



installation and maintenance manual

FOR THE INSTALLER AND THE USER

NESTA PLUS

280·420·570·840 kW

FLOOR — STANDING CONDENSING BOILER

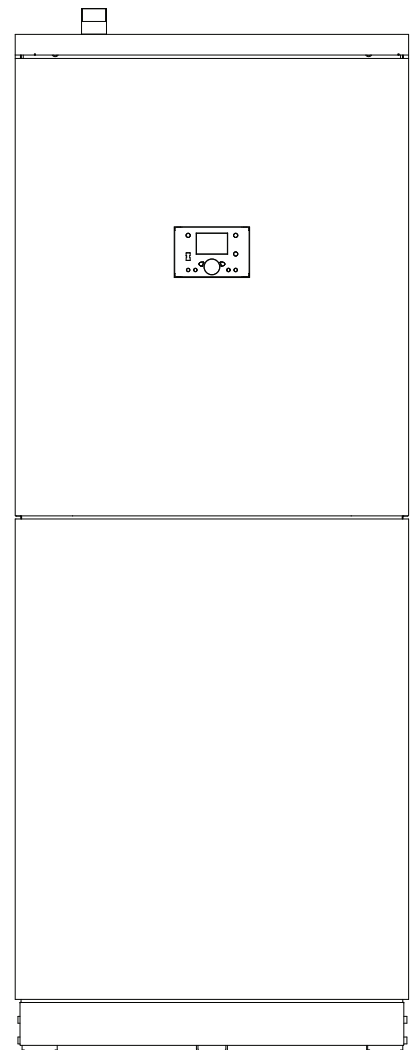


TABLE OF CONTENTS

GENERAL INFORMATION	G-4	Chimney Connection.....	I-50
Liabilities of the Manufacturer, the Installer and the End user.....	G-4	Engineering the Chimney System	I-53
About this Manual	G-5	Accessories	I-53
Safety Instructions	G-6	Safety Instructions for the Electrical Connections	I-54
Package Contents	G-7	Connections	I-54
Boiler Marking	G-7	Accessing the High Voltage Terminal Strip	I-54
Boiler Naming.....	G-7	Accessing the Low Voltage Terminal Strip and Electronic board.....	I-55
PRODUCT DESCRIPTION	G-8	Routing the Cables.....	I-55
NESTA PLUS 280 - 420 - 570 - 840.....	G-8	Wiring Diagram - NESTA PLUS 280 - 420 - 570	I-56
General Description	G-8	Wiring Diagram - NESTA PLUS 840.....	I-58
Frost Protection	G-8	COMMISSIONING	I-60
Safety Devices	G-8	Safety Instructions Before Start-up.....	I-60
Optional equipment	G-8	Filling the System	I-60
Control Panel and Main Functions	G-12	Start-up and Combustion Adjustments	I-61
Symbols and Messages on the Control Panel ...	G-13	MAINTENANCE	I-62
TECHNICAL SPECIFICATIONS	G-14	Safety Instructions for Maintenance	I-62
Dimensions and Clearances.....	G-14	Maintenance Requirements	I-63
Performance and Efficiency Data.....	G-16	Shutting Down for Maintenance.....	I-64
ErP Data	G-16	Draining the Boiler.....	I-64
Combustion Data	G-17	Restarting after Maintenance	I-65
Electrical Data	G-17	Replacing the Gas Valve Filter.....	I-65
Gas Data	G-18	Checking the Flue Gas (FPS) and Air (APS)	I-66
Gas categories	G-19	Pressure Switches operation.....	I-66
Hydraulic Data.....	G-20	Removing and Installing the Ignition and Ionization Electrodes.....	I-67
Pressure Drop Curve	G-20	Removing, Checking, Cleaning and Installing the Burner.....	I-68
Flow Rate	G-20	Replacing the Burner Plate Insulation (N280 FS)	I-70
INSTRUCTIONS FOR THE USER	U-21	Replacing the Burner Plate Insulation (N 420 FS to N 840 FS)	I-72
Safety Instructions for the User.....	U-21	Removing, Cleaning and Installing the Condensate Trap	I-74
Periodic checks	U-22	Checking and Cleaning the Combustion Chamber.....	I-76
Starting the Appliance.....	U-23	ADDITIONAL INFORMATION FOR THE INSTALLER..	I-77
Stopping the Appliance.....	U-23	Optional Modules	I-77
What to Do if... ..	U-23	Extension Module & Cable Hub.....	I-77
Basic Settings	U-24	Web Server Module	I-77
Structure of Menus for the End User	U-27	Cascading module.....	I-77
PRODUCT INSTALLATION	I-29	Boilers in a Cascade System	I-78
Safety Instructions for the Installation.....	I-29	Boiler Settings for the Installer	I-80
Handling the Product	I-30	Access Levels.....	I-80
Unpacking the Product	I-30	Commissioning Menu	I-80
Transporting the Product.....	I-30	Menus and Settings	I-80
Installing and Preparing the Boiler	I-32	Structure of Menus for the Installer.....	I-80
Removing and Installing the Access Panels ...	I-34	Error Codes and Solutions	I-84
Requirements for the Hydraulic Connections .	I-36	Maintenance Messages	I-89
Safety Instructions for the Primary Circuit.....	I-36	Troubleshooting.....	I-90
Water Quality Requirements to Prevent Scaling and Corrosion in a Heating System....	I-37	Installation Checklist	I-92
Typical Hydraulic Connections - Heating Circuit..	I-39	Combustion Parameters - Log Sheet.....	I-95
Hydraulic Connections - Cascaded boilers, with External Domestic Hot Water Tank and Plate Heat Exchanger.....	I-40	Water Parameters - Log Sheet.....	I-96
Hydraulic Connections - Cascaded boilers, with External Domestic Hot Water Tank and Low Loss Header	I-41	DECLARATION OF CONFORMITY	I-97
Safety Instructions for the Gas Connection	I-42		
Gas Conversion.....	I-43		
Preparing the Boiler for Gas Conversion.....	I-44		
Adjustment of Fan Speeds.....	I-45		
Combustion Adjustment for Gas Conversion.....	I-46		
Safety Instructions for the Chimney Connections .	I-48		

Fig. 1. Boiler Packaged for Transport	G-7	Fig. 35. Removing and Installing the Burner (NESTA PLUS 280 - 420).....	I-69
Fig. 2. Data Plate - Typical.....	G-7	Fig. 36. Removing and Installing the Burner (NESTA PLUS 570 - 840).....	I-69
Fig. 3. NESTA PLUS 280 - 420 Components - Top, Front and Rear Views.....	G-9	Fig. 37. Replacing the Burner Plate Insulation (NESTA PLUS 280).....	I-71
Fig. 4. NESTA PLUS 570 - 840 Components - Front View	G-10	Fig. 38. Replacing the Burner Plate Insulation (NESTA PLUS 420 to 840).....	I-73
Fig. 5. NESTA PLUS 570 - 840 Components - Top and Rear Views	G-11	Fig. 39. Cleaning the Condensate Pipe and Trap.....	I-75
Fig. 6. Control Panel.....	G-12	Fig. 40. Cleaning the Combustion Chamber (with burner plate installed).....	I-76
Fig. 7. Typical Display.....	G-13	Fig. 41. Extension Module and Cable hub.....	I-77
Fig. 8. NESTA PLUS 280 & 420.....	G-14	Fig. 42. Cascading Module.....	I-77
Fig. 9. NESTA PLUS 570 & 840.....	G-15	Fig. 43. Web Server Module.....	I-77
Fig. 10. NESTA PLUS clearances	G-15	Fig. 44. Principles of Cascade	I-78
Fig. 11. Boiler transport and Installation	I-30	Fig. 45. Cascading Module	I-78
Fig. 12. Lifting the Boiler from the Top	I-31	Fig. 46. Cascade System with Plate Heat Exchanger / Low Loss Header	I-79
Fig. 13. Components in their Storage Location.....	I-32		
Fig. 14. Bottom Front Panel - First Installation.....	I-32		
Fig. 15. Air Inlet Installation	I-33		
Fig. 16. Removing/Installing the Top, Front and Side Access Panels.....	I-35		
Fig. 17. Removing/Installing the rear Top and Bottom Panels.....	I-35		
Fig. 18. Typical Heating System - With Temperature and Pressure Limiters for >300 kW models.....	I-39		
Fig. 19. Cascaded Boilers, with External Domestic Hot Water Tank and Plate Heat Exchanger.....	I-40		
Fig. 20. Cascaded Boilers, with External Domestic Hot Water Tank and Low Loss Header.....	I-41		
Fig. 21. Accessing the Gas Valve	I-44		
Fig. 22. Gas Valve - Shutter Pre-adjustment for Propane	I-44		
Fig. 23. Fan Speed Adjustment - Typical Screen	I-45		
Fig. 24. Combustion Adjustment - Control Panel	I-46		
Fig. 25. Combustion Adjustment on Gas Valve	I-47		
Fig. 26. Accessing the High Voltage Terminal.....	I-54		
Fig. 27. Accessing the Low Voltage Terminals and Electronic Board	I-55		
Fig. 28. Routing the Electrical Cables	I-55		
Fig. 29. Filling the System - Typical	I-60		
Fig. 30. Gas Valve - Gas Shutter Location	I-61		
Fig. 31. Draining the Boiler - Typical	I-64		
Fig. 32. Replacing the Gas Valve Filter	I-65		
Fig. 33. Testing the Air Pressure Switch and Flue Pressure Switch.....	I-66		
Fig. 34. Removing and Installing the Electrodes	I-67		

Liabilities of the Manufacturer, the Installer and the End user

Manufacturer

Our products are manufactured in compliance with the requirements of the applicable European Directives and standards, and are therefore delivered with all the required documentation and markings.

The quality of our products is essential to us, and we aim therefore at improving them continually. To this end, we reserve the right to change the technical characteristics and features of our products without prior notice. Please check for the latest revision of the manual on our website (www.myaic.eu).

The manufacturer shall not be held liable for any malfunction of the product resulting from:

- › The failure to comply with the safety and installation instructions provided herein,
- › The failure to comply with the safety and operation instructions and recommendations provided herein,
- › The failure to have the appliance maintained regularly,
- › A modification of the appliance that is not approved by the manufacturer,
- › The use of the product for any other purpose than its intended use,
- › The use of components and accessories that are not approved by the manufacturer.

Installer

The installer is responsible for the correct installation, conversion (as required) and commissioning of the appliance according to:

- › The instructions and recommendations provided herein
- › The applicable regulations and standards

The installer shall provide the end-user with:

- › Any relevant explanation about the operation of the appliance and the heating system as well as the safety devices that are provided,
- › Any instruction regarding periodic checks to be performed and possible anomaly to be reported
- › All the documentation delivered with the appliance and installed accessories.

The installer shall also inform the end-user of the necessity to have the appliance checked and maintained regularly by a qualified professional.

End-user

To ensure the best performances and safety of the appliance, the end-user shall:

- › Make sure that the appliance is installed, converted (as required), commissioned and adjusted by a qualified professional,
- › Make sure that the appliance is checked and maintained regularly by a qualified professional,
- › Comply with all the instructions and recommendations provided in the appliance documentation,
- › Make sure to receive from the installer all the necessary explanations related to the operation of the appliance and the safety devices,
- › Make sure to receive from the installer all the appliance and accessories documentation,
- › Keep all the appliance documentation in a safe place for future use.

The end-user shall use the product for its intended use.



- › Should the installer or the end user not comply with the instructions and requirements stated in this manual, the warranty will be void.
- › For more information on the warranty terms and conditions, please connect to our website: www.myaic.eu.

About this Manual

This documentation is part of the product. It will be handed over to the end-user who will keep it, with all the other applicable documents, in a safe place and readily available for use.

Before installing, operating or maintaining the appliance, please carefully read this manual and all the applicable documents provided with the components and accessories. They contain essential safety information.

Symbols in this Manual



Indicates an essential instruction which, if not followed, can result in a hazardous situation that can cause serious damage to equipment and/or injuries or death.



Indicates an essential instruction in relation with the presence of electrical power and a danger of electrical shock.



Indicates an important instruction which, if not followed, could result in a hazardous situation that could cause damage to equipment and/or injuries.



Indicates important information.



The electrical supply to the appliance must be activated/deactivated through the external circuit breaker or the power supply cable must be connected/disconnected.



The appliance must be started/stopped using the ON/OFF switch installed on the appliance.



The gas supply to the appliance must be provided/shut down through the external gas tap.



The water circuit of the appliance must be full of water/empty.



The front and top access panel(s) of the appliance must be removed/installed.



The appliance must have cooled down.



Gas connection.



Heating circuit supply connection.



Heating circuit return connection.

Symbols on the Appliance



High Voltage - danger of electric shock.



Ground / Earth.



Heating circuit connection.



Gas connection.

For an explanation of the symbols on the control panel, refer to "*Symbols and Messages on the Control Panel*" on page G-13.

Symbols on the Packaging



This side up



Keep dry



Fragile



Do not stack



The prefixes used in the page numbering indicate the following:

G- : General information

U- : Pages intended for the End User

I- : Pages intended **exclusively** for the qualified professional (e.g. Installer)

Safety Instructions



IF YOU SMELL GAS:

→ **DO NOT:**

- Use an open flame
- Smoke
- Use electrical devices (phones, doorbell, etc.) or switches

→ **DO:**

- Close the gas supply
- Open all doors and windows to ventilate the room
- Inform the neighbours of the danger by knocking at the doors.
- Get out of the building
- Call the gas company



- This product is intended as a heat generator for heating systems.
- This appliance must be installed according to the applicable local regulations and standards.
- This appliance can be used by children who are at least 8 years old and by persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, provided that they are under supervision or have been given instructions concerning the use of the appliance in a safe way and that they understand the hazards involved.
- Cleaning and user maintenance shall not be performed by children without supervision. Children shall not play with the appliance.
- Any modification to the appliance and its components is strictly forbidden without the prior written consent of the manufacturer.
- If components need to be replaced, only genuine factory parts or components approved by the manufacturer must be used.



- When working on the appliance and the system, make sure to use the appropriate tools to avoid damaging the pipes and components.
- If works need to be performed close to the appliance (e.g. in the boiler room or close to the air inlets), make sure to shut down the appliance to prevent dust from entering and accumulating in the appliance.
- The appliance contains a frost-protection feature that will protect the appliance against frost, provided that the appliance remains in operation and the radiator valves are open.



- *When unpacking the appliance, check the integrity and condition of the packaging and that all the components and accessories described in the packing list are present. Contact your supplier in case of problem.*
- *When discarding the packaging, do not contaminate the environment. Dispose of it according to the applicable local regulations on recycling.*

PRODUCT DESCRIPTION

NESTA PLUS 280 - 420 - 570 - 840

General Description

This floor-standing series of NESTA PLUS boilers consists of low-emission condensing appliances with a pre-mix burner and a stainless steel heat exchanger.

The fully radial burner with metal stainless steel deck and external FeCrAlloy mesh ensure high modulation coefficients, combustion stability and very low NOx emissions.

The stainless steel "fire-tube" heat exchanger offers a high water capacity and a large heat exchange surface to optimise energy and heating efficiency.

The NESTA PLUS series is designed for heating systems and can be used for indirect Domestic Hot Water production (provided that the system contains an optional external tank).

The appliances are built for natural gas (G20) but can be converted by a qualified professional to operate with either G25 natural gas or G31 liquefied petroleum gas (propane), according to the procedure provided with the boiler. Gas conversion must comply with applicable local regulations and standards.

NESTA PLUS boilers are able to control 3 heating circuits with mixing functions, through 3 optional extension modules. Each extension module requires a power supply and a bus connection. Refer to "**Optional Modules**" on page I-77 for more information.

These appliances **are not** provided with a built-in circulating pump. Therefore, the hydraulic system must be equipped with at least one pump for standard system flow operation.

The NESTA PLUS boilers can be connected in a cascade configuration, which means that the boilers are connected to the same water circuit and electronic controller, with one boiler operating as the master, and the others as "slaves". Refer to "**Boilers in a Cascade System**" on page I-78 for more information on cascade system possibilities.

Frost Protection

The NESTA PLUS boilers have a built-in anti-frost protection. The pump and the burner are started as required when the return water temperature drops below 5°C (as measured by the boiler internal sensor installed on the return circuit). The pump and/or burner will turn off when the return temperature reaches the required setpoint. The anti-frost protection function only protects the boiler, not the entire system.

Safety Devices

The NESTA PLUS boilers are equipped with a series of sensors and switches that provide safety for your appliance and heating system, such as:

- Water temperature sensors (supply, return, system, etc.)
- Water temperature limiter
- Burner plate temperature limit switch
- Air pressure switch
- Gas pressure switch
- Flue pressure switch
- Water pressure sensor
- Flue temperature sensor
- Condensate level switch
- Flow switch
- Pressure relief valve
- Alarm contacts

The NESTA PLUS boilers **are not** provided with the following mandatory safety equipment that the installer must place in the system:

- Expansion tank, suitable for the system size,
- Safety group, composed of a safety valve (pressure rating adapted to the system), an automatic air relief valve and a manometer, Refer to "**Requirements for the Hydraulic Connections**" on page I-36 for installation requirements.
- Air relief valve(s), at the high point(s) of the system.

Optional equipment

Some optional equipment can be used with the NESTA PLUS boilers. Please contact your AIC representative for more information and a list of available equipment.

To lengthen the life of your boiler and heating system, in addition to the recommended water characteristics described in "**Water Quality Requirements to Prevent Scaling and Corrosion in a Heating System**" on page I-37, the following equipment can be installed in the heating circuit:

- Water filter
- Dirt separator
- Low loss header
- Plate heat exchanger
- Air separator

See "**Requirements for the Hydraulic Connections**" on page I-36 for more information on this equipment.

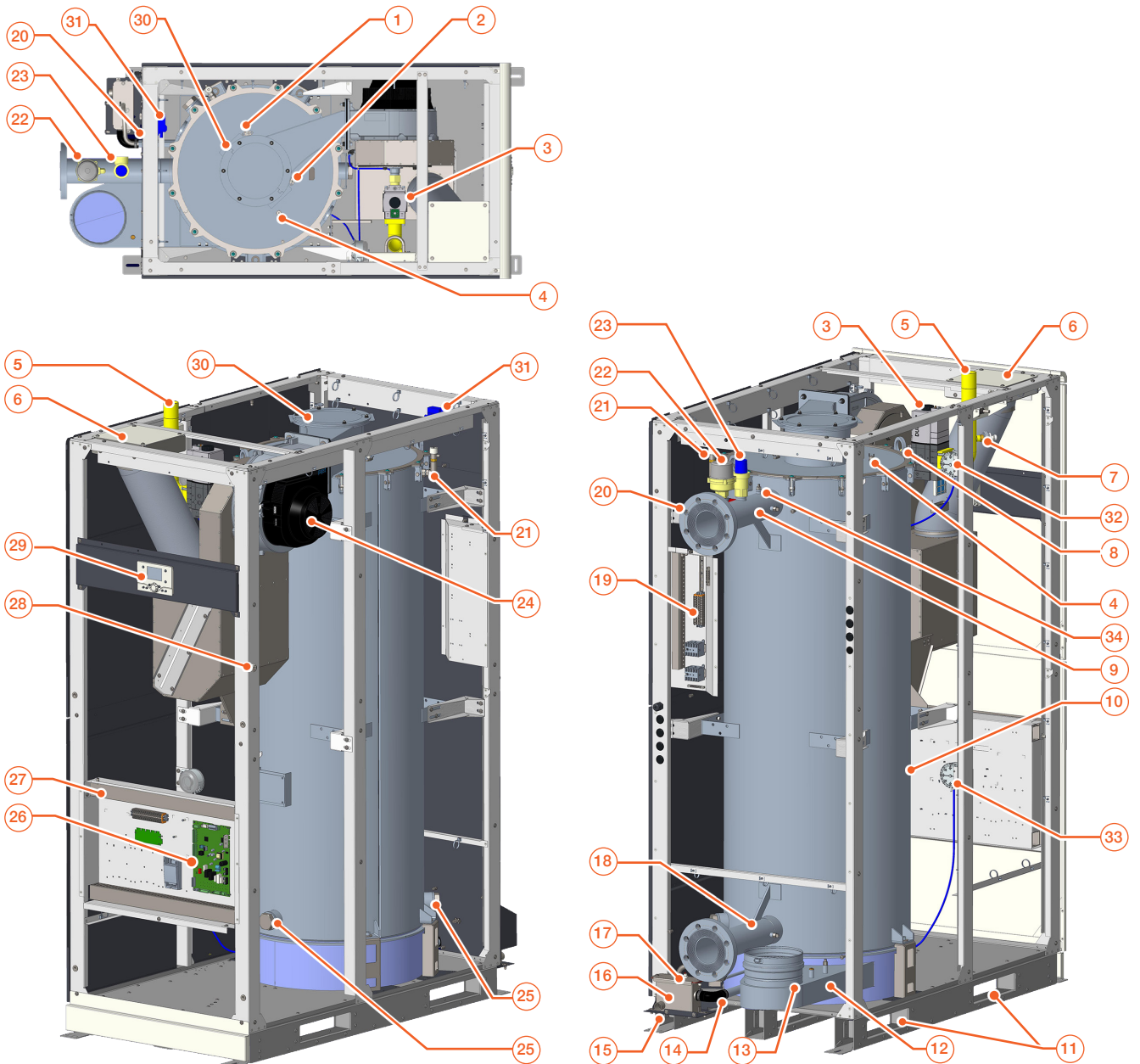


Fig. 3. NESTA PLUS 280 - 420 Components - Top, Front and Rear Views

- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Ignition electrode 2. Ionisation electrode 3. Gas valve 4. Burner plate temperature limit switch 5. Gas pipe 6. Air inlet (equipped with a removable cover for transport) 7. Gas pressure switch 8. Hoisting ring 9. Heating supply connection, with temperature sensor 10. Stainless steel "Fire tube" heat exchanger 11. Transport holes 12. Flue gas temperature sensor 13. Flue gas connection, with condensate dish 14. Condensate pipe 15. Condensate drain 16. Condensate trap (protected by a removable cover) 17. Condensate level switch 18. Heating return connection, with temperature sensor | <ul style="list-style-type: none"> 19. Rear electrical box (high voltage terminal strip) 20. Water pressure sensor 21. Manual air vent 22. Flow switch 23. Pressure relief valve (6 bar) 24. Fan and air adapter 25. Drain connection - plugged 26. Electronic main board and cable hub (for optional module connection, see "Optional Modules" on page I-77) 27. Electronic junction box 28. On/Off switch 29. Control panel with LCD display 30. Burner plate 31. Ignition transformer 32. Air pressure switch 33. Flue pressure switch 34. Water temperature limiter |
|---|--|

PRODUCT DESCRIPTION

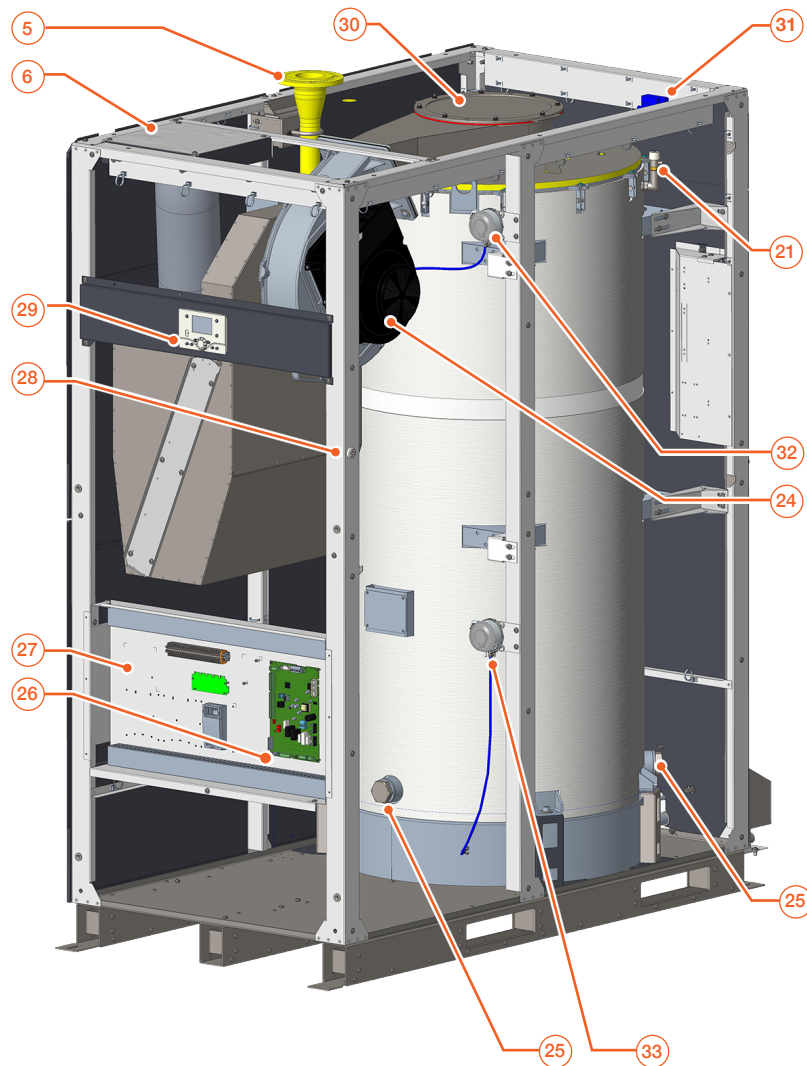


Fig. 4. NESTA PLUS 570 - 840 Components - Front View

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Ignition electrode 2. Ionisation electrode 3. Gas valve 4. Burner plate temperature limit switch 5. Gas pipe 6. Air inlet (equipped with a removable cover for transport) 7. Gas pressure switch 8. Hoisting ring 9. Heating supply connection, with temperature sensor 10. Stainless steel "Fire tube" heat exchanger 11. Transport holes 12. Flue gas temperature sensor 13. Flue gas connection, with condensate dish 14. Condensate pipe 15. Condensate drain 16. Condensate trap (protected by a removable cover) 17. Condensate level switch 18. Heating return connection, with temperature sensor | <ol style="list-style-type: none"> 19. Rear electrical box (high voltage terminal strip) 20. Water pressure sensor 21. Manual air vent 22. Flow switch 23. Pressure relief valve (6 bar) 24. Fan and air adapter 25. Drain connection - plugged 26. Electronic main board and cable hub (for optional module connection, see "Optional Modules" on page I-77) 27. Electronic junction box 28. On/Off switch 29. Control panel with LCD display 30. Burner plate 31. Ignition transformer 32. Air pressure switch 33. Flue pressure switch 34. Water temperature limiter |
|---|--|

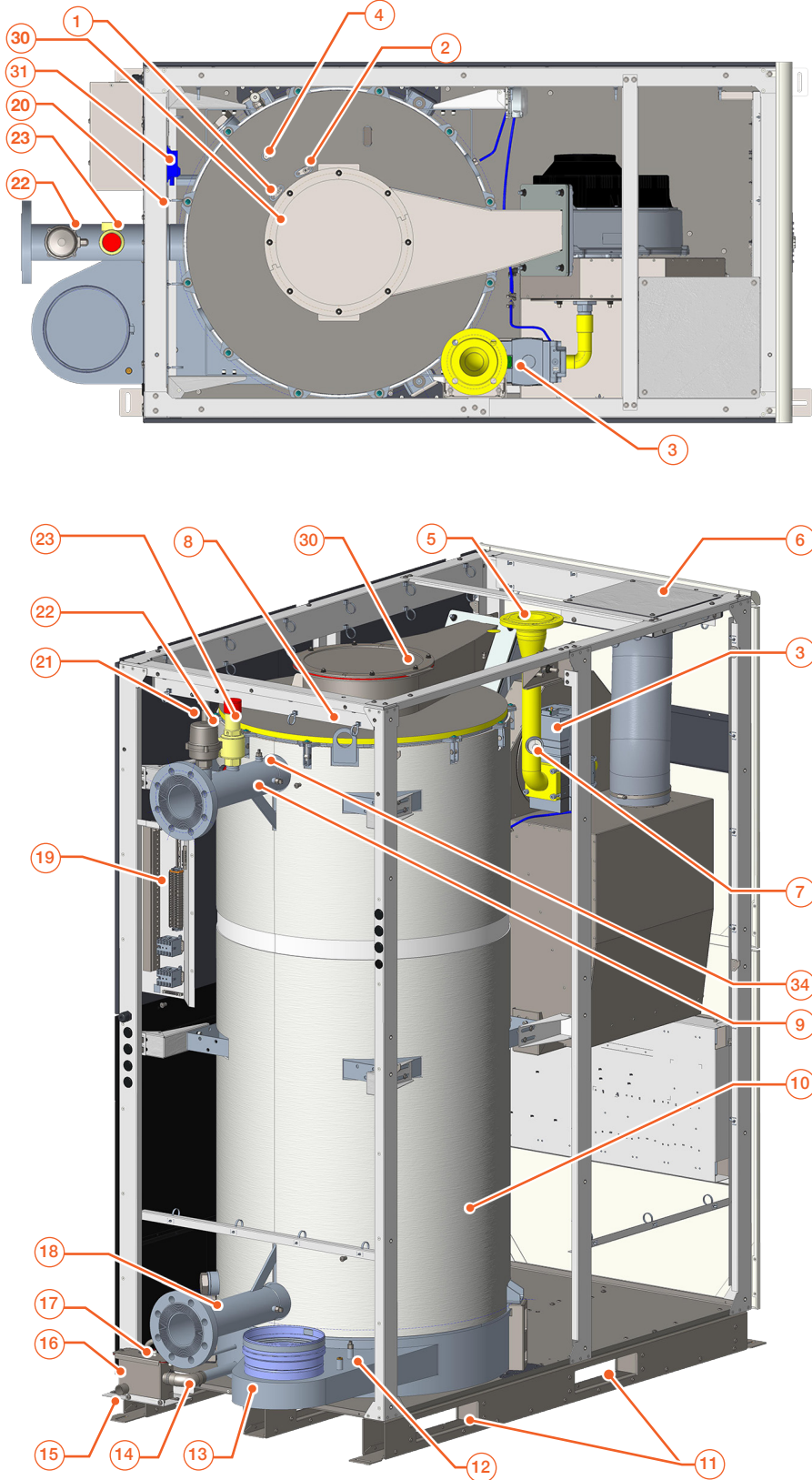


Fig. 5. NESTA PLUS 570 - 840 Components - Top and Rear Views

PRODUCT DESCRIPTION

Control Panel and Main Functions

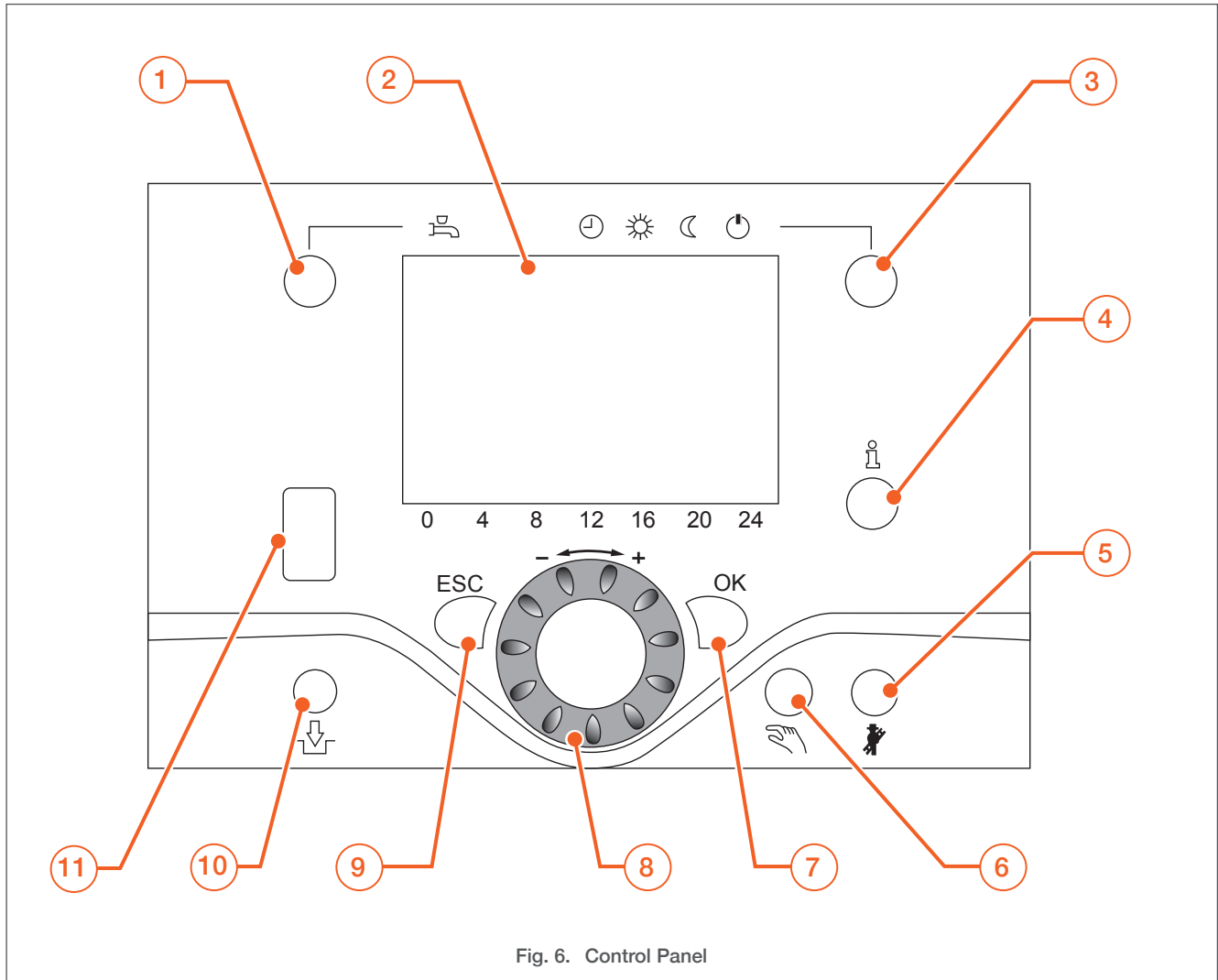


Fig. 6. Control Panel


KEY


1. Domestic Hot Water on/off button - Pressing this button activates/deactivates of the Domestic Hot Water function (🚿).
2. LCD Display - The display illuminates whenever a control is depressed, and remains on for 8 minutes. For a detail of the symbols and messages displayed on the screen, see **"Symbols and Messages on the Control Panel"** on page G-13.
3. Heating mode selection button - Pressing this button activates/deactivates one of the four following heating mode:
 - Automatic mode (🕒)
 - Comfort mode (☀️)
 - Reduced mode (🌙)
 - Protection mode (🔒)
4. Information display button - Pressing this button displays more information on the screen (e.g. details of an error or maintenance code, special mode messages and INFO lines). It also allows to access the various user levels of the controller menus.
5. Chimney sweep function button - This button allows to perform a measurement of the flue gas contents.
6. Manual operation mode button - The operation depends on the function defined for the relays (Expert Level). It can also be used to activate the bleeding function using an air purge installed at all high points of the circuit.
7. Confirmation button - This button allows to access the setting menus for the end user, and to validate a value or a selection.
8. Rotary selection knob - Turning the knob to the left or to the right allows to scroll through the menus or increase/decrease a value.
9. Escape button - To cancel any ongoing operation or go back to the Home screen.
10. Reset button - To reset an error code displayed on the screen.
11. Service Socket (BSB) - Not used


For more information on the operation and menus of the controller, see **"Basic Settings"** on page U-24.


Symbols and Messages on the Control Panel


The following symbols are present **on the control panel (See Fig. 7):**

 **Domestic Hot Water mode.** At activation, this mode also ensures that the water is heated up to 65°C once a week to prevent any development of legionella bacteria in the DHW circuit. When activated, a black line (1) is displayed under the symbol.

 **Automatic mode.** This mode operates the boiler according to a scheduled programme, using the setpoints defined for the Comfort (☀) and Reduced (☾) modes. The ECO function is active (automatic summer/winter changeover). It also allows the anti-frost and overheating protections to be active. When this mode is activated, a black line is displayed under the symbol.

 **Comfort mode.** This mode operates the appliance, up to the temperature setpoint defined for the Comfort operation and maintains it continuously (no scheduler). It also allows the anti-frost and overheating protections to be active. The ECO function is **NOT** active (automatic summer/winter changeover). When this mode is activated, a black line is displayed under the symbol.

 **Reduced mode.** This mode operates the appliance, up to the temperature setpoint defined for the reduced operation and maintains it continuously (no scheduler). It also allows the anti-frost and overheating protections to be active. When the mode is activated, a black line is displayed under the symbol.

 **Protection mode.** In this mode, the heating system is disabled, but the anti-frost and overheating protections remain active.


 Information.

 Chimney sweep.


 Manual mode.


 Reset.


The following symbols are displayed **on the screen (See Fig. 7):**


 **Comfort mode active (3).** The time scale (4) at the bottom of the display indicates the period during which this mode is active (in the screen below, the automatic mode, with scheduler active).


 **Reduced mode active.**

 **Frost protection active.** The appliance will heat up to the frost-protection setpoint.


 **Process in progress.**

 **Holiday function active.**

 **Reference to heating circuits.**

 **The burner is in operation.**

 **Maintenance message.**

 **Fault message -** An error has occurred and a fault code and text can be displayed on the screen by pushing on the Info button.

INFO Information level active (2)

PROG Setting level active - the parameters can be changed.

ECO Heating system switched off, but ECO function active.

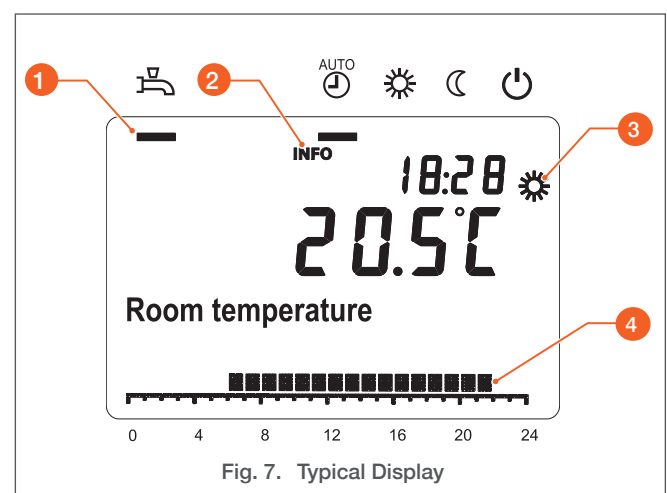
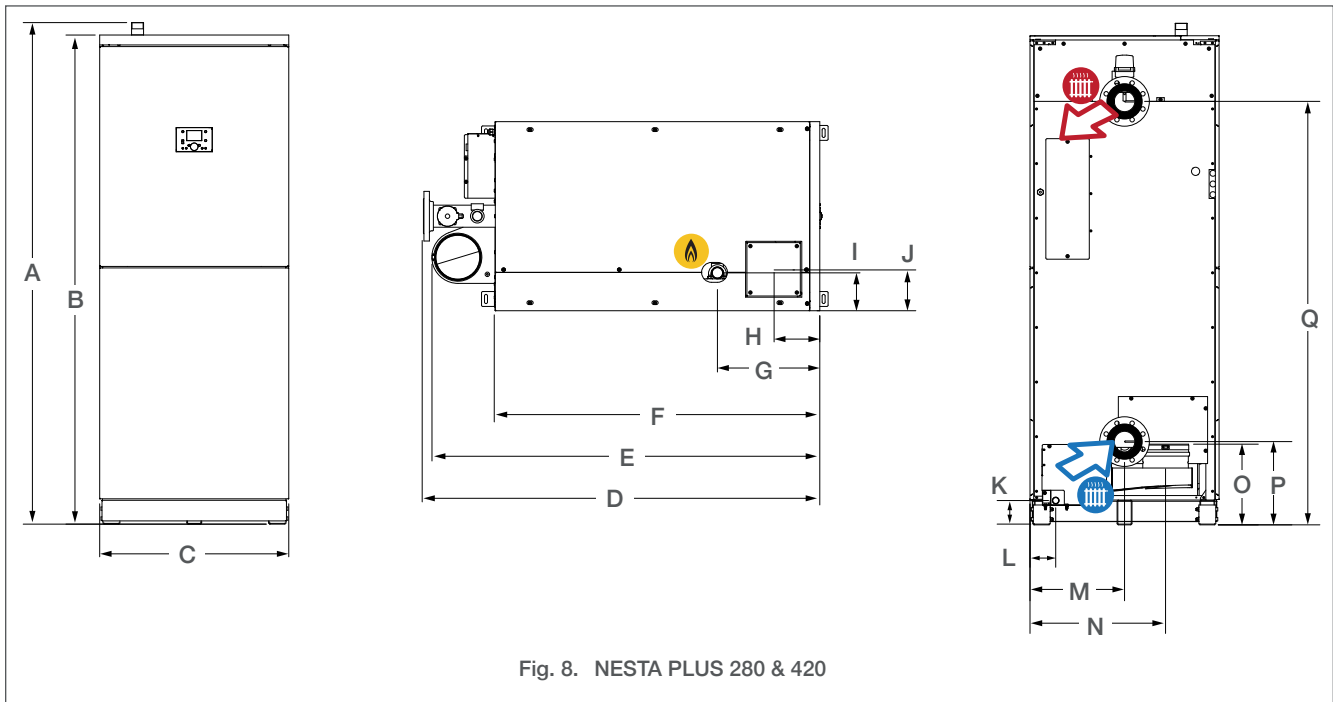


Fig. 7. Typical Display

TECHNICAL SPECIFICATIONS

Dimensions and Clearances



Dimensions & weights		N 280 FS	N 420 FS	N 570 FS	N 840 FS
A	mm	2020	2020	2020	2020
B	mm	1970	1970	1970	1970
C	mm	760	760	865	865
D	mm	1595	1595	1845	1845
E	mm	1560	1600	1825	1868
F	mm	1310	1310	1555	1555
G	mm	410	435	765	665
H	mm	185	185	225	225
I	mm	115	115	145	145
J	mm	165	165	205	205
K	mm	100	100	100	100
L	mm	105	105	105	105
M	mm	380	380	430	430
N	mm	545	565	640	655
O	mm	350	325	325	350
P	mm	335	335	335	360
Q	mm	1706	1706	1706	1731
dry weight	kg	578	658	835	934

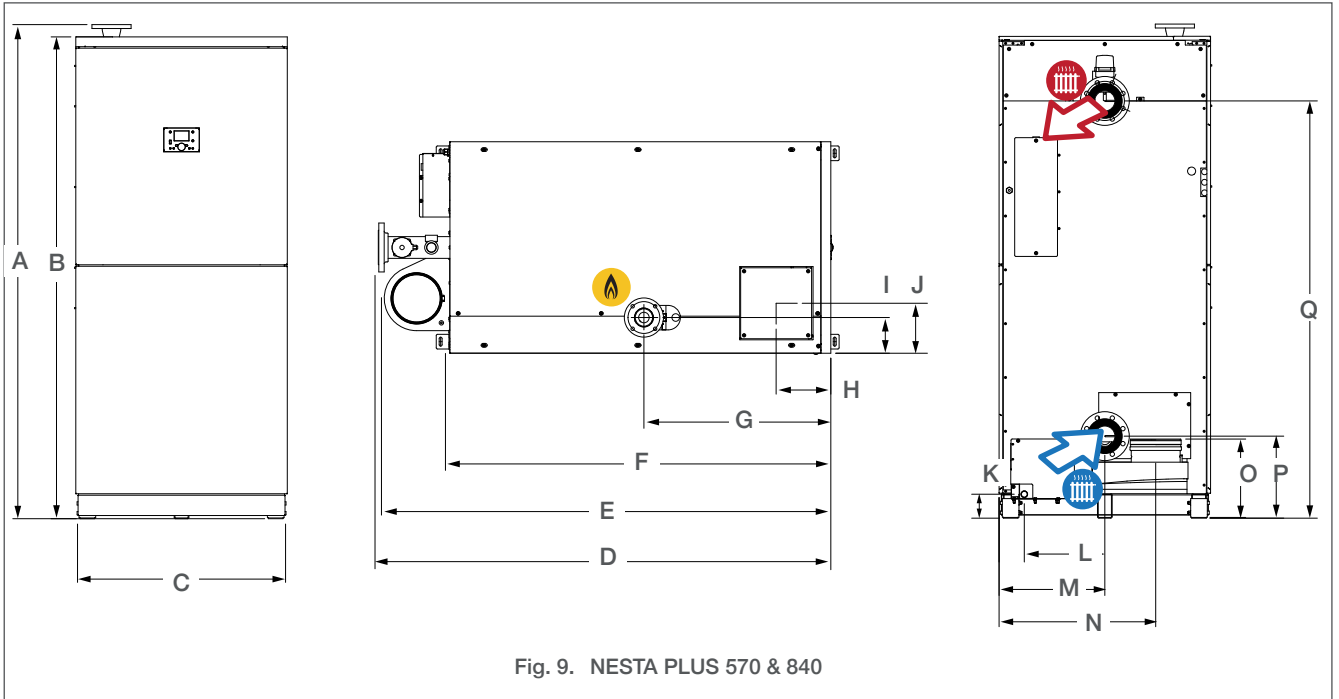


Fig. 9. NESTA PLUS 570 & 840

Connections

	N 280 FS	N 420 FS	N 570 FS	N 840 FS
supply/return connections (⊕) Ø - [M]	in. Flange DN80 Class PN16			
gas connection (🔥) Ø - [M]	in. G1 1/2			
flue gas exhaust connection Ø	mm 180	mm 200	mm 200	mm 250
combustion air inlet connection Ø	mm 150	mm 150	mm 250	mm 250
condensate drain connection Ø	mm 26,7	mm 26,7	mm 26,7	mm 26,7
min. cross section area of air inlet	mm ² 17662	mm ² 17662	mm ² 49062	mm ² 49062

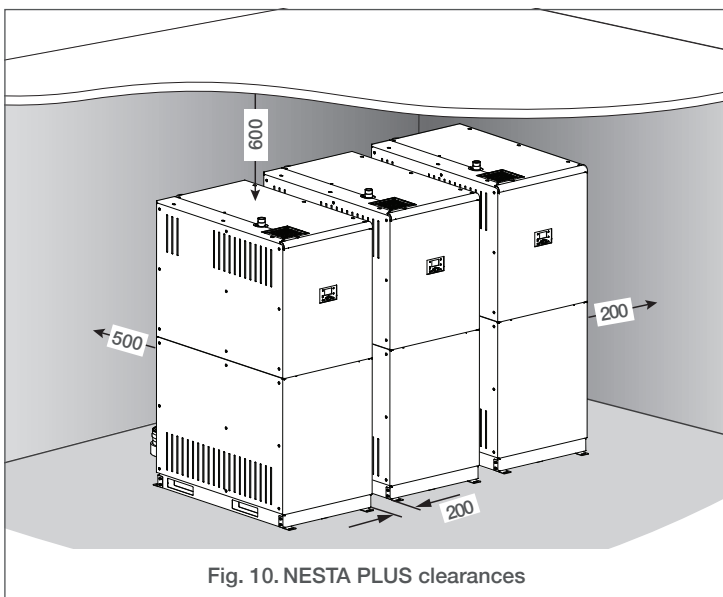


Fig. 10. NESTA PLUS clearances

Clearances	Min.	Recommended
top	mm 600	mm 800
back	mm 500	mm 700
front	mm 1000	mm 1000
sides	mm 200	mm 500

* In a cascade configuration recommended side clearance is at least 500 mm (access to the gas valve from the side or in case of gas conversion).

200 mm is an absolute minimum side clearance, with access to the gas valve from the front and top of the boiler ONLY.

Side clearance must be complied with for the "outer" side of the first and last boiler in the chain.

TECHNICAL SPECIFICATIONS

Performance and Efficiency Data			N 280 FS	N 420 FS	N 570 FS	N 840 FS
			(min. - max.)	(min. - max.)	(min. - max.)	(min. - max.)
heat input (net)	G20	kW	44,0 - 265,0	41,9 - 401,2	77,0 - 530,0	90,0 - 792,0
	G31		66,0 - 265,0	99,0 - 401,2	124,0 - 530,0	197,0 - 792,0
heat output at 80/60°C	G20	kW	42,2 - 258,0	39,8 - 388,1	74,1 - 516,0	86,6 - 769,8
	G31		64,0 - 258,0	96,0 - 390,0	120,0 - 515,0	190,4 - 769,8
heat output at 50/30°C	G20	kW	47,3 - 281,6	43,1 - 421,3	82,2 - 567,0	96,7 - 831,5
	G31		70,0 - 276,8	105,0 - 419,0	132,0 - 556,0	209,5 - 816,1
heating efficiency 80/60°C		%	96,0 - 97,4	96,2 - 97,4	96,3 - 97,4	96,2 - 97,2
heating efficiency 50/30°C		%	107,5 - 106,3	107,4 - 106,9	106,8 - 107,0	107,5 - 105,0
useful efficiency at 30% (return at 30°C)		%	108,3	108,0	108,0	108,3
seasonal efficiency		%	93,0	93,0	93,0	93,0

ErP Data

boiler type and model		N 280 FS	N 420 FS	N 570 FS	N 840 FS
condensing boiler	Y/N	Y	Y	Y	Y
low temp boiler	Y/N	Y	Y	Y	Y
combination heater	Y/N	N	N	N	N
useful heat output					
at 30% of rated heat output (P_1)	kW	49,3	70,9	97,4	138,5
at rated output and high-temp regime (P_4)	kW	258,0	388,1	516,0	769,8
useful efficiency					
at 30% of rated heat output (η_1)	%	97,6	97,4	97,4	97,6
at rated output and high-temp regime (η_4)	%	87,8	87,8	87,8	87,6
auxiliary electricity consumption					
at full load (elmax)	kW	0,462	0,578	0,683	1,541
at part load (elmin)	kW	0,041	0,050	0,056	0,071
in standby mode (P_{SB})	kW	0,006	0,007	0,008	0,006
el. consumption including typical boiler pump	kW	0,592	0,796	1,049	2,019
standby heat loss (P_{stby})	kW	0,5	0,7	0,9	2,0
annual energy consumption for space heating	kWh	—	—	—	—
sound power level indoors LWA	dB	—	—	—	—

Combustion Data				N 280 FS	N 420 FS	N 570 FS	N 840 FS
				(min. - max.)	(min. - max.)	(min. - max.)	(min. - max.)
chimney type(s)				B23 - B23p - C43 - C53 - C63 - C83			
flue gas temperature at 80/60°C		°C		55,3 - 69,4	56,0 - 72,0	56,9 - 72,3	57,7 - 74,8
flue gas temperature at 50/30°C		°C		29,0 - 45,7	30,0 - 45,0	30,2 - 44,3	29,9 - 51,4
overheat flue gas temperature		°C		108			
max. flue gas pressure (incl. max wind condition)		Pa		200			
mass flow rate of flue gases		g/s		21 - 110	23 - 169	36 - 213	38 - 322
max. condensate volume		kg/h		33,6	50,4	78,2	100,8
CO emissions		mg/kWh		26,8	24,7	31,1	21,5
CO ₂ contents*	G20	Min output	%	8,6	8,4	8,3	8,8
		Max output	%	9,5	9,5	9,6	9,6
	G25	Min output	%	9,1	9,1	9,1	9,1
		Max output	%	9,5	9,5	9,5	9,6
	G31	Min output	%	10,7	10,6	10,6	10,7
		Max output	%	11,0	11,0	11,1	11,2
O ₂ contents*	G20	Min output	%	5,9	6,0	6,3	5,3
		Max output	%	4,3	4,0	4,1	4,1
	G25	Min output	%	4,4	4,4	4,4	4,4
		Max output	%	3,7	3,7	3,5	3,5
	G31	Min output	%	4,5	4,4	4,4	4,5
		Max output	%	4,2	4,2	4,1	4,0
NOx level		mg/kWh		39,2	30,0	24,0	29,0
NOx class				6			

* Tolerance is +/- 0,3%

Electrical Data		N 280 FS	N 420 FS	N 570 FS	N 840 FS
supply voltage / frequency	V / Hz	230 / 50		3x400 / 50	
protection class	IP	X4D			

TECHNICAL SPECIFICATIONS

Gas Data

		N 280 FS (min. - max.)	N 420 FS (min. - max.)	N 570 FS (min. - max.)	N 840 FS (min. - max.)
gas type(s)		G20 - G25 - G25.1 - G25.3 - G31			
gas pressure	G20 (20 mbar)	mbar		17 - 25	
	G25 (25 mbar)	mbar		20 - 30	
	G25.1 (25 mbar)	mbar		18 - 33	
	G25.3 (25 mbar)	mbar		20 - 30	
	G31 (30 mbar)	mbar		25 - 35	
	G31 (37 mbar)	mbar		25 - 45	
	G31 (50 mbar)	mbar		42,5 - 57,5	
gas flow rate (G20)*	m ³ /h	4,5 - 26,2	4,8 - 40,4	7,6 - 52,1	8,6 - 77,8
gas flow rate (G25)*	m ³ /h	5,2 - 30,5	5,6 - 47,0	8,9 - 60,6	10,0 - 90,5
gas flow rate (G31)*	m ³ /h	2,5 - 10,2	3,7 - 15,0	5,1 - 20,7	7,6 - 31,0

* 15°C, 1013,25 mbar, dry gas

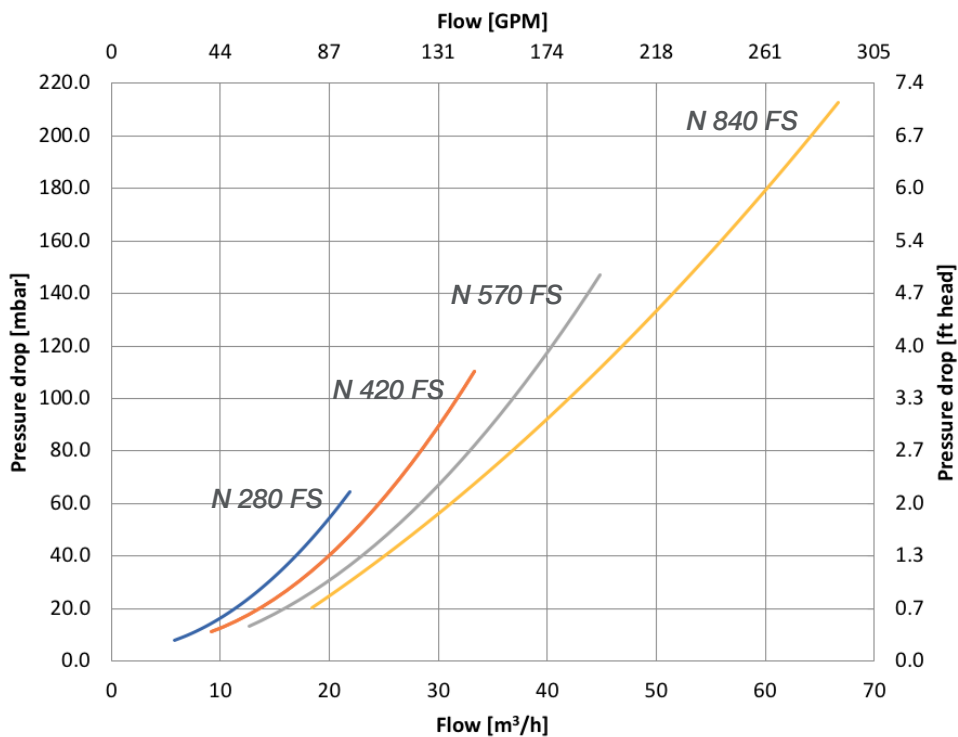
Gas categories	Gas type	Pressure (mbar)	Country of destination
I2E(S)	G20	20 mbar	BE
I2H	G20	20 mbar	AT, CH, CY, CZ, DK, EE, ES, FI, GB, GR, HR, IE, IT, LT, LU, LV, NO, PT, RO, SE, SI, SK, TR
I2E	G20	20 mbar	DE, PL, RO, NL
I2ELL	G25	20 mbar	DE
I2HS	G20/G25,1	25 mbar	HU
I2N	G20/G25	20/25 mbar	BE, DE, DK, ES, FR, GR, NL, PL, PT, SI
I2EK	G20/G25,3	25 mbar	NL
I3P	G31	30 mbar	AT, CZ, DE, FI, NL, RO
I3P	G31	37 mbar	BE, CH, CZ, ES, FR, GB, GR, HR, IE, IT, LT, NL, PL, PT, SI, SK, TR
I3P	G31	50 mbar	AT, BE, CH, CZ, DE, ES, FR, GB, NL, SK
I2E(R)	G20	20 mbar	BE
II2E3P	G20/G31	20/37 mbar	PL
II2E(S)3P	G20/G31	20/37 mbar	BE
II2EK3P	G20/G25,3/G31	20/25/37 mbar	NL
II2H3P	G20/G31	20/30 mbar	AT, CZ, FI, RO
		20/37 mbar	CH, CZ, ES, GB, GR, HR, IE, IT, LT, PT, SI, SK, TR
		20/50 mbar	AT, CH, CZ, ES, GB, SK
II2L3P	G25/G31	20/37/50 mbar	FR
		25/30 mbar	RO
II2E+3P	G20/G31	20/25/37/50 mbar	BE, FR
II2E(R)3P	G20/G31	20/37 mbar	BE
II2Esi3P	G20/G25/G31	20/25/37/50 mbar	FR
II2Er3P	G20/G25/G31	20/25/37/50 mbar	FR

TECHNICAL SPECIFICATIONS

Hydraulic Data

		N 280 FS	N 420 FS	N 570 FS	N 840 FS
water content	l	291	390	444	563
hydraulic pressure drop at $\Delta T = 20k$	mbar	18,6	26,7	34,9	60,7
minimum operating pressure	bar			0,8	
maximum operating pressure	bar			6	
maximum boiler supply temperature	$^{\circ}C$			90	

Pressure Drop Curve



Flow Rate

		N 280 FS	N 420 FS	N 570 FS	N 840 FS
minimum water flow rate at $\Delta T = 20k$	m³/h	10,8	16,2	21,5	31,5

Safety Instructions for the User

**IF YOU SMELL GAS:**→ **DO NOT:**

- Use an open flame
- Smoke
- Use electrical devices (phones, doorbells, etc.) or switches

→ **DO:**

- Close the gas supply
- Open all doors and windows to ventilate the room
- Inform your neighbours of the danger by knocking at the doors.
- Get out of the building
- Call your installer or gas company



- This appliance can be used by children who are at least 8 years old and by persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge, provided that they are under supervision or have been given instructions concerning the use of the appliance in a safe way and that they understand the hazards involved.
- Cleaning and user maintenance shall not be performed by children without supervision. Children shall not play with the appliance.
- For safety reasons, we recommend that smoke and carbon monoxide detectors are installed in the living areas of your building according to the applicable local regulations.
- If smoke is present, shut down the appliance, ventilate the room and exit the building. Then call your installer to investigate and solve the problem.
- Do not store any flammable, corrosive or explosive products near the appliance.
- Do not modify or deactivate any component, nor any safety device in the system.
- Do not operate the appliance when the casing is open.



- Do not modify any part of the electrical system or access internal components.
- Do not touch the appliance with any wet body parts when the appliance is supplied with electrical power.



- Do not modify or block the condensate outlet(s).
- Do not open any sealed part or component. Failure to comply with this instruction can result in damages and/or injuries.
- The sight glass can be very hot when the appliance is in operation. Do not touch the sight glass or its immediate surroundings.
- Make sure that the appliance and the heating system are prevented from freezing.
- In case of water leakage, disconnect the appliance from the power supply and gas source, turn off the water supply and call a qualified professional.



- › If works need to be performed close to the appliance (e.g. in the boiler room or close to the air inlets), make sure that the appliance is shut down to prevent the ingress and accumulation of dust.
- › In case of abnormal noises in the system or the appliance, please notify a qualified professional.
- › Any setting of the appliance by the end-user using the installer-specific functions, that would cause the appliance to malfunction, could result in damages to the equipment. Only the end-user settings described in this manual are available to the end-user.
- › If a condensate neutralisation system is installed, have it checked and cleaned at least once a year.



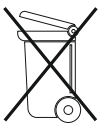
When cleaning the appliance cabinet panels, do not use solvents or aggressive/abrasive cleaning agents. Wipe the surfaces using a soft clean cloth, water and soap.

Periodic checks



- › Check regularly that the water pressure of the system is at least 0,8 bar when cold. If not, top up the system with water as instructed by the installer at appliance installation or call your installer.
- › If a topping up of the system is required to maintain the minimum recommended water pressure, always turn the appliance off and only add small quantities of water at a time. If a large amount of cold water is added in a hot appliance, the appliance can be damaged permanently.
- › If the system needs to be topped up regularly, there may be a leak in the system. In that case, call your installer.
- › Check regularly that there is no water below the appliance. If there is, call your installer.
- › Check regularly that there is no error code displayed on the control panel screen. Call your installer as required.

Disposal of the Product at the End of Service Life



At the end of service life, the product should not be disposed of as solid urban waste, but should be handed over to a differentiated waste collection centre.

Starting the Appliance



The first start-up of the boiler after its installation must be performed by a qualified professional, according to the procedure in "Start-up and Combustion Adjustments" on page I-61.

Conditions:



Procedure:

1. Make sure that the power supply cable is connected to the boiler.
2. Push in the On/Off switch located on the right side of the boiler.



When in the ON position, the switch remains pushed in and is illuminated.

3. Select the heating mode as required.
4. Activate the DHW mode as required.

Follow-on Task(s):

Check the pressure of the circuit in operation. It should be between 0,8 and 6 bar (with pump on).

Stopping the Appliance

Conditions:

None

Procedure:

1. Push the On/Off switch located on the right side of the boiler.



When in the OFF position, the switch is released from its pushed in position. Its built-in light goes off and the button comes flush with the outer frame.

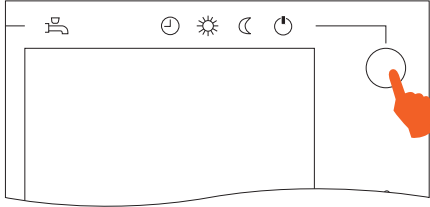
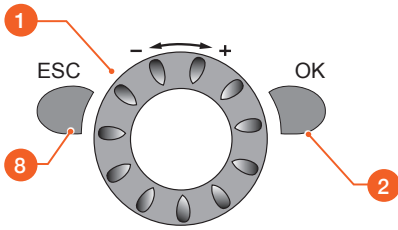
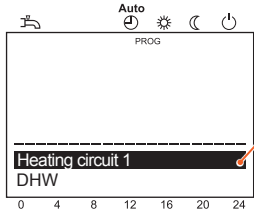
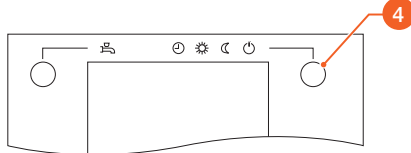
2. To completely cut the power supply to the boiler, either disconnect the power supply cable from the boiler, or use the external circuit breaker.

Follow-on Task(s):

None

What to Do if...	Cause	Action
Boiler does not start	No power supply	<ol style="list-style-type: none"> 1. Check that the power button is in ON position (pushed in and illuminated). 2. Make sure the power supply is connected to the mains. 3. Check the external power supply box (circuit breaker) and reset it as required.
Error code 133 displayed	Time out for flame ignition	<ol style="list-style-type: none"> 1. Press Reset button (⏏). 2. If the fault appears several times, call your installer.
Error code 111 displayed	Temperature limit switch open	Check that radiator valves are open/that there is flow across the boiler.
Error code 105 displayed	Maintenance message	Press information button (i) for detailed information. For an explanation of the maintenance modes, see "Maintenance Messages" on page I-89.
Maintenance icon (🔧)	Maintenance message	
Error code 118 displayed	Low water pressure	Refill the heating system.

Basic Settings

Setting	Procedure	Controls/Screens
Heating mode selection	<p>Press the Heating mode selection button to toggle from one mode to the other:</p> <ul style="list-style-type: none"> • Automatic mode (☰) (to be programmed, refer to "Boiler Settings for the Installer" on page I-80. • Comfort mode (☀) • Reduced mode (☾) • Protection mode (⏻) <p>For a description of the heating modes, refer to "Symbols and Messages on the Control Panel" on page G-13.</p>	
Temperature setpoint for the Comfort and the Reduced modes	<ol style="list-style-type: none"> 1. When in Comfort mode, rotate the knob (1) to adjust the temperature setpoint. <p>Alternatively, the setting can be performed through the menus</p> <ol style="list-style-type: none"> 1. Press the OK button (2) to access the end user menu. 2. Rotate the knob (1) to scroll through the menu until "Heating circuit 1" (3) is highlighted. 3. Press the OK button (2) to validate the selection 4. Rotate the knob (1) to select "Room comfort setpoint" 5. Press the OK button (2) to validate the selection. 6. Rotate the knob to increase/decrease the temperature to the desired value. 7. Press the OK button (2) to save the setting. 8. Rotate the knob (1) to select "Room reduced setpoint" 9. Press the OK button (2) to validate the selection. 10. Rotate the knob to increase/decrease the temperature to the desired value. 11. Press the OK button (2) to save the setting. 12. Press the Heating Mode Selection button (4) to go back to the home screen. 	  



- When a mode is selected, it is marked by a black line underneath.
- Pressing the ESC button (8) will cancel the ongoing setting operation and return to the home screen without saving the settings.
- When the setting process is interrupted for more than 8 minutes, the controller automatically returns to the home screen without saving the settings.

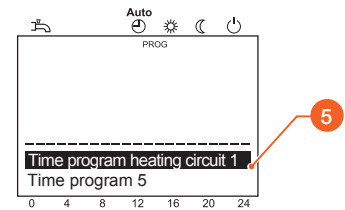
Setting

Procedure

Controls/Screens

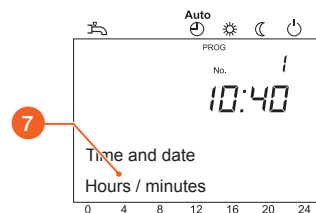
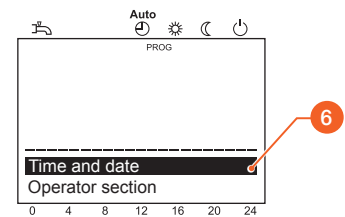
Times of start and end of comfort mode schedule

1. Press the OK button (2) to access the end user menu.
2. Rotate the knob (1) to scroll through the menu until "Time Program heating circuit 1" (5) is highlighted.
3. Press the OK button (2) to validate the selection
4. Rotate the knob (1) to select "Mo-Sun 1st phase On"
5. Press the OK button (2) to validate the selection.
6. Rotate the knob to modify the time. Press OK (2) to save the selected time.
7. Press the Heating Mode Selection button (4) to go back to the home screen.



Date and time

1. Press the OK button (2) to access the end-user menu.
2. Rotate the knob (1) to scroll through the menu until "Time and Date" (6) is highlighted.
3. Press the OK button (2) to validate the selection
4. Rotate the knob (1) to select "Hours /minutes" (7).
5. Press the OK button (2) to validate the selection.
6. Rotate the knob (1) to set the hours and press the OK button to validate.
7. Repeat the operation to set the minutes.
8. Press the OK button (2) to save the setting.
9. Press the Heating Mode Selection button (4) to go back to the home screen.
10. Repeat steps 1 to 3 and select "Month/Day".
11. Then repeat steps 5 to 8 to set the values and save the setting.
12. Repeat the procedure to set the "Year".
13. Press the Heating Mode Selection button (4) to go back to the home screen.



INSTRUCTIONS FOR THE USER

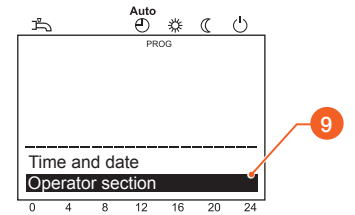
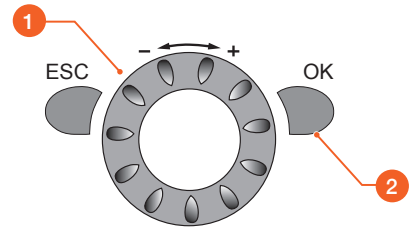
Setting

Procedure

Controls/Screens

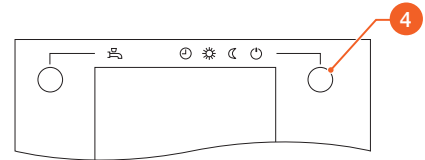
Language Selection

1. Press the OK button (2) to access the end-user menu.
2. Rotate the knob (1) to scroll through the menu until "Operator Section" (9) is highlighted.
3. Press the OK button (2) to validate the selection
4. Rotate the knob (1) to select the required language (DE, EN, FR, IT, NL, ES, DA, SV, FI, PT).
5. Press the OK button (2) to save the selection
6. Press the Heating Mode Selection button (4) to go back to the home screen.



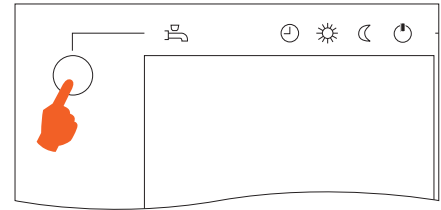
Unit Selection

1. Repeat steps 1 to 3 of above procedure.
2. Rotate the knob (1) to select the required unit (°C - bar or °F - PSI).
3. Press the OK button (2) to validate the selection
4. Press the Heating Mode Selection button (4) to go back to the home screen



DHW mode activation/deactivation

1. Press the DHW On/Off button to activate/deactivate the DHW function.



This function is active only if an external indirect DHW tank is installed in the circuit.

Structure of Menus for the End User



Some parameters are only visible if the heating circuit is installed

Top menu	Submenu 1	Submenu 2	Default
Time of day and date	› Hours / Minutes		01:00 (hh:min) (Adjust as required)
	› Day / Month		01.01 (dd.mm) (Adjust as required)
	› Year		2019 (to be adjusted)
	› Start of summertime		25.03 (dd.mm) (Adjust as required)
	› End of summertime		25.10 (dd.mm) (Adjust as required)
Operator section	› Language	• Deutsch, English, Français, Italiano, Nederlands, Español, Dansk, Suomi, Svenska, Portuguese	English
	› Units	• °C, bar • °F, PSI	°C, bar
Time Program heating circuit 1	› Preselection Mo-Su	• Mo-Su, Mo-Fr, Sa-Su, Mo, Tu, We, Th, Fr, Sa, Su	Mo-Su
	› (day or range selection) 1st phase on		6:00 (Adjust as required)
	› (day or range selection) 1st phase off		22:00 (Adjust as required)
Identical menus for 2nd and 3rd phase adjustment			
	› Default values	• No • Yes	No
Time Program 5	› Preselection Mo-Su	• Mo-Su, Mo-Fr, Sa-Su, Mo, Tu, We, Th, Fr, Sa, Su	Mo-Su
	› (day or range selection) 1st phase on		6:00 (Adjust as required)
	› (day or range selection) 1st phase off		22:00 (Adjust as required)
Identical menus for 2nd and 3rd phase adjustment			
	› Default values	• No • Yes	No
Holidays heating circuit 1	› Preselection	• Period 1 ... Period 8	Period 1
	› Period (Number): Start		--:-- (dd:mm)
	› Period (Number): End		--:-- (dd:mm)
	› Operating level	• Frost protection • Reduced	Frost protection

INSTRUCTIONS FOR THE USER

Top menu	Submenu 1	Submenu 2	Default	
Heating circuit 1	› Room comfort setpoint		20°C	
	› Room reduced setpoint		16°C	
	› Room frost protection setpoint		10°C	
	› Heating curve slope		1.5	
	› Summer/winter heating limit		18°C	
	› Flow temp setpoint room stat		65°C	
	Boiler	› Setpoint manual control		60°C
Fault	› SW Diagnostic code			
	› Burn ctrl phase lockout pos			
Service/special operation	› Chimney sweep function	• Off • On	Off	
	› Burner output	• Partial load • Full load • Max heating load	Max heating load	
	› Manual control	• Off • On	Off	
	› Hours run heating mode			
Diagnostics heat generation	› Hours run DHW			
	› Total gas energy heating			
	› Total gas energy DHW			
	› Total gas energy			
	› Gas energy heating Reset?	• Yes • No		
	› Gas energy DHW Reset?	• Yes • No		
	› Gas energy			
	› 24-hour yield solar energy			
	› Total yield solar energy			
	› Hours run solar yield			
	› Hours run collector pump			
	Diagnostics consumers	› Outside temp		
		› Outside temp min Reset?		
		› Outside temp max Reset?		

Safety Instructions for the Installation



- All connections (electrical, flue pipe, hydraulic, gas) must be carried out in accordance with current standards and regulations in force.
- If the appliance is installed against a wall made of heat-sensitive material, such as wood, a suitable insulation must be provided by the installer between the appliance and the wall surface.
- Comply with the clearance dimensions provided in this manual, to prevent any hot part of the appliance from being too close to the walls or any combustible material.
- Make sure to maintain a safe distance of 200 mm from flammable materials; the boiler room may not be used as a storage location for material.
- Do not store any flammable, corrosive or explosive products next to the appliance.
- Do not install the appliance in a location where chemical vapours or dust are present in the ambient or combustion air.
- If the appliance is used on professional premises such as hairdresser's, cleaning company, painter's, etc. where chloride products, solvents, paints, dust, etc. are likely to contaminate the air, make sure to install the appliance in a dedicated boiler room so that the appliance is supplied with clean combustion air.
- Install a condensate neutralisation system according to the applicable local regulations and standards.
- If the appliance is intended to be used with G31 liquefied petroleum gas (propane), installing the appliance below ground level can be hazardous and prohibited in some countries. Please refer to applicable local regulations for installation requirements.



- When the appliance is connected to the electrical network, it must be earthed.
- Make sure that a fuse or circuit breaker of the recommended rating is installed outside the appliance, so as to be able to shut the power down.
- Do not touch the appliance with any wet body parts when it is supplied with electrical power.
- Before performing any operation on the electrical circuit, isolate the electrical supply of the appliance through the external power-cutting device (fuse, circuit breaker, etc.)



- The appliance must be installed in a dry and protected area, with an ambient temperature comprised between 0 and 45°C.
- Make sure to protect the appliance and the water circuit against freezing.
- The appliance must be installed to ensure easy access at all times.
- Use an appropriate means of handling, suitable to the appliance size and weight.
- Floor-standing appliances must be installed on a level base and wall-hung appliances, on a vertically plumb support. Material used for base and support must have sufficient strength to support the appliance weight, water included.
- Make sure that the appliance is installed with a sufficient height to allow the condensates to flow to the sewer, and/or allow the installation of a condensate neutralisation system (as required).
- When lifting, moving or installing the appliance, be careful not to drop it. Once in position, make sure that the appliance is secured.
- Install all pipes and ducts without stress to prevent any leaks from occurring.

PRODUCT INSTALLATION

Handling the Product



- ▶ This appliance is very heavy and requires sufficient workforce to move and handle it, as well as an appropriate means of transport.
- ▶ It is prohibited to handle the boiler using protruding components or rest the boiler on protruding components.
- ▶ Failure to comply with these recommendations can result in damage to the boiler or injuries to the personnel.

The boiler is delivered on a wooden pallet and is secured to the pallet with four screws.

Make sure to transport the boiler on the pallet as close to the installation location as practical.

Unpacking the Product

The boiler is protected by a wooden packaging lined with rubber protection at the contact surfaces.

Once the appliance is in the boiler room or close to the installation location:

1. Unscrew the wooden packaging and carefully remove all the packaging pieces.
2. Discard packaging according to applicable local regulations.
3. Using an hex head size 8 wrench, remove four screws (See **Fig. 11**) from the bottom of the boiler and the pallet.



To prevent component damage during storage due to moisture, bags of desiccant are placed inside the boiler. Make sure to remove them before operating the appliance.

Transporting the Product

Lifting from the side (boiler removed from the pallet):

Slide the arms of the fork lift truck into the transport holes, located on either sides of the appliance (See **Fig. 11**).

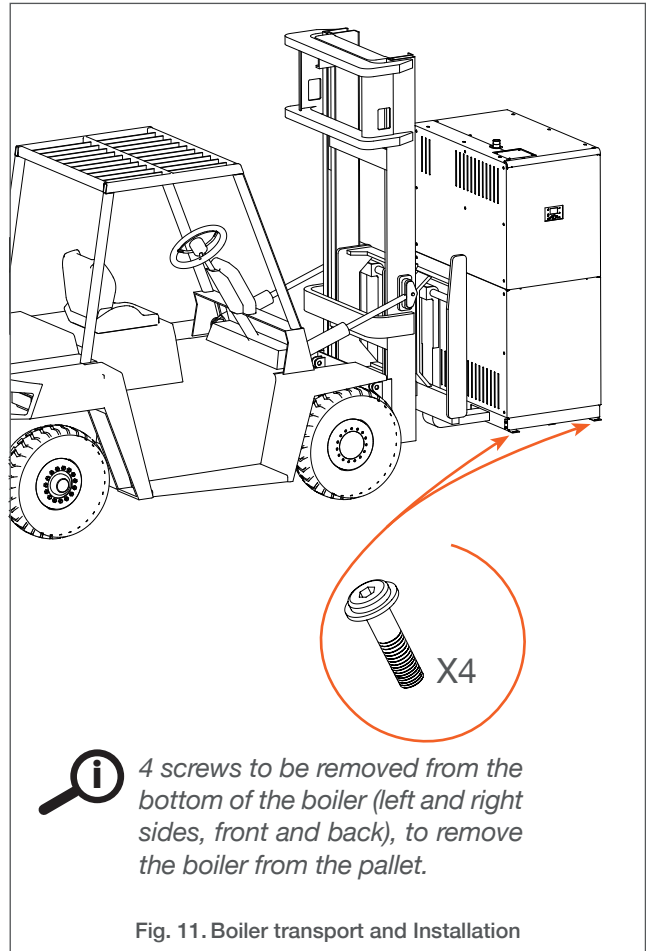


Fig. 11. Boiler transport and Installation

Lifting from the front or the back



- Lifting from the front or the back is allowed with a hand pallet truck and fork lift truck.
 - Pallet truck or fork lift arms should be at least 1,6 m long (N 280 FS and N 420 FS) or 1,9m (N 570 FS and N 840 FS) to prevent the boiler from being unbalanced and falling.
 - Do not insert the pallet truck or fork lift arms from the front or the back of the boiler if the condensate trap and front bottom panel are installed.
 - To lift the boiler from the front or the back, make sure that the front bottom panel and condensate trap are removed (they are not installed in a new boiler).
 - Failure to comply with these recommendations can result in damage to the boiler or injuries to the personnel.
1. If they are already installed, remove the front bottom panel (refer to *"Removing and Installing the Access Panels" on page I-34*), and the condensate trap cover and condensate trap (refer to *"Removing, Cleaning and Installing the Condensate Trap" on page I-74*).
 2. Slide the fork lift arms under the boiler, paying attention to the correct balance of the boiler.

Lifting from the top:



- The boiler can be lifted from the top for transport, using a forklift or a crane and a spreader bar with a load capacity of at least 1 000 Kg, and in compliance with local regulation requirements.
 - Pay attention to the correct balancing of the load when lifting the boiler, and make sure to locate the spreader bar vertically above the boiler.
 - Make sure to use a spreader bar whose length can be adjusted to the exchanger width to prevent damaging the hoisting rings and heat exchanger.
 - Failure to comply with these recommendations can result in damage to the boiler or injuries to the personnel.
1. Remove the top panels. Refer to *"Removing and Installing the Access Panels" on page I-34*.
 2. Lift up the boiler, using the spreader bar attached to the hoisting rings, as shown in *Fig. 12 below*.

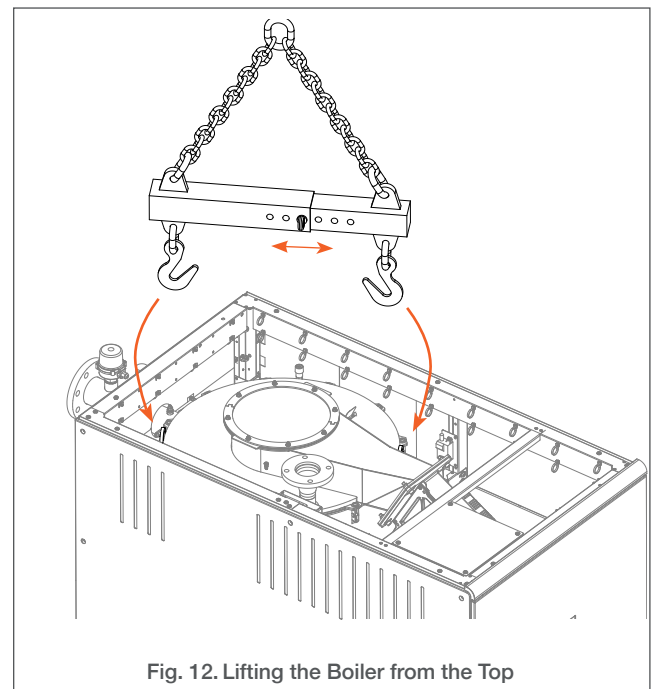
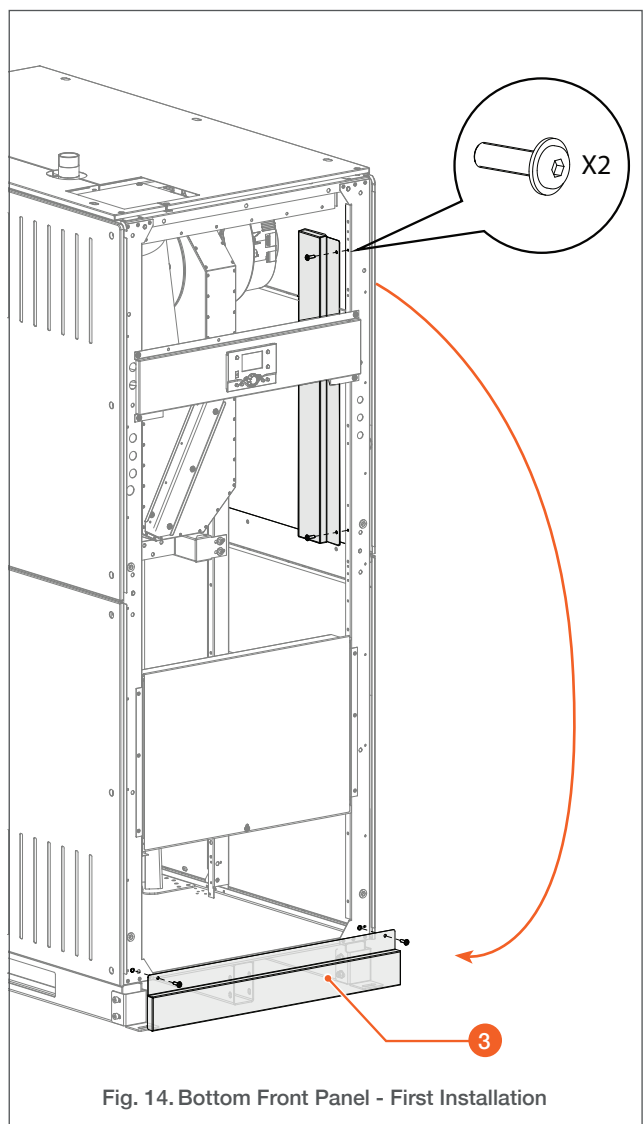
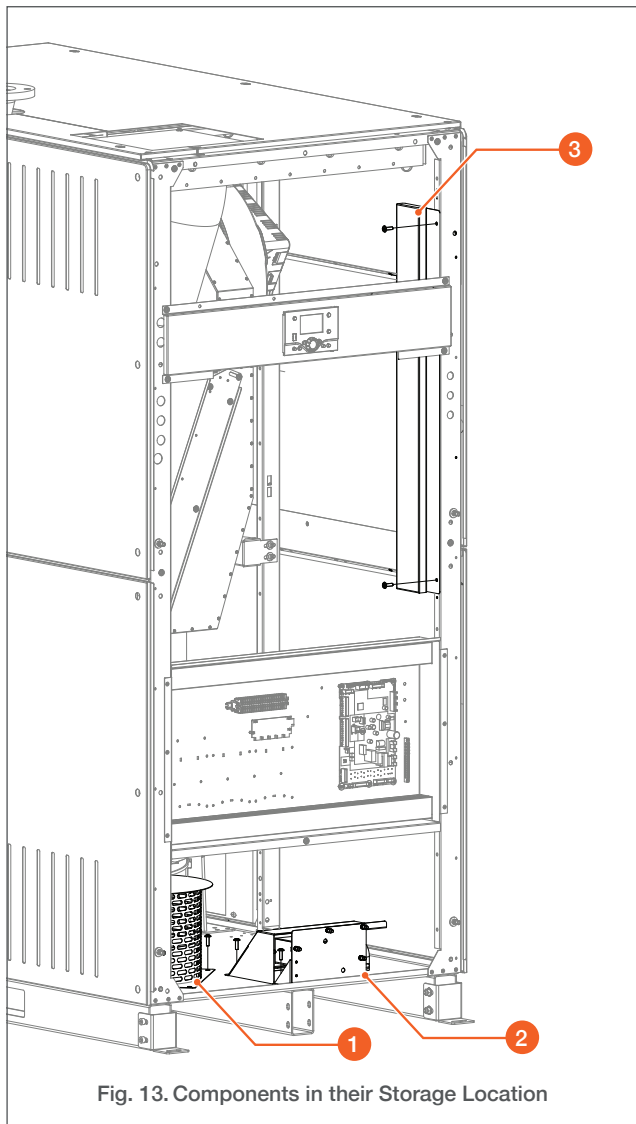


Fig. 12. Lifting the Boiler from the Top


PRODUCT INSTALLATION

Installing and Preparing the Boiler

1. Using an appropriate means of transport (e.g. forklift truck, crane, etc.), move the appliance, on the pallet and protected by its packaging, as close as possible to the installation location. See **"Transporting the Product"** on page I-30
2. Unpack the product as indicated in **"Unpacking the Product"** on page I-30.
3. Move the appliance carefully to its final position. Make sure to comply with the recommended clearances (See **"Dimensions and Clearances"** on page G-14).
4. If some height is required for condensate flow to the sewer system or if a condensate neutralisation system needs to be installed, place the appliance on a base with sufficient height (recommended slope to the sewer: 3%).
5. Open top and center front panels. Refer to **"Removing and Installing the Access Panels"** on page I-34.
6. Remove the following components from their storage location. See **Fig. 13 below**:
 - ▶ Air inlet connections (1)
 - ▶ Condensate trap (2)
 - ▶ Bottom front panel (3)
7. Using a hex head wrench size 4, release the retaining screws and remove the air inlet connections (1) and the condensate trap (2) from their storage location.
8. Using a hex head wrench size 4, remove bottom front panel (3) from its storage location and install in position. See **Fig. 14 below**.



9. Release four screws and remove air inlet protection cover (4). Retain screws for reinstallation.
10. Install appropriate air inlet connection (N 280 FS & N 420 FS : 150 mm, N 570 FS & N 840 FS : 250 mm) according to chimney connection type (open or closed), using the four retained screws.

 *Two air inlet types are provided with the boiler for installation : one for a C-type connection, and one for a B-type. See Fig. 15 below.*

Follow-on Task(s):

1. Perform gas conversion, as required. See "**Gas Conversion**" on page I-43.
2. Close front panels, as required. See "**Removing and Installing the Access Panels**" on page I-34.
3. Install the condensate trap at the back. See "**Removing, Cleaning and Installing the Condensate Trap**" on page I-74.

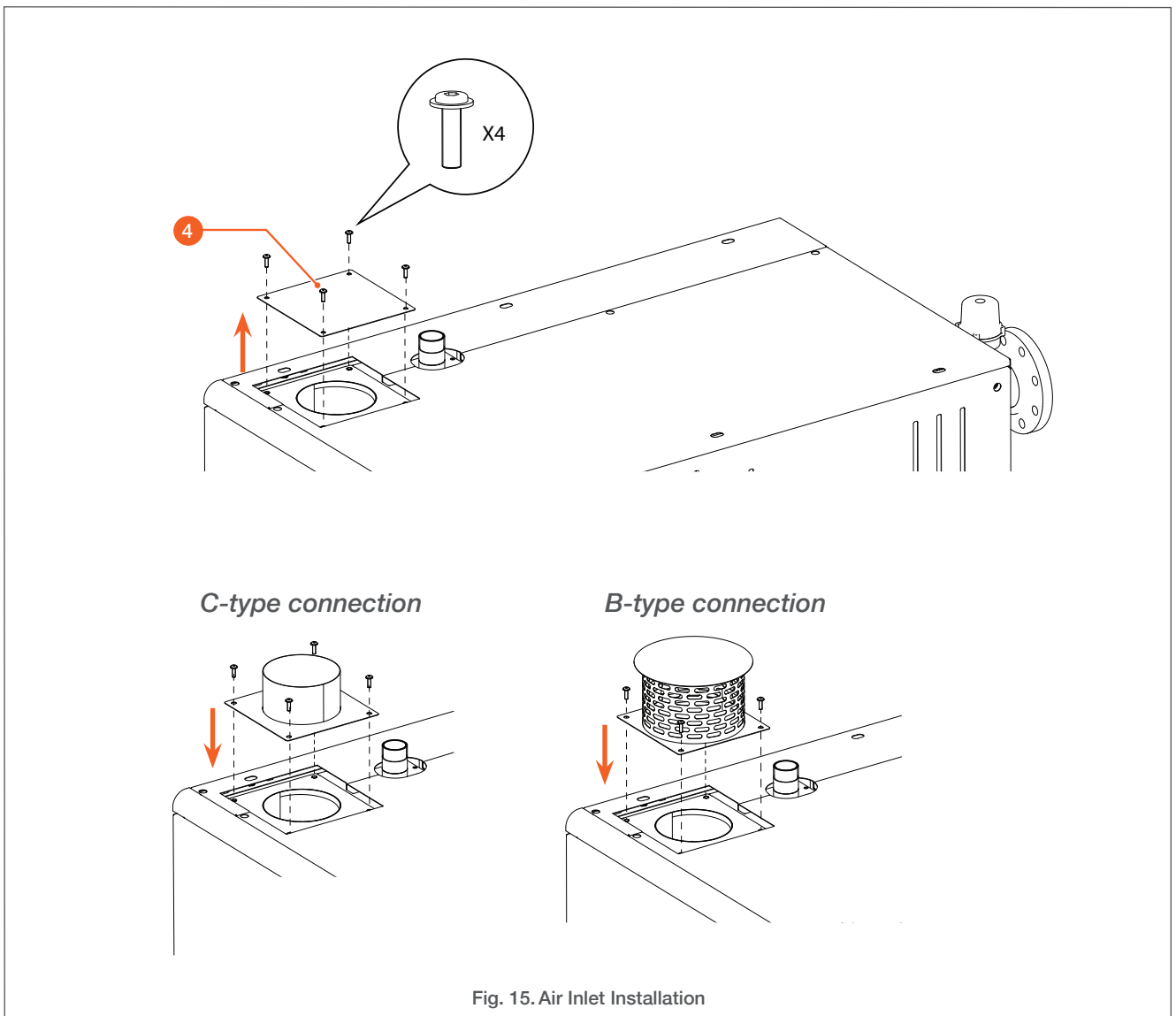


Fig. 15. Air Inlet Installation

PRODUCT INSTALLATION

Removing and Installing the Access Panels

Conditions:  

Tools and Material:

- Wrench, hex head, size 4

Removal Procedure:



The panels must be removed and installed in the indicated order for each section of the boiler.

Top panels

- Right (large): remove six screws. Retain for reinstallation.
- Left (small): remove three screws. Retain for reinstallation.

Front panels



The front corner piece is attached with two screws that maintain the left and right top panels.

- Corner: remove two top screws, as required. Retain for reinstallation.
- Top: remove two top screws. Retain for reinstallation.
- Center: remove two top screws. Retain for reinstallation.
- Bottom: remove two screws. Retain for reinstallation.

Side panels

- Top: remove nine screws. Retain for reinstallation.
- Bottom: remove nine screws. Retain for reinstallation.

Rear panels

- Top: remove nine screws. Retain for reinstallation.
- Bottom: remove six screws. Retain for reinstallation.
- High voltage terminal strip access panel, refer to "**Accessing the High Voltage Terminal Strip**" on page I-54.
- Condensate trap cover, refer to "**Removing, Cleaning and Installing the Condensate Trap**" on page I-74.

Installation Procedure

Top panels



The front corner piece is attached with two screws that maintain the left and right top panel. If the corner piece needs to be installed, do not tighten them at top panel installation.

- Left: install three screws retained at removal.
- Right: install six screws retained at removal

Front panels

- Bottom: install two screws retained at removal.
- Center: install two top screws retained at removal.
- Top: install two top screws retained at removal.

Side panels

- Bottom: install nine screws retained at removal.
- Top: install nine screws retained at removal.

Rear panels

- Top: install nine screws retained at removal.
- Bottom: install six screws retained at removal.

Follow-on Task(s):

None

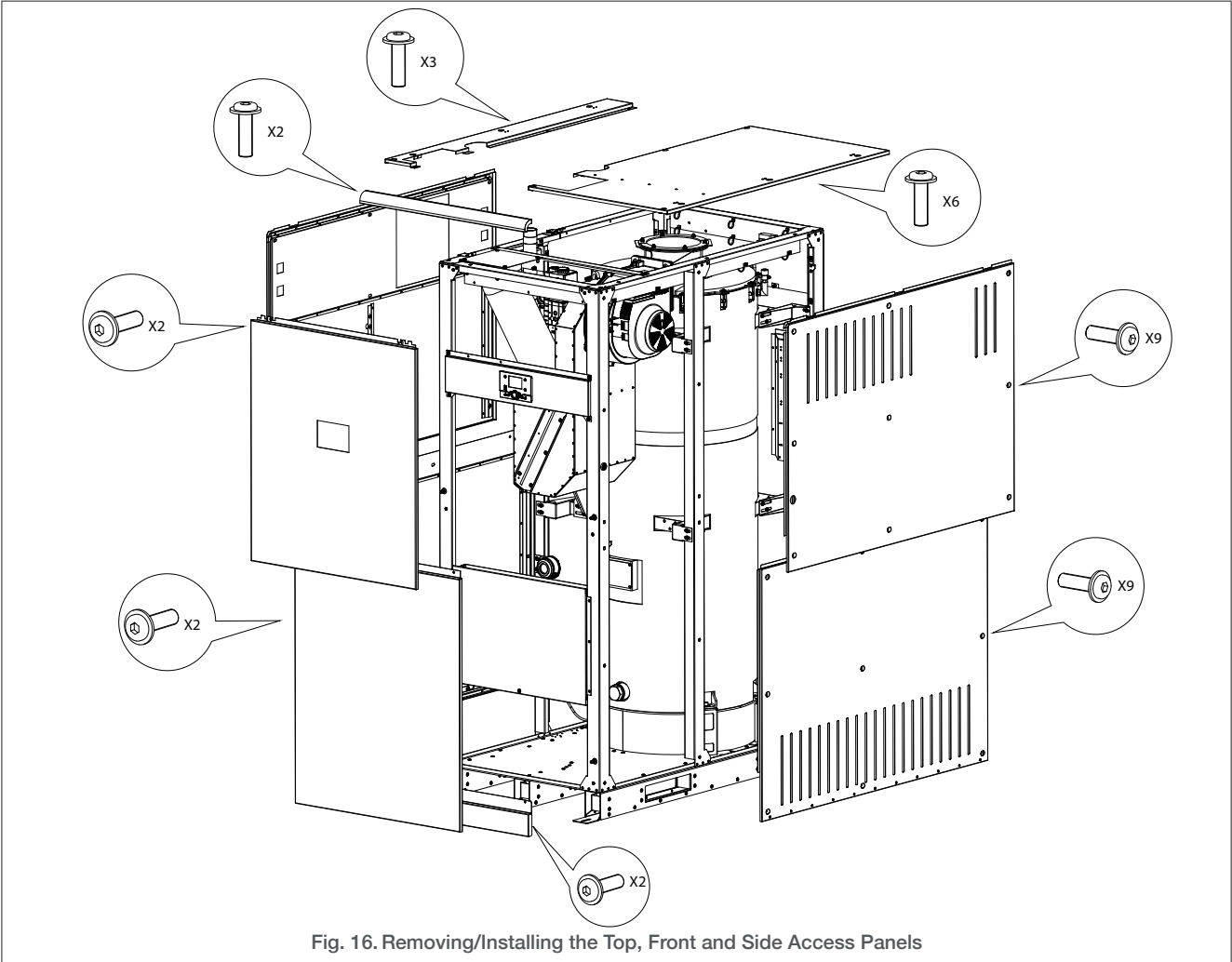


Fig. 16. Removing/Installing the Top, Front and Side Access Panels

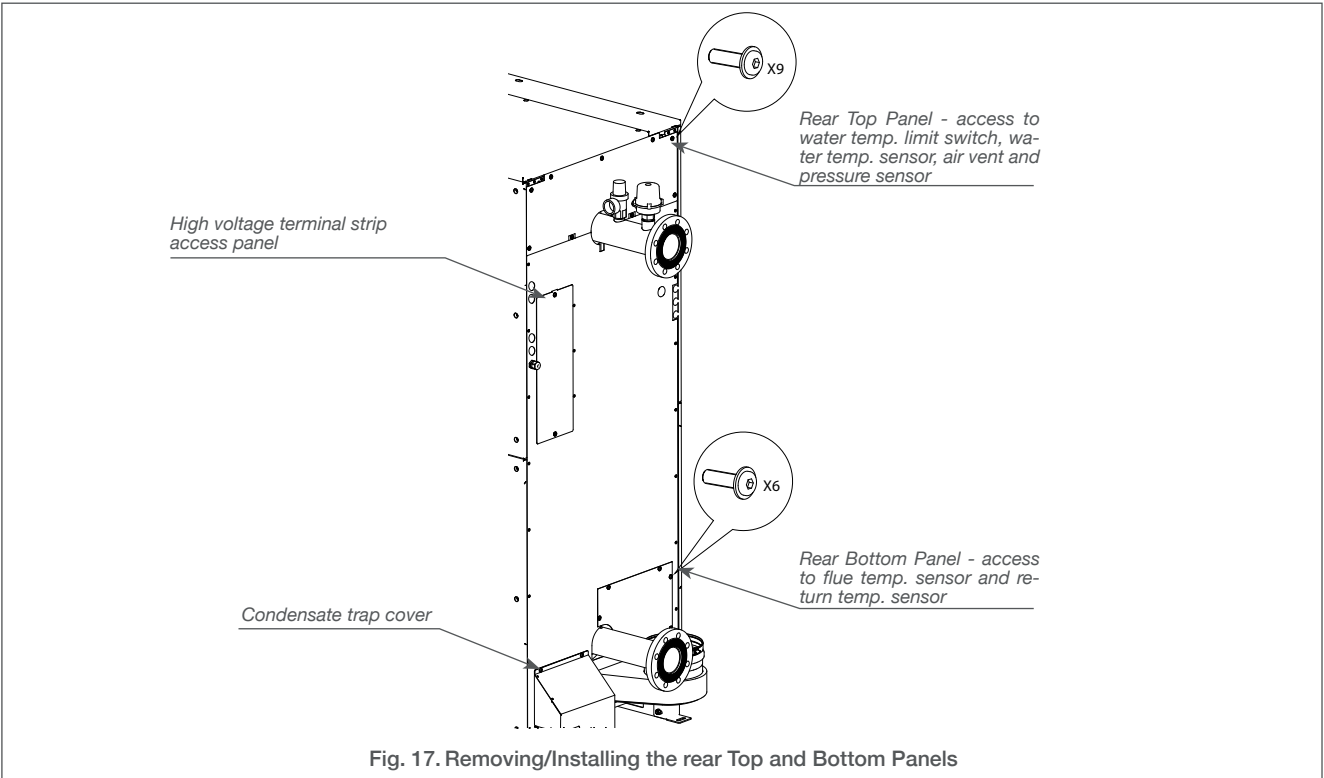


Fig. 17. Removing/Installing the rear Top and Bottom Panels

Requirements for the Hydraulic Connections

Safety Instructions for the Primary Circuit



Make sure that the circuit is provided with a safety pressure relief valve and an expansion vessel that is appropriate for the appliance power and the system size, and the increase in temperature and pressure.



- ▶ The safety group must be installed no more than 1m from the appliance on the pipe with a diameter no less than that of the valve. No isolating valve may be installed between the appliance and the safety valve. The safety valve drainage must be connected into a pipe with a diameter no less than that of the valve itself.
- ▶ The pressure of the water network used to fill the appliance must be at least 0,8 bar.
- ▶ If the supply pressure from the network is higher than 6 bar, make sure to install a pressure reducing valve set at 4,5 bar.
- ▶ Verify the water quality of the network according to the requirements defined in this manual.
- ▶ In case inhibitors are used in the system, consult the manufacturer for product suitability.



- ▶ Any antifreeze used in the primary circuit must comply with Public Hygiene Regulations and must be non-toxic. A food-grade Propylene Glycol is recommended. It must be diluted according to the ratio recommended in the local regulations, but with a maximum ratio of 30%.
- ▶ Consult the appliance manufacturer to determine the compatibility of the antifreeze product with the appliance materials.
- ▶ It is recommended to install the following devices in the system to prevent water contamination :
 - ▶ Water filter and/or dirt separator installed on the return circuit. Have the water circulate for 2 hours after installation and prior to appliance start up in order to clean the circuit of contaminants. Clean the filter after filling the system.
 - ▶ Plate heat exchanger, combined with a micro-pollutant separator, which will protect the appliance from any contaminants present in an old heating system, where fittings and pipes can be corroded. This is also mandatory for open systems where oxygen can penetrate the system and cause corrosion.



- ▶ *The use of antifreeze in the primary circuit will lead to a reduction in the heating performance. The higher the concentration of antifreeze in the circuit, the lower the performance. Maximum output must be adjusted accordingly.*
- ▶ *The circuit diagrams are theoretical representations that do not necessarily include all the required safety devices. Make sure to correctly plan your system according to the applicable local regulations and standard practices.*

Water Quality Requirements to Prevent Scaling and Corrosion in a Heating System

To prevent the formation of scale and sludge in a closed heating circuit through the penetration of oxygen and carbonates, follow the recommendations below:

- ▶ Before filling the system, clean it according to standard EN14336. Chemical cleaning agents can be used.
- ▶ If the circuit is in bad condition, or the cleaning operation was not efficient, or there is a large volume of water in the system (e.g. cascade), it is recommended to separate the appliance from the heating circuit using a plate-to-plate heat exchanger or an equivalent accessory. In that case, it is recommended to install a hydrocyclone or magnetic filter on the system side.
- ▶ Limit the fill operations. To control the quantity of water added into the system, install a water meter on the filling line of the primary circuit. No more than 5% of the total content of the system is allowed annually.
- ▶ Automatic filling systems are not recommended unless the fill frequency is checked and the levels of scale and corrosion inhibitor are maintained at an appropriate level.
- ▶ If the system needs to be refilled frequently, check for leaks in the primary circuit.
- ▶ Inhibitors may be used according to standard EN 14868.
- ▶ An air separator (on the appliance supply circuit) combined with a dirt separator (upstream of the appliance) must be installed according to the manufacturer's instructions.

- ▶ Additives can be used to keep the oxygen in solution in the water.
- ▶ Use the additives in accordance with the instructions of the manufacturer of the water treatment product.

Water Hardness

- ▶ In general, the requirements for heating water specified in VDI 2035, parts 1 and 2 "Prevention of damage in water heating installations" apply to all boiler sizes.
- ▶ Heating water should be treated:
 - during the system life, the sum of the total fill and additional amounts of water does not exceed three times the nominal volume of the heating installation, or
 - if the indicated values in the table below are not met, or
 - if the heating water pH is below 8,2 or above 10,0.
- ▶ In the VDI 2035 guidelines, the water requirements depend on the total boiler output and water capacity.
- ▶ According to the boiler output, the recommended values of general hardness for filling and top-up water should be used, as per **Table 1** below:

Table 1 from VDI part 1

Total hardness [°d] depending of nominal capacity in litres, ie: (installation capacity / output of a single boiler) [l/kW] (1)

Total heating output in kW	Specific system volume		
	≤20 l/kW	≥ 20 l/kW to < 50 l/kW	> 50 l/kW
≤ 50	≤ 17,6 for boilers with low water capacity <0,3l/kW, no requirement for boilers with high water capacity ≥ 0,3 l/kW	≤ 11,2	<0,11
> 50 to ≤ 200	≤ 11,20	≤ 8,40	< 0,11
> 200 to ≤ 600	≤ 8,20	< 0,11	< 0,11
> 600	< 0,11	< 0,11	< 0,11

(1) for cascade systems, the smallest boiler output should be used.

If the system volume is exceeded 3 times, the water must be treated in exactly the same way as for the limits given in table.

Water Parameters

- In addition to the water hardness, other parameters of the water must be checked. Treat the water if the measured values are outside the range of **Table 2**.
- If the pH of the fill water is clearly lower than 8,2, it is recommended to check the pH value of the heating water after eight to twelve weeks. If the pH value of the heating water during control is clearly lower, increase it by taking the value from **Table 2** below:

Table 2 from VDI part 2

		Low-saline	Saline
Electrical conductivity at 25 °C	µS/cm	< 100	100 – 1500
Appearance		free of sedimentating substances	
pH value at 25 °C		8,2 – 10,0	
Oxygen	mg/l	< 0,1	< 0,02

Using Table 1, based on the type of boiler, water hardness and water capacity in the heating system, you can already get preliminary information about the need for water treatment.

Graph description:

- **Above the curves, water treatment is required**
- **Below the curves, fill with untreated tap water**

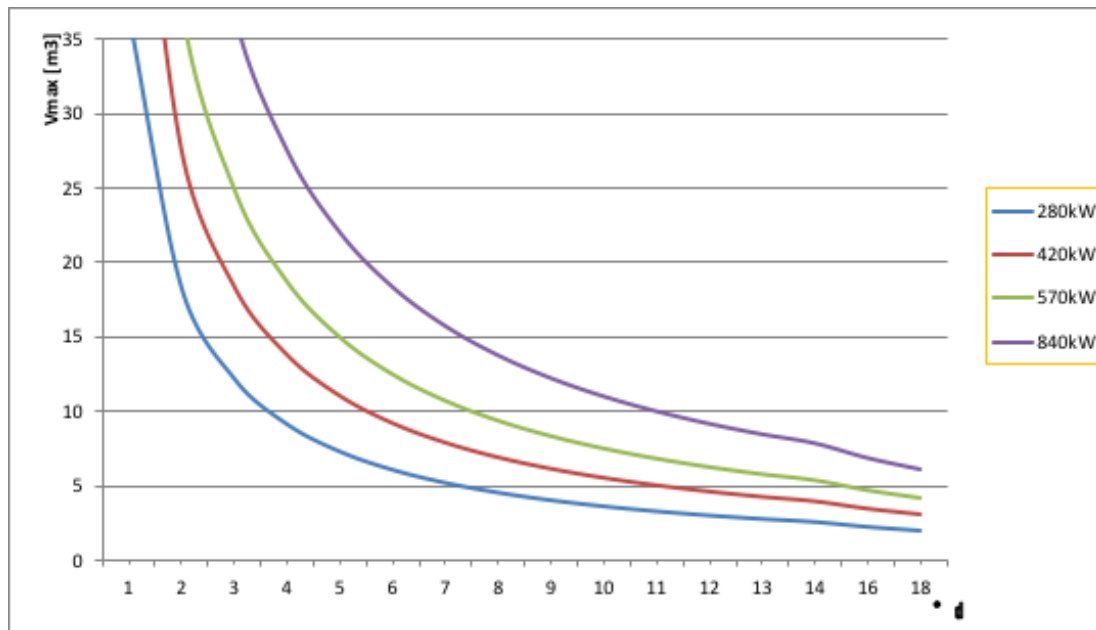
Example:

Boiler 120kW
 Installation capacity 1800l
 =>1800l / 120 kW = 15 l/kW

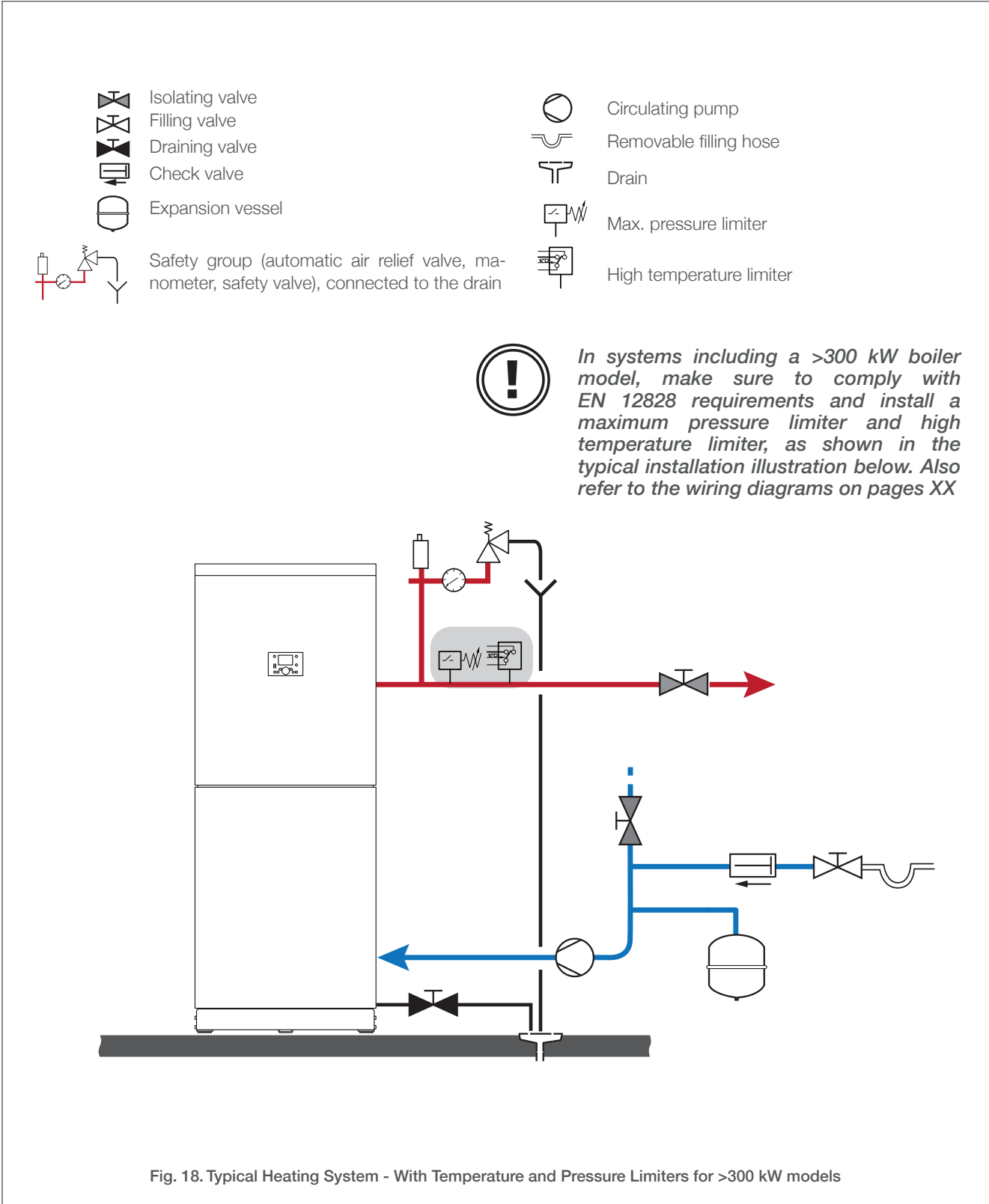
From Table 1, for the example boiler output of 120 kW, we have a range of 50-200 kW, and for a specific system volume of 15 l/kW there is a range of up to 20 l/kW, for these values we read water hardness up to 11,2°d.



Warranty claims are only valid if the requirements described in this manual and the maintenance log sheet are met. Check the water hardness, electrical conductivity and pH regularly and enter the values in the maintenance log (provided at the end of the manual).

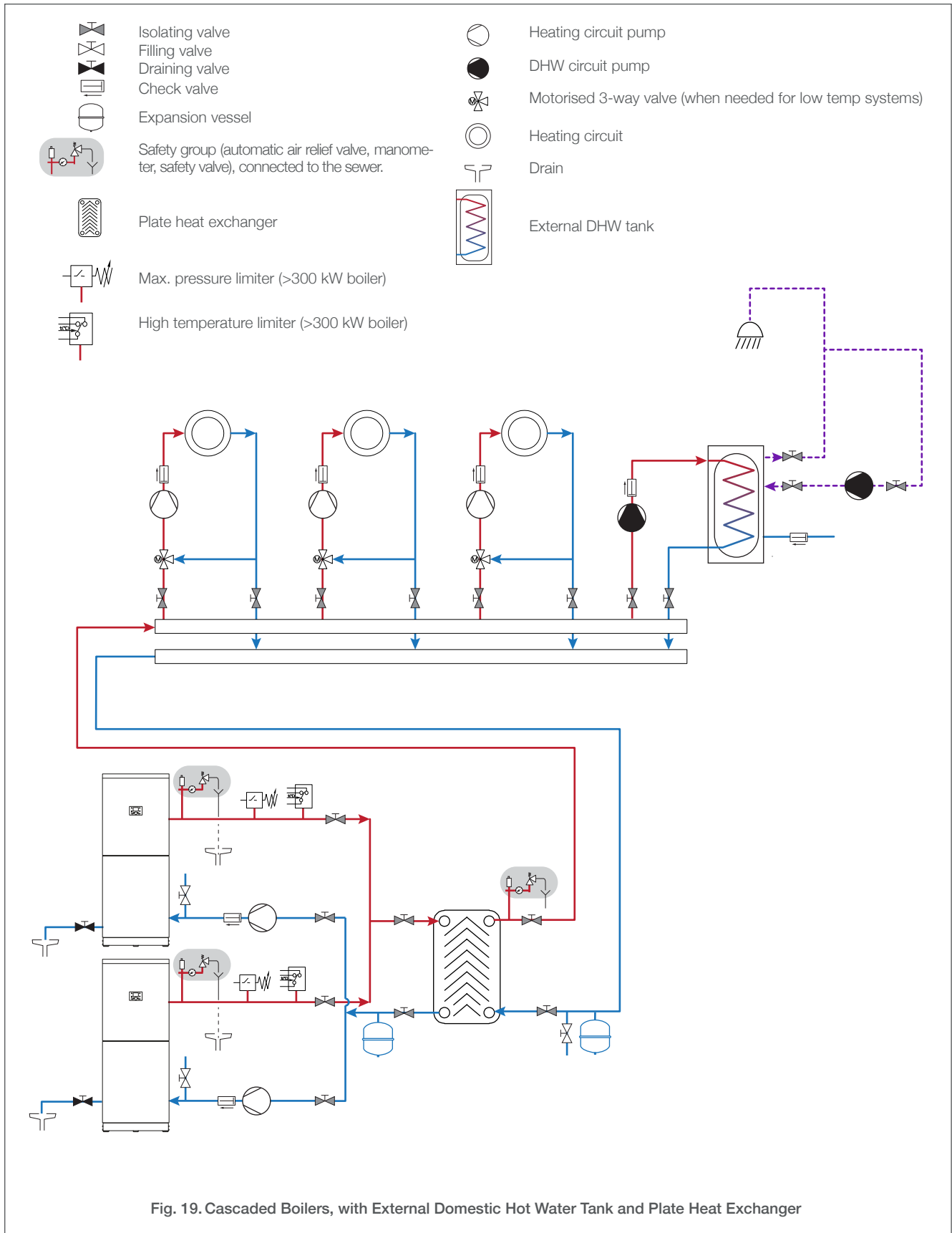


Typical Hydraulic Connections - Heating Circuit



i To make maintenance easier, we recommend to remove the plug from one of the drain connection and install a draining valve (see Fig. 3 and Fig. 4).

Hydraulic Connections - Cascaded boilers, with External Domestic Hot Water Tank and Plate Heat Exchanger



Hydraulic Connections - Cascaded boilers, with External Domestic Hot Water Tank and Low Loss Header

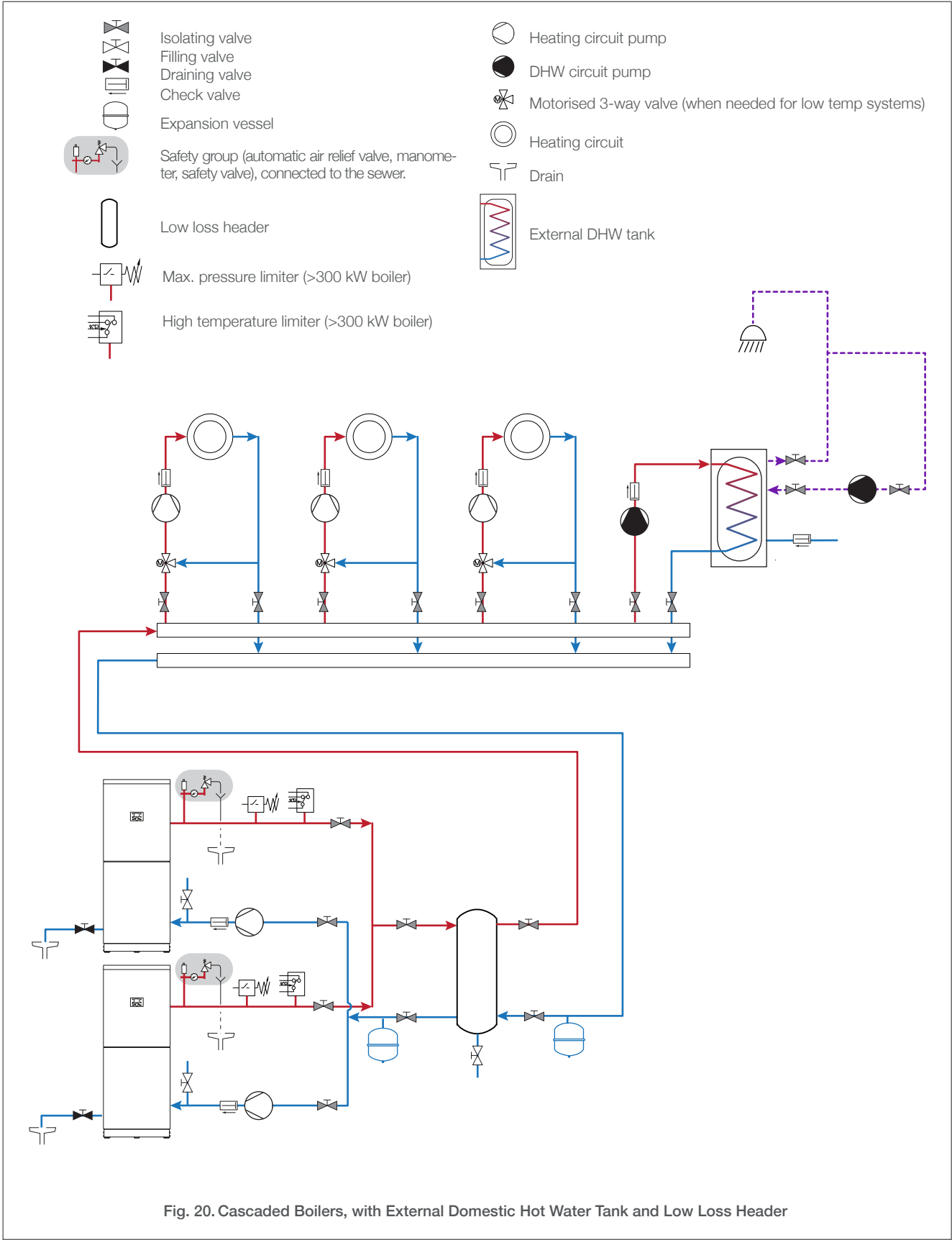


Fig. 20. Cascaded Boilers, with External Domestic Hot Water Tank and Low Loss Header

Safety Instructions for the Gas Connection



- When connecting the gas circuit, make sure to comply with all applicable local regulations and standards. The circuit will be equipped with a meter and a gas pressure regulator if required.
- Do not exceed the maximum gas pressure.
- The conversion of the appliance from natural gas to G31 liquefied petroleum gas (propane) or the reverse can only be performed by a qualified professional.
- Gas conversion shall be performed according to applicable local regulations. It is prohibited in some countries. Perform conversion according to the gas category specified for your country on the appliance data plate.
- Bleed the gas duct and check thoroughly if all the internal and external gas pipes and connections are tight.
- After gas circuit connection, check that there is no leak.
- Use a gas detection device or perform a bubble test to check for gas leaks. Never use an open flame, as it could result in an explosion.



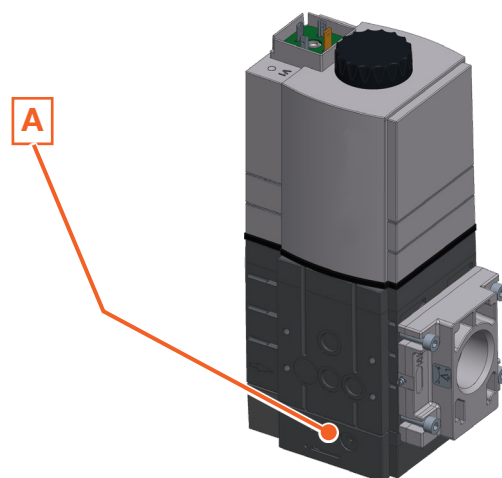
- Make sure that the gas type and pressure of the distribution network are compatible with the appliance, as per the information on the appliance data plate.
- The OFFSET (A) setting of the gas valve is factory-preset and sealed. In some countries, it is prohibited to change its setting. Please refer to applicable local regulations.
- The CO₂, gas flow rate, air flow rate and air/gas supply parameters are factory-preset and may not be modified in certain countries. Please refer to applicable local regulations.



Control the gas pressure and consumption at appliance start up, and perform the adjustment procedure provided in this manual.

Gas pressure*	Min - Max (mbar)
G20 (20 mbar)	17 - 25
G25 (25 mbar)	20 - 30
G25.1 (25 mbar)	18 - 33
G25.3 (25 mbar)	20 - 30
G31 (30 mbar)	25 - 35
G31 (37 mbar)	25 - 45
G31 (50 mbar)	42,5 - 57,5

* i.a.w. EN 437



Gas Conversion



- › Conversion of the appliance from one gas type to another can only be performed by a qualified professional.
- › If the boiler is intended to be used with G31 liquefied petroleum gas (propane), installing the boiler below ground level can be hazardous and prohibited in some countries. Please refer to applicable local regulations for installation requirements.
- › If the boiler is already installed before conversion, the boiler must be turned off, the power supply must be disconnected through the external fuse or circuit breaker, and the gas supply to the gas valve must be closed.



- › Connection of the boiler to a G31 gas system should comply with local regulations and requirements.
- › If the boiler was running before conversion, allow it to cool down before performing any task.



- › *This procedure explains how to enable an appliance adjusted in factory for G20 natural gas to operate with G25 natural gas or G31 propane gas.*
- › *Gas conversion to this appliance does not require component replacement, only adjustments:*
 - › *of gas valve (through shutter and offset screws)*
 - › *of boiler settings (fan speeds at ignition, and at max. and min. outputs).*
- › *Conversion can therefore be carried out either on a boiler about to be installed, or on an already installed and running boiler, provided that the installation location allows it.*

PRODUCT INSTALLATION

Preparing the Boiler for Gas Conversion

Conditions: OFF    

Tools and material:

- Wrench, hex head, size 4
- Screwdriver, flat head

Procedure

- Remove the front top panel (N 280 FS - N 420 FS) or left side top panel (N 570 FS - N 840 FS). See **Fig. 21** below for panel locations and refer to **"Removing and Installing the Access Panels"** on page I-34.
- Disconnect the gas pipe, as required.
- Connect the new gas supply to the gas pipe.

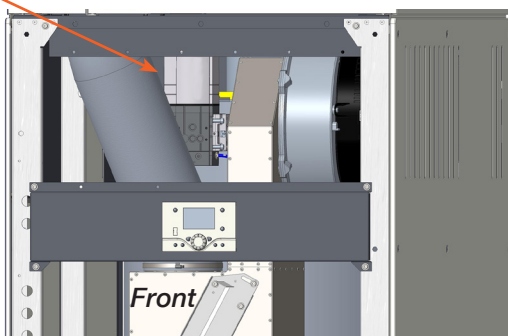


▶ The boiler is adjusted in factory to operate with natural gas (G20). When the boiler needs to operate with propane (G31), the gas valve shutter position must be adjusted.

- ▶ Conversion to other gas types only requires the adjustment of fan speeds and combustion values. refer to **"Adjustment of Fan Speeds"** on page I-45.

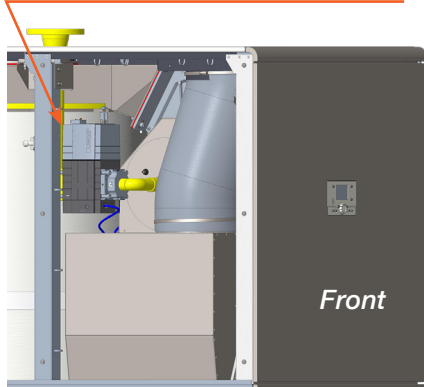
- Conversion to Propane only:** rotate the gas valve shutter screw (1) towards the “-” symbol to reduce the opening (see **Fig. 22**):
 - ▶ N 280 FS - N 420 FS – 2 full rotations.
 - ▶ N 570 FS - N 840 FS – 1 full rotation.

Access to the gas valve through the front of the boiler



N 280 FS - N 420 FS

Access to the gas valve through the left side of the boiler



N 570 FS - N 840 FS

Fig. 21. Accessing the Gas Valve

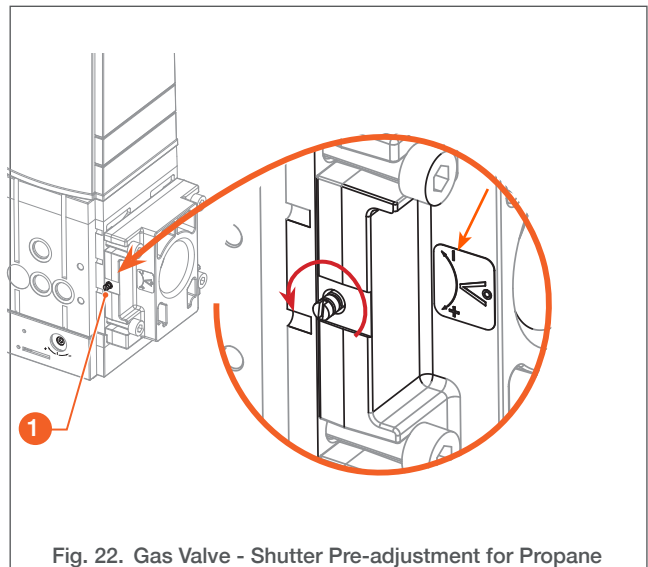


Fig. 22. Gas Valve - Shutter Pre-adjustment for Propane

Follow-on Task(s):

- Perform fan speed adjustments, refer to **"Adjustment of Fan Speeds"** on page I-45.

Adjustment of Fan Speeds

Conditions:   

Adjustment Procedure (Fig. 23)

1. Press the On/Off switch located on the right side of the boiler.



If starting the boiler for the first time after installation, the controller will open the commissioning screen automatically.

2. Perform the commissioning setting of the boiler (refer to **"Start-up and Combustion Adjustments"** on page I-61).
3. Control the gas pressure and consumption at appliance start up.
4. Press the ESC (3) button.
5. Press the OK (2) button.
6. Press the Info (1) button for more than 3 seconds. The access levels are displayed.
7. Rotating the selection knob (4), go to:
 - **"Engineer"**. Press OK (2) to confirm.
 - **"Burner Control"**. Press OK (2) to confirm.
 - **"Required speed ignition"** (Program number 9512).
8. Press OK (2) to modify the value. The value starts flashing (5).

9. Rotating the knob (4), adjust the ignition fan speed for the gas type and boiler type according to the table below.
10. Press OK (2) to confirm and save the value.
11. Rotating the knob, go to **"Required speed LF"** (Program number 9524).
12. Press OK (2) to modify the value. The value starts flashing (5).
13. Rotating the knob (4), adjust the minimum fan speed for the gas type and boiler type according to the table shown at the bottom of the page.
14. Press OK (2) to confirm and save the value.
15. Rotating the knob (4), go to **"Required speed HF"** (Program number 9529).
16. Press OK (2) to modify the value. The value starts flashing (5).
17. Rotating the knob (4), adjust the nominal fan speed for the gas type and boiler type according to the table below.
18. Press OK (2) to confirm and save the value.
19. Press ESC (3) to exit the settings.

Follow-on Task(s)

- Perform the combustion adjustment. See **"Combustion Adjustment for Gas Conversion"** on page I-46.

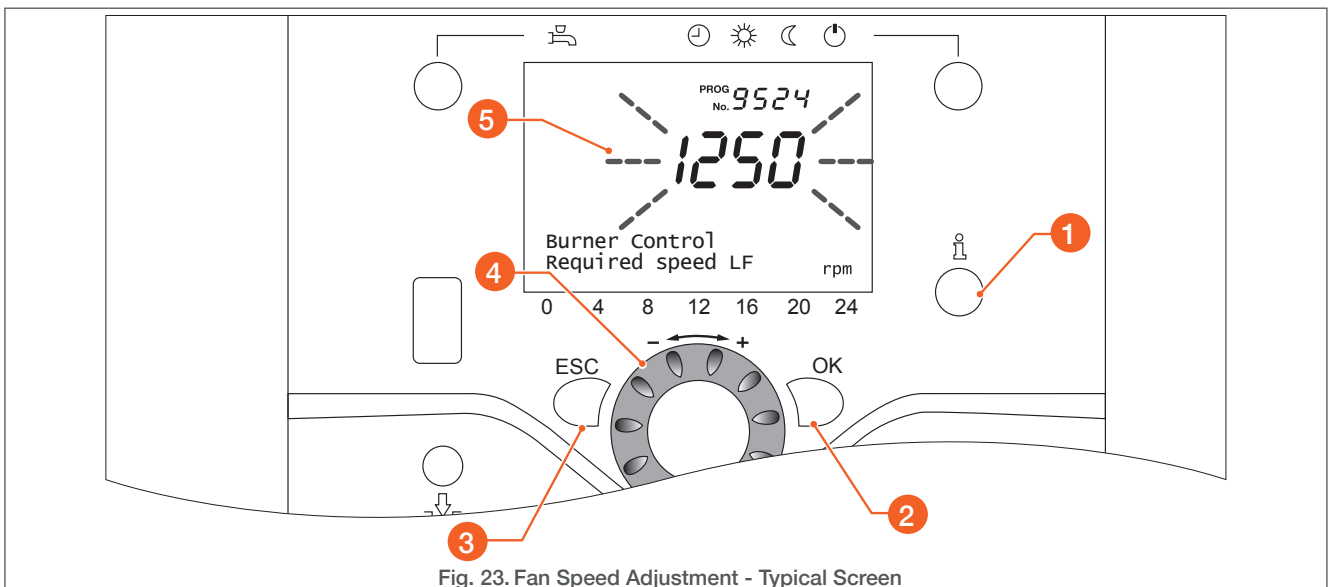


Fig. 23. Fan Speed Adjustment - Typical Screen

Fan Speeds		N 280 FS			N 420 FS			N 570 FS			N 840 FS		
		Ign.	Min	Max.	Ign.	Min	Max.	Ign.	Min	Max.	Ign.	Min	Max.
Gas Type	rpm	1700	1200	5500	1700	730	4400	1300	850	4150	1700	800	5600
G20	rpm	1700	1250	5500	1700	730	4400	1300	850	4150	1700	800	5600
G25	rpm	1700	1500	5070	1700	1210	4290	1200	1100	3910	1700	1470	5350
G31 (30/37 mbar)	rpm	1500	1500	5070	1550	1210	4290	1100	1100	3910	1600	1470	5350
G31 (50 mbar)	rpm												

Combustion Adjustment for Gas Conversion

Conditions:    

Tools and material:

- ▶ Flue gas analyser
- ▶ Screwdriver, flat head
- ▶ Wrench, hex head, sizes 2 and 2,5

Adjustment Procedure (Figs. 4 & 5):

1. Press the heating mode selection button (1) for more than 3 seconds.
2. After successful ignition, connect the flue gas analyser probe to the measuring port of the flue gas pipe.
3. Check CO₂ contents in the flue gas at max. output as follows:
 - ▶ Press the Information button (2). The modulation indicator (5) is displayed (in %).
 - ▶ Press the OK button (3), the indicator (5) starts flashing.
 - ▶ Rotate the knob (4) to increase to 100% for maximum power. Press the OK button (3) to confirm.
 - ▶ On the gas analyser, check the CO₂ contents, and compare the value with those in table below.

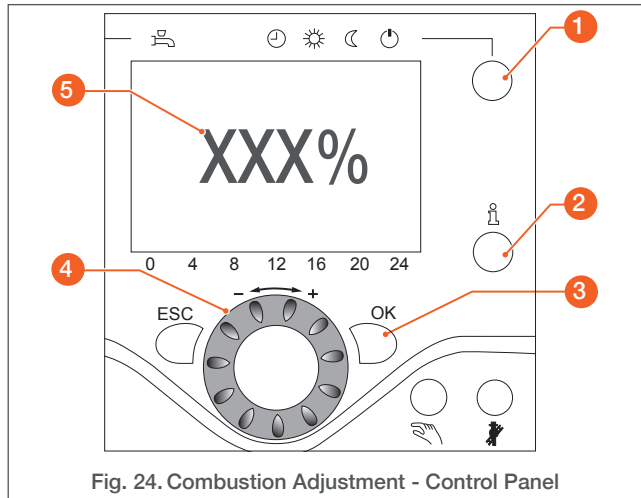


Fig. 24. Combustion Adjustment - Control Panel


- ▶ If the value is outside the range, adjust the combustion value by turning the gas valve shutter (6) in small steps, to allow the value to stabilise before performing additional adjustments.
 - Rotate shutter screw (6) **towards the “+” sign to increase** the CO₂ contents.
 - Rotate shutter screw (6) **towards the “-” sign to decrease** the CO₂ contents.

Combustion and Gas Values			N 280 FS		N 420 FS		N 570 FS		N 840 FS	
			min	max	min	max	min	max	min	max
CO ₂ contents	G20 (+/-0,3)	%	8,6	9,5	8,4	9,5	8,3	9,6	8,8	9,6
	G25 (+/-0,3)	%	9,1	9,5	9,1	9,5	9,1	9,5	9,1	9,6
	G31 (+/-0,3)	%	10,7	11,0	10,6	11,0	10,6	11,1	10,7	11,2
O ₂ contents	G20 (+/-0,3)	%	5,9	4,3	6,4	4,3	6,4	3,9	5,3	4,1
	G25 (+/-0,3)	%	4,4	3,7	4,4	3,7	4,4	3,5	4,4	3,5
	G31 (+/-0,3)	%	4,5	4,2	4,4	4,2	4,4	4,1	4,5	4,0
Gas pressure	G20 (20 mbar)	mbar					17 - 25			
	G25 (25 mbar)	mbar					20 - 30			
	G25,1 (25 mbar)	mbar					18 - 33			
	G25,3 (25 mbar)	mbar					20 - 30			
	G31 (30/37/50 mbar)	mbar					25 - 35 / 25 - 45 / 42,5 - 57,5			
Gas flow rate	G20	m3/h	2,6	26,2	4,8	40,4	7,6	52,1	8,6	77,8
	G25	m3/h	3,0	30,5	5,6	47,0	7,6	60,6	10,0	90,5
	G31	m3/h	2,5	10,2	3,7	15,0	5,1	20,7	7,6	31,0

4. Check CO₂ contents at min. output as follows:
 - ▶ Repeat steps 1 and 2, if necessary.
 - ▶ Press the Information button (2). The modulation indicator (5) is displayed (in %).
 - ▶ Press the OK button (3), the indicator (5) starts flashing.
 - ▶ Rotate the knob (4) to decrease to 0% for minimum power. Press the OK button (3) to confirm.
 - ▶ On the gas analyser, check the CO₂ contents, and compare the value with those in the table on page I-40.
 - ▶ If the value is outside the range, adjust the combustion value by turning the offset screw (7) in small steps to allow the value to stabilise before performing additional adjustments.
 - Rotate offset screw (7) towards the “+” sign to increase the CO₂ contents.
 - Rotate offset screw (7) towards the “-” sign to decrease the CO₂ contents.
5. Restart the boiler to check the ignition behaviour. Control the correct operation of the boiler by repeating steps 1 to 4 to check the CO₂ contents.
6. Reseal the offset (7) using some paint or tape.

Follow-on Task(s):

1. Record the combustion values in the log sheet at the end of this manual.
2. On the data plate (back of the boiler), place the white sticker to indicate that a gas conversion has been carried out.
3. Check the absence of leaks
4. Reinstall the access panels. Refer to "**Removing and Installing the Access Panels**" on page I-34 for the correct procedure.

 *The offset screw is factory-sealed. After adjustment, make sure to reseal it.*

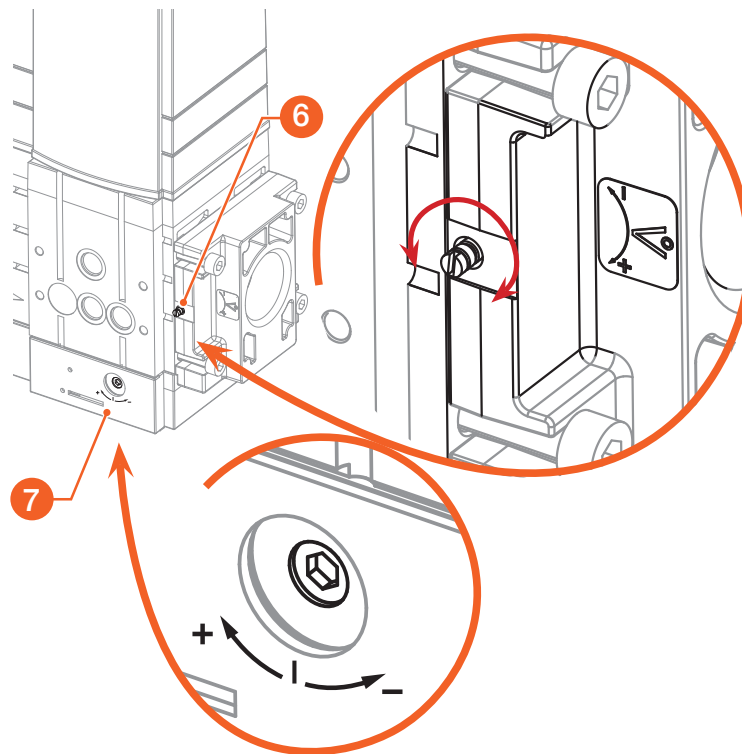


Fig. 25. Combustion Adjustment on Gas Valve

Safety Instructions for the Chimney Connections



- › Verify installed combustion air and flue gas piping are tight and meet all provided instructions and applicable codes and standards.
- › Failure to properly support the flue system can cause failure, resulting in flue gases contaminating the ambient air.
- › The appliance must be equipped with flue system components from the same manufacturer and be approved by the appliance manufacturer. Ensure that the pipe and connection diameters all match to prevent any leaks from occurring.
- › Any gas-fired appliance generates carbon monoxide. Failure to install carbon monoxide detectors with alarm in the boiler room can result in serious injury, or death. Refer to applicable local regulations.
- › A condensate neutralisation system needs to be installed according to the applicable local regulations and standards. It must be cleaned and serviced regularly.



- › Do not install the appliance into a common flue pipe with other gas or oil appliances. This will cause flue gas spillage or appliance malfunction. Please contact your AIC Technical Support for more information.
- › A condensation outlet connected to the sewer must be fitted close to the appliance.



- › Make sure to secure the flue piping to a solid structure.
- › Exclusively use the provided brackets to support the flue system.
- › When assembling the pipes, make sure not to put any stress on the components.
- › Install the horizontal flue pipes with a slight slope of 5 cm per meter (3°) back towards the appliance.
- › It is mandatory to ventilate the boiler room. The high or low air vent opening dimensions depend on the appliance power and the boiler room size. Refer to the local regulations in force.
- › If the combustion air inlet is located in an area likely to cause or contain contamination, or if products which could contaminate the air cannot be removed, the combustion air must be repiped and terminated at another location.
- › If the appliance is used on professional premises such as hairdresser's, cleaning company, painter's, etc. where chloride products, solvents, paints, dust etc. are likely to contaminate the air, make sure to install the appliance in a dedicated boiler room so that the appliance is supplied with clean combustion air.
- › In the case of parallel flue systems, make sure to maintain sufficient distance (at least 40 mm) between the appliance flue piping and combustible materials, and between the flue pipe and air inlet pipe if the latter is made of plastic material.



‣ Flue pipe elements or PP air inlet elements should not be screwed together.

‣ Piping elements should not be bonded together using glue (e.g. silicone) or foam (e.g. PUR).



‣ Make sure to insulate the flue piping in damp rooms to avoid condensation water from forming and dripping.

- Cut the pipes squarely and deburr the edges. This will ensure correct sealing and prevent seals from being damaged.
- To ease the assembly of pipes, use exclusively a mixture of water and soap (1%) on the extremity of the pipe to be fit in.
- Metal flue pipes should always be fitted into the sleeve to the end stop.

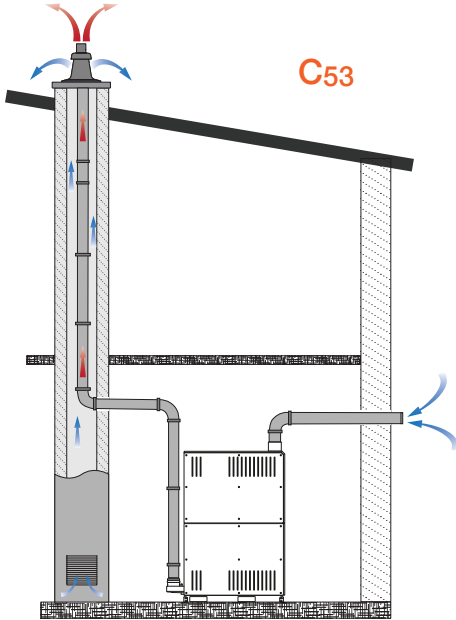


‣ Plastic flue pipes should be allowed to expand under the effect of heat. Leave about 10 mm between the pipe and the sleeve end stop.

- The flue system should be fitted with an inspection opening.
- Do not exceed the maximum length recommended for the product when connecting the flue pipes, or the system power might decrease.
- For B- and C-type appliances, the flue gas exhaust pipes must at least comply with the category T120 H1 W1/2 O30 LI E U when using parallel piping and T120 H1 W1/2 O00 LI/LE E U0 when using concentric piping (EN 14471).
- The maximum length of duct must be calculated according to the permissible difference in pressure indicated in the technical specifications.

Component	Characteristics	Recommendation
Elbow		Clamped at the sleeve
	<ul style="list-style-type: none"> ‣ Horizontal < 1m ‣ Located before or after first elbow 	Clamped at the sleeve <ul style="list-style-type: none"> ‣ One clamp with a bracket at each pipe, ‣ Clamped in pipe center or at the end for support, ‣ Even distribution of clamps, ‣ Allow free movement of pipe
Straight element	Horizontal > 1m (with 3° slope)	<ul style="list-style-type: none"> ‣ Clamped in pipe center for support ‣ Allow free movement of pipe
	Vertical < 2m	<ul style="list-style-type: none"> ‣ One clamp with a bracket at each pipe, ‣ Clamped in pipe center or at the end for support, ‣ Even distribution of clamps, ‣ Allow free movement of pipe
	Vertical > 2m	<ul style="list-style-type: none"> ‣ Clamped every 2 meters, ‣ Even distribution of clamps ‣ Allow free movement of pipe

Chimney Connection



C53

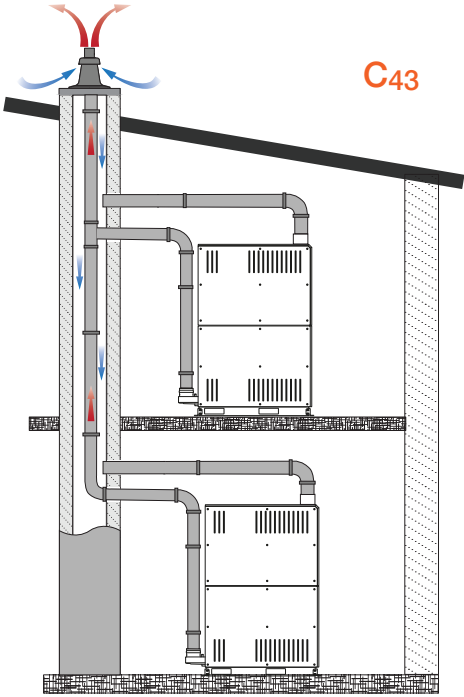
Combustion circuit	Sealed
Connection	Via separate ducts
Air inlet/flue outlet orifices	Through separate terminals that may terminate in zones of different pressures
Additional requirement	Orifices may NOT terminate on opposite walls of the building

C63

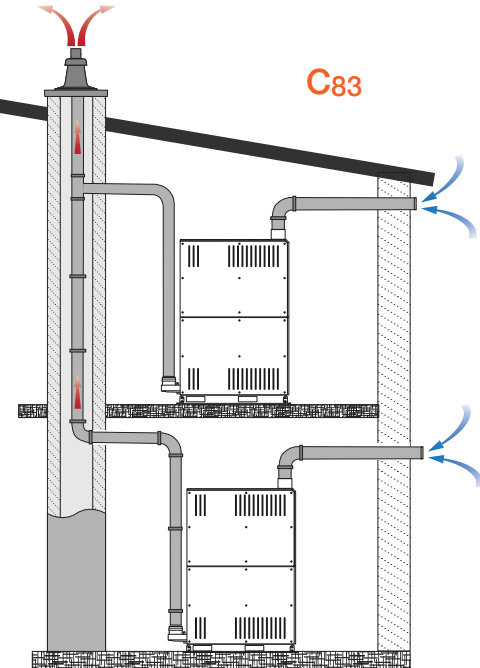
Combustion circuit	Sealed
Connection	To a system that is approved and sold separately (external supplier)
Air inlet/flue outlet orifices	May terminate in zones of different pressure
Additional requirement	<ul style="list-style-type: none"> ➤ Maximum allowable draught is 200 Pa. ➤ Maximum allowable pressure difference between combustion air inlet and flue gas outlet (including wind pressures) is indicated in the technical specifications. ➤ maximum allowable temperature of combustion air is 40°C. ➤ Condensate flow is allowed into the appliance. ➤ Maximum allowable recirculation rate of 10% under wind conditions ➤ Orifices may NOT terminate on opposite walls of the building ➤ The flue gas exhaust pipes must at least comply with the category T120 H1 W1/2 O30 LI E U when using parallel piping and T120 H1 W1/2 O00 LI/LE E U0 when using concentric piping (EN 14471).



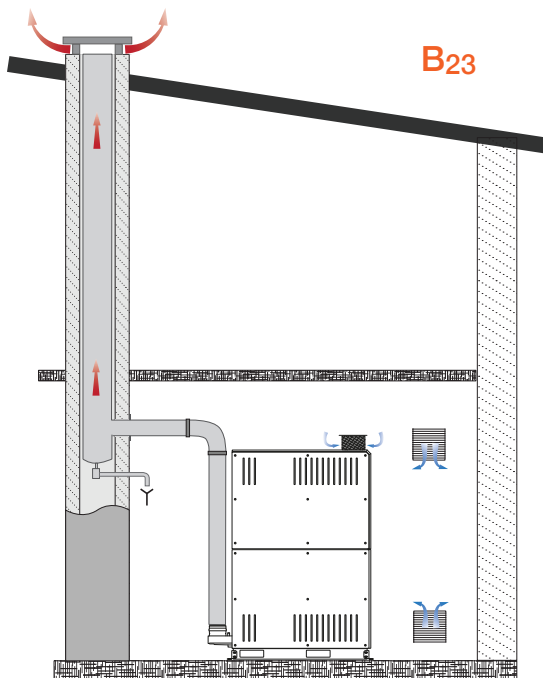
This type of connection is prohibited in some countries - refer to local regulations and standards in force



Combustion circuit	Sealed
Connection	Via two ducts to a common duct system (part of the building, designed for more than one appliance)
Air inlet/flue outlet orifices	Through a roof terminal that admits combustion air from the outside AND discharges flue to the outside <ul style="list-style-type: none"> › Concentric ducts OR › Both orifices are close enough to come under similar wind conditions
Additional requirements	<ul style="list-style-type: none"> › Chimney with natural draught only › Condensate flow is not allowed into the appliance



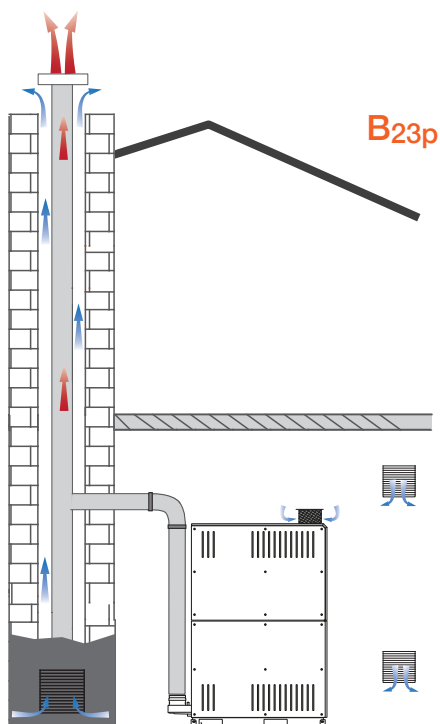
Combustion circuit	Sealed
Connection	Through: <ul style="list-style-type: none"> › a single duct system OR › a common duct system (part of the building, designed for more than one appliance)
Air inlet/flue outlet orifices	<ul style="list-style-type: none"> › Flue is discharged to the roof › Combustion air is taken from the outside
Additional requirement	› Condensate flow is not allowed into the appliance



Combustion circuit	Open
Flue	Discharged to the outside
Combustion air	Drawn from the boiler room
Remark	Can be used for cascading



Make sure that the ventilation openings remain unobstructed at all times.



Combustion circuit	Open
Flue	Discharged to the outside, through positive pressure
Combustion air	Drawn from the boiler room
Remark	Can be used for cascading



Make sure that the ventilation openings remain unobstructed at all times.

Engineering the Chimney System



The chimney system must be engineered by a qualified professional, according to local standards and regulations. The overall installation resistance of each boiler should not exceed 200 Pa (including maximum wind condition) measured at the outlet of each boiler at maximum output.

Please contact your AIC representative for more information



- › *The flue system length must be calculated so as to ensure a safe performance of the system.*
- › *Make sure to install the boiler with the shortest length of combustion air and flue ducts.*
- › *When several boilers need to be connected to a common duct, please contact your AIC representative for more information.*

Accessories



- › *When connecting several boilers to the same duct (i.e. types C43, C83 or cascades), make sure to install an AIC-approved flue gas damper on each boiler in the system. Make sure to place on the boiler the sticker provided with this accessory.*
- › *If required by local regulations, install a condensate neutralisation system. In that case, it may be necessary to install the floor-standing boiler on a base to get sufficient downward flow. If flow is not sufficient, install a condensate pump.*

Safety Instructions for the Electrical Connections



Electrical connections must be carried out by a qualified professional in accordance with current standards and regulations in force.



- ▶ When the appliance is connected to the electrical network, it must be earthed.
- ▶ Make sure that a fuse or circuit breaker of the recommended rating is installed outside the appliance, to allow electrical isolation.
- ▶ Do not touch the appliance with any wet body parts when it is supplied with electrical power.
- ▶ Before performing any operation on the electrical circuit, isolate the electrical supply of the appliance through the external power-cutting device (fuse, circuit-breaker, etc.)
- ▶ When routing the cables through sharp-edged holes in the panels, make sure to install glands or grommets, and to secure the cables in order to prevent any damage.



▶ Make sure to make the connections to the correct terminals, as indicated on the wiring diagram. If high voltage cables are installed on a low-voltage terminal, the electronic board will be damaged.

- ▶ When connecting wires to the terminals, check that the connection is secure and that all the wire strands are tightly held



Route the electrical cables through the holes at the back of the appliance.

Connections



Any damaged power supply cable must be replaced using cables as described below and installed by a qualified professional.



The cross-section of the wires should be >1,5 mm², equipped with sleeves at L and N ends.

High voltage wiring is connected to a terminal strip located at the back of the boiler. See below.

The main board and electrical connections, as well as the low-voltage terminal strip, are located at the front of the boiler. See "**Accessing the Low Voltage Terminal Strip and Electronic board**" on page I-55.

Accessing the High Voltage Terminal Strip



Make sure that the power supply to the appliance is deactivated (power supply cable disconnected from the boiler) before accessing the high voltage terminal strip.

Conditions:



Tools and Material:

- ▶ Wrench, hex head, size 4

Procedure:

1. Remove two screws (1) from the panel. Retain the panel and hardware for reinstallation.

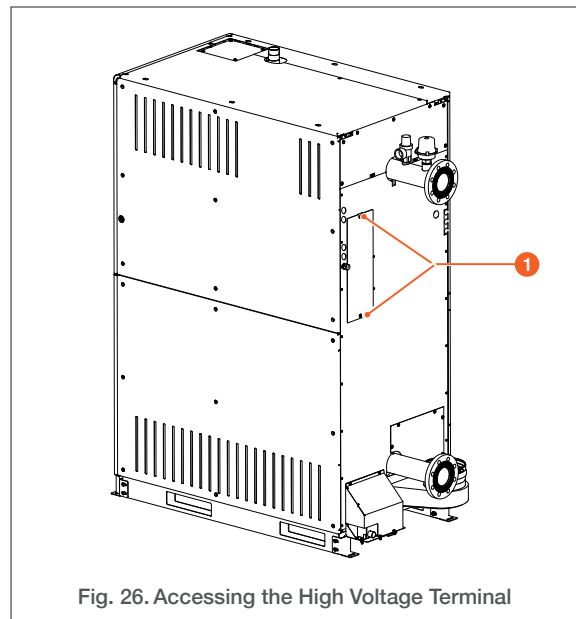


Fig. 26. Accessing the High Voltage Terminal

Accessing the Low Voltage Terminal Strip and Electronic board

Conditions:



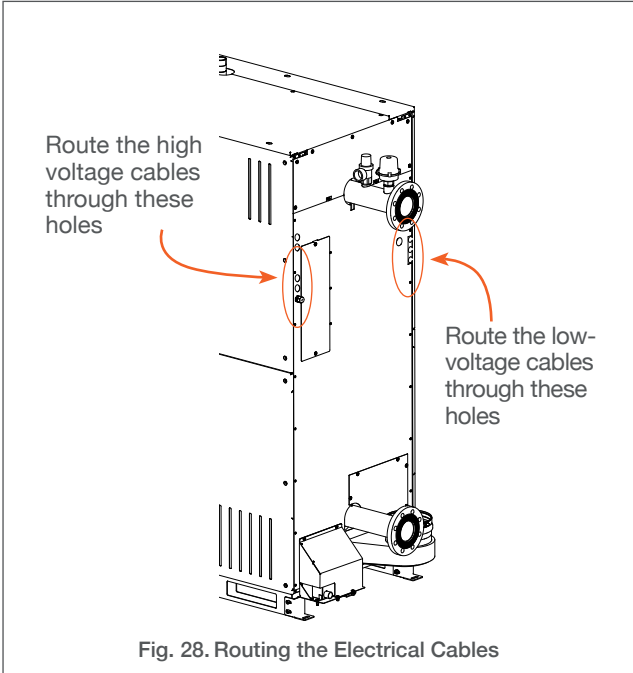
Tools and Material:

- Wrench, hex head, size 4

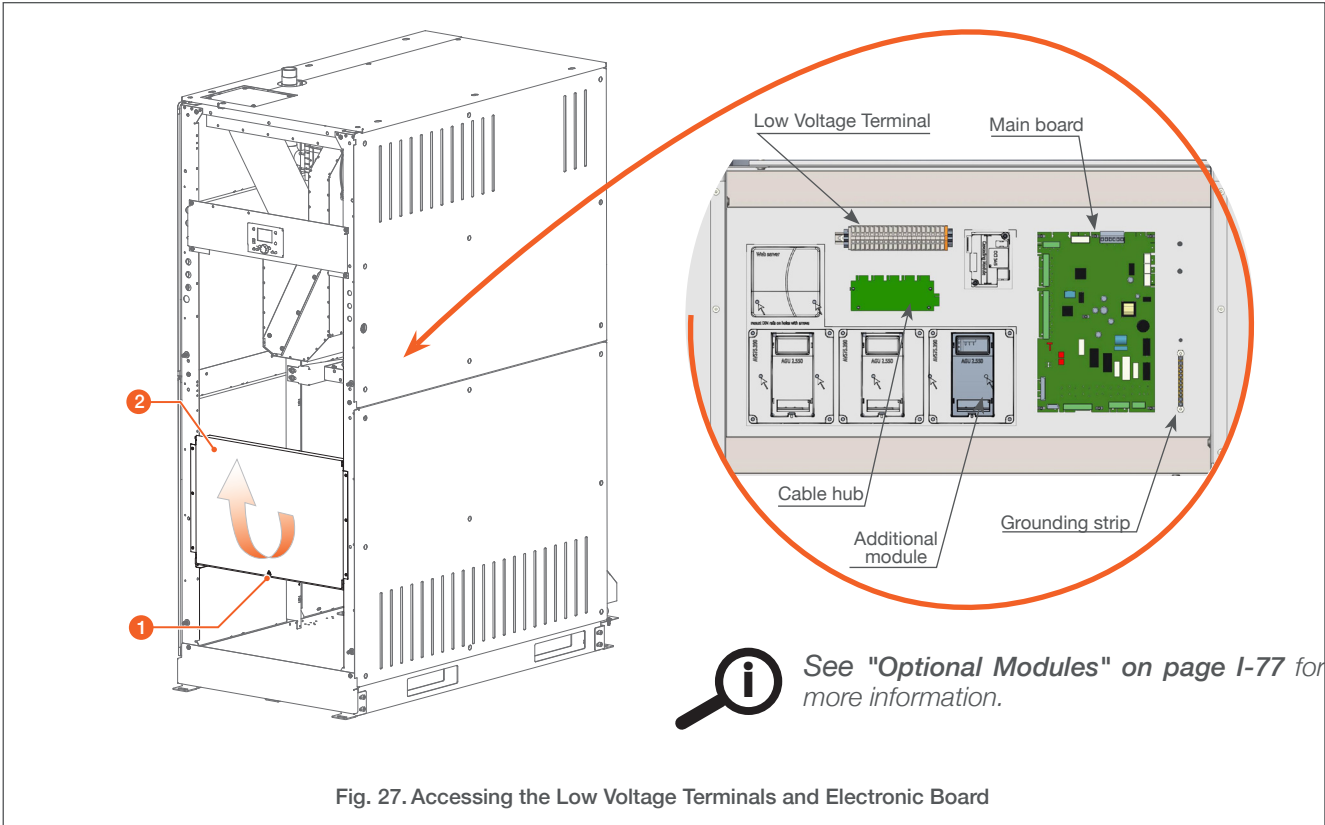
Procedure:

1. Remove center front panel, see **"Removing and Installing the Access Panels"** on page I-34.
2. Remove one screw (1) at the bottom of the electronic bay access panel. Retain for reinstallation.
3. Lift and remove access panel (2).

Routing the Cables

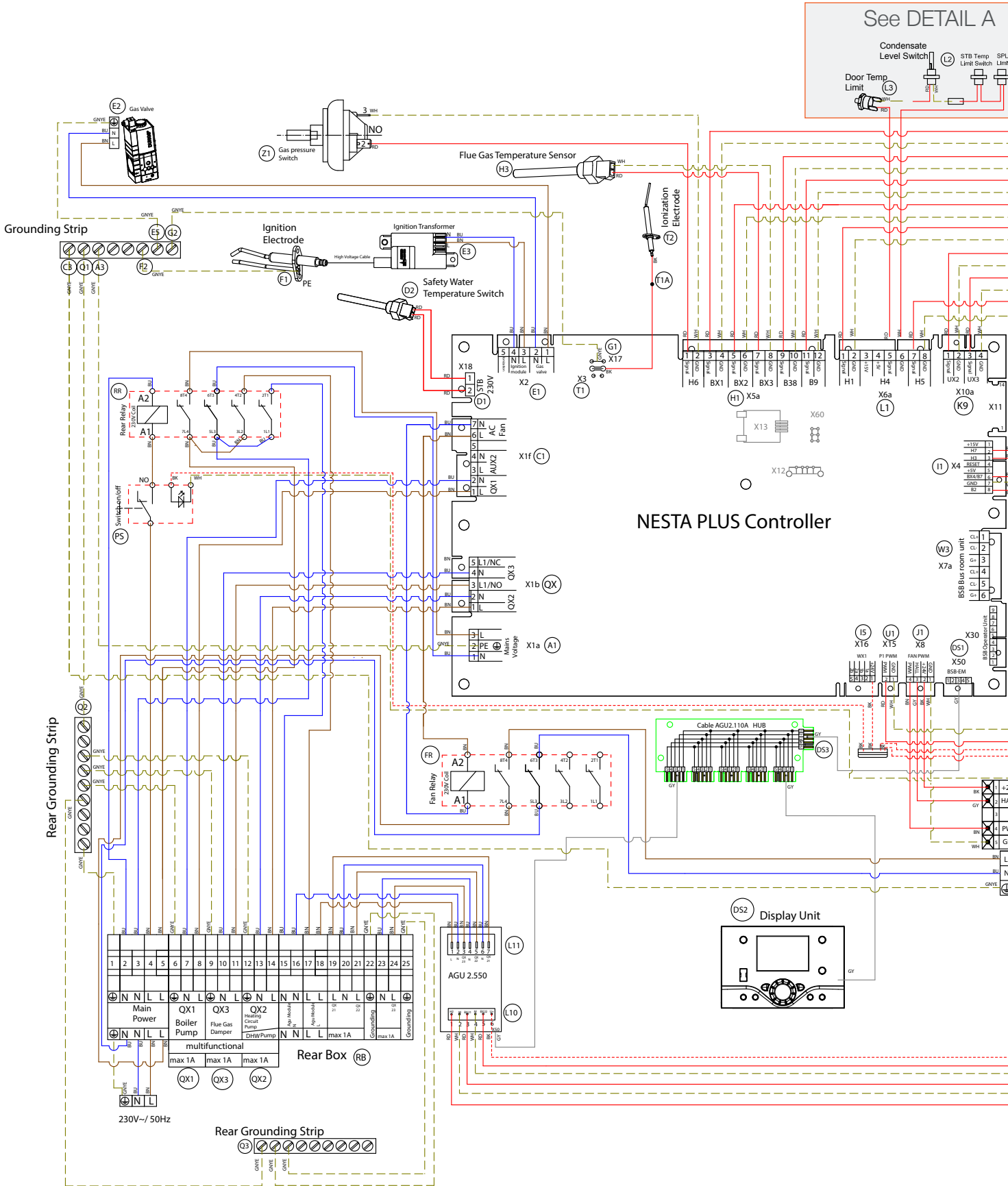


i When routing the cables through the back panel holes, make sure to install grip cable gland or similar fittings to protect and secure the cables.



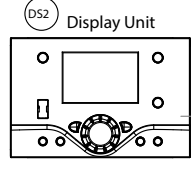
PRODUCT INSTALLATION

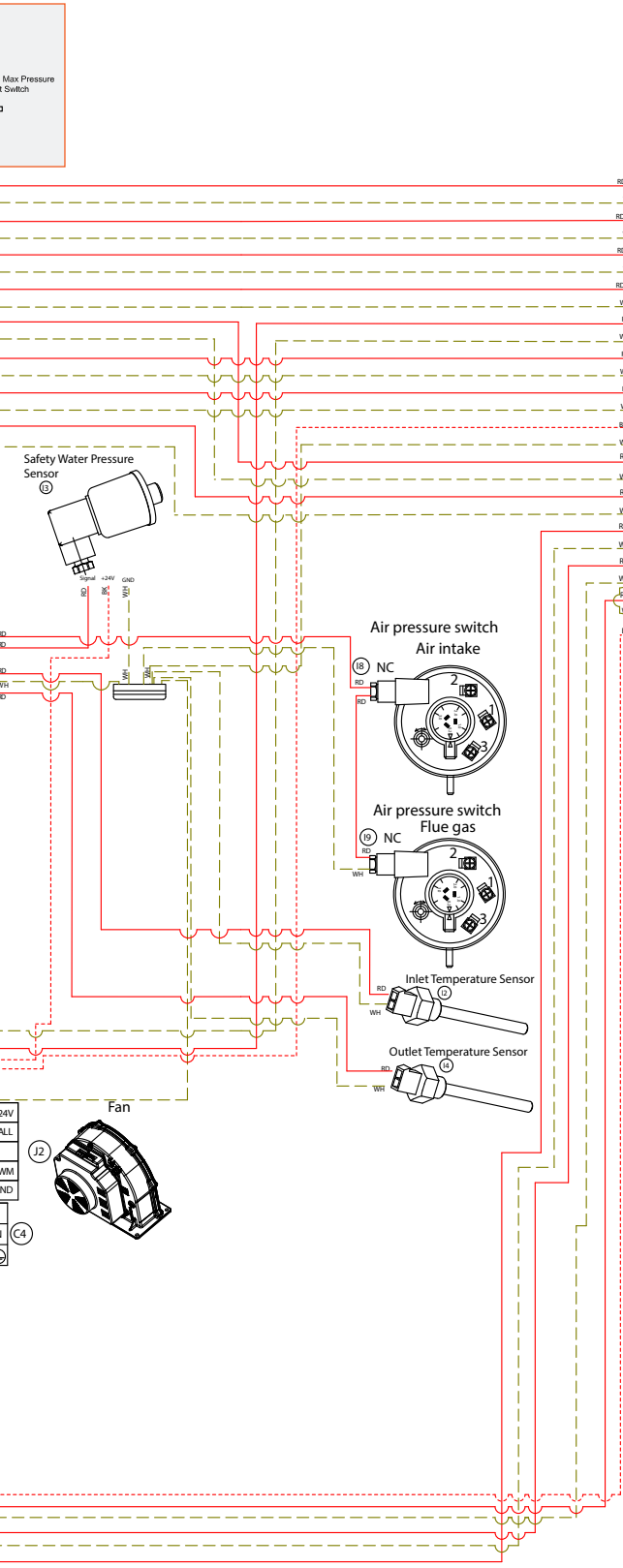
Wiring Diagram - NESTA PLUS 280 - 420 - 570



See DETAIL A

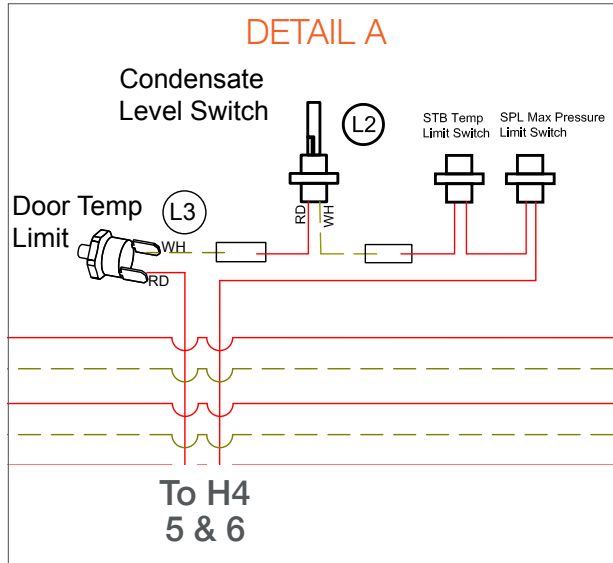
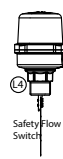
NESTA PLUS Controller





Front Panel 1 (FP1)

RD	1	●	BX1 System temp. sensor /Multifunctional	(Z2)
WH	2	●	B38	(Z4)
RD	3	●	DHW Sensor	(H5)
WH	4	●	B9	(Z3)
RD	5	●	Outside sensor	(U2)
WH	6	●	BX2 Cascade return temp. sensor /Multifunctional	(K8)
RD	7	●	X15 Boiler pump PWM	(K7)
WH	8	●	UX2 Analog output 0-10V	(W1)
RD	9	●	UX3 Analog output 0-10V	(L5)
WH	10	●	24V DC	(L6)
RD	11	●	H1 Enable/Disable /Multifunctional	(L7)
WH	12	●	H5 Multifunctional	(L8)
RD	13	●	H2	(L9)
WH	14	●	M	
RD	15	●	BX21	
WH	16	●	M	
RD	17	●	BX22	
WH	18	●	M	
RD	19	●	U+ DC 12V	
WH	20	●		
RD	21	●		
WH	22	●		
RD	23	●		
WH	24	●		
RD	25	●		
WH	26	●		
RD	27	●		



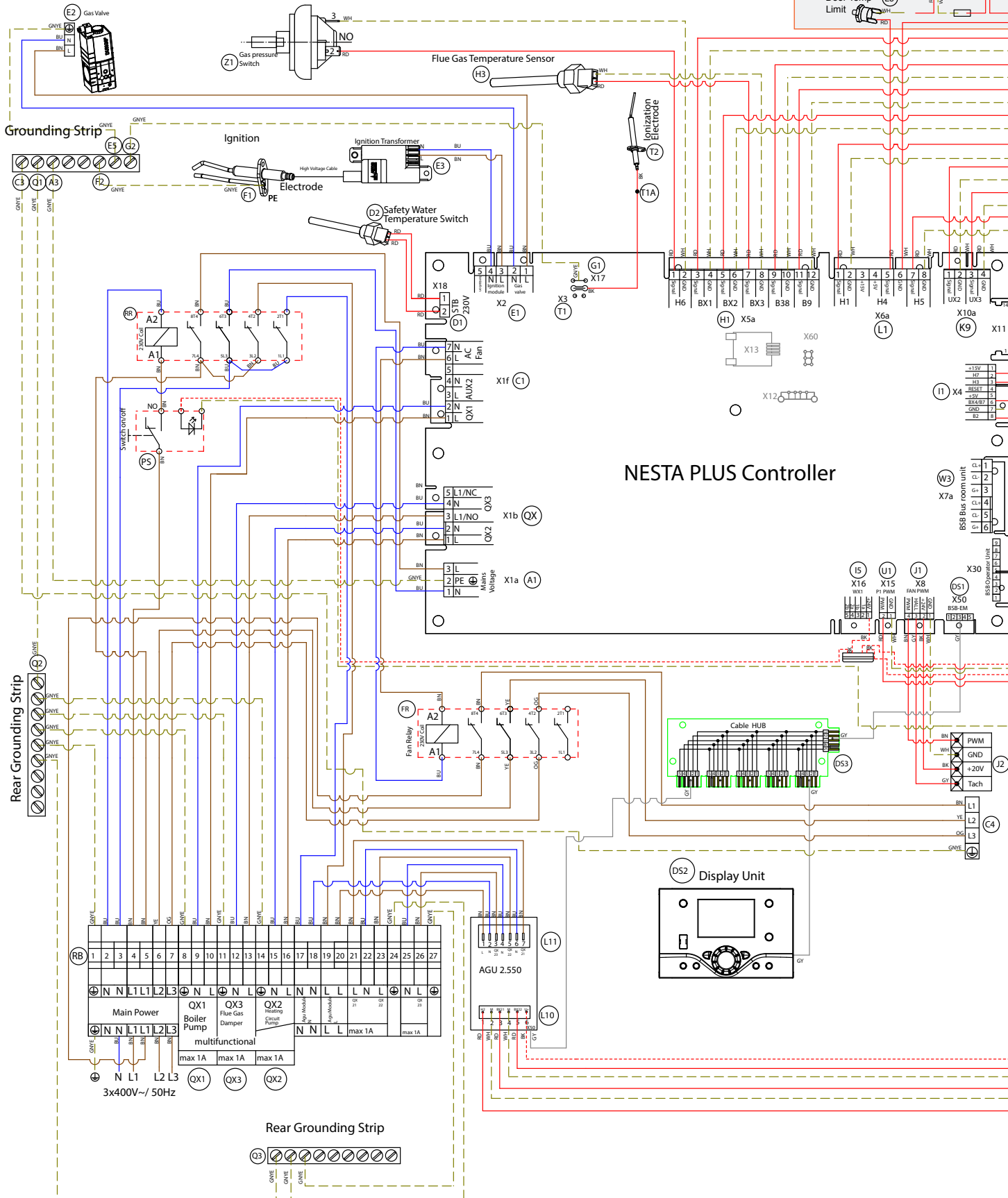
Legend

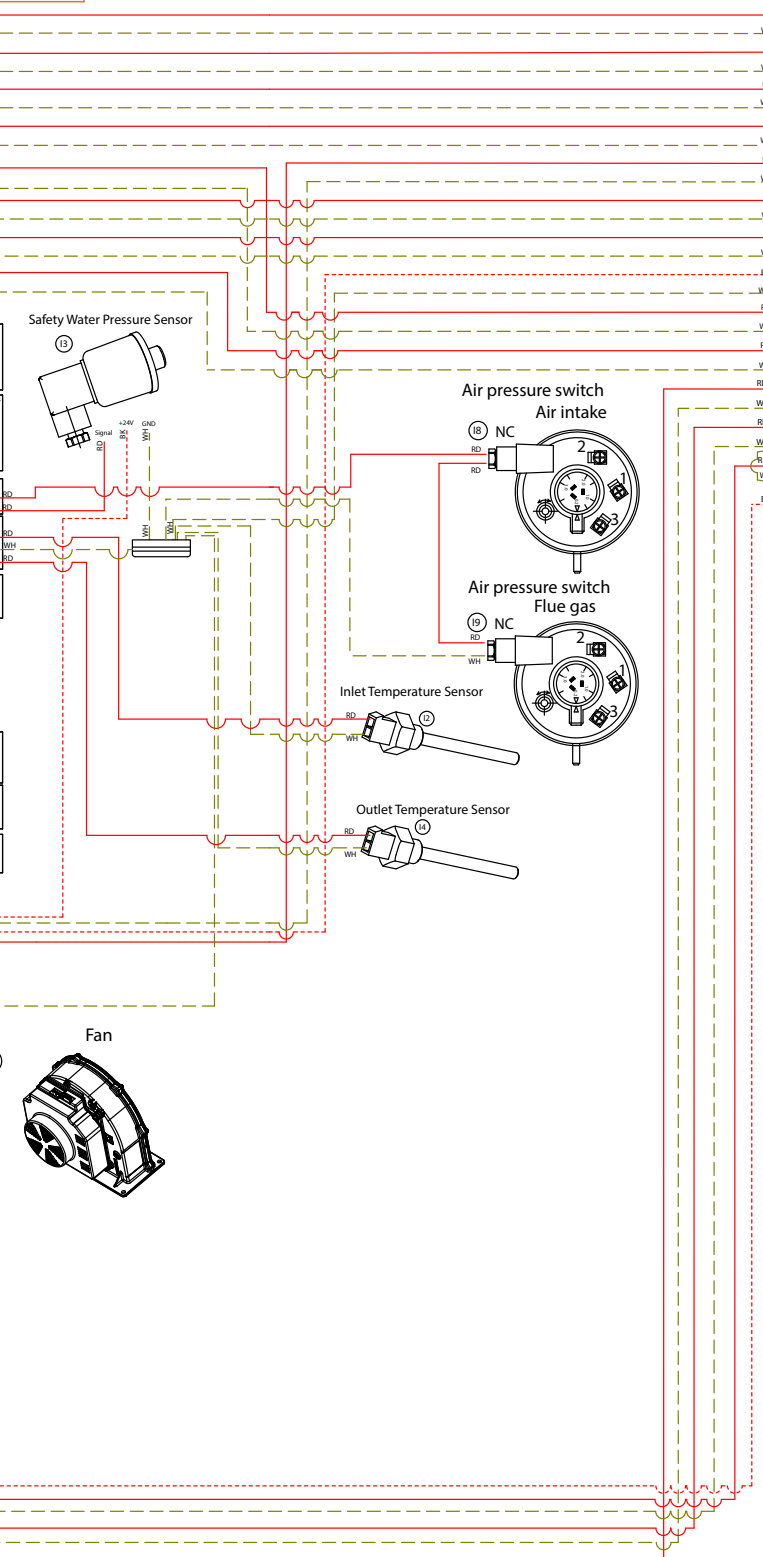
RD	Red	Signal
EK	Black	24V DC
GNYE	Green-Yellow	HV Grounding
WH	White	Signal Grounding
BU	Blue	Neutral
BN	Bronze	Phase
GY	Grey	X50

PRODUCT INSTALLATION

Wiring Diagram - NESTA PLUS 840

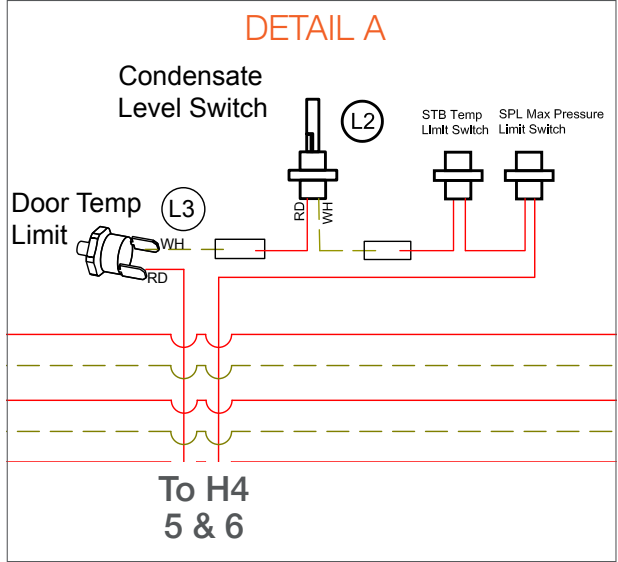
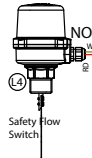
See DETAIL A





Front Panel 1 (FP1)

RD	1	BX1 System temp. sensor / Multifunctional	(Z2)
WH	2	B38 DHW Sensor	(Z4)
RD	3	B9 Outside sensor	(H5)
WH	4	BX2 Cascade return temp. sensor / Multifunctional	(Z3)
RD	5	X15 Boiler pump PWM	(U2)
WH	6	UX2 Analog output 0-10V	(K8)
RD	7	UX3 Analog output 0-10V	(K7)
WH	8	24V DC	(W1) Max P=3W I=0,125A
RD	9	H1 Enable/Disable / Multifunctional	(L5)
WH	10	H5 Multifunctional	(L6)
RD	11	H2	(L7)
WH	12	M	(L8)
RD	13	BX21	AGU 2.550
WH	14	M	
RD	15	BX22	
WH	16	M	(L9)
RD	17	U+ DC 12V	
WH	18		
RD	19		
WH	20		
RD	21		
WH	22		
RD	23		
WH	24		
RD	25		
WH	26		
RD	27		



Legend		
RD	Red	Signal
BK	Black	24V DC
GN/YE	Green-Yellow	HV Grounding
WH	White	Signal Grounding
BL	Blue	Neutral
BN	Bronze	Phase
GY	Grey	X50

Safety Instructions Before Start-up



- ▶ Check that all connections (electrical, flue pipe, hydraulic, gas) have been carried out and that they are tight and secure.
- ▶ Ensure that the condensate trap is full of water before starting up the appliance.



- ▶ Before starting the appliance, check that the heating circuit is full of water and the appliance is supplied with gas and electrical power.
- ▶ Check that the gas pressure is within the allowed range.
- ▶ Check that the water pressure is sufficient (at least 0,8 bar when cold). Low water pressure is detected by the appliance sensor and will be indicated on the control panel display. Top up the circuit as required.
- ▶ In case of repeated indication of low pressure in the water circuit, check for leaks and repair as required.
- ▶ Once the filling of the heating circuit is complete, close the filling valve.



Once the initial start-up process is complete, fill in the installation checklist with all the relevant information on the system for future reference. Refer to "Installation Checklist" on page I-92.

Filling the System

Conditions:



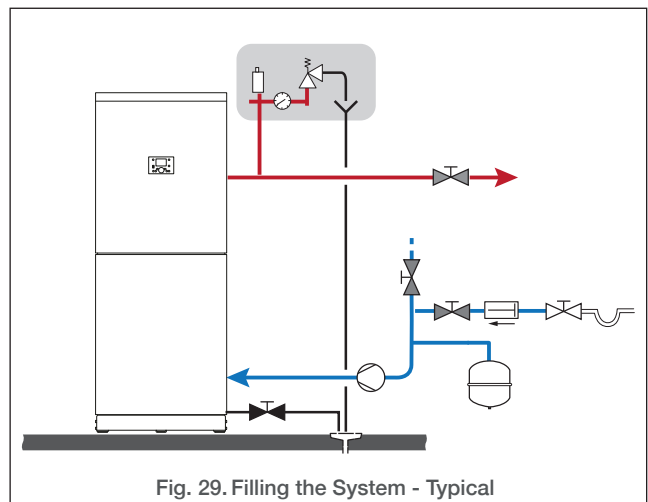
Procedure:

1. Connect the filling hose (≡) to the system filling valve (⊗) and to the water network tap.
2. Make sure that the draining valve (⊗) is closed.
3. Open the isolating valves (⊗).
4. Open the filling valve (⊗) and the water network tap.
5. Bleed the air from the system and bring the system pressure at minimum 0,8 bar.



Pressure should be suitable for the size/height of the heating system and take into account the pressure rating of the safety valve.

6. Close the filling valve (⊗).
7. Remove the filling hose (≡) from the filling valve (⊗) as required.



Follow-on Task(s): None

Start-up and Combustion Adjustments

Conditions:



Tools and Material:

- ▶ Flue gas analyser
- ▶ Screwdriver, flat head, size 3
- ▶ Wrench, hex head, sizes 2 and 2,5

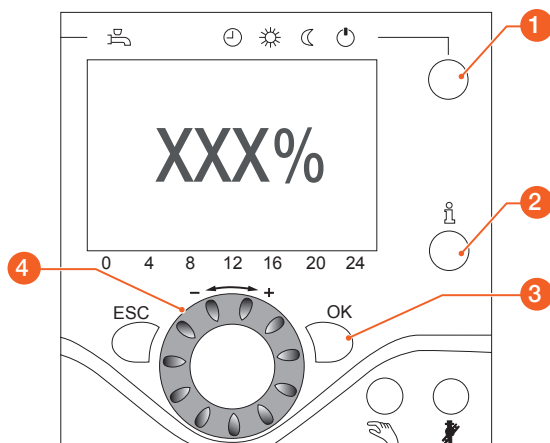
Procedure:

1. Push in the On/Off switch located on the right side of the boiler. It remains pushed in and is illuminated when on.



When starting the boiler for the first time after installation, the controller will open the commissioning screen automatically. This screen only appears once, provided that the parameters are set and saved. To bypass it, press the ESC button.

2. Perform the commissioning setting of the boiler as follows:
 - ▶ Define the language by turning the knob (4), validate the selection by pressing OK (3).
 - ▶ Define Time and Date using the knob (4), validate the selection by pressing OK (3).
 - ▶ Press the heating mode selection button (1) to exit and go back to the home screen.
3. Activate the required heating mode by pressing the heating mode selection button (1).
4. Allow the boiler to operate for a few minutes.
5. Connect the gas analyser probe to the measuring port of the flue gas pipe.
6. Press the heating mode selection button (1) for more than 3 seconds.



7. Check CO₂ contents in the flue gas at max output as follows:
 - ▶ Press the Information button (2). The modulation indicator is displayed (in %).
 - ▶ Press OK (3) to modify the value. The value starts flashing.
 - ▶ Rotate the knob (4) to increase to 100% for maximum power.
 - ▶ Check the CO₂ contents, and compare the values with those in the technical specifications (See **"Combustion Data" on page G-17**).
 - ▶ If the value is outside the range, adjust the combustion value by turning the main gas shutter (5) in small steps, to allow the value to stabilise before performing additional adjustments.
 - Rotate shutter screw (5) towards the "+" sign to increase the CO₂ contents.
 - Rotate shutter screw (5) towards the "-" sign to decrease the CO₂ contents.

Follow-on Task(s):

Write the values in the log sheet. Refer to **"Combustion Parameters - Log Sheet" on page I-95**.

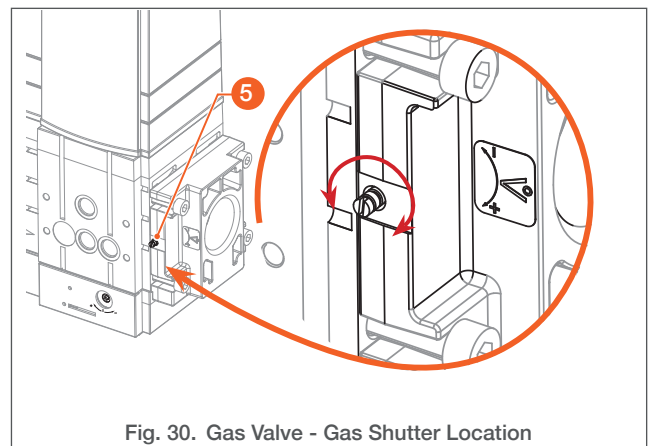


Fig. 30. Gas Valve - Gas Shutter Location

Safety Instructions for Maintenance



- › Inspection and maintenance tasks must be carried out by a qualified and certified professional, at least once a year.
- › Water flowing out of the drain valve can be extremely hot. Use extreme caution when draining a hot appliance.
- › Once the inspection and maintenance tasks are complete, ensure that all removed components are reinstalled and all connections are tight and secured.



- › Before performing any maintenance operation, shut down the appliance using the appliance on/off switch and isolate the electrical supply of the appliance through the external power-cutting device (fuse, circuit-breaker, etc.), unless power is required for the procedure (it will then be indicated in the procedure).
- › Do not touch the appliance with any wet body parts when it is supplied with electrical power.
- › Be careful ! Even when the appliance on/off switch is set to OFF, the high voltage terminals are still supplied with electrical power.



- › The maintenance of the appliance and its components must be carried out by a qualified professional.
- › Defective parts and components may only be replaced by genuine factory parts or parts approved by the manufacturer.
- › Replace any gaskets or seals present on the removed components before reinstallation, unless otherwise specified in the procedures.
- › To ensure the performance, durability and reliability of the appliance, it is recommended that the end-user perform the periodic checks mentioned in the Safety section for the user, at the beginning of this manual.
- › The minimum pressure of the primary circuit is 0,8 bar when cold, the normal pressure is 0,8 to the maximum pressure, as defined in the hydraulic characteristics in this manual.
- › If the water circuit needs to be topped up, allow the appliance to cool down and only add small quantities of water at a time. Adding a large quantity of cold water in a hot appliance can damage the appliance permanently.



The inspection and maintenance tasks are detailed in a table in this section. Make sure to perform all the recommended tasks and to fill in the log sheets available at the end of the manual with all the required information.

Maintenance Requirements

Tasks	@ inspection (1 year)	@ maintenance (2 years max)
Check that the boiler room ventilation / boiler air and flue ducts are unobstructed.	X	X
Verify flue gas and combustion air ducts are in good condition, sealed tight and properly supported.	X	X
Open the front panels and check the general condition inside the cabinet. Clean and vacuum as required.	X	X
Check the correct operation of the pressure switches (air and flue gas), refer to "Checking the Flue Gas (FPS) and Air (APS) Pressure Switches operation" on page I-66.	X	X
Clean the condensate pipe and trap. Refer to "Removing, Cleaning and Installing the Condensate Trap" on page I-74.	X	X
Clean/service the condensate neutralisation system (if any). Refer to manufacturer's documentation.	X	X
Clean any filter/dirt separator, plate heat exchanger or balance header present in the hydraulic system, as required. Refer to manufacturer's documentation.	X	X
Check for leaks, both inside and outside the appliance: water, gas, flue and condensate. Pay specific attention to the flanged connection between the fan and the burner plate.	X	X
Check boiler water pressure (at least 0,8 bar when cold). Top up the system with water if required.	X	X
Check the operation of the burner (flame) through the sight glass and that the combustion parameters (CO & CO ₂) are according to requirements. See "Combustion Data" on page G-17.	X	X
Check the gas pressure and that the gas supply shut-off devices are operating properly.	X	
Check that the pump(s) is/are operating properly.	X	
Check that the fan is operating properly.	X	
Replace the gas filter in the gas valve, refer to "Replacing the Gas Valve Filter" on page I-65	X	
Remove the burner and check its general condition. Clean as required. See "Removing, Checking, Cleaning and Installing the Burner" on page I-68.		X
Replace the ignition and ionization electrodes. Refer to "Removing and Installing the Ignition and Ionization Electrodes" on page I-67.		X

MAINTENANCE

Tasks	@ inspection (1 year)	@ maintenance (2 years max)
Check the condition of the burner plate insulation. Refer to " Removing, Checking, Cleaning and Installing the Burner " on page I-68.		X
Check all control wiring and connections.	X	X
Check the condition of the combustion chamber and clean it if required. See " Checking and Cleaning the Combustion Chamber " on page I-76.		X
Check water quality and record in log sheet, See " Water Parameters - Log Sheet " on page I-96	X	X
Check the operation of the flue damper (flue back-flow preventer), if any, and perform the required maintenance. Refer to the manufacturer's documentation.	X	X
Record the operations and results in the Log Sheets provided at the end of the manual	X	X

Shutting Down for Maintenance

Conditions:

None

Procedure:

Push the On/Off switch located on the right side of the boiler.



When in the OFF position, the switch is released from its pushed in position. Its built-in light goes off and the button comes flush with the outer frame.

Follow-on tasks:



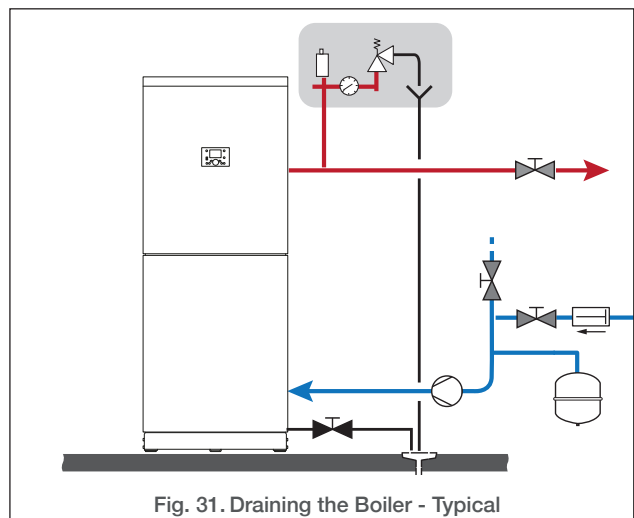
Draining the Boiler

Conditions:



Procedure:

1. Close the isolating valves (⚙️).
2. Connect the optional draining valve (⚙️) to the sewer with a hose.
3. Open the draining valve (⚙️) to empty the heating circuit of the boiler.
4. Provide relief at the manual air vent of the boiler.
5. Close the draining valve (⚙️) once the heating circuit of the boiler is empty.



Follow-on tasks: None

Restarting after Maintenance

Conditions:



Procedure:

1. Push in the On/Off switch located on the right side of the boiler.



When in the On position, the switch remains pushed in and is illuminated.

2. Select the desired heating mode, if required.
3. Activate the DHW mode as required.
4. Allow the appliance to operate for a few minutes, then bleed the air from the system.

Follow-on Task(s):

1. Check there is no leak in the water and gas circuits.
2. Check the combustion values according to "**Combustion Data**" on page G-17.
3. Record values in "**Combustion Parameters - Log Sheet**" on page I-95.
4. Check the heating circuit pressure (between 0,8 and 6 bar).

Replacing the Gas Valve Filter

Conditions:



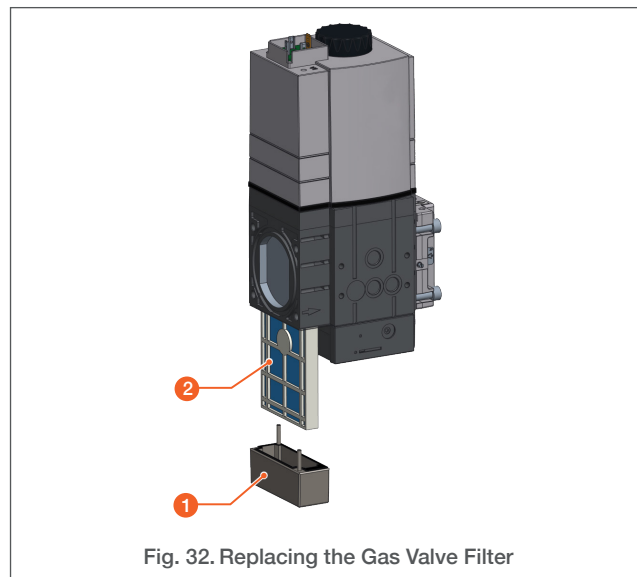
- › Left side top panel removed, refer to "**Removing and Installing the Access Panels**" on page I-34.

Cleaning Procedure (Fig. 32):

1. Release 2 screws and remove bottom cover (1). Retain for reinstallation.
2. Slide filter (2) out of its casing. Discard.
3. Insert new filter (2) into the casing.
4. Put bottom cover (1) back in position on gas valve body.

Follow-on Task(s):

Perform leakage and function test, $p_{max} = 360 \text{ mbar}$



MAINTENANCE


Checking the Flue Gas (FPS) and Air (APS) Pressure Switches operation


Conditions:     

Tools and material:

- Flat-head screwdriver
- Manometer (measuring range up to min. 10 mbar [1000 Pa])
- T-piece and 2 hoses

Check Procedure:

 This procedure needs to be performed with boiler (and controller) running, and the front panel open.

 When performing the following procedure, do not touch the high voltage connections and do not touch any inner component of the boiler with any wet body part.

1. Release the hose clamp (1) and disconnect the hose (2) running to the pressure switch (1), as illustrated below.
2. Connect a T-piece to the hose.

3. Connect manometer to one of the T-piece connections.
4. FPS: blow air into the hose while it is connected to the flue pressure switch and to the measuring device.
5. APS: suck air from the hose while it is connected to the air pressure switch and to the measuring device.
6. Verify that the pressure switch switches at the set pressure shown in table below and that the controller displays an error (refer to "Error Codes and Solutions" on page I-84):

N 280 FS - N 420 FS -
N 570 FS - N 840 FS

Flue Pressure Switch	8 mbar [800 Pa]
Air Pressure Switch	6 mbar [600 Pa]

7. In case of malfunction, replace the pressure switch.

Follow-on tasks:

1. Install hose clamp (1) on the hose (2). Reconnect the hose (2) to correct location, as shown in illustration below.
2. Check that the connection is not leaking.
3. Close boiler access panels, refer to "Removing and Installing the Access Panels" on page I-34.

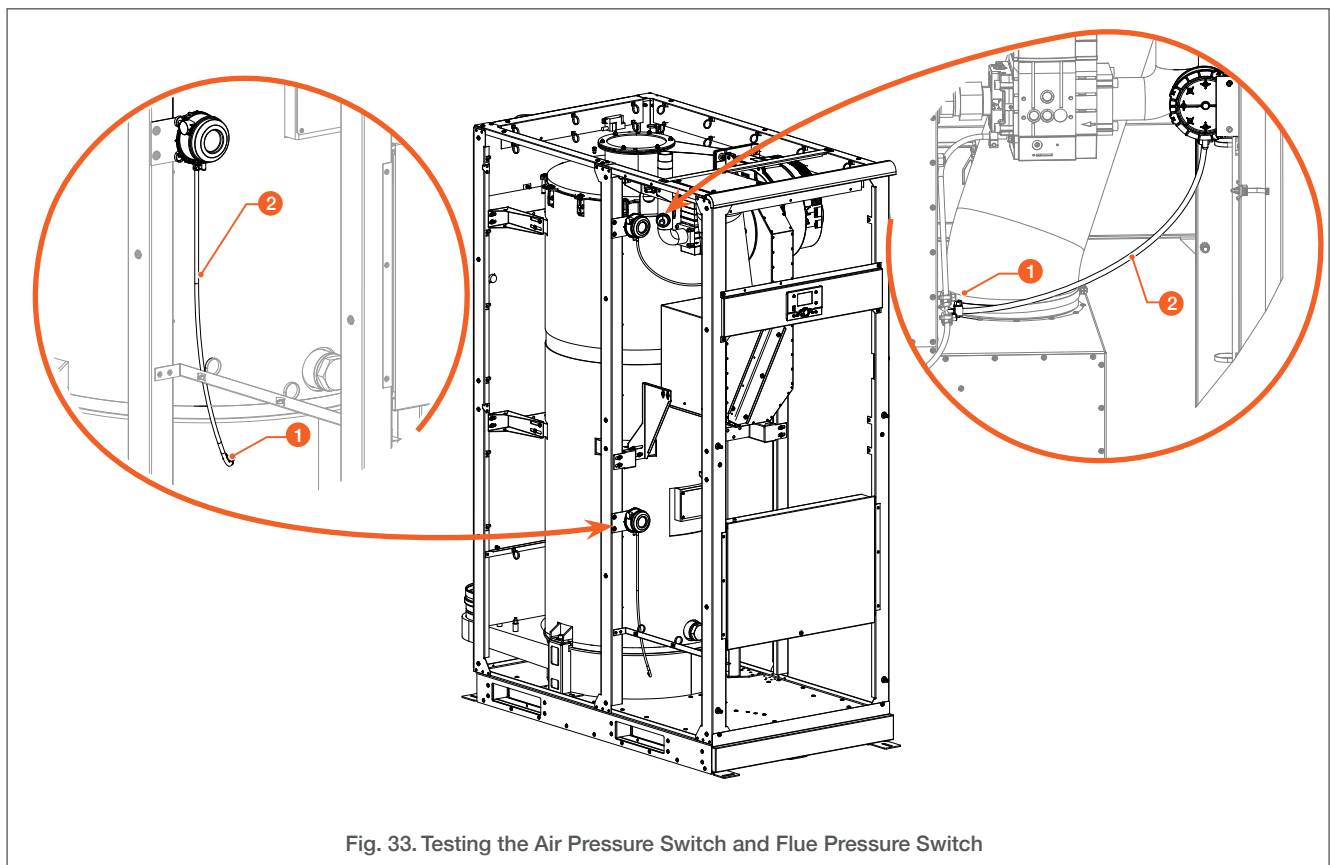


Fig. 33. Testing the Air Pressure Switch and Flue Pressure Switch

Removing and Installing the Ignition and Ionization Electrodes

Conditions:



Tools and Material:

- Wrench, hex head, size 3
- Torque wrench
- Protective gloves
- Face mask
- Loctite thread sealant 5972



These procedures are applicable to all NESTA PLUS models. Only the position of the electrodes differ. Only the N 280 FS is shown here. Please refer to Fig. 3 to Fig. 5 for the exact location on the various models.

Removal Procedure:

1. Disconnect all connectors and grounding cables from the electrodes.



- The procedure is identical for both electrodes.
- When removing the electrodes in the scope of the periodic maintenance, the electrodes and their gasket must be discarded and replaced by new ones.

2. Wearing protective gloves and a face mask, remove insulation from the upper plate. Retain for reinstallation.
3. Release two screws (1) from the electrode flange.
4. Remove the electrode and screws from the burner plate (3) and discard.
5. Remove electrode gasket (2) and discard.

Installation Procedure:

1. Install new gasket (2) on the burner plate (3).



The electrode should be inserted carefully to prevent causing any damage to the burner door insulation.

2. Carefully insert the electrode. Coat the threads of 2 electrode screws (1) with Loctite 5972.
3. Torque screws at 2,5 Nm.

Follow-on Task(s):

1. Visually check the condition of the burner plate insulation "Removing, Checking, Cleaning and Installing the Burner" on page I-68, and replace it as required. See "Replacing the Burner Plate Insulation (N280 FS)" on page I-70 or "Replacing the Burner Plate Insulation (N 420 FS to N 840 FS)" on page I-72.

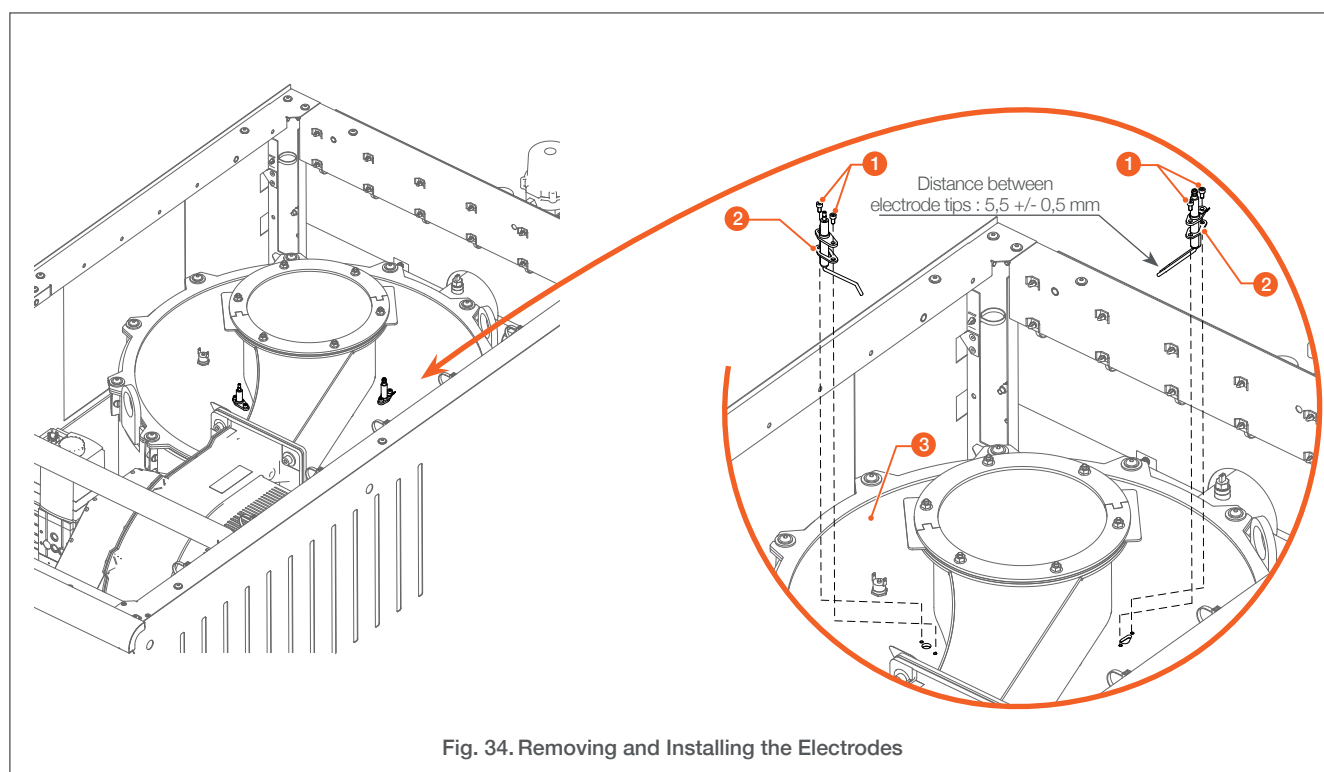


Fig. 34. Removing and Installing the Electrodes

MAINTENANCE

Removing, Checking, Cleaning and Installing the Burner

Conditions:     

- ▶ Top panels removed, refer to "**Removing and Installing the Access Panels**" on page I-34.

Tools and Material:

- ▶ Socket wrench, size 10
- ▶ Torque wrench
- ▶ Air compressor
- ▶ Protective gloves
- ▶ Face mask
- ▶ Torch
- ▶ Inspection mirror
- ▶ Loctite thread sealant 577 & 5972
- ▶ Electronic gas detector

Removal Procedure (Fig. 35 & Fig. 36):



The boiler components:

- ▶ **must be removed/installed from the top of the boiler; make sure to have an appropriate access means allowing safe work in height,**
 - ▶ **can be heavy and cumbersome. Ask for the help of another person to lift and remove them, as required.**
 - ▶ **Failure to comply could result in damages to equipment and/or injuries.**
1. Release nuts (1) securing the upper plate (2) to the heat exchanger.
 2. Remove the upper plate (2) and its gasket (3). Discard the gasket. Retain nuts for reinstallation.
 3. Release nuts (4) securing the burner tube (5) and gasket (6) to the combustion chamber.
 4. Extract burner tube (5) with gasket (6) from the combustion chamber. Discard the gasket. Retain nuts for reinstallation

Cleaning and Checks:

1. Visually check the condition of the burner tube (5). If required, clean as described in next step.
2. Wearing protective gloves and a face mask, clean the burner tube (5) with compressed air to remove residues. If it is in bad condition after cleaning, replace it.
3. Using a torch and a mirror, check the condi-

tion of the burner plate insulation, through the burner opening (particularly the area around the electrodes).

4. Replace the insulation if:
 - ▶ the insulation is cracked and damaged,
 - ▶ the burner plate shows discolouration or burns, Refer to "**Replacing the Burner Plate Insulation (N280 FS)**" on page I-70, or "**Replacing the Burner Plate Insulation (N 420 FS to N 840 FS)**" on page I-72.
5. Clean the combustion chamber, as required, see "**Checking and Cleaning the Combustion Chamber**" on page I-76.

Installation Procedure:

1. Install new gasket (6) and burner tube (5) on combustion chamber studs.
2. Put Loctite 5972 on the threads of the combustion chamber studs and install retained nuts (4).
3. Torque in a crosswise pattern at 2,5 Nm, then repeat the operation at 4,5 Nm in a crosswise pattern, then in a circle, at 4,5 Nm.
4. Place new gasket (3) and upper plate (2) on heat exchanger studs.
5. Coat stud threads with Loctite 577.
6. Install six retained nuts (1) on the studs.
7. Torque in a crosswise pattern at 2,5 Nm, then repeat the operation at 4,5 Nm in a crosswise pattern, then in a circle, at 4,5 Nm.

Follow-on Task(s):

1. Wearing protective gloves and a face mask, install insulation on the upper plate.
2. Reconnect all connectors and ground cables to the electrodes.
3. Reinstall all removed access panels, refer to "**Removing and Installing the Access Panels**" on page I-34.
4. Restart the appliance, see "**Restarting after Maintenance**" on page I-65.
5. Using an electronic gas detector, check that there are no gas leaks at the flange between the fan and the burner plate.

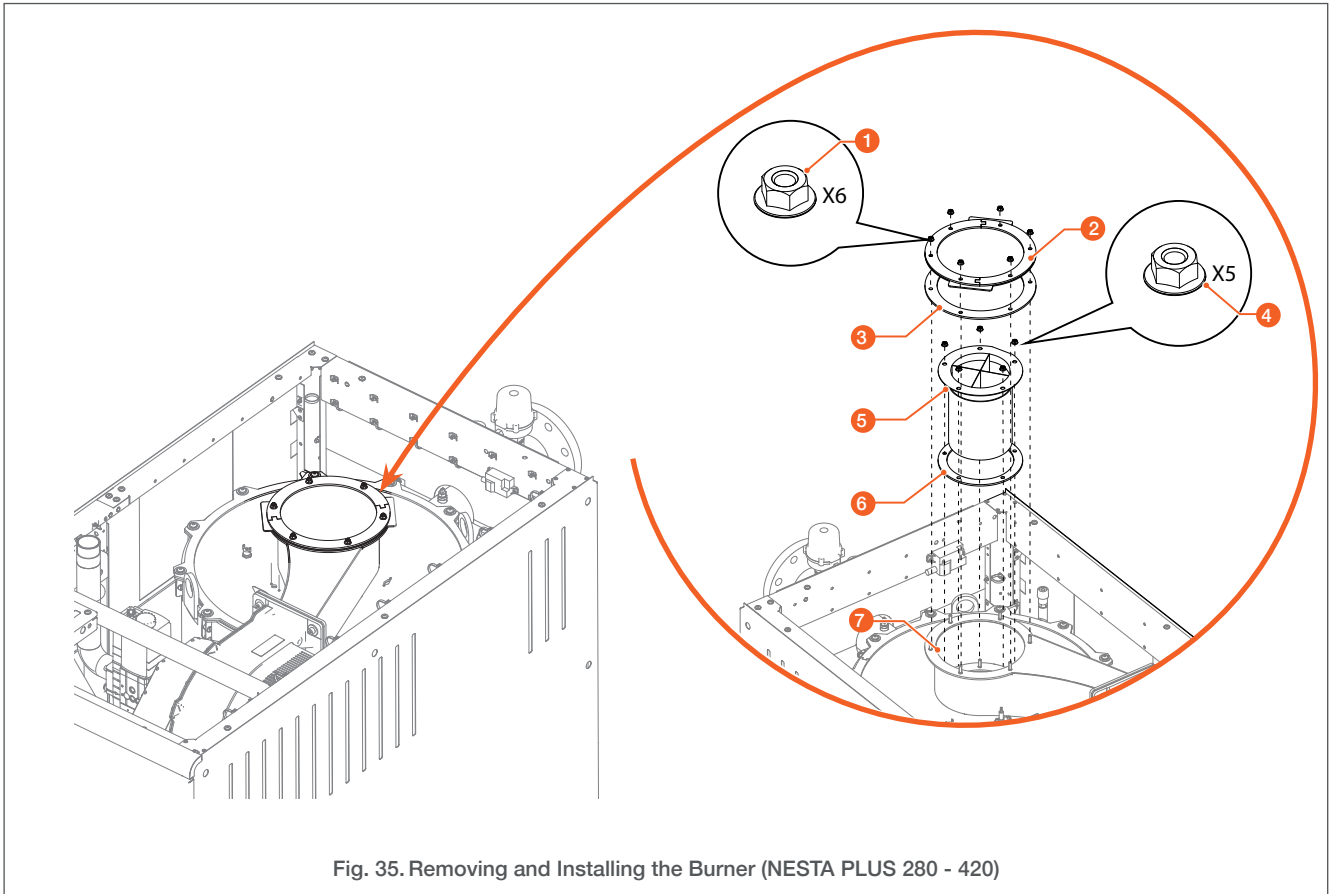


Fig. 35. Removing and Installing the Burner (NESTA PLUS 280 - 420)

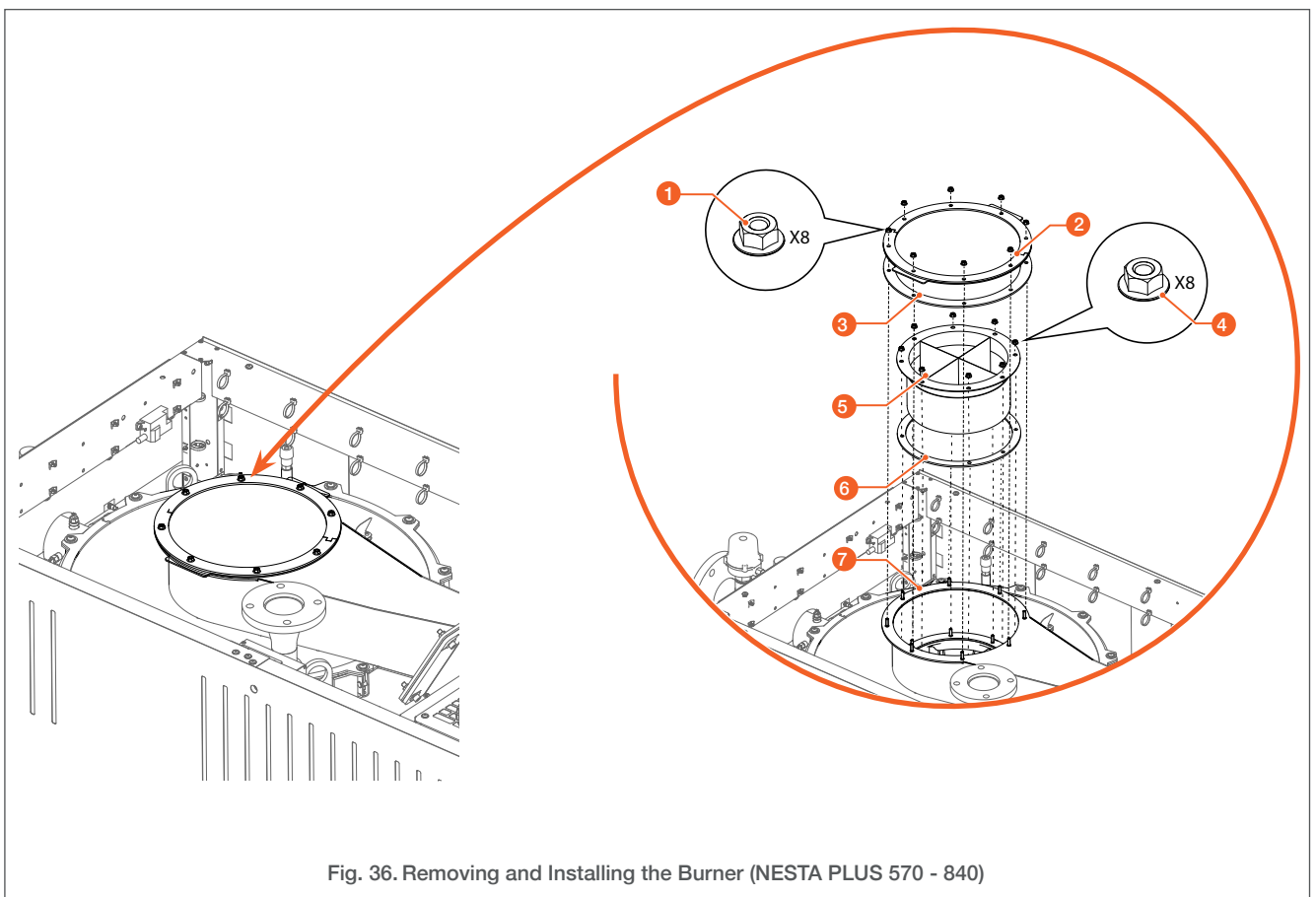


Fig. 36. Removing and Installing the Burner (NESTA PLUS 570 - 840)

Replacing the Burner Plate Insulation (N280 FS)



- ▶ Burner tube removed, refer to "Removing, Checking, Cleaning and Installing the Burner" on page I-68.
- ▶ Electrodes removed, refer to "Removing and Installing the Ignition and Ionization Electrodes" on page I-67

Tools and Material:

- ▶ Wrench, hex head, sizes 4 & 5
- ▶ Screwdriver
- ▶ Torque wrench
- ▶ Protective gloves
- ▶ Face mask
- ▶ Loctite thread sealant 577(♠) & 5972



The boiler components :

- ▶ must be removed/installed from the top of the boiler; make sure to have appropriate access means allowing safe work in height, can be heavy and cumbersome. Ask for the help of another person to lift and remove them, as required.
- ▶ Failure to comply with these instructions could result in damages to equipment and/or injuries.

Removal Procedure (Fig. 37):

1. Release four top screws securing the stiffener (1) to the boiler frame, and one from the air inlet side. Remove stiffener (1) and hardware and retain for reinstallation.
2. Using a screwdriver, release clamp (2) to disconnect air pipe from air duct. Leave end loose.
3. Release four screws securing gas inlet flange (3) to gas valve (4). Remove hardware and retain for reinstallation.
4. Release four screws securing shutter (5) to gas valve (4). Carefully remove gas valve (4), hardware and 2 O-rings. Retain for reinstallation.



Check O-ring condition. If damaged or cracked, discard and replace.

5. Release three nuts and stud bolts (6) from air-gas mixer flange. Remove mixer assembly (7) (shutter, spacer, mixer flange and whirlwind) and flange gasket. Retain all parts for reinstallation.
6. Release two screws from air duct bracket (8).
7. Release three nuts and studs (9) from whirlwind flange inside the air duct. Remove air inlet (10) and hardware and retain for reinstallation.
8. Release four bolts and nuts from fan flange (11). Remove fan, hardware and gasket (12). Discard gasket (12). Retain fan and hardware for reinstallation.
9. Wearing protective gloves and a face mask, release twelve bolts and washers securing burner plate (13) to the combustion chamber.

10. Remove burner plate along with insulation.
11. Turn burner plate over, to have insulation (14) facing upwards. Place on a clean and level surface.
12. Remove four nuts and washers (15) around the burner tube hole. Retain nuts and metal washers for reinstallation. Discard paper washers.
13. Remove eight bolts and washers (16). Retain for reinstallation.
14. Remove insulation plate (14) and discard.



To discard the damaged insulation, place in the transport bag from the new insulation, then throw away with normal waste. This will prevent any dust present to contaminate the area.

Installation Procedure:

1. Coat all burner door studs with Loctite 5972.
2. Wearing protective gloves and a face mask, locate new insulation (14) on burner plate. Ensure that electrode holes are well positioned.
3. Install eight bolts and washers (16). Torque at 4,5 Nm.
4. Install 3 paper washers per stud, then install four nuts and metal washers (15). Torque at 1,5 Nm.



Some hardware require the use of Loctite thread sealant 577 at installation. When this is the case, a "drop" symbol (♠) is added next to the part in the text and on the picture.

5. Turn burner plate (13) over and install on combustion chamber studs (♠), insulation inside.
6. Fasten burner plate (13) with twelve bolts and washers. Torque in a crosswise pattern at 3 Nm, then in a circle, at 6 Nm.
7. Install fan on fan flange (11), with a new gasket (12), using four bolts (♠) and nuts. Torque at 15 Nm.
8. Install air inlet (10) on flange, using three retained studs (♠). Torque at 6 Nm. Then install three retained nuts (9♠), and torque at 6 Nm.
9. Install two screws on air duct bracket (8).
10. Install mixer assembly (7) on mixer flange, using three retained stud bolts (♠), torque at 6 Nm, and three retained nuts (6♠). Torque at 6 Nm.
11. Install gas valve (4) on shutter (5), with new or retained O-ring. Torque four screws (♠) at 6 Nm.
12. Install gas valve (4) on gas inlet flange (3), with new or retained O-ring using four screws (♠). Torque at 6 Nm.
13. Install air pipe on whirlwind air-duct. Tighten clamp screw (2) until secure.
14. Install stiffener (1) on boiler frame, using four top screws and one side screw.

Follow-on Task(s):

1. Clean Combustion chamber. See "Checking and Cleaning the Combustion Chamber" on page I-76.
2. Install the burner. See "Removing, Checking, Cleaning and Installing the Burner" on page I-68.

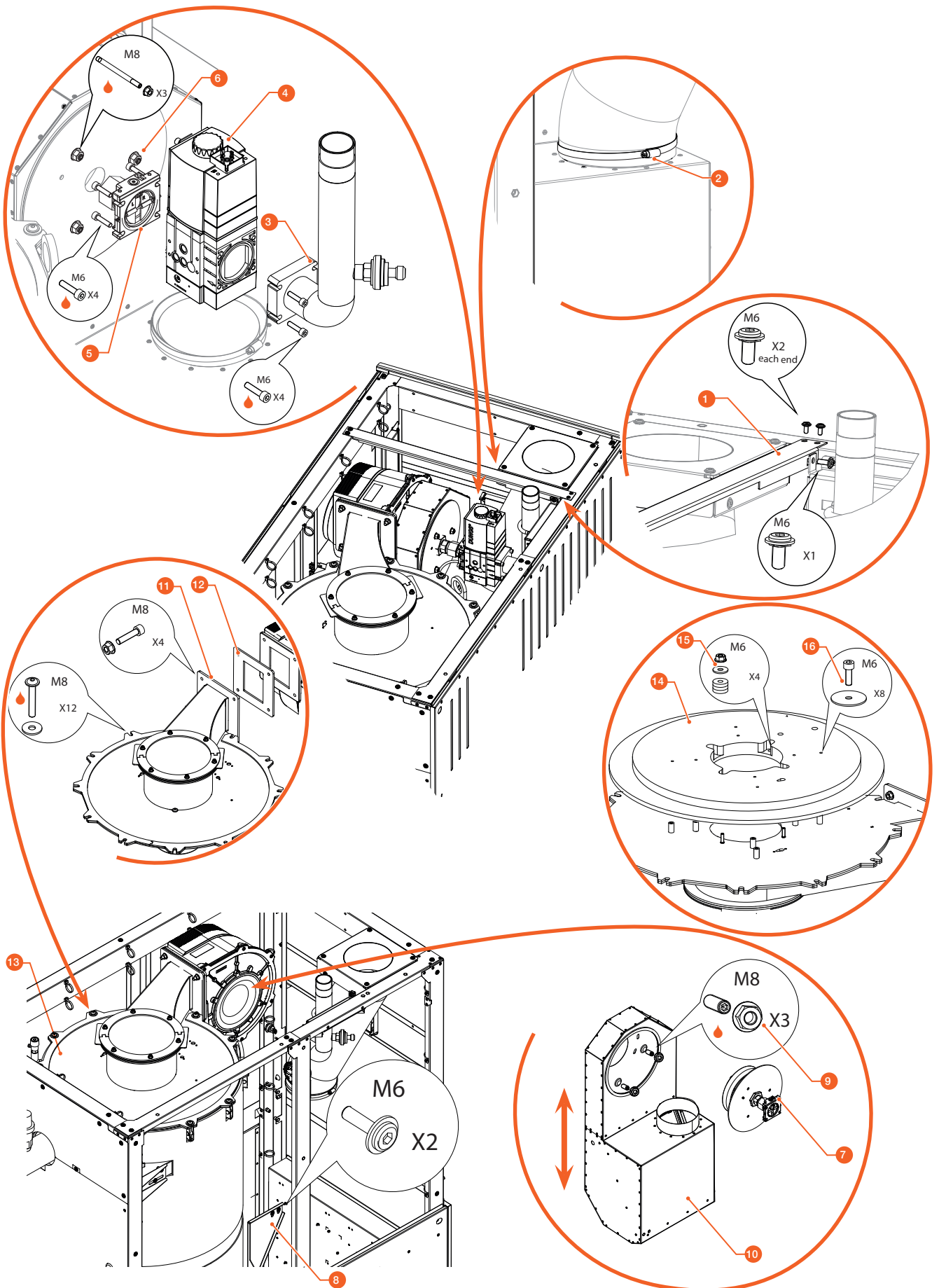


Fig. 37. Replacing the Burner Plate Insulation (NESTA PLUS 280)

MAINTENANCE

Replacing the Burner Plate Insulation (N 420 FS to N 840 FS)

Conditions:     

- ▶ Burner tube removed, refer to **"Removing, Checking, Cleaning and Installing the Burner"** on page I-68.
- ▶ Electrodes removed, refer to **"Removing and Installing the Ignition and Ionization Electrodes"** on page I-67.

Tools and Material:

- ▶ Wrench, hex head, sizes 4 & 5
- ▶ Screwdriver
- ▶ Torque wrench
- ▶ Protective gloves
- ▶ Face mask
- ▶ Loctite thread sealant 577 (🔥) & 5972



The boiler components :

- ▶ must be removed/installed from the top of the boiler; make sure to have an appropriate access means allowing safe work in height,
- ▶ can be heavy and cumbersome. Ask for the help of another person to lift and remove them, as required.
- ▶ Failure to comply with these instructions could result in damages to equipment and/or injuries.

Removal Procedure (Fig. 38):

1. Release four top screws securing the stiffener (1) to the boiler frame, and one from the air inlet side. Remove stiffener (1) and hardware and retain for reinstallation.
2. Using a screwdriver, release clamp (2) to disconnect air pipe from air duct. Leave end loose.
3. Release four screws securing shutter (3) to gas valve (4). Remove hardware and O-ring. Retain for reinstallation.



Check O-ring condition. If damaged or cracked, discard and replace.

4. Release four bolts and nuts from fan flange (7). Remove fan and air mixer assembly (6), with hardware and gasket (8). Discard gasket (8). Retain hardware for reinstallation.
5. Wearing protective gloves and a face mask, release twelve bolts and washers securing burner plate (9) to the combustion chamber.
6. Remove burner plate (9) and insulation assembly.

7. Turn burner plate (9) over, to have insulation (10) facing upwards. Place on a clean and level surface.
8. Remove six nuts and washers (11) around the burner tube hole. Retain nuts and metal washers for reinstallation. Discard paper washers.
9. Remove twelve outer bolts and washers (12). Retain for reinstallation.
10. Remove insulation plate (10) and discard.



To discard the damaged insulation, place in the transport bag from the new insulation, then throw away with normal waste. This will prevent any dust present to contaminate the area.

Installation Procedure:

1. Coat all burner door studs with Loctite 5972.
2. Wearing protective gloves and a face mask, locate new insulation (10) on burner plate (9). Ensure that electrode holes are well positioned.
3. Install twelve bolts and washers (12). Torque at 4,5 Nm.
4. Install 3 paper washers per stud, then install six nuts and washers (11). Torque at 1,5 Nm.



Some hardware require the use of Loctite thread sealant 577 at installation. When this is the case, a "drop" symbol (🔥) is added next to the part in the text and on the picture.

5. Turn burner plate (9) over and install on combustion chamber studs (🔥), insulation (10) inside.
6. Fasten burner plate (10) with twelve bolts and washers. Torque in a crosswise pattern at 3 Nm, then in a circle, at 6 Nm.
7. Secure fan and air mixer assembly (6) to fan flange (7), with a new gasket (8), using four bolts and nuts (🔥). Torque at 15 Nm.
8. Install gas valve (4) on shutter (3), with new or retained O-ring. Torque four screws (🔥) at 6 Nm.
9. Install air pipe on whirlwind air-duct. Tighten clamp screw (2) until secure.
10. Install stiffener (1) on boiler frame, using four top screws and one side screw.

Follow-on Task(s):

1. Clean Combustion chamber. See **"Checking and Cleaning the Combustion Chamber"** on page I-76.
2. Install the burner. See **"Removing, Checking, Cleaning and Installing the Burner"** on page I-68.

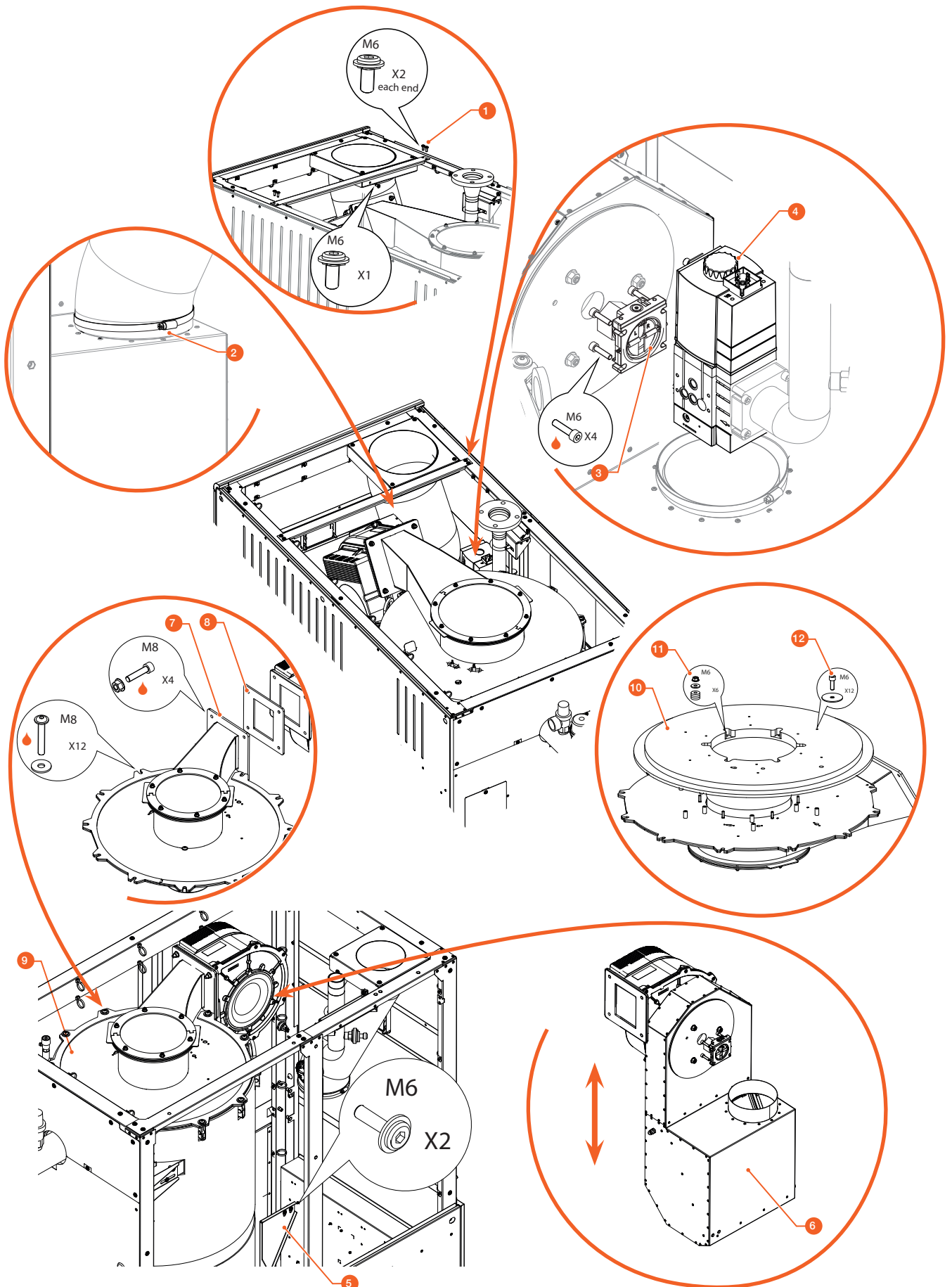


Fig. 38. Replacing the Burner Plate Insulation (NESTA PLUS 420 to 840)

MAINTENANCE

Removing, Cleaning and Installing the Condensate Trap

Conditions:     

Tools and material:

- ▶ Wrench, hex head, size 4
- ▶ Torque wrench
- ▶ Clean cloth

Protective Cover Removal:

1. Release two top screws (1) from the protective cover. Retain for reinstallation.
2. Release two bottom screws (2). Retain for reinstallation.
3. Remove protective cover (3) from condensate trap and set aside.

Condensate Trap Removal

1. Disconnect connector (6) from condensate level switch.
2. Release the clamp (5) to disconnect the condensate pipe between heat exchanger and condensate trap (8).
3. Clean the pipe. Retain for reinstallation or replace as required.
4. Release the clamp (4) to disconnect the vent hose between the heat exchanger and the condensate trap (8). Retain for reinstallation.
5. Release two screws (7) and remove condensate trap (8) and bracket from boiler frame. Retain screws (7) for reinstallation.

Cleaning

1. Check that the heat exchanger condensate outlet and the condensate trap inlet are not clogged. Clean as required.
2. Release two screws (9) and open the condensate trap cover (10). Retain cover and hardware for reinstallation.
3. Remove the cover gasket (11). Discard.
4. Wipe clean the condensate level switch (12) attached to the cover. Remove and replace as required.
5. Clean the deposits in the condensate trap (8) using clear water and a cloth.
6. Wipe the ball located above the exit pipe.

Condensate Trap Installation



- ▶ In case of first installation, go directly to step 4.
- ▶ Make sure to put the ball back in place in the trap before reinstalling the cover.

1. Install the ball in position inside the condensate trap (8).
2. Install a new gasket (11) on the condensate trap (8).
3. Reinstall the cover (10) with two retained screws (9). Torque the screws at 6 Nm.
4. Position the condensate trap (8) bracket on boiler and secure with two retained screws (7).
5. Connect the vent hose between the heat exchanger and the condensate trap (8), tighten clamp (4) to secure hose.
6. Connect the condensate pipe to the condensate trap inlet and heat exchanger condensate outlet. Tighten clamp (5) to secure pipe.
7. Connect the connector (6) to the condensate level switch.

Protective Cover Installation:



In case of first installation, use the hardware provided with the protective cover. Otherwise, use the hardware retained at removal.

1. Install protective cover (3) on condensate trap.
2. Install two bottom screws (2).
3. Install two top screws (1).

Follow-on Task(s):

None

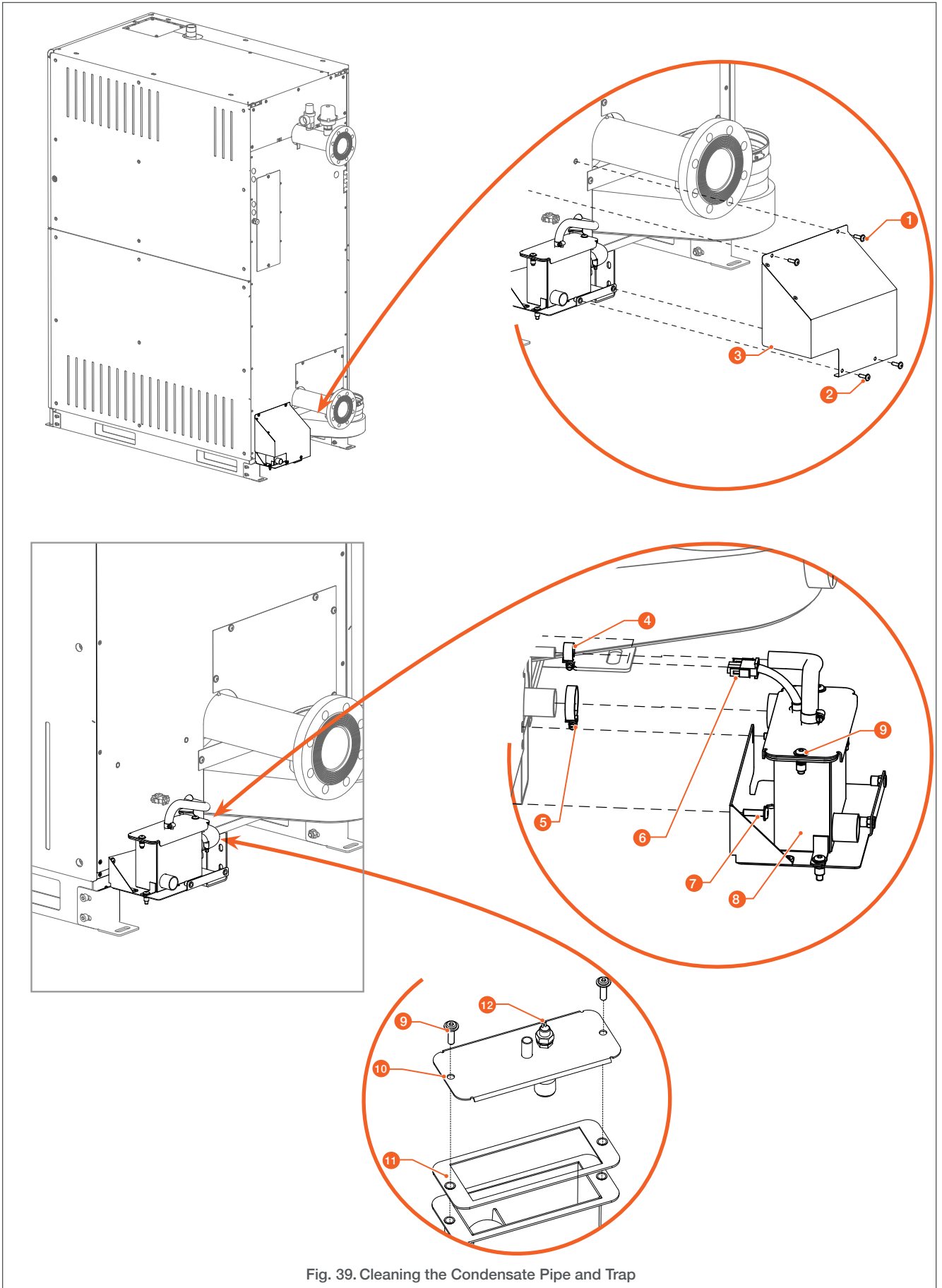


Fig. 39. Cleaning the Condensate Pipe and Trap

Checking and Cleaning the Combustion Chamber

Conditions:



- › Burner removed, see "*Removing, Checking, Cleaning and Installing the Burner*" on page I-68.

Tools and material:

- › Industrial vacuum cleaner
- › Nylon bristle brush
- › Torch

Check Procedure:



These procedures should be performed through the burner opening, unless the burner plate and insulation have been removed.

If the burner plate and insulation are still installed, be careful not to damage the insulation located under the burner plate.

1. Using a torch, visually check the condition of the combustion chamber. If it is dirty, clean it.

Cleaning Procedure

1. Using a nylon bristle brush, sweep the walls of the combustion chamber.
2. Using an industrial vacuum cleaner, remove all deposits from the combustion chamber heating surfaces.

Follow-on Task(s):

1. Install the burner plate and insulation, as required. See "*Replacing the Burner Plate Insulation (N280 FS)*" on page I-70
2. Install the burner, see "*Removing, Checking, Cleaning and Installing the Burner*" on page I-68.

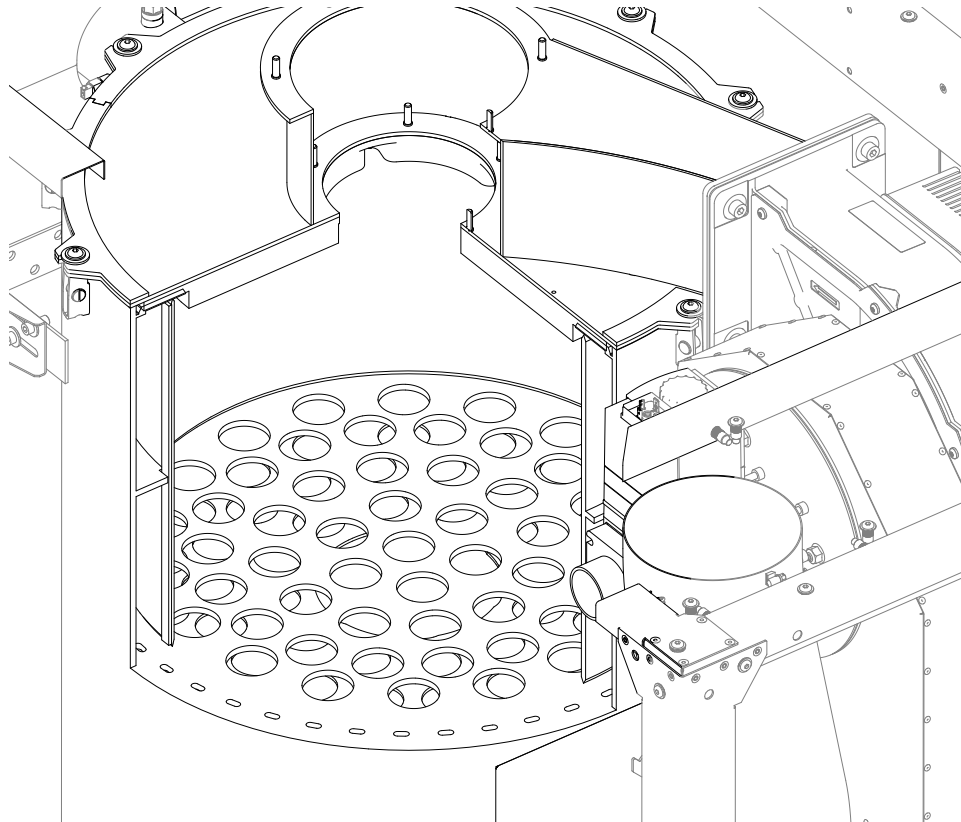


Fig. 40. Cleaning the Combustion Chamber (with burner plate installed)

Optional Modules

Extension Module & Cable Hub

NESTA PLUS boilers can control 3 heating circuits with mixing functions, using 3 extension modules. Each extension supply needs to be provided with power supply and a bus connection.

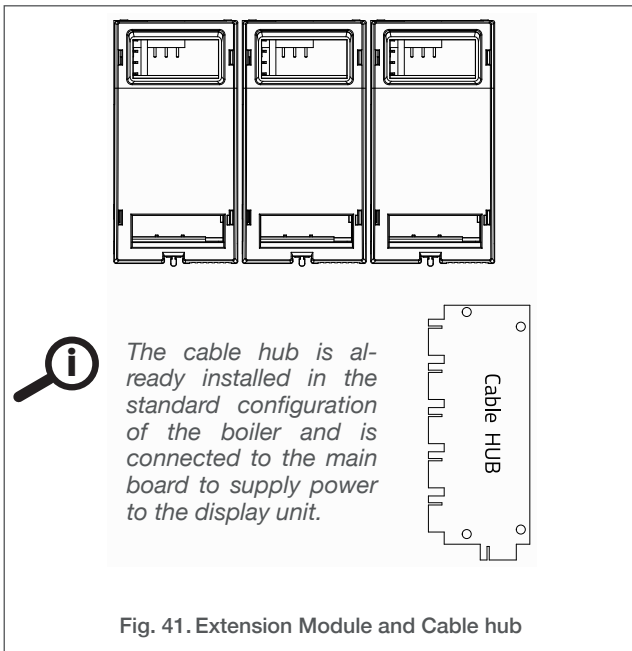


Fig. 41. Extension Module and Cable hub

Cascading module

This module allows the installation of several boilers in a cascade to increase the heating power in specific applications. This cascade module enables communication from one boiler to another, and must be installed in each boiler. See "**Boilers in a Cascade System**" on page I-78.

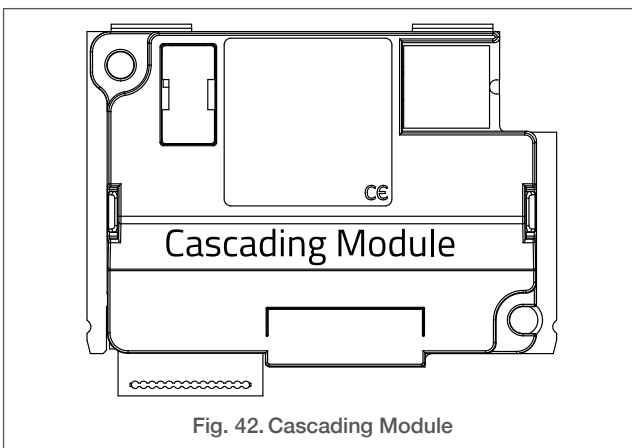


Fig. 42. Cascading Module

Web Server Module

Through the use of this module, you can connect to an Ethernet and get remote access to the boiler and all the heating system via the Internet. Using a computer or mobile devices, you can monitor and control the installation remotely. Management takes place via a web browser.

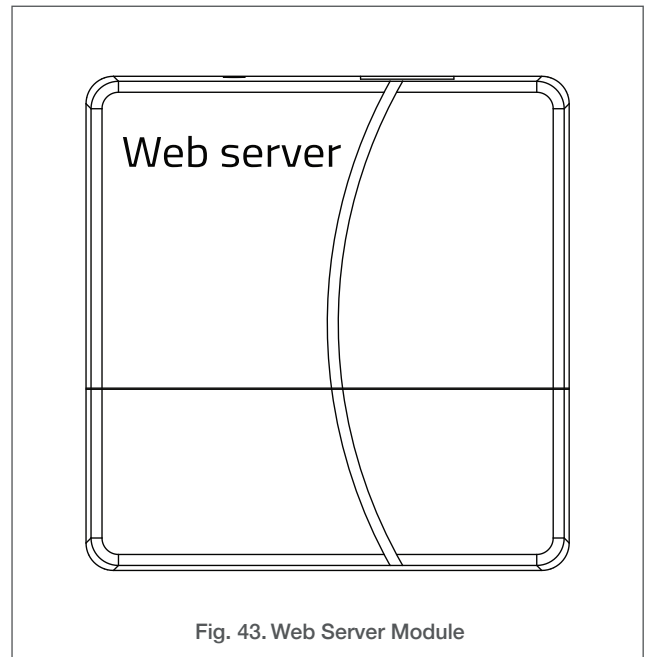


Fig. 43. Web Server Module

ADDITIONAL INFORMATION FOR THE INSTALLER

Boilers in a Cascade System

In a heating system comprised of several boilers, it is important that the power generated by the boilers adapts at any moment to the demand of the installation, always optimising the generators' efficiency.

Up to 4 boilers can be connected in a cascade to one chimney, and 4 such groups of boilers with their chimneys can be controlled using the control unit of one boiler.

The boiler with device address 1 assumes the role of the cascade Principal, and the others are Subsequent.

i *In the controller menus, please note that the Principal boiler is called "Master" and a Subsequent boiler is called "Slave".*

The principal boiler activates the required functions and shows the additional menus with the parameters for use with the cascaded system.

This boiler has all the logic control of the cascaded system and also regulates the stop/start sequence of each boiler according to the demand of the installation.

The boilers are connected to each other using the cascade module (see **Fig. 45**). Each boiler has its own module, which is connected directly to the board.

When several boilers are cascaded through their chimney system, make sure to install a non-return valve (flue damper) between the boiler flue outlet and the chimney connection. This will prevent any back flow of the flue gases into a boiler that is not in operation. Please refer to the manual provided with the accessory for installation and maintenance recommendations.

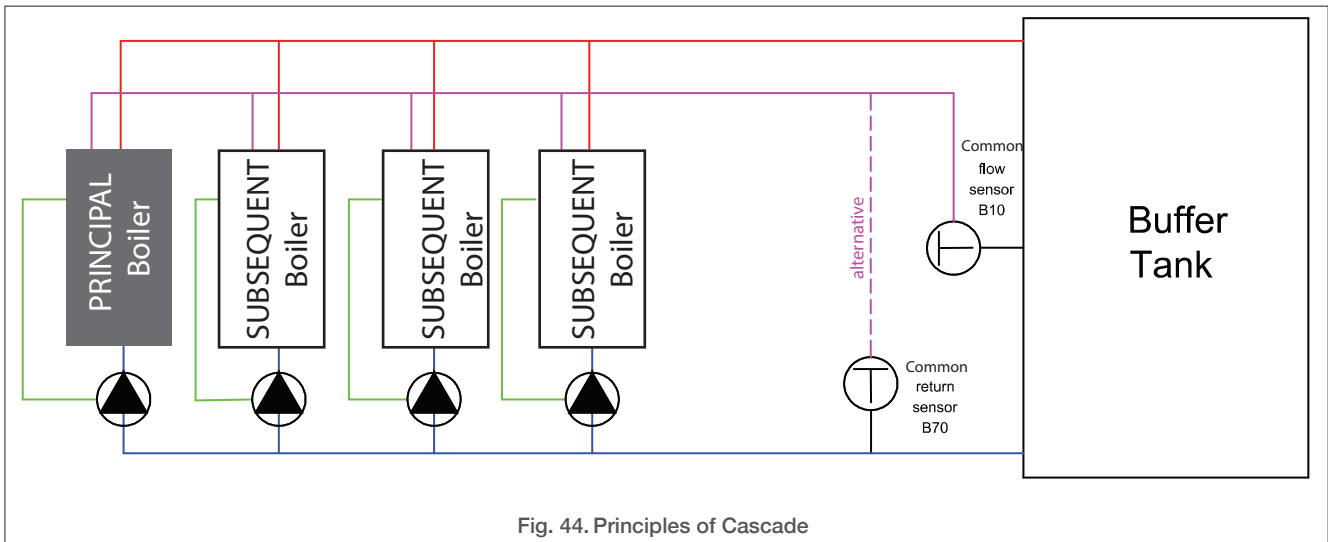


Fig. 44. Principles of Cascade

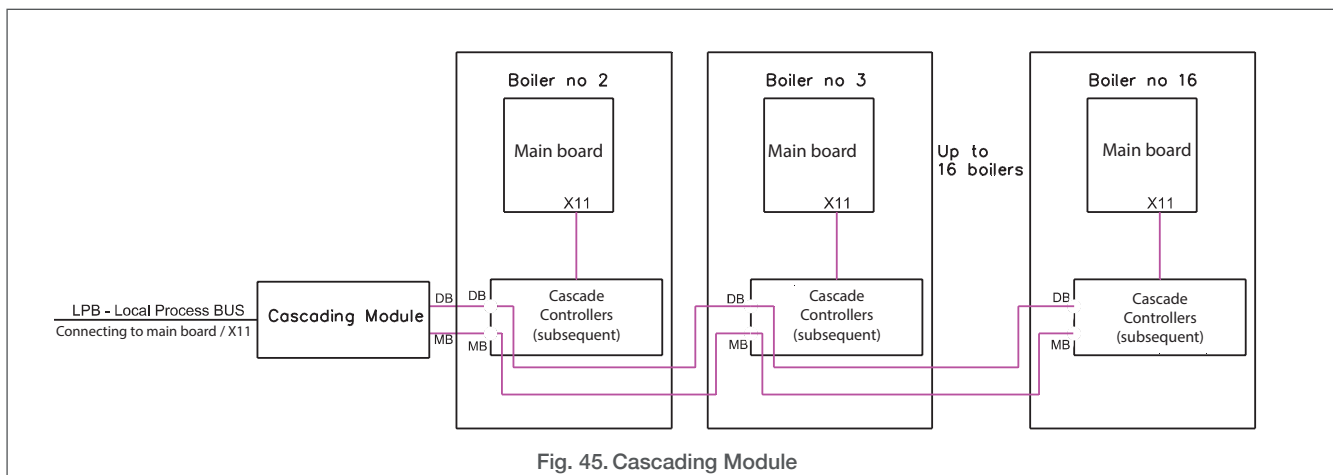
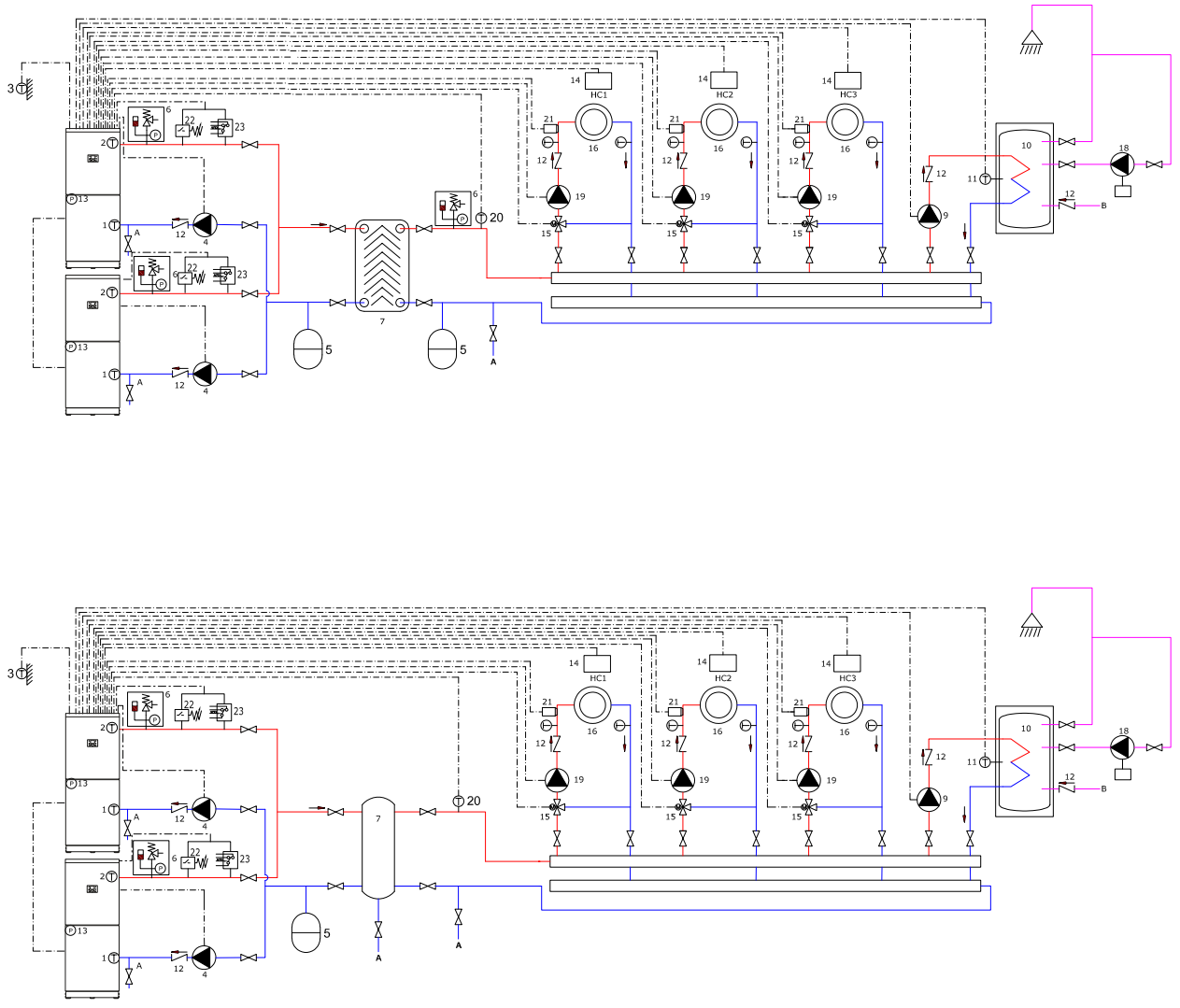


Fig. 45. Cascading Module



- | | |
|---|--|
| <p>H.C. – Heating circuit
 D.H.W. – Domestic hot water
 A – Mains cold water supply/drain
 B – DHW cold water supply
 1. Inlet temperature sensor
 2. Outlet temperature sensor
 3. Outside temperature sensor
 4. Boiler pump
 5. Expansion tank
 6. Safety group (safety valve, air vent - air purge, manometer)
 7. Plate heat exchanger/Low loss header
 8. Air vent
 9. DHW Pump</p> | <p>10. DHW Storage tank
 11. DHW Storage tank temperature sensor
 12. Check valve
 13. Water pressure sensor
 14. Room unit / Room thermostat
 15. Mixing valve
 16. Consumers
 17. Cascade return sensor
 18. DHW Circulation pump (with timer)
 19. HC Pump
 20. System flow temperature sensor
 21. HC1, HC2, HC3 temperature sensor
 22. Max. pressure limiter (>300 kW boiler)
 23. High temperature limiter (>300 kW boiler)</p> |
|---|--|

Fig. 46. Cascade System with Plate Heat Exchanger / Low Loss Header

Boiler Settings for the Installer

Access Levels

Three different levels of settings are available for the Installer : End user level (Eu), Commissioning level (C) and Engineer level (E). A fourth level, OEM, is only accessible at factory level, through the use of a code.

Each level allows to set certain specific parameters or program the boiler, according to the installed circuits.

The menus of the End user level are described in "**Structure of Menus for the End User**" on page U-27. The menus for the qualified professional (Commissioning and Engineer) are described in the following pages.

To access the Commissioning and the Engineer levels, proceed as follows:

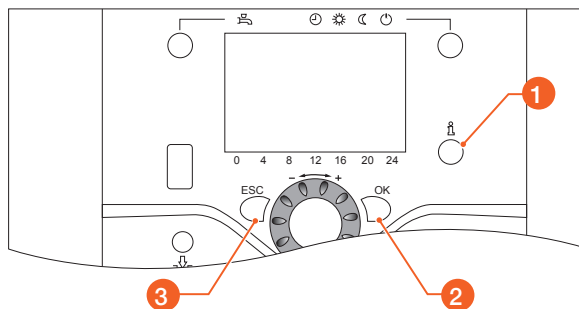
1. Press the OK (2) button
2. Press the Info button (1) for more than 3 seconds. The access levels are displayed.

Structure of Menus for the Installer

Top menu	Level	Pgm No.	Submenu 1	Submenu 2	Default	Setting
Time of day and date	Eu	1	▶ Hours / Minutes		01:00 (hh:min)	
	Eu	2	▶ Day / Month		01.01 (dd.mm)	
	Eu	3	▶ Year		2019 (yyyy)	
	Eu	5	▶ Start of summertime		25.03 (dd.mm)	
	Eu	6	▶ End of summertime		25.10 (dd.mm)	
Operator section	Eu	20	▶ Language	<ul style="list-style-type: none"> • Deutsch, English, Français, Italiano, Nederlands, Español, Dansk, Suomi, Svenska, Portuguese 	English	
	E	22	▶ Info	<ul style="list-style-type: none"> • Temporarily • Permanently 	Temporarily	
	E	26	▶ Operation lock	<ul style="list-style-type: none"> • Off • On 	Off	
	E	27	▶ Programming lock	<ul style="list-style-type: none"> • Off • On 	Off	
C	28	▶ Direct Adjustment	<ul style="list-style-type: none"> • Automatic storage • Storage with confirmation 	Storage with confirmation		

Commissioning Menu

When starting up the boiler for the first time, a commissioning screen will come up. It can be exited without adjustments by pressing the ESC (3) button. If the parameters are not set and saved, the screen will open automatically the next time the boiler is turned on, until the parameters are set and saved.



Menus and Settings

The following table contains the menus and sub-menus for the installer (End user, Commissioning and Engineer levels). The last column allows the installer to write down the setting defined for each parameter at installation, if it is different from the default.

ADDITIONAL INFORMATION FOR THE INSTALLER

Top menu	Level	Pgm No.	Submenu 1	Submenu 2	Default	Setting
	Eu	29	► Units	<ul style="list-style-type: none"> • °C, bar • °F, PSI 	°C, bar	
Operator Section (Cnt'd)	C	44	► Operation HC2	<ul style="list-style-type: none"> • Jointly with HC1 • Independently 	Jointly with HC1	
	C	46	► Operation HC3/P	<ul style="list-style-type: none"> • Jointly with HC1 • Independently 	Jointly with HC1	
	E	70	► Software version			
Time Prog heating circuit 1	Eu	500	► Select Mo-Su	<ul style="list-style-type: none"> • Mo-Su, Mo-Fr, Sa-Su, Mo, Tu, We, Th, Fr, Sa, Su 	Mo-Su	
	Eu	501	► <i>(day or range selection)</i> 1st phase on		6:00 (h/min)	
	Eu	502	► <i>(day or range selection)</i> 1st phase off		22:00 (h/min)	
	Eu	503	► <i>(day or range selection)</i> 2nd phase on		--:-- (h/min)	
	Eu	504	► <i>(day or range selection)</i> 2nd phase off		--:-- (h/min)	
	Eu	505	► <i>(day or range selection)</i> 3rd phase on		--:-- (h/min)	
	Eu	506	► <i>(day or range selection)</i> 3rd phase off		--:-- (h/min)	
	Eu	516	► Default values	<ul style="list-style-type: none"> • No • Yes 	No	
	Time Program 5	Eu	600	► Select Mo-Su	<ul style="list-style-type: none"> • Mo-Su, Mo-Fr, Sa-Su, Mo, Tu, We, Th, Fr, Sa, Su 	Mo-Su
Eu		601	► <i>(day or range selection)</i> 1st phase on		6:00 (h/min)	
Eu		602	► <i>(day or range selection)</i> 1st phase off		22:00 (h/min)	
Eu		603	► <i>(day or range selection)</i> 2nd phase on		--:-- (h/min)	
Eu		604	► <i>(day or range selection)</i> 2nd phase off		--:-- (h/min)	
Eu		605	► <i>(day or range selection)</i> 3rd phase on		--:-- (h/min)	
Eu		606	► <i>(day or range selection)</i> 3rd phase off		--:-- (h/min)	
Eu		616	► Default values	<ul style="list-style-type: none"> • No • Yes 	No	
Holidays heating circuit 1		Eu	641	► Preselection	<ul style="list-style-type: none"> • Period 1 ... Period 8 	Period 1
	Eu	642	► Period (Number): Start		--:-- (dd:mm)	
	Eu	643	► Period (Number): End		--:-- (dd:mm)	
	Eu	648	► Operating level	<ul style="list-style-type: none"> • Frost Protection • Reduced 	Frost Protection	

ADDITIONAL INFORMATION FOR THE INSTALLER

Top menu	Level	Pgm No.	Submenu 1	Submenu 2	Default	Setting
Heating circuit 1	Eu	710	▶ Room comfort setpoint		20,0°C	
	Eu	712	▶ Room reduced setpoint		16,0°C	
	Eu	714	▶ Room frost protection setpoint		10,0°C	
	E	716	▶ Comfort setpoint max		35,0°C	
	Eu	720	▶ Heating curve slope		1,5	
	E	721	▶ Heating curve displacement		0,0°C	
	E	726	▶ Heating curve adaptation	<ul style="list-style-type: none"> • Off • On 	Off	
	Eu	730	▶ Summer/winter heating limit		18,0°C	
	E	732	▶ 24-hour heating limit		-3°C	
	E	733	▶ Ext'n 24-hour heating limit	<ul style="list-style-type: none"> • No • Yes 	Yes	
	C	740	▶ Flow temp setpoint min		8°C	
	C	741	▶ Flow temp setpoint max		90°C	
	Eu	742	▶ Flow temp setpoint room stat		65°C	
	E	744	▶ Swi-on ratio room stat		---	
	C	746	▶ Delay heat request		0 s	
	E	750	▶ Room influence		20%	
	E	760	▶ Room temp limitation		1°C	
	E	770	▶ Boost heating		3°C	
	E	780	▶ Quick setback	<ul style="list-style-type: none"> • Off • To reduced setpoint • To frost prot setpoint 	Off	
	E	790	▶ Optimum start control max		0 min	
	E	791	▶ Optimum stop control max		0 min	
	E	800	▶ Reduced setp increase start		-5°C	
	E	801	▶ Reduced setp increase end		-15°C	
	E	809	▶ Continuous pump operation	<ul style="list-style-type: none"> • No • Yes 	No	
	E	820	▶ Overtemp prot pump circuit	<ul style="list-style-type: none"> • Off • On 	On	
	E	830	▶ Mixing valve boost		5°C	
	E	832	▶ Actuator type	<ul style="list-style-type: none"> • 2 position • 3 position 	3 position	
	E	833	▶ Switching differential 2-pos		2°C	
	E	834	▶ Actuator running time		120 s	
	C	850	▶ Floor curing function	<ul style="list-style-type: none"> • Off • Functional heating • Curing heating • Curing/Functional heating • Functional/Curing heating • Manually 	Off	
	C	851	▶ Floor curing setp manually		25°C	
Eu	855	▶ Floor curing setp current / Floor curing day current				

Top menu	Level	Pgm No.	Submenu 1	Submenu 2	Default	Setting
Heating circuit 1 (Cnt'd)	E	861	▶ Excess heat draw	<ul style="list-style-type: none"> • Off • Heating mode • Always 	Always	
	E	870	▶ With buffer	<ul style="list-style-type: none"> • No • Yes 	No	
	E	872	▶ With prim contr/system pump	<ul style="list-style-type: none"> • No • Yes 	Yes	
	E	880	▶ Pump speed reduction	<ul style="list-style-type: none"> • Operating level • Characteristic • Temp differential nominal 	Characteristics	
	E	881	▶ Starting speed		100%	
	E	882	▶ Pump speed min		50%	
	E	883	▶ Pump speed max		100%	
	E	888	▶ Curve readj. at 50% speed		33%	
	E	889	▶ Filter time const speed ctrl		5 min	
	E	890	▶ Flow setp readj speed ctrl	<ul style="list-style-type: none"> • No • Yes 	Yes	
	E	898	▶ Operating level changeover	<ul style="list-style-type: none"> • Frost protection • Reduced • Comfort 	Reduced	
	E	900	▶ Optg mode changeover	<ul style="list-style-type: none"> • None • Protection • Reduced • Comfort • Automatic 	Protection	
	Boiler	Eu	2214	▶ Setpoint manual control		60°C
Fault	Eu	6705	▶ SW Diagnostic code			
	Eu	6706	▶ Burn ctrl phase lockout pos			
Service/special operation	Eu	7130	▶ Chimney sweep function	<ul style="list-style-type: none"> • Off • On 	Off	
	Eu	7131	▶ Burner output	<ul style="list-style-type: none"> • Partial load • Full load • Max heating load 	Max heating load	
	Eu	7140	▶ Manual control	<ul style="list-style-type: none"> • Off • On 	Off	
Diagnostics heat generation	Eu	8338	▶ Hours run heating mode			
	Eu	8339	▶ Hours run DHW			
	Eu	8378	▶ Total gas energy heating			
	Eu	8379	▶ Total gas energy DHW			
	Eu	8380	▶ Total gas energy			
	Eu	8381	▶ Gas energy heating Reset?	<ul style="list-style-type: none"> • Yes • No 		
	Eu	8382	▶ Gas energy DHW Reset?	<ul style="list-style-type: none"> • Yes • No 		
	Eu	8383	▶ Gas energy			
	Eu	8526	▶ 24-Hour yield solar energy			
	Eu	8527	▶ Total yield solar energy			
	Eu	8530	▶ Hours run solar yield			
	Eu	8532	▶ Hours run collector pump			
	Diagnostics consumers	Eu	8700	▶ Outside temp		
Eu		8701	▶ Outside temp min Reset?			
Eu		8702	▶ Outside temp max Reset?			

ADDITIONAL INFORMATION FOR THE INSTALLER



Error Codes and Solutions

Error code	Fault description	Explanation	Action(s)
10	Outside temperature sensor error		Check connection and/or sensor. Replace as required. Emergency operation Contact AIC technical support.
20	Boiler temperature 1, sensor error	Short circuit or Open circuit boiler flow sensor.	Check connection and sensor. Replace as required.
26	Common flow temperature, sensor error	Short circuit or Open circuit common flow temperature sensor.	Check connection and sensor. Replace as required.
28	Flue gas temperature sensor error	Short circuit or Open circuit flue gas sensor.	Check connection and sensor. Replace as required.
30	Flow temperature 1, sensor error	Short circuit or Open circuit flow sensor.	Check connection and sensor. Replace as required.
32	Flow temperature 2, sensor error	Short circuit or Open circuit boiler flow sensor.	Check connection and sensor. Replace as required.
38	Flow temperature, primary controller, sensor error		Check connection and sensor. Replace as required.
40	Return temperature 1, sensor error	Short circuit or Open circuit boiler return sensor.	Check connection and sensor. Replace as required.
46	Cascade return temperature, sensor error		Check connection and sensor. Replace as required.
47	Common return temperature, sensor error		Check connection and sensor. Replace as required.
50	DHW temperature 1 sensor error		Check connection and sensor. Replace as required.
52	DHW temperature 2, sensor error		Check connection and sensor. Replace as required.
54	Flow temperature DHW, sensor error	Short circuit or Open circuit DHW flow sensor.	Check connection and sensor. Replace as required.
57	DHW circulation, sensor error		Check connection and sensor. Replace as required.
60	Room temperature 1, sensor error		Check connection and sensor. Replace as required.
65	Room temperature 2, sensor error		Check connection and sensor. Replace as required.
68	Room temperature 3, sensor error		Check connection and sensor. Replace as required.
70	Storage tank temperature 1 (top), sensor error		Check connection and sensor. Replace as required.
71	Storage tank temperature 2 (bottom), sensor error		Check connection and sensor. Replace as required.
72	Storage tank temperature 3 (center), sensor error		Check connection and sensor. Replace as required.
78	Water pressure, sensor error		Check connection and sensor. Replace as required.

Error code	Fault description	Explanation	Action(s)
81	LPB short circuit or no bus power supply		Check LPB connections and bus power supply.
82	LPB address collision		Check addresses of connected control modules
83	BSB wire cross-sectional/ no communication		Check connection of the room units
84	BSB wire address collision	2 room devices have the same assignment (prog.no. 42)	Correct device address.
85	BSB RF communication error		Check bus connection and components.
91	Data overrun in EEPROM	Internal fault in controller, process sensor	Contact AIC technical support.
98	Extension module 1, error		Check extension module connections.
99	Extension module 2, error		Check extension module connections.
100	2 clock time masters		Check time master
102	Clock time master without backup		Check clock
103	Communication error		Check connection and components
105	Maintenance message		See maintenance code (press information button once) for detailed information
109	Supervision boiler temperature		Contact AIC technical support.
110	STB (SLT) lockout	No heat removal, STB interruption, possible short-circuit in the gas valve, internal fuse faulty;	Allow device to cool down and carry out reset; if the fault occurs several times inform AIC technical support
111	Temperature limiter safety shutdown		Contact AIC technical support.
117	Water pressure too high		Release the water to a suitable pressure
118	Water pressure too low		Top up the system with water to reach a suitable pressure
121	Flow temperature heating circuit 1 not reached	Heat losses in circuit	Check the circuit for fault insulation and heat losses.
122	Flow temperature heating circuit 2 not reached	Heat losses in circuit	Check the circuit for fault insulation and heat losses.
125	Maximum boiler temperature exceeded		Contact AIC technical support.
126	DHW charging temperature not reached		Check operation and heat up times for DHW
127	DHW legionella temperature not reached		Check operation of appliance
128	Loss of flame during operation	Ionization current lost after successful ignition	Check electric supply, polarity and ionization electrode, as well as ignition components/parameters.
129	Wrong air supply		Check air supply

ADDITIONAL INFORMATION FOR THE INSTALLER

Error code	Fault description	Explanation	Action(s)
130	Flue gas temperature limit exceeded	Heat engine is overheating	Check causes of high temps Check connection and sensor. Replace as required Check connection and chimney.
132	Gas pressure switch safety shut down	Lack of gas	Check gas supply and pressure Check connection and component
133	Safety time for establishment of flame exceeded	Lack of gas, Polarity of mains connection, safety period,	Reset, if the fault re-occurs more than 3 times, contact AIC technical support. Check ignition electrode and ionization current
146	Configuration error sensor/controlling elements		Check sensor configuration or replace component
151	LMS14... error, internally		Check parameters (see adjustment table installer and/or call-up values) Reset controller and/or replace as required, Check electrode wiring Contact AIC technical support.
152	Parameterization error	Incorrect / Conflicting parameters input.	Verify parameters or reset to default parameters
153	Unit manually locked	Reset button stuck in	Check reset button
160	Fan speed threshold not reached	Fan/relay possibly defective, speed threshold set wrongly.	Check parameters, connections and component. Replace as required
162	Air pressure switch error	Air pressure switch/Flue pressure switch does not close	1. Check flue path for obstructions. Unblock as required 2. Check connection/wiring and pressure switch. Replace as required. Floor appliances (from 120 kW): 3. Check air intake for obstructions. Unblock as required.
164	Flow/pressure switch, heating circuit error	No flow detected	Remove the air from the circuit; Update the parameter set. Check connection and switches in HC. Replace as required
166	Air pressure switch error	Air pressure switch does not open	Check connection and adjustments on air pressure switch. Replace as required.
170	Error water pressure sensor, primary side		Check connection and sensor. Replace as required.
171	Alarm contact 1 active		Correct the active fault
172	Alarm contact 2 active		
173	Alarm contact 3 active		
174	Alarm contact 4 active		
176	Water pressure 2 too high		Release the water to a suitable pressure.
177	Water pressure 2 too low		Top up the system with water to reach a suitable pressure.

Error code	Fault description	Explanation	Action(s)
178	Temperature limiter heating circuit 1		Allow the circuit to cool down and carry out reset; if the fault occurs several times inform AIC technical support.
179	Temperature limiter heating circuit 2		Allow the circuit to cool down and carry out reset; if the fault occurs several times inform AIC technical support.
183	Unit in parametrization mode		Wait until parametrization process is complete
193	Start prevention signal input	<p>Short circuit or Open circuit According to appliance model, can apply to the following :</p> <ul style="list-style-type: none"> › air pressure switch › flue pressure switch › condensate level switch › burner plate temp. limit switch › Additional external max. temp limit switch › Additional external max. pressure limit switch 	<p>1. Check flue path for obstructions. Unblock as required</p> <p>2. Check connection/wiring and pressure switch. Replace as required.</p> <p>Floor appliances (120 to 280 kW):</p> <ol style="list-style-type: none"> 1. Check connection/wiring and condensate level switch. Replace as required 2. Check connection/wiring and burner plate temp. limit switch. Replace as required <p>Floor appliances >300 kW Same as 120 to 280 kW appliances and</p> <ol style="list-style-type: none"> 3. Also check additional external max temp limit switch and additional external max pressure limit switch and connection. Replace as required
195	Maximum duration of the refill per charging exceeded		Check automatic refill system.
 <i>The use of an automatic refill system is not recommended</i>			
196	Maximum duration of the refill per week exceeded		Check automatic refill system.
 <i>The use of an automatic refill system is not recommended</i>			
209	Fault heating circuit		Check the heating circuit configuration. Reset to default parameters
216	Fault boiler		Check the heating circuit configuration. Reset to default parameters
217	Sensor error		Check connection and sensor. Replace as required.
218	Pressure supervision		Check system pressure.
243	Swimming pool sensor, error		Check connection and sensor. Replace as required.
260	Flow temperature 3, sensor error		Check connection and sensor. Replace as required.

ADDITIONAL INFORMATION FOR THE INSTALLER

Error code	Fault description	Explanation	Action(s)
270	Temperature difference, heat exchanger too large		Check the heating system external hydraulic components.
317	Mains frequency outside permissible range		Check correct electric supply in boiler terminals.
320	DHW charging temperature, sensor error		Check connection and sensor. Replace as required.
321	DHW outlet temperature, sensor error		Check connection and sensor. Replace as required.
322	Water pressure 3 too high		Release the water to a suitable pressure.
323	Water pressure 3 too low		Top up the system with water to reach a suitable pressure.
324	Input BX, same sensors		Check configuration in parameters list
325	Input BX/extension module, same sensors		Check configuration in parameters list.
326	Input BX/mixing group, same sensors		Check configuration in parameters list.
327	Extension module, same function		Check configuration in parameters list.
328	Mixing group, same function		Check configuration in parameters list.
329	Extension module/mixing group same function		Check configuration in parameters list.
330	Sensor input BX1 without function		Connect temperature sensor in BX terminal
331	Sensor input BX2 without function		Connect temperature sensor in BX terminal
332	Sensor input BX3 without function		Connect temperature sensor in BX terminal
333	Sensor input BX4 without function		Connect temperature sensor in BX terminal
335	Sensor input BX21 without function		Connect temperature sensor in BX terminal
336	Sensor input BX22 without function		Connect temperature sensor in BX terminal
341	Sensor B6 missing	Solar sensor missing	Check parameters, connection and component.
349	Buffer storage tank return valve Y15 missing		Check connection of return valve Y15. Replace as required.
350	Buffer storage tank address error		Correct device address.
351	Primary controller/ system pump, address error		Correct device address.
352	Pressureless header, address error		Correct device address.
353	Sensor B10 missing	Common flow sensor missing	Check parameters, connection and component

Error code	Fault description	Explanation	Action(s)
371	Flow temperature heating circuit 3		Check the circuit for fault insulation and heat losses.
372	Temperature limiter heating circuit 3		Allow the circuit to cool down and carry out reset; if the fault occurs several times inform AIC technical support.
378	Internal repetition		Contact AIC technical support
382	Repetition speed		Contact AIC technical support
384	Extraneous light		Shut off gas supply and contact AIC technical support
385	Mains undervoltage		Check electric supply in boiler terminals
386	Fan speed tolerance		Check air supply
388	DHW sensor no function		Check connection and sensor. Replace as required.
391	Room controller 1		
392	Room controller 2		Check addresses and parameters
393	Room controller 3		
426	Feedback flue gas damper		Check the connection and component
427	Configuration flue gas damper		Check configuration parameters
429	Dynamic water pressure too high	Expansion tank is defective	Verify pump Replace expansion tank
430	Dynamic water pressure too low		Verify pump
431	Sensor primary heat exchanger		Check connection and sensor. Replace as required.
432	Function ground not connected		Check ground connection and install as required
433	Temperature primary heat exchanger too high		Check the heating system external hydraulic components.

Maintenance Messages

Code	Meaning	Action
1	Number of burner hours run exceeded	
2	Number of burner starts exceeded	Contact Maintenance service
3	Maintenance interval exceeded	
5	Water pressure 1 heating circuit too low	
18	Water pressure 2 heating circuit too low (dropped below lower pressure limit 2)	Fill the circuit to reach acceptable pressure.

ADDITIONAL INFORMATION FOR THE INSTALLER

Troubleshooting

Problem	Cause(s)	Solution(s)
Boiler does not start	No power supply	<ol style="list-style-type: none"> 1. Check that the power button is in ON position (pushed in and illuminated) 2. Make sure the power supply cable is connected to the mains 3. Check the external power supply box (circuit breaker) and reset it as required.
Boiler display remains blank	No power supply	<ol style="list-style-type: none"> 1. Check wiring connection. 2. Check wiring continuity. 3. Replace wiring.
	Main board fuse(s) blown	Replace blown fuse(s) on electronic board (T6 3AH 250V).
Circulating pump does not start	Pump power supply	<ol style="list-style-type: none"> 1. Check wiring connection. 2. Check wiring continuity. 3. Replace wiring.
	Relay malfunction	<ol style="list-style-type: none"> 1. Check the relay. 2. Replace the electronic board.
	Pump malfunction	<ol style="list-style-type: none"> 1. Reset the pump. 2. Check if there is voltage at the pump. If there is, replace the pump.
Gas smell	Leak in gas circuit	<ol style="list-style-type: none"> 1. Check tightness of connections and circuit. 2. Check that pressure measuring points are closed.
Unburned gas smell	Leak in flue gas circuit	<ol style="list-style-type: none"> 1. Check tightness of connections. 2. Check there are no obstructions in the flue system. 3. Check the quality of combustion.
	Wrong combustion settings	Check the values with a gas analyser and readjust as required.
	Combustion air circulation	Check that the air openings are not blocked.
	Burner and combustion chamber condition	Check if they are clean.
	Heat exchanger fire tubes are blocked	Check if condensate outlets are not obstructed. Clean as required.
Irregular combustion	Fan malfunction	<ol style="list-style-type: none"> 1. Check if fan is working. 2. Check wiring connections 3. Check wiring continuity 4. Check if there is voltage at the fan. If there is, replace the fan. 5. Verify signal cable connection
	Wrong size of flue and/or combustion air ducts.	Check duct sizes and correct as required
Hard ignition	Wrong combustion settings	Check the values with a gas analyser and readjust as required.
	Ignition electrode malfunction	Check the condition and distance at stem tips (refer to Electrode Removal procedure)

Problem	Cause(s)	Solution(s)
Burner does not start after receiving signal from boiler controller	Gas valve malfunction	
	Fan malfunction	1. Check wiring connections
	Ignition/ionization electrode malfunction	2. Check components
Combustion chamber gets dirty	Wrong combustion settings	Check the values with a gas analyser and readjust as required.
Boiler does not reach working temperature	Boiler controller	1. Adjust temperature setpoint. 2. Check controller operation. 3. Replace controller.
	Poor heat transfer	Clean combustion chamber
	Insufficient burner power	Check combustion settings
	Dirty burner	Clean burner
	Wrong chimney pressure drop	Check chimney pressure drop
Temperature too high compared to setpoint	Boiler controller malfunction	1. Check temperature setpoint. 2. Check controller operation. 3. Check position of temperature sensors.
	Radiator valves closed	Open radiator valves
	Air in the system	Bleed the air present in the heating system
Heat exchanger reaches temperature setpoint but radiators are cold	Circulating pump malfunction	1. Check if circulating pump is running 2. Check pump wiring connection and continuity. 3. Reset pump 4. Check if there is voltage at the pump. If there is, replace the pump.
Safety valve opens frequently	System safety valve	Check pressure rating of the safety valve (suitable to the system pressure).
	Pressure in the heating system	Check the pressure in the system (max. 6 bar).
	Expansion tank	Check the expansion tank size and operation.

ADDITIONAL INFORMATION FOR THE INSTALLER

Installation Checklist

	Unit	Values/Comments
General/heating system		
Type of building/system		
Commercial purpose (Y/N) ?		
Year of manufacture		
Output of system	kW	
Heated surface	m ²	
Number of heating circuits:		
• Floor heating		
• Radiators		
• Other		
Cascade (Y/N)? Number of boilers?		
Water		
Water hardness at start up	mol/m ³ or mg/l	
System volume	L	
Additive(s)/Antifreeze (Y/N)?		
• Type		
• Quantity	%	
Gas		
Type?		
Heating value	kWh/m ³	
Gas pressure regulator installed (Y/N)? Type ?		
Hydraulics		
Heating circuit normal pressure	bar	
Air purged from the system (Y/N)?		
Safety valve installed (Y/N)? rating?	bar or kW	
Expansion tank(s) installed (Y/N)? Type(s) ?		
• Size?	L	
• Precharged pressure ?	bar	
• Number		

	Unit	Values/Comments
Plate heat exchanger in the system (Y/N)? Type?		
Low loss header in system (Y/N)? Type ?		
Number of mixers ?		
Buffer tank (Y/N)? Size?	L	
DHW tank (Y/N)? Type?	L	
Pump(s) (Y/N)? Type?		
<ul style="list-style-type: none"> • In which circuit(s) • Chosen according to requirements for the appliance? 		
Flue gas		
Open or closed system?		
Dimensions of combustion air openings if closed system	cm ²	
Material of flue piping		
Diameter and length of piping system	mm / m	
Chimney system engineered by?		
Calculated pressure drop, including maximum wind condition (<200 Pa)?	Pa	
Cascade (Y/N)?		
Back-flow preventer or non-return valve installed (Y/N)? Type?		
Condensates		
Condensate discharge slope	° or cm/m	
Condensate trap filled (Y/N)?		
Neutralisation system installed (Y/N)? Type ?		
Condensate pump installed (Y/N)?		
Condensate pump control line connected (Y/N)?		

ADDITIONAL INFORMATION FOR THE INSTALLER

	Unit	Values/Comments
Controller		
Appliance controller?		
Other controller (Y/N)? Type?		
Optional modules installed (Y/N)		
• Type?		
Optional items installed (Y/N)?		
• Outdoor sensor (Y/N)? Type?		
• Room unit(s) (Y/N)? Type?		
• Others?		
Miscellaneous		
The end user has received all relevant information (Y/N)?		
The end user has received all relevant documents (Y/N)?		

Name

Date

Signature

NOTES

ADDITIONAL INFORMATION FOR THE INSTALLER

Water Parameters - Log Sheet

Recommended parameters to be checked during installation and operation of the boiler:

Meter reading before initial filling: Z=..... m³

Date	Meter reading Z _{new} in m ³	Quantity of Water V=Z _{new} -Z in m ³	Total alkaline earths or total hardness in mol/m ³ or °d	pH value	Conductivity in µS/cm	System pressure p _{inst} in bar	Addition	Signature

Water Filling Date	Water Top-up Date	Water Quality	Water Treatment	Remarks	Name & signature



EU Declaration of Conformity No. 2021/02EU/01

Product identification: **Floor-standing Condensing Boiler**

**Nesta Plus 280 (N 280 FS), Nesta Plus 420 (N 420 FS),
Nesta Plus 570 (N 570 FS), Nesta Plus 840 (N 840 FS).**

Manufacturer: AIC EUROPE B.V.
Graafschap Hornelaan 163A
NL-6001 AC Weert
Netherlands

This declaration of conformity is issued under the sole responsibility of the manufacturer. The object of the declaration described above is in conformity with the relevant Union harmonization legislation:

GAR Gas Appliance Regulation (EU) 2016/426
BED Boiler Efficiency Directive 92/42/EEC
ErP Energy Related Products Directive 2009/125/EC
LVD Low Voltage Directive 2014/35/EU
EMC Electromagnetic Compatibility Directive 2014/30/EU
RoHS Restriction of Hazardous Substances Directive 2011/65/EU

Conformity assessment procedure:

Module B + D

Name, address, identification number of the notified body:

Module B: SZUTEST Engineering Test Institute, Public Enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic; ID no. 1015

Number EU Type Test Examination Certificate:

**1015-GAR-02339-19
1015-BED-02341-19**

Validity date:

29.08.2029

Product-ID-Number:

CE-1015CU0750

Name, address, identification number of the notified body:

Module D: SZUTEST Engineering Test Institute, Public Enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic; ID no. 1015

The conformity of the product described above with the provisions of the applied Directives is demonstrated by compliance with the following standards / regulations:

EN 15502-1:2012+A1:2015
EN 15502-2-1:2012+A1:2016
EN 60335-1:2012
EN 60335-2-102:2016

EN 55014-1:2017
EN 55014-2:2015
EN 61000-3-2:2014-10
EN 61000-3-3:2013

Signed for and on behalf of Europe B.V.
Weert, 18.02.2021

Cyril Bongaerts
R&D Director

AIC Europe B.V.
Graafschap Hornelaan 163A
NL-6001 AC Weert
The Netherlands
www.myaic.eu