

STRATTON MK2 SERIES BOILERS

**Wall Hung, Condensing, Room Sealed,
Fully Modulating, Pre-Mix,
Gas Fired Boilers for Heating & Domestic
Hot Water Installations**

INSTALLATION, COMMISSIONING AND SERVICING INSTRUCTIONS

Models: S2-40, S2-60, S2-70, S2-80, S2-100, S2-120, S2-150

NATURAL GAS & PROPANE II_{2H3P}

IMPORTANT NOTE

**THESE INSTRUCTIONS MUST BE READ
AND UNDERSTOOD BEFORE INSTALLING,
COMMISSIONING, OPERATING OR
SERVICING EQUIPMENT**



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Technical Enquiries

To supplement the detailed technical brochures, technical advice on the application and use of products in the Hamworthy Heating range is available from our technical team in Poole and our accredited agents.

Site Assembly

Hamworthy offer a service of site assembly for many of our products in instances where plant room area is restricted. Using our trained staff we offer a higher quality of build and assurance of a boiler built and tested by the manufacturer.

Commissioning

Commissioning of equipment by our own engineers, accredited agents or specialist sub-contractors will ensure the equipment is operating safely and efficiently.

Maintenance Agreements

Regular routine servicing of equipment by Hamworthy service engineers inspects the safety and integrity of the plant, reducing the risk of failure and improving performance and efficiency. Maintenance agreements enable our customers to plan and budget more efficiently.

Breakdown service, repair, replacement

Hamworthy provide a rapid response breakdown, repair or replacement service through head office at Poole and accredited agents throughout the UK.

Spare Parts

A comprehensive spare parts service is operated from our factory in Poole, providing replacement parts for both current and discontinued products. Delivery of parts and components is normally from stock within seven days. However, a next day delivery service is available for breakdowns and emergencies.

CONTENTS

1. WARNINGS AND RECOMMENDATIONS	5
1.1. Transport and storage	5
1.2. Symbols used in this document	5
1.3. Qualification of personnel for installing, adjusting, using and maintaining the equipment	5
1.5. Safety instructions.....	6
1.4. Water characteristics.....	6
2. APPROVALS	9
2.1. Compliance with European Directives	9
2.2. Regulatory installation conditions.....	9
2.3. Gas category.....	9
2.4. Gas supply pressures	10
3. TECHNICAL SPECIFICATIONS	11
3.1. Dimensions	11
3.2. Boiler components	13
3.3. Combustion at 15°C and 1013 mbar.....	16
3.4. Conditions of use	18
3.5. Electrical connection	18
4. INSTALLATION	19
4.1. Installing the boiler	19
4.2. Removing / installing the front panels	20
4.3. Exhaust connection.....	20
4.4. Gas connection	28
4.5. Gas change (G20 to G31, only S2-40 to S2-100).....	29
4.6. Hydraulic connection.....	32
4.7. Electrical connection	34
5. FIRST USE	38
5.1. Checks before first use	38
5.2. First use	38
6. CHECKS AFTER COMMISSIONING	39
6.1. Condensate removal	39
6.2. Gas supply	39
7. MAINTENANCE OPERATIONS	40
7.1. Draining the boiler.....	40
7.2. Annual checks.....	41
8. END-OF-LIFE CYCLE OF THE APPARATUS	43

9. HYDRAULIC DIAGRAMS AND CONFIGURATIONS	44
9.1. Selection diagrams.....	44
9.2. Symbols used in the diagrams	45
9.3. List of diagrams.....	45
10. SPARE PARTS LIST	106
11. CUSTOMER PARAMETERS TABLE.....	116
12. APPENDIX A.....	133

1. WARNINGS AND RECOMMENDATIONS

PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLING, CARRYING OUT MAINTENANCE AND USING THE BOILER. IT CONTAINS IMPORTANT SAFETY INFORMATION.

1.1. Transport and storage

The boiler:

- must be stored vertically in an environment where the temperature is between -20°C and $+55^{\circ}\text{C}$, and where relative humidity is between 5% and 95%;
- must not be stacked,
- must be protected from humidity.

1.2. Symbols used in this document.



INFORMATION: This symbol draws attention to comments.



WARNING: Not following these instructions may lead to damage when installing or to other objects.



DANGER: Not following these instructions may cause injuries and serious material damage.



DANGER: Not following these instructions may cause electrocution.

1.3. Qualification of personnel for installing, adjusting, using and maintaining the equipment

Boiler installation, adjustment and maintenance operations must be conducted by a qualified and approved professional in accordance with prevailing local and national regulations. These operations may require work to be carried out with the power turned on and the casing doors (on the front of the boiler) open.

Basic utilisation operations must be carried out with the casing doors closed.

1.5. Safety instructions

- Always switch the boiler off and shut off the general gas supply before carrying out any work on the boiler.
- After performing work on the boiler (maintenance or breakdown), check that there are no gas leaks from the installation.



DANGER:

If you smell gas:

- **Do not use a naked flame, do not smoke, do not turn on electrical contacts or switches.**
- **Cut off the gas supply.**
- **Air the premises.**
- **Look for the leak and repair it.**



DANGER:

If you see smoke:

- **Switch off the boiler.**
- **Air the premises.**
- **Look for the leak and repair it.**



DANGER:

This boiler's earth bonding is ensured with connecting cables (green/yellow) and specific attachment screws. During any dismantling work, make sure you reconnect the cables concerned; it is IMPERATIVE to reuse the original attachment screws.

1.4. Water characteristics

The following rules apply as soon as the boiler is commissioned and remain valid until the product's end-of-life.



DANGER:

It is forbidden to use water containing glycol.

1.4.1. Preparation of the water circuit before commissioning the boiler

For all installation work (new or renovation), the water network pipes must be meticulously cleaned. The purpose of cleaning prior to commissioning is to remove germs and residues which are the cause of deposits.

In new installations in particular, residue from grease, oxidised metal and even copper micro deposits must be removed.

In renovated installations, cleaning should focus on removing sludge and the products of corrosion formed when the unit was last in operation.

There are two types of methods for cleaning and removing sludge: a high intensity approach that takes a few hours and a slower, more gradual approach that takes several weeks. This first type of cleaning must be done before connecting the new boiler, and with the second type, a filter should be installed on the back of the boiler to capture loosened deposits.

Cleaning prior to commissioning helps to improve the equipment's performance, reduce energy consumption and fight against scaling and corrosion. This operation must be done by a professional (water treatment).

1.4.2. Protecting the unit against scaling

Water naturally contains dissolved calcium ions and carbonates that cause scaling (calcium carbonate) to form. To prevent excessive deposits, take precautions with regard to the water used to fill the unit **TH < 10°f**

Water must be added during the life of the boiler. The new water adds scaling to the water system. The amount of fill water and the amount of make-up water added throughout the unit's lifecycle must not be more than three times the water capacity of the heating system. Also, the hardness of the make-up water must be controlled. Make-up water: **TH < 5°f**

Adding a large amount of untreated water always contributes a significant amount of scaling. To monitor this and to detect problems, a system water meter must be installed.

Failure to comply with these guidelines (such that the fill water plus the make-up water is more than three times the water capacity of the heating system) requires a full cleaning (to remove sludge and scaling) to be performed.

Additional precautions are required for operation:

- When the unit has a water softener, the equipment must be inspected on a regular basis in order to ensure that it is not outputting chloride-rich water into the system. The concentration of chlorides must always remain below 50 mg/litre.
- To prevent the build-up of calcium deposits (such as on exchange surfaces), the unit should be brought into service slowly, starting by operating at a low power with high primary water flow.
- When the tap water lacks the desired qualities (e.g. high level of hardness), water treatment is required. The fill water must be treated, and whenever new water is added, the make-up water must also be treated.
- Installations with multiple boilers require all of the boilers to be started simultaneously at minimal power. Doing this prevents the calcium in the water from depositing on the exchange surfaces of the first boiler.
- When working on the unit, avoid draining it completely; only the required parts of the system are to be drained.

The rules listed above are designed to minimise scaling on the exchange surfaces and thus to increase the life of the boilers.

To optimise the equipment's operation, remove lime scale deposits. This must be done by a specialised company. Also, before putting the unit into service, verify that the heating system is not damaged (e.g. leaks). If it has excessive scaling, the unit's settings for operation and for water treatment must be adjusted.

1.4.3. Protecting steel and stainless steel boilers against corrosion

Corrosion can affect the iron components used in boilers and heating systems, which is directly related to the presence of oxygen in the water heater's water. Dissolved oxygen that enters the unit when it is being filled for the first time reacts with the equipment materials and quickly disappears. Without refreshing the oxygen through significant contributions of water, the unit might not experience any damage whatsoever.

However, it is important to follow the sizing rules and installation guidelines in order to prevent oxygen from continuously flowing into the heating water.

These rules include:

- Opt for an expansion vessel with a membrane rather than an open expansion vessel that allows direct passage.
- Make sure pressure in the equipment is more than 1 bar when cold.
- Remove non-gas-tight components (permeable) and use gas-tight equipment instead.

If the guidelines above are followed, the unit's system water has the proper characteristics to last a long time: $8.2 < \text{pH} < 9.5$ and concentration in dissolved oxygen < 0.1 mg/litre.

If there is a chance that oxygen could enter the unit, you must take additional precautions. Adding an oxygen scavenger (e.g. sodium sulphite) is highly recommended. We recommend you contact specialised companies for water treatment issues, which will be able to suggest:

- the appropriate treatment based on the characteristics of the installation,
- a monitoring and performance warranty contract.

For units in which the water comes into contact with heterogeneous materials, such as copper or aluminium, appropriate treatment is recommended in order to ensure that the unit will last. In most cases, this consists of adding corrosion inhibitors (in the form of chemical solutions) to the unit. It is recommended to contact water treatment specialists.

1.4.4. Unit monitoring

If the above recommendations are followed (new installation or renovation), it should be sufficient to:

- check the amount of make-up water (fill water volume + make-up water volume < 3 times the unit volume).
- check the pH level (stable or slightly increasing).
- check the TH (stable or slightly decreasing).

We recommend these checks are carried out 2 to 3 times a year. Note that monitoring the quantity of make-up water is critical to the long life of the unit. If any of these three parameters deviates from the above recommendations, refer to a water treatment specialist to correct the problem.

1.4.5. Installation of the plate exchanger

If the recommendations above cannot be met, you can set up a plate exchanger to separate the primary system from the secondary system, which protects the boiler from undesirable effects.

1.4.6. Installation of a filtration system

A filtration system (filter, sediment well, etc.) on the back of the boiler is recommended in order to remove suspended particles from the unit.

2. APPROVALS

2.1. Compliance with European Directives

- Low voltage (2006/95/EC)

This appliance is not intended for use by persons (including children) whose physical, sensory or mental abilities are reduced, or persons without experience or knowledge, unless they have been able to benefit, through someone responsible for their safety, from supervision or prior instruction concerning the use of the appliance.

Children must be supervised to ensure they do not play with the appliance.

- Electromagnetic compatibility (2004/108/CEE)

- Gas appliances (2009/142/CE)

- Energy labelling (2010/30/EU):

In application of the directive and according to the requirements of the EU regulation No. 811/2013 of 18 February 2013, the information on condensation boilers with a power of less than or equal to 70 kW is available in appendix A.

- Eco-design (2009/125/EC):

In application of the directive and according to the requirements of the EU regulation No. 813/2013 of 02 August 2013, the technical parameters of condensation boilers with a power of less than or equal to 400 kW are available in appendix A.

- WEEE (2012/19/UE)

Waste Electrical and Electronic Equipment. See chapter 8.

2.2. Regulatory installation conditions

The appliance must be installed by an approved professional in accordance with regulations and current professional practices.

2.3. Gas category

This boiler has been adjusted in the factory to work with **group H natural gas (type G20) with a supply pressure of 20 mbar**.

See chapter 4.4 for how to change the gas, and use a qualified professional.



INFORMATION: Any work on a sealed component will lead to loss of the guarantee.

STRATTON MK2	Category
S2-40, S2-60, S2-70, S2-80, S2-100	II _{2H3P}
S2-120, S2-150	I _{2H}

2.4. Gas supply pressures

**INFORMATION:**

The pressures given below should be measured at the input to the gas valve.

	H G20 natural gas	G31 propane
Nominal pressure (mbar)	20	37
Minimum pressure (mbar)	17	25
Maximum pressure (mbar)	25	45

3. TECHNICAL SPECIFICATIONS

3.1. Dimensions

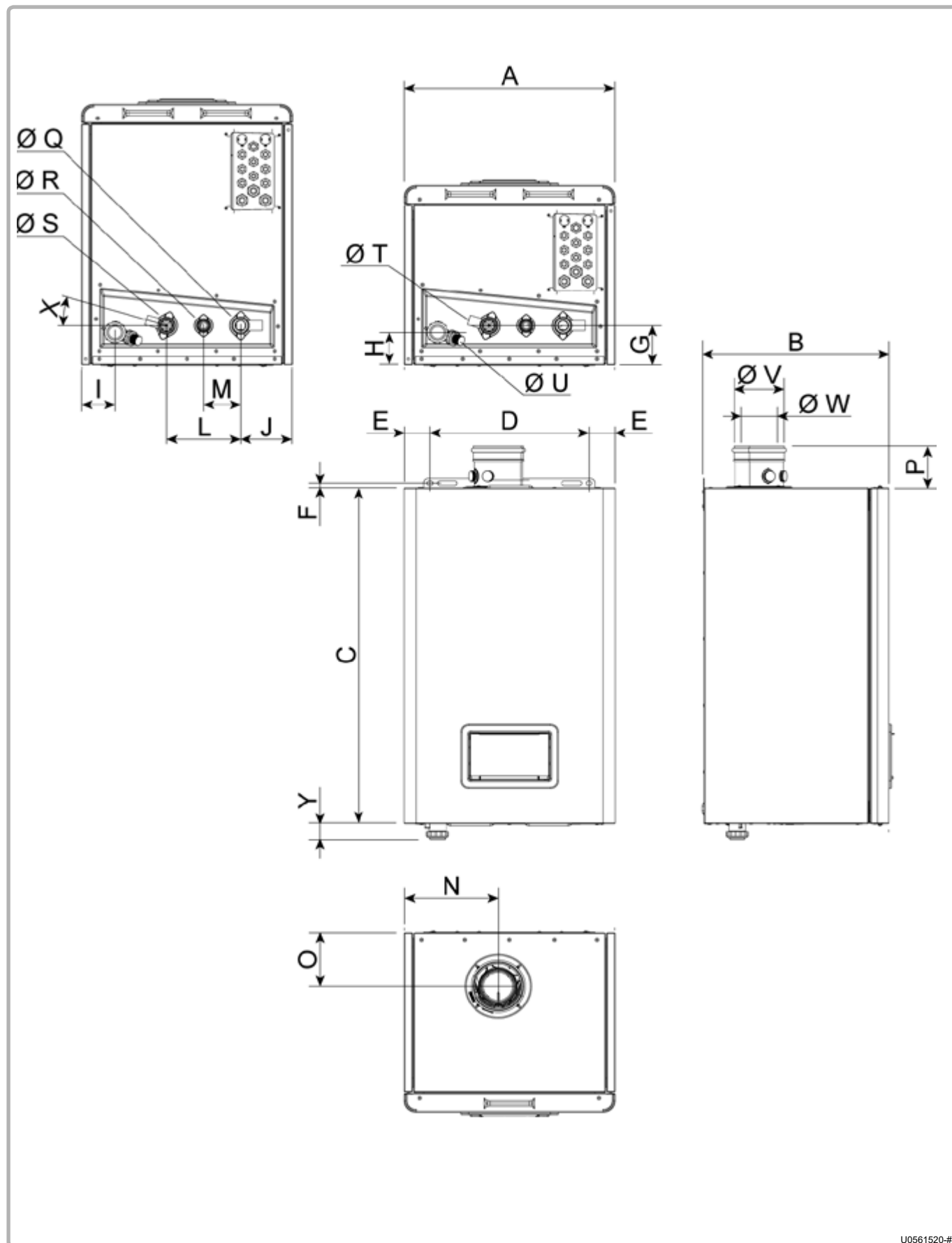


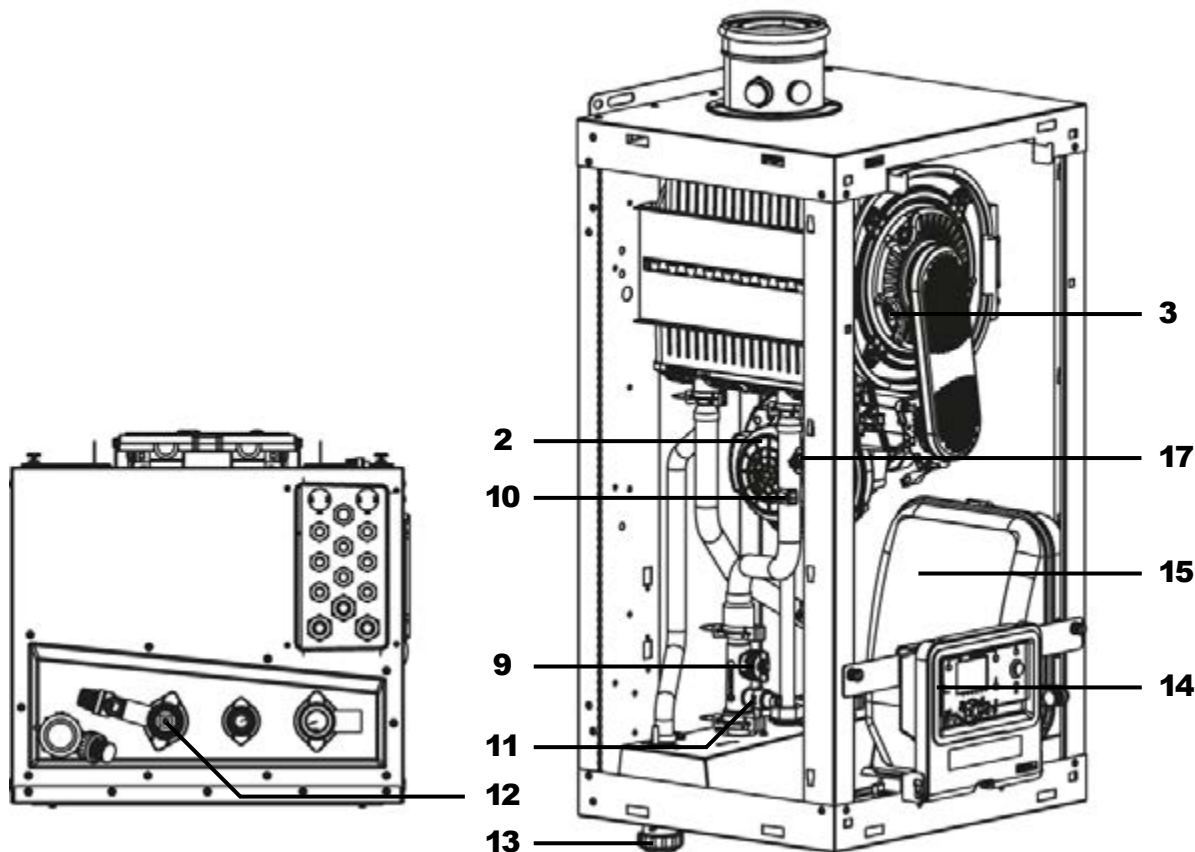
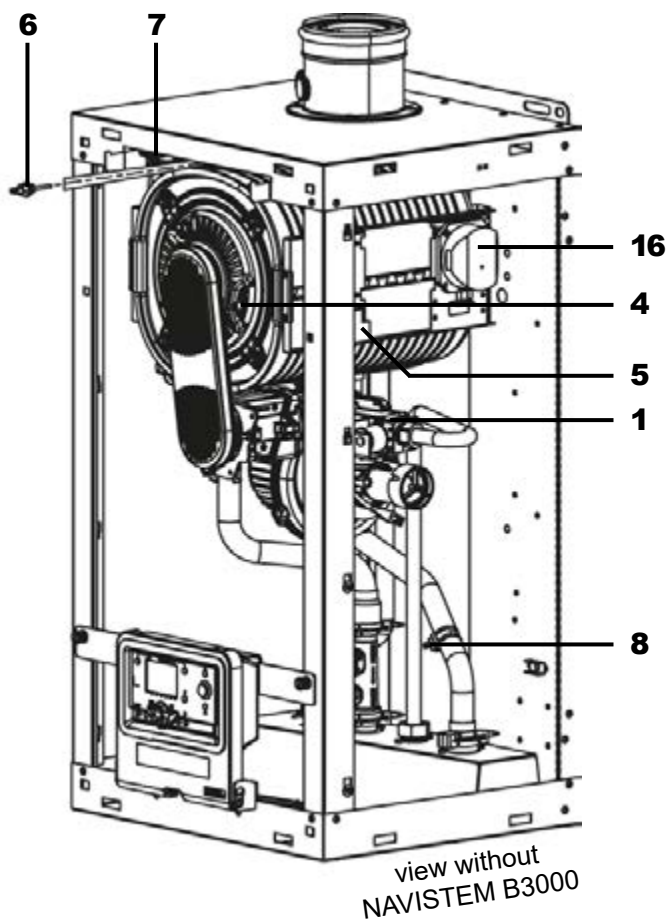
figure 1 - Dimensional characteristics

U0561520-#

		MODELS						
		S2-40	S2-60	S2-70	S2-80	S2-100	S2-120	S2-150
A	(mm)	541						
B	(mm)	477			574		692	800
C	(mm)	890						
D	(mm)	408						
E	(mm)	66,5						
F	(mm)	12,3						
G	(mm)	103,5						
H	(mm)	85,5						
I	(mm)	86						
J	(mm)	133						
L	(mm)	190						
M	(mm)	95						
N	(mm)	241				242,5		
O	(mm)	143,5				120		
P	(mm)	86				111		
Ø Q	Heating return connection	G 1"1/4						
Ø R	Gas supply	G 1"						
Ø S	Heating outlet connection	G 1"1/4						
Ø T	Safety valve connection	G 1/2" (female)						
Ø U	Condensate evacuation (mm)	24						
Ø V	Air inlet (mm)	125				150		
Ø W	Fume duct (mm)	80				100		
X	Valve angle	16°						
Y	(mm)	45						

3.2. Boiler components

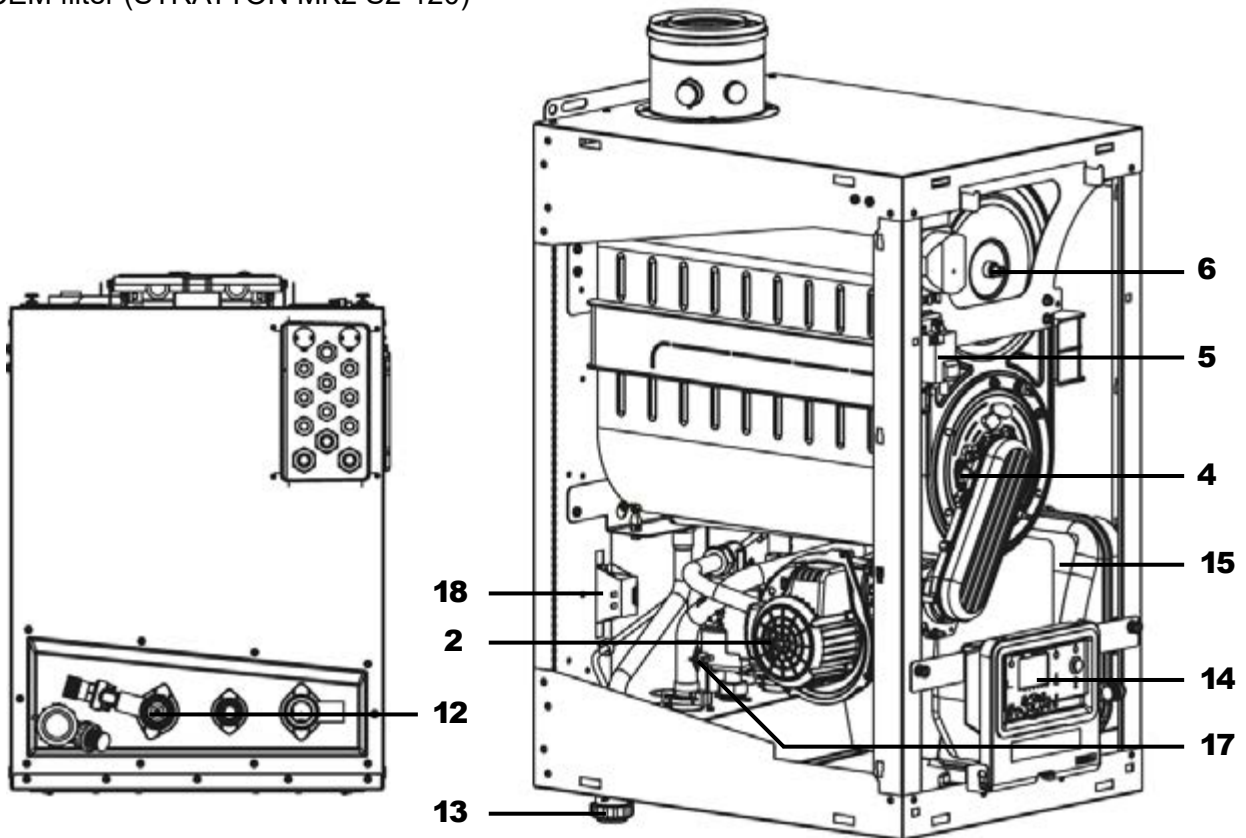
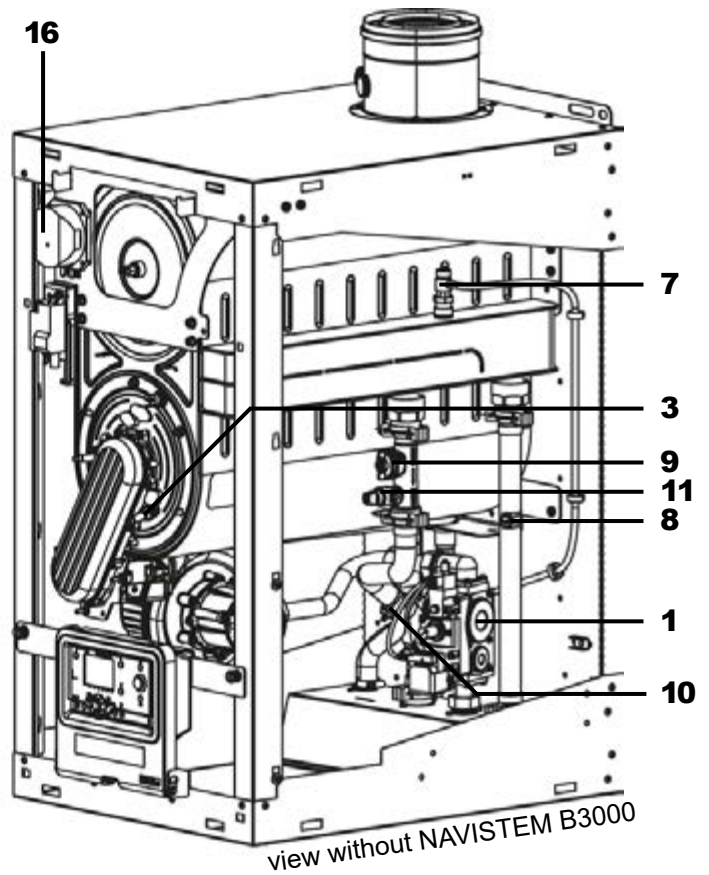
- 1 Gas valve
- 2 Fan
- 3 Ionisation electrode
- 4 Ignition electrode
- 5 Ignition transformer
- 6 Fume temperature sensor
- 7 Bleed valve
- 8 Water return temperature sensor
- 9 Flowmeter
- 10 Water outlet temperature sensor
- 11 Pressure sensor
- 12 Anti-return flap
- 13 Condensate siphon (supplied unmounted)
- 14 User interface control panel
- 15 NAVISTEM B3000 unit
- 16 Air pressure switch
- 17 Safety thermostat



U0561578-#

figure 2 - Boiler components for S2-40 and S2-60 kW models

- 1 Gas valve
- 2 Fan
- 3 Ionisation electrode
- 4 Ignition electrode
- 5 Ignition transformer
- 6 Fume temperature sensor
- 7 Bleed valve
- 8 Water return temperature sensor
- 9 Flowmeter
- 10 Water outlet temperature sensor
- 11 Pressure sensor
- 12 Anti-return flap
- 13 Condensate siphon (supplied unmounted)
- 14 User interface control panel
- 15 NAVISTEM B3000 unit
- 16 Air pressure switch
- 17 Safety thermostat
- 18 CEM filter (STRATTON MK2 S2-120)



U0561578-#

figure 3 - Boiler components for S2-70 to S2-120 kW models

- 1 Gas valve
- 2 Fan
- 3 Ionisation electrode
- 4 Ignition electrode
- 5 Ignition transformer
- 6 Fume temperature sensor
- 7 Bleed valve
- 8 Water return temperature sensor
- 9 Flowmeter
- 10 Water outlet temperature sensor
- 11 Pressure sensor
- 12 Anti-return flap
- 13 Condensate siphon (supplied unmounted)
- 14 User interface control panel
- 15 NAVISTEM B3000 unit
- 16 Air pressure switch
- 17 Safety thermostat
- 18 CEM filter

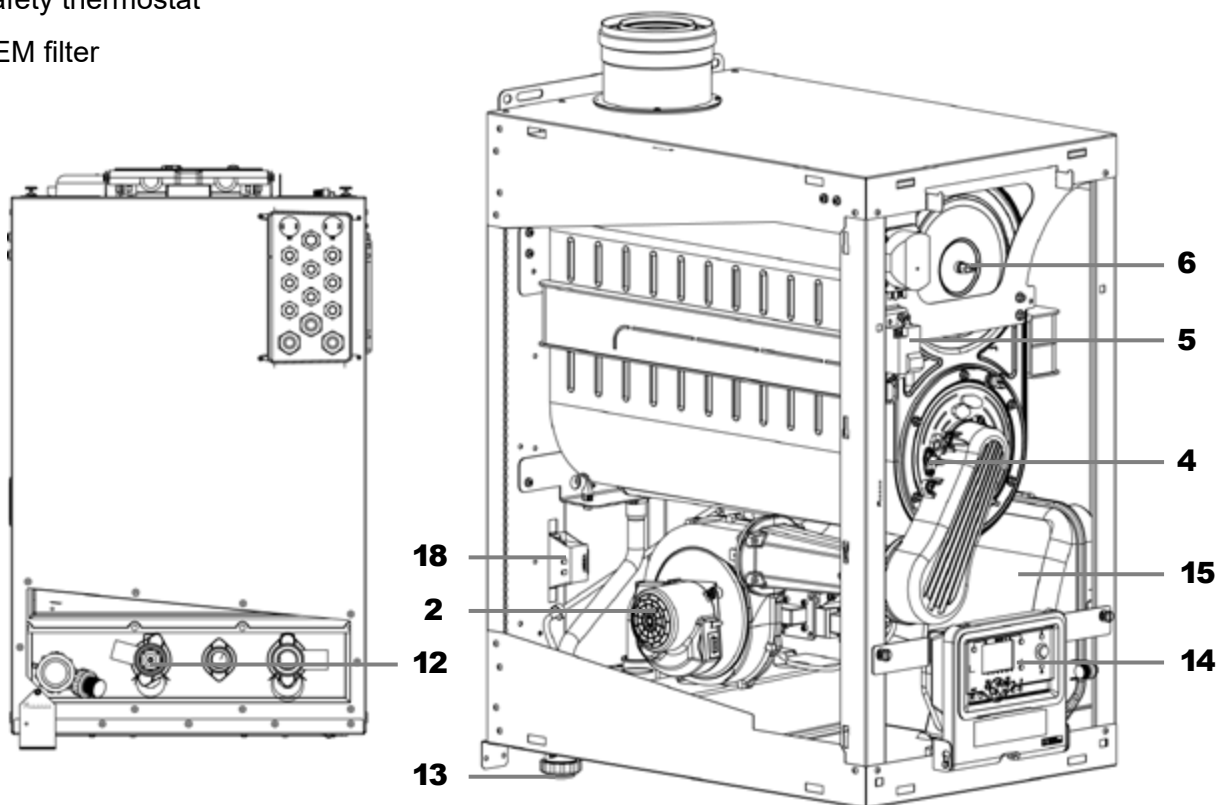
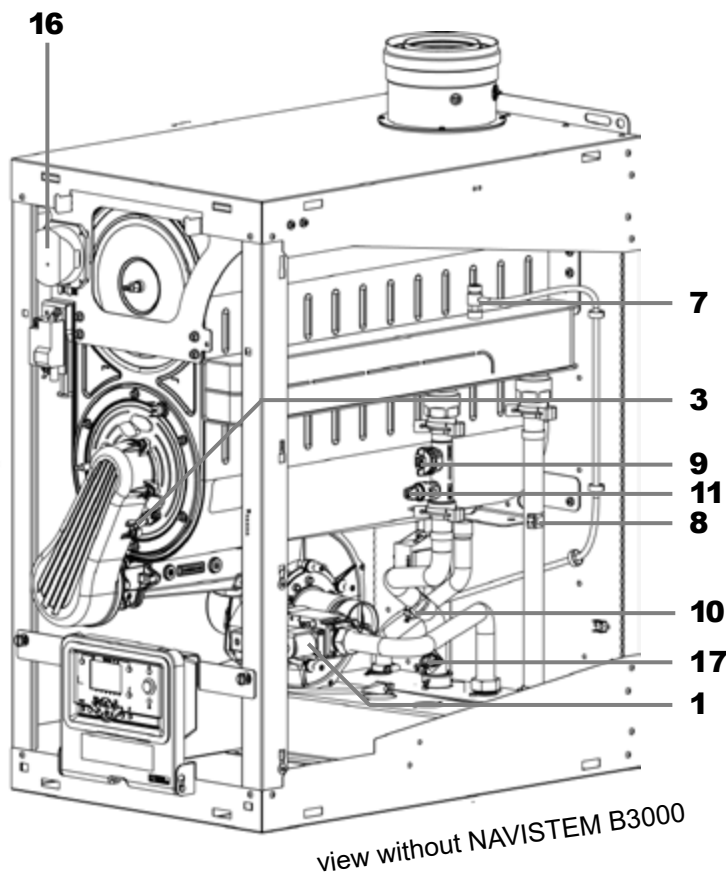


figure 4 - Boiler components for S2-150 kW model

U0590800-#

3.3. Combustion at 15°C and 1013 mbar

3.3.1. G20 natural gas

		MODELS						
		S2-40	S2-60	S2-70	S2-80	S2-100	S2-120	S2-150
Nominal power P _n (80/60°C)	kW	40,0	56,4	69,9	79,8	95,7	119,5	134,0
Nominal power when condensing P (50/30°C)	kW	43,0	61,0	76,8	87,5	104,5	129,5	146,0
Minimal power P _n (80/60°C)	kW	8,3	11,5	17,1	17,1	19,0	23,9	26,8
Nominal heat input Q _n	kW	41,2	58,0	72,1	82,3	98,5	123,0	137,9
Ignition heat input Q _{all}	kW	21,8	23,5	26,1	26,1	30,5	39,0	72,4
Minimum heat input Q _{min}	kW	8,5	11,8	17,6,4	17,6	19,6	24,6	27,6
Gas flow rate at P _n	m ³ /h	4,4	6,1	7,6	8,7	10,4	13,0	14,6
CO ₂ value ranges	%	S2-40 to S2-120 : at Q _{min} : 8,7% < CO ₂ < 8,9% at Q _{max} : 9,1% < CO ₂ < 9,3% S2-150 : at Q _{min} : 8,5% < CO ₂ < 8,7% at Q _{max} : 8,9% < CO ₂ < 9,1%						
Flue-gas mass flow rate (80/60°C)	Q _n	18,4	26,0	32,3	36,9	44,1	55,1	62,9
	Q _{all}	9,8	10,5	11,7	11,7	13,7	17,5	30,9
	Q _{min}	3,8	5,3	7,7	7,7	8,8	11,0	12,5
Flue-gas mass flow rate (50/30°C)	Q _n	17,5	25,0	31,2	35,6	42,7	52,5	57,3
	Q _{all}	9,3	10,1	11,2	11,2	13,3	16,7	29,9
	Q _{min}	3,5	5,1	7,5	7,5	8,5	10,2	12,1
Flue-gas temperature (80/60°C)	Q _n	80	76	70	74	76	70	70
	Q _{all}	65	63	58	58	61	56	60
	Q _{min}	61	62	57	57	62	56	59
Flue-gas temperature (50/30°C)	Q _n	62	60	48	53	57	52	42
	Q _{all}	42	39	33	33	38	31	32
	Q _{min}	39	38	34	34	38	32	30
Inside diameter of flue-gas output	mm	80	80	100	100	100	100	100
Maximum allowable nozzle pressure (B23P) (80/60°C)	Q _n	156	200	123	179	187	200	200
	Q _{all}	33	31	15	15	17	32	51
	Q _{min}	20	20	15	15	17	20	5
Maximum allowable nozzle pressure (B23P) (50/30°C)	Q _n	122	174	100	149	159	200	172
	Q _{all}	27	27	14	14	17	31	41
	Q _{min}	20	20	14	14	17	20	9
Combustion air flow rate at Q _n	m ³ /h	51,8	72,8	90,6	103,4	123,7	154,5	176,7
NO _x class		6						
Flue-gas removal and air inlet type classifications		B23, B23P C13, C33, C53						

3.3.2. G31 Propane Gas (for relevant models)

		MODELS					
		S2-40	S2-60	S2-70	S2-80	S2-100	
Nominal power P _n (80/60°C)	kW	40,0	56,4	69,9	79,8	95,7	
Nominal power when condensing P (50/30°C)	kW	42,1	59,7	75,2	85,6	102,3	
Minimal power P _n (80/60°C)	kW	8,3	11,5	31,9	31,9	33,5	
Nominal heat input Q _n	kW	41,2	58,0	72,1	82,3	98,5	
Ignition heat input Q _{all}	kW	21,8	18,0	32,9	32,9	34,5	
Minimum heat input Q _{min}	kW	8,5	11,8	32,9	32,9	34,5	
Gas flow rate at P _n	m ³ /h	1,7	2,4	3,0	3,4	4,0	
CO ₂ value ranges	%	at Q _{min} : 9,9 % < CO ₂ < 10,1 % at Q _{max} : 10,3 % < CO ₂ < 10,5 %					
Flue-gas mass flow rate (80/60°C)	Q _n	g/s	18,5	26,0	32,4	36,8	44,1
	Q _{all}		9,8	8,1	14,8	14,8	15,5
	Q _{min}		3,8	5,3	14,8	14,8	15,5
Flue-gas mass flow rate (50/30°C)	Q _n	g/s	18,3	25,7	31,2	35,3	44,0
	Q _{all}		9,6	7,9	14,6	14,6	15,3
	Q _{min}		3,7	5,2	14,6	14,6	15,3
Flue-gas temperature (80/60°C)	Q _n	°C	81	78	69	73	75
	Q _{all}		66	64	60	60	60
	Q _{min}		62	63	60	60	60
Flue-gas temperature (50/30°C)	Q _n	°C	65	60	47	52	56
	Q _{all}		44	42	34	34	34
	Q _{min}		40	40	34	34	34
Inside diameter of flue-gas output	mm	80	80	100	100	100	
Maximum allowable nozzle pressure (B23P) (80/60°C)	Q _n	Pa	126	200	105	150	138
	Q _{all}		29	19	24	24	20
	Q _{min}		20	19	24	24	20
Maximum allowable nozzle pressure (B23P) (50/30°C)	Q _n	Pa	112	177	93	129	129
	Q _{all}		24	16	22	22	20
	Q _{min}		20	16	22	22	20
Combustion air flow rate at Q _n	m ³ /h	51,8	73,0	90,7	103,5	123,9	
NO _x class		6					
Flue-gas removal and air inlet type classifications		B23, B23P C13, C33, C53					

3.4. Conditions of use

		MODELS						
		S2-40	S2-60	S2-70	S2-80	S2-100	S2-120	S2-150
Maximum start setting temperature	°C	85						
Safety temperature	°C	105						
Maximum service pressure	hPa (bar)	4000 (4)						
Minimum cold pressure	hPa (bar)	1000 (1)						
Nominal water flow rate (to P/20)	m ³ /h	1,7	2,4	3,0	3,4	4,1	5,1	5,8
Minimal water flow rate (to P/25)	m ³ /h	1,4	1,9	2,4	2,7	3,3	4,1	4,7
Water content	l	3,6	5	9	9	10,2	12,8	15,3
Weight without water	kg	50	60	90	90	95	100	125
Temperature of installation room (min. / max.)	°C	5 / 45						
Relative humidity of installation room		between 5% and 95%						
Protection level		IP24D						
Maximum altitude of installation	m	2000						

3.5. Electrical connection

		MODELS						
		S2-40	S2-60	S2-70	S2-80	S2-100	S2-120	S2-120
Electrical supply	V	230 V AC (+10% -15%), 50Hz						
Electrical power consumption at Qn (without accessories)	W	68	138	96	141	160	206	263
Electrical power consumption at Qn (with accessories)	W	107	192	135	196	274	348	403
Electrical power consumption in standby mode	W	3						
Max length of sensor cables	m	DHW sensor: 10 External sensor: 40 in 0.5 mm ² (120 in 1.5 mm ²) Ambient thermostat: 200 in 1.5 mm ² Ambient sensor: 200 in 1.5 mm ²						
Power terminal output	V	230V AC (+10%, -15%)						
	A	5 mA - 1A						

4. INSTALLATION



IMPORTANT:

The boiler must not bear the weight of the accessories and connections (hydraulics, gas, exhaust system, etc.).

4.1. Installing the boiler

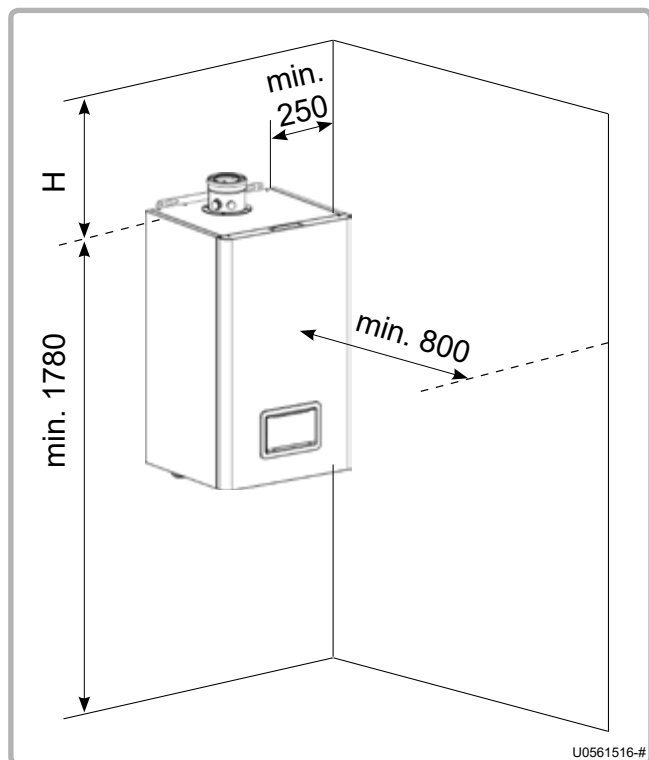


figure 5 - Clearances

STRATTON MK2 boilers must not be mounted on a wall covered with an inflammable material: plastic, wood, etc.

The combustion air must be free of agents containing chlorine, ammonia, fluorine and alkaline. These compounds are found in aerosols, paints, cleaning products, washing powder, detergents, glue, snow-clearing salt, etc.

Do not draw in the air that is evacuated from places where these products are used - swimming pools, laundries, hair dressing salons, cold rooms - as one or more of these compounds could be introduced into the combustion air.

Recommended distances relative to walls:

Sufficient clearances must be provided to permit easy maintenance operations on the boilers. The **minimum** values (in mm) are indicated in the diagram opposite and table below:

These values cannot be substituted for the specific regulatory requirements.

H** (mm)	B23 / B23P					C13		C33		C53	
	S2-40 and S2-60 ø80	S2-40 and S2-60 ø125	S2-70 to S2-120			S2-40 and S2-60 ø80/125	S2-70 to S2-120 ø100/150	S2-40 and S2-60 ø80/125	S2-70 to S2-120 ø100/150	S2-40 and S2-60 ø80/80	S2-70 to S2-120 ø100/100
	280	360	310	430	450	290	350	140	170	510	570

* Ø110 is prohibited for a 150 boiler.

**The minimum value of H corresponds to the spare required to install the exhaust system accessories. It takes account of the dimensions of the 87° angle of a horizontal duct, independently of the length and gradient of the latter.



IMPORTANT:

The boiler must be positioned horizontally using a spirit level to promote effective ventilation of the boiler body (use the roof as a reference surface).



IMPORTANT:

The front and side jackets are held in place by clips. Remove the jackets before handling the boiler (risk of falling).

4.2. Removing / installing the front panels

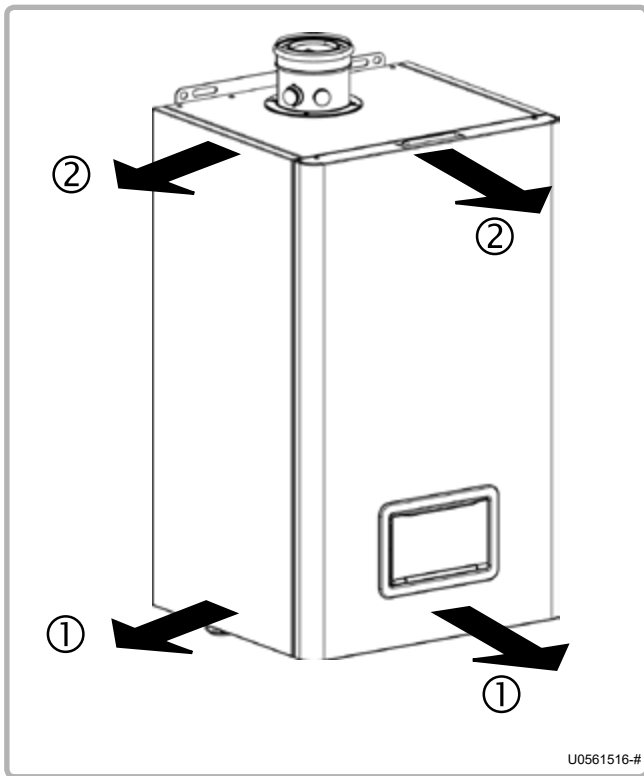


figure 6 - Removing the trim doors

- ① Pull the bottom of the panel forwards to release.
- ② Pull the top of the panel forwards to release.

Remove the panel.

Do the opposite to install the panel.

4.3. Exhaust connection

You must comply with the regulatory texts and rules of the art that apply in the country where the boiler will be installed.

The exhaust extraction ducts must be made in a material resistant to the condensate that can form when the boiler is operating. These materials must also be capable of supporting flue gas temperatures up to 120°C.

One exhaust temperature sensor guarantees the protection of the type B and C combustion product evacuation ducts.

STRATTON MK2 boilers are approved to be connected to:

- a B23 or B23P flue
- a C13, C33 or C53 suction pipe



IMPORTANT:

The boiler must not be made to support the exhaust duct's weight.

4.3.1. Connection to a B23 chimney

B23 type connection:

Air from the installation premises, gas evacuation through the roof via a natural draft pipe.



IMPORTANT:

Check that the boiler installation premises have high and low ventilation, that it conforms to current regulations and that it is not obstructed.

For the **STRATTON MK2 S2-40 and S2-60**, the use of the Ø125 Chimney Adaptor accessory (code 040940) is mandatory to connect the boiler to a B23 chimney duct. This kit is suitable for Ø 125 external ducts.

For the **STRATTON MK2 S2-70 to S2-150**, the use of the Ø160 Chimney Adaptor accessory (code 041050) is mandatory to connect the boiler to a B23 chimney duct. This kit is suitable for Ø 160 external ducts.



IMPORTANT:

Under no circumstances is use of these mandatory accessories a substitute for checking the dimensioning of the chimney ducts (given a combustion gas pressure at the boiler outlet equal to 0 Pa).

STRATTON MK2 boilers are high performance boilers with very low exhaust temperatures; consequently to retain a favourable draft the ducts must run upwards from the boiler outlet.

Horizontal duct runs must be avoided so as to limit condensate retention. To do this use a minimum slope of 3 % towards the boiler in the horizontal parts.



WARNING:

If several boilers are connected to one flue, check by calculation that the flue is not pressurised when all the boilers are operating at Qn.

Ø duct	STRATTON MK2	Accessory part number	A (mm)
Ø 125	S2-40 and S2-60	040940	310
Ø 160	S2-70 to S2-150	041050	390

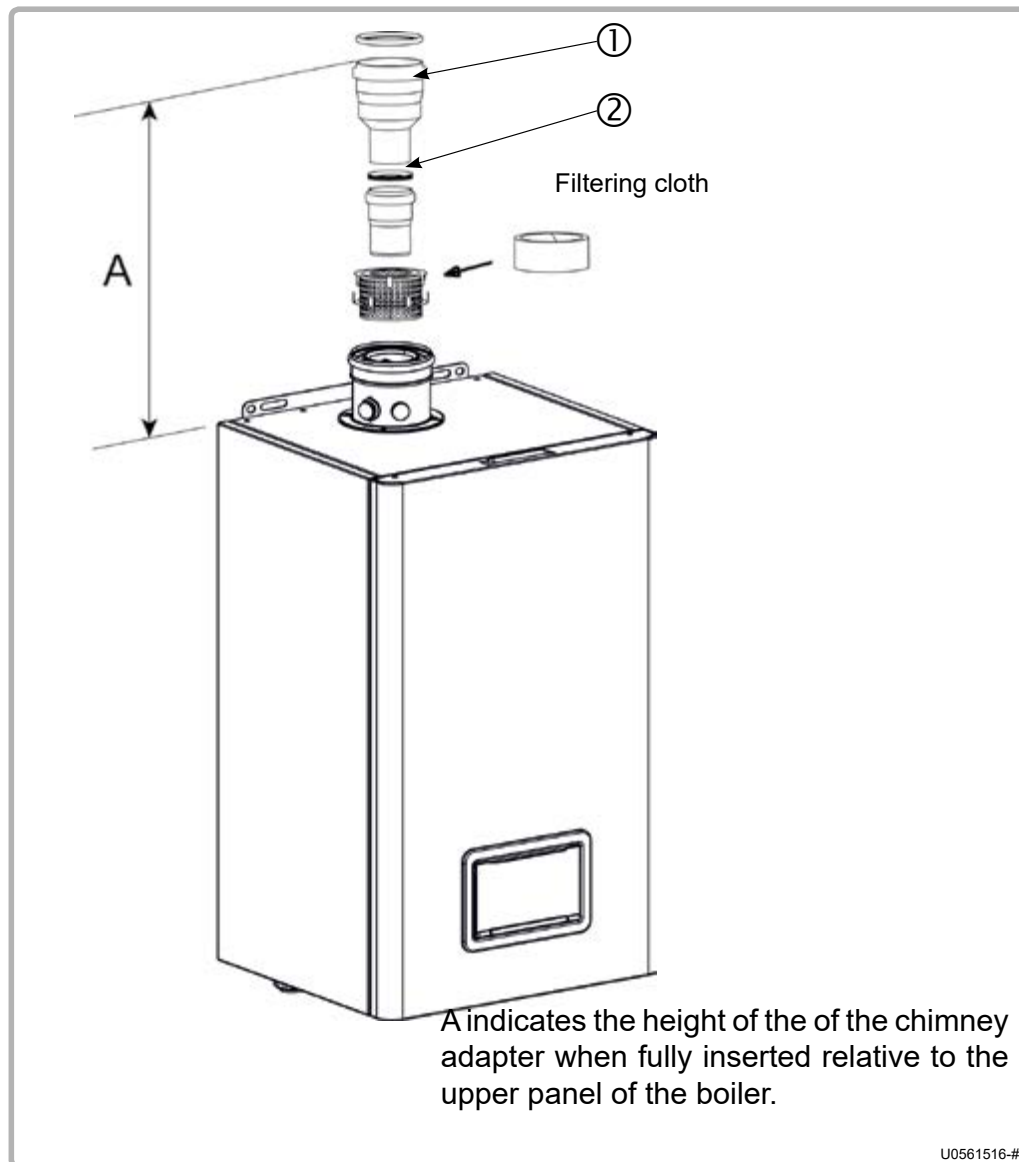


figure 7 - Sizing recommendations

4.3.2. Connection to a B23P chimney

B23P type connection:

Air from the installation premises, gas evacuation through the roof via a pressurised duct.



IMPORTANT:

Check that the boiler installation premises have high and low ventilation, that it conforms to current regulations and that it is not obstructed.



IMPORTANT:

The use of the “Chimney Adaptor” accessory is mandatory to connect a STRATTON MK2 boiler to a B23 chimney duct. The table below represents the accessories available for each boiler type.



IMPORTANT:

The combustion product extraction duct must be dimensioned by using the parameters set out in the table in chapter 3.3.

Depending on the actual configuration of the duct, a calculation is required to check that the pressures at the boiler outlet at Qmin, Qall and Qn do not exceed the maximum allowable values in this table.

Values corresponding to the 50/30°C regime are to be used for this calculation.



IMPORTANT:

If several boilers are connected to the same flue, check the following by calculation:

- **One boiler at Qmin and the others at Qmax:** The outlet pressure of the boiler at Qmin must be lower than the permissible pressure specified in the table in Chapter 3.3.
- **One boiler at Qall and the others at Qmax:** The outlet pressure of the boiler at Qall must be lower than the permissible pressure specified in the table in Chapter 3.3.
- **All the boilers at Qmax:** The outlet pressure of the four boilers must be lower than the permissible pressure specified in the table in Chapter 3.3.

Ø duct	STRATTON MK2	Accessory part number	A (mm)
Ø 80	S2-40 and S2-60	040945 (contains part ②) *	220
Ø 110	S2-40 and S2-60	041096 (contains parts ①+②) *	255
	S2-70 to S2-120	041052 (contains part ②) *	260
Ø 125	S2-40 and S2-60	040940 (contains parts ①+②) *	310
	S2-70 to S2-150	041051 (contains parts ①+②) *	375
Ø 160	S2-70 to S2-150	041050 (contains parts ①+②) *	390

* : See figure 6.



IMPORTANT:

For this type of configuration, it is imperative to use an exhaust system with technical evaluation document (ducts under pressure)

The 80 Chimney Adaptor accessory (code 040945) has an Ø80, 500 mm long straight component that can be cut to the desired dimension (195 mm min).

The Ø 110 (code 041052 and 041096), Ø 125 (codes 040940 and 041051) and Ø 160 (code 041050) chimney adapter have an outlet that cannot be cut.

A purge tee is not necessary, because condensate recovery is incorporated in the boiler. To do this use a minimum slope of 3 % towards the boiler in the horizontal parts.

To ease fitting coat the joints with liquid soap or an appropriate grease.

4.3.3. Connection to a C13 or C33 suction pipe

C13 type connection:

Air inlet and gas evacuation through concentric ducts connected to a horizontal concentric terminal (suction pipe).

C33 type connection:

Air inlet and gas evacuation through concentric ducts connected to a vertical concentric terminal.



WARNING:

The use of the “Horizontal suction pipe” accessory is mandatory to connect the boiler to a C13 concentric suction pipe.

The use of the “Vertical black suction pipe” or “Vertical ochre suction pipe” accessory is mandatory to connect the boiler to a C33 concentric suction pipe.

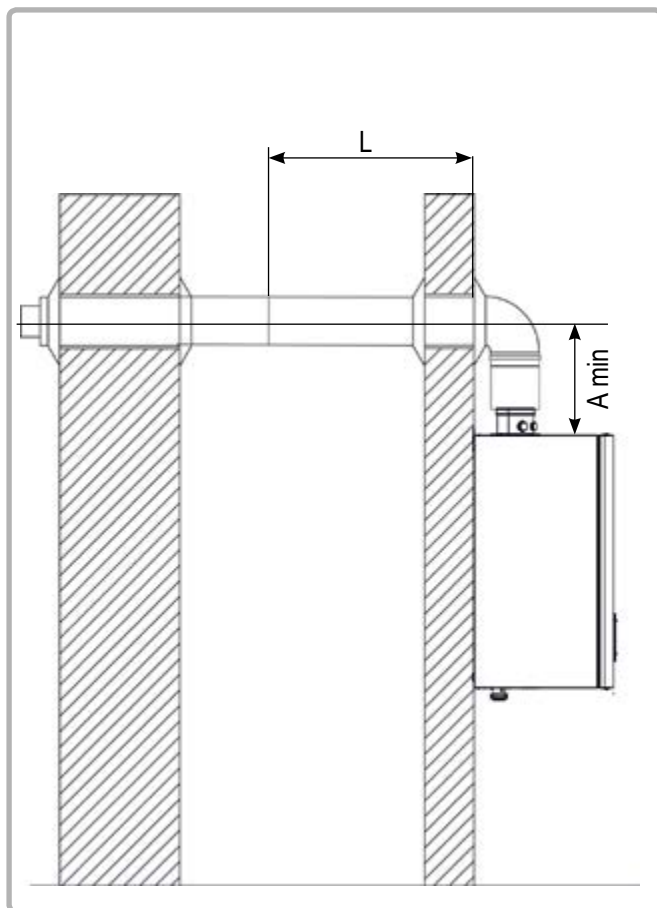


figure 8 - C13 type connection

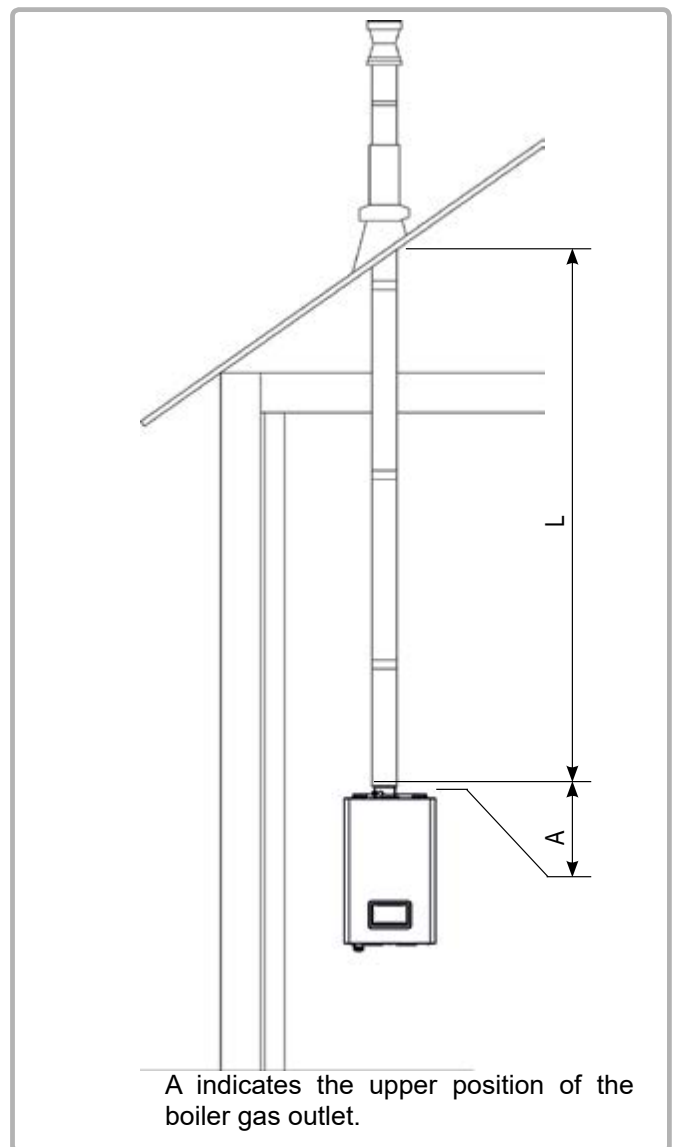


figure 9 - C33 type connection



IMPORTANT:

The ignition speed MUST be modified on the 150 kW boilers.

Place the boiler in standby mode (see § 3.3.1 of the NAVISTEM B3000 boiler command table instructions).

If necessary, press the ESC button to return to the main screen.

Open the **Burner control** menu.

Adjust the ignition speed parameter (9512):

Connection type	9512 (rpm)
B23 / B23P	3410
C13 / C33	3030

The table below shows the available accessories according to the type of boiler, the diameters of the ducts and the maximum rectilinear lengths. The approved ducts are Ubbink Rolux Concentric Condensation ducts.

		STRATTON MK2						
		S2-40	S2-60	S2-70	S2-80	S2-100	S2-120	S2-150
Suction pipe horizontal type C13	Terminal C13	040946			040987			
	Ø duct	Concentric 80/125			Concentric 100/150			
	A min (mm)	168			215			
	Lmax (m)	G20	15	10	10	10	10	8
	G31	15	8	10	10	10	--	--
Suction pipe vertical type C33	Terminal C33 black	040947			040988			
	Terminal C33 ochre	040948						
	Ø duct	Concentric 80/125			Concentric 100/150			
	A min (mm)	85			110			
	Lmax (m)	G20	15	10	10	10	10	8
	G31	15	8	10	10	10	--	--

The Lmax lengths are the lengths excluding the terminal and 90° elbow for the type C13 and excluding the terminal for the type C33.

In addition, in calculating the duct length, take the following equivalences into account:

- 90° elbow = 1 m of straight duct
- 45° elbow = 0.5 m of straight duct

Use a minimum slope of 3% towards the boiler.

For type C13, drill a 150mm hole in the wall for the 80/125 terminal and a 180 diameter hole for the 100/150 terminal. Seal the air vent terminal into the wall with polyurethane foam to allow for removal if necessary.

To ease fitting coat the joints with liquid soap or an appropriate grease.

4.3.4. Connection to a C53 suction pipe

C53 type connection:

Air inlet and gas evacuation through two separate ducts.



WARNING:

The use of the “Vertical black separate suction pipe” or “Vertical ochre separate suction pipe” accessory is mandatory to connect the boiler to a C53 separate suction pipe.



IMPORTANT:

The ignition speed **MUST** be modified on the 150 kW boilers.

Place the boiler in standby mode (see § 3.3.1 of the NAVISTEM B3000 boiler command table instructions).

If necessary, press the ESC button to return to the main screen.

Open the **Burner control** menu.

Adjust the ignition speed parameter (9512):

Connection type	9512 (rpm)
B23 / B23P	3410
C53	3030

The table below represents the accessories available for each boiler type.

	STRATTON MK2					
	S2-40	S2-60	S2-70	S2-80	S2-100	S2-120
C53 black	040951		040999			
C53 ochre	040952					

The approved ducts are Ubbink Rolux Separate Condensation 80/80 ducts for S2-40 and S2-60 kW models and Ubbink Rolux Separate Condensation 100/100 ducts for S2-70 to S2-120 models.

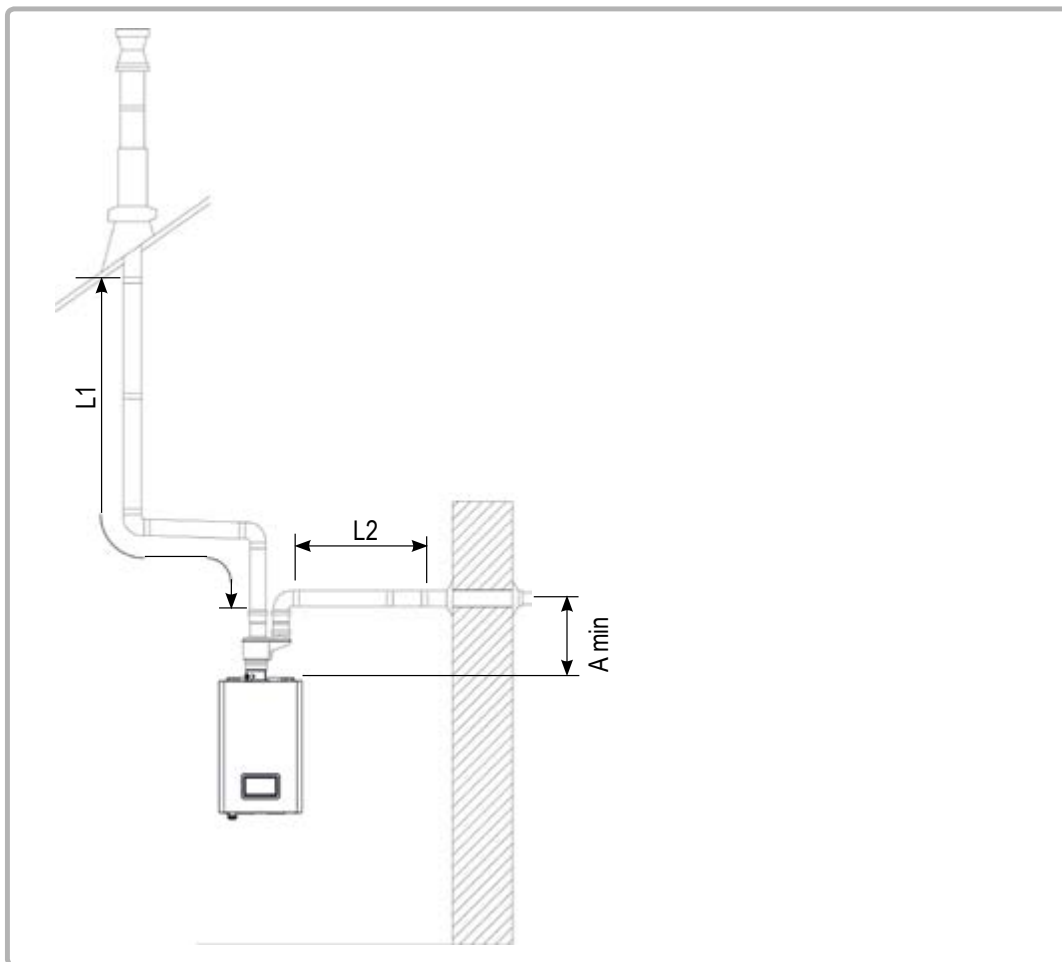


figure 10 - C53 type connection

			STRATTON MK2						
			S2-40	S2-60	S2-70	S2-80	S2-100	S2-120	S2-150
Ø duct			Separated 80/80		Separated 100/100				
A min (mm)			414		460				
Max lengths (m)	G20	Gas (L1)	17	15	15	15	15	14	6
		Air (L2)	20	15	20	20	20	10	6
	G31	Gas (L1)	17	15	15	15	15	--	--
		Air (L2)	20	15	20	20	20	--	--

In calculating the duct length take the following rules into account:

- 90° elbow = 1 m of straight duct
- 45° elbow = 0.5 m of straight duct

For the gas duct, use a minimum slope of 3% towards the boiler in the horizontal parts.

To ease fitting coat the joints with liquid soap or an appropriate grease.

4.3.5. Condensate removal

Removal to the drains, via a drain hopper, using a P.V.C tube (minimum diameter 32 mm) is mandatory because the condensates are acid and thus aggressive (pH between 3 and 5).

Use a sufficient slope of the order of 3% to ensure correct flow of the condensates.



IMPORTANT:

Neutralise these condensates before removal according to the current regulations.

4.4. Gas connection

Before installing the boiler, clean the interior of the gas line, which must be free of metal particles and welding debris. This will lengthen the lifespan of the product.

Before starting up for the first time, check that the pressure of the natural gas supply corresponds to the nominal boiler pressure, stated on the name plate.

The gas valve is fitted with an integrated filter (125µm), but this is not able to retain all the impurities contained in the gas and in the mains pipes. To avoid any malfunction of the gas valve, we advise the fitting of a suitable filter to the boiler gas supply (50µm).

Before feeding gas to the installation, ensure that the different connections are correctly made and gas tight.

In particular check the presence of a removable connector between the isolating valve and the boiler gas supply tapping.

The value before the gas valve must be within the limits shown in the table in chapter 2.4 for the type of gas.



IMPORTANT:

Before connecting the gas line, check whether the boiler uses G20 or G31 gas. If it uses G31, make the changes described in chapter 4.5. The gas line must not be subject to any mechanical stress (risk of loss of gas tightness of the gas valve). Check that the natural gas supply corresponds to the nominal boiler pressure, stated on the name plate.

4.5. Gas change (G20 to G31, only S2-40 to S2-100)

This STRATTON MK2 boiler has been adjusted in the factory to work with group H (type G20) natural gas with a supply pressure of 20 mbar.



IMPORTANT:

Any operations involving changing the type of gas used must be performed by a qualified professional.

Any operation involving a change of gas type must be done by a qualified professional. To change gas type, use the operation mode "Manual power adjustment" (see point 3.3.4 in the instructions for the Navistem B3000 boiler controller) which enables the user to switch straight to the minimum or maximum setpoint value (i.e. to zero or full power).



IMPORTANT:

The settings have been approved for the gas supply pressures at the valve inlet (measured on the pressure meter before the gas valve and with the burner working) in the following tables.



IMPORTANT:

Since the combustion is adjusted with the door open, check that the combustion is clean after installing the front door.

4.5.1. *Installing the propane injector*



IMPORTANT:

ONLY S2-70, S2-80 and S2-100 model boilers.

Change the type of gas by installing an injector at the gas valve inlet. Close the gas feed valve and switch off the electric power supply. Disconnect the electric cable and connect on the gas valve. Undo the two nuts before and after the valve (see figure below) and remove the valve from the boiler. Undo the four screws (see below). Install the injector. Install the assembly.

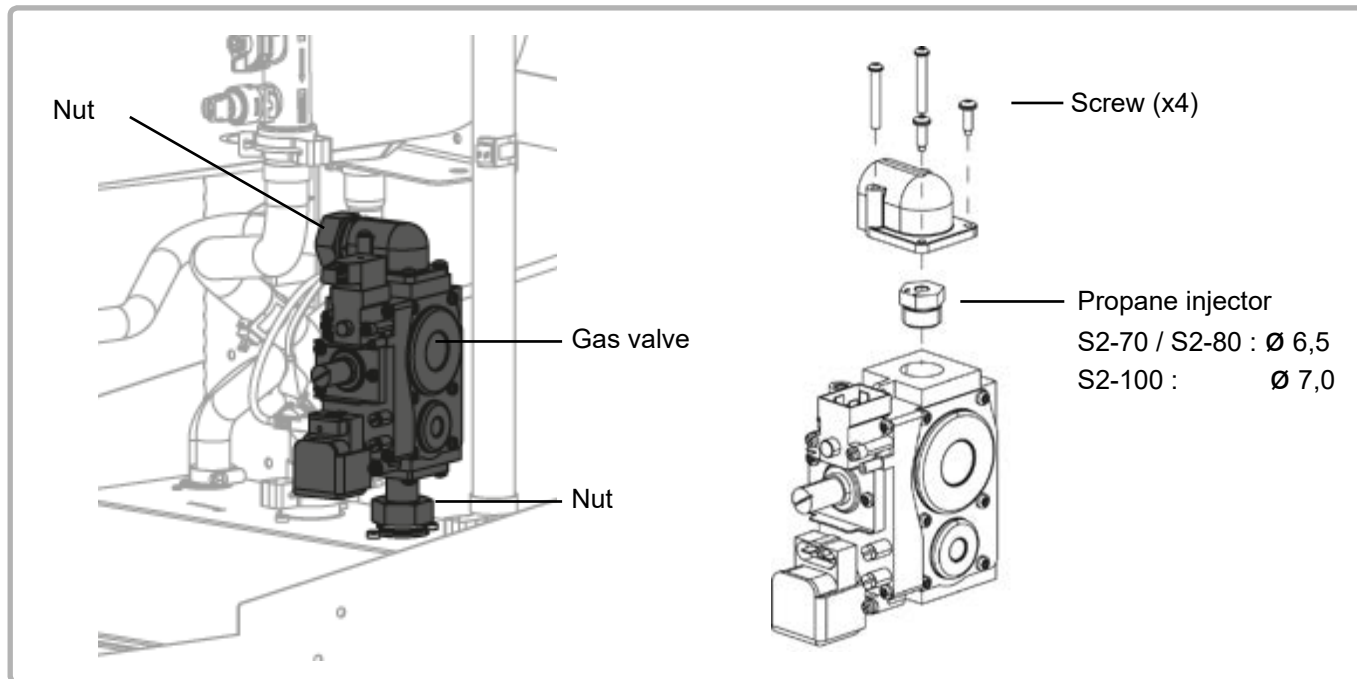


figure 11 - Installing the propane injector



IMPORTANT:

Always replace the washers on the two nuts.
Check the seals.

4.5.2. Changing the ignition, pre-ventilation, minimum and maximum speeds

Place the boiler in standby mode (see § 3.3.1 of the NAVISTEM B3000 boiler command table instructions).

If necessary, press the ESC button to return to the main screen.

Open the **Settings / Safety unit** menu.

Adjust the pre-ventilation speed (9504), ignition speed (9512), minimum speed (9524) and maximum speed (9529) settings:

Models	Gas	9504	9512	9524	9529
40	G20	3380	3380	1780	6100
	G31	3250	3250	1690	5900
60	G20	3130	3130	1920	7250
	G31	2790	2470	1840	6900
70	G20	2450	2300	1760	5480
	G31	2770	2770	2770	5330
80	G20	2450	2300	1760	6240
	G31	2770	2770	2770	6100
100	G20	2750	2350	1750	6450
	G31	2750	2550	2550	6250

4.5.3. Adjustment of the gas valve

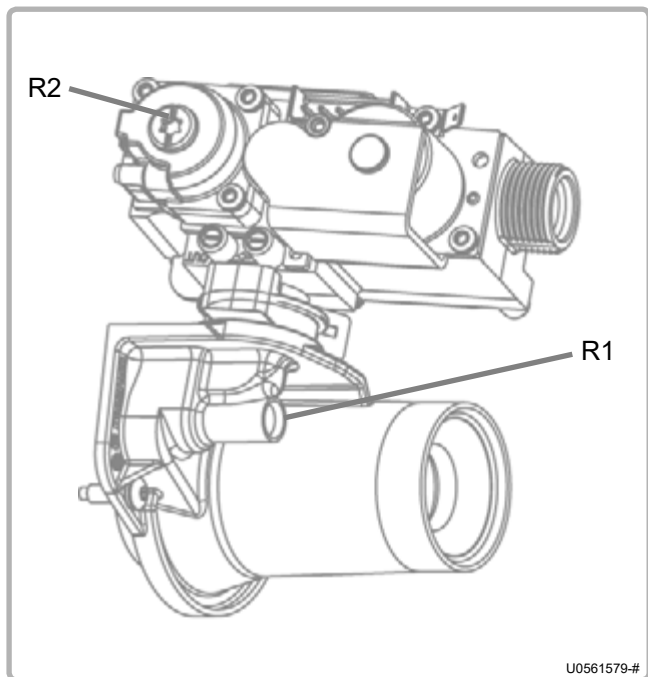


figure 12 - STRATTON MK2 S2-40 and S2-60 settings

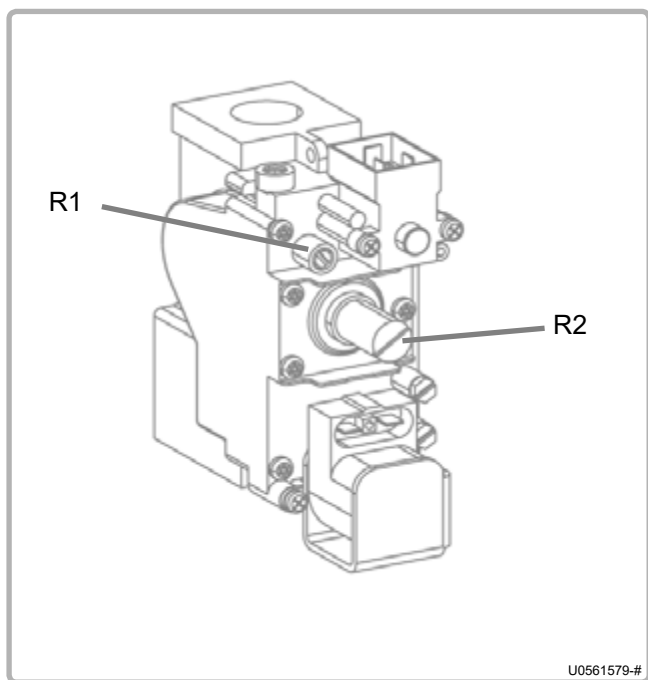


figure 13 - STRATTON MK2 S2-7 to S2-100 settings

- Before starting the burner, on the gas valve, preset the gas flow rate, using the gas flow rate adjustment screw R1, to the appropriate value given in the table below.
- Start the burner at maximum power.
- Using a combustion analyser, measure the CO₂ ratio in the exhaust gases: on the gas duct, remove the plug from the opening and insert the CO₂ measurement sensor into the centre of the flow in the exhaust duct.
- Check the CO₂ value at maximum power Q_{max} and, if necessary, adjust the gas flow screw R1 of the valve in order to obtain the CO₂ values in the table below.
- Change to minimum power Q_{min} and check that the CO₂ value is within the range in the table below. If necessary, use the setting adjustment screw R2.
- If the setting is adjusted at minimum power, go back to maximum power Q_{max} and recheck the CO₂ value. Repeat the operation until both values comply with the table below.
- Return to the standard operating mode.

After changing the type of gas:

- Check the sealing of the gas line.
- Stick the G31 label provided in place of the original label (G20).

Model	Gas	Pre-adjustment of the gas flow adjusting screw R1	Door open pre-setting		Checking the door closed settings	
			CO ₂ Pmax	Indicative CO ₂ Pmin	CO ₂ Pmax	Indicative CO ₂ Pmin
S2-40	G20	--	9,0 - 9,2	8,5 - 8,7	9,1 - 9,3	8,7 - 8,9
	G31	Screw R1 2 turns 1/2 Screw R2 1/8 turn	10,2 - 10,4	9,7 - 9,9	10,3 - 10,5	9,9 - 10,1

Model	Gas	Pre-adjustment of the gas flow adjusting screw R1	Door open pre-setting		Checking the door closed settings	
			CO ₂ Pmax	Indicative CO ₂ Pmin	CO ₂ Pmax	Indicative CO ₂ Pmin
S2-60	G20	--	9,0 - 9,2	8,6 - 8,8	9,1 - 9,3	8,7 - 8,9
	G31	Screw R1 3 turns 3/4 Screw R2 1/4 turn	10,2 - 10,4	9,8 - 10,0	10,3 - 10,5	9,9 - 10,1
S2-70	G20	--	9,0 - 9,2	8,5 - 8,7	9,1 - 9,3	8,7 - 8,9
	G31	Screw R1 1/4 turn Screw R2 1/4 turn	10,2 - 10,4	9,7 - 9,9	10,3 - 10,5	9,9 - 10,1
S2-80	G20	--	9,0 - 9,2	8,5 - 8,7	9,1 - 9,3	8,7 - 8,9
	G31	Screw R1 1/4 turn Unscrew R2 1/4 turn	10,2 - 10,4	9,7 - 9,9	10,3 - 10,5	9,9 - 10,1
S2-100	G20	--	9,0 - 9,2	8,5 - 8,7	9,1 - 9,3	8,7 - 8,9
	G31	Don't touch R1 Unscrew R2 1/8 turn	10,2 - 10,4	9,7 - 9,9	10,3 - 10,5	9,9 - 10,1

4.6. Hydraulic connection

The boiler irrigation flow rate must be at least equal to $P_{inst}/25$ (P_{inst} = instantaneous power in Th/h - 1 Th/h = 1.163 kW).

The circulation pump must be sized according to the maximum power delivered.

In the exchanger, never exceed the flow rates specified in paragraph 3.4.

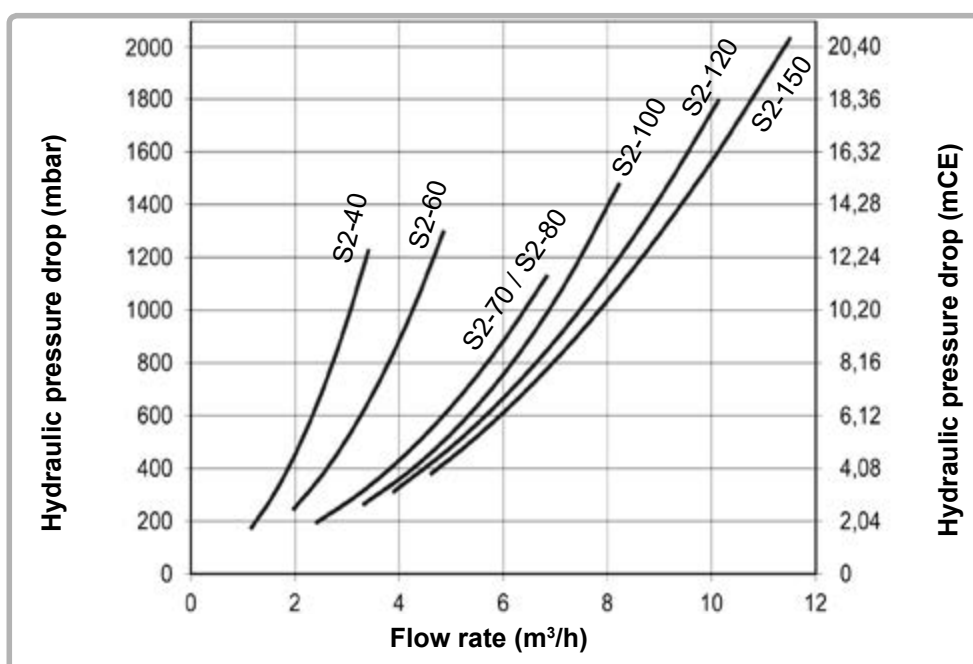


figure 14 - Pressure drop

The boilers are equipped with the following elements:

- an anti-return flap,
- a manual drain tap,
- a flow rate controller.

It is imperative to fit the boiler and its installation with the following components:

- isolating valves on the flow and return taps,
- an expansion tank,
- a safety valve rated at 4 bar max. (as close to the outlet as possible),
- an effective drain mechanism,
- a filling mechanism (to be installed on the return tap),
- a drain mechanism.

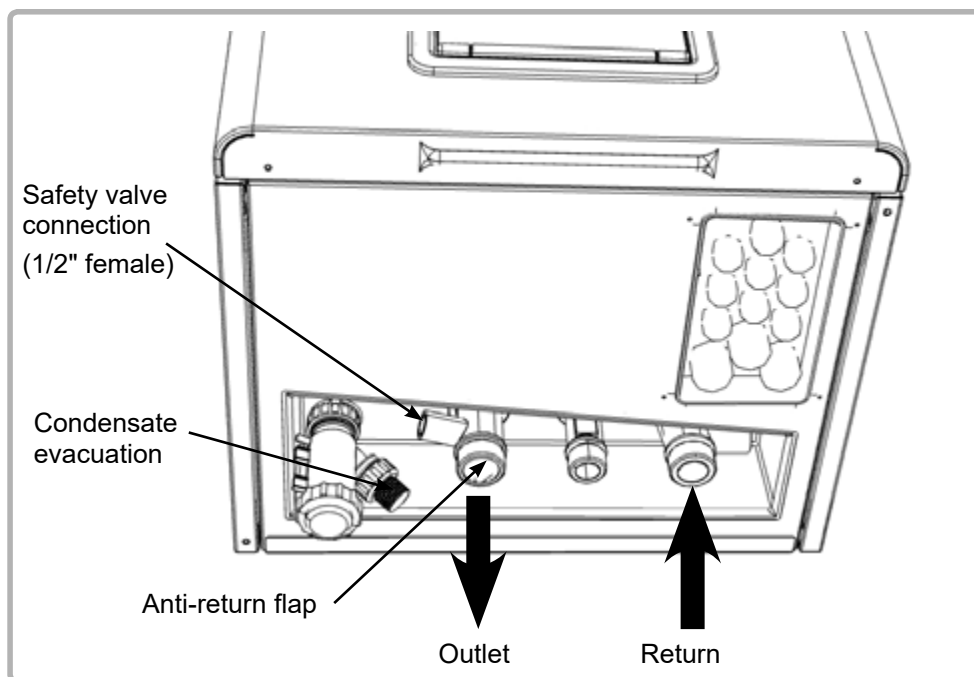


figure 15 - Elements

Filling the installation:

The network must be properly drained. This will be more effective if the boiler is filled slowly, while keeping:

- the manual drain of the exchanger open,
- the safety valve open.

When these two parts discharge a continuous flow of water that is free of bubble, close them and stop filling.

After filling with water:

- Check the water pressure on the pressure gauge (not included). This must be a maximum of 4 bar when hot and a **minimum of 1 bar when cold**.
- Check that the boiler and its installation are completely bled (check the boiler levelling with a spirit level).

Condensate removal:

Removal to the drains, via a drain hopper, using a P.V.C tube (minimum diameter 32 mm) is mandatory because the condensates are acid and thus aggressive (pH between 3 and 5).

Use a sufficient slope of the order of 3% to ensure correct flow of the condensates.



IMPORTANT:

Neutralise these condensates before removal according to the current regulations.

4.7. Electrical connection



WARNING:

Always check that the electric power supply is switched off before working on the boiler.



IMPORTANT:

It is mandatory to connect this boiler correctly to earth and to comply with standard for low-voltage electrical installations. Provide a two-pole circuit breaker upstream of the boiler (distance between contacts: 3.5 mm minimum). Fitting the electrical installation with a 30 mA differential protective device is strongly advised.

Please refer to the installation and user manuals of the NAVISTEM B3000 boiler controller for more information about the electrical connections on the control panel (characteristics of the electric power supply, cable cross-sections and connections to the terminals).

4.7.1. Control panel

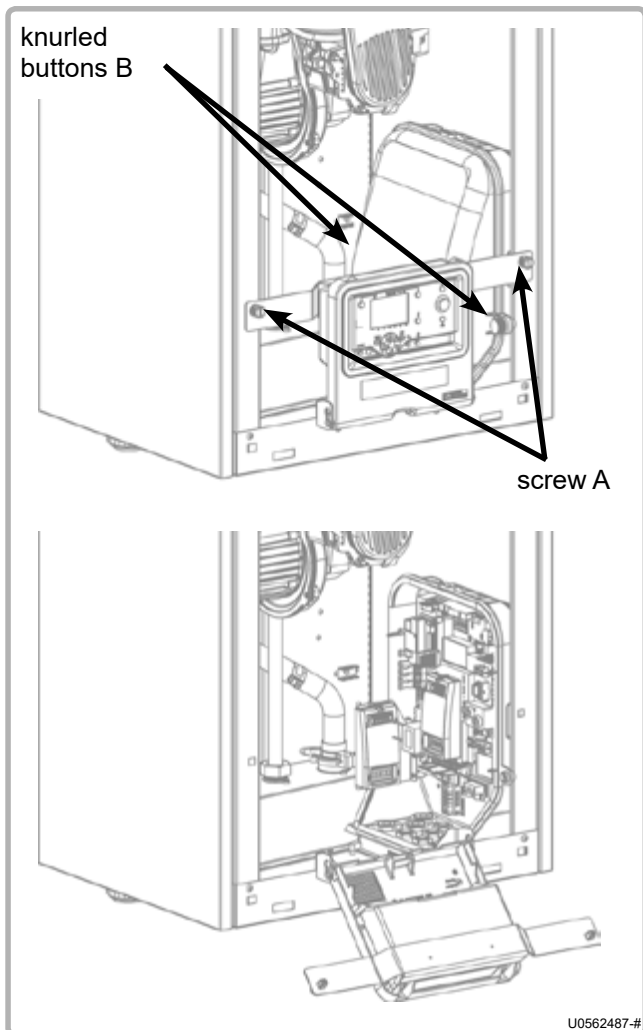


figure 16 - Access to the NAVISTEM B3000

Remove the front panel of the boiler in order to gain access to the control panel.

The panel is located in the lower right-hand part of the boiler.

Loosen the screws A (see opposite) by a quarter turn and tilt the display forwards.

The cover of the panel is secured by two knurled buttons B. Undo them and remove the cover.

4.7.2. Cable ways

Use the packing glands beneath the boiler to pass the cables to the various terminals of the NAVISTEM B3000.

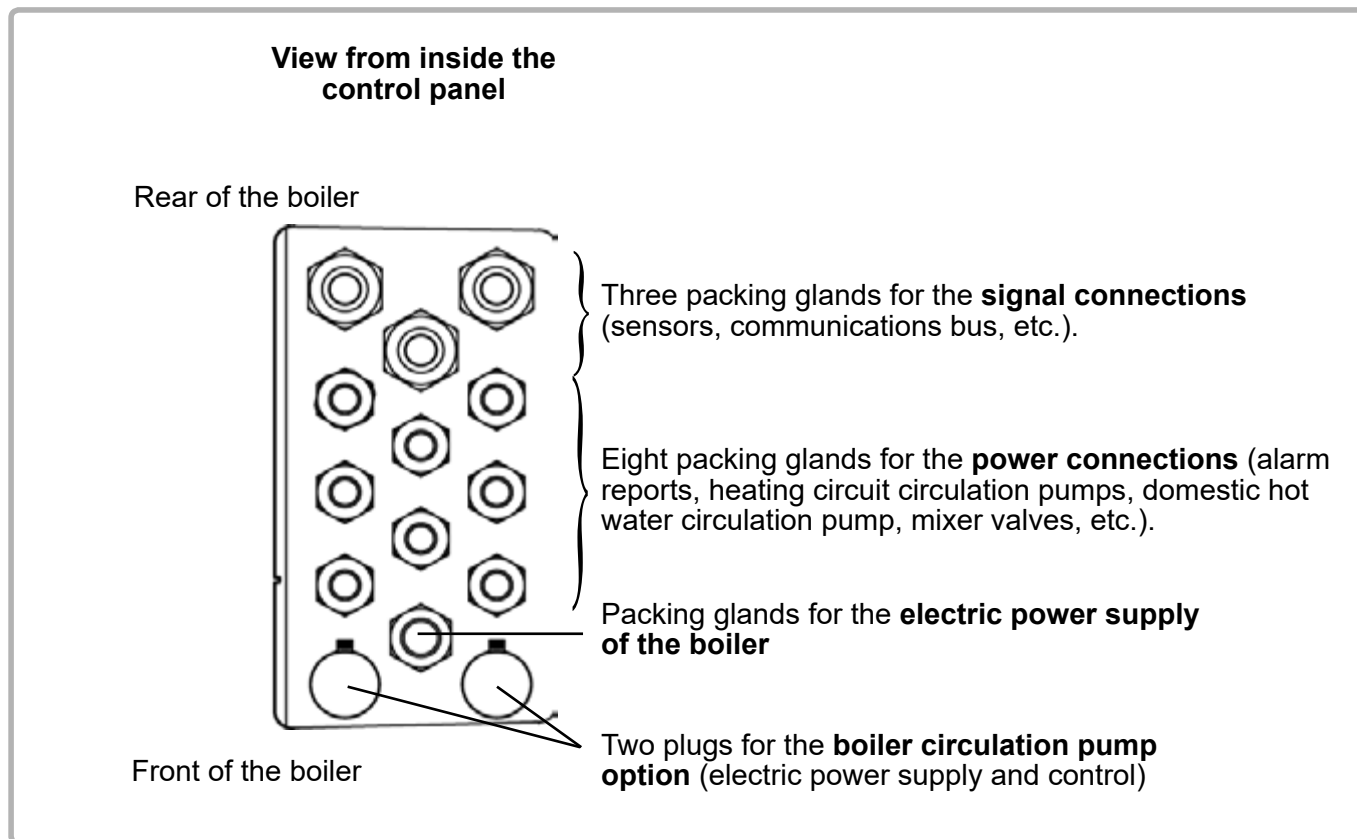


figure 17 - Packing gland

4.7.3. Wiring diagram

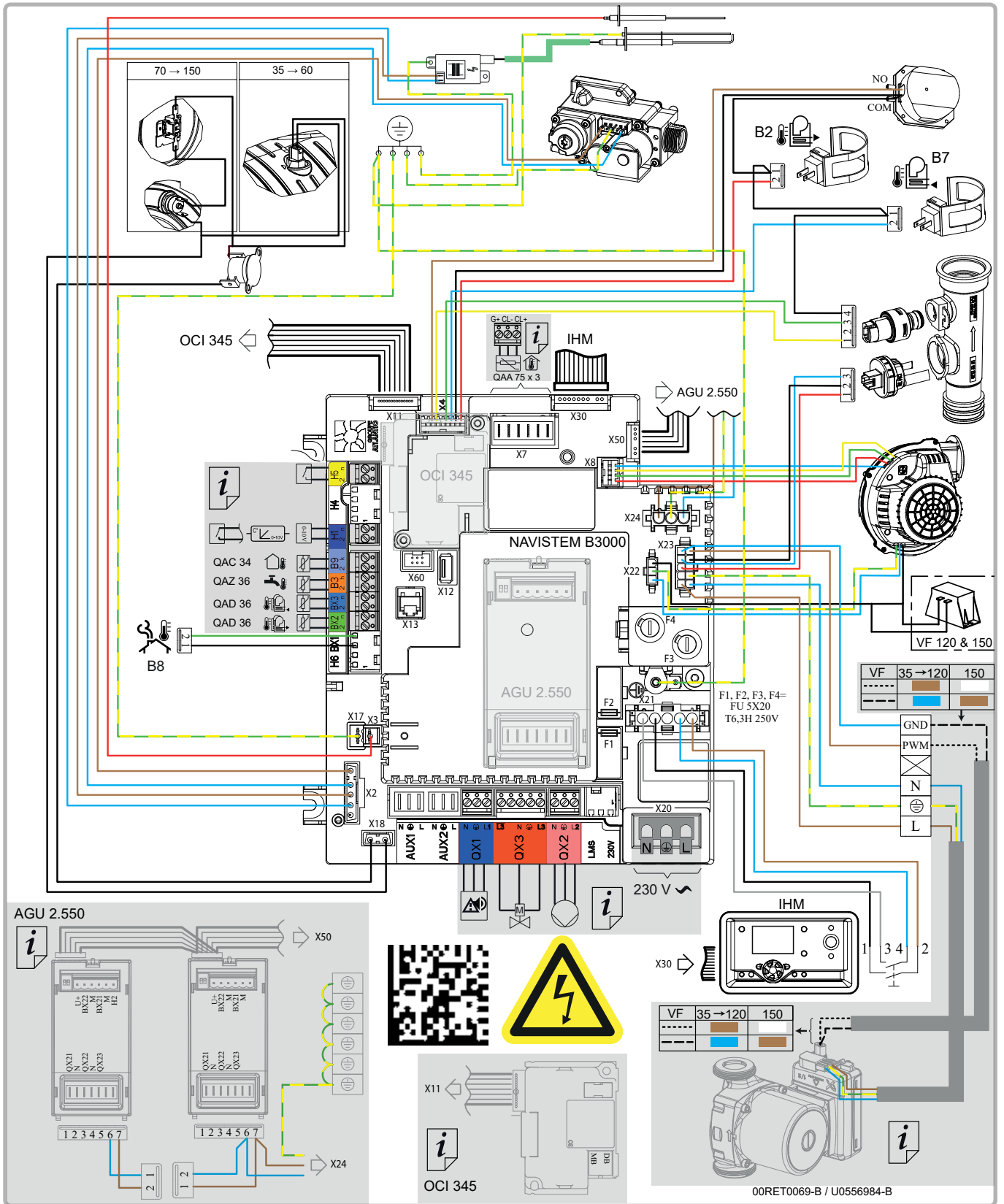


figure 18 - Wiring diagram

4.7.4. Connection to the terminals of the NAVISTEM B3000 boiler controller

To connect the NAVISTEM B3000 boiler controller, please refer to the installation and user manual.

4.7.5. Connection of the boiler circulation pump (compulsory accessory)

4.7.5.1. Accessory supplied by HAMWORTHY

If the accessory is supplied by HAMWORTHY, please refer to the installation manual for the connection of the boiler circulation pump.

4.7.5.2. Accessory supplied by the customer

The circulation pump is controlled by a 230 VAC (1A max.) output on the NAVISTEM B3000 panel.

This output is active when a request for heat is in progress on the boiler.

If the circulation pump does not have a control switch:

Directly wire the power supply of the circulation pump (230 VAC - 1A max.) to the terminal QX3 (contacts L3, N and ⊕) on the NAVISTEM B3000 panel. If the circulation pump consumes more than 1A, the power supply must be relayed.

If the circulation pump is equipped with a dry-contact On / Off control:

Connect the power supply of the circulation pump directly from your electric panel.

Use the QX3 output (contacts L3 and N) on the NAVISTEM B3000 panel (230 VAC - 1 A max.) to wire the circulation pump relay control.

4.7.6. Connection of the OCI 345 module (optional accessory)

To install the OCI 345 module, please refer to the manual provided with the accessory.

4.7.7. Connection of the AGU 2.550 module(s) (optional accessory)

To install the AGU 2.550 module(s), please refer to the manual provided with the accessory.

4.7.8. Fuses

The STRATTON MK2 boiler is fitted with four fuses on the boiler controller (refer to the label on the protective cover for their positions and characteristics).

Three spare fuses are also provided on the boiler controller.

5. FIRST USE

5.1. Checks before first use

Check that the cold pressure is a minimum of 1 bar.

If this is a boiler house renovation, ensure that flushing and if necessary silt removal from the installation have been correctly done (see chapter 1.5, page 6 of this manual).

Verify the connecting of the gases according to the type of chimney.

Check that the pressure and the type of gas are adapted to the product.



WARNING:

The use of glycol water is forbidden.



IMPORTANT:

The use of the connection accessories is mandatory to connect a STRATTON MK2 boiler to a B23 or B23P chimney duct.

5.2. First use

Before packing all boilers are subjected to a factory test using group H (type G20) natural gas during which all the settings are done.

For first use perform the following operations:

1. Switch on the main circuit breaker.
2. Create a request for heat via the comfort mode using the customer interface (see the chapter "3 - Interface utilisateur" in the NAVISTEM B3000 boiler controller manual).
3. After starting the burner, check the gas tightness of the gas line connections using a foaming product. Check combustion health using an exhaust gas analyser.
4. Adjust the boiler setting (refer to the table summarising customer parameters at the end of this manual).



IMPORTANT:

Any work on a sealed component will lead to loss of the guarantee.

6. CHECKS AFTER COMMISSIONING

6.1. Condensate removal

Check that the removal of condensates is not obstructed on either the boiler side or the pipe side.

6.2. Gas supply

Check that the gas pipe diameter is correctly sized:

It is necessary to stop all the boilers together abruptly using the boiler room main circuit breaker to check that the gas pressure regulator safety device is not triggered.

If this is triggered, the gas pipe is undersized. After this operation, re-engage the circuit breaker. The boilers should start automatically, if not, consult the supplier of the gas pressure regulator.

7. MAINTENANCE OPERATIONS

These operations must be carried out by a qualified professional.

Before performing the following operations:

- Switch off the main circuit breaker.
- Close the gas supply isolation valve.
- Isolate the boiler hydraulically.

Clean the exchanger (see details in the next chapter)
<p>Check tube sooting visually.</p> <p>If necessary, clean the tubes with a non-metal brush. Chemical cleaning is forbidden.</p>
Ignition / ionisation electrodes (see details in the next chapter)
<p>Check the geometry of the ignition electrode (gap width) and the ionising electrode.</p> <p>If necessary, replace the electrodes.</p>
Condensate removal siphon
<p>Clean the removal siphon and check that the condensates flow correctly (replace the water after checking).</p>
Check the gas valve and the differential air pressure switch. Check the connection of the pressure transfer pipe.
Carry out a combustion hygiene check.

7.1. Draining the boiler

- Hydraulically isolate the boiler (for installations with our cascade packs, the shut-off valves are on the collectors),
- Reduce the pressure by opening the boiler bleed valve,
- Open the drain valve of the installation or the valve supplied with our hydraulic packs,
- Complete the draining of the outlet pipe by actuating the safety valve.

7.2. Annual checks

- Switch off the electric power supply of the boiler,
- Close the gas supply,
- Remove the front panel (see § 4.2, page 20).



WARNING:

Protect all the electric connectors inside the control panel when working on the boiler hydraulics (risk of splashing).

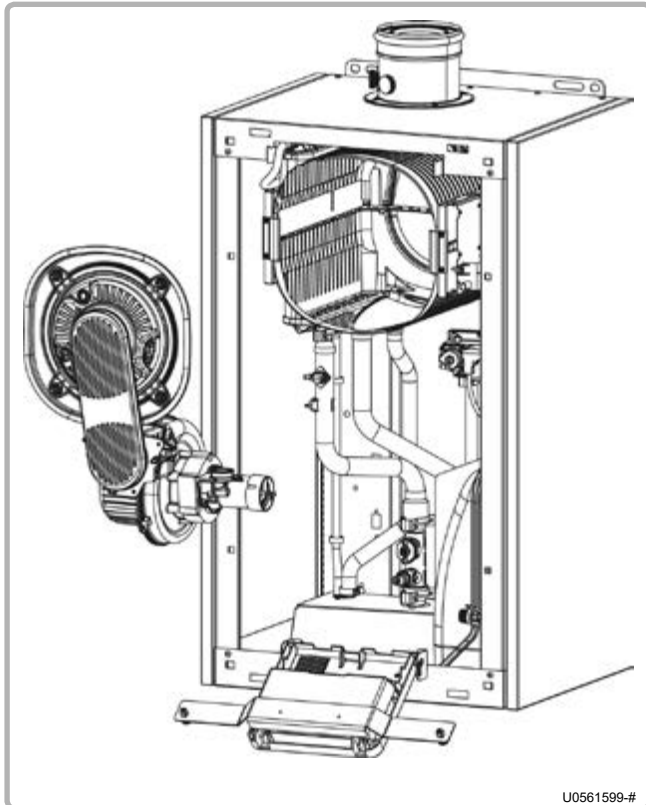


figure 19 - Open STRATTON MK2

- Disconnect the gas tube after the gas valve,
 - Disconnect the electrodes, the fan and the air transfer pipe by the air pressure switch,
 - Unscrew the M6 nuts attaching the door,
 - Remove the burner support, fan and venturi assembly and carefully put it in a clean place.
-
- If there are any deposits in the combustion chamber, brush the tubes of the exchanger with a **non-metal brush**. **Chemical cleaning of the combustion chamber with an acid or alkaline product is forbidden**. Vacuum clean the deposits.
 - If the refractory insulation at the bottom of the combustion chamber and of the burner support is damaged, then it must be replaced.
 - If the level of condensates in the combustion chamber has risen due to poor evacuation, the refractory insulation at the bottom of the combustion chamber and of the burner holder must be replaced.
 - Replace the seals on the burner holder if they are damaged.
 - The burner rail does not require any maintenance. Replace it, if damaged.

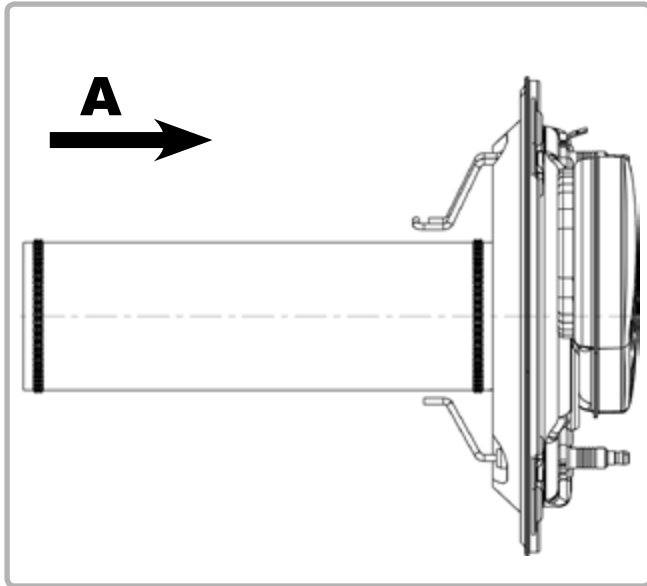


figure 20 - Side view of the burner

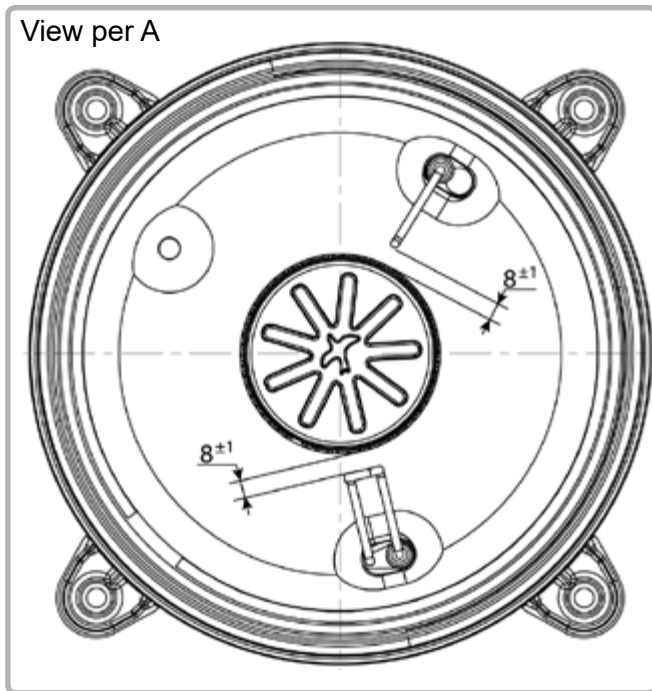


figure 21 - Position of the burner electrodes

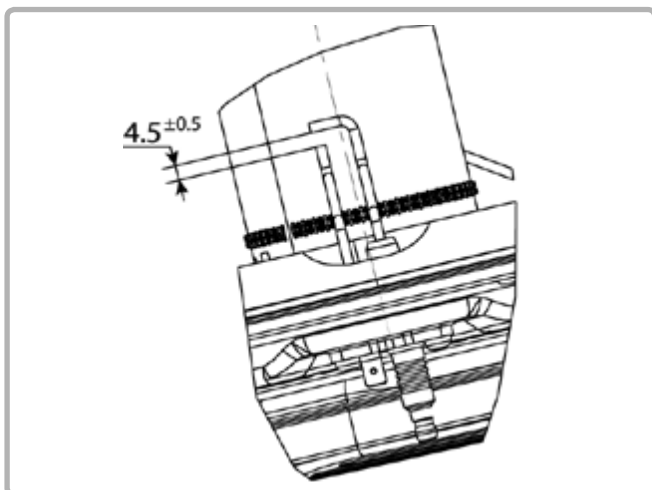


figure 22 - Geometry of the electrodes

- Check the geometry of the electrodes, alumina deposits and the appearance of the ceramic and the seals. Replace the electrodes and the seals if they are damaged.
- Clean the siphon and check that the condensate flows freely through it. The siphon must be filled after maintenance.
- Install the burner holder and tighten the M6 nuts crossways (four nuts on S-40 and to S2-60 models, six nuts on S2-70 to S2-120 models). Maximum tightening torque: 5 Nm.
- Connect the gas supply.
- Check that the gas circuit is sealed with a foaming product.
- Install the control panel.
- Switch on the electric power supply.
- Start the boiler, check that the burner holder is properly sealed and check the hygiene of the combustion. The rate of CO₂ must comply with the values in the table in paragraph 4.5.
- Install the front panel and check the hygiene of the combustion with the door closed.

8. END-OF-LIFE CYCLE OF THE APPARATUS

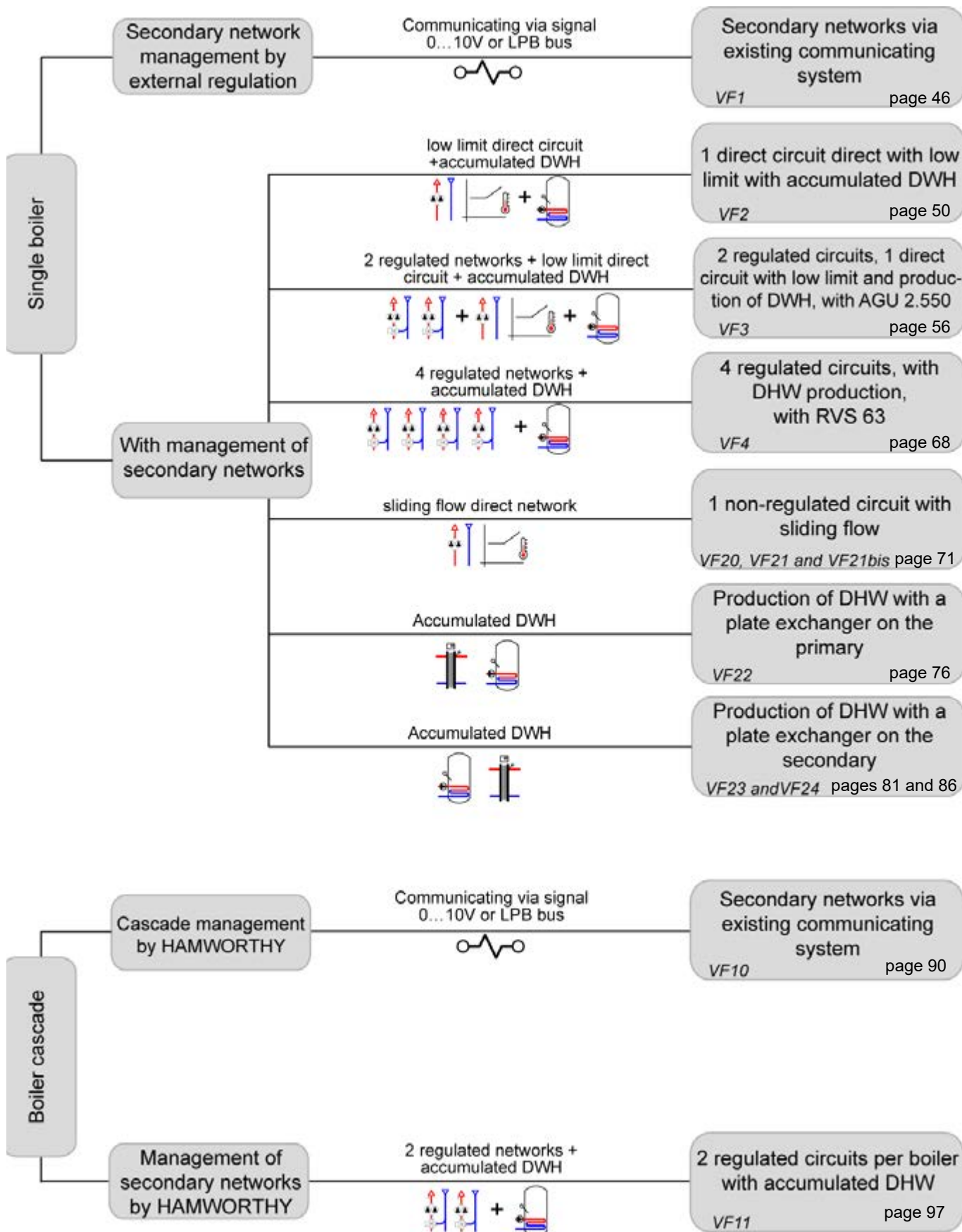
Regulatory disposal and managed recycling of this product can prevent damage to the environment and health risks.

- a) For the disposal of the product and the component parts, the services of an accredited waste disposal company should be used.
- b) For more information on waste disposal/management, contact the Local Authority responsible for waste management or the point of sales where the product was purchased















9. HYDRAULIC DIAGRAMS AND CONFIGURATIONS

9.1. Selection diagrams



9.2. Symbols used in the diagrams

Symbol	Function
	Isolation valve open
	Motor-controlled 2-way valve
	Filter
	Safety unit
	Mud cup
	External sensor

Symbol	Function
	Balancing valve
	Motor-controlled 3-way valve
	Anti-return flap
	Pump
	Bleed valve
	Temperature sensor

9.3. List of diagrams

SINGLE BOILER	46
Without control of the secondary communications networks 0...10V or LPB.....	46
VF1	
Control 1 direct circuit with low limit and production of DWH.....	50
VF2	
2 regulated circuits, 1 direct circuit with low limit and production of DWH.....	56
VF3	
4 regulated circuits, with DWH production.....	63
VF4	
1 non-regulated circuit with sliding flow.....	71
VF20, VF21, VF21bis	
Production of DWH with a plate exchanger on the primary.....	76
VF22	
DHW production with hygiatherm.....	81
VF23	
DHW production with tank with coil.....	86
VF24	
 BOILER CASCADE	 90
Without control of the secondary, communications networks 0...10V or LPB.....	90
VF10	
2 regulated circuits per boiler and production of DWH.....	97
VF11	

SINGLE BOILER

Without control of the secondary communications networks 0...10V or LPB

Diagram

VF1

page 1 / 4

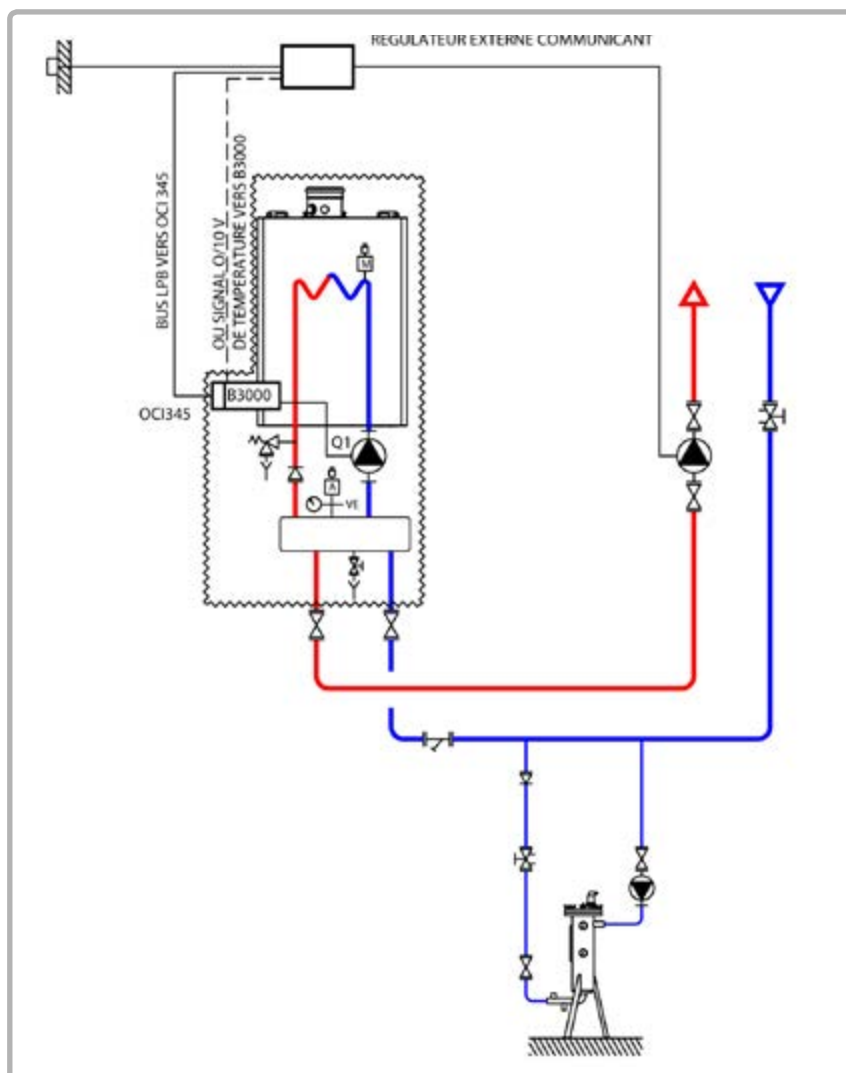
A. HYDRAULIC DIAGRAM

figure 23 - VF1 diagram

The existing regulation system controls the installation's heating circuit.

It sends the outlet temperature set point to the boiler, either over the LPB bus through the OCI 345 interface (SIEMENS protocol), or by a 0 - 10 V signal, sent directly to the NAVISTEM B3000.

When controlled by the external regulator, the boiler operates according to a sliding temperature scale when it starts for the heating, according to the outdoor temperature.

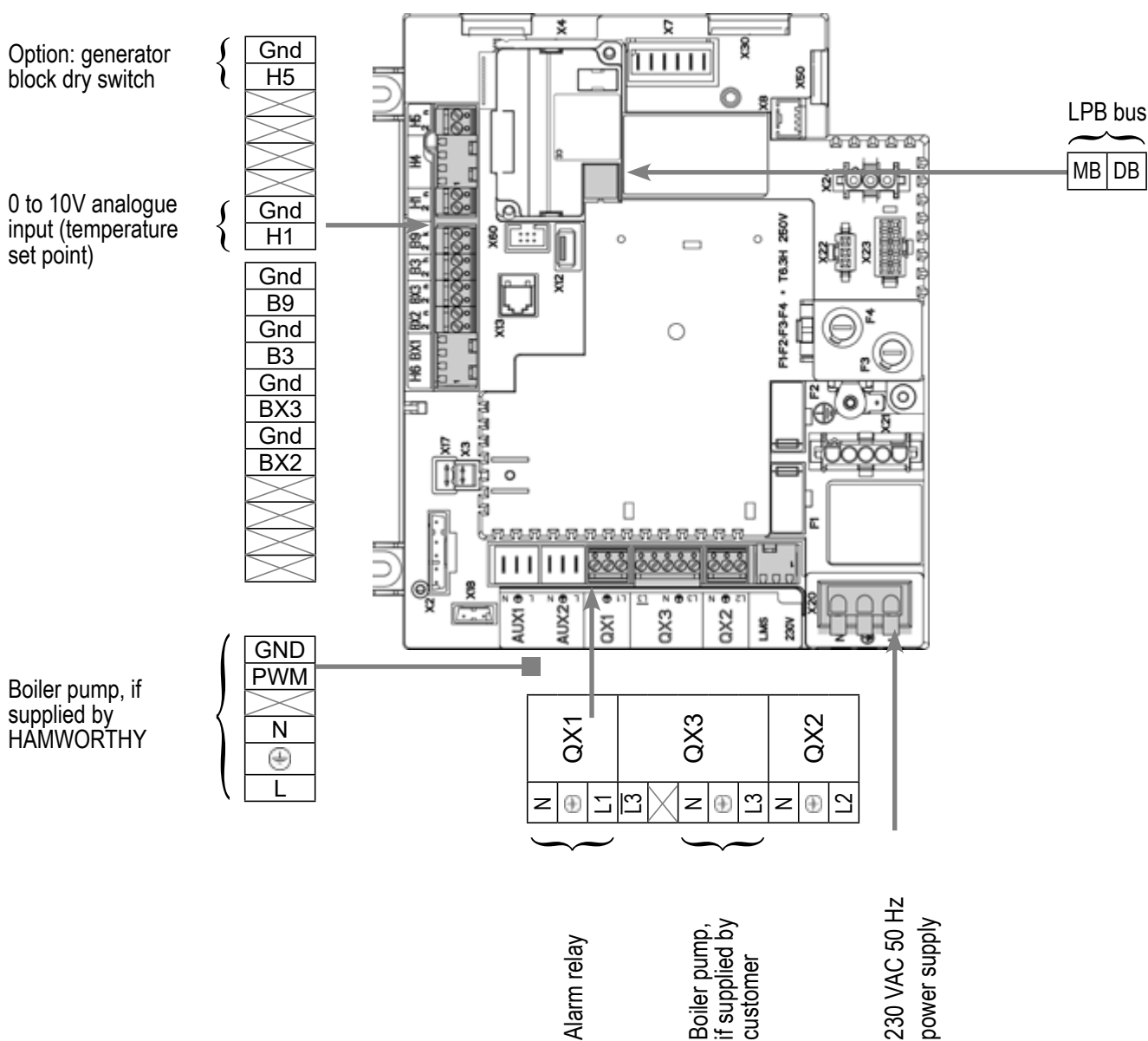
B. REGULATION ACCESSORY REQUIRED

	Quantity	Appliance reference	Order No.
Communication kit for LPB bus <i>(for dialogue over LPB bus)</i>	1	OCI 345	059572

Diagram: VF1

C. RECOMMENDED HYDRAULIC ACCESSORY

		Order No.
Hydraulic kit for boiler only	for STRATTON MK2 S2-40 and S2-60	082324
	for STRATTON MK2 S2-70, S2-80 and S2-100	082325
	for STRATTON MK2 S2-120 kW	082326
	for STRATTON MK2 S2-150 kW	082327



D. CUSTOMER'S ELECTRICAL CONNECTION**E. SPECIFIC START-UP PROCEDURE**

☞ Make the accessories' electrical connections.

☞ Start up the boiler only.

☞ Make the following settings:

	Line No.	Value
• Configuration menu		
Boiler pump supplied by HAMWORTHY	No adjustments necessary	
Boiler pump supplied by the customer (all-or-nothing control)	Relay output QX3 (5892)	Boiler pump Q1
• Time and date menu		
Set the time	Hours / minutes (1)	HH.MM
Set the date	Day / month (2)	DD.MM
Set the year	Year (3)	YYYY
For a request via 0...10V input		
• Configuration menu		
Configure the H1 input	Function input H1 (5950)	Consumer request VK1 10V
	Voltage value 1 H1 (5953)	0.0
	Function value 1 H1 (5954)	0
	Voltage value 2 H1 (5955)	10.0
	Function value 2 H1 (5956)	1000 (for equivalence 10 V = 100 °C)
Option: to keep the generator at a stop, even if the 0...10V signal is different from 0	Function input H5 (5977)	Inhibit starting (produces a fault E846)
For a request by LPB (LPB network menu)		
• LPB network menu		
Check that the boiler is defined as the master generator	Device address (6600)	1
	Segment address (6601)	0
	Bus power supply function (6604)	Automatically
	Clock mode (6640)	Slave with remote setting
• Configuration menu		
Save the sensors	Save sensors (6200)	Yes (switches back to no automatically)

F. ELECTRICAL AND HYDRAULIC VALIDATION

For a request via 0...10V input

- **Inputs/outputs test** menu

	<i>Line No.</i>	<i>Value</i>
Voltage in H1	Voltage signal H1 (7840)	To be validated with the voltage sent by the boiler room's PLC
Direction of switch H5	Contact state H5 (7865)	Open / Closed

For a request via LPB

If the boiler room's regulator is configured as master clock, it must retrieve the date and time.

In both cases

- **Inputs/outputs test** menu

Alarm relay	Relay test (7700)	Relay output QX1
Boiler pump control, if supplied by customer	Relay test (7700)	Relay output QX3
Reset the outputs	Relay test (7700)	No test

- **Configuration** menu

Check the hydraulic diagram	Check no. heat source 1 (6212)	14
	Check no. heat source 2 (6213)	0
	Check no. storage tank (6215)	0
	Check no. heating circuits (6217)	0

G. CONFIGURATION OPTIMISATION

Maintenance optimisation

A maintenance message may be generated that does not set the boiler to fault. This maintenance message may be displayed after the following 3 counters have expired:

- Time since last maintenance (or commissioning): set parameter 7044 to 12 months.
- Operating hours of the burner (parameter 7040).
- Number of starts (parameter 7042)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.

<h2 style="margin: 0;">SINGLE BOILER</h2> <p style="margin: 0;"><i>Control 1 direct circuit with low limit and production of DWH</i></p>	<p>Diagram VF2</p> <p>page 1 / 6</p>
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A. HYDRAULIC DIAGRAM

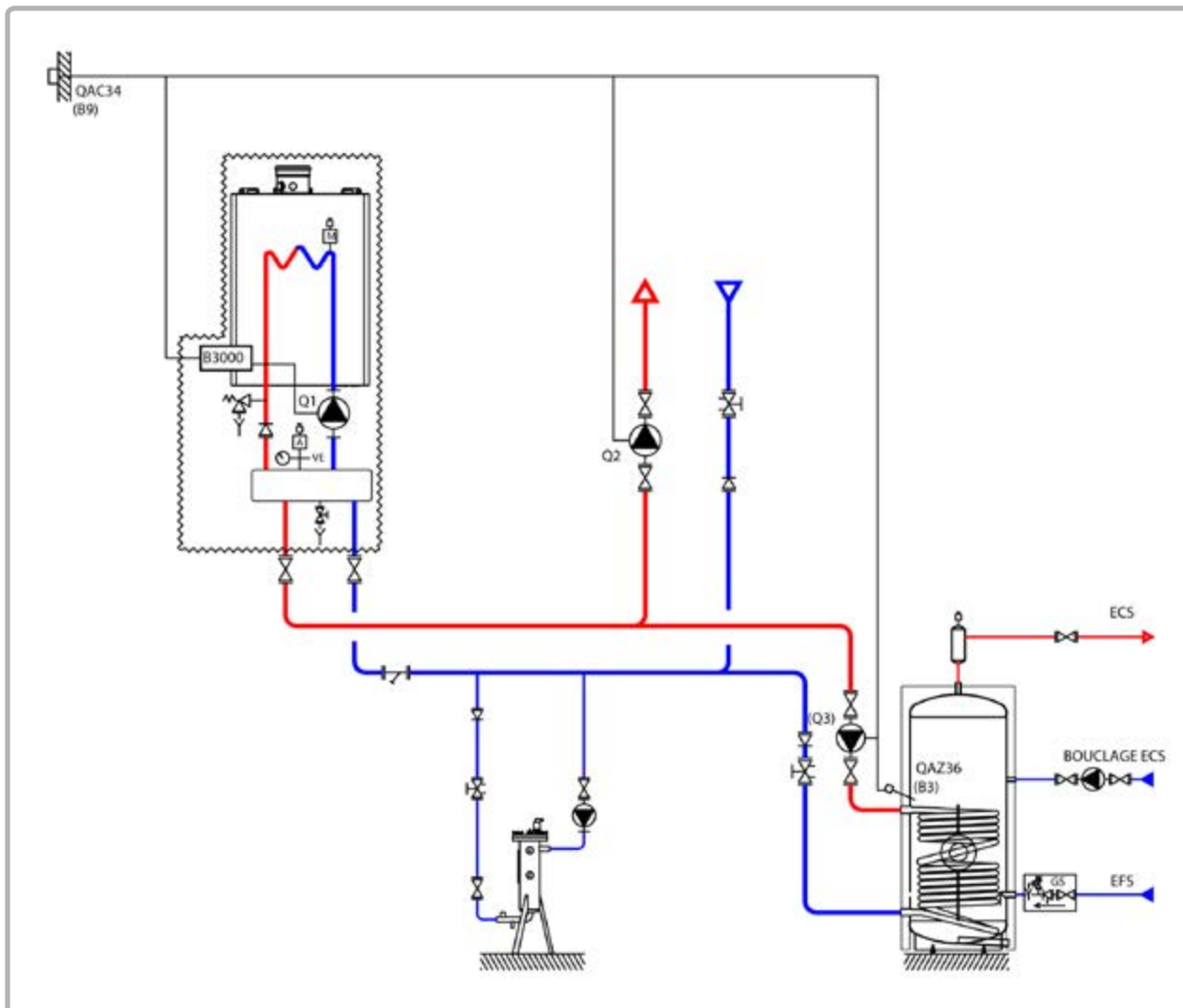


figure 24 - VF2 diagram

The boiler operates in variable flow temperature according to the outdoor temperature measured by the exterior sensor QAC 34.

The heating water law is programmed on the NAVISTEM B3000, with or without a low temperature limit and with a weekly programme.

The production of domestic hot water is controlled by the NAVISTEM B3000 using the QAZ 35 sensor in the tank.

B. REGULATION ACCESSORY REQUIRED

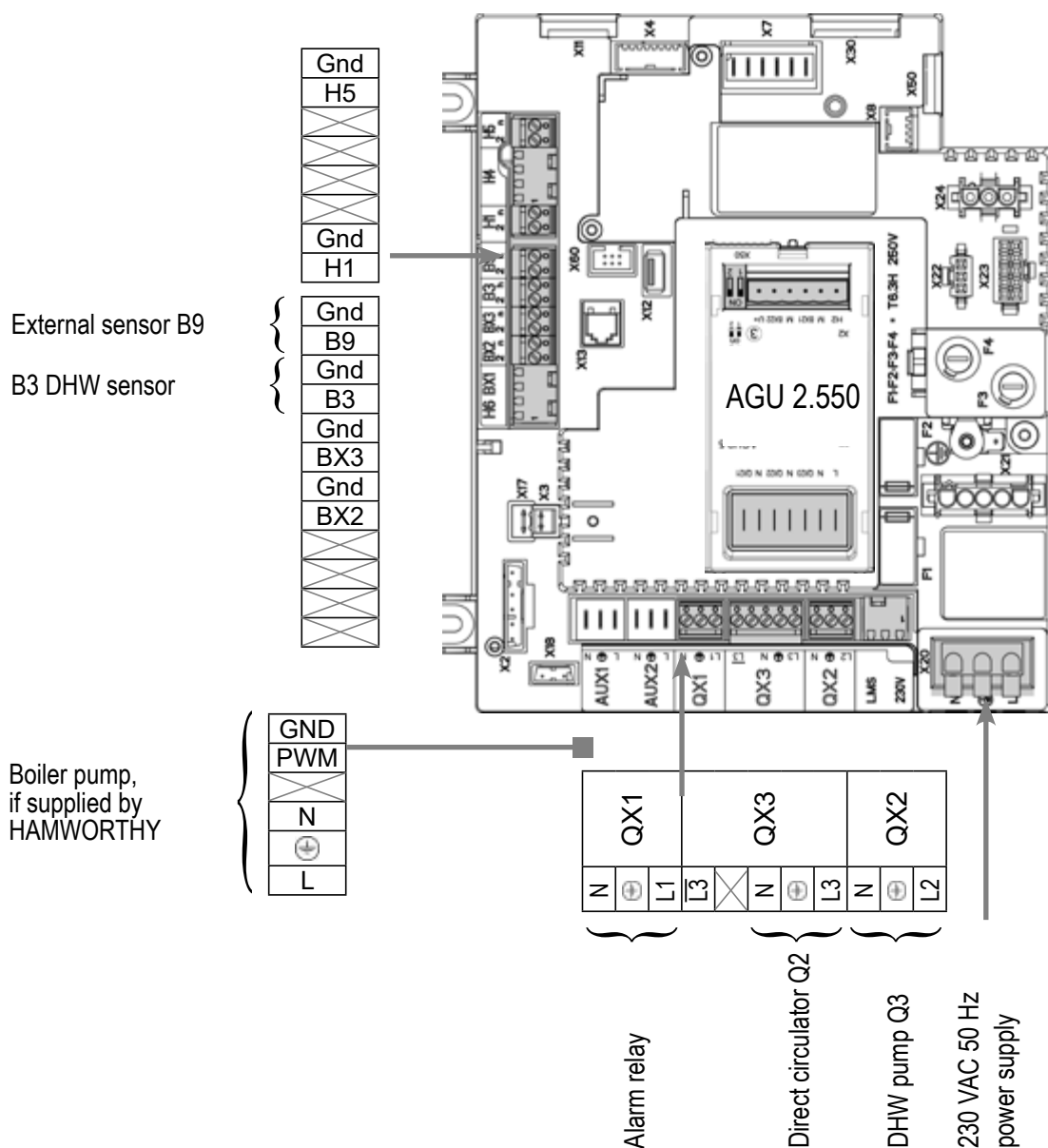
	Quantity	Appliance reference	Order No.
Output sensor kit	1	QAC 34	059260
DHW sensor kit	1	QAZ 36	059261
Boiler pump supplied by the customer (all-or-nothing control) Extension module kit (delivered with a network sensor QAD 36)	1	AGU 2.550	059753

Diagram: VF2

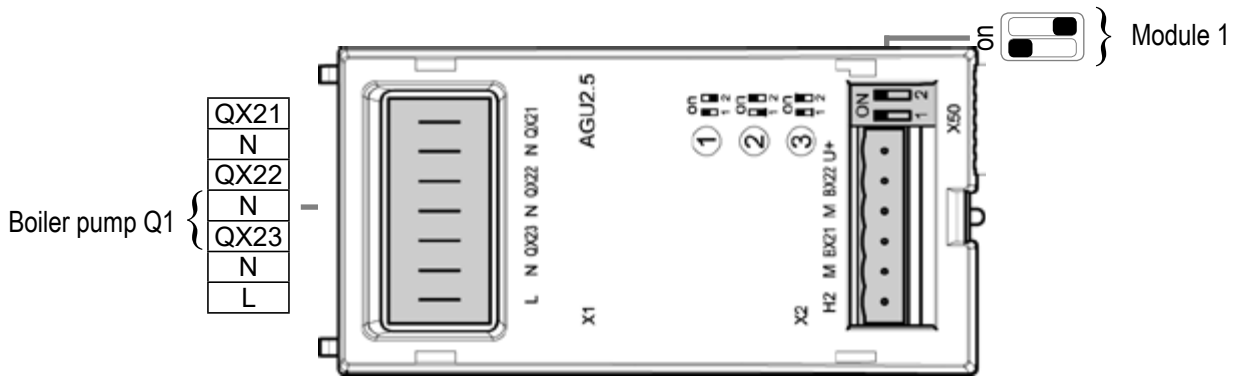
C. RECOMMENDED HYDRAULIC ACCESSORY

		Order No.
Hydraulic kit for boiler only	for STRATTON MK2 S2-40 and S2-60	082324
	for STRATTON MK2 S2-70, S2-80 and S2-100	082325
	for STRATTON MK2 S2-120 kW	082326
	for STRATTON MK2 S2-150 kW	082327

D. CUSTOMER'S ELECTRICAL CONNECTION



Boiler pump supplied by the customer (all-or-nothing control):





IMPORTANT: configure the switches on the AGU 2.550 extension modules.

E. SPECIFIC START-UP PROCEDURE

- Make the accessories' electrical connections.
- Start up the boiler only.
- Carry out the adjustments below.

	<i>Line No.</i>	<i>Value</i>
• Time and date menu		
Set the time	Hours / minutes (1)	HH.MM
Set the date	Day / month (2)	DD.MM
Set the year	Year (3)	YYYY
• Configuration menu		
Start up heating circuit 1	Heating circuit 1 (5710)	On
Configure the alarm output	Relay output QX1 (5890)	Alarm output K10
Configure DHW pump Q3	Relay output QX2 (5891)	DHW ctrl elem Q3
Configure the direct circuit pump Q2	Relay output QX3 (5892)	Heat circuit pump HC1 Q2
<i>Boiler pump supplied by HAMWORTHY:</i>		
	No adjustments necessary	

	Line No.	Value
Boiler pump supplied by the customer (all-or-nothing control)		
Configure the extension module function	Function extension module 1 (6020)	Multifunctional
Configure the output to control the boiler pump	Relay output QX23 module 1 (6032)	Boiler pump Q1
• Heating circuit 1 menu		
Adjust the comfort setting	Comfort setpoint (710)	---
Adjust the curve slope	Heating curve slope (720)	---
Adjust the min. flow temperature if necessary	Flow temp setpoint min (740)	60°C (adjust according to the lower limit)
• Switch the heating regime to permanent comfort		
• Domestic hot water menu		
Adjust the comfort setting	Nominal setpoint (1610)	---
• Activate the DHW mode		
• Configuration menu		
Save the sensors	Save sensors (6200)	Yes (switches back to no automatically)

E. ELECTRICAL AND HYDRAULIC VALIDATION

• Inputs/outputs test menu		
Check the outputs		
Alarm relay	Relay test (7700)	Relay output QX1
DHW pump Q3	Relay test (7700)	Relay output QX2
Direct circuit pump Q2	Relay test (7700)	Relay output QX3
Boiler pump control, if supplied by customer	Relay test (7700)	Relay output QX23 module 1
Reset the outputs	Relay test (7700)	No test
Check the sensor values		
External sensor B9	Outside temp B9 (7730)	in °C
DHW sensor B3	DHW temp B3/B38 (7750)	in °C

Diagram: VF2

page 5 / 6

	<i>Line No.</i>	<i>Value</i>
• Configuration menu		
Check the hydraulic diagram	Check no. heat source 1 (6212)	14
	Check no. heat source 2 (6213)	0
	Check no. storage tank (6215)	4
	Check no. heating circuits (6217)	2

F. CONFIGURATION OPTIMISATION

Heating circuit optimisation:

• Heating circuit 1 menu		
Adjust the reduced setting	Reduced setpoint (712)	---
• Heating circuit 1 timer programme menu		
Preselection	Preselection (500)	---
Adjust the timer programming	On / off phases (501...506)	---
• Heating circuit 1 holiday menu		
Preselection	Preselection (641)	---
Adjust the timer programming	On / off phases (642...643)	---
• Switch the heating regime to automatic		Auto

DHW optimisation:

• Domestic hot water menu		
Adjust the reduced setting	Reduced setpoint (1612)	---
Adjust the DHW release mode	Release (1620)	Time program 4/DHW
• Timer programme 4/DHW menu		
Preselection	Preselection (560)	---
Adjust the timer programming	On / off phases (561...566)	---
• DHW tank menu		
Adjust the over value	Flow setpoint boost (5020)	---

Diagram: VF2

page 6 / 6

	<i>Line No.</i>	<i>Value</i>
• Domestic hot water menu		
Configure a Legionella function	Legionella function (1640)	---
	Legionella funct periodically (1641)	---
	Legionella funct weekday (1642)	---
	Legionella funct setpoint (1645)	---
	Legionella funct duration (1646)	---

Maintenance optimisation

A maintenance message may be generated that does not set the boiler to fault. This maintenance message may be displayed after the following 3 counters have expired:

- Time since last maintenance (or commissioning): set parameter 7044 to 12 months.
- Operating hours of the burner (parameter 7040).
- Number of starts (parameter 7042)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.

<h2 style="margin: 0;">SINGLE BOILER</h2> <p style="margin: 0;"><i>2 regulated circuits, 1 direct circuit with low limit and production of DWH</i></p>	<p>Diagram VF3</p> <p>page 1 / 7</p>
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A. HYDRAULIC DIAGRAM

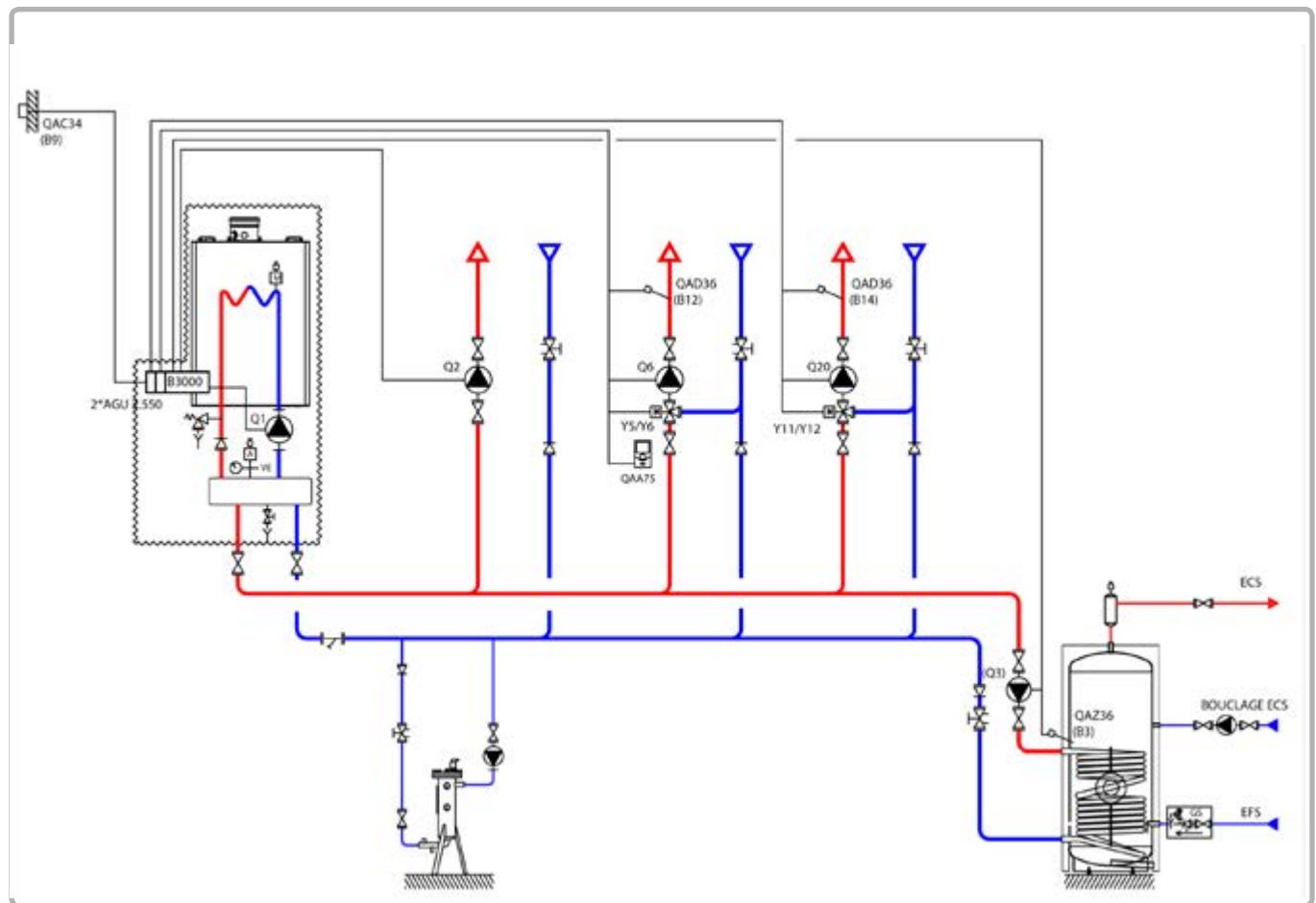


figure 25 - VF3 diagram

The water law of the heating circuit is programmed on the NAVISTEM B3000 with a weekly heating programme.

The AGU 2.550 interfaces built into the boiler are used to control the two three-way regulating valves of the heating networks.

The boiler operates in variable flow temperature according to the outdoor temperature measured by the exterior sensor QAC 34, without a low temperature limit.

The production of domestic hot water is controlled by the NAVISTEM B3000 using the QAZ 36 sensor in the tank.

B. REGULATION ACCESSORY REQUIRED

	Quantity	Appliance reference	Order No.
Extension module kit (delivered with a network sensor QAD 36)	2	AGU 2.550	059753
DHW sensor kit	1	QAZ 36	059261
Output sensor kit	1	QAC 34	059260
Room sensor kit	1	QAA 75	040954

C. RECOMMENDED HYDRAULIC ACCESSORY

	Order No.	
Hydraulic kit for boiler only	for STRATTON MK2 S2-40 and S2-60	082324
	for STRATTON MK2 S2-70, S2-80 and S2-100	082325
	for STRATTON MK2 S2-120 kW	082326
	for STRATTON MK2 S2-150 kW	082327

D. CUSTOMER'S ELECTRICAL CONNECTION

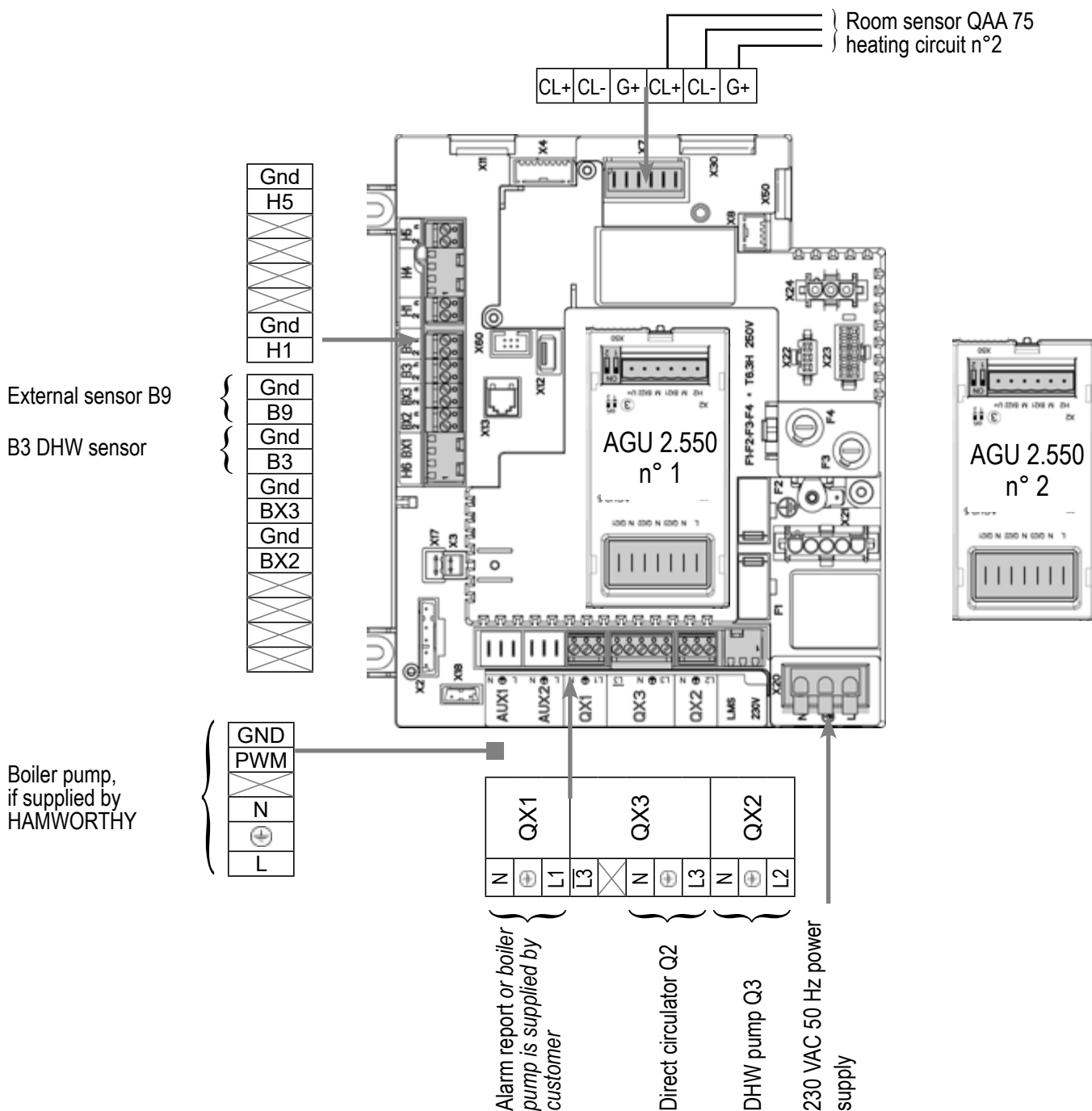
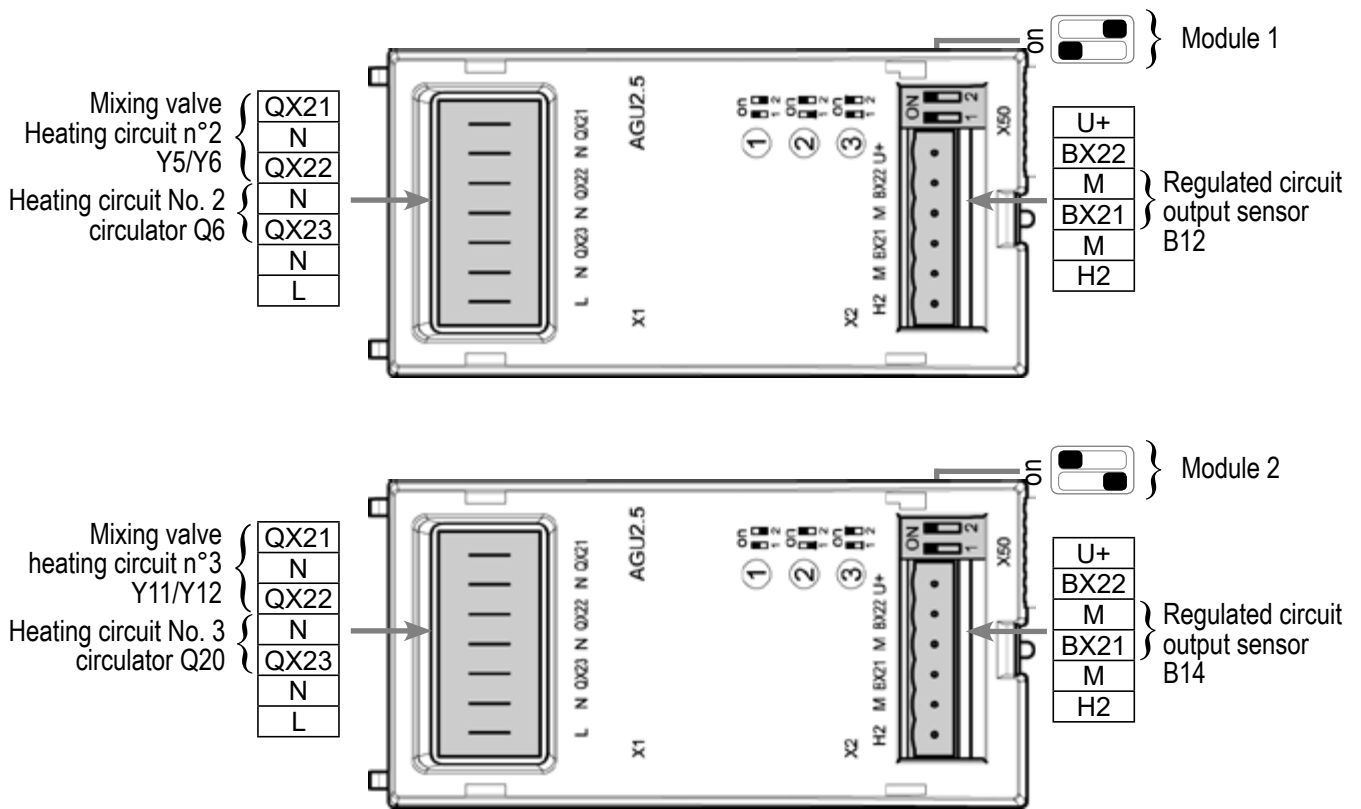


Diagram: VF3



E. SPECIFIC START-UP PROCEDURE



Make the accessories' electrical connections..

IMPORTANT: Configure the switches on the AGU 2.550 extension modules.

- Start up the boiler only.
- Carry out the adjustments below.

	Line No.	Value
• Time and date menu		
Set the time	Hours / minutes (1)	HH.MM
Set the date	Day / month (2)	DD.MM
Set the year	Year (3)	YYYY
• Configuration menu		
Start up heating circuit 1	Heating circuit 1 (5710)	On
Start up heating circuit 2	Heating circuit 2 (5715)	On
Start up heating circuit 3	Heating circuit 3 (5721)	On

Diagram: VF3

	Line No.	Value
Configure the boiler pump or alarm report		
HAMWORTHY supply		
Configure the alarm output	Relay output QX1 (5890)	Alarm output K10
Customer supply (all-or-nothing control)		
Configure the output (no more alarm outputs available)	Relay output QX1 (5890)	Boiler pump Q1
Configure DHW pump	Relay output QX2 (5891)	DHW ctrl elem Q3
Configure the direct circuit pump Q2	Relay output QX3 (5892)	Heat circuit pump HC1 Q2
Configure the extension modules	Function extension module 1 (6020)	Heat circuit 2
	Function extension module 2 (6021)	Heat circuit 3
• Heating circuit 1 / 2 / 3 menu		
For each circuit:		
Adjust the Comfort setpoint	Comfort setpoint (710/1010/1310)	---
Adjust the curve slope	Heating curve slope (720/1020/1320)	---
Adjust the min. flow temperature for heating circuit 1	Flow temp setpoint min (740)	60°C (adjust according to the lower limit)
Removal of the over-value	Mixing valve boost (830)	0 °C
• Switch the heating regime to permanent comfort		
• Domestic hot water menu		
Adjust the Comfort setpoint	Nominal setpoint (1610)	---
• Activate the DHW mode		
• Configuration menu		
Save the sensors	Save sensors (6200)	Yes (switches back to no automatically)

F. ELECTRICAL AND HYDRAULIC VALIDATION

	<i>Line No.</i>	<i>Value</i>
• Inputs/outputs test menu		
Check the outputs		
Boiler pump supplied by HAMWORTHY		
Alarm relay	Relay test (7700)	Relay output QX1
Boiler pump supplied by the customer (all-or-nothing control)		
Boiler pump Q1	Relay test (7700)	Relay output QX1
DHW pump Q3	Relay test (7700)	Relay output QX2
Direct circuit pump Q2	Relay test (7700)	Relay output QX3
Heating circuit 2 3-channel valve opening	Relay test (7700)	Relay output QX21 module 1
Heating circuit 2 3-channel valve closure	Relay test (7700)	Relay output QX22 module 1
Heating circuit 2 pump	Relay test (7700)	Relay output QX23 module 1
Heating circuit 3 3-channel valve opening	Relay test (7700)	Relay output QX21 module 2
Heating circuit3 3-channel valve closure	Relay test (7700)	Relay output QX22 module 2
Heating circuit 3 pump	Relay test (7700)	Relay output QX23 module 2
Reset the outputs	Relay test (7700)	No test
Check the sensor values		
External sensor B9	Outside temp B9 (7730)	in °C
DHW sensor B3	DHW temp B3/B38 (7750)	in °C
B12 flow sensor	Sensor temp BX21 module 1 (7830)	in °C
B14 flow sensor	Sensor temp BX21 module 2 (7832)	in °C
• Configuration menu		
Check the hydraulic diagram	Check no. heat source 1 (6212)	14
	Check no. heat source 2 (6213)	0
	Check no. storage tank (6215)	4
	Check no. heating circuits (6217)	30302

G. CONFIGURATION OPTIMISATION

Heating circuit optimisation

	Line No.	Value
<ul style="list-style-type: none"> • Heating circuit 1 / 2 / 3 menu Adjust the reduced setting 	Reduced setpoint (712/1012/1312)	---
<ul style="list-style-type: none"> • Heating circuit 2 / 3 menu ECO function for automatic summer / winter switch (see NAVISTEM B3000 manual) <i>Function activated by default</i> 	Summer/winter heating limit (1030/1330)	19 °C
<ul style="list-style-type: none"> <ul style="list-style-type: none"> Daily ECO function for automatic comfort / reduced switch according to the difference between the set point and the outdoor temperature (see NAVISTEM B3000 manual). <i>Function not activated by default</i> 	24-hour heating limit (1032/1332)	-3 °C
<ul style="list-style-type: none"> • Heating circuit 1 / 2 / 3 timer programme menu 		
<ul style="list-style-type: none"> <ul style="list-style-type: none"> Preselection 	Preselection (500/520/540)	---
<ul style="list-style-type: none"> <ul style="list-style-type: none"> Adjust the timer programming 	On / off phases (501...506) (521...526) (541...546)	---
<ul style="list-style-type: none"> • Heating circuit 1 / 2 / 3 holiday menu 		
<ul style="list-style-type: none"> <ul style="list-style-type: none"> Preselection 	Preselection (641/651/661)	---
<ul style="list-style-type: none"> <ul style="list-style-type: none"> Adjust the timer programming 	On / off phases (642...643) (652-653) (662-663)	---
<ul style="list-style-type: none"> • Switch the heating regime to automatic 		Auto

DHW optimisation:

<ul style="list-style-type: none"> • DHW tank menu 		
<ul style="list-style-type: none"> Adjust the over value 	Flow setpoint boost (5020)	16 °C

Maintenance optimisation

A maintenance message may be generated that does not set the boiler to fault. This maintenance message may be displayed after the following 3 counters have expired:

- Time since last maintenance (or commissioning): set parameter 7044 to 12 months.
- Operating hours of the burner (parameter 7040).
- Number of starts (parameter 7042)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.

H. CONFIGURING THE ROOM SENSOR**Connecting the sensor to the heating circuit:**

- **User interface** menu of the **room sensor**

Assign the heating circuit to the room sensor

Line No.	Value
Use (40)	Ambience appliance 2

The room sensor is used to configure the heating circuit. It adjusts parameter 1012 (heating circuit 2). Refer to the NAVISTEM B3000 manual for the other room sensor functions.

<h2 style="margin: 0;">SINGLE BOILER</h2> <p style="margin: 0;"><i>4 regulated circuits, with DHW production</i></p>	<p style="margin: 0;">Diagram VF4</p> <p style="margin: 0;">page 1 / 8</p>
--	---

A. HYDRAULIC DIAGRAM

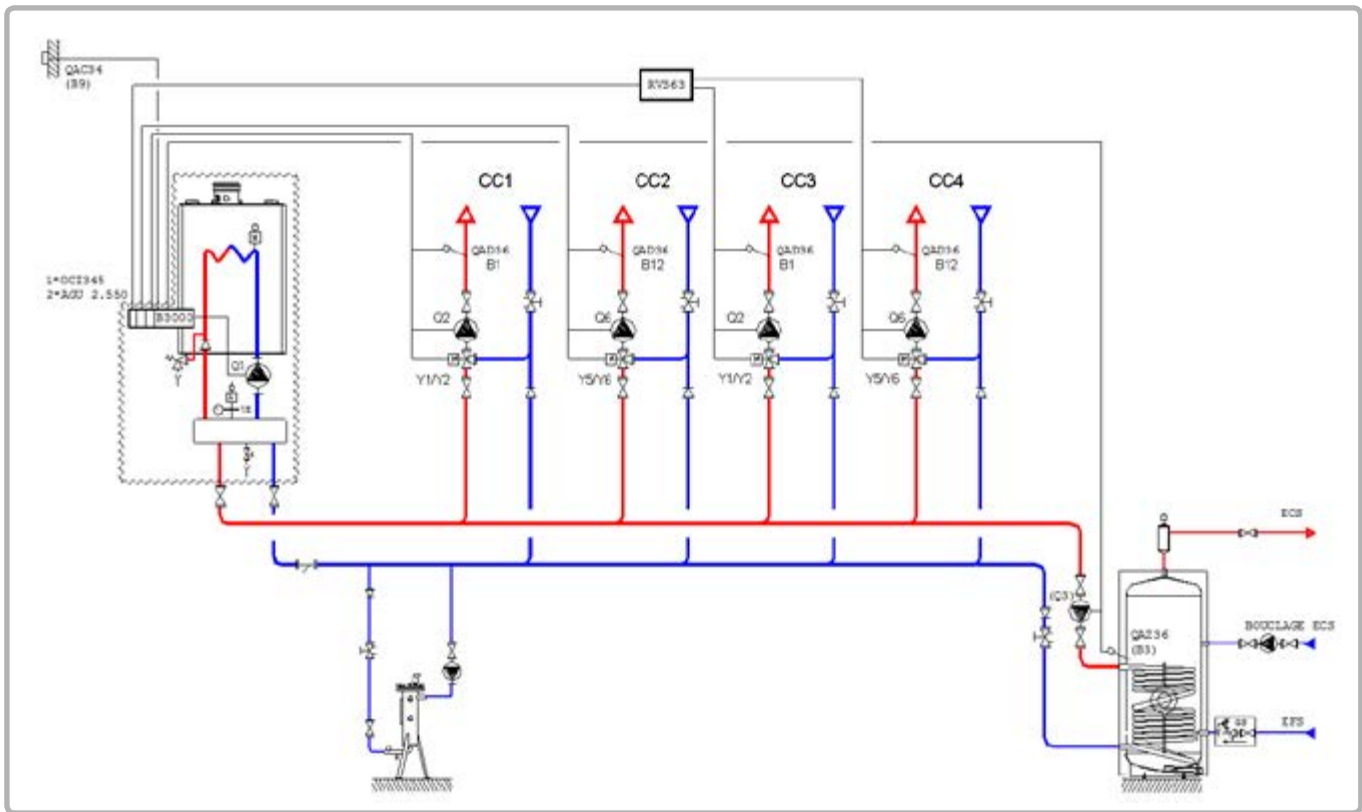


figure 26 - VF4 diagram

The water law of the heating circuit is programmed on the NAVISTEM B3000 with a weekly heating programme.

The AGU 2.550 interfaces built into the boiler are used to control the two three-way regulating valves of the heating networks. The two others will be managed by the RVS 63 integrated into an outside case at the boiler.

The boiler operates in variable flow temperature according to the outdoor temperature measured by the exterior sensor QAC 34, without a low temperature limit.

The production of domestic hot water is controlled by the NAVISTEM B3000 using the QAZ 36 sensor in the tank.

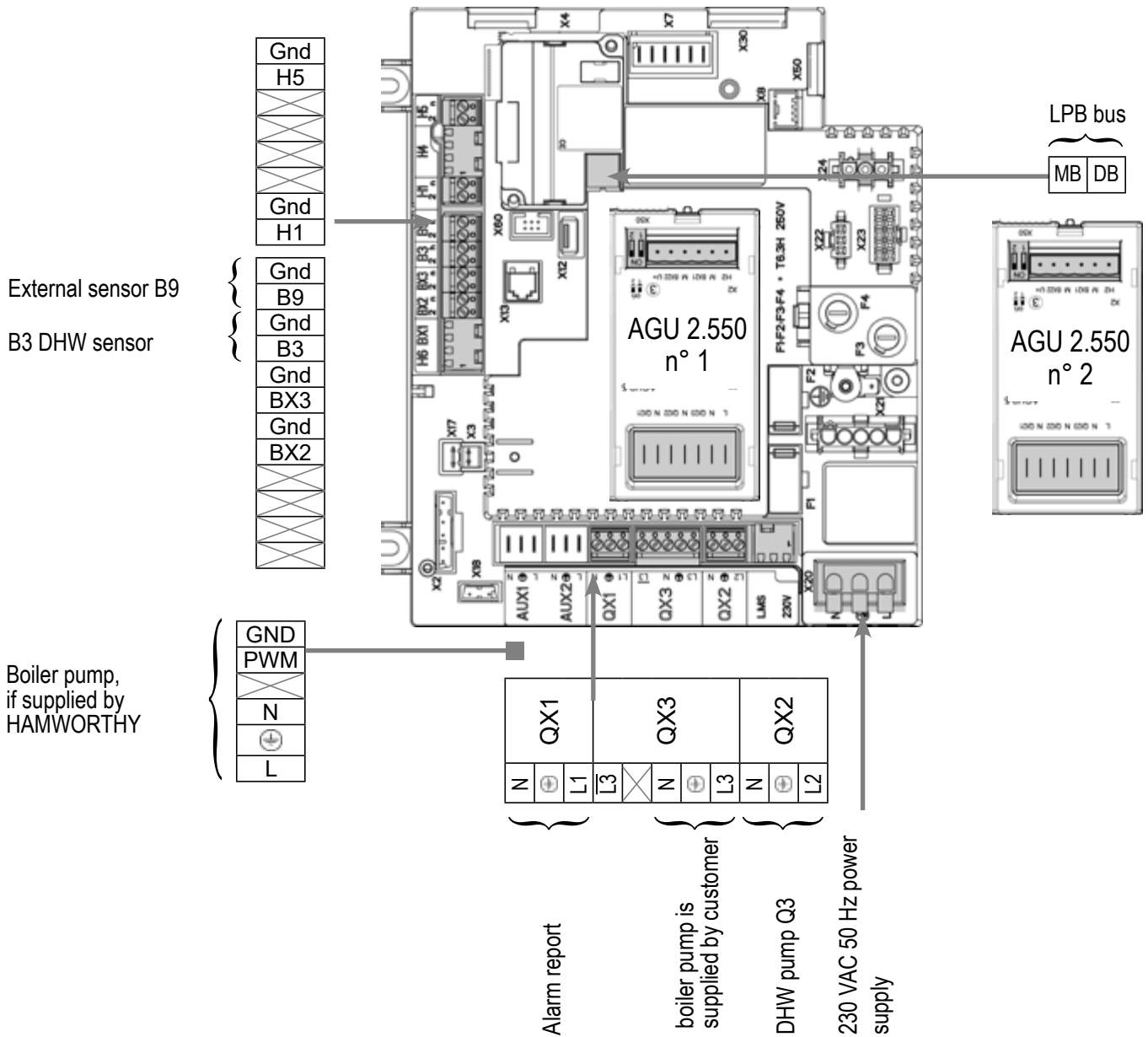
B. REGULATION ACCESSORY REQUIRED

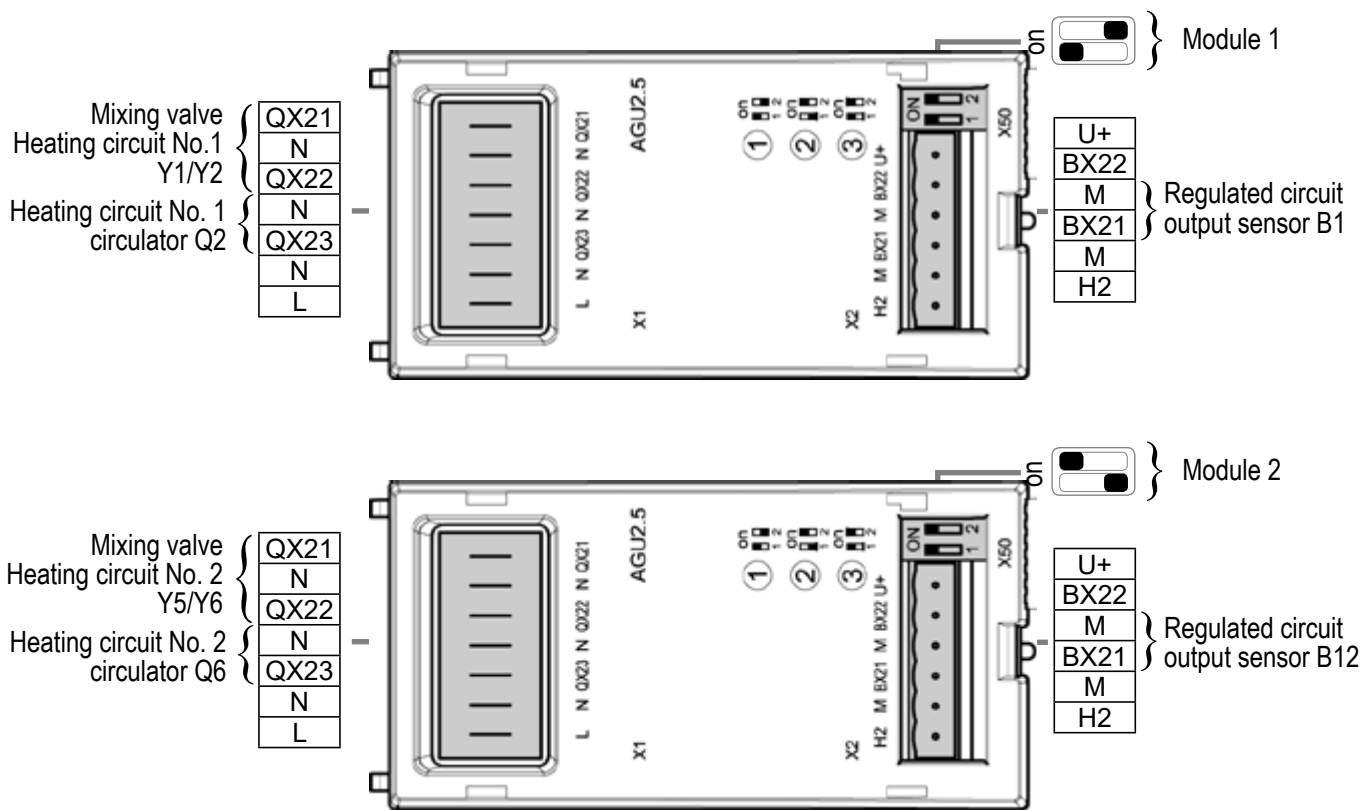
	Quantity	Appliance reference	Order No.
Heating circuit regulation kit	1	RVS 63	059516
Extension module kit (delivered with a network sensor QAD 36)	2	AGU 2.550	059753
Communication kit for LPB bus	1	OCI 345	059752
DHW sensor kit	1	QAZ 36	059261
Output sensor kit	1	QAC 34	059260

C. RECOMMENDED HYDRAULIC ACCESSORY

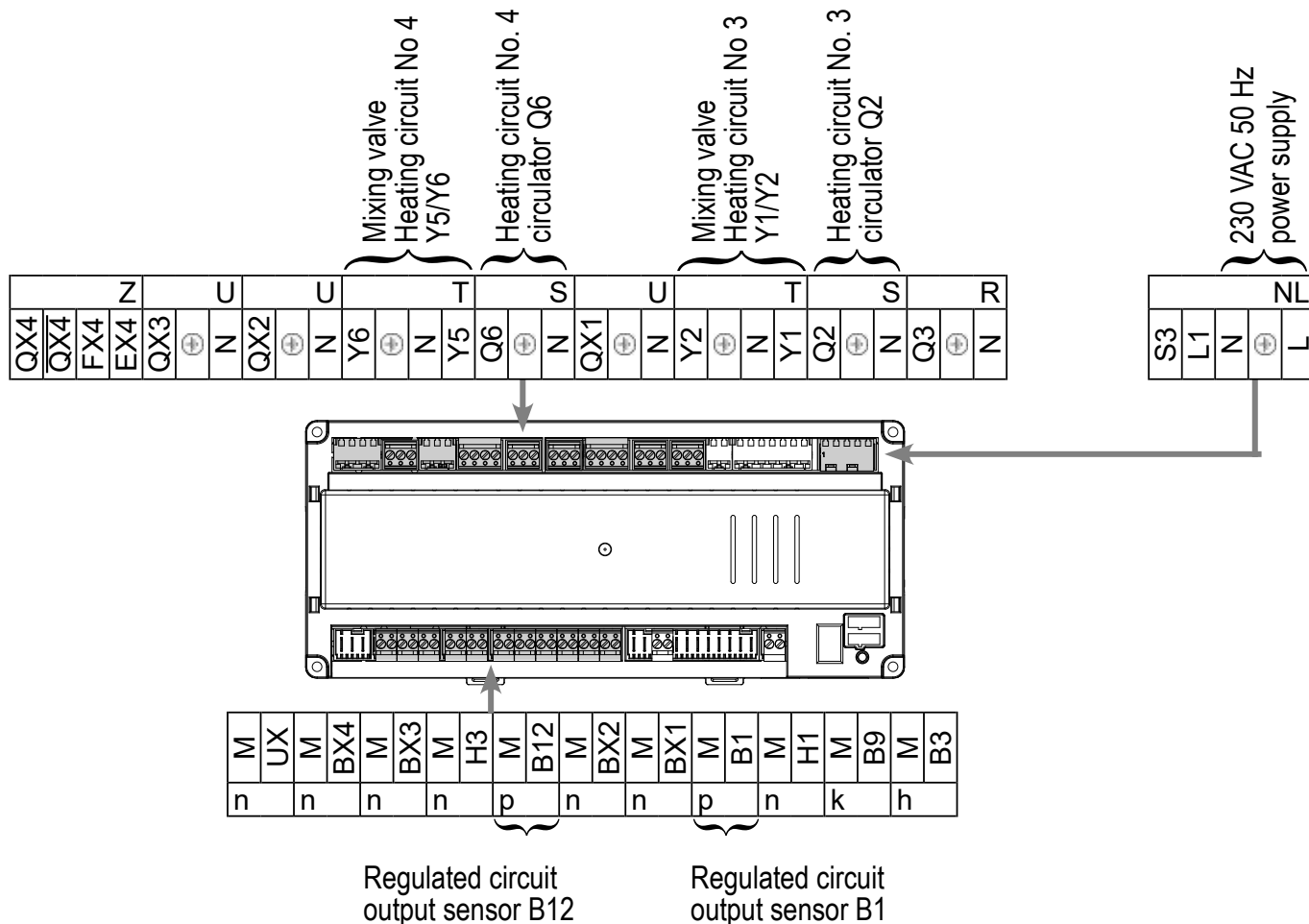
	Order No.
Hydraulic kit for boiler only	for STRATTON MK2 S2-40 and S2-60
	for STRATTON MK2 S2-70, S2-80 and S2-100
	for STRATTON MK2 S2-120 kW
	for STRATTON MK2 S2-150 kW
	082324
	082325
	082326
	082327

D. SPECIFIC START-UP PROCEDURE





Boîtier régulateur RVS 63 :



E. SPECIFIC START-UP PROCEDURE

Make the accessories' electrical connections.





IMPORTANT: Configure the switches on the AGU 2.550 extension modules.

- ☞ Start up the boiler only.
- ☞ Carry out the adjustments below.

On STRATTON MK2 boiler:

	<i>Line No.</i>	<i>Value</i>
• Time and date menu		
Set the time	Hours / minutes (1)	HH.MM
Set the date	Day / month (2)	DD.MM
Set the year	Year (3)	YYYY
• Configuration menu		
Start up heating circuit 1	Heating circuit 1 (5710)	On
Start up heating circuit 2	Heating circuit 2 (5715)	On
Configure the alarm report	Relay output QX1 (5890)	Alarm output K10
Configure DHW pump	Relay output QX2 (5891)	DHW ctrl elem Q3
	Relay output QX3 (5892)	Boiler pump Q1
If the boiler pump is supplied by customer		
Configure the extension modules	Function extension module 1 (6020)	Heat circuit 1
	Function extension module 2 (6021)	Heat circuit 2
• LPB network menu		
Device number	Device address (6600)	1
Segment number	Segment address (6601)	0
Configure the bus supply	Bus power supply function (6604)	Automatically
Set the clock program	Clock mode (6640)	Master
• Heating circuit 1 / 2		
Adjust the comfort setting	Comfort setpoint (710/1010)	---
Adjust the curve slope	Heating curve slope (720/1020)	---

Diagram: VF4

	<i>Line No.</i>	<i>Value</i>
<ul style="list-style-type: none"> • Domestic hot water menu 		
Adjust the comfort setting	Nominal setpoint (1610)	---
Adjust the DHW release mode	Release (1620)	24h/day
<ul style="list-style-type: none"> • Activate the DHW mode  		
<ul style="list-style-type: none"> • Configuration menu 		
Save the sensors	Save sensors (6200)	Yes (switches back to no automatically)
<p>On RVS 63 :</p>		
<ul style="list-style-type: none"> • Menu Configuration 		
Start heating circuit 1	Heating circuit 1 (5710)	On
Start heating circuit 2	Heating circuit 1 (5715)	On
Save the sensors	Save sensors (6200)	Yes (switches back to no automatically)
<ul style="list-style-type: none"> • LPB network menu 		
Device number	Device address (6600)	1
Segment number	Segment address (6601)	1
Configure the bus supply	Bus power supply function (6604)	Automatically
Set the clock program	Clock mode (6640)	Slave without remote setting
<ul style="list-style-type: none"> • Heating circuit 1 / 2 		
Adjust the comfort setting	Comfort setting temperature (710/1010)	---
Adjust the curve slope	Heating curve slope (720/1020)	---
<ul style="list-style-type: none"> • Set the heating program to permanent comfort  		

F. ELECTRICAL AND HYDRAULIC VALIDATION

On STRATTON MK2 boiler:

	<i>Line No.</i>	<i>Value</i>
• Inputs/outputs test menu		
Check the outputs		
Alarm report	Relay test (7700)	Relay output QX1
DHW pump Q3	Relay test (7700)	Relay output QX2
Boiler pump control, if supplied by customer	Relay test (7700)	Relay output QX3
HC1 3-channel valve opening	Relay test (7700)	Relay output QX21 module 1
HC1 3-channel valve close	Relay test (7700)	Relay output QX22 module 1
HC1 pump	Relay test (7700)	Relay output QX23 module 1
HC2 3-channel valve opening	Relay test (7700)	Relay output QX21 module 2
HC2 3-channel valve close	Relay test (7700)	Relay output QX22 module 2
HC2 pump	Relay test (7700)	Relay output QX23 module 2
Reset the outputs	Relay test (7700)	No test
Check the sensor values		
External sensor B9	Outside temp B9 (7730)	en °C
DHW sensor B3	DHW temp B3/B38 (7750)	en °C
B1 flow sensor	Sensor temp BX21 module 1 (7830)	en °C
B12 flow sensor	Sensor temp BX21 module 2 (7832)	en °C
• Configuration menu		
Check the hydraulic diagram	Check no. heat source 1 (6212)	14
	Check no. heat source 2 (6213)	0
	Check no. storage tank (6215)	4
	Check no. heating circuits (6217)	303

On the RVS 63:

	<i>Line No.</i>	<i>Value</i>
• Inputs/outputs test menu		
Check the outputs		
HC3 pump (Q2)	Relay test (7700)	HC pump Q2
HC3 3-channel valve opening	Relay test (7700)	HC mixing valve open Y1
HC3 3-channel valve close	Relay test (7700)	HC mixing valve close Y2
HC4 pump (Q6)	Relay test (7700)	Pompe CdeC Q6
HC4 3-channel valve opening	Relay test (7700)	HC mixing valve open Y5
HC4 3-channel valve close	Relay test (7700)	HC mixing valve close Y6
Reset the outputs	Relay test (7700)	No test
Check the sensor values		
Circuit 3 network flow sensor (B1)	Flow temp. B1 (7732)	en °C
Circuit 4 network flow sensor (B12)	Flow temp. B12 (7734)	en °C

G. CONFIGURATION OPTIMISATION

On STRATTON MK2 boiler and RVS 63 :

Heating circuit optimisation:

• Heating circuit 1 / 2 menu		
Adjust the reduced setting	Reduced setpoint (712/1012)	---
ECO function for automatic summer / winter switch (see NAVISTEM B3000 manual)	Summer/winter heating limit (1030/1330)	19 °C
Daily ECO function for automatic comfort / reduced switch according to the difference between the set point and the outdoor temperature (see NAVISTEM B3000 manual).	24-hour heating limit (1032/1332)	-3 °C

Diagram: VF4

page 8 / 8

	<i>Line No.</i>	<i>Value</i>
• Heating circuit 1 / 2 timer programme menu		
Preselection	Preselection (500/520)	---
Adjust the timer programming	On / off phases (501...506) (521...526)	---
• Heating circuit 1 / 2 holiday menu		
Preselection	Preselection (641/651)	---
Adjust the timer programming	On / off phases (642...643) (652-653)	---
• Switch the heating regime to automatic		AUTO

Maintenance optimisation on STRATTON MK2 boiler:

A maintenance message may be generated that does not set the boiler to fault. This maintenance message may be displayed after the following 3 counters have expired:

- Time since last maintenance (or commissioning): set parameter 7044 to 12 months.
- Operating hours of the burner (parameter 7040).
- Number of starts (parameter 7042)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.

Ajusting the DWH (on the RVS 63):

• Timer prog. 4/DHW menu		
Adjust the programmed times	On/off phases (561...566)	---
• DHW menu		
Adjust the low setpoint	Low setpoint (1612)	---
Release the DHW load according to the timer program	Release (1620)	---
Adjust the frequency of the anti-legionella cycle	Anti-legionella function (1640)	---
Selon le réglage précédent, ajuster la périodicité ou le jour de la semaine	Periodic legion. funct.(1641) or Legionella funct weekday (1642)	---
Adjust the anti-legionella cycle temperature setpoint	Anti-legionella setpoint (1645)	---
Adjust the duration of the anti-legionella cycle	Anti-legionella function duration (1646)	---
• DHW tank menu		
Adjust the primary rise/DHW	Rise in initial setpoint (5020)	16 °C

SINGLE BOILER

1 non-regulated circuit with sliding flow

Diagrams
VF20, VF21,
VF21bis
page 1 / 5

A. HYDRAULIC DIAGRAM

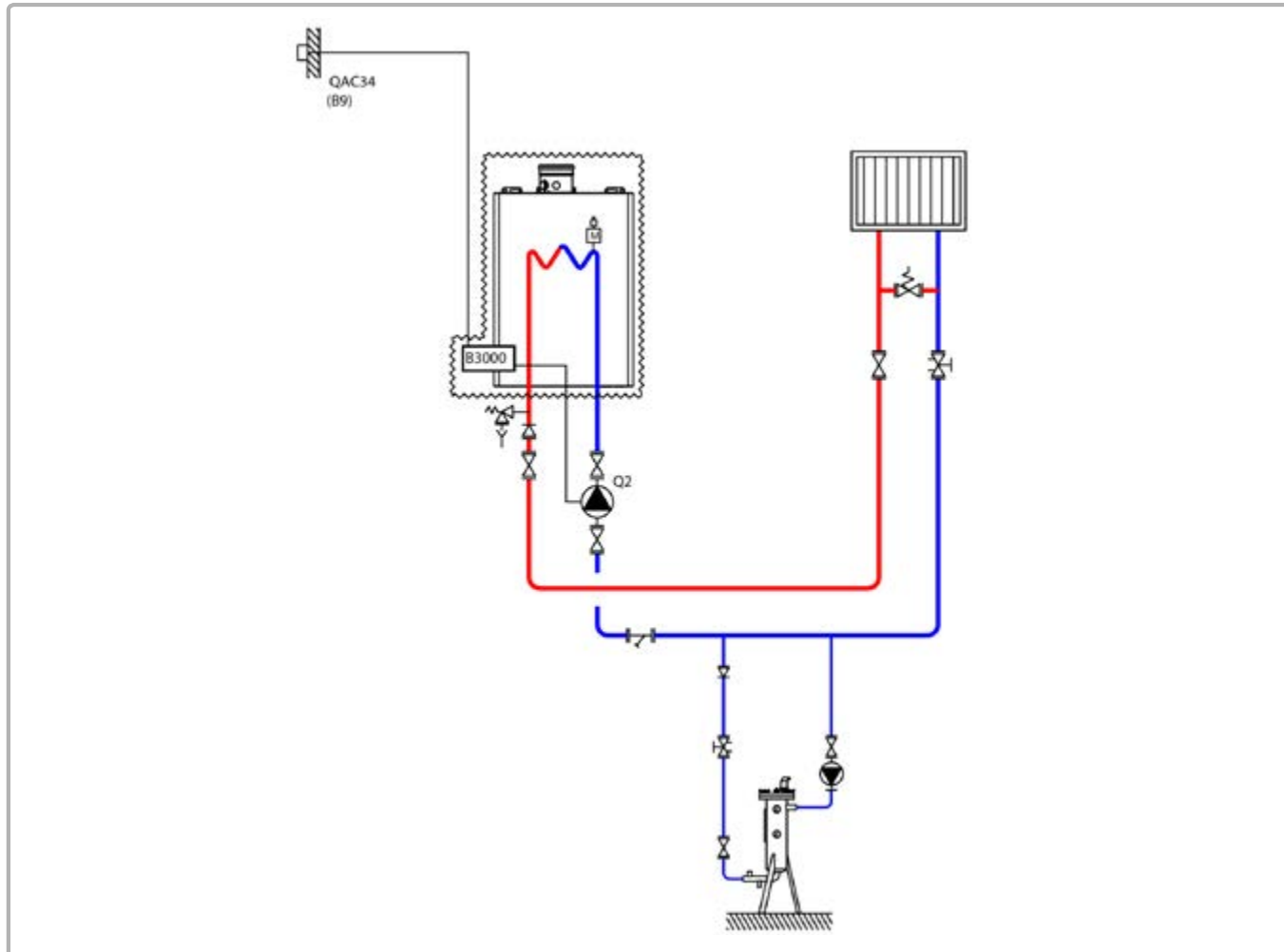


figure 27 - VF20 diagram

The boiler operates in variable flow temperature according to the outdoor temperature measured by the exterior sensor QAC 34.

The heating water law is programmed on the NAVISTEM B3000, with or without a low temperature limit and with a weekly programme.

The flow rate of the heating pump, in m³/h, is adjusted to the real needs of the installation and, as a minimum, to P/25, with P power in th/h of the boiler.

If the heating pump is variable-flow rate, it must be set to a constant flow rate to deliver the minimum flow required by the generator.

If the installation is equipped with thermostatic taps on the emitters, the bypass between the outward and return lines of the network is essential. It is equipped with a differential valve that allows for the free flow of the heating pump when the thermostatic taps close.

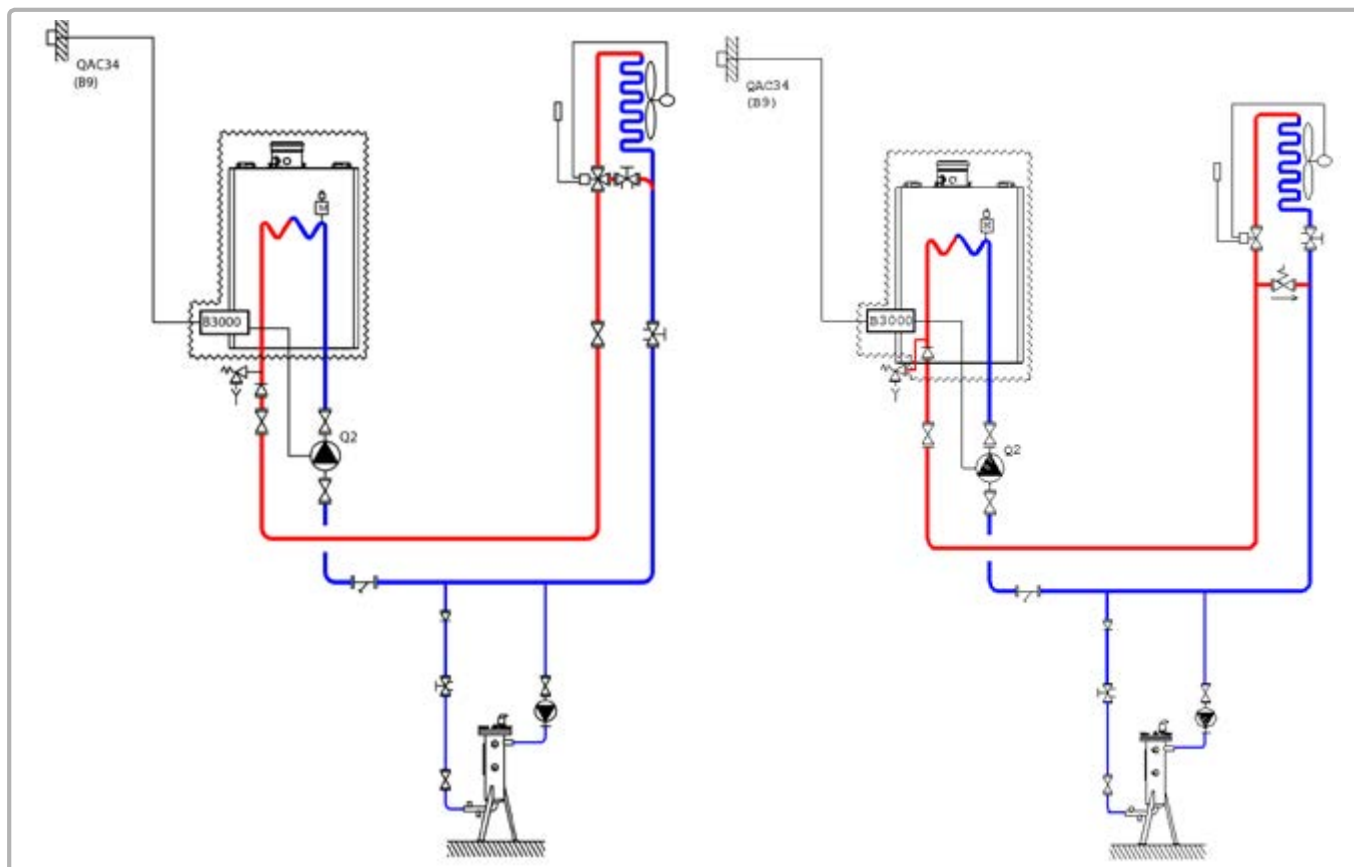


figure 28 - VF21, VF21bis diagrams

The boiler operates in variable flow temperature according to the outdoor temperature measured by the exterior sensor QAC 34.

The heating water law is programmed on the NAVISTEM B3000, with or without a low temperature limit and with a weekly programme.

The flow rate of the heating pump, in m³/h, is adjusted to the real needs of the installation and, as a minimum, to P/25, with P power in th/h of the boiler.

The pump heating will have to allow to work in constant speed to insure the minimum flow necessary for the generator.

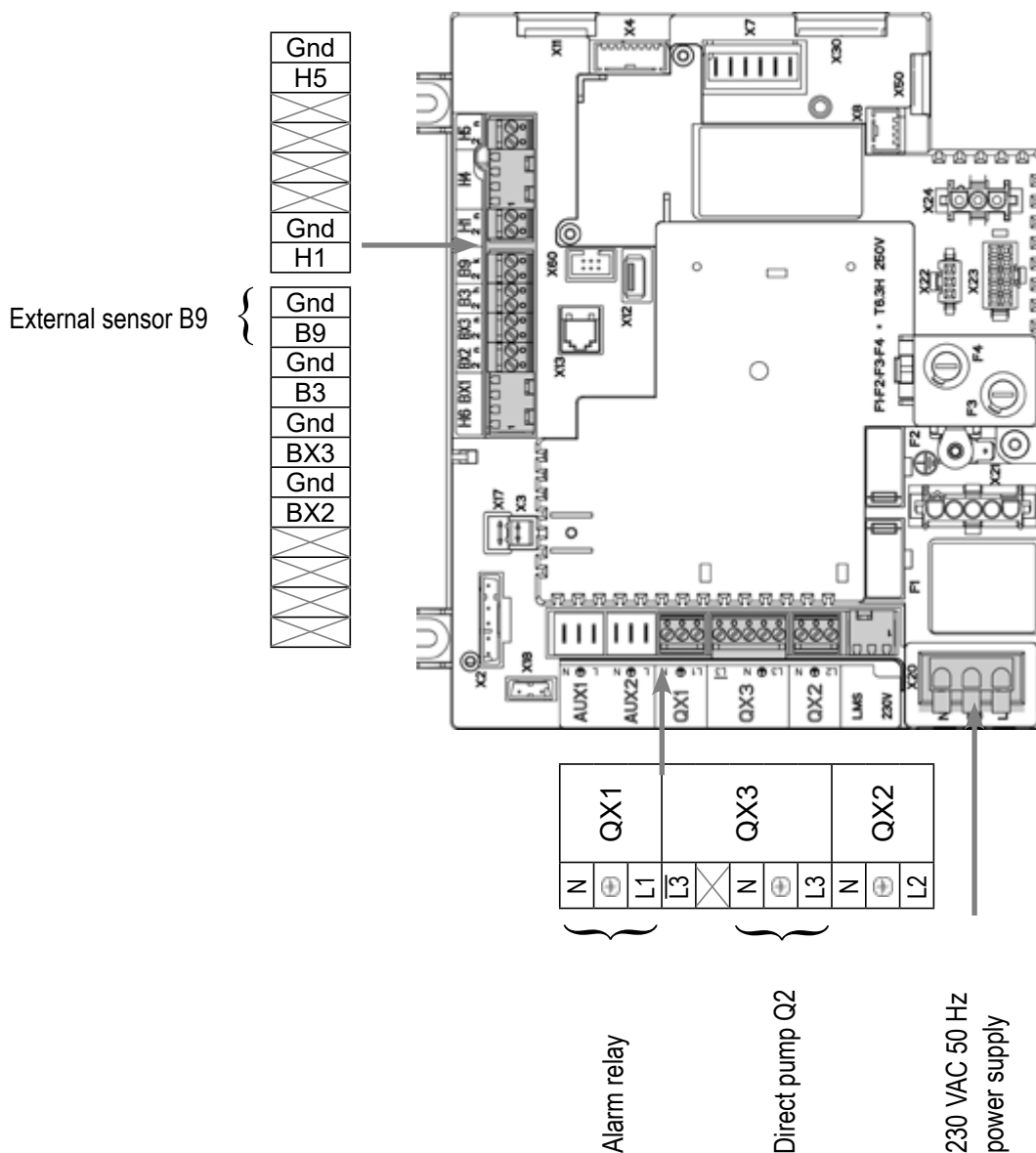
B. REGULATION ACCESSORY REQUIRED

	Quantity	Appliance reference	Order No.
Output sensor kit	1	QAC 34	059260

C. RECOMMENDED HYDRAULIC ACCESSORY

	Order No.	
Hydraulic kit for boiler only	for STRATTON MK2 S2-40 and S2-60	082324
	for STRATTON MK2 S2-70, S2-80 and S2-100	082325
	for STRATTON MK2 S2-120 kW	082326
	for STRATTON MK2 S2-150 kW	082327

D. CUSTOMER'S ELECTRICAL CONNECTION



E. SPECIFIC START-UP PROCEDURE

- ☞ Make the accessories' electrical connections.
- ☞ Start up the boiler only.
- ☞ Make the following settings:

	Line No.	Value
• Configuration menu		
Save the sensors	Save sensors (6200)	Yes (switches back to no automatically)
• Time and date menu		
Set the time	Hours / minutes (1)	HH.MM
Set the date	Day / month (2)	DD.MM
Set the year	Year (3)	YYYY
• Configuration menu		
Start up heating circuit 1	Heating circuit 1 (5710)	On
Configure the alarm output	Relay output QX1 (5890)	Alarm output K10
Configure the direct circuit pump Q2	Relay output QX2 (5891)	Heat circuit pump HC1 Q2
• Heating circuit 1 menu		
For each circuit:		
Adjust the comfort setting	Comfort setpoint (710)	---
Adjust the curve slope	Heating curve slope (720)	---
Adjust the min. flow temperature for heating circuit 1, if necessary	Flow temp setpoint min (740)	in °C
Removal of the over-value	Mixing valve boost (830)	0 °C

- Switch the heating regime to permanent comfort



F. ELECTRICAL AND HYDRAULIC VALIDATION

• Inputs/outputs test menu		
Check the outputs		
Alarm relay	Relay test (7700)	Relay output QX1
Direct circuit pump Q2	Relay test (7700)	Relay output QX3
Reset the outputs	Relay test (7700)	No test

	<i>Line No.</i>	<i>Value</i>
Check the sensor values		
External sensor B9	Outside temp B9 (7730)	in °C
• Configuration menu		
Check the hydraulic diagram	Check no. heat source 1 (6212)	14
	Check no. heat source 2 (6213)	0
	Check no. storage tank (6215)	0
	Check no. heating circuits (6217)	2

G. CONFIGURATION OPTIMISATION



IMPORTANT:

In diagram VF21, it is **IMPERATIVE** to programme the same ranges on the unit heater for the optimisation to work.

Heating circuit optimisation:

• Heating circuit 1 menu		
Adjust the reduced setting	Reduced setpoint (712)	---
• Heating circuit 1 timer programme menu		
Preselection	Preselection (500)	---
Adjust the timer programming	On / off phases (501...506)	---
• Heating circuit 1 holiday menu		
Preselection	Preselection (641)	---
Adjust the timer programming	On / off phases (642...-643)	---
• Switch the heating regime to automatic		Auto

Maintenance optimisation

A maintenance message may be generated that does not set the boiler to fault. This maintenance message may be displayed after the following 3 counters have expired:

- Time since last maintenance (or commissioning): set parameter 7044 to 12 months.
- Operating hours of the burner (parameter 7040).
- Number of starts (parameter 7042)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.

SINGLE BOILER*Production of DHW with a plate exchanger on the primary*

Diagram

VF22

page 1 / 5

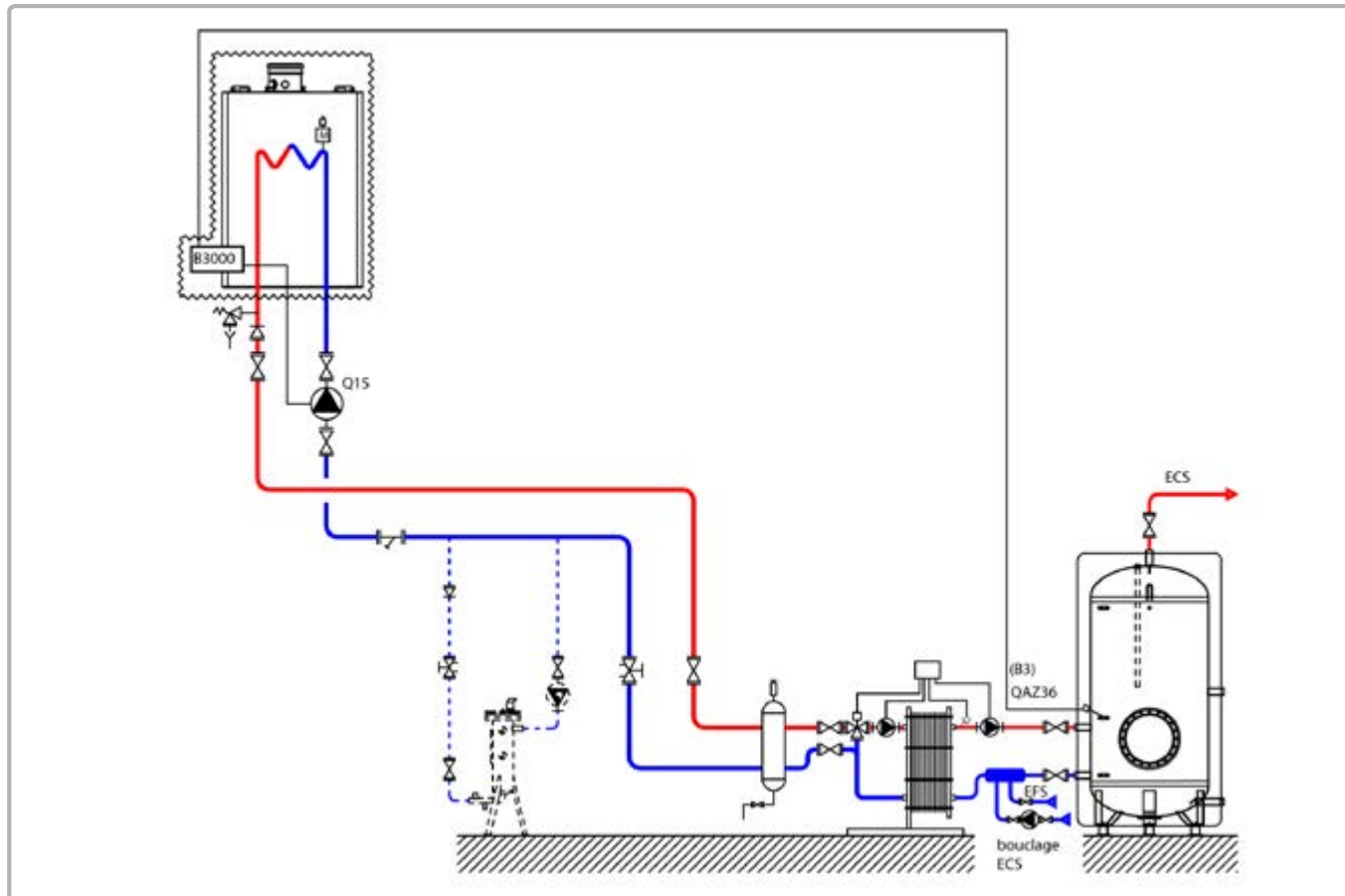
A. HYDRAULIC DIAGRAM

figure 29 - VF22 diagram

The boiler operates at the flow temperature required to produce the domestic hot water.

The flow rate of the pump, in m³/h, is adjusted to the real needs of the installation and, as a minimum, to P/25, with P power in th/h of the boiler.

The pump heating will have to allow to work in constant speed to insure the minimum flow necessary for the generator.

The domestic hot water production system has its own regulator.

A sensor QAZ 36, positioned inside the storage tank and connected to the generator, informs the boiler of the need for domestic hot water.

B. REGULATION ACCESSORY REQUIRED

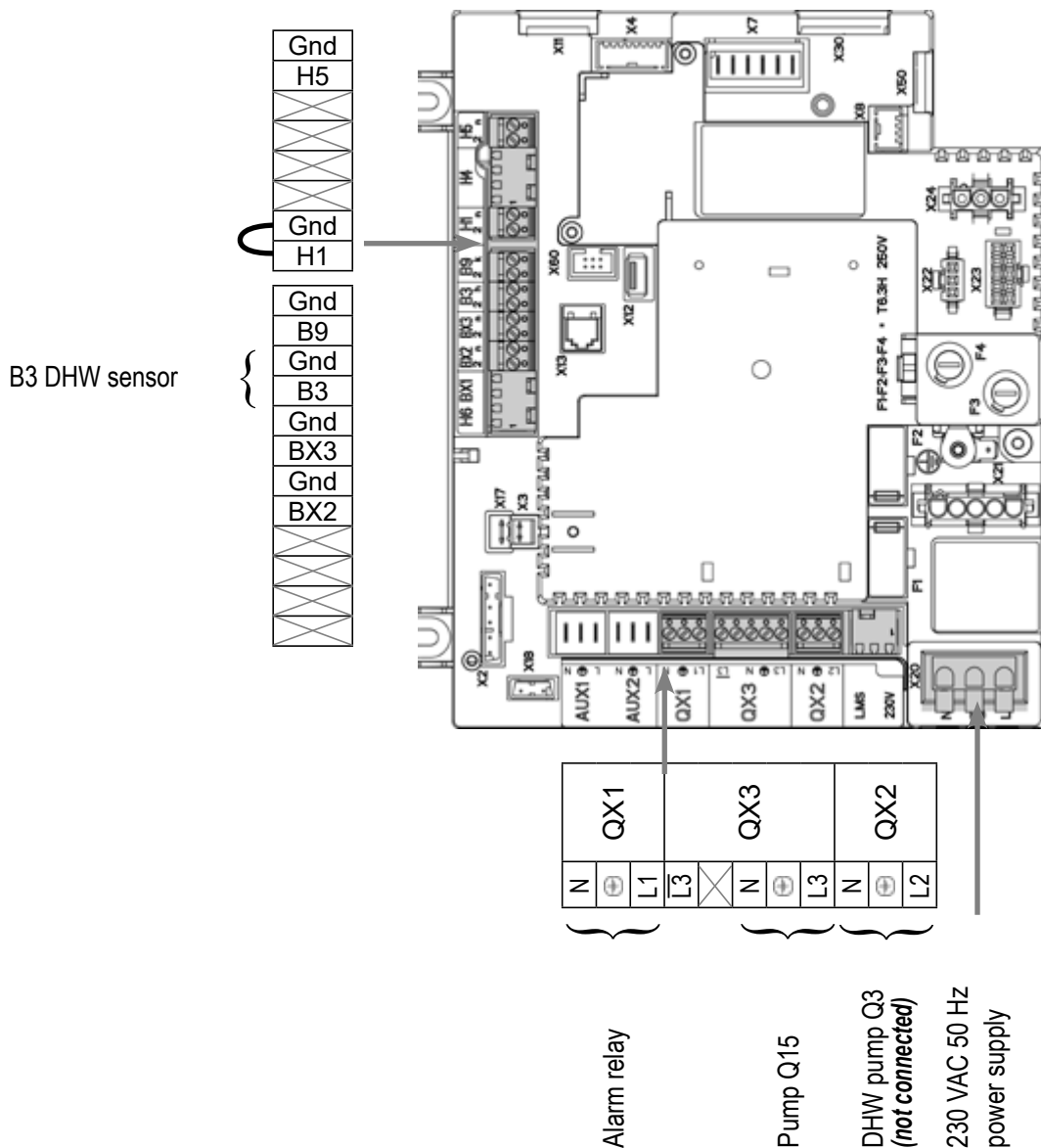
	Quantity	Appliance reference	Order No.
DHW sensor kit	1	QAZ 36	059261

Diagram: VF22

C. RECOMMENDED HYDRAULIC ACCESSORY

		Order No.
Hydraulic kit for boiler only	for STRATTON MK2 S2-40 and S2-60	082324
	for STRATTON MK2 S2-70, S2-80 and S2-100	082325
	for STRATTON MK2 S2-120 kW	082326
	for STRATTON MK2 S2-150 kW	082327

D. CUSTOMER'S ELECTRICAL CONNECTION



E. SPECIFIC START-UP PROCEDURE

☞ Make the accessories' electrical connections.

☞ Start up the boiler only.

☞ Make the following settings:

	Line No.	Value
• Time and date menu		
Set the time	Hours / minutes (1)	HH.MM
Set the date	Day / month (2)	DD.MM
Set the year	Year (3)	YYYY
• Configuration menu		
Configure the alarm output	Relay output QX1 (5890)	Alarm output K10
Configure the tank pump	Relay output QX3 (5892)	Consumer circuit pump 1 Q15
Define a low limit	Function input H1 (5950)	Consumer request VK1
Position a shunt on H1 OU reverse the contact direction	Contact type (5951)	Normally-closed contact (NC)
For the DHW to be effective, an activator must be defined, even if it is not connected	Relay output QX2 (5891)	DHW ctrl elem Q3
• Consumer circuit 1 menu		
Set the output setting to be taken into account if the Consumer circuit is requested	Flow temp setp cons request (1859)	60 °C (depends on the Rubis setting)
Remove pump stoppage on DHW priority (OEM setting)	DHW priority (1874)	No
• Domestic hot water menu		
Adjust the comfort setting	Nominal setpoint (1610)	3°C less than the Rubis set point
Adjust the DHW release mode	Release (1620)	24h/day
Remove the DHW priority	Charging priority (1630)	Without
• DHW tank menu		
Adjust the over value	Flow setpoint boost (5020)	13 °C

Settings on the Rubis

Adjust the outlet temperature set point on the Rubis to 58°C.

Summary of the rules for the adjustment of the set points for the DHW

Set point of the consuming circuit (low limit) = set point of the outlet T° of the Rubis +5°C

Set point of the DHW on the boiler = set point of the outlet T° of the Rubis -2°C

Over-value of the boiler outlet temperature when the DHW is restarted = 13°C

Process description

The consuming circuit keeps the temperature of the tank at 63°C. In this case, the set point of the boiler = the set point of the consuming circuit (63°C).

If the sensor inside the tank detects a temperature = the set point of the DHW (56°C) -5°C=51°C, the DHW cycle starts. The output temperature of the boiler is then = the set point of the DHW (56°C) + over-value (13°C) = 69°C.

The DHW cycle stops when the sensor inside the tank reaches the DHW set point temperature (56°C). The boiler then returns to the set point of the consuming circuit (63°).

- Activate the DHW mode



- **Configuration** menu

Save the sensors

Line No.	Value
Save sensors (6200)	Yes (switches back to no automatically)

F. ELECTRICAL AND HYDRAULIC VALIDATION

- **Inputs/outputs test** menu

Check the outputs

Alarm relay

Relay test (7700) Relay output QX1

Tank pump Q15

Relay test (7700) Relay output QX3

Reset the outputs

Relay test (7700) No test

Check the sensor values

B3 DHW sensor

DHW temp B3/B38 (7750) in °C

Check the status of contact H1

Contact state H1 (7841) Closed if the shunt is in place

- **Configuration** menu

Check the hydraulic diagram

Check no. heat source 1 (6212)	13
Check no. heat source 2 (6213)	0
Check no. storage tank (6215)	4
Check no. heating circuits (6217)	0

G. CONFIGURATION OPTIMISATION

DHW optimisation:

	<i>Line No.</i>	<i>Value</i>
<ul style="list-style-type: none"> • DHW tank menu 		
Adjust the over value	Flow setpoint boost (5020)	16 °C

Maintenance optimisation

A maintenance message may be generated that does not set the boiler to fault. This maintenance message may be displayed after the following 3 counters have expired:

- Time since last maintenance (or commissioning): set parameter 7044 to 12 months.
- Operating hours of the burner (parameter 7040).
- Number of starts (parameter 7042)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.

SINGLE BOILER

DHW production with hygiatherm

Diagram
VF23
page 1 / 5

A. HYDRAULIC DIAGRAM

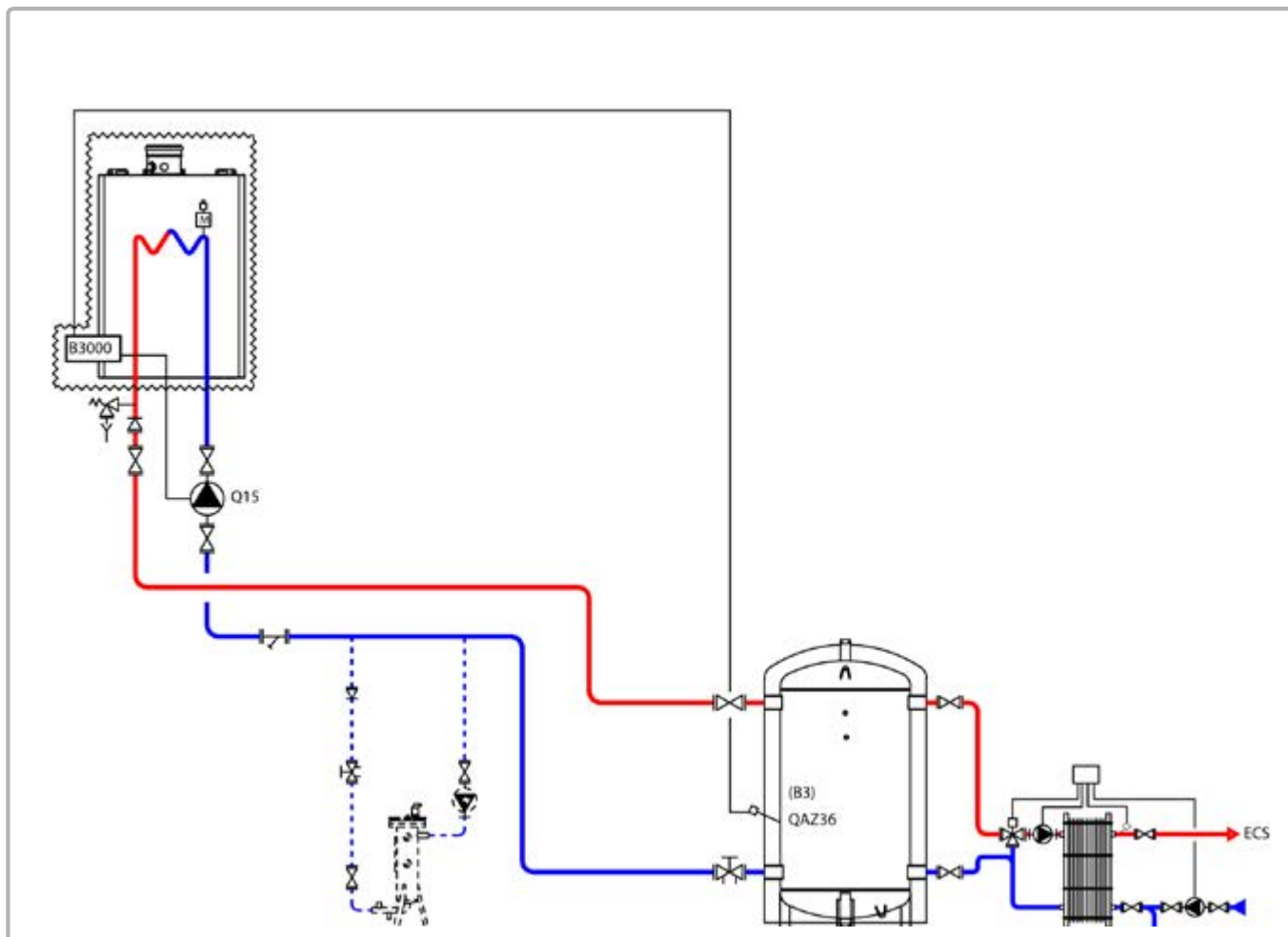


figure 30 - VF23 diagram

The boiler operates at the flow temperature required to produce the domestic hot water.

The flow rate of the pump, in m³/h, is adjusted to the real needs of the installation and, as a minimum, to P/25, with P power in th/h of the boiler.

The pump heating will have to allow to work in constant speed to insure the minimum flow necessary for the generator.

The domestic hot water production system has its own regulator.

A sensor QAZ 36, inside the primary tank, and connected to the generator, is used to restart the boiler more quickly, especially when the base primary temperature is low.

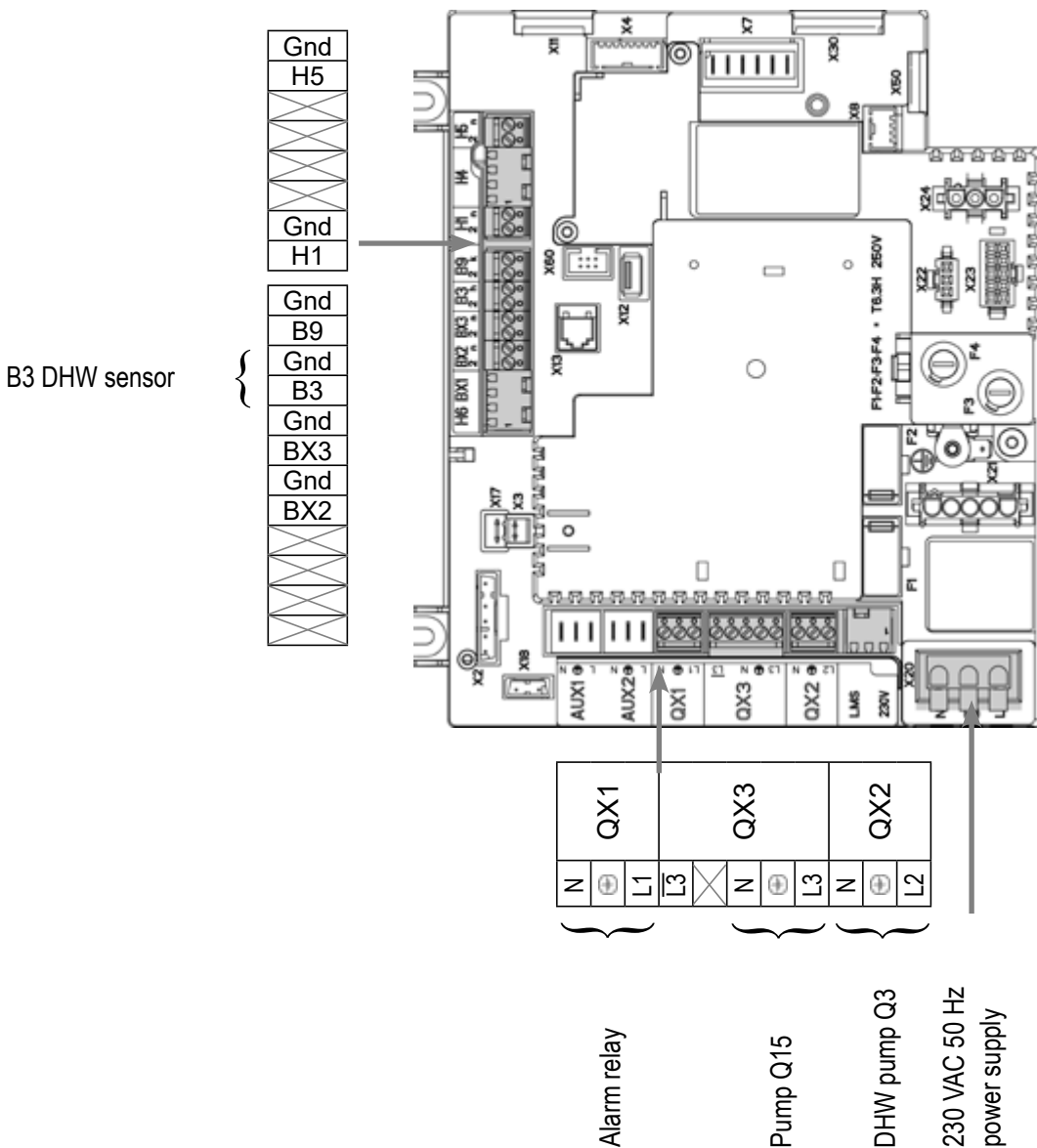
B. REGULATION ACCESSORY REQUIRED

	Quantity	Appliance reference	Order No.
DHW sensor kit	1	QAZ 36	059261

C. RECOMMENDED HYDRAULIC ACCESSORY

	Order No.	
Hydraulic kit for boiler only	for STRATTON MK2 S2-40 and S2-60	082324
	for STRATTON MK2 S2-70, S2-80 and S2-100	082325
	for STRATTON MK2 S2-120 kW	082326
	for STRATTON MK2 S2-150 kW	082327

D. CUSTOMER'S ELECTRICAL CONNECTION



E. SPECIFIC START-UP PROCEDURE

- ☞ Make the accessories' electrical connections.
- ☞ Start up the boiler only.
- ☞ Make the following settings:

	<i>Line No.</i>	<i>Value</i>
• Time and date menu		
Set the time	Hours / minutes (1)	HH.MM
Set the date	Day / month (2)	JJ.MM
Set the year	Year (3)	AAAA
• Configuration menu		
Configure the alarm output	Relay output QX1 (5890)	Alarm output K10
For the DHW to be effective, an activator must be defined, even if it is not connected	Relay output QX2 (5891)	DHW ctrl elem Q3
Configure the tank charge pump	Relay output QX3 (5892)	Consumer circuit pump 1 Q15
• Consumer circuit 1 menu		
Set the output setting to be taken into account if the Consumer circuit is requested	Flow temp setp cons request (1859)	60 °C (depends on the Rubis setting)
Remove pump stoppage on DHW priority (OEM setting)	DHW priority (1874)	No
• Domestic hot water menu		
Adjust the comfort setting	Nominal setpoint (1610)	55 °C
Adjust the DHW release mode	Release (1620)	24/day
• DHW tank Menu		
Adjust the over value	Flow setpoint boost (5020)	7 °C

Settings on the Rubis

Adjust the outlet temperature set point on the Rubis to 58°C.

Summary of the rules for the adjustment of the set points for the DHW

- Set point of the consuming circuit (low limit) = set point of the outlet T° of the Rubis +5°C
- Set point of the DHW on the boiler = set point of the outlet T° of the Rubis +3°C
- Over-value of the boiler outlet temperature when the DHW is restarted = 7°C

Process description

The consuming circuit keeps the temperature of the tank at 63°C. In this case, the set point of the boiler = the set point of the consuming circuit (63°C).

If the sensor inside the tank detects a temperature = the set point of the DHW (61°C) -5°C, the DHW cycle starts. The output temperature of the boiler is then = the set point of the DHW (61°C) + over-value (7°C) = 68°C.

The DHW cycle stops when the sensor inside the tank reaches the DHW set point temperature (61°C). The boiler then returns to the set point of the consuming circuit (63°).

- Activate the DHW mode



- **Configuration menu**

Save the sensors

<i>Line No.</i>	<i>Value</i>
Save sensors (6200)	Yes (switches back to no automatically)

F. ELECTRICAL AND HYDRAULIC VALIDATION

- **Inputs/outputs test** menu

Check the outputs

Alarm relay

Relay test (7700) Relay output QX1

Tank pump Q15

Relay test (7700) Relay output QX3

Reset the outputs

Relay test (7700) No test

Check the sensor values

B3 DHW sensor

DHW temp B3/B38 (7750) in °C

- **Configuration menu**

Check the hydraulic diagram

Check no. heat source 1 (6212)	13
Check no. heat source 2 (6213)	0
Check no. storage tank (6215)	4
Check no. heating circuits (6217)	0

G. CONFIGURATION OPTIMISATION

Maintenance optimisation

A maintenance message may be generated that does not set the boiler to fault. This maintenance message may be displayed after the following 3 counters have expired:

- Time since last maintenance (or commissioning): set parameter 7044 to 12 months.
- Operating hours of the burner (parameter 7040).
- Number of starts (parameter 7042)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.

SINGLE BOILER

DHW production with tank with coil

Diagram
VF24
page 1 / 4

A. HYDRAULIC DIAGRAM

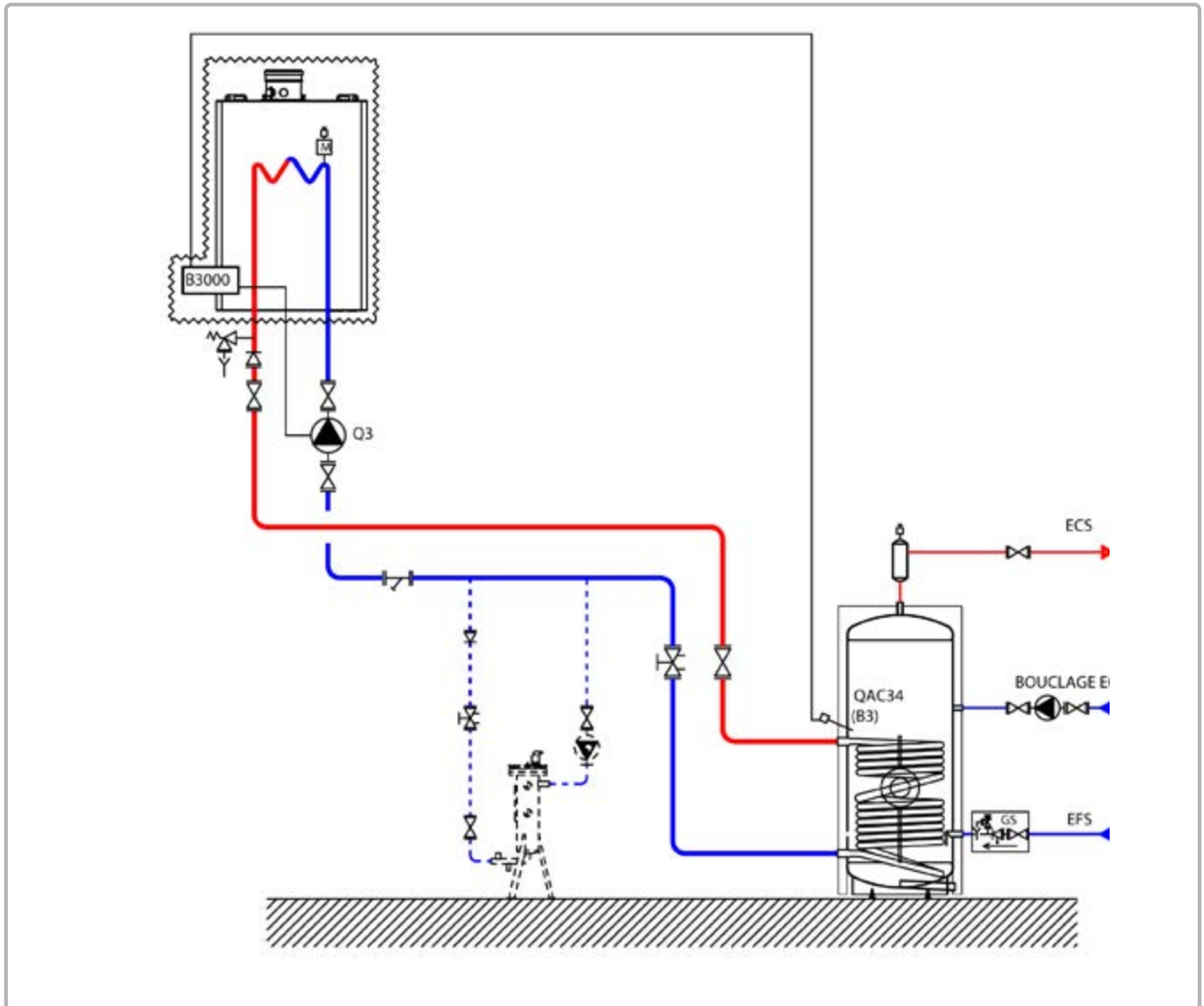


figure 31 - VF24 diagram

The boiler operates at the flow temperature required to produce the domestic hot water.

The flow rate of the pump, in m^3/h , is adjusted to the real needs of the installation and, as a minimum, to $P/25$, with P power in th/h of the boiler.

The pump heating will have to allow to work in constant speed to insure the minimum flow necessary for the generator.

The domestic hot water production system has its own regulator.

A sensor QAZ 36, positioned inside the storage tank and connected to the generator, informs the boiler of the need for domestic hot water.

Diagram: VF24

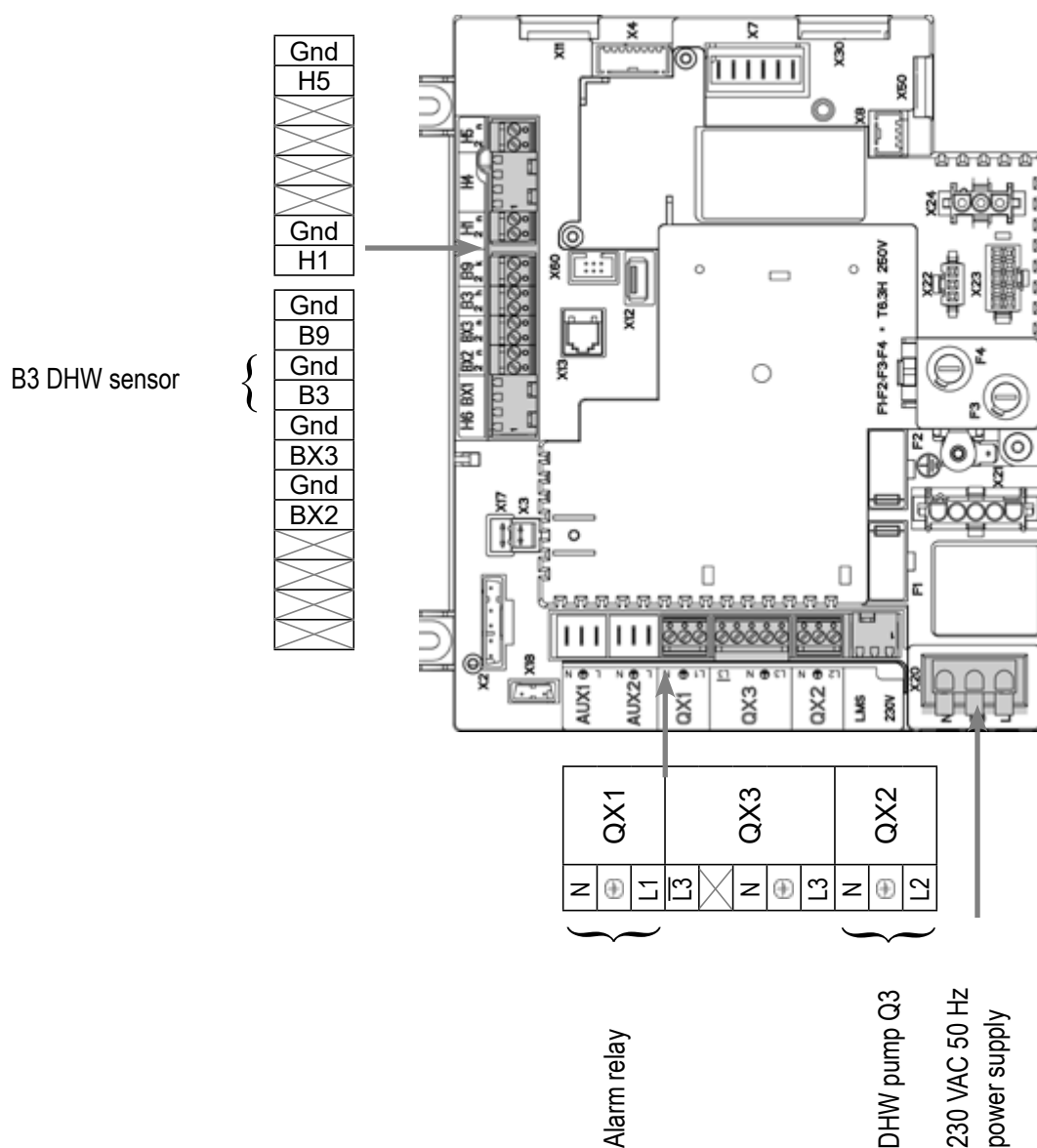
B. REGULATION ACCESSORY REQUIRED

	Quantity	Appliance reference	Order No.
DHW sensor kit	1	QAZ 36	059261

C. RECOMMENDED HYDRAULIC ACCESSORY

	Order No.	
Hydraulic kit for boiler only	for STRATTON MK2 S2-40 and S2-60	082324
	for STRATTON MK2 S2-70, S2-80 and S2-100	082325
	for STRATTON MK2 S2-120 kW	082326
	for STRATTON MK2 S2-150 kW	082327

D. CUSTOMER'S ELECTRICAL CONNECTION




E. D. SPECIFIC START-UP PROCEDURE

☞ Make the accessories' electrical connections.

☞ Start up the boiler only.

☞ Make the following settings:

	Line No.	Value
• Time and date menu		
Set the time	Hours / minutes (1)	HH.MM
Set the date	Day / month (2)	DD.MM
Set the year	Year (3)	YYYY
• Configuration menu		
Configure the alarm output	Relay output QX1 (5890)	Alarm output K10
Configure DHW pump Q3	Relay output QX2 (5891)	DHW ctrl elem Q3
• Configuration menu		
Save the sensors	Save sensors (6200)	Yes (switches back to no automatically)
• Domestic hot water menu		
Adjust the comfort setting	Nominal setpoint (1610)	55 °C
Adjust the DHW release mode	Release (1620)	24/day
• Activate the DHW mode		

F. ELECTRICAL AND HYDRAULIC VALIDATION

• Inputs/outputs test menu		
Check the outputs		
Alarm relay	Relay test (7700)	Relay output QX1
DHW pump Q3	Relay test (7700)	Relay output QX2
Reset the outputs	Relay test (7700)	No test

Diagram: VF24

page 4 / 4

	Line No.	Value
Check the sensor values		
B3 DHW sensor	DHW temp B3/B38 (7750)	in °C
• Configuration menu		
Check the hydraulic diagram	Check no. heat source 1 (6212)	13
	Check no. heat source 2 (6213)	0
	Check no. storage tank (6215)	4
	Check no. heating circuits (6217)	0

G. CONFIGURATION OPTIMISATION

DHW optimisation:

• DHW tank menu		
Adjust the over value	Flow setpoint boost (5020)	16 °C

Maintenance optimisation

A maintenance message may be generated that does not set the boiler to fault. This maintenance message may be displayed after the following 3 counters have expired:

- Time since last maintenance (or commissioning): set parameter 7044 to 12 months.
- Operating hours of the burner (parameter 7040).
- Number of starts (parameter 7042)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.

<h2 style="margin: 0;">BOILER CASCADE</h2> <p style="margin: 0;"><i>Without control of the secondary, communications networks 0...10V or LPB</i></p>	<p>Diagram VF10</p> <p>page 1 / 7</p>
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A. HYDRAULIC DIAGRAM

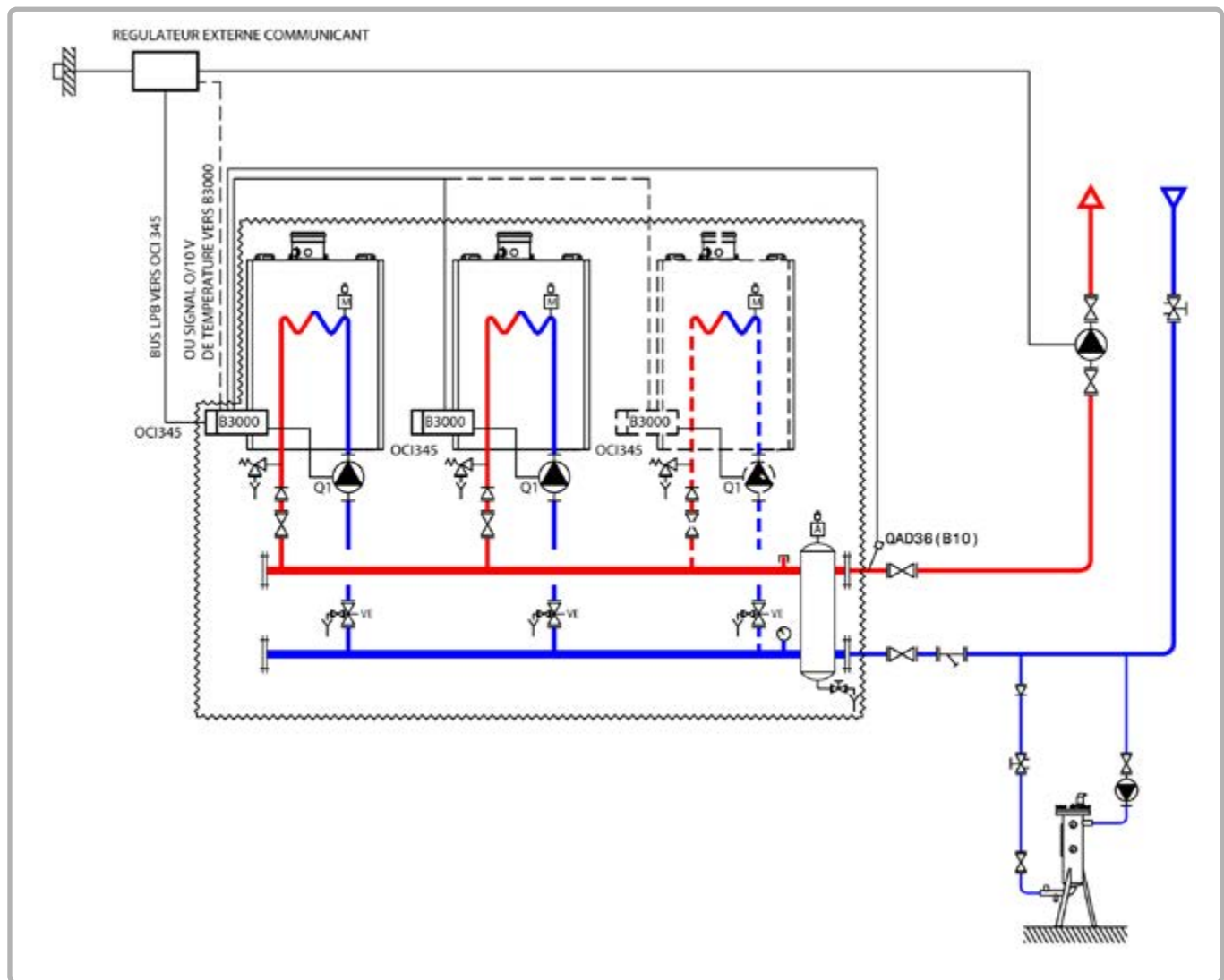


figure 32 - VF10 diagram

The existing regulation controls all the circuits of the installation. It determines the outlet set point temperature that the installation requires and sends it to the boilers, either in a 0 - 10V signal directly to the NAVISTEM B3000 that is the master of the cascade, or over the LPB bus to each NAVISTEM B3000. The cascade of boilers is controlled by the installation's regulation system according to the needs. The set point that is sent reflects the heating temperature that the installation requires at the time t.

B. REGULATION ACCESSORY REQUIRED

	Quantity	Appliance reference	Order No.
Communication kit	2	OCI 345	059572
Network sensor kit	1	QAD 36	059592

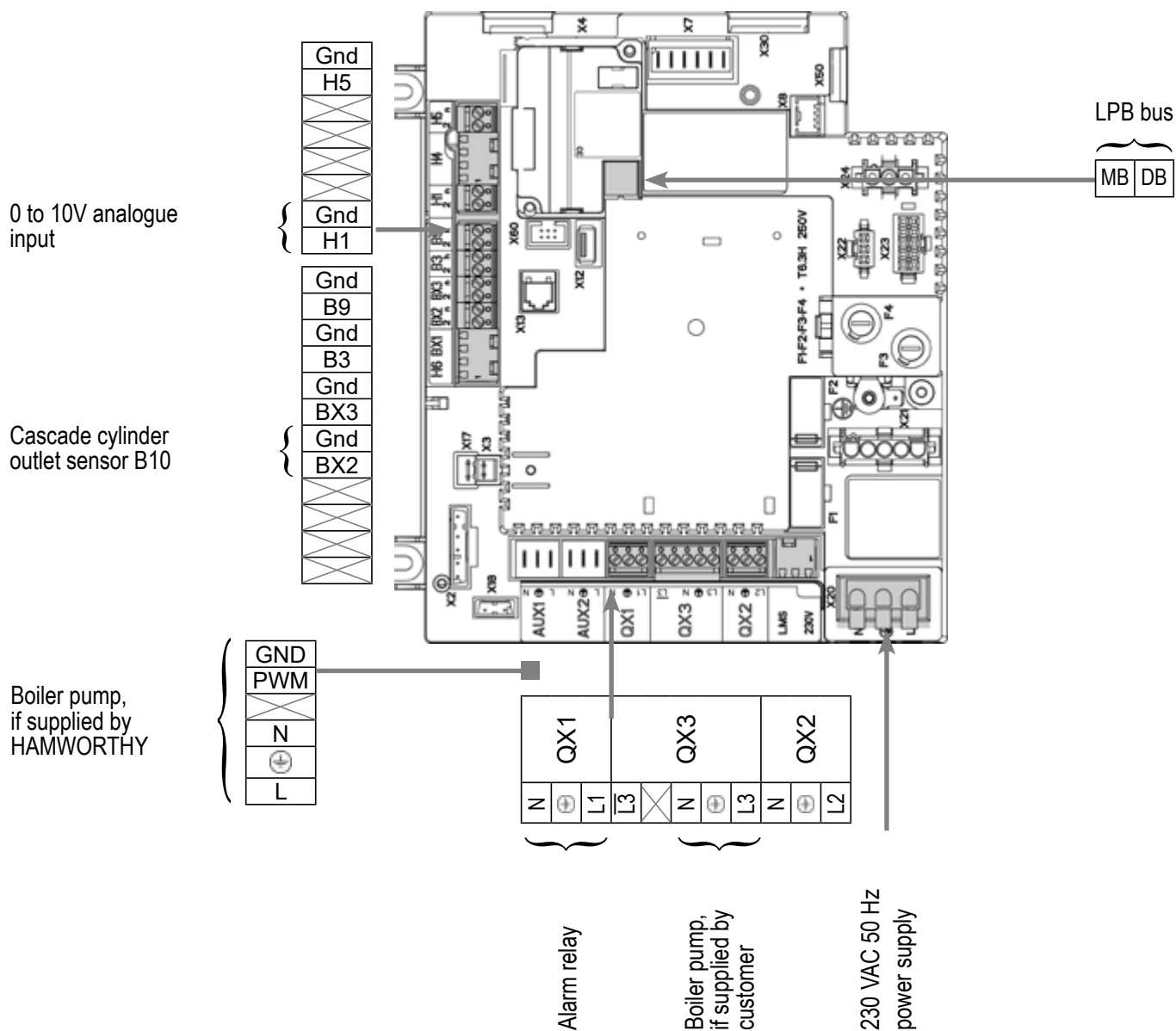
Diagram: VF10

C. RECOMMENDED HYDRAULIC ACCESSORY

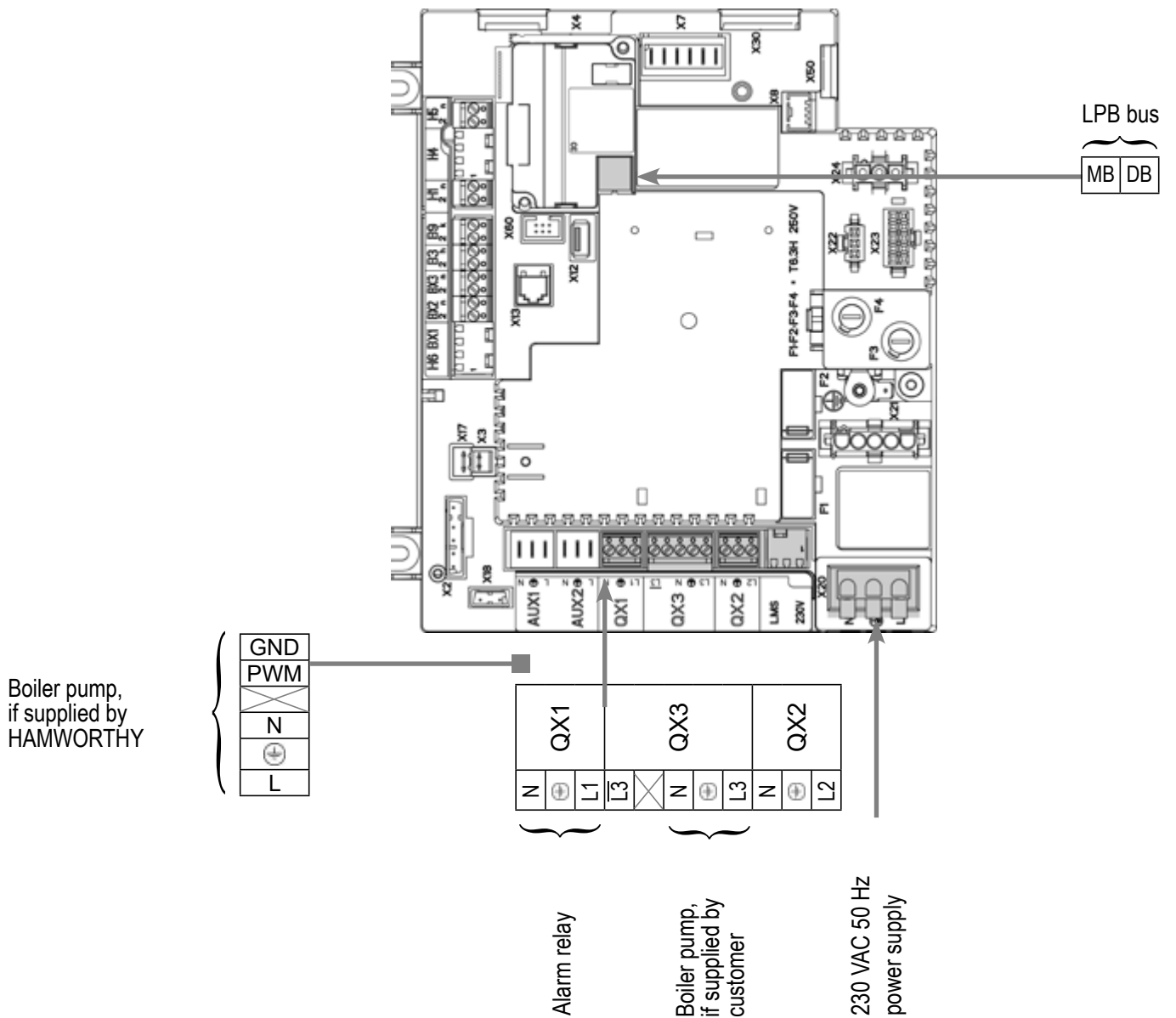
	Order N° for STRATTON MK2 ...			
	S2-40 and S2-60	S2-70, S2-80 and S2-100	S2-120	S2-150
Duo Pack	082275	082278	082281	082284
Trio Pack	082276	082279	082282	082285
Quatro Pack	082277	082280	082283	082286

C. CUSTOMER'S ELECTRICAL CONNECTION

Boiler No. 1:



Boiler No. 2 (and the following ones):



E. SPECIFIC START-UP PROCEDURE

- ☞ Make the accessories' electrical connections.
- ☞ Start up the boiler only.
- ☞ Make the following settings:

On boiler No. 1: master

• **Configuration menu**

Boiler pump supplied by HAMWORTHY
 Boiler pump supplied by the customer (all-or-nothing control)

No adjustments necessary
 Relay output QX3 (5892)

Line No.	Value
	Boiler pump Q1

	Line No.	Value
• Time and date menu		
Set the time	Hours / minutes (1)	HH.MM
Set the date	Day / month (2)	DD.MM
Set the year	Year (3)	YYYY
• Configuration menu		
Configure the cascade cylinder outlet sensor B10	Sensor input BX2 (5931)	Common flow sensor B10
For a request via 0...10V input		
Configure the H1 input	Function input H1 (5950)	Consumer request VK1 10V
	Voltage value 1 H1 (5953)	0.0
	Function value 1 H1 (5954)	0
	Voltage value 2 H1 (5955)	10.0
	Function value 2 H1 (5956)	1000 (for equivalence 10 V = 100 °C)
For a request via LPB		
Check that the secondary regulatory is defined on an LPB segment other than 0 (reserved for the generators)		
In all cases (LPB network menu)		
Configure the boiler as master the of the cascade:	Device address (6600)	1
	Segment address (6601)	0
	Bus power supply function (6604)	Automatically
	Clock mode (6640)	Master (or <i>slave with remote setting</i> if the PLC is the master clock)
To display the faults from other modules on the console of the module you are adjusting	Display system messages (6610)	Yes
If you want an alarm report on this module (output K10 (QX1)) containing all the faults from all the modules	Syst messages alarm relay (6611)	Yes
Save the sensors	Save sensors (6200)	Yes (switches back to no automatically)

On boiler No. 2 or the following boilers: slave

	<i>Line No.</i>	<i>Value</i>
• Configuration menu		
Boiler pump supplied by HAMWORTHY	No adjustments necessary	
Boiler pump supplied by the customer (all-or-nothing control)	Relay output QX3 (5892)	Boiler pump Q1
• LPB network menu		
Configure the boiler as a slave in the cascade:	Device address (6600)	2 (or following, for the other slaves)
	Segment address (6601)	0
	Bus power supply function (6604)	Automatically
	Clock mode (6640)	Slave without remote setting

- Connect the bus between the boilers (⚠ pay attention to the polarity).
- Switch off, then switch on the slave boiler(s). If the communication has been correctly established, the clock is updated correctly.

F. ELECTRICAL AND HYDRAULIC VALIDATION

On boiler No. 1: master

• Cascade diagnostic menu		
Check that all the boilers are in the cascade	Priority source 1 (8100)	Released / not released
	Priority source 2 (8101)	Released / not released
	
 For a request via 0...10V input		
• Inputs/outputs test menu		
Voltage in H1	Voltage signal H1 (7840)	To be validated with the voltage sent by the boiler room's PLC
 For a request via LPB		

Diagram : VF10

If the boiler room's regulator is configured as slave clock, it must retrieve the date and time.

In both cases

	Line No.	Value
• Configuration menu		
Check the hydraulic diagram	Check no. heat source 1 (6212)	14
	Check no. heat source 2 (6213)	0
	Check no. storage tank (6215)	0
	Check no. heating circuits (6217)	0
• Inputs/outputs test menu		
Check the outputs		
Alarm relay	Relay test (7700)	Relay output QX1
Boiler pump control, if supplied by customer	Relay test (7700)	Relay output QX3
Reset the outputs	Relay test (7700)	No test
Check the sensor values		
Cascade cylinder outlet sensor B10	Sensor temp BX2 (7821)	in °C

On boiler No. 2 or the following boiler(s): slave

• Inputs/outputs test menu		
Boiler pump control, if supplied by customer	Relay test (7700)	Relay output QX3
Reset the outputs	Relay test (7700)	No test
• Configuration menu		
Check the hydraulic diagram	Check no. heat source 1 (6212)	14
	Check no. heat source 2 (6213)	0
	Check no. storage tank (6215)	0
	Check no. heating circuits (6217)	0

G. CONFIGURATION OPTIMISATION

Cascade optimisation:

The cascade can be optimised if necessary using the settings in the *Cascade* menu. Refer to the NAVISTEM B3000 boiler's controller manual for more details.

Maintenance optimisation

A maintenance message may be generated that does not set the boiler to fault. This maintenance message may be displayed after the following 3 counters have expired:

- Time since last maintenance (or commissioning): set parameter 7044 to 12 months.
- Operating hours of the burner (parameter 7040).
- Number of starts (parameter 7042)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.

<h2 style="margin: 0;">BOILER CASCADE</h2> <p style="margin: 0;"><i>2 regulated circuits per boiler and production of DHW</i></p>	<p style="margin: 0;">Diagram VF11</p> <p style="margin: 0;">page 1 / 9</p>
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A. HYDRAULIC DIAGRAM

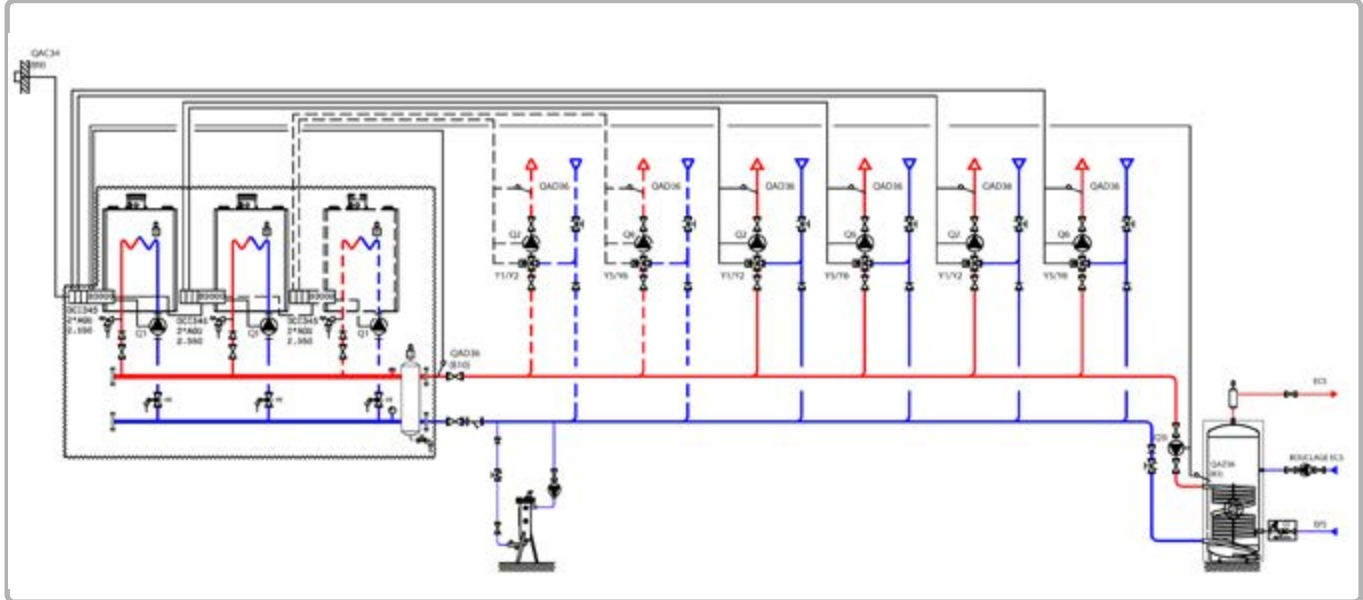


figure 33 - VF11 diagram

The master NAVISTEM B3000 controls the cascade of boilers on the basis of the outlet temperature measured by the sensor QAD 36. Each NAVISTEM B3000 controls the charge pump of its own generator.

The boilers operate with a variable outlet temperature according to the outdoor temperature measured by the sensor QAC 34, temperature adjusted according to the most demanding circuit, without parallel offset, without a low temperature limit and with a weekly programme.

The heating programme is per week. Each AGU 2.550 module controls a regulated circuit with a 3-way valve.

B. REGULATION ACCESSORY REQUIRED

	Quantity	Appliance reference	Order No.
Communication kit	2 (3)	OCI 345	059752
Extension module kit (delivered with a network sensor QAD 36)	2	AGU 2.550	059753
DHW sensor kit	1	QAZ 36	059261
Output sensor kit	1	QAC 34	059260
Network sensor kit	1	QAD 36	059592

C. RECOMMENDED HYDRAULIC ACCESSORY

	Order N° for STRATTON MK2 ...			
	S2-40 and S2-60	S2-70, S2-80 and S2-100	S2-120	S2-150
Duo Pack	082275	082278	082281	082284
Trio Pack	082276	082279	082282	082285
Quatro Pack	082277	082280	082283	082286

D. CUSTOMER'S ELECTRICAL CONNECTION

Boiler No. 1:

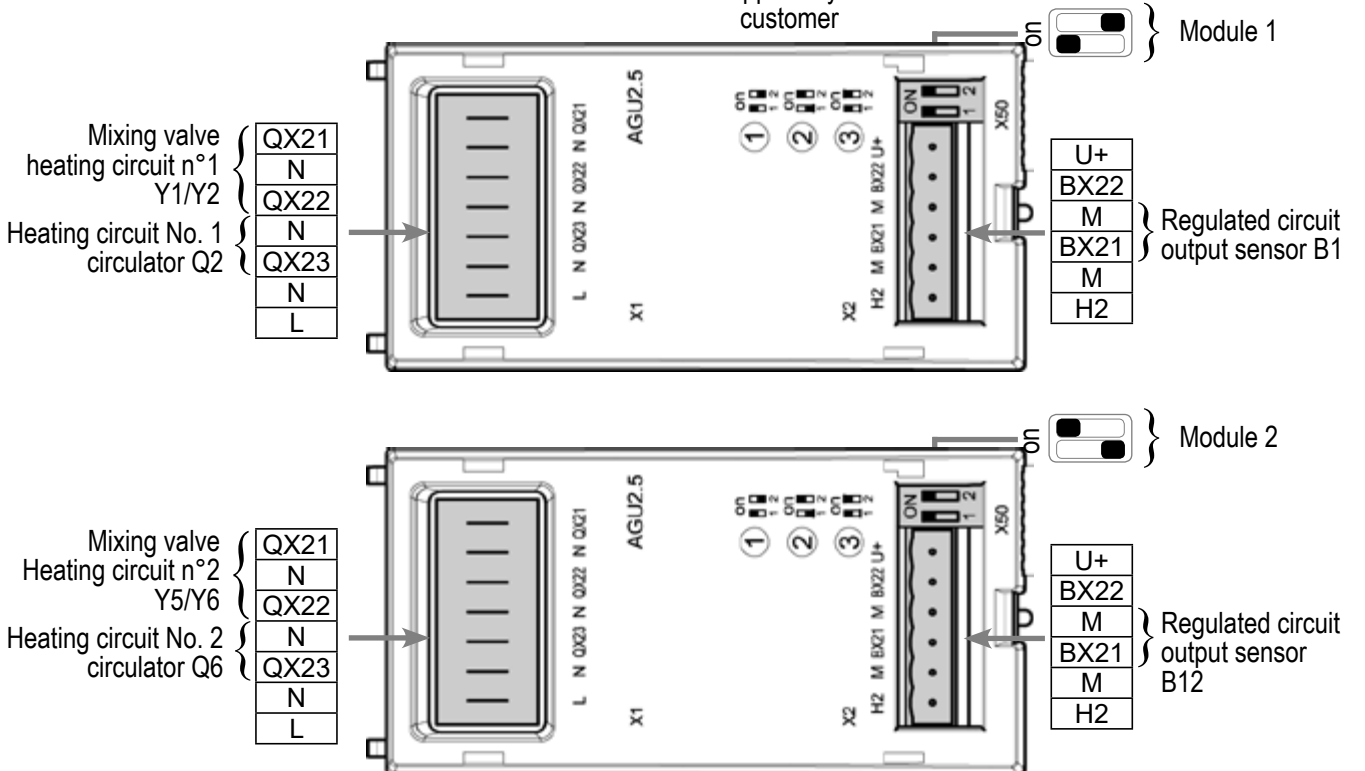
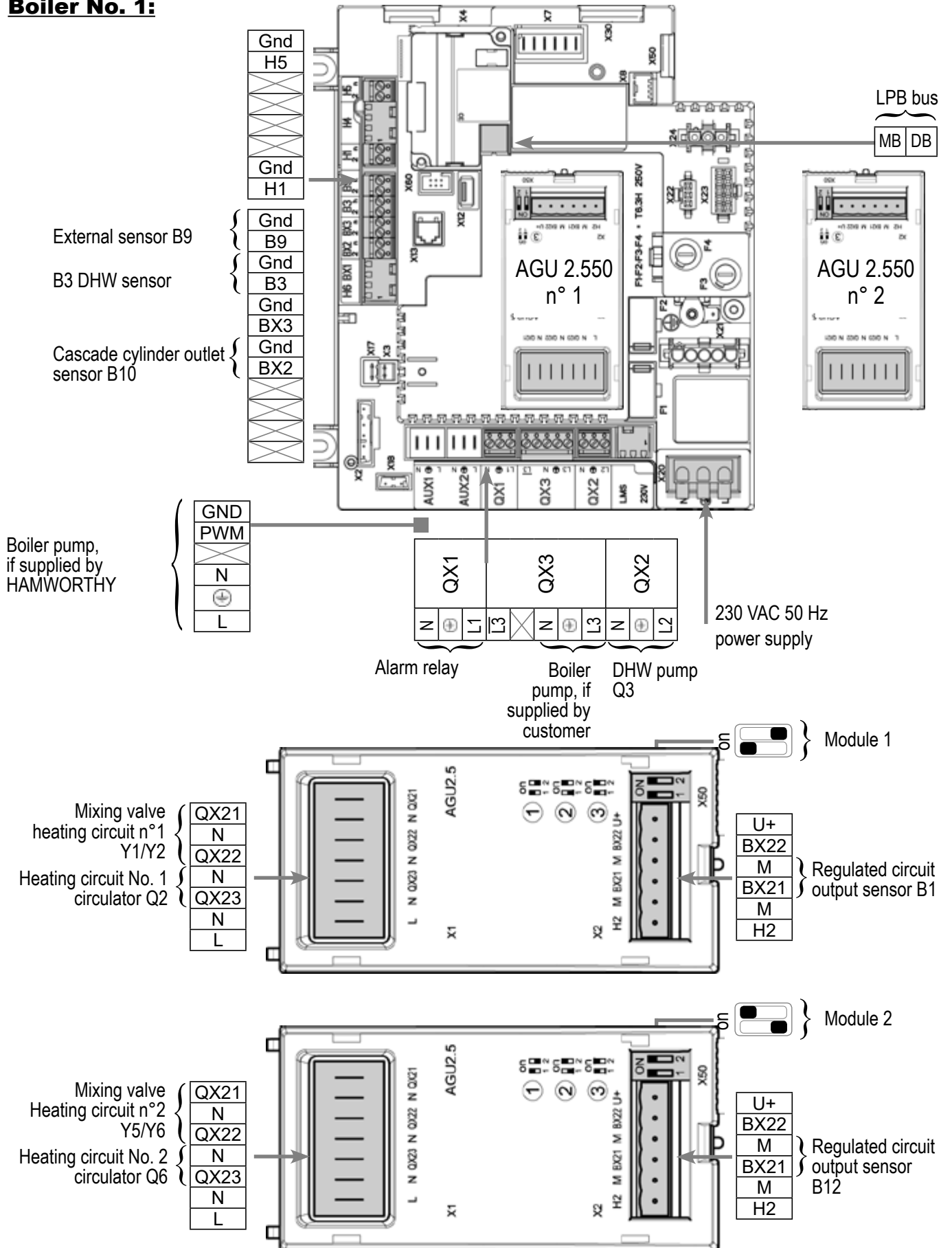
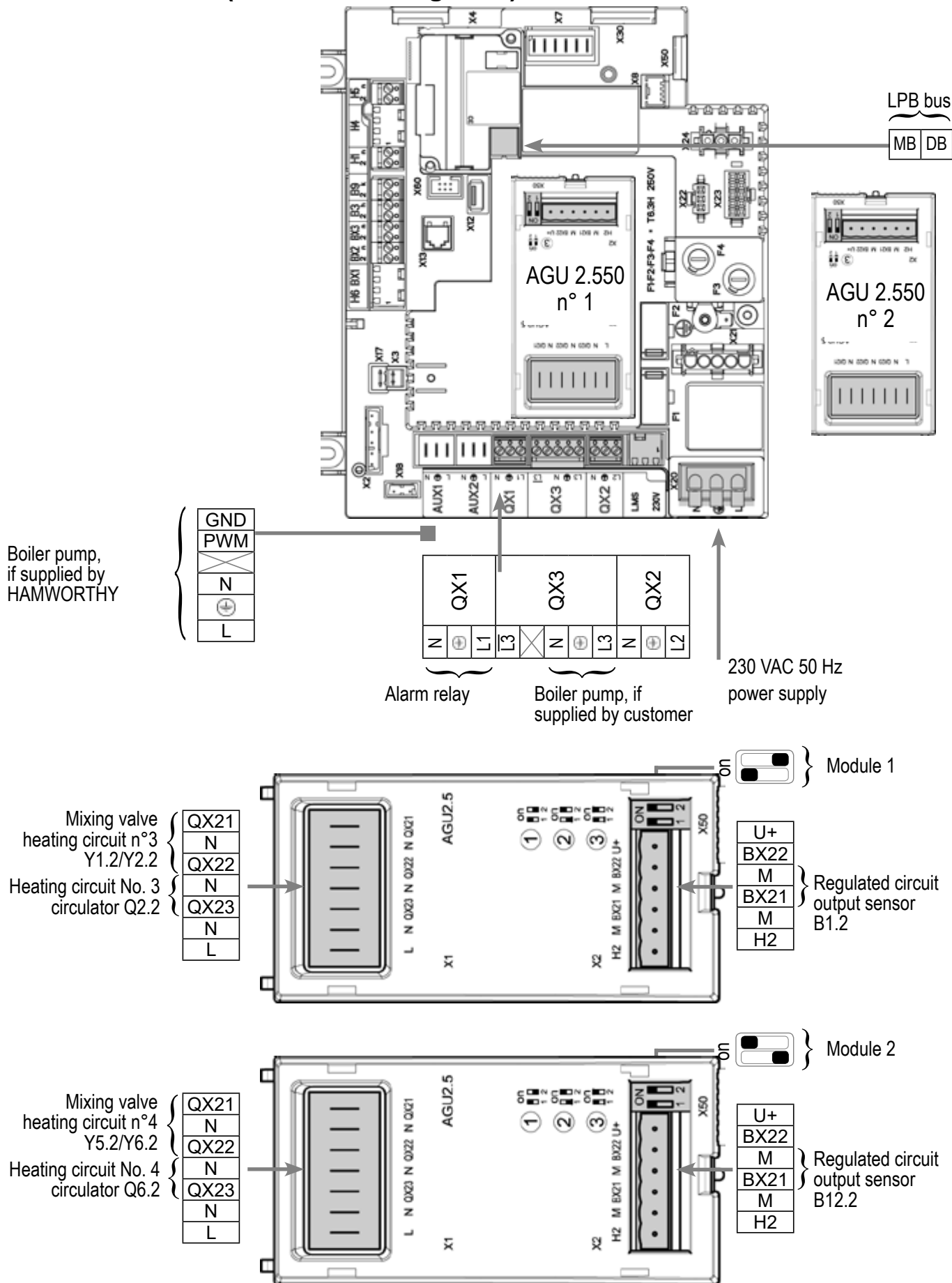


Diagram: VF11

Boiler No. 2 (and the following ones):



E. SPECIFIC START-UP PROCEDURE

☞ Make the accessories' electrical connections.



IMPORTANT: Configure the switches on the AGU 2.550 extension modules.



☞ Start up the boiler only.

☞ Carry out the adjustments below.

On boiler No. 1: master

	<i>Line No.</i>	<i>Value</i>
• Configuration menu		
Boiler pump supplied by HAMWORTHY	No adjustments necessary	
Boiler pump supplied by the customer (all-or-nothing control)	Relay output QX3 (5892)	Boiler pump Q1
• Time and date menu		
Set the time	Hours / minutes (1)	HH.MM
Set the date	Day / month (2)	DD.MM
Set the year	Year (3)	YYYY
• Configuration menu		
Start up heating circuit 1	Heating circuit 1 (5710)	On
Start up heating circuit 2	Heating circuit 2 (5715)	On
Configure the alarm output	Relay output QX1 (5890)	Alarm output K10
Configure DHW pump Q3	Relay output QX2 (5891)	DHW ctrl elem Q3
Configure the cascade cylinder outlet sensor B10	Sensor input BX2 (5931)	Common flow sensor B10
Configure the extension modules	Function extension module 1 (6020)	Heat circuit 1
	Function extension module 2 (6021)	Heat circuit 2
• Configure as master of the cascade: LPB network menu		
Appliance number	Device address (6600)	1
Segment number	Segment address (6601)	0
Adjust the bus supply	Bus power supply function (6604)	Automatically

Diagram: VF11	page 5 / 9
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	<i>Line No.</i>	<i>Value</i>
Adjust the clock rate	Clock mode (6640)	Master
• Heating circuit 1 / 2 menu		
Adjust the comfort setting	Comfort setpoint (710/1010)	---
Adjust the curve slope	Heating curve slope (720/1020)	---
• Switch the heating regime to permanent comfort		
• Domestic hot water menu		
Adjust the comfort setting	Nominal setpoint (1610)	---
• Activate the DHW mode		
• Configuration menu		
Save the sensors	Save sensors (6200)	Yes (switches back to no automatically)

On boiler n°2 or the following boilers: slave

• Configuration menu		
Boiler pump supplied by HAMWORTHY	No adjustments necessary	
Boiler pump supplied by the customer (all-or-nothing control)	Relay output QX3 (5892)	Boiler pump Q1
Start the third heating circuit	Heating circuit 1 (5710)	On
Start the fourth heating circuit	Heating circuit 2 (5715)	On
Configure the alarm output	Relay output QX1 (5890)	Alarm output K10
Configure the extension modules	Function extension module 1 (6020)	Heat circuit 1
	Function extension module 2 (6021)	Heat circuit 2
• Configure as a slave of the cascade: LPB network menu		
Appliance number	Device address (6600)	2 (or following, for the other slaves)

Segment number	Segment address (6601)	0
Adjust the bus supply	Bus power supply function (6604)	Automatically
Adjust the clock rate	Clock mode (6640)	Slave without remote setting

	Line No.	Value
To display the faults from other modules on the console of the module you are adjusting	Display system messages (6610)	Yes
If you want an alarm report on this module (output K10 (QX1)) containing all the faults from all the modules	Syst messages alarm relay (6611)	Yes

- Switch the heating regime to permanent comfort
- Connect the bus between the boilers (⚠ pay attention to the polarity).
- Switch off, then switch on the slave boiler(s). If the communication has been correctly established, the clock is updated correctly.

F. ELECTRICAL AND HYDRAULIC VALIDATION

On boiler N°1: master

- **Cascade diagnostic** menu

Check that all the boilers are in the cascade

Priority source 1 (8100)	Released / not released
Priority source 2 (8101)	Released / not released

- **Inputs/outputs test** menu

Check the outputs

Alarm relay	Relay test (7700)	Relay output QX1
Boiler pump control, if supplied by customer	Relay test (7700)	Relay output QX3
DHW pump Q3	Relay test (7700)	Relay output QX2
Heating circuit 2/3 3-channel valve opening	Relay test (7700)	Relay output QX21 module 1, 2

Schéma : VF11	page 7 / 9
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Heating circuit 2/3 3-channel valve close	Relay test (7700)	Relay output QX22 module 1, 2
Heating circuit 1 / 2 pumps	Relay test (7700)	Relay output QX23 module 1, 2
Reset the outputs	Relay test (7700)	No test
	Line No.	Value
Check the sensor values		
External sensor B9	Outside temp B9 (7730)	in °C
DHW sensor B3	DHW temp B3/B8 (7750)	in °C
Cascade cylinder outlet sensor B10	Sensor temp BX2 (7821)	in °C
B1 flow sensor	Sensor temp BX21 module 1 (7830)	in °C
B12 flow sensor	Sensor temp BX21 module 2 (7832)	in °C
• Configuration menu		
Check the hydraulic diagram	Check no. heat source 1 (6212)	14
	Check no. heat source 2 (6213)	0
	Check no. storage tank (6215)	4
	Check no. heating circuits (6217)	303

On boiler n°2 or the following boilers: slave

• Inputs/outputs test menu		
Check the outputs		
Alarm relay	Relay test (7700)	Relay output QX1
Boiler pump control, if supplied by customer	Relay test (7700)	Relay output QX3
Heating circuit 2/3 3-channel valve opening	Relay test (7700)	Relay output QX21 module 1, 2
Heating circuit 2/3 3-channel valve close	Relay test (7700)	Relay output QX22 module 1, 2
Heating circuit 1 / 2 pumps	Relay test (7700)	Relay output QX23 module 1, 2
Reset the outputs	Relay test (7700)	No test

Schéma : VF11

page 8 / 9

Check the sensor values			
B1.2 flow sensor	Sensor temp BX21 module 1 (7830)		in °C
B12.2 flow sensor	Sensor temp BX21 module 2 (7832)		in °C
		Line No.	Value
• Configuration menu			
Check the hydraulic diagram		Check no. heat source 1 (6212)	14
		Check no. heat source 2 (6213)	0
		Check no. storage tank (6215)	0
		Check no. heating circuits (6217)	303

G. CONFIGURATION OPTIMISATION**On master and slave boilers****Heating circuit optimisation**

• Heating circuit 1 / 2 menu			
Adjust the reduced setting	Reduced setpoint (712/1012)		---
ECO function for automatic summer / winter switch (see NAVISTEM B3000 manual)	Summer/winter heating limit (1030/1330)		19 °C
Daily ECO function for automatic comfort / reduced switch according to the difference between the set point and the outdoor temperature (see NAVISTEM B3000 manual).	24-hour heating limit (1032/1332)		-3 °C
• Heating circuit 1 / 2 timer programme menu			
Preselection	Preselection (500/520)		---
Adjust the timer programming	On / off phases (501...506) (521...526)		---
• Heating circuit 1 / 2 holiday menu			
Preselection	Preselection (641/651)		---
Adjust the timer programming	On / off phases (642...643) (652-653)		---
• Switch the heating regime to automatic			Auto

DHW optimisation:

- **DHW tank** menu

Adjust the over value

Flow setpoint boost (5020) | 16 °C

Maintenance optimisation

A maintenance message may be generated that does not set the boiler to fault. This maintenance message may be displayed after the following 3 counters have expired:

- Time since last maintenance (or commissioning): set parameter 7044 to 12 months.
- Operating hours of the burner (parameter 7040).
- Number of starts (parameter 7042)

These last 2 parameters are dependent on the boiler's hydraulic installation. We recommend using at least parameter 7044 for annual maintenance.

10. SPARE PARTS LIST

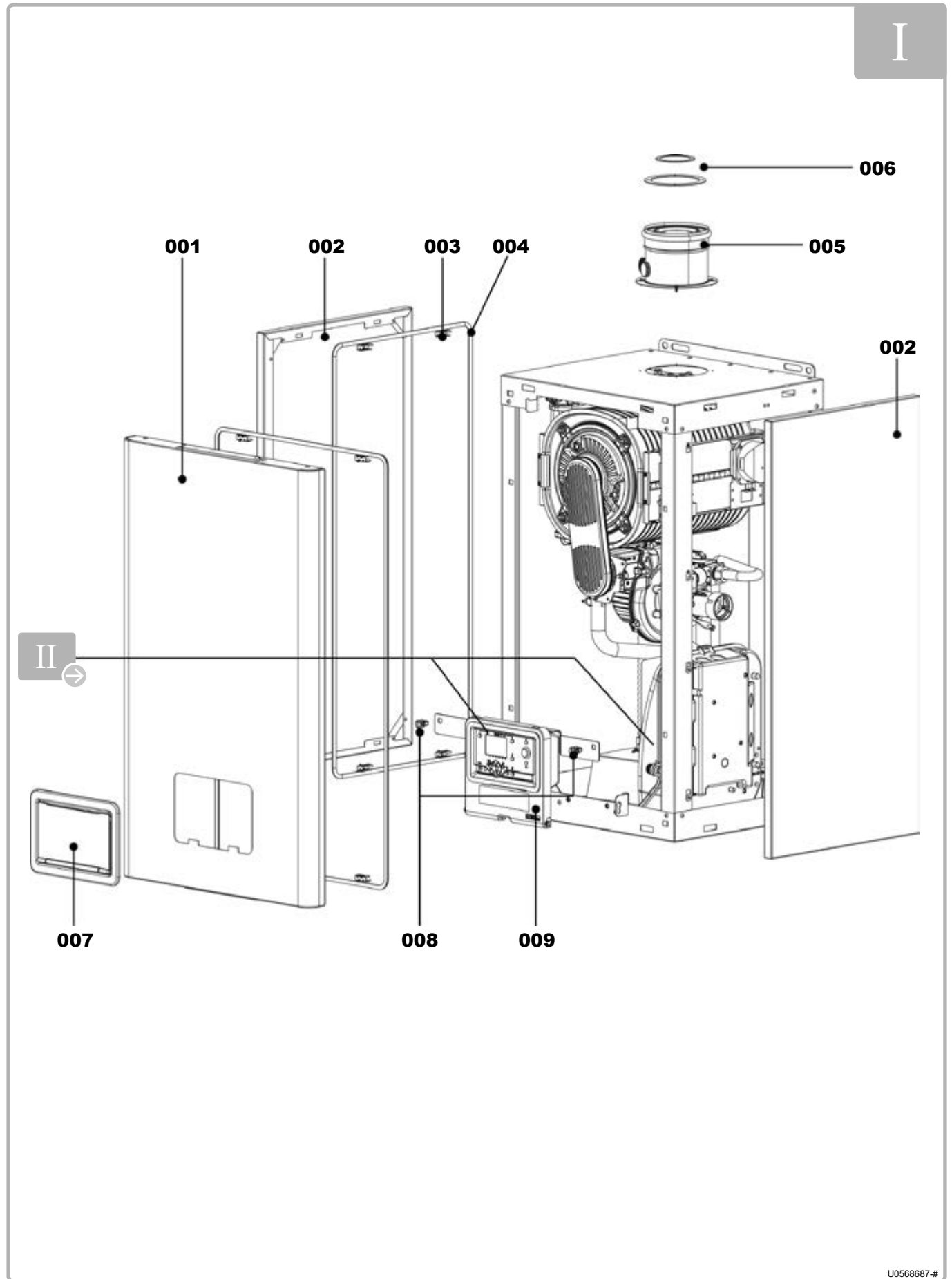
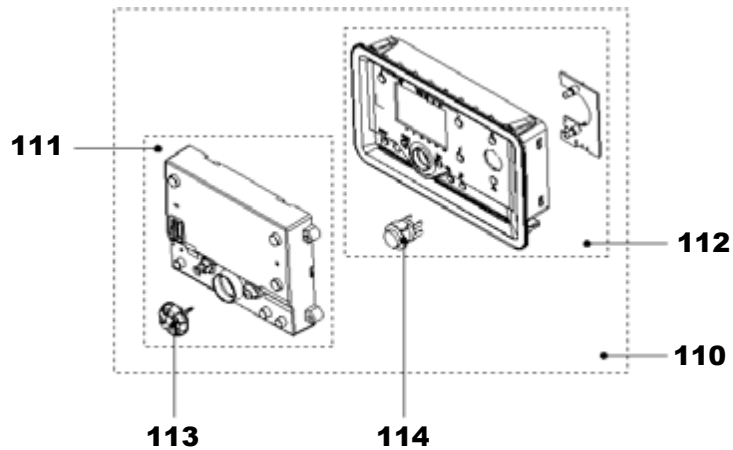
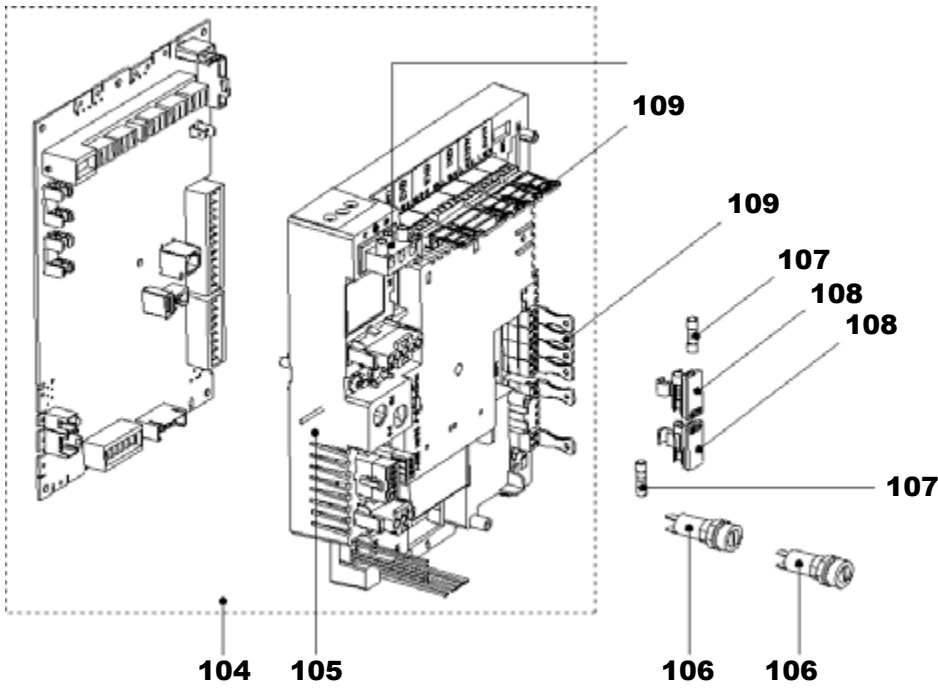
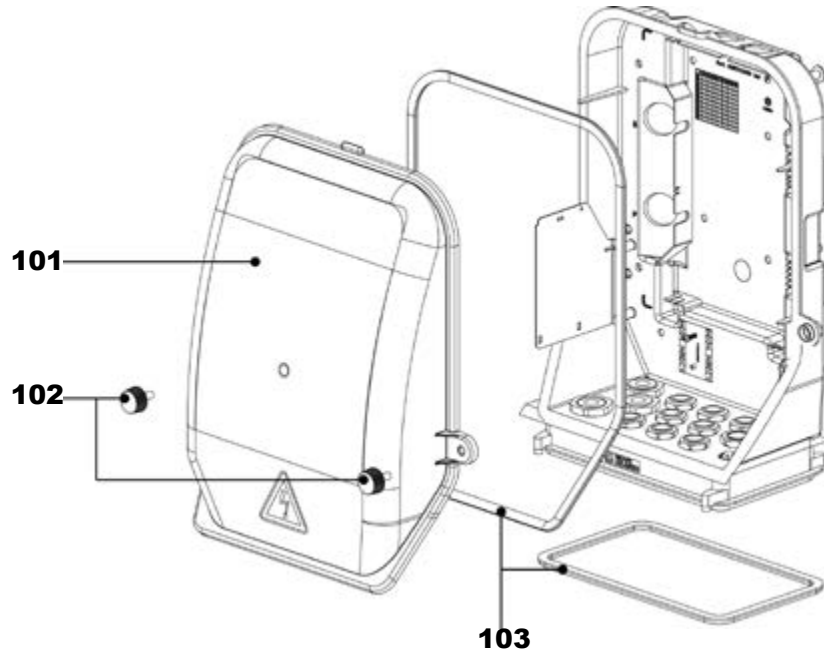


figure 34 - Trim (shown on STRATTON MK2 S2-40 and S2-60)

ITEM	DESIGNATION	MODELS						
		S2-40	S2-60	S2-70	S2-80	S2-100	S2-120	S2-150
001	Front jacket	076639						
002	Left or right side jacket	076640		076641		076642	076643	
003	Jacket fasteners (x 4)	076644						
004	Adhesive seal for front / side jacket: long 3.5 m	076649						
005	Concentric adaptor	076650		076651				
006	Adaptor seals	076652		076653				
007	Complete user interface flap	076695						
008	User interface support clip (x 2)	076694						
009	User interface support	076693						



U0568658-# / U0505839-# / U0505841-#

figure 35 - Control panel

ITEM	DESIGNATION	MODELS						
		S2-40	S2-60	S2-70	S2-80	S2-100	S2-100	S2-150
101	Cover (with screws and washers) for NAVISTEM B3000	076697						
102	Screw (x 2) for NAVISTEM B3000 cover	076698						
103	Adhesive seal for NAVISTEM B3000 unit (upper and lower): long. 1.5 m	076648						
104	Platform with configured NAVISTEM B3000	076505	076506	076619	076507	076508	076510	076511
105	Platform without NAVISTEM B3000 and with wiring	076127						
106	Round fuse holder	076130						
107	Fuse (T 6.3 H - 5x20)	071898						
108	Square fuse holder (with fuse)	076129						
109	Customer platform connectors	076128						
110	Complete display (user interface)	076131						
111	Display alone (user interface) with selector	076132						
112	Plastic part for display (user interface) + LED board + switch + LED ribbon cable	076133						
113	Selector	076135						
114	Switch	076134						
--	EMC fan filter	--					076634	
--	Power wiring	076621		076622			076623	
--	Signal wiring	076624		076625			076626	
--	Gas valve connector cable	076627		076628				076469
--	Ignition electrode cable	073150						
--	Rear body thermostat cable	--		076629				
--	Fan adapter wiring	076630	--					
--	Fan remote control wiring	--	076631	--				
--	Switch power supply wiring	076632						
--	Display signal wiring	076633						

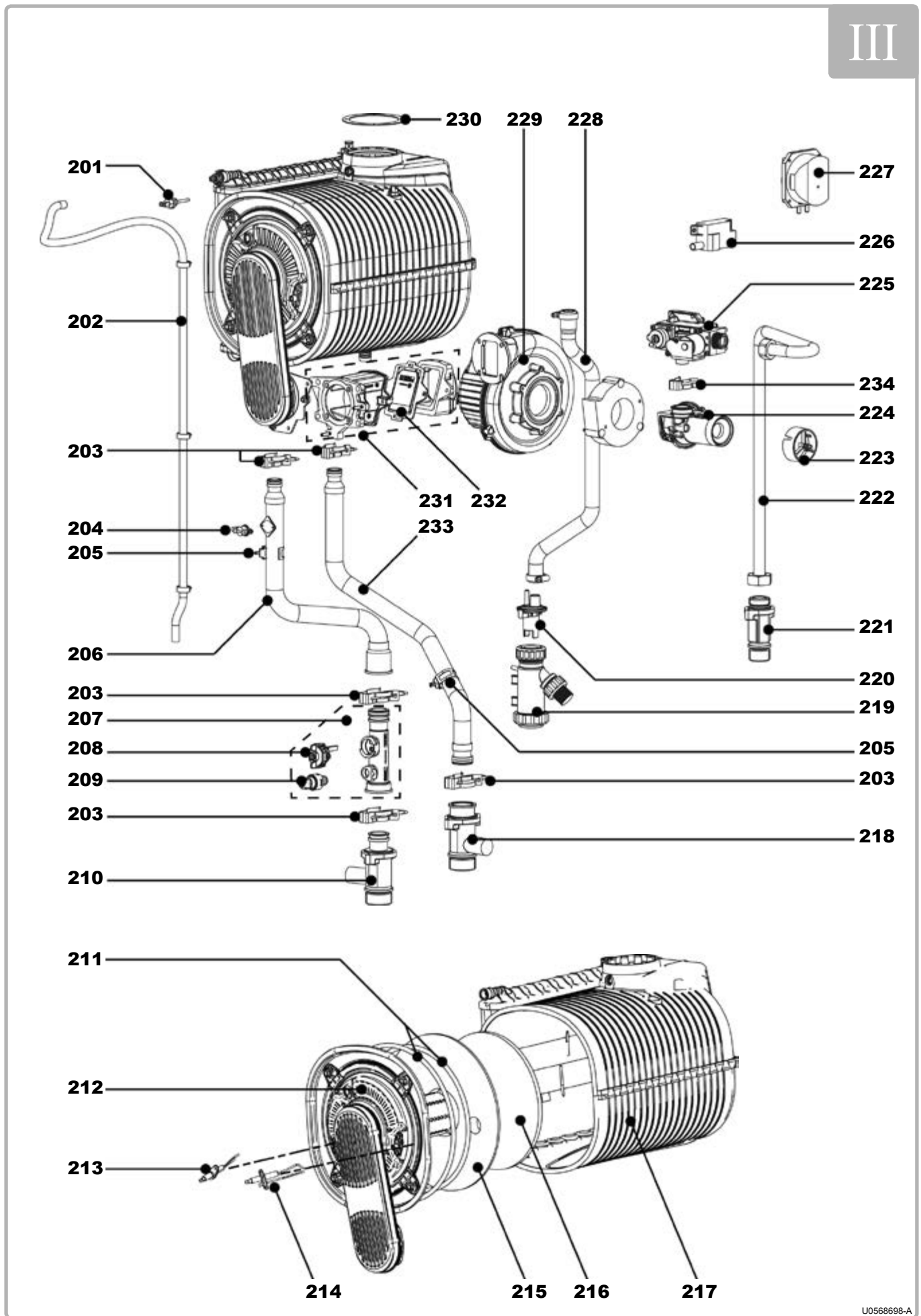


figure 36 - Body and burner for S2-40 and S2-60 models

U0568698-A

ITEM	DESIGNATION	MODELS	
		S2-40	S2-60
201	Gas temperature sensor	076516	
202	Long bleed pipe 1.2 m	076661	
203	Hydraulic clip (sachet)	076685	
204	Horn safety thermostat	076158	
205	Outlet / return contact temperature sensor	076515	
206	Outlet tube	076667	076668
207	Hydraulic collector (with sensors)	076518	
208	Flow meter	076513	
209	Pressure sensor	076514	
210	Customer outlet tap (with valve and O-rings)	076665	
211	Seal + burner holder braid	076464	
212	Complete burner holder + rail	076465	076466
213	Ionising electrode + seal	076463	
214	Ignition electrode + seal	076462	
215	Burner holder refractory insulation	076471	
216	Exchanger bottom refractory insulation	076470	
217	Exchanger	076456	076457
218	Customer return tap	076681	
219	Condensate siphon	071838	
220	Siphon coupling	076662	
221	Gas tap	076671	
222	Gas tube	076672	076673
223	Venturi measurement connection	076658	
224	Venturi	076654	
225	Gas valve	076687	
226	ZAG 1 ignition transformer	072131	
227	Air pressure switch	072573	
228	Condensate evacuation pipe	076663	
229	Fan	076690	076691
230	Gas outlet seal	076512	
231	Complete premix valve	076520	
232	Premix valve seal	076519	
233	Return tube	076682	
234	Clip for gas valve	076688	
--	Bag of gas line seals	076646	
--	Bag of hydraulic seals	076645	

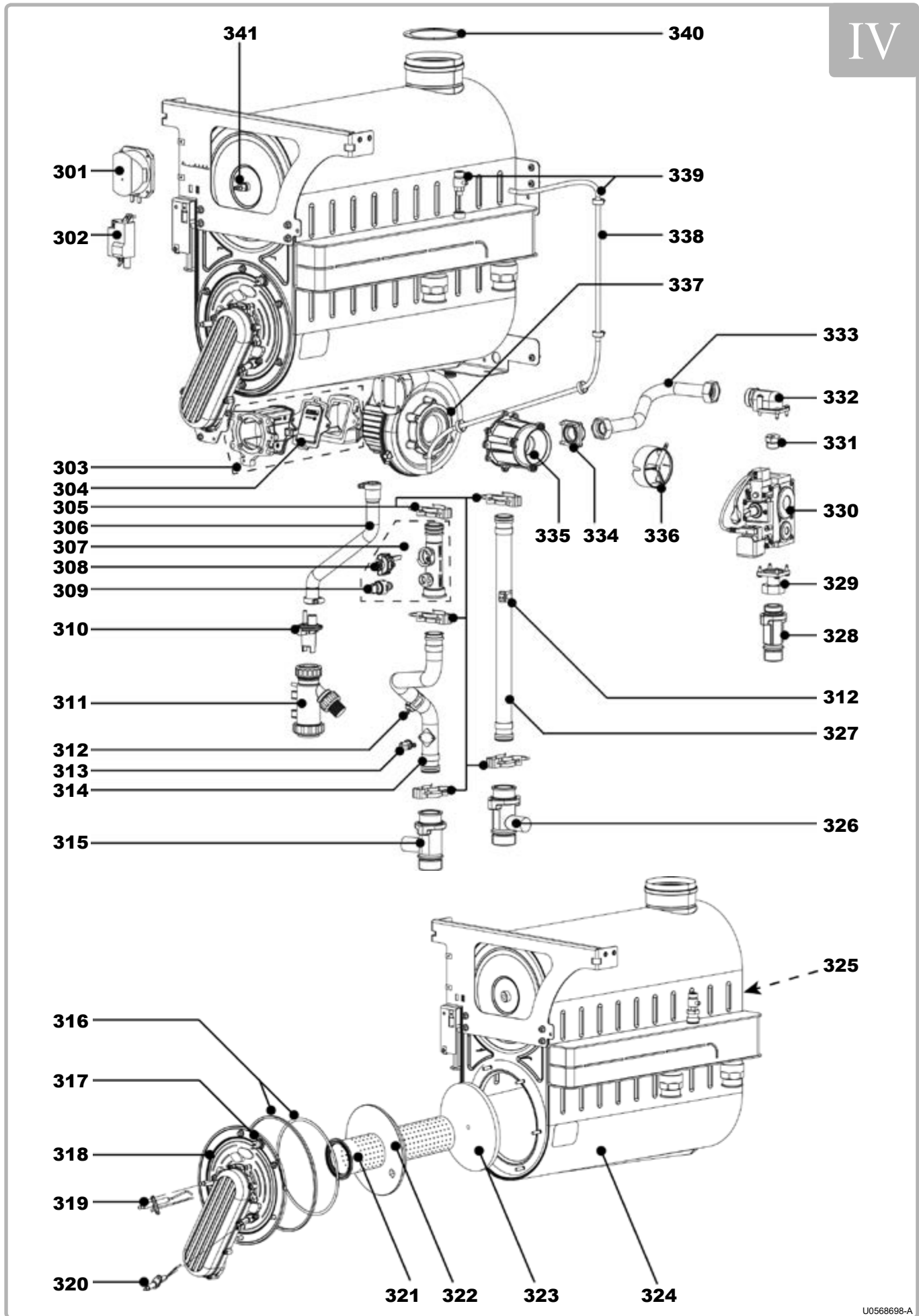
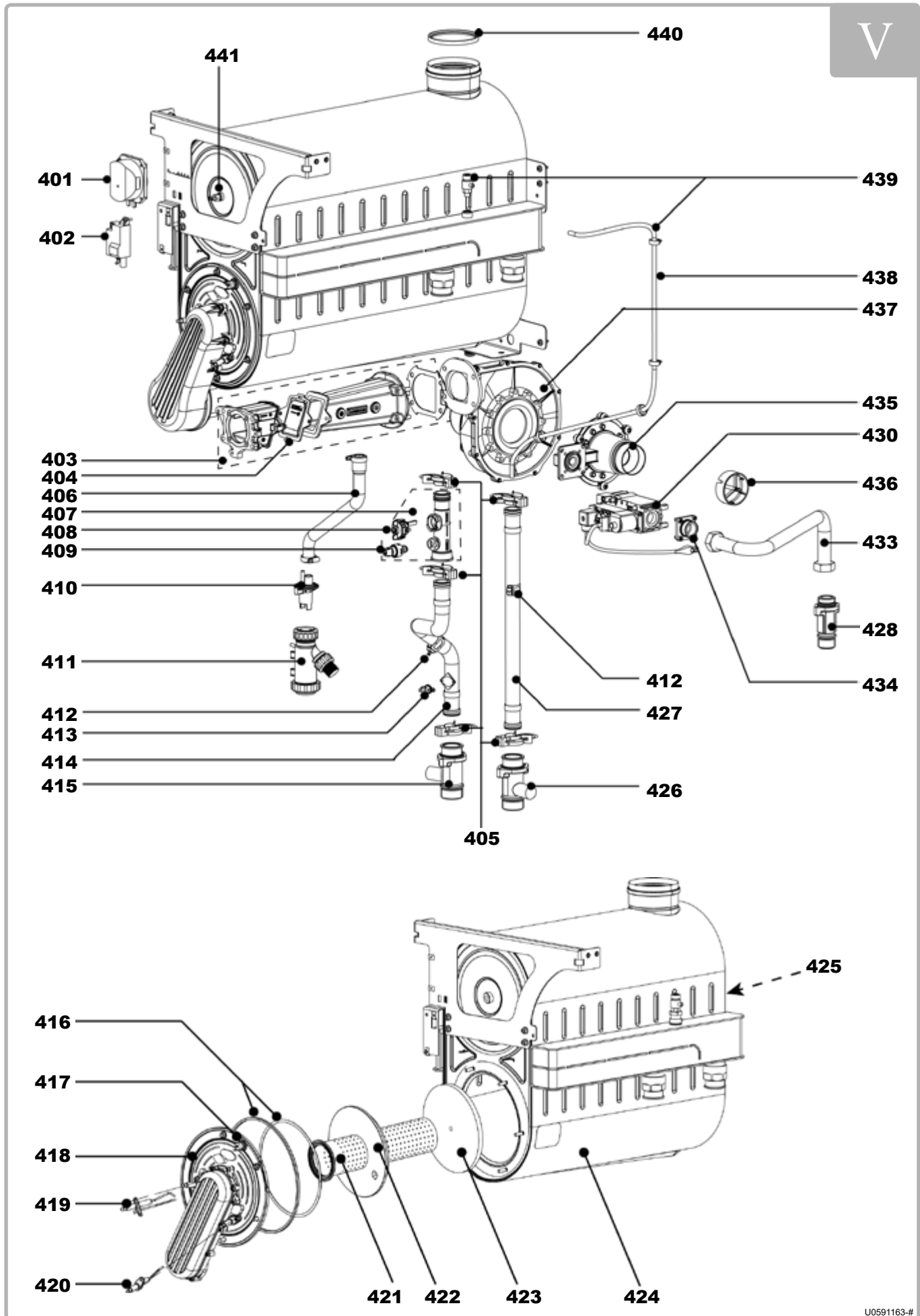


figure 37 - Body and burner for S2-70 to S2-120 models

U0568698-A

ITEM	DESIGNATION	MODELS			
		S2-70	S2-80	S2-100	S2-120
301	Air pressure switch	072173			
302	ZAG 1 ignition transformer	072131			
303	Complete premix valve	076520			
304	Premix valve seal	076519			
305	Hydraulic clip (sachet)	076686			
306	Condensate evacuation pipe	076664			
307	Hydraulic collector (with sensors)	076518			
308	Flow meter	076513			
309	Pressure sensor	076514			
310	Siphon coupling	076662			
311	Condensate siphon	071838			
312	Outlet / return contact temperature sensor	076515			
313	Horn safety thermostat	076158			
314	Outlet tube	076669		076670	
315	Customer outlet tap (with valve and seals)	076666			
316	Seal + burner holder braid	072153			
317	Burner holder safety thermostat	076476			
318	Complete burner holder + rail	076473		076526	
319	Ignition electrode + seal	072505			
320	Ionising electrode + seal	072506			
321	Burner rail + seal	076467		076468	
322	Burner holder refractory insulation	076472			
323	Exchanger bottom refractory insulation	072152			
324	Exchanger	076458		076459 076460	
325	Rear body safety thermostat	076475			
326	Customer return tap	076681			
327	Return tube	076683		076684	
328	Gas tap	076671			
329	Gas valve inlet flange	076677			
330	Gas valve	076689			
331	Propane injector (Ø 6.5)	076635		--	
	Propane injector (Ø 7.0)	--		076636 --	
332	Gas valve outlet elbow flange	076678		076679	
333	Gas tube	076674		076675 076676	
334	Straight venturi flange	--		076680	
335	Venturi	076655		076656 076657	
336	Venturi measurement connection	076659			
337	Fan	076691			
338	Long bleed pipe 1.2 m	076661			
339	Drain tap + plug	072171			
340	Gas outlet seal	072519			
341	Gas temperature sensor	076517			
--	Bag of gas line seals	076647			
--	Bag of hydraulic seals	076645			



U0591163-#

figure 38 - Body and burner for S2-150 kW model

ITEM	DESIGNATION	MODEL 150
401	Air pressure switch	072173
402	ZAG 1 ignition transformer	072131
403	Complete premix valve	076692
404	Premix valve seal	076519
405	Hydraulic clip (sachet)	076686
406	Condensate evacuation pipe	076664
407	Hydraulic collector (with sensors)	076518
408	Flow meter	076513
409	Pressure sensor	076514
410	Siphon coupling	076662
411	Condensate siphon	071838
412	Outlet / return contact temperature sensor	076515
413	Horn safety thermostat	076158
414	Outlet tube	076990
415	Customer outlet tap (with valve and seals)	076666
416	Seal + burner holder braid	072153
417	Burner holder safety thermostat	076476
418	Complete burner holder + rail	076474
419	Ignition electrode + seal	072505
420	Ionising electrode + seal	072506
421	Burner rail + seal	072518
422	Burner holder refractory insulation	072517
423	Exchanger bottom refractory insulation	072152
424	Exchanger	076461
425	Rear body safety thermostat	076475
426	Customer return tap	076681
427	Return tube	076684
428	Gas tap	076671
430	Gas valve	076986
433	Gas tube	076985
434	Straight venturi flange	076680
435	Venturi	076984
436	Venturi measurement connection	076660
437	Fan	076987
438	Long bleed pipe 1.2 m	076661
439	Drain tap + plug	072171
440	Gas outlet seal	072519
441	Gas temperature sensor	076517
--	Bag of gas line seals	076647
--	Bag of hydraulic seals	076645

11. CUSTOMER PARAMETERS TABLE

Boiler: site:.....

serial no.:

Please transfer all parameter modifications into this document!

Note: The "access" column indicates the degree of accessibility for information or programming (E for the end user, C for commissioning and S for specialist). The *Commissioning* accessibility level includes the *End User* level. Similarly, the *Specialist* level includes the *Commissioning* level.

Line No.	Programming	Access	Default value	Customer setting
Time of day and date				
1	Hours / minutes	E	00 : 00	
2	Day / month	E	dd.mm	
3	Year	E	yyyy	
5	Start of summertime	C	dd.mm	
6	End of summertime	C	dd.mm	
Operator section				
20	Language	E	English	
22	Info	C	Temporarily	
26	Operation lock	C	Off	
27	Programming lock	C	Off	
28	Direct adjustment	C	Storage with confirmation	
29	Units	E	°C, bar	
42	Assignment device 1	C	CC 1	
44	Operation HC2	C	Jointly with HC1	
46	Operation HC3/P	C	Jointly with HC1	
70	Software version	C		
Time prog heating circuit 1				
500	Preselection	E	Mo-Su	
501	First period start time	E	06:00	
502	First period stop time	E	22:00	
503	Second period start time	E	24:00	
504	Second period stop time	E	24:00	
505	Second period start time	E	24:00	
506	Second period stop time	E	24:00	
516	Default values	E	No	
Time prog heating circuit 2				
520	Preselection	E	Mo-Su	
521	First period start time	E	06:00	
522	First period stop time	E	22:00	
523	Second period start time	E	24:00	
524	Second period stop time	E	24:00	
525	Second period start time	E	24:00	
526	Second period stop time	E	24:00	
536	Default values	E	No	

Line No.	Programming	Access	Default value	Customer setting
Time prog heating circuit 3				
540	Preselection	E	Mo-Su	
541	First period start time	E	06:00	
542	First period stop time	E	22:00	
543	Second period start time	E	24:00	
544	Second period stop time	E	24:00	
545	Second period start time	E	24:00	
546	Second period stop time	E	24:00	
556	Default values	E	No	
Time program 4 / DHW				
560	Preselection	E	Mo-Su	
561	First period start time	E	06:00	
562	First period stop time	E	22:00	
563	Second period start time	E	24:00	
564	Second period stop time	E	24:00	
565	Second period start time	E	24:00	
566	Second period stop time	E	24:00	
576	Default values	E	No	
Time program 5				
600	Preselection	E	Mo-Su	
601	First period start time	E	06:00	
602	First period stop time	E	22:00	
603	Second period start time	E	24:00	
604	Second period stop time	E	24:00	
605	Second period start time	E	24:00	
606	Second period stop time	E	24:00	
616	Default values	E	No	
Holidays heating circuit 1				
641	Preselection	E	Period 1	
642	Begin (dd.mm)	E	01.01	
643	End (dd.mm)	E	01.01	
648	Operating level	E	Frost protection	
Holidays heating circuit 2				
651	Preselection	E	Period 1	
652	Begin (dd.mm)	E	01.01	
653	End (dd.mm)	E	01.01	
658	Operating level	E	Frost protection	
Holidays heating circuit 3				
661	Preselection	E	Period 1	
662	Begin (dd.mm)	E	01.01	
663	End (dd.mm)	E	01.01	
668	Operating level	E	Frost protection	
Heating circuit 1				
710	Comfort setpoint	E	20 °C	
712	Reduced setpoint	E	16 °C	
714	Frost protection setpoint	E	10 °C	
716	Comfort setpoint max	S	35 °C	
720	Heating curve slope	E	1,5	
721	Heating curve displacement	S	0 °C	

Line No.	Programming	Access	Default value	Customer setting
726	Heating curve adaptation	S	Off	
730	Summer/winter heating limit	E	18 °C	
732	24-hour heating limit	S	--- °C	
740	Flow temp setpoint min	C	8 °C	
741	Flow temp setpoint max	E	80 °C	
742	Flow temp setpoint room stat	E	65 °C	
746	Delay heat request	C	0 s	
750	Room influence	S	20 %	
760	Room temp limitation	S	1 °C	
761	Heating limit room controller	S	16 %	
770	Boost heating	S	5 °C	
780	Quick setback	S	Down to reduced setpoint	
790	Optimum start control max	S	00:00	
791	Optimum stop control max	S	00:00	
800	Reduced setp increase start	S	-5 °C	
801	Reduced setp increase end	S	-15 °C	
809	Continuous pump operation	S	No	
820	Overtemp prot pump circuit	S	On	
830	Mixing valve boost	S	5 °C	
832	Actuator type	S	3-position	
833	TOR Switching differential	S	2 °C	
834	Actuator running time	S	120 s	
835	Mixing valve Xp	S	32 °C	
836	Mixing valve Tn	S	120 s	
850	Floor curing function	C	Off	
851	Floor curing setp manually	C	25 °C	
855	Floor curing setp current	E	0 °C	
856	Floor curing day current	E	0	
861	Excess heat draw	S	Always	
870	With buffer	S	Yes	
872	With prim contr/system pump	S	Yes	
880	Pump speed reduction	S	Characteristic	
882	Pump speed min	S	50 %	
883	Pump speed max	S	100 %	
888	Curve readj at 50% speed	S	33 %	
889	Filter time const speed ctrl	S	5 min	
890	Flow setp readj speed ctrl	S	Yes	
898	Operating level changeover	S	Reduced	
900	Optg mode changeover	S	Protection	
Heating circuit 2				
1010	Comfort setpoint	E	20 °C	
1012	Reduced setpoint	E	16 °C	
1014	Frost protection setpoint	E	10 °C	
1016	Comfort setpoint max	S	35 °C	
1020	Heating curve slope	E	1,5	
1021	Heating curve displacement	S	0 °C	
1026	Heating curve adaptation	S	Off	
1030	Summer/winter heating limit	E	18 °C	
1032	24-hour heating limit	S	--- °C	

Line No.	Programming	Access	Default value	Customer setting
1040	Flow temp setpoint min	C	8 °C	
1041	Flow temp setpoint max	C	80 °C	
1042	Flow temp setpoint room stat	E	65 °C	
1046	Delay heat request	C	0 s	
1050	Room influence	S	20 %	
1060	Room temp limitation	S	1 °C	
1061	Heating limit room controller	S	16 %	
1070	Boost heating	S	5 °C	
1080	Quick setback	S	Down to reduced setpoint	
1090	Optimum start control max	S	00:00	
1091	Optimum stop control max	S	00:00	
1100	Reduced setp increase start	S	-5 °C	
1101	Reduced setp increase end	S	-15 °C	
1109	Continuous pump operation	S	No	
1120	Overtemp prot pump circuit	S	On	
1130	Mixing valve boost	S	5 °C	
1132	Actuator type	S	3-position	
1133	TOR Switching differential	S	2 °C	
1134	Actuator running time	S	120 s	
1135	Mixing valve Xp	S	32 °C	
1136	Mixing valve Tn	S	120 s	
1150	Floor curing function	C	Off	
1151	Floor curing setp manually	C	25 °C	
1155	Floor curing setp current	E	0 °C	
1156	Floor curing day current	E	0	
1161	Excess heat draw	S	Always	
1170	With buffer	S	Yes	
1172	With prim contr/system pump	S	Yes	
1180	Pump speed reduction	S	Characteristic	
1182	Pump speed min	S	50 %	
1183	Pump speed max	S	100 %	
1188	Curve readj at 50% speed	S	33 %	
1189	Filter time const speed ctrl	S	5 min	
1190	Flow setp readj speed ctrl	S	Yes	
1198	Operating level changeover	S	Reduced	
1200	Optg mode changeover	S	Protection	
Heating circuit 3				
1310	Comfort setpoint	E	20 °C	
1312	Reduced setpoint	E	16 °C	
1314	Frost protection setpoint	E	10 °C	
1316	Comfort setpoint max	S	35 °C	
1320	Heating curve slope	E	1,5	
1321	Heating curve displacement	S	0 °C	
1326	Heating curve adaptation	S	Off	
1330	Summer/winter heating limit	E	18 °C	
1332	24-hour heating limit	S	--- °C	
1340	Flow temp setpoint min	C	8 °C	
1341	Flow temp setpoint max	C	80 °C	
1342	Flow temp setpoint room stat	E	65 °C	

Line No.	Programming	Access	Default value	Customer setting
1346	Delay heat request	C	0 s	
1350	Room influence	S	20 %	
1360	Room temp limitation	S	1 °C	
1361	Heating limit room controller	S	16 %	
1370	Boost heating	S	5 °C	
1380	Quick setback	S	Down to reduced setpoint	
1390	Optimum start control max	S	00:00	
1391	Optimum stop control max	S	00:00	
1400	Reduced setp increase start	S	-5 °C	
1401	Reduced setp increase end	S	-15 °C	
1409	Continuous pump operation	S	No	
1420	Overtemp prot pump circuit	S	On	
1430	Mixing valve boost	S	5 °C	
1432	Actuator type	S	3-position	
1433	TOR Switching differential	S	2 °C	
1434	Actuator running time	S	120 s	
1435	Mixing valve Xp	S	32 °C	
1436	Mixing valve Tn	S	120 s	
1450	Floor curing function	C	Off	
1451	Floor curing setp manually	C	25 °C	
1455	Floor curing setp current	E	0 °C	
1456	Floor curing day current	E	0	
1461	Excess heat draw	S	Always	
1470	With buffer	S	Yes	
1472	With prim contr/system pump	S	Yes	
1480	Pump speed reduction	S	Characteristic	
1482	Pump speed min	S	50 %	
1483	Pump speed max	S	100 %	
1488	Curve readj at 50% speed	S	33 %	
1489	Filter time const speed ctrl	S	5 min	
1490	Flow setp readj speed ctrl	S	Yes	
1498	Operating level changeover	S	Reduced	
1500	Optg mode changeover	S	Protection	
Domestic hot water				
1610	Nominal setpoint	E	50 °C	
1612	Reduced setpoint	S	40 °C	
1614	Nominal setpoint max	S	65 °C	
1620	Release	C	Time programs HCs	
1630	Charging priority	C	MC shifting, PC absolute	
1640	Legionella function	S	Off	
1641	Legionella funct periodically	S	3	
1642	Legionella funct weekday	S	Monday	
1644	Legionella funct time	S	05:00	
1645	Legionella funct setpoint	S	65 °C	
1646	Legionella funct duration	S	30 min	
1647	Legionella funct circ pump	S	On	
1660	Circulating pump release	S	DHW release	
1661	Circulating pump cycling	S	On	
1663	Circulation setpoint	S	45 °C	

Line No.	Programming	Access	Default value	Customer setting
1680	Optg mode changeover	S	Off	
Consumer circuit 1				
1859	Flow temp setp cons request	C	60 °C	
1875	Excess heat draw	S	On	
1878	With buffer	S	No	
1880	With prim contr/system pump	S	No	
Consumer circuit 2				
1909	Flow temp setp cons request	C	60 °C	
1925	Excess heat draw	S	On	
1928	With buffer	S	No	
1930	With prim contr/system pump	S	No	
Consumer circuit 3				
1959	Flow temp setp cons request	C	70 °C	
1975	Excess heat draw	S	On	
1978	With buffer	S	No	
1980	With prim contr/system pump	S	No	
Swimming pool				
2055	Setpoint solar heating	S	26 °C	
2056	Setpoint source heating	S	22 °C	
2065	Charging priority solar	S	Priority 3	
2080	With solar integration	S	Yes	
Boiler				
2203	Release below outside temp	S	0 °C	
2208	Full charging buffer	S	Off	
2210	Setpoint min	S	8 °C	
2212	Setpoint max	S	80 °C	
2214	Setpoint manual control	E	60 °C	
2217	Setpoint frost protection	S	7 °C	
2243	Burner off time min	S	5 min	
2245	SD burner off time	S	10 °C	
2250	Pump overrun time	S	5 min	
2253	Pump overr time after DHW	S	1 min	
2270	Return setpoint min	S	8 °C	
2330	Output nominal	S	S2-40 : 40 S2-60 : 60 S2-70 : 70 S2-80 : 80 S2-100 : 100 S2-120 : 120 S2-150 : 134	
2331	Output basic stage	S	S2-40 : 8 S2-60 : 12 S2-70 : 17 S2-80 : 17 S2-100 : 20 S2-120 : 24 S2-150 : 28	
2441	Fan speed heating max	S	S2-40 : 6100 S2-60 : 7250 S2-70 : 5480 S2-80 : 6380 S2-100 : 6450 S2-120 : 6950 S2-150 : 6350	

Line No.	Programming	Access	Default value	Customer setting
2442	Fan speed full charging max	S	S2-40 : 6100 S2-60 : 7250 S2-70 : 5480 S2-80 : 6380 S2-100 : 6450 S2-120 : 6950 S2-150 : 6350	
2444	Fan speed DHW max	S	S2-40 : 6100 S2-60 : 7250 S2-70 : 5480 S2-80 : 6380 S2-100 : 6450 S2-120 : 6950 S2-150 : 6350	
2454	Switching diff on HCs	S	3 °C	
2455	Switching diff off min HCs	S	3 °C	
2456	Switching diff off max HCs	S	6 °C	
2457	Settling time HCs	S	20 min	
2460	Switching diff on DHW	S	3 °C	
2461	Switching diff off min DHW	S	3 °C	
2462	Switching diff off max DHW	S	6 °C	
2463	Settling time DHW	S	20 min	
2470	Delay heat req special op	C	0 s	
Cascade				
3510	Lead strategy	S	Late on, late off	
3511	Output band min	S	30 %	
3512	Output band max	S	90 %	
3530	Release integral source seq	S	300 °Cmin	
3531	Reset integral source seq	S	100 °Cmin	
3532	Restart lock	S	300 s	
3533	Switch on delay	S	5 min	
3534	Forced time basic stage	S	60 s	
3540	Auto source seq ch'over	S	500 h	
3541	Auto source seq exclusion	S	none	
3544	Leading source	S	source 1	
3560	Return setpoint min	S	8 °C	
3562	Return influence consumers	S	On	
DHW storage tank				
5020	Flow setpoint boost	S	16 °C	
5021	Transfer boost	S	8 °C	
5022	Type of charging	S	Full charging	
5030	Charging time limitation	S	150 min	
5050	Charging temp max	S	80 °C	
5055	Recooling temp	S	80 °C	
5056	Recooling heat gen/HCs	S	Off	
5057	Recooling collector	S	Off	
5060	El imm heater optg mode	S	Substitute	
5061	El immersion heater release	S	DHW release	
5062	El immersion heater control	S	DHW sensor	
5085	Excess heat draw	S	On	
5090	With buffer	S	No	
5092	With prim contr/system pump	S	No	
5093	With solar integration	S	Yes	

Line No.	Programming	Access	Default value	Customer setting
5101	Pump speed min	S	40 %	
5102	Pump speed max	S	100 %	
General functions				
5570	Temp diff on dT contr 1	S	20 °C	
5571	Temp diff off dT contr 1	S	10 °C	
5572	On temp min dT contr 1	S	0 °C	
5573	Sensor 1 controller 1	S	None	
5574	Sensor 2 controller 1	S	None	
5575	On time min dT contr 1	S	0 s	
5577	Pump/valve kick K21	S	On	
5580	Temp diff on dT contr 2	S	20 °C	
5581	Temp diff off dT contr 2	S	10 °C	
5582	On temp min dT contr 2	S	0 °C	
5583	Sensor 1 controller 2	S	None	
5584	Sensor 2 controller 2	S	None	
5585	On time min dT contr 2	S	0 s	
5587	Pump/valve kick K22	S	On	
Configuration				
5710	Heating circuit 1	C	Off	
5711	Cooling circuit 1	C	Off	
5715	Heating circuit 2	C	Off	
5721	Heating circuit 3	C	Off	
5730	DHW sensor	C	DHW sensor B3	
5731	DHW controlling element	C	Charging pump	
5732	Pump off change div valve	C	0 s	
5733	Delay pump off	C	0 s	
5734	Basic position DHW div valve	S	Last request	
5736	DHW separate circuit	C	Off	
5737	Optg action DHW div valve	S	Position on DHW	
5738	Midposition DHW div valve	S	Off	
5774	Ctrl boiler pump/DHW valve	C	All requests	
5840	Solar controlling element	C	Charging pump	
5841	External solar exchanger	C	Jointly	
5870	Combi storage tank	C	No	
5890	Relay output QX1	C	Alarm output K10	
5891	Relay output QX2	C	DHW ctrl elem Q3	
5892	Relay output QX3	C	Boiler pump Q1	
5931	Sensor input BX2	C	None	
5932	Sensor input BX3	C	None	
5950	Function input H1	C	None	
5951	Contact type H1	C	NO	
5953	Voltage value 1 H1 (U1)	C	0 V	
5954	Function value 1 H1 (F1)	C	0	
5955	Voltage value 2 H1 (U2)	C	10 V	
5956	Function value 2 H1 (F2)	C	1000	
5977	Function input H5	C	None	
5978	Contact type H5	C	NO	
6020	Function extension module 1	C	None	
6021	Function extension module 2	C	None	

Line No.	Programming	Access	Default value	Customer setting
6022	Function extension module 3	C	None	
6024	Funct input EX21 module 1	C	None	
6026	Funct input EX21 module 2	C	None	
6028	Funct input EX21 module 3	C	None	
6030	Relay output QX21 module 1	C	None	
6031	Relay output QX22 module 1	C	None	
6032	Relay output QX23 module 1	C	None	
6033	Relay output QX21 module 2	C	None	
6034	Relay output QX22 module 2	C	None	
6035	Relay output QX23 module 2	C	None	
6036	Relay output QX21 module 3	C	None	
6037	Relay output QX22 module 3	C	None	
6038	Relay output QX23 module 3	C	None	
6040	Sensor input BX21 module 1	C	None	
6041	Sensor input BX22 module 1	C	None	
6042	Sensor input BX21 module 2	C	None	
6043	Sensor input BX22 module 2	C	None	
6044	Sensor input BX21 module 3	C	None	
6045	Sensor input BX22 module 3	C	None	
6046	Function input H2 module 1	C	None	
6047	Contact type H2 module 1	C	NO	
6049	Voltage value 1 H2 module 1(U1)	C	0 V	
6050	Function value 1 H2 module 1 (F1)	C	0	
6051	Voltage value 2 H2 module 1 (U2)	C	0 V	
6052	Function value 2 H2 module 1 (F2)	C	0	
6054	Function input H2 module 2	C	None	
6055	Contact type H2 module 2	C	NO	
6057	Voltage value 1 H2 module 2(U1)	C	0 V	
6058	Function value 1 H2 module 2 (F1)	C	0	
6059	Voltage value 2 H2 module 2 (U2)	C	0 V	
6060	Function value 2 H2 module 2 (F2)	C	0	
6062	Function input H2 module 3	C	None	
6063	Contact type H2 module 3	C	NO	
6065	Voltage value 1 H2 module 3(U1)	C	0 V	
6066	Function value 1 H2 module 3 (F1)	C	0	
6067	Voltage value 2 H2 module 3 (U2)	C	0 V	
6068	Function value 2 H2 module 3 (F2)	C	0	
6097	Sensor type collector	S	NTC	
6098	Readjustm collector sensor	S	0 °C	
6100	Readjustm outside sensor	S	0 °C	
6110	Time constant building	S	15 h	
6116	Const tmpr compens consig.	S	1 min	
6117	Compens centr T° consigne	S	5 °C	
6120	Frost protection plant	S	Off	
6127	Pump/valve kick duration	S	30 s	
6200	Save sensors	C	No	
6205	Reset to default parameter	S	No	

Line No.	Programming	Access	Default value	Customer setting
6230	Info 1 OEM	S	S2-40 : 1 S2-60 : 2 S2-70 : 7 S2-80 : 3 S2-100 : 4 S2-120 : 5 S2-150 : 6	
6231	Info 2 OEM	S		
LPB system				
6600	Device address	C	1	
6601	Segment address	S	0	
6604	Bus power supply function	S	Automatically	
6605	Bus power supply state	S	Automatically	
6610	Display system messages	S	Yes	
6611	Syst messages alarm relay	S	No	
6620	Action changeover functions	S	System	
6621	Summer changeover	S	Locally	
6623	Optg mode changeover	S	Centrally	
6624	Manual source lock	S	Locally	
6625	DHW assignment	S	All HCs in system	
6631	Ext source in Eco mode	S	Off	
6640	Clock mode	C	Autonomously	
6650	Outside temp source	S	0	
Fault				
6705	SW diagnostic code	E	0	
6706	Burn ctrl phase lockout pos	E	0	
6710	Reset alarm relay	C	No	
6740	Flow temp 1 alarm	S	120 min	
6741	Flow temp 2 alarm	S	120 min	
6742	Flow temp 3 alarm	S	120 min	
6743	Boiler temp alarm	S	120 min	
6745	DHW charging alarm	S	8 h	
6800	History 1	S	00:00	
6803	Error code 1	S	0	
6805	SW diagnostic code 1	S	0	
6806	Burner control phase 1	S	0	
6810	History 2	S	00:00	
6813	Error code 2	S	0	
6815	SW diagnostic code 2	S	0	
6816	Burner control phase 2	S	0	
6820	History 3	S	00:00	
6823	Error code 3	S	0	
6825	SW diagnostic code 3	S	0	
6826	Burner control phase 3	S	0	
6830	History 4	S	00:00	
6833	Error code 4	S	0	
6835	SW diagnostic code 4	S	0	
6836	Burner control phase 4	S	0	
6840	History 5	S	00:00	
6843	Error code 5	S	0	
6845	SW diagnostic code 5	S	0	

Line No.	Programming	Access	Default value	Customer setting
6846	Burner control phase 5	S	0	
6850	History 6	S	00:00	
6853	Error code 6	S	0	
6855	SW diagnostic code 6	S	0	
6856	Burner control phase 6	S	0	
6860	History 7	S	00:00	
6863	Error code 7	S	0	
6865	SW diagnostic code 7	S	0	
6866	Burner control phase 7	S	0	
6870	History 8	S	00:00	
6873	Error code 8	S	0	
6875	SW diagnostic code 8	S	0	
6876	Burner control phase 8	S	0	
6880	History 9	S	00:00	
6883	Error code 9	S	0	
6885	SW diagnostic code 9	S	0	
6886	Burner control phase 9	S	0	
6890	History 10	S	00:00	
6893	Error code 10	S	0	
6895	SW diagnostic code 10	S	0	
6896	Burner control phase 10	S	0	
6900	History 11	S	00:00	
6903	Error code 11	S	0	
6905	SW diagnostic code 11	S	0	
6906	Burner control phase 11	S	0	
6910	History 12	S	00:00	
6913	Error code 12	S	0	
6915	SW diagnostic code 12	S	0	
6916	Burner control phase 12	S	0	
6920	History 13	S	00:00	
6923	Error code 13	S	0	
6925	SW diagnostic code 13	S	0	
6926	Burner control phase 13	S	0	
6930	History 14	S	00:00	
6933	Error code 14	S	0	
6935	SW diagnostic code 14	S	0	
6936	Burner control phase 14	S	0	
6940	History 15	S	00:00	
6943	Error code 15	S	0	
6945	SW diagnostic code 15	S	0	
6946	Burner control phase 15	S	0	
6950	History 16	S	00:00	
6953	Error code 16	S	0	
6955	SW diagnostic code 16	S	0	
6956	Burner control phase 16	S	0	
6960	History 17	S	00:00	
6963	Error code 17	S	0	
6965	SW diagnostic code 17	S	0	
6966	Burner control phase 17	S	0	

Line No.	Programming	Access	Default value	Customer setting
6970	History 18	S	00:00	
6973	Error code 18	S	0	
6975	SW diagnostic code 18	S	0	
6976	Burner control phase 18	S	0	
6980	History 19	S	00:00	
6983	Error code 19	S	0	
6985	SW diagnostic code 19	S	0	
6986	Burner control phase 19	S	0	
6990	History 20	S	00:00	
6993	Error code 20	S	0	
6995	SW diagnostic code 20	S	0	
6996	Burner control phase 20	S	0	
Service/special operation				
7040	Burner hours interval	S	1500 h	
7041	Burn hrs since maintenance	S	0 h	
7042	Burner start interval	S	9000	
7043	Burn starts since maint	S	0	
7044	Maintenance interval	S	24 months	
7045	Time since maintenance	S	0 months	
7050	Fan speed ionization current	S	0	
7051	Message ionization current	S	No	
7130	Chimney sweep function	E	Off	
7131	Burner output	E	Max heating load	
7140	Manual control	E	Off	
7143	Controller stop function	S	Off	
7145	Controller stop setpoint	S	0 %	
7146	Deaeration function	C	On	
7147	Type of venting	C	None	
7170	Telephone customer service	C	0	
Input/output test				
7700	Relay test	C	No test	
7730	Outside temp B9	C	0 °C	
7750	DHW temp B3/B38	C	0 °C	
7760	Boiler temp B2	C	0 °C	
7820	Sensor temp BX1	C	0 °C	
7821	Sensor temp BX2	C	0 °C	
7822	Sensor temp BX3	C	0 °C	
7823	Sensor temp BX4	C	0 °C	
7830	Sensor temp BX21 module 1	C	0 °C	
7831	Sensor temp BX22 module 1	C	0 °C	
7832	Sensor temp BX21 module 2	C	0 °C	
7833	Sensor temp BX22 module 2	C	0 °C	
7834	Sensor temp BX21 module 3	C	0 °C	
7835	Sensor temp BX22 module 3	C	0 °C	
7840	Voltage signal H1	C	0 V	
7841	Contact state H1	C	Open	
7845	Voltage signal H2 module 1	C	0 V	
7846	Contact state H2 module 1	C	Open	
7848	Voltage signal H2 module 2	C	0 V	

Line No.	Programming	Access	Default value	Customer setting
7849	Contact state H2 module 2	C	Open	
7851	Voltage signal H2 module 3	C	0 V	
7852	Contact state H2 module 3	C	Open	
7854	Voltage signal H3	C	0 V	
7855	Contact state H3	C	Open	
7860	Contact state H4	C	Open	
7862	Frequency H4	C	0	
7865	Contact state H5	C	Open	
7872	Contact state H6	C	Open	
7874	Contact state H7	C	Open	
7950	Input EX21 module 1	C	0 V	
7951	Input EX21 module 2	C	0 V	
7952	Input EX21 module 3	C	0 V	
State				
8000	State heating circuit 1	C	0	
8001	State heating circuit 2	C	0	
8002	State heating circuit 3	C	0	
8003	State DHW	C	0	
8005	State boiler	C	0	
8007	State solar	C	0	
8008	State solid fuel boiler	C	0	
8009	State burner	C	0	
8010	State buffer	C	0	
8011	State swimming pool	C	0	
Diagnostics cascade				
8100	Priority source 1	C	0	
8101	State source 1	C	Missing	
8102	Priority source 2	C	0	
8103	State source 2	C	Missing	
8104	Priority source 3	C	0	
8105	State source 3	C	Missing	
8106	Priority source 4	C	0	
8107	State source 4	C	Missing	
8108	Priority source 5	C	0	
8109	State source 5	C	Missing	
8110	Priority source 6	C	0	
8111	State source 6	C	Missing	
8112	Priority source 7	C	0	
8113	State source 7	C	Missing	
8114	Priority source 8	C	0	
8115	State source 8	C	Missing	
8116	Priority source 9	C	0	
8117	State source 9	C	Missing	
8118	Priority source 10	C	0	
8119	State source 10	C	Missing	
8120	Priority source 11	C	0	
8121	State source 11	C	Missing	
8122	Priority source 12	C	0	
8123	State source 12	C	Missing	

Line No.	Programming	Access	Default value	Customer setting
8124	Priority source 13	C	0	
8125	State source 13	C	Missing	
8126	Priority source 14	C	0	
8127	State source 14	C	Missing	
8128	Priority source 15	C	0	
8129	State source 15	C	Missing	
8130	Priority source 16	C	0	
8131	State source 16	C	Missing	
8138	Cascade flow temp	C	0 °C	
8139	Cascade flow temp setp	C	0 °C	
8140	Cascade return temp	C	0 °C	
8141	Cascade return temp setp	C	0 °C	
8150	Source seq ch'over current	C	0 h	
Diagnostics heat generation				
8304	Boiler pump Q1	S	Off	
8308	Boiler pump speed	S	0 %	
8309	Bypass pump speed	S	0 %	
8310	Boiler temp	E	0 °C	
8311	Boiler setpoint	E	0 °C	
8312	Boiler switching point	C	0 °C	
8313	Control sensor	C	0 °C	
8314	Boiler return temp	E	0 °C	
8315	Boiler return temp set	C	0 °C	
8316	Flue gas temp	E	0 °C	
8318	Flue gas temp max	E	0 °C	
8321	Primary exchanger temp	C	0 °C	
8323	Fan speed	E	0 tr/min	
8324	Set point fan	E	0 tr/min	
8325	Current fan control	C	0 %	
8326	Burner modulation	E	0 %	
8327	Water pressure	E	0	
8329	Ionization current	E	0 µA	
8330	Hours run 1st stage	E	00:00:00 h	
8331	Start counter 1st stage	E	0	
8338	Hours run heating mode	E	00:00:00 h	
8339	Hours run DHW	E	00:00:00 h	
8366	Boiler throughput	E	l / min	
8390	Current phase number	S	TNB	
8499	Collector pump 1	S	0	
8501	Solar ctrl elem buffer	S	0	
8502	Solar ctrl elem swi pool	S	0	
8505	Speed collector pump 1	S	0 %	
8506	Speed solar pump ext exch	S	0 %	
8507	Speed solar pump buffer	S	0 %	
8508	Speed solar pump swi pool	S	0 %	
8510	Collector temp 1	C	0 °C	
8511	Collector temp 1 max	C	-28 °C	
8512	Collector temp 1 min	C	350 °C	
8513	dt collector 1/DHW	C	0 °C	

Line No.	Programming	Access	Default value	Customer setting
8514	dt collector 1/buffer	C	0 °C	
8515	dt collector 1/swimming pool	C	0 °C	
8519	Solar flow temp	C	0 °C	
8520	Solar return temp	C	0 °C	
8526	24-hour yield solar energy	E	0 kW/h	
8527	Total yield solar energy	E	0 kW/h	
8530	Hours run solar yield	E	00:00:00 h	
8531	Hours run collect overtemp	E	00:00:00 h	
8532	Hours run collector pump	E	00:00:00 h	
8560	Solid fuel boiler temp	C	0 °C	
8570	Hours run solid fuel boiler	E	00:00:00 h	
Diagnostics consumers				
8700	Outside temp	E	0 °C	
8701	Outside temp min	E	50 °C	
8702	Outside temp max	E	-50 °C	
8703	Outside temp attenuated	C	0 °C	
8704	Outside temp composite	E	0 °C	
8730	Heating circuit pump 1	E	Off	
8731	Heat circ mix valv 1 open	E	Off	
8732	Heat circ mix valv 1 close	E	Off	
8735	Speed heating circuit pump 1	S	0 %	
8740	Room temp 1	C	20 °C	
8741	Room setpoint 1	C	20 °C	
8743	Flow temp 1	E	60 °C	
8744	Flow temp setpoint 1	E	60 °C	
8749	Room thermostat 1	C	No demand	
8760	Heating circuit pump 2	E	Off	
8761	Heat circ mix valv 2 open	E	Off	
8762	Heat circ mix valv 2 close	E	Off	
8765	Speed heating circuit pump 2	S	0 %	
8770	Room temp 2	C	20 °C	
8771	Room setpoint 2	C	20 °C	
8773	Flow temp 2	E	60 °C	
8774	Flow temp setpoint 2	E	60 °C	
8779	Room thermostat 2	C	No demand	
8790	Heating circuit pump 3	E	Off	
8791	HC mixing valve 3 open	E	Off	
8792	HC mixing valve 3 closed	E	Off	
8795	Speed heating circuit pump 3	S	0 %	
8800	Room temp 3	C	20 °C	
8801	Room setpoint 3	C	20 °C	
8803	Flow temp 3	E	60 °C	
8804	Flow temp setpoint 3	E	60 °C	
8809	Room thermostat 3	C	No demand	
8820	DHW pump	C	Off	
8825	Speed DHW pump	S	0 %	
8826	Speed DHW interm circ pump	S	0 %	
8827	Speed inst DHW heater pump	S	0 %	
8830	DHW temp 1	C	0 °C	

Line No.	Programming	Access	Default value	Customer setting
8831	DHW temp setpoint	C	55 °C	
8832	DHW temp 2	C	0 °C	
8835	DHW circulation temp	C	0 °C	
8836	DHW charging temp	C	0 °C	
8852	DHW consumption temp	C	0 °C	
8853	Instant WH setpoint	C	0 °C	
8860	DHW flow	C	0 l/min	
8875	Flow temp setp VK1	C	5 °C	
8885	Flow temp setp VK2	C	5 °C	
8895	Flow temp setp swimming pool	C	5 °C	
8900	Swimming pool temp	C	0 °C	
8901	Swimming pool setpoint	C	24 °C	
8930	Primary controller temp	C	0 °C	
8931	Primary controller set	C	0 °C	
8950	Common flow temp	C	0 °C	
8951	Common flow temp setp	C	0 °C	
8952	Common return temp	C	0 °C	
8962	Common output setpoint	C	0 %	
8980	Buffer temp 1	C	0 °C	
8981	Buffer setpoint	C	0 °C	
8982	Buffer temp 2	C	0 °C	
8983	Buffer temp 3	C	0 °C	
9005	Water pressure H1	C	0 bar	
9006	Water pressure H2	C	0 bar	
9009	Water pressure H3	C	0 bar	
9031	Relay output QX1	C	Off	
9032	Relay output QX2	C	Off	
9033	Relay output QX3	C	Off	
9034	Relay output QX4	C	Off	
9050	Relay output QX21 module 1	C	Off	
9051	Relay output QX22 module 1	C	Off	
9052	Relay output QX23 module 1	C	Off	
9053	Relay output QX21 module 2	C	Off	
9054	Relay output QX22 module 2	C	Off	
9055	Relay output QX23 module 2	C	Off	
9056	Relay output QX21 module 3	C	Off	
9057	Relay output QX22 module 3	C	Off	
9058	Relay output QX23 module 3	C	Off	
Burner control				
9504	Required speed prepurging	S	S2-40 : 3380 S2-60 : 3130 S2-70 : 2450 S2-80 : 2450 S2-100 : 2750 S2-120 : 2590 S2-150 : 3410	
9512	Required speed ignition	S	S2-40 : 3380 S2-60 : 3130 S2-70 : 2300 S2-80 : 2450 S2-100 : 2350 S2-120 : 2480 S2-150 : 3410	

Line No.	Programming	Access	Default value	Customer setting
9524	Required speed LF	S	S2-40 : 1780 S2-60 : 1920 S2-70 : 1760 S2-80 : 1760 S2-100 : 1750 S2-120 : 1820 S2-150 : 1610	
9529	Required speed HF	S	S2-40 : 6100 S2-60 : 7250 S2-70 : 5480 S2-80 : 6380 S2-100 : 6450 S2-120 : 6950 S2-150 : 6350	
9650	Chimney drying	S	Off	
9651	Req speed chimney drying	S	500 tr/min	
9652	Duration chimney drying	S	10 min	

12. APPENDIX A

Data on products ≤ 70 kW

Product reference				
Trade mark		HAMWORTHY		
Models		S2 - 40	S2 - 60	S2 - 70
Code		082450	082451	082452
Nominal power	Prated kW	40	56	70
Seasonal energy efficiency class	Class	A	A	A
Seasonal energy efficiency	η_s (PCS) %	93	93	92
Useful heat production				
At nominal power and in 80°C / 60°C regime	P_4 kW	40,0	56,4	69,9
	η_4 (PCS) %	87,5	87,6	87,3
At 30% nominal power and in 30°C return temperature regime	P_1 kW	13,4	18,9	23,4
	η_1 (PCS) %	97,6	98,0	97,3
Auxiliary electricity consumption				
Under full load	elmax kW	0,068	0,138	0,096
Under partial load	elmin kW	0,017	0,028	0,025
In standby mode	P_{SB} kW	0,003	0,003	0,003
Other properties				
Heat loss	Pstby kW	0,042	0,051	0,087
Nitrogen oxide emissions	NOx (PCS) mg/kWh	36	35	35
Annual energy consumption	QHE kWh	1	2	2
Acoustic power	L_{WA} dB	57	60	57

Data on products ≤ 400 kW

Product reference						
Trade mark		HAMWORTHY				
Models		S2 - 80	S2 - 100	S2 - 120	S2 - 150	
Nominal power	Prated kW	80	96	120	134	
Useful heat production						
At nominal power and in 80°C / 60°C regime	P_4 kW	79,8	96,0	119,9	134	
	η_4 (PCS) %	87,3	87,8	87,8	87,5	
At 30% nominal power and in 30°C return temperature regime	P_1 kW	26,7	32,1	40,1	44,8	
	η_1 (PCS) %	97,3	97,8	97,7	97,6	
Auxiliary electricity consumption						
Under full load	elmax kW	0,141	0,160	0,206	0,263	
Under partial load	elmin kW	0,027	0,030	0,030	0,031	
In standby mode	P_{SB} kW	0,003	0,003	0,003	0,003	
Other properties						
Heat loss	Pstby kW	0,087	0,094	0,104	0,117	
Nitrogen oxide emissions	NOx (PCS) mg/kWh	35	34	36	35	

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