managed directly by the controller.
2. By setting a value of parameter P01 other than 5 (heating only), the parameters relating to DHW production, i.e. P09, P10, P11, P15, P21, P25, P30 and the DHW antifreeze functions, DHW probe error and diverter valve anti-locking are enabled.
3. Parameters P26, P27, P28 relating to Modbus settings must be configured only in the presence of the cascade controller ODSP039 (optional), following the instructions provided in the manual supplied with the controller itself.

5.4.2 Caldaria 55.1

The parameters and their values refer to the firmware L224G.

Table 5.2 *Caldaria 55.1 electronic board parameters*

Parameter	Description	Range	Default	Setting
P00	**Boiler model selection**	0 ÷ 10	10	10 = Caldaria 55.1
P01 (1) (2)	**Boiler type selection**	0 ÷ 5	5	0 = heating and buffer tank DHW (with DHW function controlled by cascade controller ODSP039) 1 = do not use 2 = heating and buffer tank DHW 3 = heating and buffer tank DHW (DHW setpoint increased by 7 °C) 4 = do not use 5 = heating only
P02	**Gas type selection** WARNING: before changing the parameter value, read the instructions in Paragraph 5.6 *p. 46*.	0 ÷ 1	0	0 = G20, G25, G25.3 1 = LPG, G30, G31
P03	**Heating temperature setting**	0 ÷ 1	0	0 = standard (30÷80 °C) 1 = reduced (25÷45 °C)
P04	**Heating run-up** It is possible to set the time, during the start-up phase, that the boiler takes to reach the maximum set power (for the space heating service).	0 ÷ 4	3	0 = disabled 1 = 50 s 2 = 100 s 3 = 200 s 4 = 400 s
P05	**Anti-water hammer function** Enabling this function delays the DHW contact, for a time equal to the set value, during the activation in DHW mode.	0 ÷ 20	2	0 = disabled Value in seconds
P06	**DHW position holding function** By enabling this function it is possible to keep the DHW diverter valve in the DHW position for a time equal to the DHW post-circulation (parameter P09), in order to exploit this heat as well.	0 ÷ 1	0	0 = disabled 1 = enabled
P07	**Heating timing** You can set the minimum time in which the burner is kept off once the heating temperature has achieved the setpoint.	0 ÷ 90	36	Value in multiples of 5 s (default 36 x 5 = 180 s)
P08	**Post-circulation heating timing** It is possible to set the operating time of the pump, in heating mode, after the main burner has been switched off due to the intervention of the room thermostat.	0 ÷ 90	36	Value in multiples of 5 s (default 36 x 5 = 180 s)
P09	**Post-circulation DHW timing** It is possible to set the operating time of the pump, for the DHW service, after the setpoint in the DHW buffer tank has been reached.	0 ÷ 90	24	Value in multiples of 5 s (default 24 x 5 = 120 s)
P10	**Minimum blower speed adjustment for DHW** It is possible to set the minimum speed of the blower for the DHW service, which corresponds to the minimum power of the burner during a DHW request (see Figure 5.8 *p. 44*). The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	45 ÷ P11	--	Value in hertz (1 Hz = 30 RPM)
P11	**Maximum blower speed adjustment for DHW** It is possible to set the maximum speed of the blower for the DHW service, which corresponds to the maximum power of the burner during a DHW request (see Figure 5.8 *p. 44*). The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	P10 ÷ 203	--	Value in hertz (1 Hz = 30 RPM)
P12	**Minimum blower speed adjustment for heating** It is possible to set the minimum speed of the blower for the heating service, which corresponds to the minimum power of the burner during a heating request (see Figure 5.8 *p. 44*). The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	45 ÷ P13	--	Value in hertz (1 Hz = 30 RPM)
P13	**Maximum blower speed adjustment for heating** It is possible to set the maximum speed of the blower for the heating service, which corresponds to the maximum power of the burner during a heating request (see Figure 5.8 *p. 44*). The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	P12 ÷ 203	--	Value in hertz (1 Hz = 30 RPM)
P14	**Starting step adjustment** It is possible to set the blower speed during the start-up phases. The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	P10 ÷ 203	--	Value in hertz (1 Hz = 30 RPM)
P15 (1)	**Legionella function** WARNING: burn hazard. See Paragraph 5.8 *p. 47*.	0 ÷ 1	1	0 = disabled 1 = enabled
P16	**Setting the climate curve (only with outdoor probe OSND009 connected)** The OSND009 outdoor temperature probe may be connected and acts by automatically changing the outlet temperature according to the measured outdoor temperature. The extent of the correction depends on the set heating control value Kd (Figure 5.6 *p. 43*). The choice of the curve is determined by the maximum outlet temperature Tm and the minimum outdoor temperature Te, taking into account the degree of insulation of the building. The values of the outlet temperatures Tm refer to standard systems 30-80 °C or floor systems 25-45 °C. The type of system can be set using parameter P03.	0 ÷ 30	25	The numbering of the value corresponds to the 'Kd' curves of the graph (Figure 5.6 *p. 43*)

P17	**Centralized control function via CS contact** By enabling this parameter you can deactivate specific services when closing the CS contact (Paragraph 4.5 *p. 33*).	0 ÷ 1	0	0 = disabled 1 = enabled
P18	**0-10 V industrial bus drive enable** The 0-10 V industrial bus input can be enabled or disabled to set burner power or delivery temperature via the external bus.	0 ÷ 2	0	0 = disabled 1 = temperature control mode 2 = power control mode
P19	**Min heating setpoint** It is possible to set the minimum user-adjustable heating temperature.	20 ÷ 40	30	Value in °C
P20	**Max heating setpoint** It is possible to set the maximum user-adjustable heating temperature.	40 ÷ 90	80	Value in °C
P21 (1)	**Maximum setpoint for DHW** It is possible to set the maximum user-adjustable DHW temperature.	45 ÷ 75	60	Value in °C
P22	**Δt delivery-return setpoint** It is possible to set the temperature difference between delivery and return.	0 10 ÷ 40	20	0 = disabled Value in °C
P23	**Modulating pump minimum speed** It is possible to set the minimum speed value of the modulating pump during a request for space heating operation.	50 ÷ 70	60	Value in percentage
P24	**Modulating pump maximum speed** It is possible to set the maximum speed value of the modulating pump during a request for space heating operation.	70 ÷ 100	100	Value in percentage
P25 (1)	**DHW buffer tank setpoint differential** It is possible to set the differential value with respect to the DHW setpoint at which the DHW buffer tank charge is activated. For example, with the DHW setpoint at 50 °C and the parameter value at 5 °C, DHW buffer tank recharging starts at 45 °C (50-5) and stops when the storage reaches the DHW setpoint. The parameter is only active if the buffer tank probe OSND011 is connected.	3 ÷ 9	9	Value in °C
P26 (3)	**Modbus address** Not used	-	1	Do not change
P27 (3)	**Modbus communication baud rate** Not used	-	0	Do not change
P28 (3)	**Modbus mode** Not used	-	2	Do not change
P29	**Post-circulation heating Δt** It is possible to set the temperature difference from the main burner shut down due to the room thermostat, below which the pump is deactivated for the heating service.	0 ÷ 25	0	Value in °C
P30	**Post-circulation DHW Δt** It is possible to set the temperature difference from the deactivation of the DHW request to the pump deactivation for the DHW service.	0 ÷ 25	10	Value in °C
P31	**Heating antifreeze temperature setting** It is possible to set the temperature of the water in the heating system at which the antifreeze protection is activated.	5 ÷ 12	12	Value in °C
P32	**Flowmeter enable** Not used	-	0	Do not change
P33	**Minimum water flow setting** Not used	-	28	Do not change
P34	**Activation of the auxiliary relay on the SVZ additional board** Not used	-	0	Do not change
P35	**Water flow control enable during start-up** It allows the verification, at each switch on, of the correct operation of the circulator.	0 ÷ 1	1	0 = disabled 1 = enabled
P36	**Functionality of telephone contact** Not used	0 ÷ 2	0	Do not change

1. In presence of cascade controller ODSP039 (optional), if DHW production is managed by the controller itself, parameter P01 must be set to value 0. Parameters P15, P21, P25 will be inhibited as they are managed directly by the controller.
2. By setting a value of parameter P01 other than 5 (heating only), the parameters relating to DHW production, i.e. P09, P10, P11, P15, P21, P25, P30 and the DHW antifreeze functions, DHW probe error and diverter valve anti-locking are enabled.
3. Parameters P26, P27, P28 relating to Modbus settings must be configured only in the presence of the cascade controller ODSP039 (optional), following the instructions provided in the manual supplied with the controller itself.

5.4.3 Caldaria 100.2

The parameters and their values refer to the firmware L226E.

Table 5.3 *Caldaria 100.2 electronic board parameters*

Parameter	Description	Range	Default	Setting
P00 (1)	**Boiler model selection**	0 ÷ 11	3	3 = 55 kW

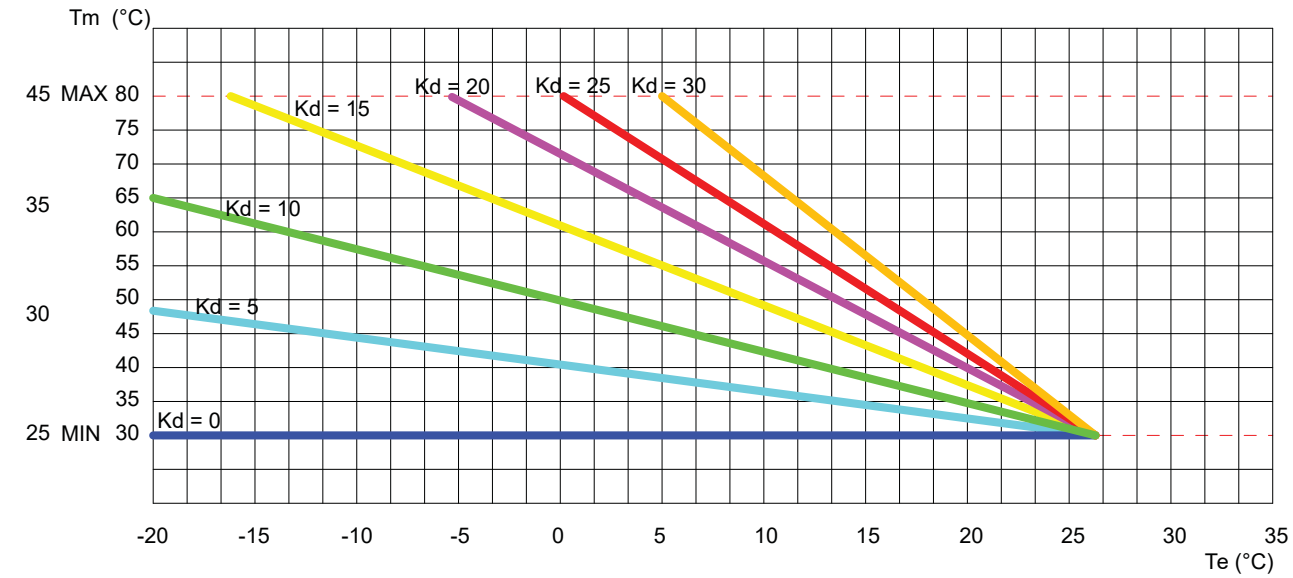
P01 (2) (3)	**Boiler type selection**	0 ÷ 2	1	0 = heating and storage DHW (the DHW management mode is specified in parameter P32) 1 = heating only 2 = do not use
P02	**Gas type selection** WARNING: before changing the parameter value, read the instructions in Paragraph 5.6 *p. 46*.	0 ÷ 1	0	0 = G20, G25, G25.3 1 = LPG, G30, G31
P03	**Heating temperature setting**	0 ÷ 1	0	0 = standard (30÷80 °C) 1 = reduced (25÷45 °C)
P04	**Heating run-up** It is possible to set the time, during the start-up phase, that the boiler takes to reach the maximum set power (for the space heating service).	0 ÷ 5	3	0 = disabled 1 = 50 s 2 = 100 s 3 = 200 s 4 = 400 s 5 = 600 s
P05	**Primary ignition time of a single unit** Time for which a single unit becomes primary at startup, after which the automatic changeover with the other unit takes place.	0 ÷ 255	50	Value in hours
P06	**Switching off a single unit**	1 ÷ 3	3	1 = only master on 2 = only slave on 3 = both on
P07	**Heating timing** You can set the minimum time in which the burner is kept off once the heating temperature has achieved the setpoint.	0 ÷ 90	36	Value in multiples of 5 s (default 36 x 5 = 180 s)
P08	**Post-circulation heating timing** It is possible to set the operating time of the pump, in heating mode, after the main burner has been switched off due to the intervention of the room thermostat.	0 ÷ 90	36	Value in multiples of 5 s (default 36 x 5 = 180 s)
P09 (2)	**Post-circulation DHW timing** It is possible to set the operating time of the pump, for the DHW service, after the setpoint in the DHW buffer tank has been reached.	0 ÷ 90	18	Value in multiples of 5 s (default 18 x 5 = 90 s)
P10 (1) (2)	**Minimum blower speed adjustment for DHW** It is possible to set the minimum speed of the blower for the DHW service, which corresponds to the minimum power of the burner during a DHW request (see Figure 5.8 *p. 44*). The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	38 ÷ P11	--	Value in hertz (1 Hz = 30 RPM)
P11 (1) (2)	**Maximum blower speed adjustment for DHW** It is possible to set the maximum speed of the blower for the DHW service, which corresponds to the maximum power of the burner during a DHW request (see Figure 5.8 *p. 44*). The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	P10 ÷ 290	--	Value in hertz (1 Hz = 30 RPM)
P12 (1)	**Minimum blower speed adjustment for heating** It is possible to set the minimum speed of the blower for the heating service, which corresponds to the minimum power of the burner during a heating request (see Figure 5.8 *p. 44*). The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	38 ÷ P13	--	Value in hertz (1 Hz = 30 RPM)
P13 (1)	**Maximum blower speed adjustment for heating** It is possible to set the maximum speed of the blower for the heating service, which corresponds to the maximum power of the burner during a heating request (see Figure 5.8 *p. 44*). The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	P12 ÷ 290	--	Value in hertz (1 Hz = 30 RPM)
P14 (1)	**Starting step adjustment** It is possible to set the blower speed during the start-up phases. The value is preset according to the set power (parameter P00) and the type of gas (parameter P02).	P10 ÷ 255	--	Value in hertz (1 Hz = 30 RPM)
P15 (2) (3)	**Legionella function** WARNING: burn hazard. See Paragraph 5.8 *p. 47*.	0 ÷ 1	1	0 = disabled 1 = enabled
P16	**Setting the climate curve (only with outdoor probe OSND009 connected)** The OSND009 outdoor temperature probe may be connected and acts by automatically changing the outlet temperature according to the measured outdoor temperature. The extent of the correction depends on the set heating control value Kd (Figure 5.6 *p. 43*). The choice of the curve is determined by the maximum outlet temperature Tm and the minimum outdoor temperature Te, taking into account the degree of insulation of the building. The values of the outlet temperatures Tm refer to standard systems 30-80 °C or floor systems 25-45 °C. The type of system can be set using parameter P03.	0 ÷ 30	25	The numbering of the value corresponds to the 'Kd' curves of the graph (Figure 5.6 *p. 43*)
P17 (2) (3)	**DHW buffer tank setpoint differential** It is possible to set the differential value with respect to the DHW setpoint at which the DHW buffer tank charge is activated. For example, with the DHW setpoint at 50 °C and the parameter value at 5 °C, DHW buffer tank recharging starts at 45 °C (50-5) and stops when the storage reaches the DHW setpoint. The parameter is only active if the buffer tank probe OSND011 is connected.	3 ÷ 15	5	Value in °C

P18	**0-10 V industrial bus drive enable** The 0-10 V industrial bus input can be enabled or disabled to set burner power or delivery temperature via the external bus.	0 ÷ 2	0	0 = disabled 1 = temperature control mode 2 = power control mode
P19	**Min heating setpoint** It is possible to set the minimum user-adjustable heating temperature.	20 ÷ 40	30	Value in °C
P20	**Max heating setpoint** It is possible to set the maximum user-adjustable heating temperature.	40 ÷ 90	80	Value in °C
P21 (2) (3)	**Maximum setpoint for DHW** It is possible to set the maximum user-adjustable DHW temperature.	45 ÷ 75	60	Value in °C
P22	**Δt delivery-return setpoint** It is possible to set the temperature difference between delivery and return.	0 10 ÷ 40	20	0 = disabled Value in °C
P23	**Modulating pump minimum speed** It is possible to set the minimum speed value of the modulating pump during a request for space heating operation.	50 ÷ 70	60	Value in percentage
P24	**Modulating pump maximum speed** It is possible to set the maximum speed value of the modulating pump during a request for space heating operation.	70 ÷ 100	100	Value in percentage
P25	**Control period of ΔT flow/return** Expresses the response time to pump modulation.	20 ÷ 100	30	Value in seconds
P26 (4)	**Modbus address** Not used	-	1	Do not change
P27	**Percentage of activation of the secondary unit**	60 ÷ 100	85	Value in percentage
P28	**Percentage of deactivation of the secondary unit**	5 ÷ 40	10	Value in percentage
P29	**CRAD optional board activation** Not used	-	0	Do not change
P30	**Temperature measurement unit setting**	0 ÷ 1	0	0 = °C 1 = °F
P31	**Selection of the destination country** Not used	-	0	Do not change
P32 (2) (3)	**DHW management mode**	0 ÷ 2	0	0 = DHW buffer tank probe OSND011 1 = buffer tank thermostat 2 = cascade controller ODSP039
P33 (4)	**Modbus communication baud rate** Not used	-	0	Do not change
P34	**Status of the additional solar board** Not used	-	0	Do not change
P69	**Activation of the auxiliary relay on the SVZ additional board** Not used	-	0	Do not change
P70	**Water flow control enable during start-up** It allows the verification, at each switch on, of the correct operation of the circulator.	0 ÷ 1	1	0 = disabled 1 = enabled
P71	**Functionality of telephone contact** Not used	0 ÷ 2	0	Do not change

1. If the setting is changed, the change must be made on both the master and the slave module.
2. To activate the DHW service, parameter P01 must be set to the value 0 and parameter P32 must be set to the appropriate value according to the DHW request device used (DHW buffer tank probe OSND011, DHW buffer tank thermostat or cascade controller ODSP039). Setting parameter P01 to the value 0 enables the parameters related to DHW production, i.e. P09, P10, P11, P15, P17, P21, P32 and the DHW antifreeze functions, the DHW probe error and the diverter valve anti-locking function.
3. In presence of cascade controller ODSP039 (optional), if DHW production is managed by the controller itself, parameter P01 must be set to value 0 and parameter P32 to value 2. Parameters P15, P17, P21 will be disabled as they are managed directly by the controller.
4. Parameters P26, P33 relating to Modbus settings must be configured only in the presence of the cascade controller ODSP039 (optional), following the instructions provided in the manual supplied with the controller itself.

5.4.4 Climatic curves

Figure 5.6 *Climatic curves*



Tm Delivery temperature
Te Outdoor temperature
Kd Heating control value

5.4.5 Blower frequencies

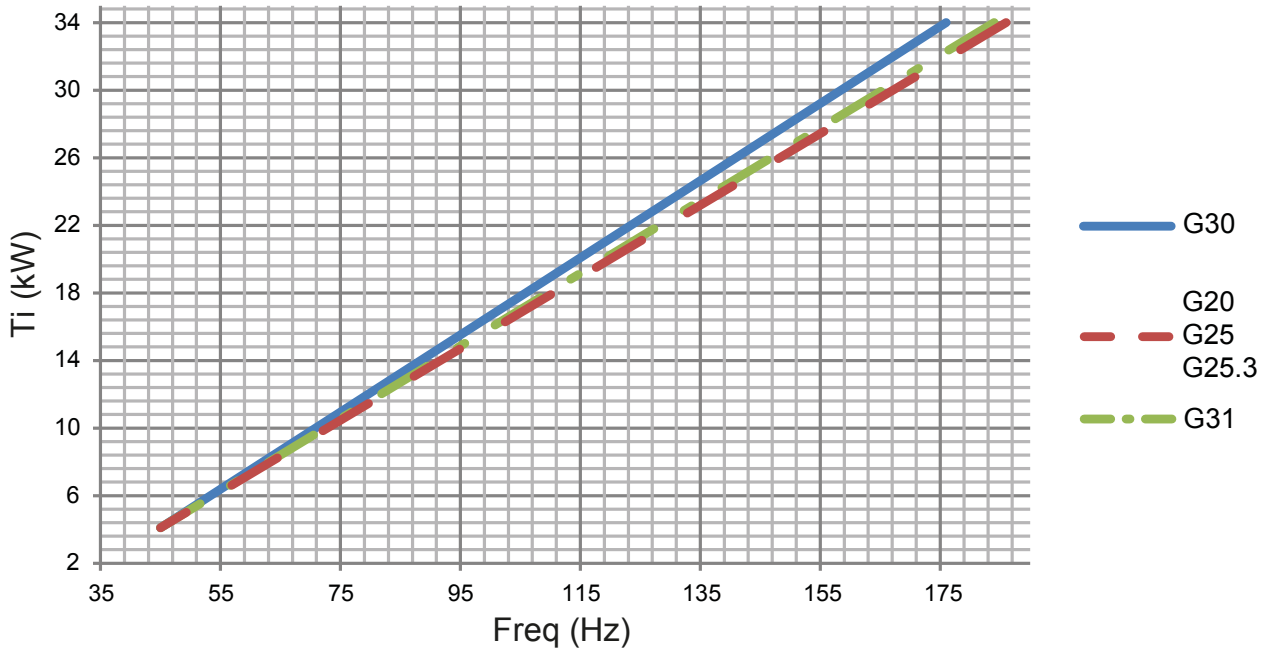
Table 5.4 *Minimum and maximum blower frequencies*

Boiler	Gas type	Measurement unit	Frequency (heating/DHW) (1)	
			minimum	maximum
Caldaria 35 **AY 35**	G20	Hz	53	203
	G25	Hz	53	203
	G25.3	Hz	53	203
	G30	Hz	55	195
	G31	Hz	55	203
Caldaria 55.1 **Caldaria 100.2** **AY 50** **AY 100**	G20	Hz	53	247
	G25	Hz	53	247
	G25.1	Hz	53	247
	G25.3	Hz	53	247
	G2.350	Hz	53	247
	G27	Hz	53	247
	G30	Hz	55	230
	G31	Hz	53	240

1 Caldaria 35, Caldaria 55.1, Caldaria 100.2: check parameters P10 and P11 for DHW, P12 and P13 for heating. AY 35, AY 50, AY 100: check parameters P62 and P63 for heating.

5.4.5.1 Caldaria 35

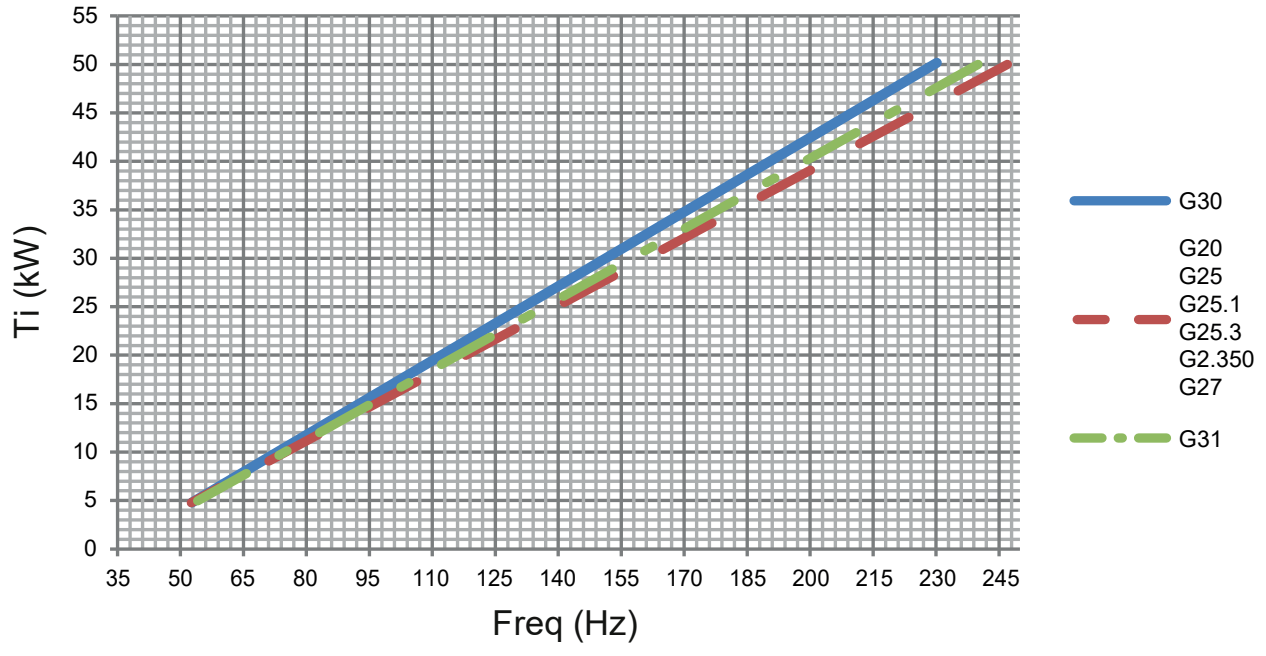
Figure 5.7 *Heat input/blower frequency diagram*



Ti Thermal input Freq Frequency

5.4.5.2 Caldaria 55.1 and 100.2

Figure 5.8 *Heat input/blower frequency diagram*



Ti Thermal input Freq Frequency

5.5 COMBUSTION PARAMETERS CHECK

The CO_2 value should be checked with casing assembled, while the gas valve should be adjusted with the casing open.

The ignition system will automatically activate the system venting cycle function shown in the display with code F33, lasting 2 minutes (except for the first start-up, where the duration is 5 minutes), during which the pump will be started and switched off in alternate cycles. When the function is active, the pump is activated and the burner

ignition request is disabled. The regular operation of the boiler is allowed only when the operation is completed.

To check and calibrate the CO_2 value at maximum and minimum power, proceed as follows, referring to Figure 5.9 *p. 45*.
The CO_2 values and other parameters useful to verify combustion are summarized in Table 5.5 *p. 45*.

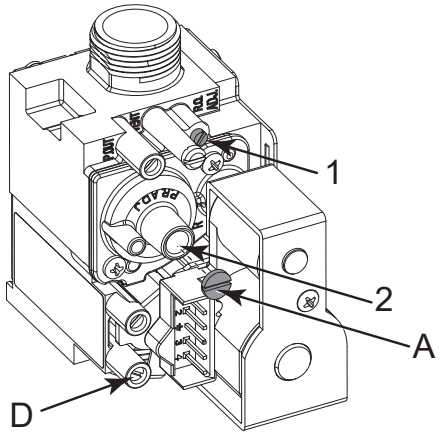
- ► Power the boiler.
- ► Open the gas valve on the boiler and check that the valves connecting to the system are open.
- ► Activate the heating request to the boiler, through the control devices provided, and provide an adequate thermal load for carrying out the verification operations.
- ► Insert the flue gas analyser into the flue gas analyser socket and turn it on.

For the Caldaria 35 and Caldaria 55.1 models, the flue gas analysis socket is positioned on the flanged socket (detail PF, Figure 5.10 *p. 45*), or on the optional rainproof terminal (code OTRM031).

If you want to use the flue gas analysis socket positioned on the flanged socket, to access the socket it is necessary to remove the upper flange and the upper casing of the boiler (Paragraph 5.2 *p. 34*).

For the Caldaria 100.2 model, the flue gas analysis socket must be provided on the flue gas exhaust pipe. It is already provided on the rainproof terminal, available as optional OTRM009.

Figure 5.9 *Gas valve*



A	Protection screw	1	Gas flow adjustment screw
D	Gas mains pressure intake	2	Offset adjustment screw

Figure 5.10 *Socket for flue gas analysis for Caldaria 35 and 55.1*

PF Flue gas analysis socket

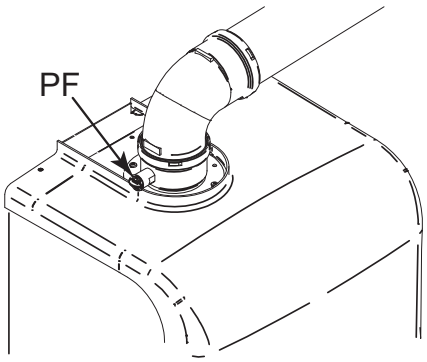


Table 5.5 *Caldaria combustion parameters*

				Caldaria 35	Caldaria 55.1	Caldaria 100.2
Installation data						
CO_2 percentage in fumes	Nominal heat input	G20	%	9,45 ÷ 9,25	9,3 ÷ 9,1	
		G25	%	9,35 ÷ 9,15	9,3 ÷ 9,1	
		G25.1	%	- (1)	10.5 ÷ 10,3	
		G25.3	%	9,3 ÷ 9,1		
		G2.350	%	- (1)	9,3 ÷ 9,1	
		G27	%	- (1)	9,3 ÷ 9,1	
		G30	%	11,4 ÷ 11,2	11,3 ÷ 11,1	
		G31	%	10,55 ÷ 10,35	10,3 ÷ 10,1	
	Minimal heat input	G20	%	9,05 ÷ 8,85	9,0 ÷ 8,8	
		G25	%	9,0 ÷ 8,8		
		G25.1	%	- (1)	9.9 ÷ 9,7	
		G25.3	%	9,0 ÷ 8,8		
		G2.350	%	- (1)	9,0 ÷ 8,8	
		G27	%	- (1)	9,0 ÷ 8,8	
		G30	%	10,75 ÷ 10,55	10,9 ÷ 10,7	
		G31	%	9,9 ÷ 9,7		
Flue temperature	Nominal heat input	G20	°C	69,4	66,4	
	Minimal heat input	G20	°C	61,3	56,8	
Fumes flow rate	Nominal heat input	G20	kg/h	54	80	80 (2)
	Minimal heat input	G20	kg/h	7	8	8 (2)
CO emission			ppm	75,0	68,0	

(1) Gas not available for Caldaria 35.
(2) Data refers to each thermal module.

5.5.1 Minimum heating power

1. Activate the chimney sweep function by pressing for 7 seconds the ® key (Figure 6.1 *p. 48*). The maximum time before being forced out of the function is 15 minutes.
2. Check that the CO_2 value conforms to that reported in Table 5.5 *p. 45*.
3. If this is not the case, unscrew the protection screw A and adjust with a 4 hex key the screw 2 of the offset adjuster (Figure 5.9 *p. 45*). To increase the value of CO_2 turn the screw clockwise and vice-versa if you want to decrease it.
4. Once completed the adjustment, tighten the protection screw A on the offset adjuster.

5.5.2 Maximum heating power

1. Press the ⊕ key of the heating side for the calibration of the maximum heating power.
2. Check that the CO_2 value complies to the value shown in Table 5.5 *p. 45*.
3. If this is not the case, adjust the gas flow adjuster using the screw 1 (Figure 5.9 *p. 45*). To increase the CO_2 value turn the screw counterclockwise and vice versa if you want to decrease it.
4. After each adjustment on screw 1 of the gas flow adjuster, you have to wait about 30 seconds for the boiler to stabilize itself to the set value.
5. Press the ⊖ key of the heating side and check that CO_2 value at minimum power has not changed. If so, repeat the calibration described in previous Paragraph 5.5.1 *p. 46*.
6. Deactivate the chimney sweep function by switching the boiler to OFF mode using the button (symbol appears on the display).
7. Disconnect the flue gas analyzer and screw the cap of the flue gas analysis socket back on.
8. Replace the boiler front panel.

5.6 GAS CHANGEOVER

Paragraph reserved exclusively to TACs.

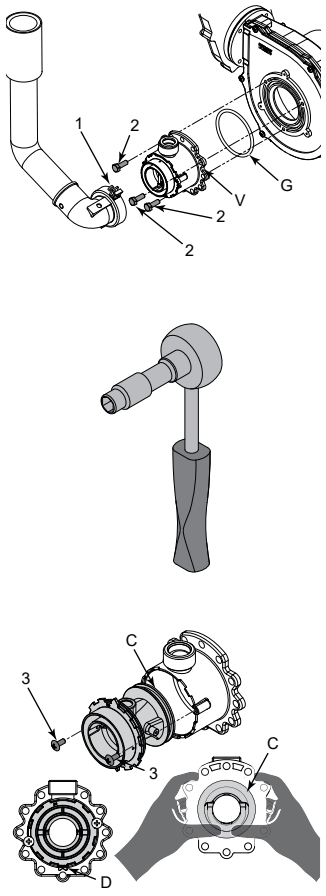
The following instructions apply to both the conversion from natural gas (G20) to any other gas and vice versa.

Check that the gas supply line is suitable for the new fuel type used to supply the unit.

How to change gas (Figure 5.11 *p. 46*)

1. Loosen the two screws 1 from the fixing bushing, and remove the air intake pipe.
2. Unscrew the pipe connection connecting the gas valve to the venturi.
3. Unscrew the three fixing screws 2 of the venturi V with a 10 mm wrench.
4. Unscrew the two screws 3 and press on the back side of the venturi body C.
5. Replace the venturi with the one suitable for the type of gas to be used and make sure that the orientation of tooth D is downwards on the aluminium body.
6. Reassemble the components, proceeding in the opposite sequence to the disassembly operations, making sure that the gasket G is reassembled.
7. Set the boiler to operate with the new type of gas, changing the value of parameter P02 (gas type selection) from the control panel (Paragraph 5.4 *p. 36*).
8. Proceed to the adjustment of the CO_2 value, as described in Paragraph 5.5 *p. 44*.
9. Replace the sticker indicating the gas type on the appliance with the sticker for the new gas type.

Figure 5.11 *Gas changeover*



1	Bushing fixing screw	V	Venturi
2	Venturi fastening screws	G	Gasket
3	Venturi fastening screws	C	Venturi backside

5.7 COMMISSIONING

1. Remove the boiler front panel (Paragraph 5.2 *p. 34*).
2. Power the boiler.

The ignition system will automatically activate the system venting cycle function shown in the display with the code F33, which lasts 2 minutes (except the first time the appliance is switched on, where the duration is 5 minutes).

When function F33 is active, the pump is activated at intervals and the burner ignition request is disabled. The regular operation of the boiler is allowed only when the operation is completed.

3. Make sure that the water pump is not locked.
4. If it is locked, wait for the water pump to perform the automatic unlocking function (duration 3 minutes).
5. If the water pump is still locked, reactivate the automatic un-

locking function of the water pump (a further 3 minutes) by power cycling the boiler.
6. At the end of the above operations, open the gas tap.
7. To switch the boiler to the heating operating mode, press the key; the fixed symbol will appear on the display, indicating that the function has been activated.
8. When there is a request for service from the provided control device, the burner ignition will start.
9. In case of lack of flame, the board repeats the ignition operations again after the post-ventilation (20 seconds).
10. It may be necessary to repeat the ignition operation several times to remove any air in the gas pipe. Before repeating the operation, wait about 5 seconds from the last ignition attempt and unlock the boiler from error code E01 by pressing the reset key.
11. Check the system pressure. If a decrease is observed, open the filling tap again until the pressure reaches 1,2 bar for Caldaria 35 and 1,5 bar for Caldaria 55.1 and Caldaria 100.2. After the operation, close the filling tap again.

5.8 ANTI-LEGIONELLA SERVICE SETTINGS

The anti-legionella service managed by the boiler is set by default **active** (parameter P15 at default value 1), but is activated only if parameter P01 is set to value 2 or 3 (for Caldaria 35 and Caldaria 55.1) or to value 0 (for Caldaria 100.2).
The service aims to bring the DHW buffer tank above 60 °C and is carried out with the following settings, **non-modifiable**:

- The cycle is run for the first time one hour after electrically starting the boiler.
- Then the cycle is run every 7 days, at the same time.
- Following loss of boiler voltage (e.g. after a blackout, even if brief) the previous anti-legionella cycle timing is reset. So the next anti-legionella cycle will be run one hour after electrical start-up following the voltage loss.

It is not, therefore, possible to specify in advance the day and time of execution of the anti-legionella disinfection cycle.

Thermostatic valve

In order to avoid scalding or damage to persons, animals or property we recommend installing a thermostatic valve at the DHW buffer tank output.
If it is not possible to install a thermostatic valve at the DHW buffer tank output, it is recommended to deactivate the anti-legionella function (set parameter P15 to 0) and provide for the anti-legionella disinfection with methods other than the thermal shock (e.g. chemical methods, UV lamps or addition of ozone).

5.9 SWITCHING OFF

To switch off the unit, select the OFF mode using the key (Figure 6.1 *p. 48*). In this way the appliance is in standby mode (symbol appears on the display), ONLY the antifreeze function (system water) and the boiler pump anti-lock function remain active.

As it is harmful to the appliance, it is essential to avoid switching off the appliance by removing the power supply to it.

For the antifreeze and pump anti-lock functions to be active, the boiler must be left powered.

5.10 PROLONGED PERIODS OF INACTIVITY

To switch off the unit, select the OFF mode using the key (Figure 6.1 *p. 48*). In this way the appliance is in standby mode (symbol appears on the display).
Switch off the power using the main switch, outside the boiler, and close the gas tap upstream of the appliance.

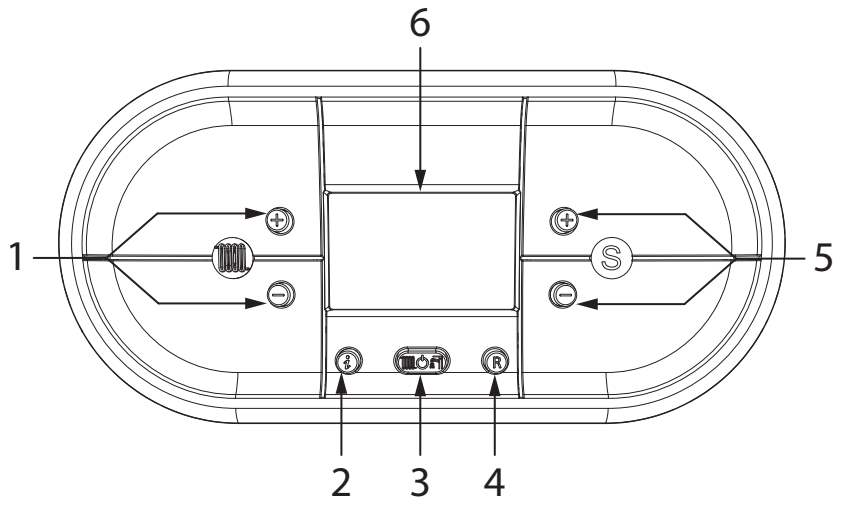
By removing the power supply, the automatic antifreeze and pump anti-lock functions will be disabled. If it is expected that during the period of inactivity the external temperature may fall below zero, it is therefore advisable NOT to cut off the electrical and gas supply to the appliance.

6 NORMAL OPERATION

This section is for the end user.

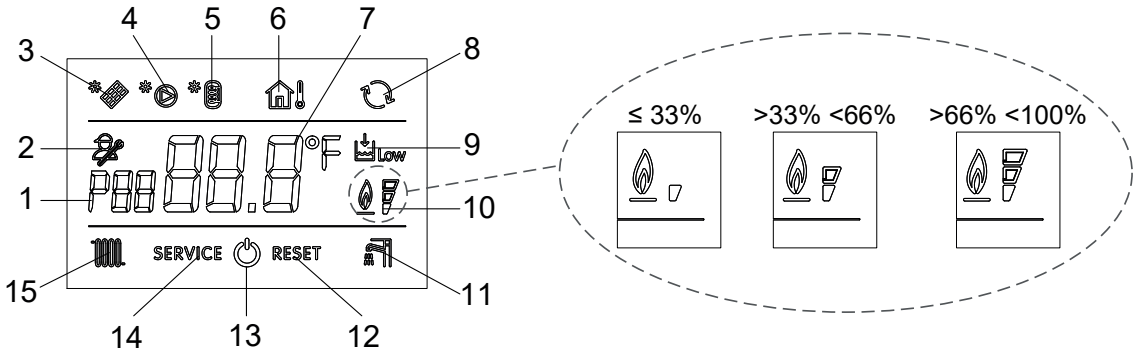
The use of the device by the end user is only permitted after the Robur authorised TAC has completed the first start-up.

Figure 6.1 *Boiler control panel*



1 Heating temperature adjustment keys
2 INFO key: press once to view the temperatures and other informations - hold for 5 seconds, in off operating mode, to view the last 5 faults
3 Operating mode selection key: winter / space heating / summer / OFF
4 RESET key: faults reset - chimney sweep function activation (hold for 7 seconds)
5 Keys for setting DHW temperature / parameter values / by pressing the keys simultaneously for 5 seconds, the display backlighting can be activated for a continuous period of 10 minutes
6 Display

Figure 6.2 *Boiler display icons*



1 Parameter number indication or displayed info code
2 Parameter programming function active
3 Not used
4 Not used
5 Not used
6 Installed outdoor probe / Outdoor temperature display
7 Temperature display / setpoint / parameter value
8 OpenTherm communication present (remote control)
9 Insufficient system water pressure signal
10 Flame presence signal / it also indicates, on 3 percentage levels, the modulating power level of the boiler
11 Operation in DHW mode enabled (only for boilers having this function)
12 Resettable error signal
13 Off operating mode
14 Non resettable error signal
15 Operation in heating mode enabled

6.1 WARNINGS

General warnings

Prior to using the appliance carefully read the warnings in Chapter III.1 *p. 4*, providing important information on regulations and on safety.

First startup by TAC

First start-up may exclusively be carried out by a Robur TAC (Chapter 5 *p. 34*).

Never power the appliance off while it is running

NEVER power the appliance off while it is running (except in the event of danger, Chapter III.1 *p. 4*), since the appliance or system might be damaged.

Routine switching on/off

The appliance may exclusively be switched on/off by means of the suitably provided control device.

Do not switch on/off with the power supply switch

Do not switch the appliance on/off with the power supply switch. This may be harmful and dangerous for the appliance and for the system.

6.2 PRELIMINARY CHECKS

Checks before switching on

Before switching on the appliance, ensue that:
- Gas valve open.
- Appliance electrical power supply (main switch ON).
- The fumes exhaust duct is free and correctly connected

to the fumes exhaust system.
- The hydraulic circuit has been filled. If this is not the case, fill the system according to the instructions in Paragraph 3.3.2 *p. 23* and 3.3.4 *p. 25*.
- Check on the pressure gauge that the system pressure is 1,2 bar for Caldaria 35 and 1,5 bar for Caldaria 55.1 and Caldaria 100.2.

If there is no water in the system or if the system pressure is lower than the minimum required pressure, Low appears on the display of the control panel (Figure 6.2 *p. 48*), while error E04 appears on the remote control (if any). When the correct pressure is restored, the error code disappears.

6.3 OPERATION WITHOUT REMOTE CONTROL

6.3.1 Turning the boiler on and off

Switching on

1. Open the gas tap and provide electrical power.
2. Supply the boiler with electric power by closing the omnipolar switch (to be provided by the installer).
3. Press the key on the control panel of the boiler (Figure 6.1 *p. 48*) and select the desired operating mode.
4. The fixed symbol that appears on the display, corresponding to the operating mode, indicates that the function has been activated.

After a long period of unit inactivity or at the first start-up, it may be necessary to repeat the ignition operation a few times due to the presence of air in the gas piping.

Switching off

To switch off the boiler, press the button on the boiler (Figure 6.1 *p. 48*) until the symbol appears on the display.

6.3.2 Winter mode

In this operating mode the boiler provides both heating and domestic hot water.
To switch the boiler to the winter operating mode:

1. Press the key (Figure 6.1 *p. 48*), the fixed and symbols will appear on the display, indicating that the function has been activated.
2. Adjust the heating water and DHW temperatures as described in Paragraphs 6.3.5 *p. 49* and 6.3.6 *p. 49*.
3. Whenever there is a request for space heating and/or domestic hot water production, the automatic ignition system will ignite the burner; the operation is represented by the ignition of the symbol or of the symbol with an intermittent signal on the display.

6.3.3 Heating mode

In this operating mode the boiler provides heating only.
To switch the boiler to the space heating operating mode:

1. Press the key (Figure 6.1 *p. 48*), the fixed symbol will appear on the display, indicating that the function has been activated.
2. Adjust the heating water temperature as described in Paragraph 6.3.5 *p. 49*.
3. Whenever there is a request for space heating, the automatic ignition system will ignite the burner; the operation is represented by the ignition of the symbol with an intermittent signal on the display.
4. Program the operation according to your needs.

6.3.4 Summer mode

In this operating mode the boiler provides domestic hot water only.
To switch the boiler to the summer operating mode:

1. Press the key (Figure 6.1 *p. 48*), the fixed symbol will appear on the display, indicating that the function has been activated.
2. Adjust the DHW temperature as described in Paragraph 6.3.6 *p. 49*.
3. Whenever there is a request for domestic hot water, the automatic ignition system will ignite the burner; the operation is represented by the ignition of the symbol with an intermittent signal on the display.

6.3.5 Setting the heating temperature

The temperature is adjusted using the and keys of the heating side (Figure 6.1 *p. 48*):

1. Pressing the key decreases the temperature.
2. Pressing the key increases the temperature.
3. The heating temperature control range is from a minimum of 30 °C to a maximum of 80 °C.

6.3.6 Setting the DHW temperature

The temperature is adjusted using the and keys of the DHW circuit (Figure 6.1 *p. 48*):

1. Pressing the key decreases the temperature.
2. Pressing the key increases the temperature.
3. The temperature adjustment field of the domestic hot water ranges from a minimum of 35 °C to a maximum of 60 °C.

6.3.7 OFF mode

In this operating mode the boiler no longer provides heating and DHW, but the antifreeze and pump anti-lock systems remain active.
To switch the boiler to the OFF operating mode, press the key; the fixed symbol will appear on the display, indicating that the function has been activated.
If the boiler was previously in operation, it is switched off and the post-ventilation and post-circulation functions are activated.
If you decide to shut down the boiler for a long period of time, secure it by operating in one of the following two ways:

1. Call the TAC that will empty the water system, where there is no provision for the use of antifreeze, and disconnect the power supply, water and gas.
2. Leave the boiler in the OFF operating mode, keeping the power and gas supply active, so that the antifreeze function and the pump anti-lock function can be activated.

6.3.8 Pump antifreeze and anti-lock function

Refer to Paragraph 3.5 *p. 27*.

6.4 REMOTE CONTROL OPERATION (OPTIONAL)

For switching on, adjusting and switching off the boiler, refer to the instructions supplied with the remote control.

6.5 INFO MENU DISPLAY

To view the boiler data from Info menu you have to:

1. Press the ⓘ key (Figure 6.1 *p. 48*). The info code will be displayed on the left side of the screen and its value will be displayed on the centre of the screen.
2. To scroll through the list of displayable data, use the ⊕ and ⊖ keys of the heating side.
3. Press the ⓘ key to exit the Info menu.

Table 6.1 *p. 50* shows the list of data that can be viewed from the Info menu for Caldaria 35 and Caldaria 55.1, Table 6.2 *p. 50* those for Caldaria 100.2.

Table 6.1 *List of displayable data from menu Info*

Info code	Description
d0	Not used temperature
d1	Outdoor probe temperature
d2	Combustion blower speed
d3	Not used temperature
d4	Return probe temperature
d5 - dE	Not-operating data

Table 6.2 *Caldaia 100.2 - List of displayable data from menu Info*

Info code	Description
d00	Not used temperature
d01	Outdoor probe temperature
d02	Not used temperature
d03	Percentage of total power delivered by the boiler
d10	Delivery probe temperature of the master unit
d11	Return probe temperature of the master unit
d12	Blower speed of the master unit
d20	Delivery probe temperature of the slave unit
d21	Return probe temperature of the slave unit
d22	Blower speed of the slave unit

7 MAINTENANCE

Correct maintenance prevents problems, assures efficiency and keeps running costs low.

Maintenance operations described herein may exclusively be performed by the TAC or skilled maintenance technician.

Any operation on internal components may exclusively be performed by the TAC.

Before performing any operation, switch off the appliance by means of the control device and wait for the end of the shutdown cycle, then disconnect power and gas supply, by acting on the electrical disconnector and gas valve.

It is recommended that the following operations and checks be carried out each year:

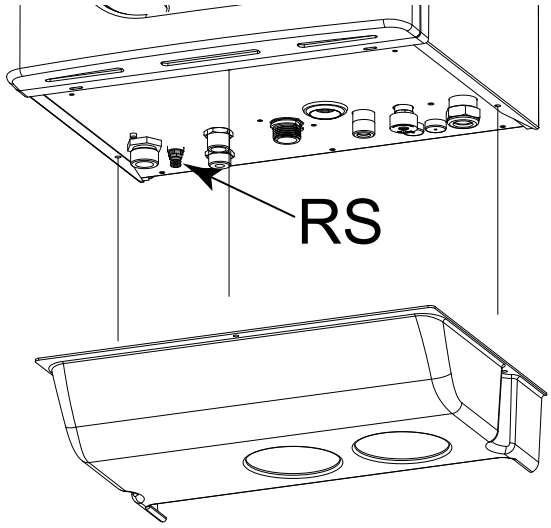
- ► Combustion circuit functionality and heat exchange control:
  - ■ Burner and flue exhaust duct inspection
  - ■ Cleaning of burner and water/flue exchanger (if applicable)
  - ■ Flame ignition/detection system control
- ► Hydraulic circuit and internal components functionality check:
  - ■ Hydraulic circuit control (pipes, gaskets)
  - ■ Expansion tank
  - ■ Control and safety devices
  - ■ Water temperature probes
- ► Periodic analysis of combustion, in accordance with regulations in force

7.1 HYDRAULIC BOILER EMPTYING

Whenever there is a need to empty the boiler, proceed as follows:

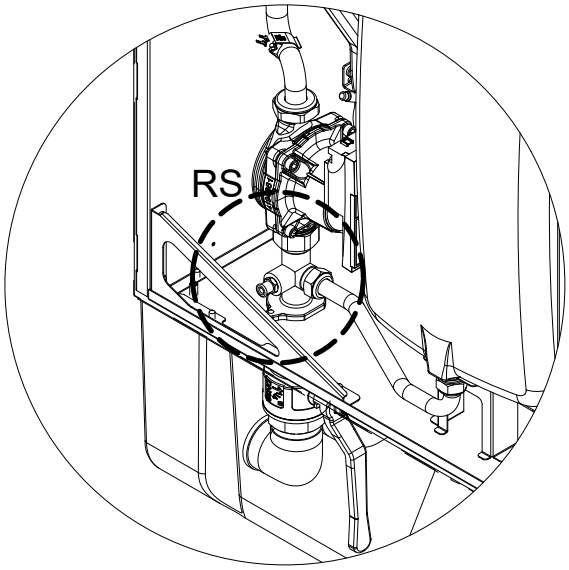
- ► Switch off the boiler by pressing the button.
- ► Only after the water pump has completed its post-circulation cycle, cut off the power supply via the main switch.
- ► Wait until the boiler has cooled down.
- ► Connect a hose to the emptying point and connect the other end of the hose to a suitable drain.
- ► Open the drain tap (Figure 7.1 *p. 50* for Caldaria 35, Figure 7.2 *p. 51* for Caldaria 55.1 and Figure 7.3 *p. 51* for Caldaria 100.2).
- ► When all the water has drained off, close the drain tap.

Figure 7.1 *System drain tap position*



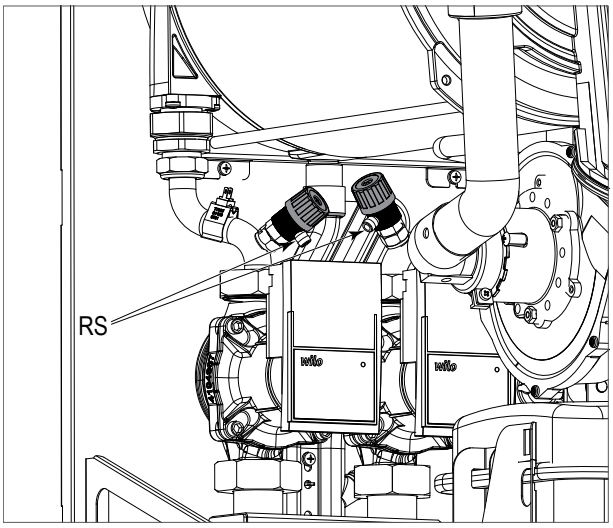
RS Drain tap

Figure 7.2 *Caldaria 55.1 - Drain tap position*



RS Drain tap

Figure 7.3 *Caldaria 100.2 - Drain tap position*



RS Drain tap

8 DIAGNOSTICS

In the event of a malfunction of the appliance, before contacting the TAC, make sure that:

- ► There is a full electricity supply.
- ► The gas is supplied.
- ► The gas pressure is within the indicated limits.
- ► The remote control (if any) is set so that the appliance is switched on and the appliance does not signal a fault.

8.1 SYSTEM PRESSURE RESTORE

In case of malfunction of the appliance, with pressure inside the hydraulic circuit lower than 0,3 bar, which can be seen through the pressure gauge located on the instrument panel inside the boiler, it is necessary, after having identified and solved any leaks on the circuit, to proceed with the restoring the correct amount of water (with glycol, if needed), as indicated in Paragraph 3.3 *p. 22*.

8.2 ERROR CODES

To display the last 5 fault codes, from the most recent in chronological order, activate the off mode using the key (Figure 6.1 *p. 48*) and press and hold the key for 5 seconds.

- ► To scroll through the list of stored faults, use the and keys of the heating side .
- ► To reset the fault history, press the reset key Ⓡ.
- ► To exit the display press the key.

Only for Caldaria 100.2

The fault codes are shown only in the display of the master control panel (detail 1 of Figure 5.4 *p. 36*).
In the event of faults that are not common to both units, the fault message code is displayed with the prefix 01 or 02, which indicates in which unit the fault is present (01 = master unit, 02 = slave unit).
In the event of failure of both appliances, the display will show only the most severe code. To display the next code, press the key of the DHW circuit Ⓢ. After resolving the most severe code, the display will show the next code alternating with the collector temperature.
When a fault code represents an anomaly common to both units (such as E04, E78, E06, E99) it is preceded by the word E(x), where (x) will be the number of the chronological order in the last 5 reports.

Table 8.1 *Error codes*

Code	Fault	Possible cause	Remedial action	Reset
E01	Flame lockout	**Without flame ignition**		
		No gas supply	Check the gas supply network	Manual reset (press ® key) (1)
		Broken or badly positioned ignition electrode	Replace	
		Gas valve fault	Replace	
		Slow ignition set too low	Adjust the minimum pressure to the burner or slow ignition	
		Inlet pressure of gas valve too high (only for LPG supply)	Check the maximum burner pressure	
		With flame ignition		
		Power supply with phase and neutral inverted	Connect the power supply correctly	Manual reset (press ® key) (1)
		Flame detector fault	Replace	
		Detection electrode cable disconnected	Check the electrical connection	
		Phase-to-phase electric current	If the voltage measured between neutral and earth is almost the same as the one measured between phase and earth, eliminate the dispersions	
E02	Safety thermostat trip (95 °C)	Hydraulic circuit overheating	Remove the cause of the lack of heat exchange	Automatic
		Thermostat cable broken or disconnected	Check the electrical connection	
		Thermostat fault	Replace	
E03	Flue safety thermal fuse (102 °C)	Hydraulic circuit overheating	Remove the cause of the lack of heat exchange	Manual reset (press ® key) (1)
		Thermal fuse fault	Replace	
		Thermal fuse cable disconnected	Check the electrical connection	
E04	Low system water pressure	Insufficient water pressure in the system (less than 0,3 bar)	Load the system at the required pressure	Automatic
		Water pressure cable disconnected	Check the electrical connection	
		Water pressure switch fault	Replace	
E05	Heating probe fault	Probe fault or out of calibration (nominal resistance 10 KΩ at 25 °C)	Replace	Automatic
		Probe connector wet or disconnected	Check the electrical connection	
E06 (2)	DHW probe fault	Probe fault or out of calibration (nominal resistance 10 KΩ at 25 °C)	Replace	Automatic
		Probe connector wet or disconnected	Check the electrical connection	
E10 (3)	False safety trip	Incorrect setting of parameter P32 to value 1	Set parameter P32 to 0	Automatic
E14 (4)	Air pressure switch	Exhaust duct obstructed	Check the flue exhaust duct	Manual reset (press ® key) (1)
		Pressure switch disconnected	Check the electrical connection	
		Pressure switch fault	Replace	
E15	Return probe fault	Probe fault or out of calibration (nominal resistance 10 KΩ at 25 °C)	Replace	Automatic
		Probe connector wet or disconnected	Check the electrical connection	
E16	Blower fault	Blower board fault	Replace	Automatic
		Broken blower	Replace	
		Power supply cable fault	Replace	
E18	Low water flow	Clogged exchanger	Clean the heat exchanger or replace it	Automatic
		Circulator fault or dirty impeller	Clean the impeller or replace the circulator	
E21	Generic internal electronic board error	Wrong recognition of a signal by the microprocessor of the modulation board	If the modulation board does not reset the error automatically, replace it	Automatic
E22	Parameter programming request	Microprocessor memory loss	Reprogram parameters	Manual reset (disconnect the power supply)
E31	Not compatible remote control	The remote controller connected to the boiler is not compatible with the electronic board	Replace with a compatible one	Automatic
E31 (4)	Solar board connection error	Incorrect setting of parameter P34 to value 1	Set parameter P34 to 0	Automatic
E32	Communication error between boiler board and Modbus board	No electrical connection	Check the electrical connection	Automatic
		Modbus board fault	Replace	
E35	Parasitic flame	Flame detector fault	Clean or replace	Manual reset (press ® key) (1)
		Flame detector cable fault	Replace	
		Modulation board fault	Replace	
E40	Wrong power supply voltage	Supply voltage out of operating range (≤160 V)	Check the power supply network	Automatic

1 In the Caldaria 100.2 press the ® key on the master control panel.
2 Only for boilers with DHW production.
3 Not applicable to Caldaria 100.2.
4 Only for Caldaria 100.2.

Code	Fault	Possible cause	Remedial action	Reset
E52	Communication error between the OT/ Modbus interface and the ODSP039 cascade controller	No electrical connection	Check the electrical connection	Automatic
		Modbus board fault	Replace	
E78	Manifold probe fault	Probe fault or out of calibration (nominal resistance 10 KΩ at 25 °C)	Replace	Automatic
		Probe connector wet or disconnected	Check the electrical connection	
E99	Generic CRAD board error	Incorrect setting of parameter P29 to value 1	Set parameter P29 to 0	Automatic

1 In the Caldaria 100.2 press the ® key on the master control panel.
2 Only for boilers with DHW production.
3 Not applicable to Caldaria 100.2.
4 Only for Caldaria 100.2.

Table 8.2 *Signalling codes (visible ONLY on the boiler display)*

Code	Function	Description
F07	Chimney sweep function active	It is activated by pressing the reset ® key for 7 seconds and it is deactivated by turning off the boiler. Brings the boiler to the minimum and maximum power for 15 minutes by deactivating the modulation function. Generally used for combustion and calibration tests.
F08	Heating antifreeze function	It is automatically activated when the heating probe detects a temperature of 12 °C. The boiler operates at minimum power and is deactivated when a water temperature of 30 °C (on the outlet) or 20 °C (on the inlet) is detected.
F09 (1)	DHW antifreeze function	It is automatically activated when the DHW probe detects a temperature of 4 °C. The boiler operates at minimum power with diverter valve in summer position. It is deactivated when a temperature of 8 °C is detected.
F28 (1)	Legionella function	It is activated for the first time one hour after the boiler has been turned on. After, the cycle is carried out every 7 days at the same time, with the aim of raising the temperature of the DHW buffer tank above 60 °C.
F33	System air purge cycle in progress	It automatically starts when the boiler is powered up, running for 5 minutes a series of cycles in which the pump is turned on for a period of 40 seconds and then turned off for a period of 20 seconds. Regular operation is only permitted at the end of the function. It can also be activated during normal operation of the boiler, in the event that the enable of the water pressure switch is lacking, when the contact is closed, a 2-minute venting cycle is performed.
FH (2)	Fast H_2O	It is activated or deactivated by holding down the reset ® and ⊖ keys of the DHW circuit Ⓢ for 7 seconds.

1 Only for boilers with DHW production.
2 Only for boilers with instantaneous production of DHW.

9 APPENDICES

9.1 PRODUCT FICHE

9.1.1 Caldaria 35

Figure 9.1

Table 7

COMMISSION DELEGATED REGULATION (EU) No 811/2013

Technical parameters for boiler space heaters, boiler combination heaters and cogeneration space heaters

Model(s):				Caldaria 35			
Condensing boiler:				yes			
Low-temperature (**) boiler:				no			
B11 boiler:				no			
Cogeneration space heater:			no	If yes, equipped with a supplementary heater:			no
Combination heater:				no			
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Rated heat output	*Prated*	33,4	kW	**Seasonal space heating energy efficiency**	η_s	92,5	%
For boiler space heaters and boiler combination heaters: Useful heat output				For boiler space heaters and boiler combination heaters: Useful efficiency			
At rated heat output and high-temperature regime (*)	P_4	33,4	kW	At rated heat output and high-temperature regime (*)	η_4	88,3	%
At 30 % of rated heat output and low-temperature regime (**)	P_1	10,0	kW	At 30 % of rated heat output and low-temperature regime (**)	η_1	97,8	%
Auxiliary electricity consumption				Other items			
At full load	*elmax*	0,125	kW	Standby heat loss	P_{stby}	0,059	kW
At part load	*elmin*	0,025	kW	Ignition burner power consumption	P_{ign}	0	kW
In standby mode	P_{SB}	0,004	kW	Annual energy consumption	Q_{HE}	268,7	GJ
				Sound power level, indoors/outdoors	L_{WA}	- / 52,4	dB

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

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

Contact details	Robur SPA, Via Parigi 4/6, I-24040 Zingonia (BG)

Additional information required by COMMISSION REGULATION (EU) No 813/2013, Table 1:

Emissions of nitrogen oxides:	NO_x	52	mg/kWh

9.1.2 Caldaria 55.1

Figure 9.2

Table 7

COMMISSION DELEGATED REGULATION (EU) No 811/2013

Technical parameters for boiler space heaters, boiler combination heaters and cogeneration space heaters

Model(s):			Caldaria 55.1				
Condensing boiler:			yes				
Low-temperature (**) boiler:			no				
B11 boiler:			no				
Cogeneration space heater:		no	If yes, equipped with a supplementary heater:				no
Combination heater:			no				
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Rated heat output	*Prated*	49,2	kW	**Seasonal space heating energy efficiency**	η_s	92,7	%
For boiler space heaters and boiler combination heaters: Useful heat output				For boiler space heaters and boiler combination heaters: Useful efficiency			
At rated heat output and high-temperature regime (*)	P_4	49,2	kW	At rated heat output and high-temperature regime (*)	η_4	88,8	%
At 30 % of rated heat output and low-temperature regime (**)	P_1	14,8	kW	At 30 % of rated heat output and low-temperature regime (**)	η_1	98,2	%
Auxiliary electricity consumption				Other items			
At full load	*elmax*	0,241	kW	Standby heat loss	P_{stby}	0,059	kW
At part load	*elmin*	0,049	kW	Ignition burner power consumption	P_{ign}	0	kW
In standby mode	P_{SB}	0,004	kW	Annual energy consumption	Q_{HE}	394,8	GJ
				Sound power level, indoors/outdoors	L_{WA}	- / 52,4	dB

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

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

Contact details	Robur SPA, Via Parigi 4/6, I-24040 Zingonia (BG)

Additional information required by COMMISSION REGULATION (EU) No 813/2013, Table 1:

Emissions of nitrogen oxides: NO_x 52 mg/kWh

9.1.3 Caldaria 100.2

Figure 9.3

Table 7

COMMISSION DELEGATED REGULATION (EU) No 811/2013

Technical parameters for boiler space heaters, boiler combination heaters and cogeneration space heaters

Model(s):			Caldaria 100.2				
Condensing boiler:			yes				
Low-temperature (**) boiler:			no				
B11 boiler:			no				
Cogeneration space heater:		no	If yes, equipped with a supplementary heater:				no
Combination heater:			no				
Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Rated heat output	*Prated*	98,1	kW	**Seasonal space heating energy efficiency**	η_s	93	%
For boiler space heaters and boiler combination heaters: Useful heat output				For boiler space heaters and boiler combination heaters: Useful efficiency			
At rated heat output and high-temperature regime (*)	P_4	98,1	kW	At rated heat output and high-temperature regime (*)	η_4	88,8	%
At 30 % of rated heat output and low-temperature regime (**)	P_1	29,5	kW	At 30 % of rated heat output and low-temperature regime (**)	η_1	98,2	%
Auxiliary electricity consumption				Other items			
At full load	*elmax*	0,482	kW	Standby heat loss	P_{stby}	0,100	kW
At part load	*elmin*	0,049	kW	Ignition burner power consumption	P_{ign}	0	kW
In standby mode	P_{SB}	0,004	kW	Annual energy consumption	Q_{HE}	784,7	GJ
				Sound power level, indoors/outdoors	L_{WA}	- / 52,4	dB

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

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

Contact details	Robur SPA, Via Parigi 4/6, I-24040 Zingonia (BG)

Additional information required by COMMISSION REGULATION (EU) No 813/2013, Table 1:

Emissions of nitrogen oxides: NO_x 52 mg/kWh

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