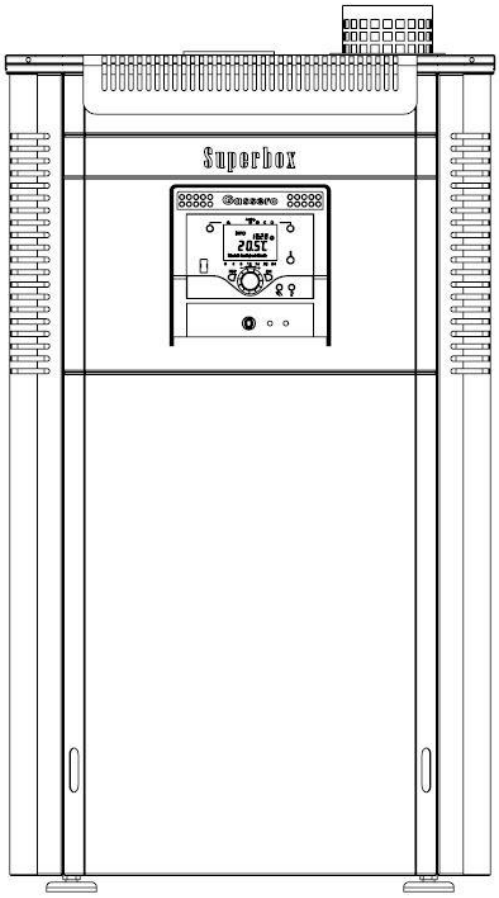

Installation and Operating Manual for the Superbox 160-1060kW

MHG Heating Ltd Unit 4 Epsom Downs Metro Centre, Waterfield, Tadworth, Surrey KT20 5LR
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1.0 Appliance Type

There are 3 outputs within the Superbox range.

Please ensure you have the correct unit for the application and where required located correctly within the cascade prior to beginning the installation.

2.0 Installation Regulations and Requirements

The installation of Superbox boilers must be in accordance with the relevant requirements of Gas Safety (Installation & Use) Regulations 1994, Health & Safety at Work Act, Building Regulations, IEE Regulations, Construction (Design & Management) Regulations 1994, Local Authority Bye-Laws, National, Fire Regulations and Insurance Company requirements.

The following Codes of Practice are also applicable:-

BS 5440-1: 2000 Installation of flues and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases).
Part 1: Specification for the installation of flues.

BS 5440-2: 2000 Installation of flues and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases).
Part 2: Specification for installation and maintenance of ventilation for gas appliances.

BS 5449: 1990 Specification for forced circulation hot water central heating systems for domestic premises.

BS 6644: 2011 Specification for gas fired hot water boilers of rated inputs between 70kW (net) and 1.8MW(net) (2nd and 3rd family gases).

BS 6798: 1987 Specification for installation of gas fired hot water boilers of rated input not exceeding 60 kW.

BS 6880: 1988 Code of Practice for low temperature hot water heating systems of output greater than 45kW.Parts 1, 2 & 3.

BS 6891: 1988 Specification for installation of low pressure gas pipework of up to 28mm (R1) in domestic premises (2nd family gases)

BS 7593: 1992 Code of Practice for treatment of water in domestic hot water central heating systems.

BS 7671: 1992 Requirements for electrical installations.IEE Wiring Regulations.Sixteenth edition.

CISBE Guide reference sections B7, B11 and B13.

CP342 Part 2: 1974 Code of Practice for centralized hot water supply.

GE/UP/2 Gas installation pipework, boosters and compressors on industrial and commercial premises.

IGE/UP/4 Commissioning of gas fired plant on industrial and commercial premises

IGE/UP/10 Installation of gas appliances in industrial and commercial premises. Part 1: Flued appliances.

And any addition prevailing regulation and or code of practice not detailed above.

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3.0 Appliance Warranties

All MHG appliances enjoy a full 24 month warranty as detailed in our terms and conditions.

The guarantee period shall begin on the day of commissioning, or at latest 3 months after delivery has been made.

The customer shall only be able to claim against MHG under guarantee if the commissioning of the object of delivery has been carried out by MHG staff or the authorised supplier, If the customer has followed MHG's instructions relating to the treatment and maintenance of the object of delivery, and if no replacement parts of outside origin have been fitted.

Parts subject to wear such as ignition electrodes, seals etc. are strictly excluded from the guarantee.

In addition to the above warranties, the Stainless Steel Primary Heat Exchangers carry a 60 month guarantee against manufacturing or material defect.

3.1 Supplied Components

All Superbox are supplied with a HWS probe sensor (can be used as cascade sensor) and QAC 34 outside Air Sensor. (To activate direct on boiler weather compensation)

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4.0 Technical Data

Model		160		500		1000	
		Min.	Max.	Min.	Max.	Max	Min
Type of Flue Installation		B23, C43, C53, C63, C83		B23, C43, C53, C83			
Gas Category		2H, 2E, 2LL, 3+, 3B/P		Hu, I2H, G20			
Fuel Type		G20,G31					
Gas Pressure (Min/Max) Natural Gas	mbar	17/25					
Nominal Heat Input	kW	21.5	152	27.3	498.8	27.3	997.05
Nominal Heat Output at (80-60°C)	kW	20.9	146	26.25	481.7	26.25	962.14
Nominal Heat Output at (50-30°C)	kW	23.4	158.8	29.11	527.3	29.11	1051.86
Water Operating Pressure	Bar	0.8	6	0.8	0.6	0.8	6
Maximum Operation Temperature	°C	90		90		90	
Water Content	L	14.9		55		110	
Condensing Water Mass	kg/h	22.4		69.79		139.56	
Efficiency & Emissions							
Heat Efficiency (80-60°C)	%	97.2		96.5		96.5	
Heat Efficiency (50-30°C)	%	104.5		106.6		106.6	
Partial Load Efficency, Return 30°C	%	109.1		107.0		106.9	
Flue gas Temperature (50-30°C)	°C	32.4	62.6	30.6	43.2	30.6	44.8
Flue gas Temperature (80-60°C)	°C	59.4	82.5	59.8	80.3	59.8	81.2
CO_2 Emissions (G20)	%	9.2	9.4	8.9	9.1	8.9	9.2
NO_X Emissions (G20)	mg/kWh	98.76		50.00		59.00	
NO_X Class		4		5		5	
Flue Gas Mass Flow Rate (G20)	g/sec	9.69	67.24	13	227	13	453
Gas Consumption (G20)	m^3/h	2.28	16.08	2.83	51.79	2.83	103.57
Boiler Connections							
Boiler flow Connection	“	1 ¼”		2 ½”		2 ½”	
Boiler Return connection	“	1 ¼”		2 ½”		2 ½”	
Gas Supply	“	1”		2 ½”		2 ½”	
Safety Relief Valve Discharge	“	½”		External by others		External by others	
Condensate Syphon Discharge	Ø	25		25		25	
Flue Gas Outlet	Ø	100		180		180	
Air Inlet	Ø	100		-		-	
Electrical Connections							
Power supply	V/Hz	230-50		230-50		230-50	
Power Consumption	W	400		900		1800	
IP Class	IP	X4D		X4D		X4D	
Boiler dimensions & weight							
Dimensions WxLxH	mm	557x780x865		714x1560x1350		706x1560x2248	
Dry Weight	kg	110		389		572	

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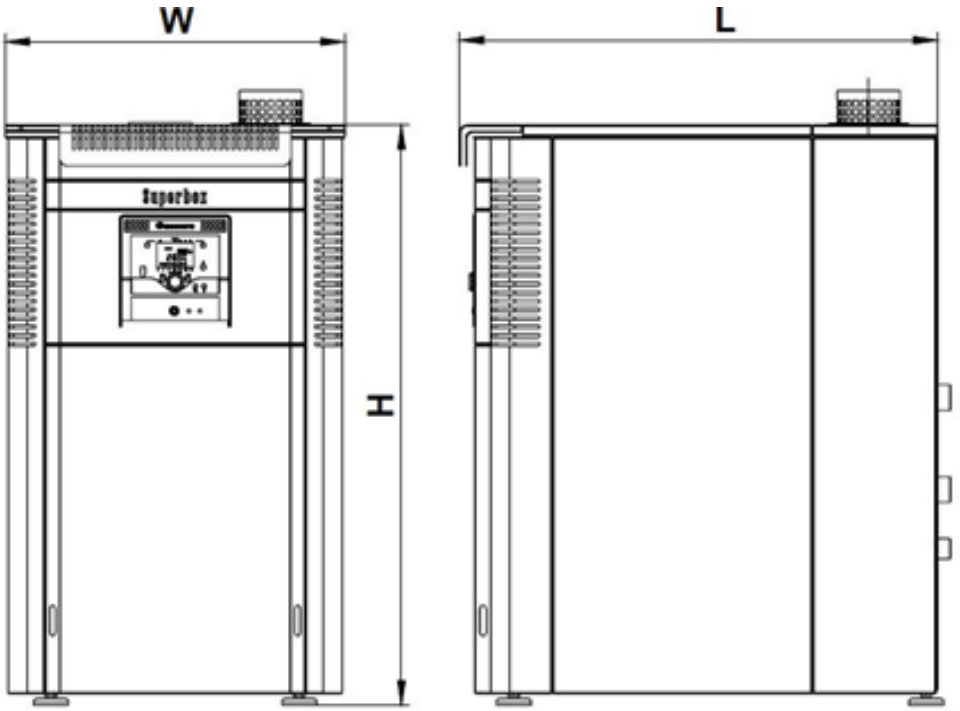
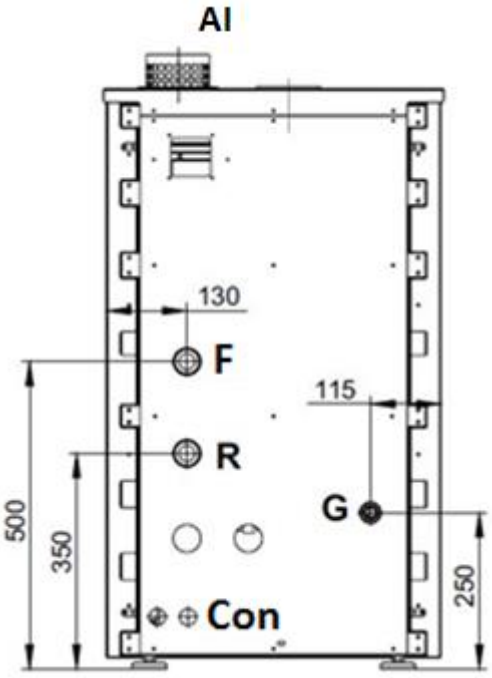
5.0 DimensionsSuperbox 160





Label	Connections
F	System Flow – 1 ¼”
R	System Return – 1 ¼”
G	Gas Supply – 1”
FO	Flue Outlet – Ø100mm
AI	Air Intake – Ø100mm
Con	Condensate Discharge – Ø25mm

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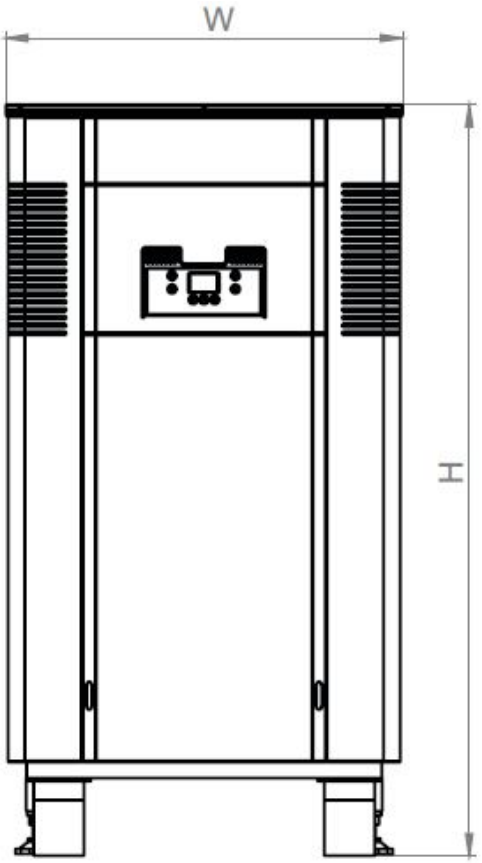
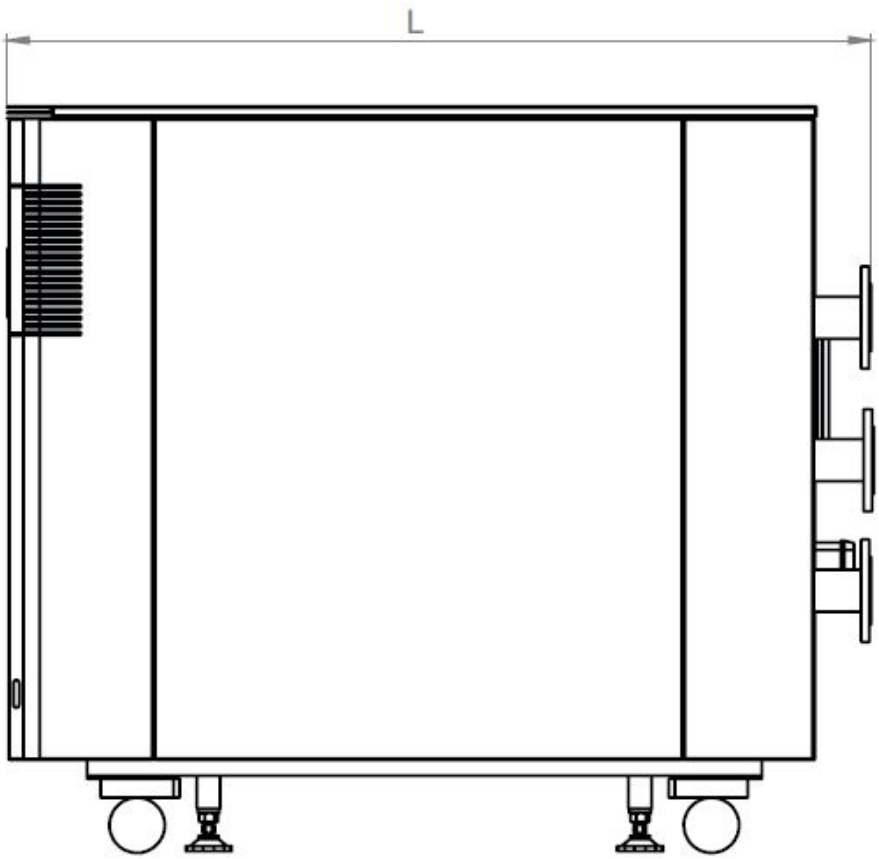
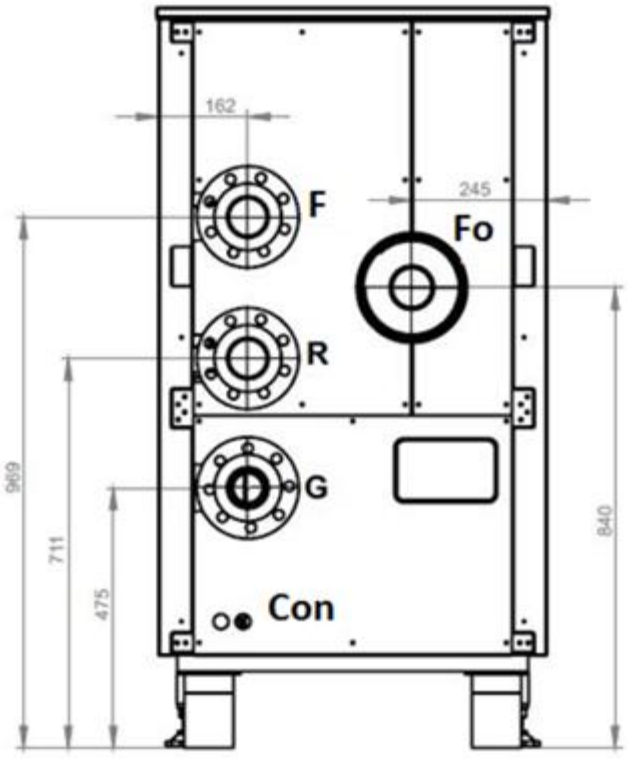
5.1 Dimensions Superbox 500







Label	Connections
F	System Flow – 2 1/2”
R	System Return – 2 1/2”
G	Gas Supply – 2 1/2”
FO	Flue Outlet – Ø180mm
Con	Condensate Discharge – Ø25mm

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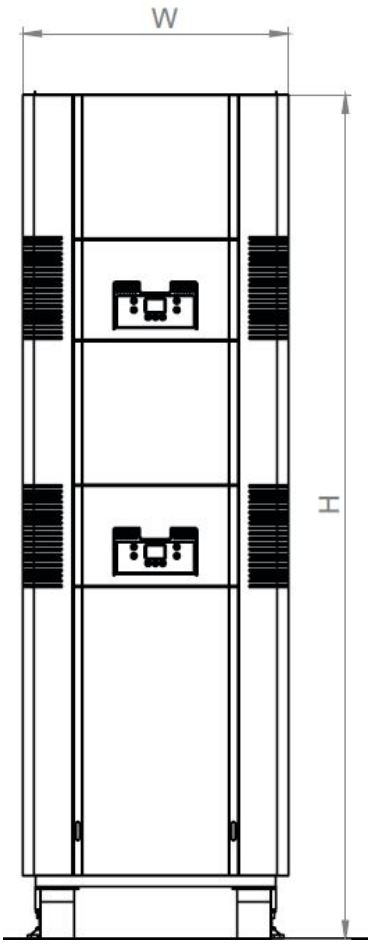
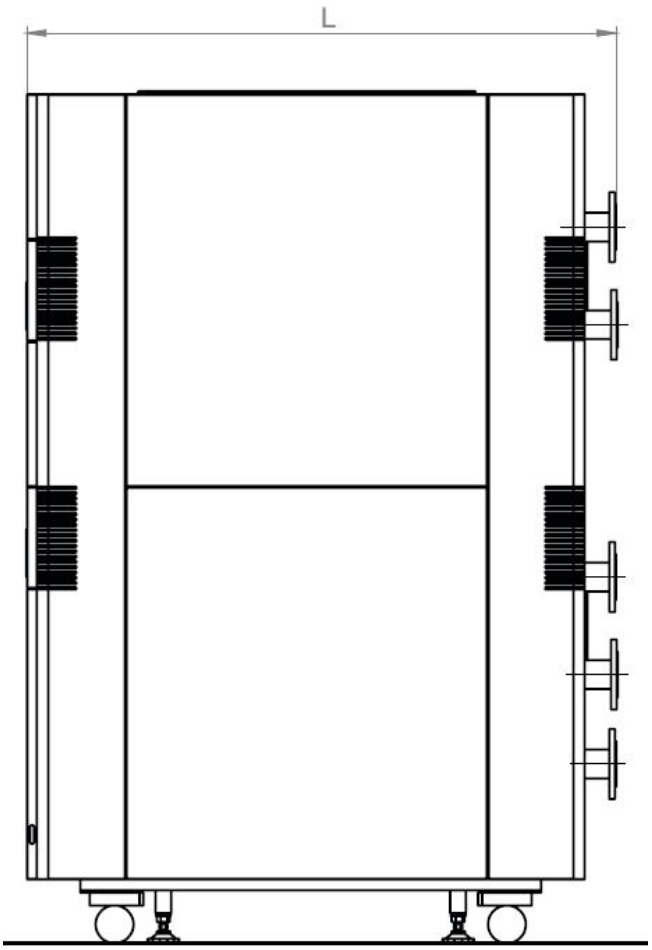
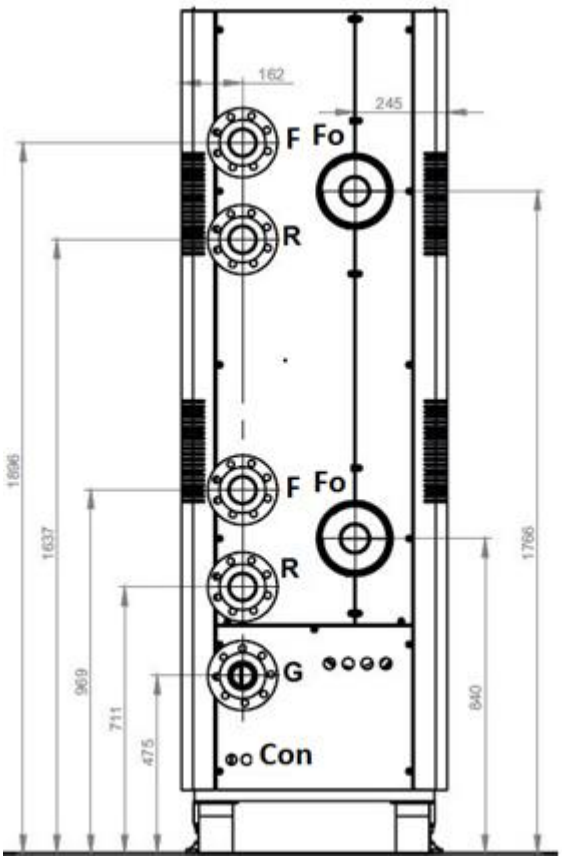
5.2 Dimensions Superbox 1000







Label	Connections
F	System Flow – 2 1/2”
R	System Return – 2 1/2”
G	Gas Supply – 2 1/2”
FO	Flue Outlet – Ø180mm
Con	Condensate Discharge – Ø25mm

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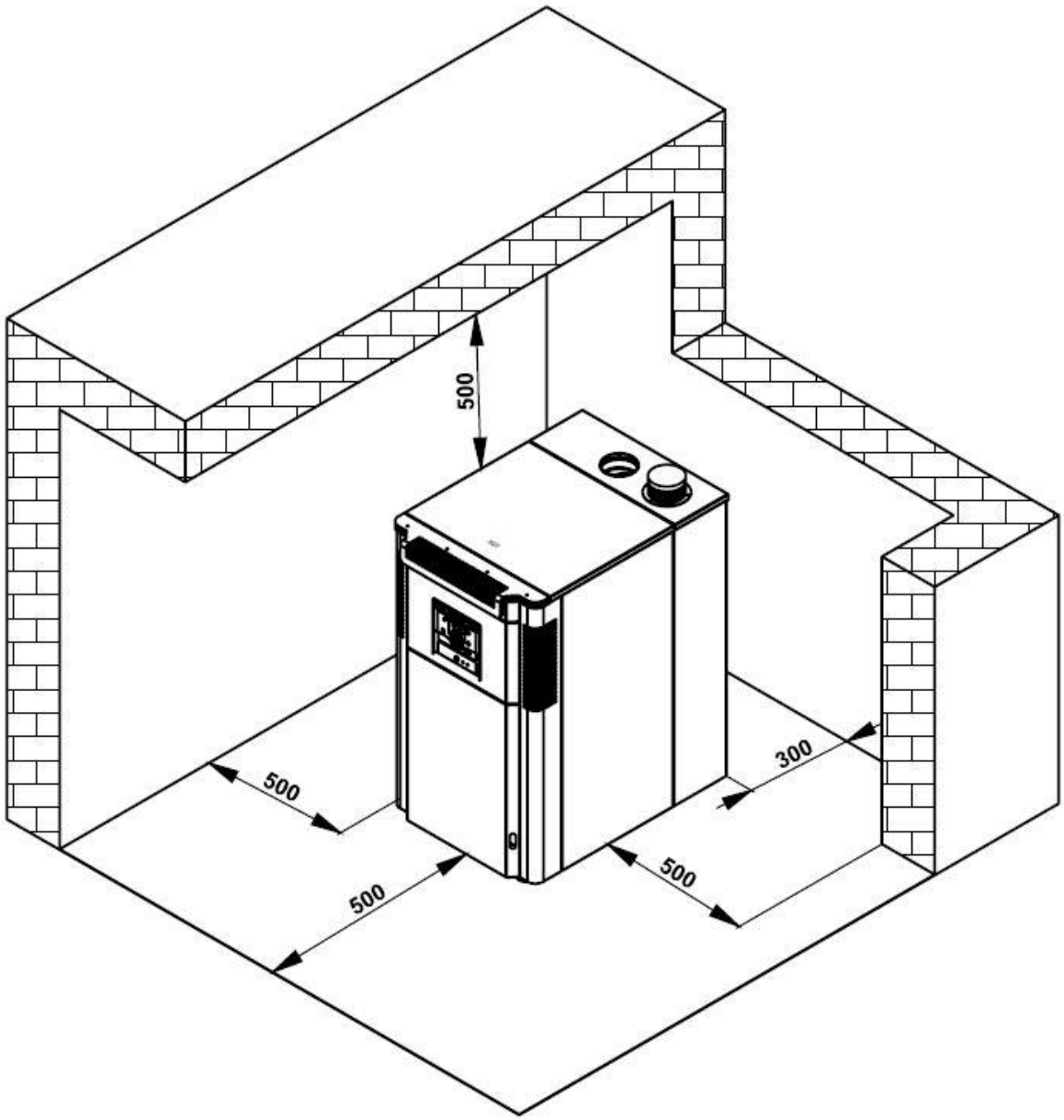
5.4 Installation and Service Clearances



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6.0 Electrical Connections

Basic electrical connection for the Ultrabox range.

The wiring connections of the Ultrabox boilers are located within a terminal box mounted to the rear of the boilers case.

All wiring via terminal blocks provided.

High voltage Wiring terminals	
Power in to Boiler	230 Volts - 50 Hertz
Q2 Heating circuit pump	Live, Neutral, Earth, (Max switching 0.5Amp) (Q2) Can be used as Multifunctional Output
Q3 Hot water charging pump	Live, Neutral, Earth, (Max switching 0.5Amp) (Q3) Can be used as a Multifunctional Output
*Additional wiring to be added at commissioning if required.	Additional outputs can be configured if required.

Low Voltage Wiring Terminals	
Room Thermostat	Volt Free Enable, Not Polarity Sensitive, Room stat/BMS (<24 Volts) (H5)
0-10V enable *	Polarity sensitive, Max 10Volts, To be configured at Commissioning, (H3)
Outside Air Temperature Sensor	QAC34 sensor provided for direct on boiler weather compensation. (B9)
Cascade Sensor	QAD36 strap on sensor, provided on request.
Hot Water Enable	Thermostat or Sensor, to be configured at commissioning, (B3)
Cascade Communication *	To be wired from Master boiler to all slave boilers in parallel, polarity sensitive.
*Additional wiring to be added at commissioning if required.	Additional outputs can be configured if required.

* Screened cable must be used for this connection.

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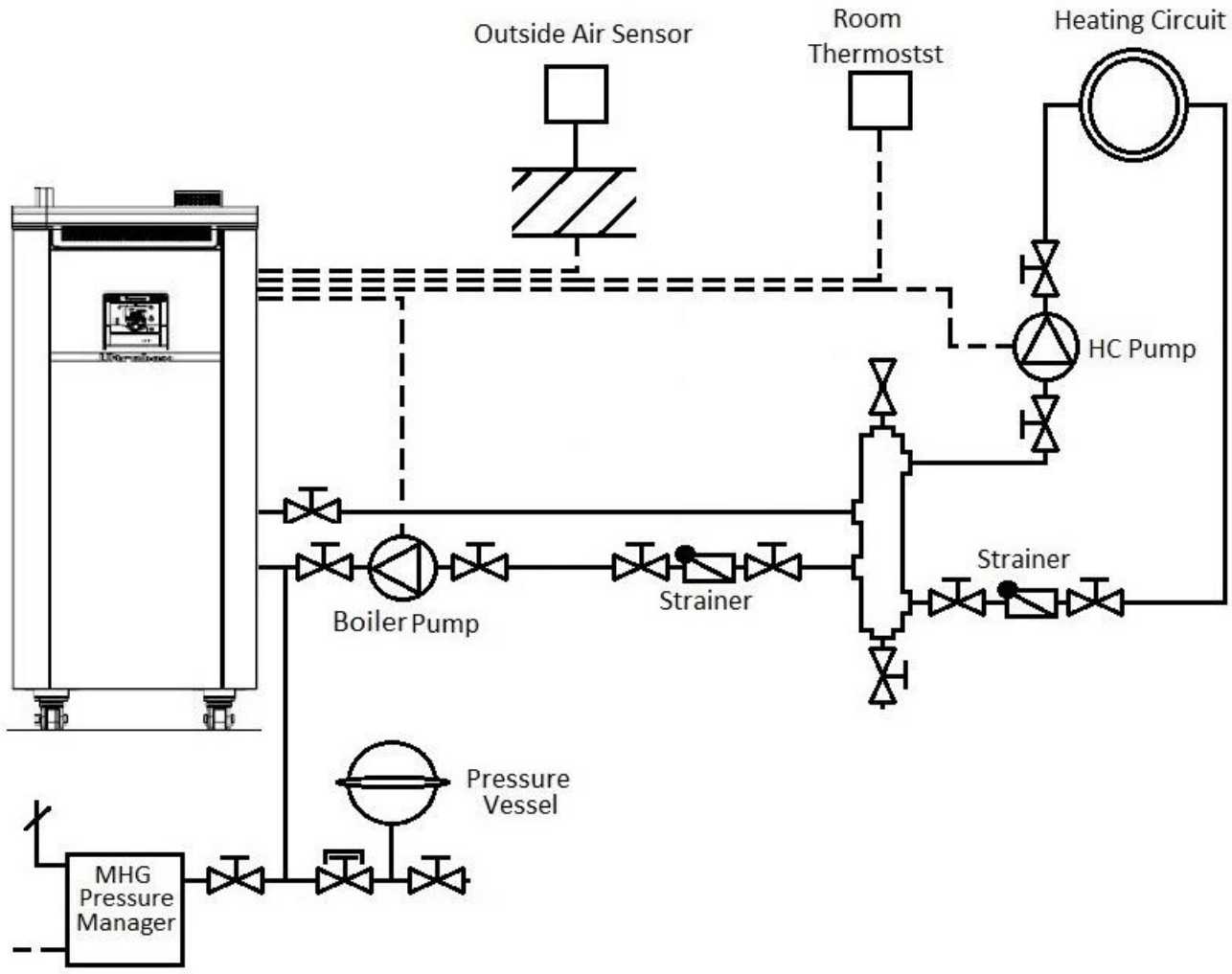
7.0 Hydraulic Design Single Unit (Option 1)



Electrical Connections Single Unit (Option 1)

High Voltage	Input/Output	Terminal Description/Label	Type
Mains power	Input	Brown=Live, Blue=Neutral, Yellow/Green=Earth	230Volts-50Hz
External Boiler Pump	Output	Q1 Boiler Circulation Pump Max 0.5Amp	230Volts-50Hz
Heating Circuit Pump	Output	Q2 Central Heating Pump Max 0.5Amp	230Volts-50Hz

Low Voltage	Input/Output	Terminal Description/Label	Type
Outside Air Sensor	Input	Outside temperature Sensor. QAC34 sensor provided	
**Room Thermostat	Input	Room thermostat, Volt free Enable	<24 Volts
**0-10Volt Enable	Input	0-10Volt Enable H3	0-10Volts
MHG Pressure Manager	Input	Multifunctional to be configured during commissioning	<24 Volts

**Only one enable to be used per installation. Volt Free or 0-10.

***Superbox 160 have internal pressure relief valves. All other models require external valves supplied by others.**

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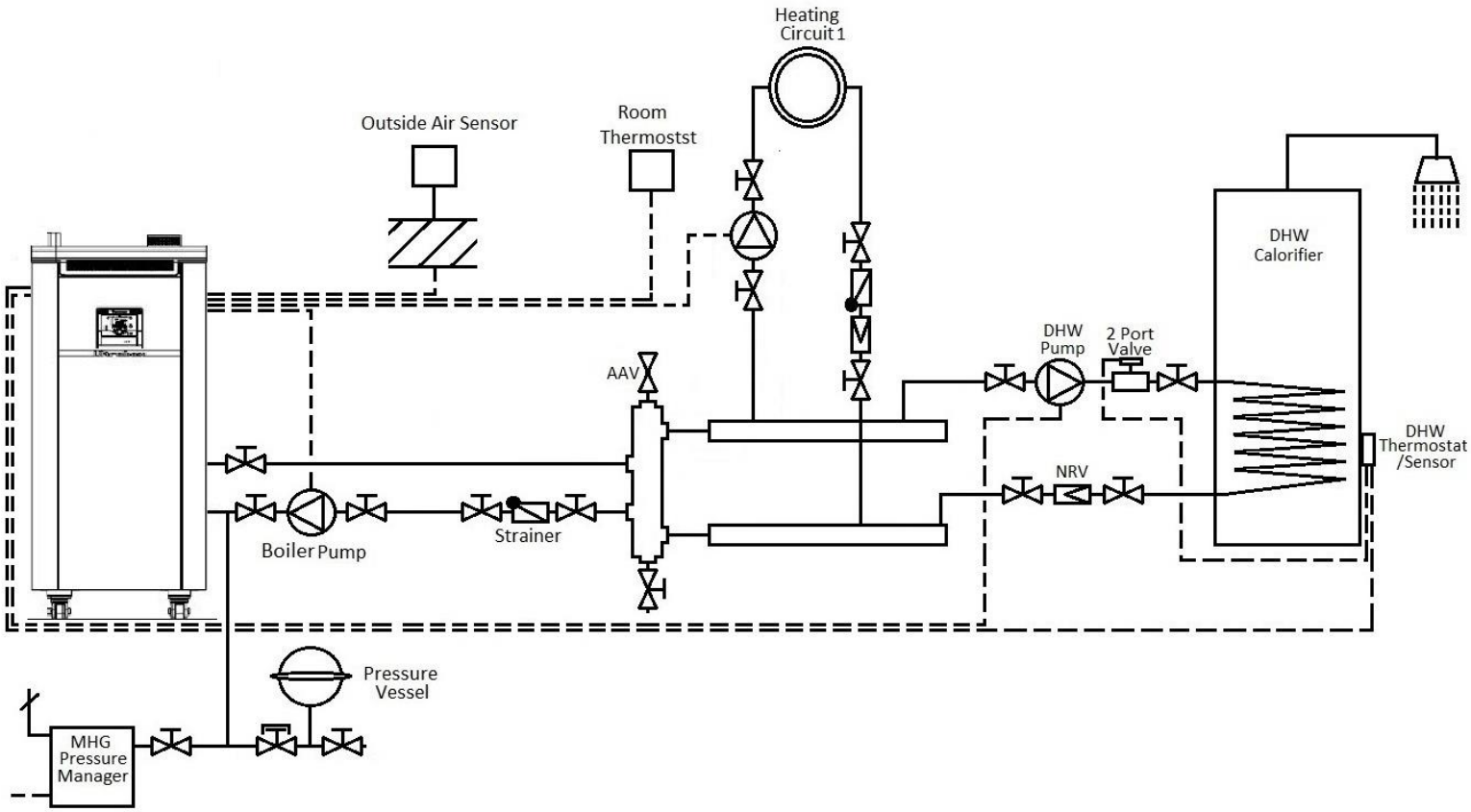
7.1 Hydraulic Design Single Unit (Option 2)



Electrical Connections Single Unit (Option 2)

High Voltage	Input/Output	Terminal Description/Label	Type
Mains power	Input	Brown=Live, Blue=Neutral, Yellow/Green=Earth	230Volts-50Hz
External Boiler Pump	Output	Q1 Boiler Circulation Pump Max 0.5Amp	230Volts-50Hz
Heating Circuit Pump	Output	Q2 Central Heating Pump Max 0.5Amp	230Volts-50Hz
DHW Pump	Output	Q3DHW Storage Pump Max 0.5Amp	230Volts-50Hz

Low Voltage	Input/Output	Terminal Description/Label	Type
Outside Air Sensor	Input	Outside temperature Sensor. QAC34 sensor provided	
**Room Thermostat	Input	Room thermostat, Volt free Enable	<24 Volts
**0-10Volt Enable	Input	0-10Volt Enable H3	0-10Volts
DHW Demand	Input	Volt free thermostat or sensor	<24Volts
MHG Pressure Manager	Input	Multifunctional to be configured during commissioning	<24 Volts

**Only one enable to be used per installation. Volt Free or 0-10.

***Superbox 160 have internal pressure relief valves. All other models require external valves supplied by others.**

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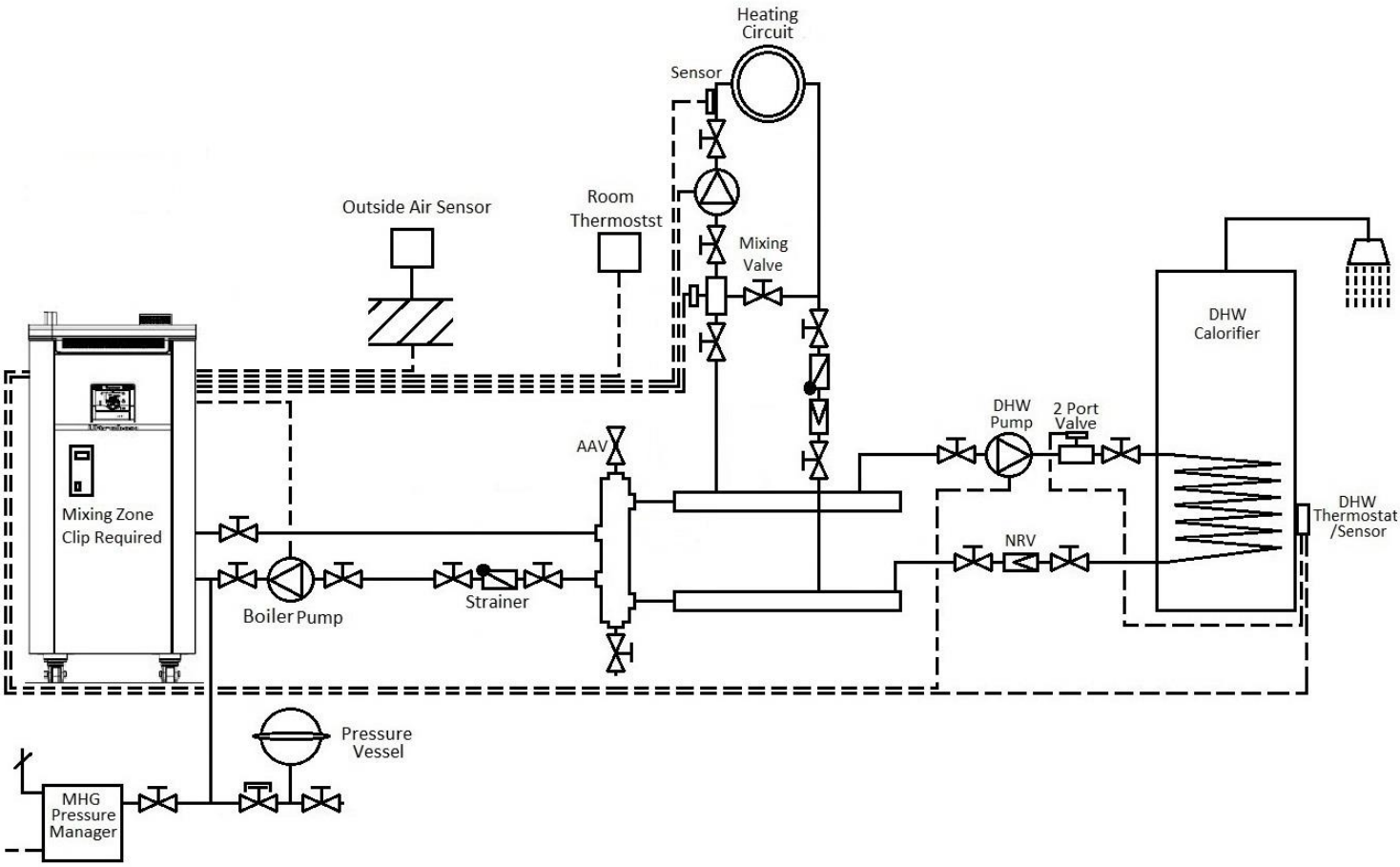
7.2 Hydraulic Design Single Unit (Option 3)



Electrical Connections Single Unit (Option 3)

High Voltage	Input/Output	Terminal Description/Label	Type
Mains power	Input	Brown=Live, Blue=Neutral, Yellow/Green=Earth	230Volts-50Hz
External Boiler Pump	Output	Q1 Boiler Circulation Pump Max 0.5Amp	230Volts-50Hz
3 Way Valve Open	Output	Additional internal wiring required at Commissioning	230volts-50Hz
3 Way Valve Close	Output	Additional internal wiring required at Commissioning	230volts-50Hz
Heating Circuit Pump	Output	Q2 Central Heating Pump Max 0.5Amp	230Volts-50Hz
DHW Pump	Output	Q3DHW Storage Pump Max 0.5Amp	230Volts-50Hz

Low Voltage	Input/Output	Terminal Description/Label	Type
Outside Air Sensor	Input	Outside temperature Sensor. QAC34 sensor provided	
**Room Thermostat	Input	Room thermostat, Volt free Enable	<24 Volts
**0-10Volt Enable	Input	0-10Volt Enable H3	0-10Volts
Mixed Circuit Sensor	Input	Additional internal wiring required at Commissioning QAD 36 sensor required	<24 Volts
DHW Demand	Input	Volt free thermostat or sensor	<24Volts
MHG Pressure Manager	Input	Multifunctional to be configured during commissioning	<24 Volts

**Only one enable to be used per installation. Volt Free or 0-10.

***Superbox 160 have internal pressure relief valves. All other models require external valves supplied by others.**

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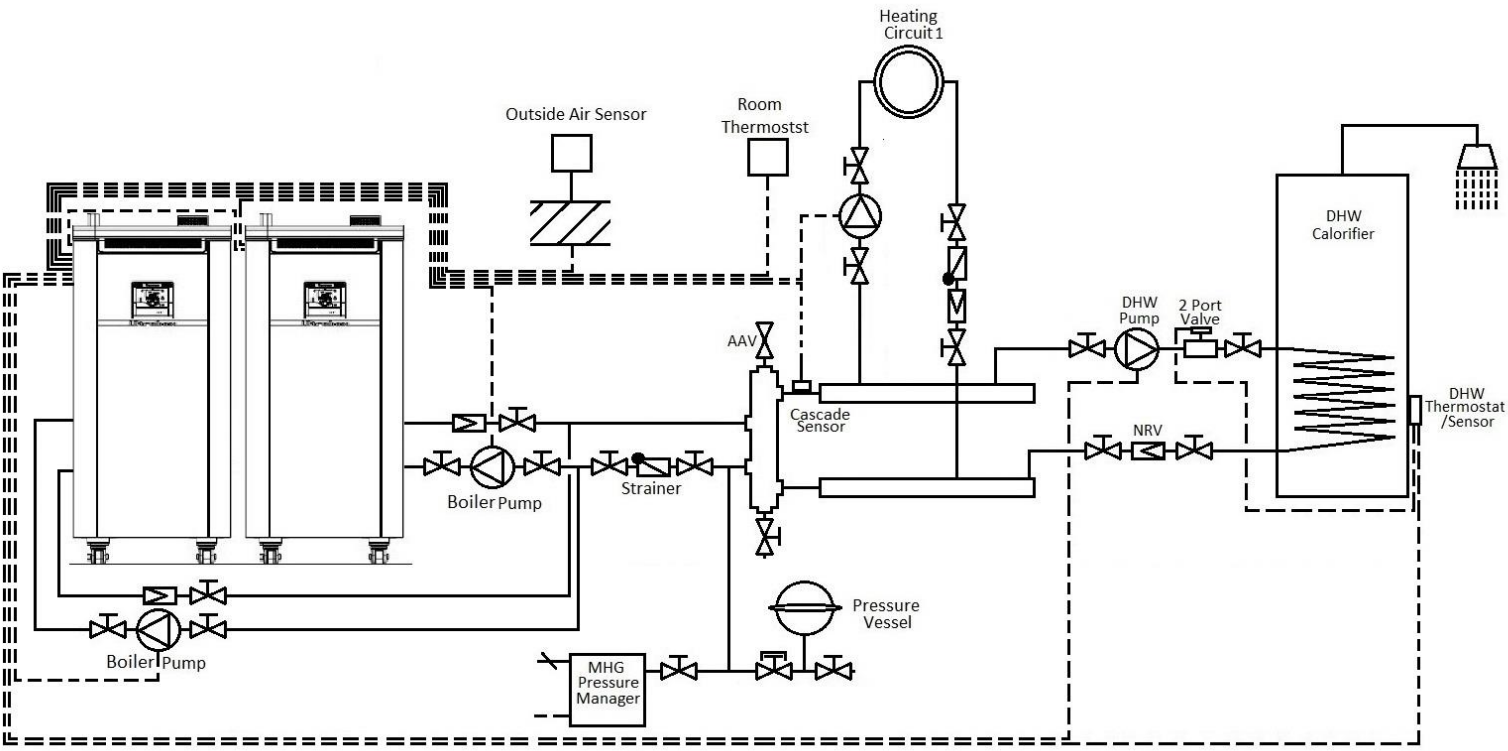
7.3 Hydraulic Design Cascade System (Option 4)



Electrical Connections Cascade System (Option 4)

Master Boiler

High Voltage	Input/Output	Terminal Description/Label	Type
Mains power	Input	Brown=Live, Blue=Neutral, Yellow/Green=Earth	230Volts-50Hz
External Boiler Pump	Output	Q1 Boiler Circulation Pump max 0.5Amp	230Volts-50Hz
Heating Circuit1 Pump	Output	Q2 Central Heating Pump Max 0.5Amp	230Volts-50Hz
DHW Pump	Output	Q3DHW Storage Pump Max 0.5Amp	230Volts-50Hz

Low Voltage	Input/Output	Terminal Description/Label	Type
Cascade Communication	Output	Cascade Module. Screened Cable must be used	Coms
Outside Air Sensor	Input	Outside temperature Sensor. QAC34 sensor provided	
**Room Thermostat HC1	Input	Room thermostat, Volt free Enable	<24 Volts
**0-10Volt Enable HC1	Input	0-10Volt Enable H3	0-10Volts
DHW Demand	Input	Volt free thermostat or sensor	<24Volts
MHG Pressure Manager	Input	Multifunctional to be configured during commissioning	<24 Volts

**Only one enable to be used per installation. Volt Free or 0-10.

Slave Boiler

High Voltage	Input/Output	Terminal Description/Label	Type
Mains power	Input	Brown=Live, Blue=Neutral, Yellow/Green=Earth	230Volts-50Hz
External Boiler Pump	Output	Q1 Boiler Circulation Pump max 0.5Amp	230Volts-50Hz

Low Voltage	Input/Output	Terminal Description/Label	Type
Cascade Communication	Input	Cascade Module. Screened Cable must be used	Coms

***Superbox 160 have internal pressure relief valves. All other models require external valves supplied by others.**

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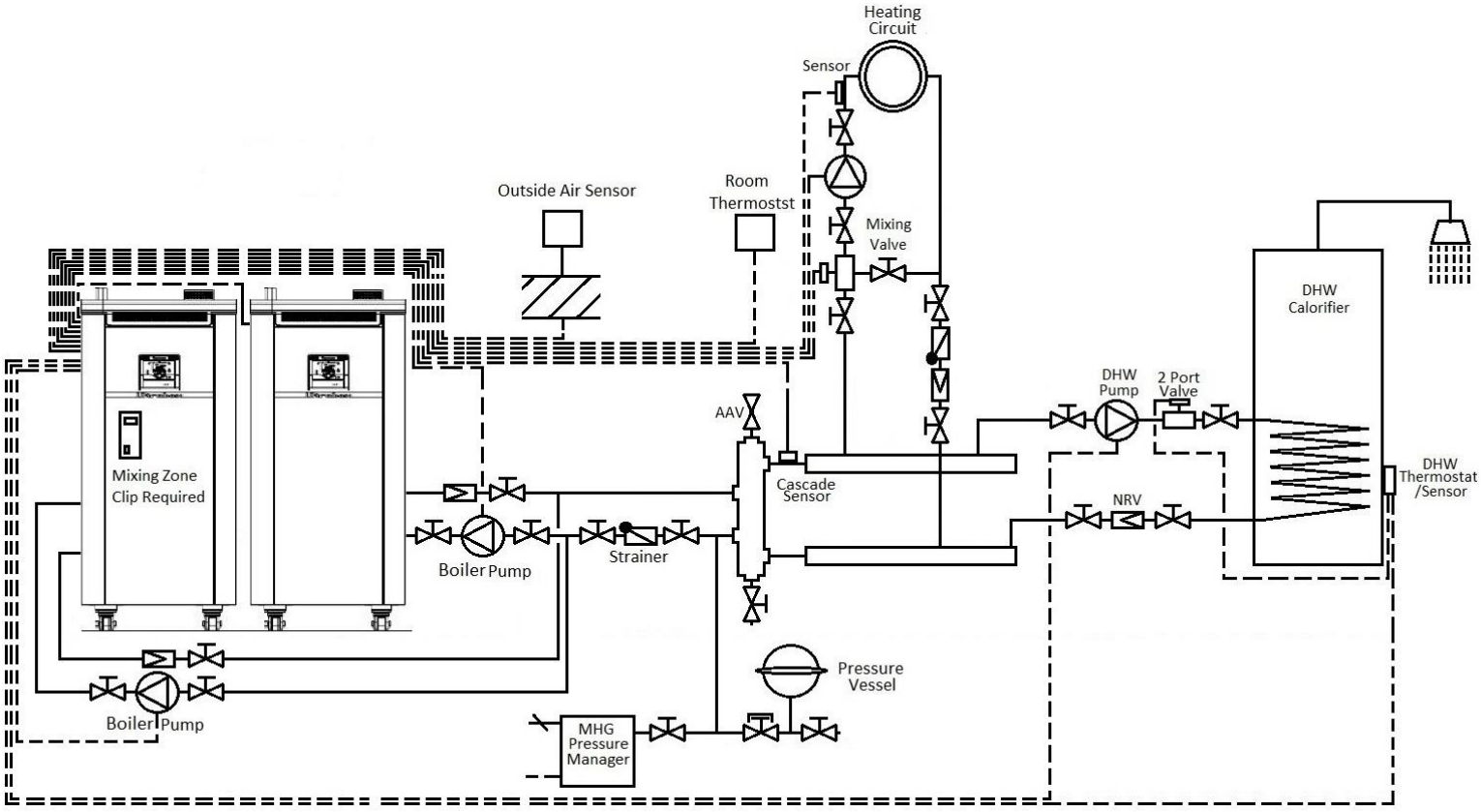
7.4 Hydraulic Design Cascade System (Option 5)



Electrical Connections Cascade System (Option 5)

Master Boiler

High Voltage	Input/Output	Terminal Description/Label	Type
Mains power	Input	Brown=Live, Blue=Neutral, Yellow/Green=Earth	230Volts-50Hz
External Boiler Pump	Output	Q1 Boiler Circulation Pump max 0.5Amp	230Volts-50Hz
Heating Circuit1 Pump	Output	Q2 Central Heating Pump Max 0.5Amp	230Volts-50Hz
DHW Pump	Output	Q3DHW Storage Pump Max 0.5Amp	230Volts-50Hz

Low Voltage	Input/Output	Terminal Description/Label	Type
Cascade Communication	Output	Cascade Module. Screened Cable must be used	Coms
Outside Air Sensor	Input	Outside temperature Sensor. QAC34 sensor provided	
**Room Thermostat HC1	Input	Room thermostat, Volt free Enable	<24 Volts
**0-10Volt Enable HC1	Input	0-10Volt Enable H3	0-10Volts
Mixed Circuit Sensor	Input	Additional internal wiring required at Commissioning QAD 36 sensor required	<24 Volts
DHW Demand	Input	Volt free thermostat or sensor	<24Volts
MHG Pressure Manager	Input	Multifunctional to be configured during commissioning	<24 Volts

**Only one enable to be used per installation. Volt Free or 0-10.

Slave Boiler

High Voltage	Input/Output	Terminal Description/Label	Type
Mains power	Input	Brown=Live, Blue=Neutral, Yellow/Green=Earth	230Volts-50Hz
External Boiler Pump	Output	Q1 Boiler Circulation Pump max 0.5Amp	230Volts-50Hz

Low Voltage	Input/Output	Terminal Description/Label	Type
Cascade Communication	Input	Cascade Module. Screened Cable must be used	Coms

***Superbox 160 have internal pressure relief valves. All other models require external valves supplied by others.**

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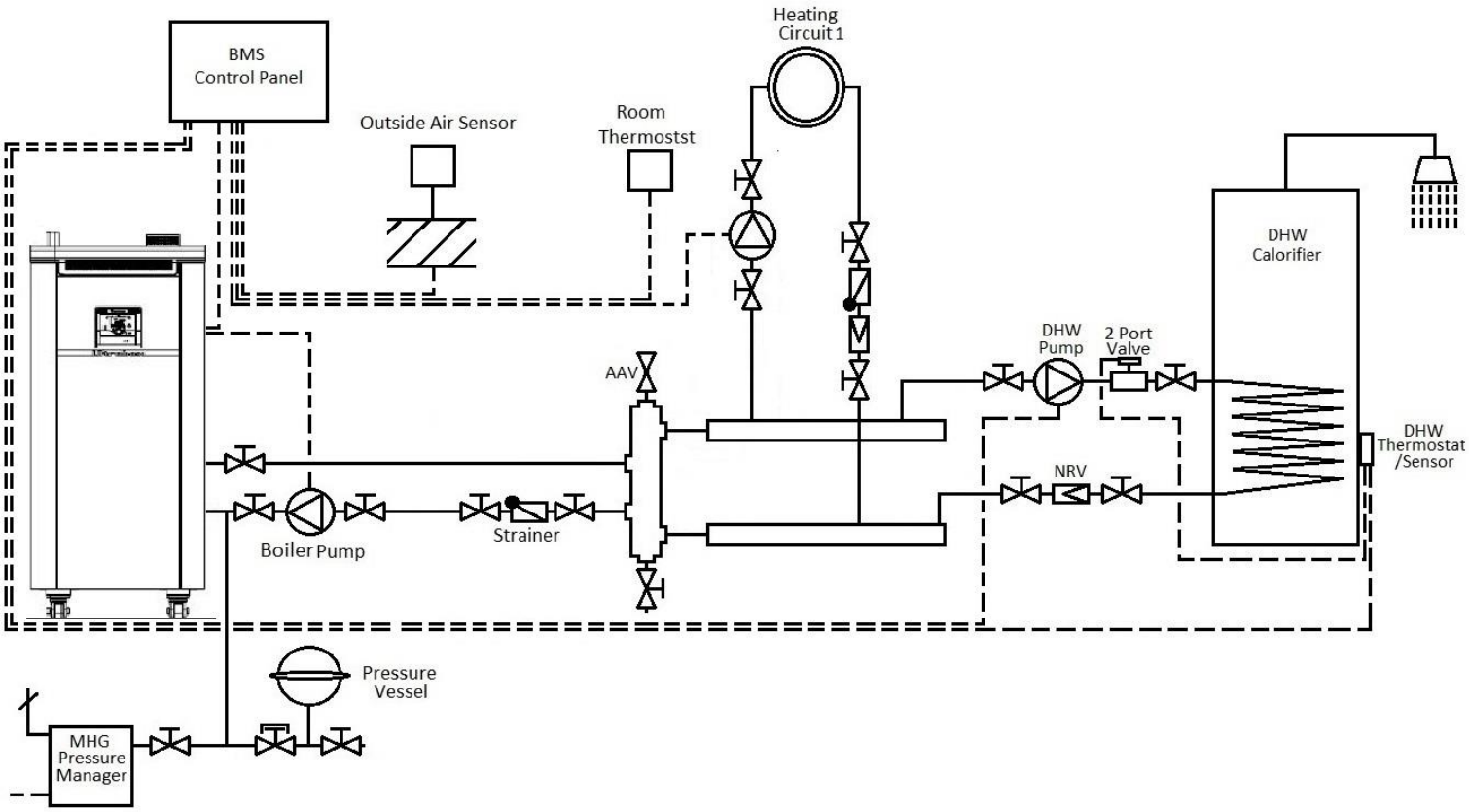
7.5 Hydraulic Design BMS System (Option 6)



Electrical Connections BMS System (Option 6)

High Voltage	Input/Output	Terminal Description/Label	Type
Mains power	Input	Brown=Live, Blue=Neutral, Yellow/Green=Earth	230Volts-50Hz
External Boiler Pump	Output	Q1 Boiler Circulation Pump max 0.5Amp	230Volts-50Hz

Low Voltage	Input/Output	Terminal Description/Label	Type
**Room Thermostat HC1	Input	Room thermostat, Volt free Enable	<24 Volts
**0-10Volt Enable HC1	Input	0-10Volt Enable H3	0-10Volts

**Only one enable to be used per installation. Volt Free or 0-10.

***Superbox 160 have internal pressure relief valves. All other models require external valves supplied by others.**

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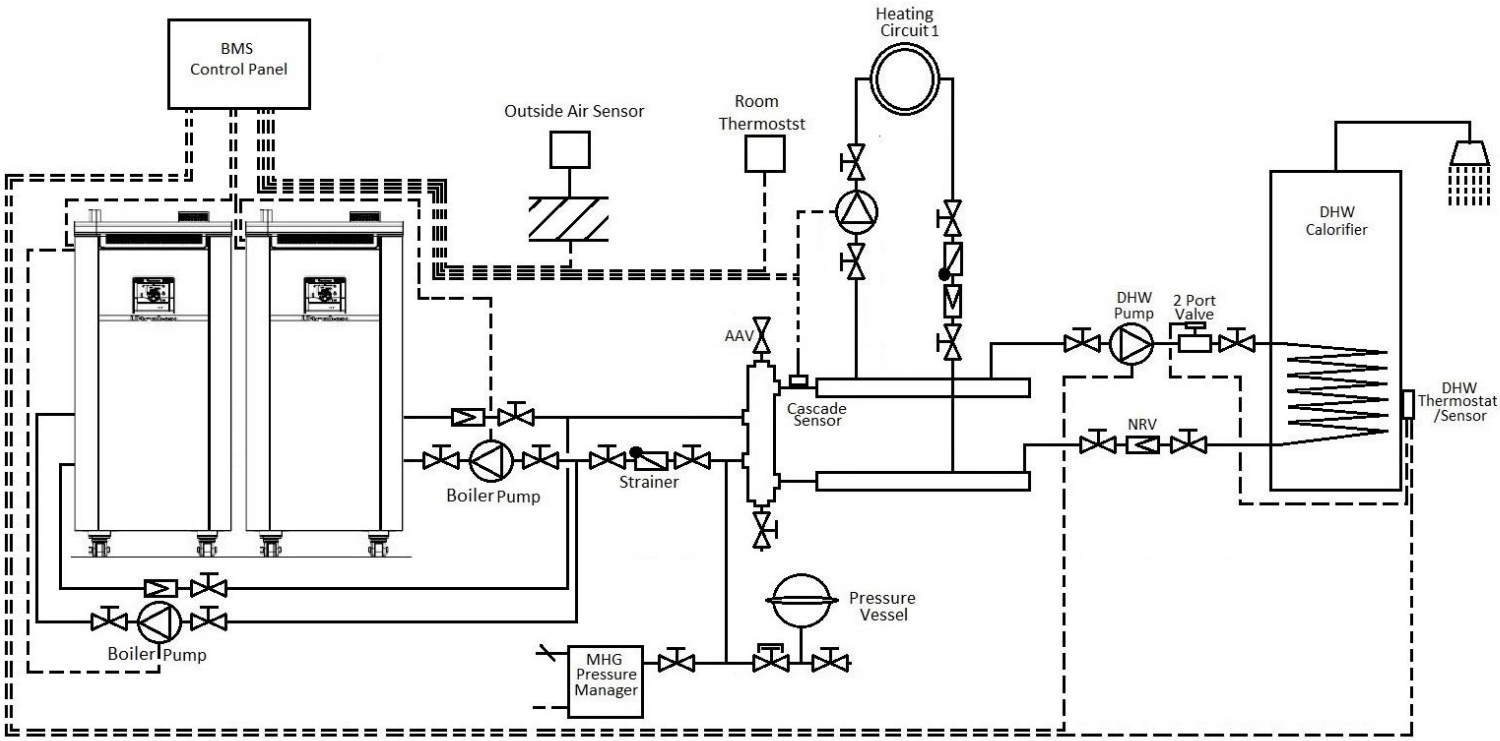
7.6 Hydraulic Design BMS System (Option 7)



Electrical Connections BMS System (Option 7)

Master and Slave boilers require the following wiring

High Voltage	Input/Output	Terminal Description/Label	Type
Mains power	Input	Brown=Live, Blue=Neutral, Yellow/Green=Earth	230Volts-50Hz
External Boiler Pump	Output	Q1 Boiler Circulation Pump max 0.5Amp	230Volts-50Hz

Low Voltage	Input/Output	Terminal Description/Label	Type
**Room Thermostat HC1	Input	Room thermostat, Volt free Enable	<24 Volts
**0-10Volt Enable HC1	Input	0-10Volt Enable H3	0-10Volts

**Only one enable to be used per installation. Volt Free or 0-10.

***Superbox 160 have internal pressure relief valves. All other models require external valves supplied by others.**

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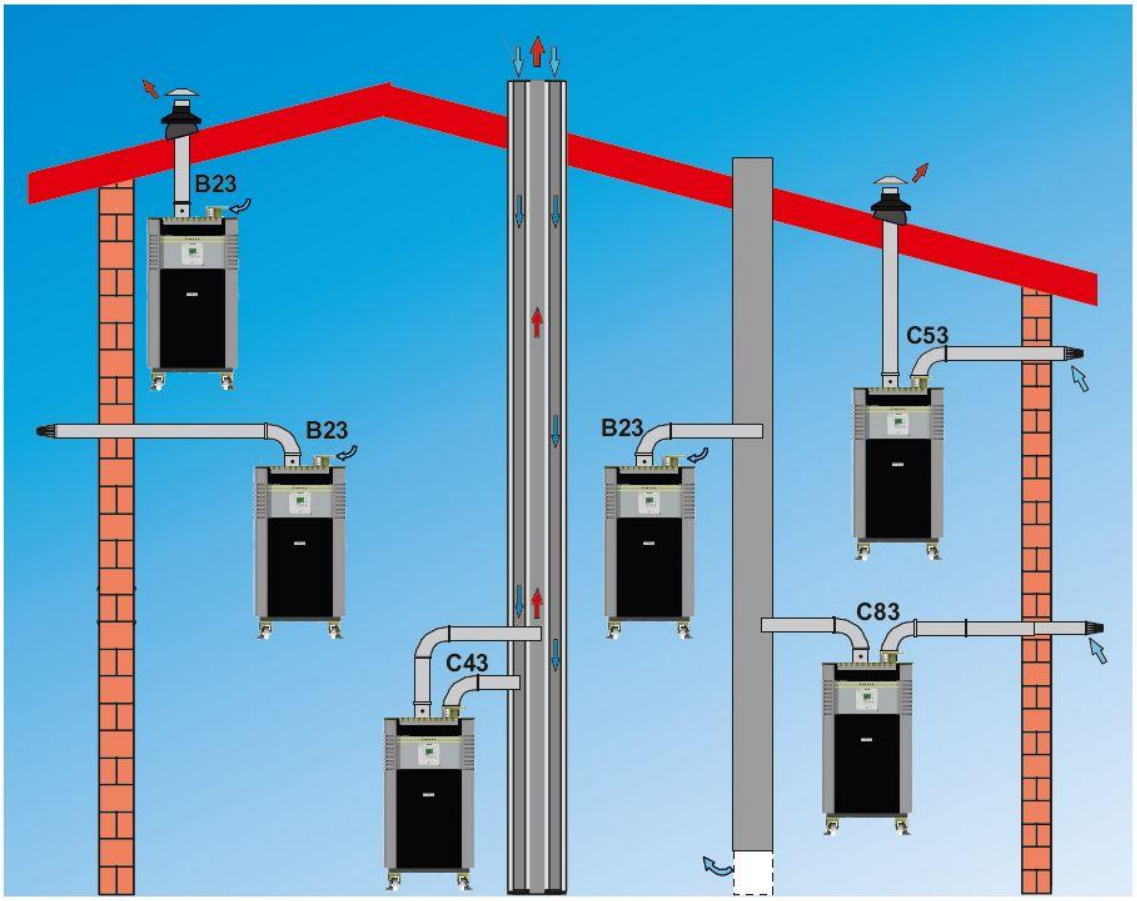
8.0 Fluing Options



Flue Type	Description
B23	Open Flued Installation with products of combustion flued through a wall or roof to outside. Combustion air taken from the room via adequate ventilation.
C43	A Balanced Flue System/ Room sealed installation. Independent air ducted in and products out via a duct.
C53	A Balanced Flue System/ Room sealed installation. Independent air ducted in and products flued out to separate zones.
C83	A Balanced Flue System/ Room sealed installation. Air ducted from outside and the products flued out via a shared stack.

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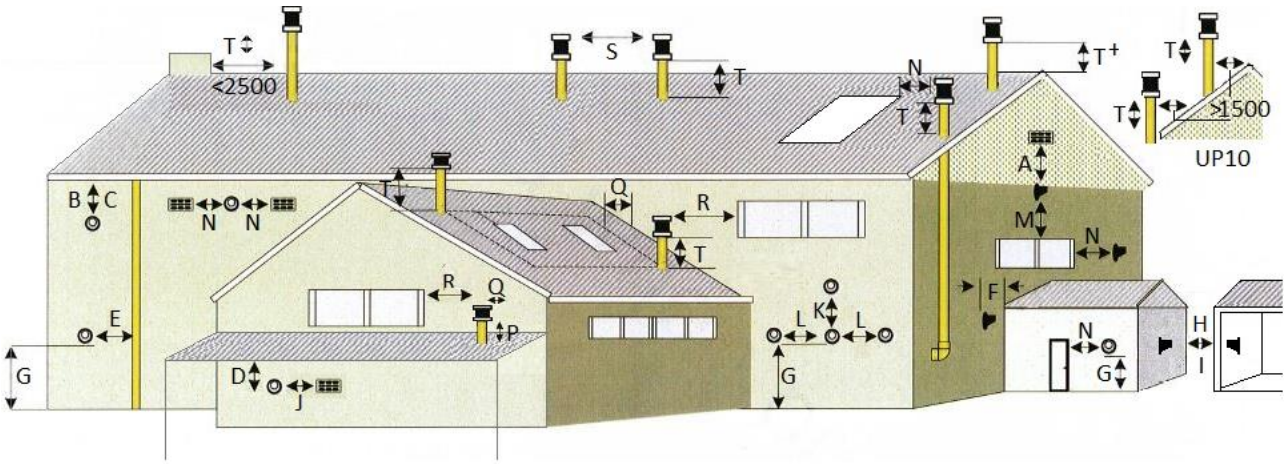
8.1 Balanced Flue Terminal Positions For Boilers Below and Above 70kW Net Input

(All measurements are in mm and are minimum clearances)

Terminal Location		BS5440 Boilers with a rated Input <70kW Net	IGE-UP-10 Boilers Input >70kW <333kW Net Fan Draught Balanced Flue X	IGE-UP-10 Boilers Input >70kW <333kW Net Fan Draught& Open Flued V
A	Directly below an opening into the building	300	2500	2500
B	Below gutter soil pipes etc.	75	200	200
C	Below Eaves	200	200	200
D	Below balconies or car port roof	200*	Not Recommended**	Not Recommended**
E	From vertical drain or soil pipe etc.	150	150	150
F	From internal or external corners	300	If <2500 use Plume Ext	If <2500 use P/T below#
G	Above ground or balcony level	300	If <3000 use Plume Ext	If <3000 use Plume Ext
H	From a surface facing the terminal	600	23.126 x (kW) + 618.84	23.126 x (kW) + 618.84
I	From a terminal facing the terminal#	1200	19.32 x (kW) + 647.59	19.32 x (kW) + 647.59#
J	From opening in a carport into a dwelling	1200*	Not Recommended**	Not Recommended**
K	Vertically from a terminal on the same wall#	1500	2500	2500#
L	Horizontally from a terminal on the same wall	300	7.232 x (kW) + 93.708	9.5156 x (kW) + 833.91
M	Above an opening into the building	300	7.232 x (kW) + 93.708	9.5156 x (kW) + 833.91
N	Horizontally to an opening into the building	300*	7.232 x (kW) + 93.708	9.5156 x (kW) + 833.91
P	Above a flat roof (Obstacle> 2500) From Roof Level	300	4.5675 x (kW) -19.723	4.5675 x (kW) -19.723
P+	Above a flat roof (Obstacle<2500) From Obstacle Level	300	4.5675 x (kW) -19.723	4.5675 x (kW) -19.723
Q	From an adjacent wall (edge of terminal)	300	If <2500 use Plume Ext	If <2500 use Plume Ext#
R	To an opening into the building	1000	7.232 x (kW) + 93.708	9.5156 x (kW) + 833.91
S	From any other flue terminal#	300	7.232 x (kW) + 93.708	9.5156 x (kW) + 833.91#
T	Above a >20^0 Pitched Roof (BOT)	300	4.5675 x (kW) -19.723	4.5675 x (kW) -19.723
T+	Above a >20^0 Pitched Roof (BOT) (Valley)	300	4.5675 x (kW) -19.723	4.5675 x (kW) -19.723

kW=Net Heat Input. * Positions not recommended. ** Risk assessment required (App 9). (BOT = Base of Terminal). # Contact MHG



Groups of appliances of 150kW gross input (136kW net input) and above must comply with the Clean Air Act with respect to the chimney discharge height.

The terminal/s shall be guarded if it is less than 2000mm above the ground or in any position where it may cause injury to persons resulting from touching a hot surface. Absolute guidance must be sought from the respective regulation.

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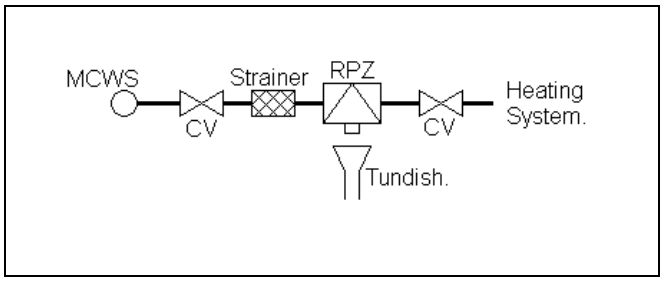
9.0 Filling The System

The Initial filling of a sealed heating system, and subsequent refilling, must be by a method that has been approved by the Water Regulation Advisory Scheme (WRAS) for that type of heating system.

i.e Non Domestic (Other than *In-House*) Fluid Category 4 (*C-4*)

For Category 4 systems, the approved method of filling must comprise of the following components in the arrangement shown;

- Control Valve.
- Strainer.
- Verifiable Backflow Device with Reduced Pressure Zone (RPZ Valve)
- Incorporating a 'Type BA' Air Gap.
- Tundish.
- Control Valve.



Furthermore, in accordance with BS 6644: 2011 system with an input greater than 70kW (nett), an automatic water replenishment unit shall be installed to automatically replenish any lost or evaporated water.

Please refer to BS 6644: 2011 for allowable water replenishment methods for use with sealed/pressurized heating systems.

For information on a comprehensive range of pressurization units that comply with current British Standards and WRAS Regulations, please contact MHG Heating Ltd Sales.

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9.1 Expansion Vessel

In accordance with BS 6644: 2011, WRAS Regulations, and Local Authority Water Regulations, as applicable, the installer shall install a suitably sized, and approved, Expansion Vessel to ensure that the water capacity of the system has ample expansion capacity.

The location of the expansion vessel shall only be isolatable from the system via a Lockable Type Service Valve, which shall be locked in the *OPEN* position, to prevent accidental isolation.
Furthermore, a drain facility should be provided adjacent to the expansion vessel to aid the routine maintenance, overhaul, of the vessels Air Pressure setting.

For information on a comprehensive range of expansion vessels that comply with current British Standards and WRAS Regulations, please contact MHG Heating Ltd Sales.

10.0 System Water Quality

Water Treatment, System Cleaning (BS 7592: 2006)

The entire primary system MUST be thoroughly cleaned and flushed to remove debris, flux residues, etc. before opening the boiler isolation valves & flooding the boiler. Particular care must be taken where the Wallcon boiler is being retro-fitted into an old/existing system, as system silt or magnetite can be very damaging to the new boiler.
Following cleaning and flushing the system MUST be dosed with a good quality water treatment to prevent corrosion and the formation of scale. FAILURE TO OBSERVE THESE REQUIREMENTS WILL RENDER THE WARRANTEE ON THE APPLIANCE VOID.
Cleaning, flushing and water treatment must be carried out in accordance with the requirements of BS 7593:1992, prior to commissioning the boiler.
Repeated draining and refilling of the system, without replenishment of water treatment, must be avoided, as this is very damaging to the boiler. The boiler must not operate without the system water being correctly and adequately treated, and maintained, with an appropriate level of corrosion inhibitor.

For specific guidance on water treatment, direct contact is advisable with:-

Fernox
2 Genesis Business Park
Albert Drive
Sheerwater
Woking Surrey
GU21 5RW

P:0330 100 7750
F: 0330 100 7751
E: sales@fernox.com
W: www.fernox.com

10.1 Care With The Use of Solder Flux

The Wallcon range has heat exchangers fabricated from Stainless Steel. It is most important that the compatibility of any flux is checked with the supplier before use, and that any flux manufactures recommendations are strictly followed with regards to use in conjunction with Stainless Steel.

If you are applying any of the Wallcon Range to a system where the water quality cannot be cleansed or treated please consider installing a system separation plate heat exchanger to ensure absolute separation of the system water and the boiler water.

Please refer to our website for further details on our matched brazed and gasketed plate heat exchanger range.

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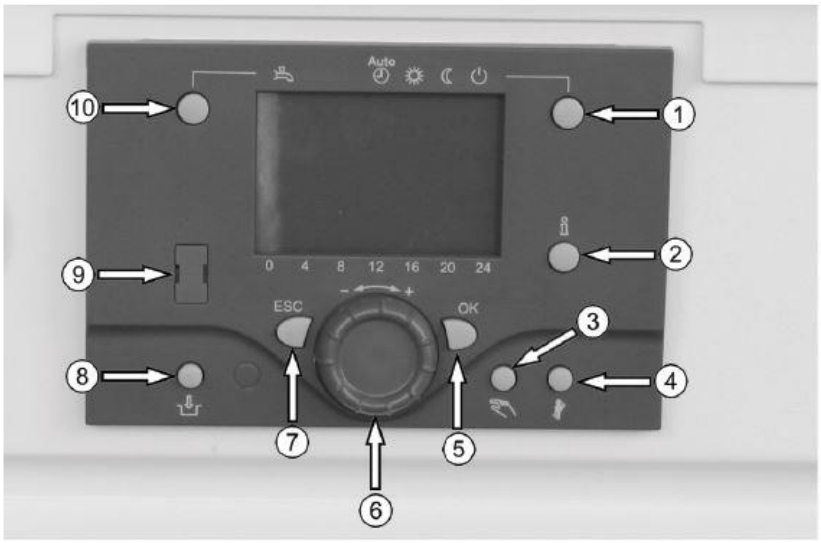
11.0 Boiler Controller



Label	Description
1	Heating Mode Select Button
2	Show Information
3	Manual (Hand)
4	Emission Test Mode
5	Accept Setting (Select)
6	Navigation and Setting (Rotary)
7	Escape Button
8	Reset Button
9	Service Connector for BSB data BUS
10	Hot Water Mode Select

Symbol	Description
AUTO	Automatic Mode
	Continuous Operation (Day Mode)
	Reduced Operation (Night Mode)
	Frost Protection Mode
	Ongoing Process - Wait
	Battery Requires Changing
	Holiday Mode Active
	Heating Circuit 1/2/3 Active
	Maintenance / Special Operation
	Error Alarm Activated
	Burner in Operation (Burner Stage)
INFO	INFO Level Activated
PROG	PROG Level Activated
ECO	ECO Function Activated (Heating Temporarily Switched Off)

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11.1 Accessing Controller Parameters

To access the controller parameter menu, from the standard home screen, press the OK button once then press and hold the INFO button for 5 seconds until the lower section of the screen changes. Use the wheel to highlight the ENGINEER setting. Press the OK button.
Access to all setting below is now possible using the rotary button.

Setting Slave Module Using Master Controller

To set the combustion of a slave module within a Superbox boiler the following steps need to be followed;
1: Isolate the boiler electrically and ensure no secondary supplies have been installed.
2: Remove all boiler casing.
3: Remove screws from controller plastic front case of the master control module.
4: Gently pull the front case forwards and away from the boiler.
5: Disconnect the wiring connections from the components mounted to the front case. Place front case to one side.
6:Rrepeat steps 3 to 5 for the Slave module.
7: Attached the wiring for the display module to the LMS controller. Wiring loom with correct plug already fitted.
8: Mount the front case onto the unit. Hold in place with one screw to ensue it can not move while settings are adjusted.
9: Fit the Slave boiler control cover over the Master controller to prevent damage and risk of electrocution.
10: Reinstate power to boiler. Check and set required settings. Once completed re fit controller covers to original positions.

Button	Notation	Description
	Rotary Button	Used to move through menus/lists of options.
	OK Button	Used to confirm a selection
	Escape Button	Used to escape back one level through menus

Parameter #	Description	Range	Default	Advised Change	Unit
Time And Date					
1	Hours/Minutes	00:00-24:00	----		hh:mm
2	Day/Month	01.01-31.12	----		dd:mm
3	Year	2004-2099	----		yyyy
Operator Section					
20	Language	English / Deutsch / Französisch / Italienisch /Niederländisch / Spanisch / Portugiesisch / Dänisch / Schwedisch / Finnisch	English		
22	Info	Temporarily, Permanent	Temporarily		
26	Operation	On, Off	Off		
27	Programming Lock	On, Off	Off		
28	Direct Adjustment	Storage with Confirmation, Automatic Storage	Storage With Confirmation		
29	Units	°C, bar / Fahrenheit, PSI	°C, bar		
44	Operation HC2	Jointly with HC1, Independent	Jointly with HC1		
46	Operation HC3/P	Jointly with HC1, Independently	Jointly with HC1		

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70	Software	----	06.7		
Time Program Heating Circuit 1					
500	Day/Days	Mo-Su, Mo-Fr,Sa-Su,Mo,Tu,We,Th,Fr,Sa,Su	Mo-Su		
501	1st Phase On	00:00-24:00	06:00		hh:mm
502	1st Phase Off	00:00-24:00	22:00		hh:mm
503	2nd Phase On	00:00-24:00	24:00		hh:mm
504	2nd Phase Off	00:00-24:00	24:00		hh:mm
505	3rd Phase On	00:00-24:00	24:00		hh:mm
506	3rd Phase Off	00:00-24:00	24:00		hh:mm
516	Default Values	No, Yes	No		
Time Program Heating Circuit 2					
520	Day/Days	Mo-Su, Mo-Fr,Sa-Su,Mo,Tu,We,Th,Fr,Sa,Su	Mo-Su		
521	1st Phase On	00:00-24:00	06:00		hh:mm
522	1st Phase Off	00:00-24:00	22:00		hh:mm
523	2nd Phase On	00:00-24:00	24:00		hh:mm
524	2nd Phase Off	00:00-24:00	24:00		hh:mm
525	3rd Phase On	00:00-24:00	24:00		hh:mm
526	3rd Phase Off	00:00-24:00	24:00		hh:mm
536	Default Values	No, Yes	No		
Time Program3/ Heating Circuit 3					
540	Day/Days	Mo-Su, Mo-Fr,Sa-Su,Mo,Tu,We,Th,Fr,Sa,Su	Mo-Su		
541	1st Phase On	00:00-24:00	06:00		hh:mm
542	1st Phase Off	00:00-24:00	22:00		hh:mm
543	2nd Phase On	00:00-24:00	24:00		hh:mm
544	2nd Phase Off	00:00-24:00	24:00		hh:mm
545	3rd Phase On	00:00-24:00	24:00		hh:mm
546	3rd Phase Off	00:00-24:00	24:00		hh:mm
556	Default Values	No, Yes	No		
Time Program 4/DHW					
560	Day/Days	Mo-Su, Mo-Fr,Sa-Su,Mo,Tu,We,Th,Fr,Sa,Su	Mo-Su		
561	1st Phase On	00:00-24:00	06:00		hh:mm
562	1st Phase Off	00:00-24:00	22:00		hh:mm
563	2nd Phase On	00:00-24:00	24:00		hh:mm
564	2nd Phase Off	00:00-24:00	24:00		hh:mm
565	3rd Phase On	00:00-24:00	24:00		hh:mm
566	3rd Phase Off	00:00-24:00	24:00		hh:mm
576	Default Values	No, Yes	No		
Time Program 5					
600	Day/Days	Mo-Su, Mo-Fr,Sa-Su,Mo,Tu,We,Th,Fr,Sa,Su	Mo-Su		
601	1st Phase On	00:00-24:00	06:00		hh:mm
602	1st Phase Off	00:00-24:00	22:00		hh:mm
603	2nd Phase On	00:00-24:00	24:00		hh:mm
604	2nd Phase Off	00:00-24:00	24:00		hh:mm
605	3rd Phase On	00:00-24:00	24:00		hh:mm
606	3rd Phase Off	00:00-24:00	24:00		hh:mm
616	Default Values	No, Yes	No		

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Holiday Heating Circuit 1					
641	Pre-selection	Period1, Period2, Period3, Period4, Period5, Period6, Period7, Period8	Period1		
642	Start	01.01-31.12	--.--		dd:mm
643	End	01.01-31.12	--.--		dd:mm
648	Operating Level	Frost, Reduced	Frost Protection		
Holiday Heating Circuit 2					
651	Pre-selection	Period1, Period2, Period3, Period4, Period5, Period6, Period7, Period8	Period1		
652	Start	01.01-31.12	--.--		dd:mm
653	End	01.01-31.12	--.--		dd:mm
658	Operating Level	Frost, Reduced	Frost Protection		
Holiday Heating Circuit 3					
661	Pre-selection	Period1, Period2, Period3, Period4, Period5, Period6, Period7, Period8	Period1		
662	Start	01.01-31.12	--.--		dd:mm
663	End	01.01-31.12	--.--		dd:mm
668	Operating Level	Frost, Reduced	Frost Protection		
Heating Circuit 1					
700	Operating Mode HC1	Protection, Automatic, Reduced, Comfort	Automatic		
710	Comfort Setpoint	P712-P716	20.0		°C
712	Reduced Setpoint	P714-P710	16.0		°C
714	Frost Protection Setpoint	4-P712	10.0		°C
716	Comfort Setpoint Max	P710 - 35	35.0		°C
720	Heating Curve Slope	0.10 - 4.00	1.50	3.20	-
721	Heating Curve Displacement	-4.5 - 4.5	0.0		°C
726	Heating Curve Adaption	Off - On	Off		-
730	Summer/Winter heating limit	---/8 – 30	18		°C
732	24-Hour heating limit	---/-10 – 10	-3		°C
733	Ext'n 24-Hour heating limit	Yes – No	Yes		
740	Flow temp setpoint min	8 – P741	8		°C
741	Flow temp setpoint max	P740 – 95	85		°C
742	Flow temp setpoint room stat	---/P740 - ---/P741	---		°C
744	Swi-on ratio room stat	---/1 – 99	---		%
746	Delay Heat request	0 – 600	0		S
750	Room Influence	---/1 – 100	---		%
760	Room temp limitation	---/0.5 – 4	1		°C
761	Heating limit room controller	---/0 – 100	---		%
770	Boost heating	---/0 – 20	5		°C
780	Quick setback	Off, Down to Reduced Setpoint, Down to Frost Protection Setpoint	To Reduced Setpoint		-
790	Optimum start control max	0 - 360	0		Min.
791	Optimum stop control max	0 – 360	0		Min.
794	Heat up gradient	0 – 600	60		Min/k
800	Reduced setp. increase start	---/P801 – 10	---		°C
801	Reduced setp. increase end	-30 – P800	-15		°C
809	Continuous pump operation	No – Yes	No		
812	Frost protection flow temp.	Off – On	On		-
820	Overtempprot. pump circuit	Off – On	On		-
830	Mixing valve boost	0 – 50	5		°C

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832	Actuator type	Two Position – Three Position	Three-position		-
833	Switching differential 2-pos	0 – 20	2		°C
834	Actuator running time	30 – 873	120		S
835	Mixing valve Xp	1 – 100	32		°C
836	Mixing valve Tn	10 – 873	120		S
850	Floor curing Function	Off, Function heating, Curing heating, Function + Curing heating, Curing + functional heating, Manually	Off		-
851	Floor curing setp. manually	0 – 95	25		°C
855	Floor curing setp. current	0 – 95			°C
856	Floor curing day current	0 – 32			
861	Excess heat draw	Off, Heating mode, Always	Always		
870	With buffer	No, Yes	Yes		-
872	With prim contr./system pump	No, Yes	Yes		
880	Pump speed reduction	According HC operating level, According characteristic curve, Temp. differential nominal	According characteristic curve		
881	Starting speed	0 – 100	100		%
882	Pump speed min	P885 – P883	50		%
883	Pump speed max	P882 – P886	100		%
885	Pump speed min OEM	0 – P882	50		%
886	Pump speed max OEM	P883 – 100	100		%
888	Curve readj. at 50% speed	0 – 100	33		%
889	Filter time const. speed ctrl.	0 – 20	5		Min.
890	Flow setp. readj. speed ctrl.	No, Yes	No		
898	Operating level changeover	Frost protection, Reduced, Comfort	Reduced		
900	Optgmode changeover	None, Protection, Reduced, Comfort, Automatic	Protection		Min.
Heating Circuit 2					
1000	Operating Mode HC2	Protection, Automatic, Reduced, Comfort	Automatic		-
101	Comfort Setpoint	P1012 – P1016	20.0		°C
1012	Reduced Setpoint	P1014 – P1010	16.0		°C
1014	Frost Protection Setpoint	4 – P1012	10.0		°C
1016	Comfort Setpoint Max	P1010 - 35	35.0		°C
1020	Heating Curve Slope	0.10 - 4.00	1.50	3.20	-
1021	Heating Curve Displacement	-4.5 - 4.5	0.0		°C
1026	Heating Curve Adaption	Off - On	Off		-
1030	Summer/Winter heating limit	---/8 – 30	18		°C
1032	24-Hour heating limit	---/-10 – 10	-3		°C
1033	Ext'n 24-Hour heating limit	Yes – No	Yes		
1040	Flow temp setpoint min	8 – P1041	8		°C
1041	Flow temp setpoint max	P1040 – 95	85		°C
1042	Flow temp setpoint room stat	---/P1040 - ---/P1041	---		°C
1044	Swi-on ratio room stat	---/1 – 99	---		%
1046	Delay Heat request	0 – 600	0		S
1050	Room Influence	---/1 – 100	---		%
1060	Room temp limitation	---/0.5 – 4	1		°C
1061	Heating limit room controller	---/0 – 100	---		%
1070	Boost heating	---/0 – 20	5		°C

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1080	Quick setback	Off, Down to Reduced Setpoint, Down to Frost Protection Setpoint	To Reduced Setpoint		-
1090	Optimum start control max	0 – 360	0		Min.
1091	Optimum stop control max	0 – 360	0		Min.
1094	Heat up gradient	0 – 600	60		Min/k
1100	Reduced setp. increase start	---/P1101 – 10	---		°C
1101	Reduced setp. increase end	-30 – P1100	-15		°C
1109	Continuous pump operation	No – Yes	No		
1112	Frost protection flow temp.	Off – On	On		
1120	Overtempprot. pump circuit	Off – On	On		-
1130	Mixing valve boost	0 – 50	5		°C
1132	Actuator type	Two Position – Three Position	Three-position		-
1133	Switching differential 2-pos	0 – 20	2		°C
1134	Actuator running time	30 – 873	120		S
1135	Mixing valve Xp	1 – 100	32		°C
1136	Mixing valve Tn	10 – 873	120		S
1150	Floor curing Function	Off, Function heating, Curing heating, Function + Curing heating, Curing + functional heating, Manually	Off		-
1151	Floor curing setp. manually	0 – 95	25		°C
1155	Floor curing setp. current	0 – 95			°C
1156	Floor curing day current	0 – 32			°C
1161	Excess heat draw	Off, Heating mode, Always	Always		
1170	With buffer	No, Yes	Yes		-
1172	With prim contr./system pump	No, Yes	Yes		
1180	Pump speed reduction	According HC operating level, According characteristic curve, Temp. differential nominal	According characteristic curve		
1181	Starting speed	0 – 100	100		%
1182	Pump speed min	P1185 – P1183	50		%
1183	Pump speed max	P1182 – P1186	100		%
1185	Pump speed min OEM	0 – P1182	50		%
1186	Pump speed max OEM	P1183 – 100	100		%
1188	Curve readj. at 50% speed	0 – 100	33		%
1189	Filter time const. speed ctrl.	0 – 20	5		Min.
1190	Flow setp. readj. speed ctrl.	No, Yes	No		
1198	Operating level changeover	Frost protection, Reduced, Comfort	Reduced		
1200	Optgmode changeover	None, Protection, Reduced, Comfort, Automatic	Protection		
Heating Circuit 3					
1300	Operating Mode HC3	Protection, Automatic, Reduced, Comfort	Automatic		-
1310	Comfort Setpoint	P1312 – P1316	20.0		°C
1312	Reduced Setpoint	P1314 – P1310	16.0		°C
1314	Frost Protection Setpoint	4 – P1312	10.0		°C
1316	Comfort Setpoint Max	P1310 - 35	35.0		°C
1320	Heating Curve Slope	0.10 - 4.00	1.50	3.20	-
1321	Heating Curve Displacement	-4.5 - 4.5	0.0		°C
1326	Heating Curve Adaption	Off - On	Off		-
1330	Summer/Winter heating limit	---/8 – 30	18		°C
1332	24-Hour heating limit	---/-10 – 10	-3		°C

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1333	Ext'n 24-Hour heating limit	Yes – No	Yes		
1340	Flow temp setpoint min	8 – P1341	8		°C
1341	Flow temp setpoint max	P1340 – 95	85		°C
1342	Flow temp setpoint room stat	---/P1340 - ---/P1341	---		°C
1344	Swi-on ratio room stat	---/1 – 99	---		%
1346	Delay Heat request	0 – 600	0		S
1350	Room Influence	---/1 – 100	---		%
1360	Room temp limitation	---/0.5 – 4	1		°C
1361	Heating limit room controller	---/0 – 100	---		%
1370	Boost heating	---/0 – 20	5		°C
1380	Quick setback	Off, Down to Reduced Setpoint, Down to Frost Protection Setpoint	To Reduced Setpoint		-
1390	Optimum start control max	0 – 360	0		Min.
1391	Optimum stop control max	0 – 360	0		Min.
1394	Heat up gradient	0 – 600	60		Min/k
1400	Reduced setp. increase start	---/P1401 – 10	---		°C
4101	Reduced setp. increase end	-30 – P1400	-15		°C
1409	Continuous pump operation	No – Yes	No		
1412	Frost protection flow temp.	Off – On	On		
1420	Overtempprot. pump circuit	Off – On	On		-
1430	Mixing valve boost	0 – 50	5		°C
1432	Actuator type	Two Position – Three Position	Three-position		-
1433	Switching differential 2-pos	0 – 20	2		°C
1434	Actuator running time	30 – 873	120		S
1435	Mixing valve Xp	1 – 100	32		°C
1436	Mixing valve Tn	10 – 873	120		S
1450	Floor curing Function	Off, Function heating, Curing heating, Function + Curing heating, Curing + functional heating, Manually	Off		-
1451	Floor curing setp. manually	0 – 95	25		°C
1455	Floor curing setp. current	0 – 95			°C
1456	Floor curing day current	0 – 32			
1461	Excess heat draw	Off, Heating mode, Always	Always		
1470	With buffer	No, Yes	Yes		-
1472	With prim contr./system pump	No, Yes	Yes		
1480	Pump speed reduction	According HC operating level, According characteristic curve, Temp. differential nominal	According characteristic curve		
1481	Starting speed	0 – 100	100		%
1482	Pump speed min	P1485 – P1483	50		%
1483	Pump speed max	P1482 – P1486	100		%
1485	Pump speed min OEM	0 – P1482	50		%
1486	Pump speed max OEM	P1483 – 100	100		%
1488	Curve readj. at 50% speed	0 – 100	33		%
1489	Filter time const. speed ctrl.	0 – 20	5		Min.
1490	Flow setp. readj. speed ctrl.	No, Yes	Yes		
1498	Operating level changeover	Frost protection, Reduced, Comfort	Reduced		
1500	Optgmode changeover	None, Protection, Reduced, Comfort, Automatic	Protection		

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DHW					
1600	DHW Operating Mode	Off, On, Eco	On		-
1610	Nominal setpoint	P1612 – P1614	55	60	°C
1612	Reduced setpoint	8 – P1610	40		°C
1614	Nominal setpoint max	P1610 – 80	65		°C
1620	Release	24h/day, Heating program with forward shift, time switch program 4	Heating programs with shift		-
1630	Charging priority	Absolute, shifting, none, shifting, absolute	Shifting,		-
1640	Legionella function	Off, periodically, fixed weekday	Fixed weekday		-
1641	Legionella func. periodically	1 – 7	3		Days
1642	Legionella func. weekday	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	Monday		
1644	Legionella funct. Time	----/00:00 – 23.50	----		hh:mm
1645	Legionella funct. Setpoint	55 – 95	65		°C
1646	Legionella funct. Duration	---/10 – 360	30		Min.
1647	Legionella funct. circ pump	Off – On	On		-
1660	Circulating pump release	Time switch program 3, DHW release, Time switch program 4, time switch program 5	DHW release		-
1661	Circulating pump cycling	Off, On	On		-
1663	Circulating setpoint	8 – 80	45		°C
1680	Optg. Mode changeover	None, Off, On	Off		
Consumer Circuit 1					
1859	Flow temp. setp. cons. request	8 – 120	70		°C
1874	DHW charging priority	Yes, No	Yes		
1875	Excess heat draw	Off, On	On		
1878	With Buffer	No, Yes	Yes		
1880	With prim. Contr./system pump	No, Yes	Yes		
Consumer Circuit 2					
1909	Flow temp. setp. cons. request	8 – 120	70		°C
1924	DHW charging priority	Yes, No	Yes		
1925	Excess heat draw	Off, On	On		
1928	With Buffer	No, Yes	Yes		
1930	With prim. Contr./system pump	No, Yes	Yes		
Swimming pool Circuit					
1959	Flow temp. setp. cons. request	8 – 120	70		°C
1947	DHW charging priority	Yes, No	Yes		
1945	Excess heat draw	Off, On	On		
1948	With Buffer	No, Yes	Yes		
1980	With prim. Contr./system pump	No, Yes	Yes		
Swimming pool					
2055	Setpoint solar heating	8 – 80	26		°C
2056	Setpoint source heating	8 – 80	22		°C
2065	Charging priority solar	Priority 1, Priority 2, Priority 3	Priority 3		
2070	Swimming pool temp max	P2055 – 95	32		°C
2080	With solar integration	No, Yes	Yes		
Primary contr./system pump					
2110	Flow temp. setpoint min	8 – P2111	8		°C
2111	Flow temp. setpoint max	P2110 – 95	80		°C
2121	Syst. Pump on heat gen. lock	Off, On	Off		

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2130	Mixing valve boost	0 – 50	10		°C
2132	Actuator type	Two position, Three position	Three position		
2133	Switching differential 2-pos.	0 – 20	2		°C
2134	Actuator running time	30 – 873	120		S
2135	Mixing valve Xp	1 – 100	32		°C
2136	Mixing valve Tn	10 – 873	120		S
2150	Primary contr./system pump	Up stream of buffer, Downstream from buffer	Downstream from buffer		-
Boiler					
2203	Release below outside temp.	---/-50 – 50	0		°C
2208	Full charging buffer	Off, On	Off		
2210	Setpoint min	P2211 – P2214	10		°C
2211	Setpoint min OEM	8 – P2210	40		°C
2212	Setpoint max	P2214 – P2213	90		°C
2213	Setpoint max OEM	P2212 – 120	85		°C
2214	Setpoint manual control	P2210 – P2212	70		°C
2217	Setpoint frost protection	---/-20 – 20	8		°C
2233	P-band Xp HCs	1 – 200	52		°C
2234	Int action time Tn HCs	4 – 873	80		S
2235	Der action time Tv HCs	0 – 30	0		S
2236	P-band Xp DHW	1 – 200	34		°C
2237	Int action time Tn DHW	4 – 873	80		S
2238	Der action time Tv DHW	0 – 30	8		S
2241	Burner running time min	0 – 20	0		Min.
2243	Burner off time min	0 – 20	3		Min.
2245	SD burner off time	0 – 80	15		°C
2250	Pump overrun time	0 – 240	5		Min.
2253	Pump over. time after DHW	0 – 20	1		Min.
2260	Prot. boiler startup consumers	Off, On	Off		
2263	Setpoint min boiler Switch Off	Off, On	Off		
2264	Prot. boiler startup anticipation	0 – 240	0		S
2270	Return setpoint min	P2270 – 95	8		°C
2271	Return setpoint min OEM	8 – P2270	8		°C
2272	Return influence consumers	Off, On	On		
2300	Frost protection boiler plant	Off, On	Off		
2301	Boiler pump on heat gen. lock	Off, On	Off		
2305	Impact heat generation lock	Heating mode only, Heating and DHW mode	Heating mode only		
2310	Limit thermostat function	Off, On	On		
2316	Temp. differential max	----/0 – 80	----		°C
2317	Temp. differential nominal	----/0 – 80	16		°C
2320	Pump modulation	None, Demand, Boiler setpoint, Temp differential Nominal, Burner output	Temp Differential Nominal		
2321	Starting speed	----/0 – 100	100		
2322	Pump speed min	P2327 – P2323	80		
2323	Pump speed max	P2322 – P2328	100		
2324	Speed Xp	1 – 200	32		°C
2325	Speed Tn	10 – 873	120		S
2326	Speed Tv	0 – 30	10		S

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2327	Pump speed min OEM	0 – P2322	40		
2328	Pump speed max OEM	P2323 – 100	100		
2329	Pump setpoint reduction	0 – 20	10		°C
2330	Output nominal	0 – 2000	25		kW
2331	Output basic stage	0 – 2000	5		kW
2334	Output at pump speed min	0 – 100	0		%
2335	Output at pump speed max	0 – 100	100		%
2441	Fan speed heating max	P9525 – P9530	6900		$Min.^{-1}$
2442	Fan speed full charging max	P9525 – P9530	6900		$Min.^{-1}$
2443	Fan sp. start value inst. DHW	0 – P9530	0		$Min.^{-1}$
2444	Fan speed DHW max	----/P9525 – P9530	---		$Min.^{-1}$
2445	Fan shutdown heating mode	Off, On	Off		
2446	Fan shutdown delay	0 -0200	3		S
2450	Controller delay	Off, Heating mode only, DHW mode only, Heating and DHW mode	Off		
2452	Controller delay speed	P9525 – P9530	2400		$Min.^{-1}$
2453	Controller delay duration	0 – 255	10		S
2454	Switching diff on HCs	0 – 20	4		°C
2455	Switching diff off min HCs	0 – 20	4		°C
2456	Switching diff off max HCs	0 – 20	4		°C
2457	Settling time HCs	0 – 240	10		Min.
2460	Switching diff on DHW	0 – 20	0		°C
2461	Switching off min DHW	0 – 20	5		°C
2462	Switching off max DHW	0 – 20	5		°C
2463	Settling time DHW	0 – 240	10		Min.
2464	Dyn SD on setpoint	Off, On	Off		
2465	Min setpoint change dyn SD	0 – 80	20		°C
2466	Dyn SD with HC/DHW change	Off, On	Off		
2467	Dyn SD when burner on	Off, On	On		
2470	Delay heat req special op.	0 – 600	0		S
2473	Flue gas temp output red	0 – 200	95		°C
2474	Flue gas temp switch-off limit	0 – 200	100		°C
2476	Flue gas superv. Shutdown	Start pre-ventilation, Lockout position	Lockout position		
2477	Flue gas superv. st. prev. time	10 – 218	10		Min.
2478	Flue gas temp output limit	0 – 200	80		°C
2479	Fl'gsuperv. time con rel mod	0 – 50	0		S
2480	Static press superv. sh'down	Start preventilation, Lockout position	Lockout position		
2490	Dyn press superv. sh'down	Start preventilation, Lockout position	Lockout position		
2491	Dynsuperv. press diff min	0 – 5	0		Bar
2492	Dynsuperv. press diff max	0 – 5	5		Bar
2494	Dynsuperv. press increase	No, Yes	Yes		
2495	Dyn press superv time	0 – 10	0.2		S
2630	Auto deaeration procedure	Off, On	Off		
Cascade					
3510	Lead Strategy	[Late on, Early off], [Late on, late off], [Early on, late off]	Late on, Late off		
3511	Output ban min	0 – P3512	40		%
3512	Output ban max	P3511 – 100	90		%
3530	Release integral source seq.	0 – 500	50		°C*min.

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3531	Reset integral source seq.	0 – 500	20		°C*min.
3532	Restart lock	0 – 1800	300		S
3533	Switch on delay	0 – 120	5		Min.
3534	Forced time basic stage	0 – 1200	60		S
3540	Auto source seq. ch'over	----/10 – 990	500		H
3541	Auto source seq. exclusion	None, First producer, last producer, first and last producer	None		
3544	Leading source	Producer 1, Producer 2, Producer 3, Producer 4, Producer 5, Producer 6, Producer 7, Producer 8, Producer 9, Producer 10, Producer 11, Producer 12, Producer 13, Producer 14, Producer 15, Producer 16	Producer 1		
3560	Return setpoint min	P3561 – 95	8		°C
3561	Return setpoint min OEM	8 – P3560	8		°C
3562	Return influence consumers	Off, On	On		
3590	Temp differential min	----/0 - 20	---		°C
Buffer Storage Tank					
4720	Auto generation lock	None, With B4, With B4 and B42/B41	With B4		-
4721	Auto heat gen lock SD	0 – 20	8		°C
4722	Temp diff buffer/HC	-20 – 20	-5		°C
4724	Min st tank temp heat mode	----/8 – 95	----		°C
4750	Charging temp max	8 – P4751	80		°C
4751	Storage tank temp max	P4750 – 95	90		°C
4755	Re-cooling temp	8 – 95	60		°C
4756	Re-cooling DHW/HCs	Off, On	Off		
4757	Re-cooling collector	Off, Summer, Always	Off		
4783	With solar integration	None, Yes	None		
4790	Temp diff on return div	P4791 – 40	10		°C
4791	Temp diff off return div	0 – P4790	5		°C
4795	Compar temp return div	Buffer sensor B4, Buffer sensor B41, Buffer sensor B41	With B42		
4796	Optg. action return diversion	Return temp setback, Return temp rising	Return temp rising		
4800	Partial charging setpoint	----/8 – 95	----		°C
4810	Full charging	Off, Heating mode, Always	Off		
4811	Full charging temp min	8 – 80	8		°C
4813	Full charging sensor	With B4, With B42/B41	With B42/B41With B42/B41		
DHW Storage Tank					
5010	DHW charging	Once/day, Several times/day	Several times/day		
5011	DHW forward shift charge	---/00:30 – 04:00	----		H
5012	DHW forced charging	Off, On	On		
5020	Flow setpoint boost	0 – 30	16		°C
5021	Transfer boost	0 - 30	8		°C
5022	Type of charging	Recharging, full charging, full charging legio, full charging first time of day, full charging first time Legio	Full charging		
5024	Switching diff	0 – 20	5		°C
5030	Charging time limitation	----/10 – 600	150		Min.

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5040	Discharging protection	Off, Always, Automatically	Automatically		
5050	Charging temp max	8 – P5051	80		°C
5051	Storage tank temp max	P5050 – 95	90		°C
5055	Storage tank return cooling	8 – 95	80		°C
5056	Storage tank return cooling producer/HC	Off – On	Off		-
5057	Storage tank return cooling Collector	Off, summer, always	Off		-
5060	El imm heater optg mode	Backup mode, summer only, always	Backup mode		-
5061	El immersion heater release	24h/day, DHW release, time switch program 4	DHW release		-
5062	Ei immersion heater control	External thermostat, DHW sensor	DHW sensor		-
5070	Automatic push	OFF, ON	On		
5071	Charging prio time push	0 – 120	0		Min.
5085	Excess heat draw	Off – On	On		-
5090	With Buffer	No - Yes	No		
5092	With prim contr/system pump	No, Yes	No		
5093	With solar integration	No, Yes	Yes		
5101	Pump speed min	P5106 – P5102	40		%
5102	Pump speed max	P5101 – P5107	100		%
5103	Speed Xp	1 – 100	32		°C
5104	Speed Tn	10 – 873	120		S
5015	Speed Tv	0 – 60	0		S
5016	Pump speed min OEM	0 – P5101	40		%
5107	Pump speed max OEM	P5102 – 100	100		%
5108	Starting speed charg pump	----/0 – 100	100		%
5109	St. speed intermcirc pump	----/0 – 100	100		%
5130	Transfer strategy	Off, Always, DHW release	Always		
5131	Comparison temp transfer	DHW sensor B3, DHW sensor B31	DHW sensor B3		
5139	Intermcirc boost recharging	0 – 10	2		°C
5140	Intermediate circuit boost	0 – 10	2		°C
5141	Excess intern circuit temp max	2 – 20	2		°C
5142	Flow setp. compensation delay	----/0 – 60	30		S
5143	Flow setp. compensation Xp	1 – 100	24		°C
5144	Flow setp. compensation Tn	10 – 873	120		S
5145	Flow setp. compensation Tv	0 – 60	0		S
5146	Full charging with B36	No, Yes	Yes		Min.
5148	Min start temp diff Q33	----/-20 – 20	0		°C
5151	Excess intermcirc temp delay	0 - 255	30		S
Instantaneous Water Heater					
5420	Flow setpoint boost	0 - 30	16		°C
5429	Switching Off	0 - 20	5		°C
5441	Flow Measurement	None, With input H4	None		
5444	Threshold flow detection	0.1 - 25.5	5		l/min
5445	Switching diff flow detection	0.1 – 25.5	0.5		l/min
5450	Gradient end cons	-2 – 1.98	0.25		K/s
5451	Gradient start cons keep hot	-2 – 0	-1		K/s
5452	Gradient start cons	-2 – 0	-1		K/s
5455	Setp readjust cons 40°C	-20 – 20	0		°C
5456	Setp readjust cons 60°C	-20 – 20	0		°C
5460	Setpoint keep hot	---/10 – 60	50		°C

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5461	Readjust setp keep hot 40°C	-20 – 20	0		°C
5462	Readjust setp keep hot 60°C	-20 – 20	0		°C
5464	Keep hot release	24h/day, DHW release, Time program 3,Time prog 4, Time prog 5	DHW release		
5468	Min cons time keep hot	0 – 60	5		s
5470	Keep hot time without Heating	0 – 1440	10		Min.
5471	Keep hot time with Heating	0 – 30	5		Min.
5472	Pump overrun time keep hot	0 – 255	20		Min.
5473	Pump overrun time keep hot	0 – 59	0		s
5475	Control sensor keep hot	Boiler sensor B2, Return sensor B7, DHW outlet sensor B38	Boiler sensor B2		
5482	Flow switch time cons	0 – 10	0		s
5489	Overrun Via InstWH	Off, On	On		
5530	Pump speed Min	40 – See 5531	40		%
5531	Pump Speed Max	See 5530 - 100	100		%
5537	Starting Speed	---/0 – 100	100		%
5550	Aqua Booster	No, Yes, Yes WO gradient detection	No		
Configuration					
5700	Presetting	Changed, Unchanged	Changed		-
5710	Heating circuit 1	Off, On	On		-
5711	Cooling circuit 1	Off, 4-pipe system cooling	Off		
5715	Heating circuit 2	Off, On	Off		-
5721	Heating circuit 3	Off, On	Off		-
5730	DHW sensor	DHE sensor B3, Thermostat, DHW outlet sensor B38	DHW Sensor B3		-
5731	DHW controlling element	No charging request, charging pump, diverting valve	Diverting Valve		-
5732	Pump off change div valve	0 – 10s	0		S
5733	Delay pump off	0 – 10s	0		S
5734	Basic position DHW div valve	Last request, Heating circuit, DHW	DHW		-
5736	DHW separate circuit	Off, On	Off		-
5737	Optg action DHW div valve	Position on DHW, Position on heating circuit	Position on DHW		-
5738	Mid-position DHW div Valve	Off, On	Off		-
5774	Ctrl boiler pump/DHW valve	All requests, Request HC1/DHW only	All requests		-
5775	Boiler pump with DHW	On, Off	On		-
5840	Solar controlling element	Charging pump, Diverting valve	Charging Pump		-
5841	External solar charger	Jointly, DHW storage tank, Buffer storage tank	Jointly		-
5870	Combi storage tank	No, Yes	No		-

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5890	Relay output QX1	None, Circulating pump Q4, El imm heater DHWK6, Collector pump Q5, Cons circuit pump VK1 Q15, Boiler pump Q1, Bypass pump Q12, Alarm output K10, 2nd pump speed HC1 Q21, 2nd pump speed HC2 Q22, 2nd pump speed HC3 Q23, Heat circuit pump HC3 Q20, Cons circuit pump VK2 Q18, System pump Q14, Heat gen shutoff valve Y4, solid fuel boiler pump Q10, Time program 5 K13, Buffer return valve Y15, Solar pump extexch K9, Solar ctrl elem buffer K8, Solar ctrl elemswi pool K18, Swimming pool pump Q19, Cascade pump Q25, St tank transfer Q11, DHW mixing pump Q35, DHW intermcirc pump Q33, Heat request K27, Refrigeration request K28, Heat circuit pump HC1 Q2, Heat circuit pump HC2 Q6, DHW ctrl elem Q3, Instant heater ctrl elem Q34, Water filling K34, 2nd boiler pump speed Q27, Status output K35, Status information K36, Flue gas damper K37, Fan shutdown K38, dT controller 1 K21, dT controller 2 K22	Boiler Pump Q1		-
5891	Relay output QX2	See Para 5890	None		-
5892	Relay output QX3	See Para 5890	DHW ctrl elem Q3		-
5894	Relay output QX4	None, Heat gen shutoff valve Y4, Buffer return valve Y15, Solar ctrl elem buffer K8, Solar ctrl elemswi pool K18, DHW ctrl elem Q3, Instant heat ctrl elem Q34	None		-
5930	Sensor input BX1	None, DHW sensor B32, Collector sensor B6, DHW circulation sensor B39, Buffer sensor B4, Buffer sensor B41, Flue gas temp sensor B8, Segment flow sensor B10, Solid fuel boiler sensor B22, DHW charging sensor B36, Buffer sensor B42, Segment return sensor B73, Cascade return flow sensor B70, Pool sensor B13, Solar flow sensor B63, Solar return sensor B64, Primary exch sensor B26	Flue gas temp sensor B8		-
5931	Sensor input BX2	See Para 5930	None		-
5932	Sensor input BX3	See Para 5930	None		-

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5950	Function of Input H1	None, Optg mode change HCs + DHW, Optgmode changeover DHW, Optgmode changeover HCs, Opt mode changeover HC1, Opt changeover HC2, Opt changeover HC3, Heat generation lock, Error/alarm message, Consumer request VK1, consumer request VK2, release swi pool source heat, Excess heat discharge, release swi pool solar, Operating level DHW, Operating level HC1, Operating level HC2, Operating level HC3, Room thermostat HC1, Room thermostat HC2, Room thermostat HC3, DHW flow switch, DHW thermostat, Pulse count, Check sign flue gas damper, Start prevention, Boiler flow switch, Boiler pressure switch, Consumer request VK1 10V, Consumer request VK2 10V, Pressure measurement 10V, Output request 10V	Boiler pressure switch		-
5951	Contact Type H1	Normal closed, Normal Open	Normal Open		-
5953	Voltage value 1 H1	0 – 10	0		Volts
5954	Function value 1 H1	-1000 – 5000	0		-
5955	Voltage value 2 H1	0 – 10	0		Volts
5956	Function value 2 H1	-1000 – 5000	0		-
5960	Function input H3	None, Optg mode change HCs + DHW, Optgmode changeover DHW, Optgmode changeover HCs, Opt mode changeover HC1, Opt changeover HC2, Opt changeover HC3, Heat generation lock, Error/alarm message, Consumer request VK1, consumer request VK2, release swi pool source heat, Excess heat discharge, release swi pool solar, Operating level DHW, Operating level HC1, Operating level HC2, Operating level HC3, Room thermostat HC1, Room thermostat HC2, Room thermostat HC3, DHW flow switch, DHW thermostat, Pulse count, Checkb sign flue gas damper, Start prevention, Boiler flow switch, Boiler pressure switch, Consumer request VK1 10V, Consumer request VK2 10V, Pressure measurement 10V, Output request 10V	None		-
5961	Contact type H3	Normal closed, Normal open	Normal open		-
5963	Voltage value 1 H3	0 – 10	0		Volts
5964	Function value 1 H3	-1000 – 5000	0		-

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5965	Voltage value 2 H3	0 – 10	0		Volts
5966	Function value 2 H3	-1000 – 5000	0		-
5970	Function input H4	None, Optg mode change HCs + DHW, Optgmode changeover DHW, Optgmode changeover HCs, Opt mode changeover HC1, Opt changeover HC2, Opt changeover HC3, Heat generation lock, Error/alarm message, Consumer request VK1, consumer request VK2, release swi pool source heat, Excess heat discharge, release swi pool solar, Operating level DHW, Operating level HC1, Operating level HC2, Operating level HC3, Room thermostat HC1, Room thermostat HC2, Room thermostat HC3, DHW flow switch, DHW thermostat, Pulse count, Checkb sign flue gas damper, Start prevention, Boiler flow switch, Boiler pressure switch, Consumer request VK1 10V, Consumer request VK2 10V, Pressure measurement 10V, Output request 10V	None		-
5971	Contact type H4	Normal closed, Normal open	Normal open		-
5973	Frequency value 1 H4	0 – 1000	0		-
5974	Function value 1 H4	-1000 - 5000	0		-
5975	Frequency value 2 H4	0 – 1000	0		-
5976	Function value 2 H4	-1000 - 5000	0		-
5977	Function input H5	None, Optg mode change HCs + DHW, Optgmode changeover DHW, Optgmode changeover HCs, Opt mode changeover HC1, Opt changeover HC2, Opt changeover HC3, Heat generation lock, Error/alarm message, Consumer request VK1, consumer request VK2, release swi pool source heat, Excess heat discharge, release swi pool solar, Operating level DHW, Operating level HC1, Operating level HC2, Operating level HC3, Room thermostat HC1, Room thermostat HC2, Room thermostat HC3, DHW flow switch, DHW thermostat, Pulse count, Checkb sign flue gas damper, Start prevention, Boiler flow switch, Boiler pressure switch, Consumer request VK1 10V, Consumer request VK2 10V, Pressure measurement 10V, Output request 10V	Room Thermostat HC1		-
5978	Contact type H5	Normal closed, Normal open	Normal open		-

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6008	Function input H6	None, Optg mode change HCs + DHW, Optgmode changeover DHW, Optgmode changeover HCs, Opt mode changeover HC1, Opt changeover HC2, Opt changeover HC3, Heat generation lock, Error/alarm message, Consumer request VK1, consumer request VK2, release swi pool source heat, Excess heat discharge, release swi pool solar, Operating level DHW, Operating level HC1, Operating level HC2, Operating level HC3, Room thermostat HC1, Room thermostat HC2, Room thermostat HC3, DHW flow switch, DHW thermostat, Pulse count, Checkb sign flue gas damper, Start prevention, Boiler flow switch, Boiler pressure switch, Consumer request VK1 10V, Consumer request VK2 10V, Pressure measurement 10V, Output request 10V			-
6009	Contact type H6	Normal closed, Normal open	Normal open		-
6011	Function input H7	None, Optg mode change HCs + DHW, Optgmode changeover DHW, Optgmode changeover HCs, Opt mode changeover HC1, Opt changeover HC2, Opt changeover HC3, Heat generation lock, Error/alarm message, Consumer request VK1, consumer request VK2, release swi pool source heat, Excess heat discharge, release swi pool solar, Operating level DHW, Operating level HC1, Operating level HC2, Operating level HC3, Room thermostat HC1, Room thermostat HC2, Room thermostat HC3, DHW flow switch, DHW thermostat, Pulse count, Check sign flue gas damper, Start prevention, Boiler flow switch, Boiler pressure switch, Consumer request VK1 10V, Consumer request VK2 10V, Pressure measurement 10V, Output request 10V	Boiler flow switch		-
6012	Contact type H7	Normal closed, Normal open	Normal open		-
6020	Function extension module 1	None, Multifunctional, Heating circuit 1, Heating circuit 2, Heating circuit 3, Return temp controller, Solar DHW, Primary contr/system pump	Heating circuit 2		-

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6021	Function extension module 2	None, Multifunctional, Heating circuit 1, Heating circuit 2, Heating circuit 3, Return temp controller, Solar DHW, Primary contr/system pump	None		-
6022	Function extension module 3	None, Multifunctional, Heating circuit 1, Heating circuit 2, Heating circuit 3, Return temp controller, Solar DHW, Primary contr/system pump	None		-
6024	Funct. Input EX21 module 1	None, Limit thermostat HC	None		-
6026	Funct. Input EX21 module 2	None, Limit thermostat HC	None		
6028	Funct. Input EX21 module 3	None, Limit thermostat HC	None		
6030	Relay output QX21 module 1	None, Circulating pump Q4, El imm heater DHW K6, Collector pump Q5, Cons circuit pump VK1 Q15, Boiler pump Q1, Bypass pump Q12, Alarm output K10, 2nd pump speed HC1 Q21, 2nd pump speed HC2 Q22, 2nd pump speed HC3 Q23, Heat circuit pump HC3 Q20, Cons circuit pump VK2 Q18, System pump Q14, Heat gen shutoff valve Y4, Solid fuel boiler pump Q10, Time program 5 K13, Buffer return valve Y15, Solar pump extexch K9, Solar ctrl elem buffer K8, Solar ctrl elemswi pool K18, Swimming pool pump Q19, Cascade pump Q25, St tank transfer pump Q11, DHW mixing pump Q35, DHW intermcirc pump Q33, Heat request K27, Refrigeration request K28, Heat circuit pump HC1 Q2, Heat circuit pump HC2 Q6, DHW ctrl elem Q3, Instant heater ctrl elem Q34, Water filling K34, 2nd boiler pump speed Q27, Status output K35, Status information K36, Fan shutdown K38, dT controller 1 K21, dT controller 2 K22	None		
6031	Relay output QX22 module 1	See Para 6030	None		
6032	Relay output QX23 module 1	See Para 6030	None		
6033	Relay output QX21 module 2	See Para 6030	None		
6034	Relay output QX22 module 2	See Para 6030	None		
6035	Relay output QX23 module 2	See Para 6030	None		
6036	Relay output QX21 module 3	See Para 6030	None		
6037	Relay output QX22 module 3	See Para 6030	None		
6038	Relay output QX23 module 3	See Para 6030	None		

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6040	Sensor input BX21 module 1	None, DHW sensor B31, Collectoe sensor B6, DHW circulation sensor B39, Buffer sensor B4, Buffer sensor B41, Flue gas temp sensor B8, Common flow sensor B10, Solid fuel boiler sensor B22, DHW charging sensor B36, Buffer sensor B42, Common flow sensor B37, buffer return sensor B70, Swimming pool sensor B13, Solar flow sensor B63, Solar return sensor B64, Primary exch sensor B26	None		
6041	Sensor input BX22 module 1	See Para 6040	None		
6042	Sensor input BX21 module 2	See Para 6040	None		
6043	Sensor input BX22 module 2	See Para 6040	None		
6044	Sensor input BX21 module 3	See Para 6040	None		
6045	Sensor input BX22 module 3	See Para 6040	None		
6046	Function input H2 module 1	None, Optg mode change HCs + DHW, Optgmode changeover DHW, Optgmode changeover HCs, Opt mode changeover HC1, Opt changeover HC2, Opt changeover HC3, Heat generation lock, Error/alarm message, Consumer request VK1, consumer request VK2, release swi pool source heat, Excess heat discharge, release swi pool solar, Operating level DHW, Operating level HC1, Operating level HC2, Operating level HC3, Room thermostat HC1, Room thermostat HC2, Room thermostat HC3, DHW flow switch, DHW thermostat, Pulse count, Checkb sign flue gas damper, Start prevention, Boiler flow switch, Boiler pressure switch, Consumer request VK1 10V, Consumer request VK2 10V, Pressure measurement 10V, Output request 10V	None		
6047	Contact type H2 module 1	Normal closed, Normal open	Normal open		
6049	Voltage value 1 H2 module 1	0 - 10	0		Volts
6050	Function value 1 H2 module 1	-1000 - 5000	0		
6051	Voltage value 2 H2 module 1	0 - 10	0		Volts
6052	Function value 2 H2 module 1	-1000 - 5000	0		

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6054	Function input H2 module 2	None, Optg mode change HCs + DHW, Optgmode changeover DHW, Optgmode changeover HCs, Opt mode changeover HC1, Opt changeover HC2, Opt changeover HC3, Heat generation lock, Error/alarm message, Consumer request VK1, consumer request VK2, release swi pool source heat, Excess heat discharge, release swi pool solar, Operating level DHW, Operating level HC1, Operating level HC2, Operating level HC3, Room thermostat HC1, Room thermostat HC2, Room thermostat HC3, DHW flow switch, DHW thermostat, Pulse count, Checkb sign flue gas damper, Start prevention, Boiler flow switch, Boiler pressure switch, Consumer request VK1 10V, Consumer request VK2 10V, Pressure measurement 10V, Output request 10V	None		
6055	Contact type H2 module 2	Normal closed, Normal open	Normal open		
6057	Voltage value 1 H2 module 2	0 - 10	0		Volts
6058	Function value 1 H2 module 2	-1000 - 5000	0		
6059	Voltage value 2 H2 module 2	0 - 10	0		Volts
6060	Function value 2 H2 module 2	-1000 - 5000	0		
6062	Function input H2 module 3	None, Optg mode change HCs + DHW, Optgmode changeover DHW, Optgmode changeover HCs, Opt mode changeover HC1, Opt changeover HC2, Opt changeover HC3, Heat generation lock, Error/alarm message, Consumer request VK1, consumer request VK2, release swi pool source heat, Excess heat discharge, release swi pool solar, Operating level DHW, Operating level HC1, Operating level HC2, Operating level HC3, Room thermostat HC1, Room thermostat HC2, Room thermostat HC3, DHW flow switch, DHW thermostat, Pulse count, Checkb sign flue gas damper, Start prevention, Boiler flow switch, Boiler pressure switch, Consumer request VK1 10V, Consumer request VK2 10V, Pressure measurement 10V, Output request 10V	None		
6063	Contact type H2 module 3	Normal closed, Normal open	Normal open		
6065	Voltage value 1 H2 module 3	0 - 10	0		Volts
6066	Function value 1 H2 module 3	-1000 - 5000	0		

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6067	Voltage value 2 H2 module 3	0 - 10	0		Volts
6068	Function value 2 H2 module 3	-1000 - 5000	0		
6072	Signal output UX	0...10V, PWM	PWM		
6078	Function output UX2	None, Boiler pump Q1, DHW pump Q3, DHW intermcir pump Q33, Heat circuit pump HC1 Q2, Heat circuit pump HC2 Q6, Heat circuit pump HC3 Q20, Collector pump Q5, Solar pump extexch K9, Solar pump buffer K8, Solar pump swi pool K18, Instant heater pump Q34, Solid fuel boiler pump Q10, Bypass pump Q12	None		
6085	Function output P1	See Para 6078	Boiler pump Q1		
6089	Function output UX3	See Para 6078	None		
6097	Sensor type collector	NTC, Pt 1000	NTC		
6098	Readjust collector sensor	-20 - 20	0		°C
6100	Readjust outside sensor	-3.0 - 3.0	0		°C
6101	Sensor type flue gas temp	NTC, Pt 1000, NTC 20k	NTC		
6102	Readjust flue gas sensor	-20 - 20	0		°C
6110	Time constant building	0 - 50	15		H
6116	Time constant setp. compens.	0 - 14	0		Min.
6117	Central setp. compensation	----/1 - 100	5		°C
6118	Setpoint drop delay	----/1 - 200	----		°C
6120	Frost protection plant	Off, /on	Off		-
6127	Pump/valve kick duration	0 - 51	30		S
6140	Water pressure max	----/0.0 - 10.0	3		Bar
6141	Water pressure min	----/0.0 - 10.0	0.8		Bar
6142	Water pressure critical min	----/0.0 - 10.0	0.5		Bar
6143	Water press. switching diff.	0.0 - 10.0	0.3		Bar
6150	Water pressure 2 max	----/0.0 - 10.0	3		Bar
6151	Water pressure 2 min	----/0.0 - 10.0	0.8		Bar
6152	Water pressure 2 critical min	----/0.0 - 10.0	0.5		Bar
6153	water press. 2 switching diff.	0.0 - 10.0	0.3		Bar
6180	Water pressure 3 max	----/0.0 - 10.0	3		Bar
6181	Water pressure 3 min	----/0.0 - 10.0	0.8		Bar
6182	Water pressure 3 critical min	----/0.0 - 10.0	0.5		Bar
6183	Water press. 3 switching diff.	0.0 - 10.0	0.3		Bar
6200	Save sensors	No, Yes	No		-
6204	Save parameters	No, Yes	No		-
6205	Reset to default parameters	No, Yes	No		-
6212	Check no. heat source 1	0 - 199999	12		-
6213	Check no. heat source 2	0 - 199999	0		-
6215	Check no. storage tank	0 - 199999	0		-
6217	Check no. heating circuits	0 - 199999	101		-
6220	Software version	0 - 99	03.5		-
LPB System					
6600	Device address	0 - 16	1		-
6601	Segment address	0 - 14	0		-
6604	Bus power supply function	Off, Automatic	Automatic		-
6605	Bus power supply state	Off, On	On		
6610	Display system message	No, Yes	Yes		-

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6611	Sys message alarm	No, Yes	No		-
6612	Alarm delay	----/2 – 60	----		Min.
6620	Action changeover function	Segment, System	System		-
6621	Summer changeover	Local, Central	Local		-
6623	Optgmode changeover	Local, Central	Central		-
6624	Manual source lock	Local, Own segment	Local		-
6625	DHW assignment	Own controller, All controllers within own segment, All controllers within system	All controllers within system		-
6630	Cascade master	Always, Automatically	Automatically		-
6631	Ext source in Eco mode	Off, On DHW, On	Off		-
6632	Note OT limit ext source	No, Yes	No		-
6640	Clock mode	Autonomously, From BUS slave without remote setting, From BUS slave with remote setting, Controller is clock time master	Autonomously		-
6650	Outside temp source	S0/G1 – S14/G16	S0/G1		-
Fault					
6700	Message	No error, Error 1…….	No Error		-
6705	Internal value of diagnostic code				-
6706	Current value of lockout phase				-
6710	Reset alarm	No, Yes	No		-
6740	Flow temp 1 alarm	----/10 – 240	----		Min.
6741	Flow temp 2 alarm	----/10 – 240	----		Min.
6742	Flow temp 3 alarm	----/10 – 240	----		Min.
6743	Boiler tamp alarm	----/10 – 240	----		Min.
6745	DHW charging alarm	----/1 – 48	----		H
6800	History 1	0 – 65535	-		-
6803	Error code 1	0 – 65535	No error		-
6805	Internal diagnostic code 1	0 – 255	-		-
6806	Burner control phase 1		-		-
6810	History 2	0 – 65535	-		-
6813	Error code 2	0 – 65535	No error		-
6815	Internal diagnostic code 2	0 – 255	-		-
6816	Burner control phase 2		-		-
6820	History 3	0 – 65535	-		-
6823	Error code 3	0 – 65535	No error		-
6825	Internal diagnostic code 3	0 – 255	-		-
6826	Burner control phase 3		-		-
6830	History 4	0 – 65535	-		-
6833	Error code 4	0 – 65535	No error		-
6835	Internal diagnostic code 4	0 – 255	-		-
6836	Burner control phase 4		-		-
6840	History 5	0 – 65535	-		-
6843	Error code 5	0 – 65535	No error		-
6845	Internal diagnostic code 5	0 – 255	-		-
6846	Burner control phase 5		-		-
6850	History 6	0 – 65535	-		-
6853	Error code 6	0 – 65535	No error		-
6855	Internal diagnostic code 6	0 – 255	-		-

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6856	Burner control phase 6		-		-
6860	History 7	0 – 65535	-		-
6863	Error code 7	0 – 65535	No error		-
6865	Internal diagnostic code 7	0 – 255	-		-
6866	Burner control phase 7		-		-
6870	History 8	0 – 65535	-		-
6873	Error code 8	0 – 65535	No error		-
6875	Internal diagnostic code 8	0 – 255	-		-
6876	Burner control phase 8		-		-
6880	History 9	0 – 65535	-		-
6883	Error code 9	0 – 65535	No error		-
6885	Internal diagnostic code 9	0 – 255	-		-
6886	Burner control phase 9		-		-
6890	History 10	0 – 65535	-		-
6893	Error code 10	0 – 65535	No error		-
6895	Internal diagnostic code 10	0 – 255	-		-
6896	Burner control phase 10		-		-
6900	History 11	0 – 65535	-		-
6903	Error code 11	0 – 65535	No error		-
6905	Internal diagnostic code 11	0 – 255	-		-
6906	Burner control phase 11		-		-
6910	History 12	0 – 65535	-		-
6913	Error code 12	0 – 65535	No error		-
6915	Internal diagnostic code 12	0 – 255	-		-
6916	Burner control phase 12		-		-
6920	History 13	0 – 65535	-		-
6923	Error code 13	0 – 65535	No error		-
6925	Internal diagnostic code 13	0 – 255	-		-
6926	Burner control phase 13		-		-
6930	History 14	0 – 65535	-		-
6933	Error code 14	0 – 65535	No error		-
6935	Internal diagnostic code 14	0 – 255	-		-
6936	Burner control phase 14		-		-
6940	History 15	0 – 65535	-		-
6943	Error code 15	0 – 65535	No error		-
6945	Internal diagnostic code 15	0 – 255	-		-
6946	Burner control phase 15		-		-
6950	History 16	0 – 65535	-		-
6953	Error code 16	0 – 65535	No error		-
6955	Internal diagnostic code 16	0 – 255	-		-
6956	Burner control phase 16		-		-
6960	History 17	0 – 65535	-		-
6963	Error code 17	0 – 65535	No error		-
6965	Internal diagnostic code 17	0 – 255	-		-
6966	Burner control phase 17		-		-
6970	History 18	0 – 65535	-		-
6973	Error code 18	0 – 65535	No error		-
6975	Internal diagnostic code 18	0 – 255	-		-
6976	Burner control phase 18		-		-
6980	History 19	0 – 65535	-		-
6983	Error code 19	0 – 65535	No error		-

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6985	Internal diagnostic code 19	0 – 255	-		-
6986	Burner control phase 19		-		-
6990	History 20	0 – 65535	-		-
6993	Error code 20	0 – 65535	No error		-
6995	Internal diagnostic code 20	0 – 255	-		-
6996	Burner control phase 20		-		-
6999	Reset history	No, Yes	No		-
Service / Special Operation					
7040	Burner hours interval	----/10 – 10000	----		H
7041	Burner hrs since maintenance	0 – 10000	0		H
7042	Burner start interval	----/100 – 65500	----		-
7043	Burner start sinc maintenance	0 – 65535	0		-
7044	Maintenance interval	----/1 – 240	----		Months
7045	Time since maintenance	0 – 240	0		Months
7050	Fan speed threshold for service	0 – 10000	0		Min^{-1}
7051	Ionization current service message	No, Yes	No		-
7130	Chimney sweep function	Off, On	Off		-
7131	Chimney sweep burner output	Low fire, High fire, Max heating load	Max heating load		-
7140	Manual operation	Off, On	Off		-
7143	Controller stop function	Off, On	Off		-
7145	Controller stop setpoint	0 – 100	0		%
7146	Deaeration function	Off, On	Off		-
7147	Type of ventilation	None, heating circuit continuous, Heating circuit cycled, DHW continuous, DHW cycled	None		-
7165	Forced heat draw DHW	Off, On	Off		-
7170	Telephone customer service	0 – 9	0		-
7250	PStick storage pos	0 – 250	0		-
7251	PStick description				-
7252	PStick command	No operation, Reading from stick, Writing on stick	No operation		-
7253	PStick progress	0 – 100	0		%
7254	PStick status	No stick, Stick ready, Writing on stick, Reading from stick, EMC test active, Writing error, Reading error, Incompatible data set, Wrong stick type, Stick format error, Check data set, Data set disabled, Reading disabled	No stick		

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Input / Output Test					
7700	Relay test	No test, Everything off, Relay output QX1, Relay output QX2, Relay output QX3, Relay output QX4, Relay output QX21 module 1, Relay output QX 22 module 1, Relay output QX23 module 1, Relay output QX21 module 2, Relay output QX22 module 2, Relay output QX23 module 2, Relay output QX21 module 3, Relay output QX22 module 3, Relay output QX23 module 3	No Test		
7713	Output test P1	----/0 – 100	----		%
7714	PWM signal P1	0 – 100	-		%
7716	Output test UX2	----/0 – 100	----		%
7717	Output signal UX2	----/0 – 100	----		
7717 *	Voltage output UX2	----/0 – 10	----		V
7719	PWM output UX2	----/0 – 100	----		%
7724	Output test UX3	----/0 – 100	----		%
7725	Output signal UX3	----/0 – 100	----		
7725 *	Voltage output UX3	----/0 – 10	----		V
7726	PWM output UX3	----/0 – 100	----		%
7730	Outside temp B9	-50 – 50	-		°C
7750	DHW temp B3/B38	0 – 140	-		°C
7760	Boiler temp B2	0 – 140	-		°C
7820	Sensor temp BX1	-28 – 350	-		°C
7821	Sensor temp BX2	-28 – 350	-		°C
7822	Sensor temp BX3	-28 – 350	-		°C
7823	Sensor temp BX4	-28 – 350	-		°C
7830	Sensor temp BX21 module 1	-28 – 350	-		°C
7831	Sensor temp BX22 module 1	-28 – 350	-		°C
7832	Sensor temp BX21 module 2	-28 – 350	-		°C
7833	Sensor temp BX22 module 2	-28 – 350	-		°C
7834	Sensor temp BX21 module 3	-28 – 350	-		°C
7835	Sensor temp BX22 module 3	-28 – 350	-		°C
7840	Voltage signal H1	0 – 10	-		V
7841	Contact state H1	Open, Closed	Open		
7845	Voltage H2 module 1	0 – 10	-		V
7846	Contact state H2 module 1	Open, Closed	Open		
7848	Voltage H2 module 2	0 – 10	-		V
7849	Contact state H2 module 2	Open, Closed	Open		
7851	Voltage H2 module 3	0 – 10	-		V
7852	Contact state H2 module 3	Open, Closed	Open		
7854	Voltage signal H3	0 – 10	-		V
7855	Contact state H3	Open, Closed	Open		
7860	Contact state H4	Open, Closed	Open		
7862	Frequency H4	0 – 2000	-		
7865	Contact state H5	Open, Closed	Open		
7872	Contact state H6	Open, Closed	Open		

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7874	Contact state H7	Open, Closed	Open		
7950	Input EX21 module 1	0V, 230	0		V
7951	Input EX21 module 2	0V, 230	0		V
7952	Input EX21 module 3	0V, 230	0		V
State					
8000	State heating circuit 1	SLT cut out, Fault, Man …….	-		
8001	State heating circuit 2	SLT cut out, Fault, Man …….	-		
8002	State heating circuit 3	SLT cut out, Fault, Man …….	-		
8003	State DHW	SLT cut out, Fault, Man …….	-		
8005	State boiler	SLT cut out, Fault, Man …….	-		
8007	State solar	SLT cut out, Fault, Man …….	-		
8008	State solid fuel boiler	SLT cut out, Fault, Man …….	-		
8009	State burner	SLT cut out, Fault, Man …….	-		
8010	State buffer	SLT cut out, Fault, Man …….	-		
8011	State swimming pool	SLT cut out, Fault, Man …….	-		
Diagnostic Cascade					
8100	Priority/ state source 1	Not available, Fault, Manual control active, Heat generation lock active, Chimney sweep funct active, Temporarily unavailable, utside temp limit active, No released, Released			
8102	Priority/ state source 2	See Para 8100			
8104	Priority/ state source 3	See Para 8100			
8106	Priority/ state source 4	See Para 8100			
8108	Priority/ state source 5	See Para 8100			
8110	Priority/ state source 6	See Para 8100			
8112	Priority/ state source 7	See Para 8100			
8114	Priority/ state source 8	See Para 8100			
8116	Priority/ state source 9	See Para 8100			
8118	Priority/ state source 10	See Para 8100			
8120	Priority/ state source 11	See Para 8100			
8122	Priority/ state source 12	See Para 8100			
8124	Priority/ state source 13	See Para 8100			
8126	Priority/ state source 14	See Para 8100			
8128	Priority/ state source 15	See Para 8100			
8130	Priority/ state source 16	See Para 8100			
8138	Cascade flow temp	0 – 140			°C
8139	Cascade flow temp setp.	0 – 140			°C
8140	Cascade return temp	0 – 140			°C
8141	Cascade return temp setp.	0 – 140			°C
8150	Source seqch'over current	0 – 990			H
Diagnostic Heat Generation					
8304	Boiler pump Q1	Off, On	Off		
8308	Boiler pump speed	0 – 100	-		%
8310	Boiler temp, Control temperature	0 – 140	-		°C
8311	Boiler/Control setpoint	0 – 140	-		°C
8312	Boiler switching point	0 - 140	-		°C

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8313	Switching point DHW operation	None, Boiler sensor B2, Return sensor B7, DHW charging sensor B36, DHW outlet sensor B38, DHW circulation sensor B39, Cascade sensor B10/B70			°C
8314	Boiler return temp	0 – 140	-		°C
8315	Boiler return temp setpoint	0 – 140	-		°C
8316	Flue gas temp	0 – 350	-		°C
8318	Flue gas temp max	0 – 350	-		°C
8321	Primary exchanger temp	0 – 140	0		°C
8323	Fan speed	0 – 10000	-		U/min
8324	Set point fan	0 – 10000	-		U/min
8325	Current fan control	0 – 100	0		%
8326	Burner modulation	0 – 100	-		%
8327	Water pressure	0 – 10	0		Bar
8329	Ionization current	0 – 100	-		µA
8330	Hour run 1st stage	0 – 65535	-		H
8331	Start counter 1st stage	0 – 199999	-		-
8338	Hours run burner	0 – 199999	-		H
8339	Hours run DHW	0 – 199999	-		H
8378	Total gas Heating	0 2147483647	0		kWh
8379	Total gas DHW	0 2147483647	0		kWh
8380	Total gas HC+DHW	0 2147483647	0		kWh
8381	Gas energy heating	0 2147483647	0		kWh
8382	Gas DHW	0 2147483647	0		kWh
8383	Gas HC+DHW	0 2147483647	0		kWh
8390	Current phase number	1 – 21 TNB, TLO, TNN, STY, STV, THL1, THL1A, TV, TBRE, TW1, TW2, TVZ, TSA1, TSA2 TI, MOD, THL2, THL21, TN, SAV, STOE	TNB		
8499	Collector pump 1	Off, On	Off		
8501	Solar ctrl elem buffer	Off, On	Off		
8502	Solar ctrl elemswi pool	Off, On	Off		
8505	Speed collector pump 1	0 – 100	0		%
8506	Speed solar pump extexch	0 – 100	-		%
8507	Speed solar pump buffer	0 – 100	-		%
8508	Speed solar swi pool	0 – 100	-		%
8510	Collector temp 1	-28 – 350	-		°C
8511	Collector temp 1 max	-28 – 350	-28		°C
8512	Collector temp 1 min	-28 – 350	350		°C
8513	dT collector 1/DHW	-168 – 350	-		°C
8514	dT collector 1/buffer	-168 – 350	-		°C
8515	dT collector 1/swimming pool	-168 – 350	-		°C
8519	Solar flow temp	-28 – 350	-		°C
8520	Solar return temp	-28 – 350	-		°C
8526	24-hour yield solar energy	0 – 999.9	-		kWh
8527	Total yield solar energy	0 – 9999999.9	-		kWh
8530	Hours run solar yield	0 – 199999	-		H
8531	Hours run collector overtemp	0 – 199999	-		H
8532	Hours run collector pump	0 – 199999	-		H
8560	Solid fuel boiler temp	0 – 140	-		°C

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8570	Hours run solid fuel boiler	0 – 199999	-		H
Diagnostic Consumer					
8700	Outside temp	-50.0 – 50.0	-		°C
8701	Outside temp min	-50.0 – 50.0	-		°C
8702	Outside temp max	-50.0 – 50.0	-		°C
8703	Outside temp attenuated	-50.0 – 50.0	-		°C
8704	Outside temp composite	-50.0 – 50.0	-		°C
8730	Heating circuit pump 1	Off, On	Off		
8731	Heat circ. Mix valve 1 open	Off, On	Off		
8732	Heat circ. Mix valve 1 close	Off, On	Off		
8735	Speed heating circuit pump 1	0 – 100	0		%
8740	Room temp 1	0.0 – 50.0	-		°C
8741	Room setpoint 1	4.0 – 35.0	-		°C
8742	Room temp 1 model	0.0 – 50.0	-		°C
8743	Flow temp 1	0.0 – 140.0	-		°C
8744	Flow temp setpoint 1	0.0 – 140.0	-		°C
8749	Room thermostat 1	No demand, Demand	No Demand		
8760	Heating circuit pump 2	Off, On	Off		
8761	Heat circ. Mix valve 2 open	Off, On	Off		
8762	Heat circ. Mix valve 2 close	Off, On	Off		
8765	Speed heating circuit pump 2	0 – 100	0		%
8770	Room temp 2	0.0 – 50	-		°C
8771	Room setpoint 2	4.0 – 35	-		°C
8772	Room temp 2 model	0.0 – 50	-		°C
8773	Flow temp 2	0.0 – 140	-		°C
8774	Flow temp setpoint 2	0.0 – 140	-		°C
8779	Room thermostat 2	No demand, Demand	No Demand		
8790	Heating circuit pump 3	Off, On	Off		
8791	Heat circ. Mix valve 3 open	Off, On	Off		
8792	Heat circ. Mix valve 3 close	Off, On	Off		
8795	Speed heating circuit pump 3	0 – 100	0		%
8800	Room temp 3	0.0 – 50	-		°C
8801	Room setpoint 3	4.0 – 35	-		°C
8802	Room temp 3 model	0.0 – 50	-		°C
8803	Flow temp 3	0.0 – 140	-		°C
8804	Flow temp setpoint 3	0.0 – 140	-		°C
8809	Room thermostat 3	No demand, Demand	No Demand		
8820	DHW pump	Off, On	Off		
8825	Speed DHW pump	0 - 100	0		5
8826	Speed DHW interm. circ pump	0 – 100	0		%
8827	Speed inst. DHW Heater pump	0 – 100	0		%
8830	DHW temp 1	0.0 – 140	-		°C
8831	DHW temp setpoint	8.0 – 80	-		°C
8832	DHW temp 2	0.0 – 140	-		°C
8835	DHW circulation temp	0.0 – 140	-		°C
8836	DHW charging temp	0 – 140	-		°C
8852	DHW consumption temp	0 - 140	-		°C
8853	Instant DHW setpoint	0 – 140	-		°C
8860	DHW flow	0 – 30	-		l/min
8875	Flow temp setp. VK1	5 – 130	-		°C
8885	Flow temp setp. VK2	5 – 130	-		°C

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8895	Flow temp setp. swimming pool	5 – 130	-		°C
8900	Swimming pool temp	0 – 140	0		°C
8901	Swimming pool setpoint	8 – 80	24		°C
8930	Primary controller temp	0.0 – 140.0	-		°C
8931	Primary controller setpoint	0.0 – 140.0	-		°C
8950	Common flow temp	0.0 – 140.0	-		°C
8951	Common flow temp setpoint	0.0 – 140.0	-		°C
8952	Common return temp	0 – 140	0		°C
8962	Common output setpoint	0 – 100	0		%
8980	Buffer temp 1	0.0 – 140.0	-		°C
8981	Buffer setpoint	0 – 140	0		°C
8982	Buffer temp 2	0.0 – 140.0	-		°C
8983	Buffer temp 3	0 – 140	0		°C
9005	Water pressure H1	0.0 – 10.0	-		Bar
9006	Water pressure H2	0.0 – 10.0	-		Bar
9009	Water pressure H3	0 – 10	0		Bar
9031	Relay output QX1	Off, On	Off		
9032	Relay output QX2	Off, On	Off		
9033	Relay output QX3	Off, On	Off		
9034	Relay output QX4	Off, On	Off		
9050	Relay output QX21 module 1	Off, On	Off		
9051	Relay output QX22 module 1	Off, On	Off		
9052	Relay output QX23 module 1	Off, On	Off		
9053	Relay output QX21 module 2	Off, On	Off		
9054	Relay output QX22 module 2	Off, On	Off		
9055	Relay output QX23 module 2	Off, On	Off		
9056	Relay output QX21 module 3	Off, On	Off		
9057	Relay output QX22 module 3	Off, On	Off		
9058	Relay output QX23 module 3	Off, On	Off		
Burner Control					
9500	Pre-purge time	0 – 51	10		S
9501	Pre-purge time min	0 – 51	10		S
9504	Required speed pre-purging	200 – 10000	2400		Min^{-1}
9505	Req. speed pre-purging min	200 – 10000	2400		Min^{-1}
9506	Speed tolerance pre-purging	50 – 1200	600		Min^{-1}
9512	Required speed ignition	200 – 10000	2700		Min^{-1}
9513	Required speed ignition max	200 – 10000	2700		Min^{-1}
9514	Speed tolerance ignition	50 – 1200	600		Min^{-1}
9517	Pre-ignition time	0.4 – 1200	1		S
9518	Safety time	1.8 – 9.8	5		S
9519	Safety time with ignition	0.2 – 9.6	4.6		S
9524	Required speed LF	0 – 10000	1250		Min^{-1}
9525	Required speed LF min	0 – 10000	1250		Min^{-1}
9526	Required tolerance LF	50 – 1200	600		Min^{-1}
9529	Required speed HF	0 – 10000	60000		Min^{-1}
9530	Required speed HF max	0 – 10000	60000		Min^{-1}
9531	Required tolerance HF	50 – 1200	600		Min^{-1}
9534	Optg time with ignition load	0.2 – 10	1		S
9540	Post-purge time	0 – 51	5		S
9541	Post-purge time TL max	0 – 10	5		Min

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9542	Post-purge time min	0 – 51	5		S
9544	Post-purge time 2	0.2 – 51	0.2		S
9545	Post-purge in lockout pos	Off, On	Off		
9551	Required speed stop max	0 – 2000	300		Min^{-1}
9610	Capacity	Up to 70kW, Up to 120kW, Above 120kW	Up to 70kW		
9611	LP configuration	LP mode 1, LP mode 2, LP mode 3, LP mode 4, LP mode 5	LP mode 1		
9612	GP configuration	GP not connected, GP connected	GP not connected		
9613	Home run mode	Startup with home run, startup without home run	Startup with home run		
9614	Post-purging level	Run, Pre-purge	Run		
9615	Forced pre-purging on error	Off,On	On		
9616	Max speed	0 – 10000	10000		Min^{-1}
9617	Hall sensor pulse/rev	0 – 6	2		
9618	Ion. Curr. Level extran light	0 – 100	0.61		µA
9619	Ion. Curr. Level flame exting	0 – 100	0.78		µA
9626	Fan output/speed slope	-1000 – 1000	0		
9627	Fan output/speed Y-section	-1500 – 1500	0		
9630	Speed Kp	0 – 15.9375	1.125		
9631	Speed Tn	0 – 600	8		S
9632	Speed Tv	0 – 1.75	0		S
9650	Chimney drying	Off, Temporarily, Permanently	Off		
9651	Req. speed chimney drying	0 – 10000	500		Min^{-1}
9652	Duration chimney drying	10 – 1440	10		Min.

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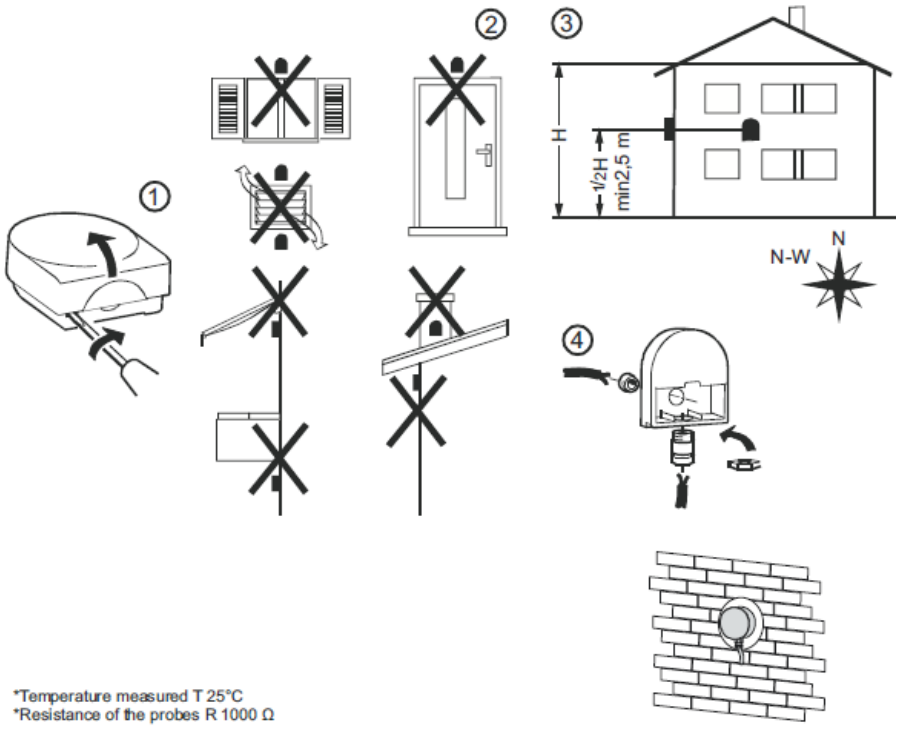
11.2 Weather Compensation Slope

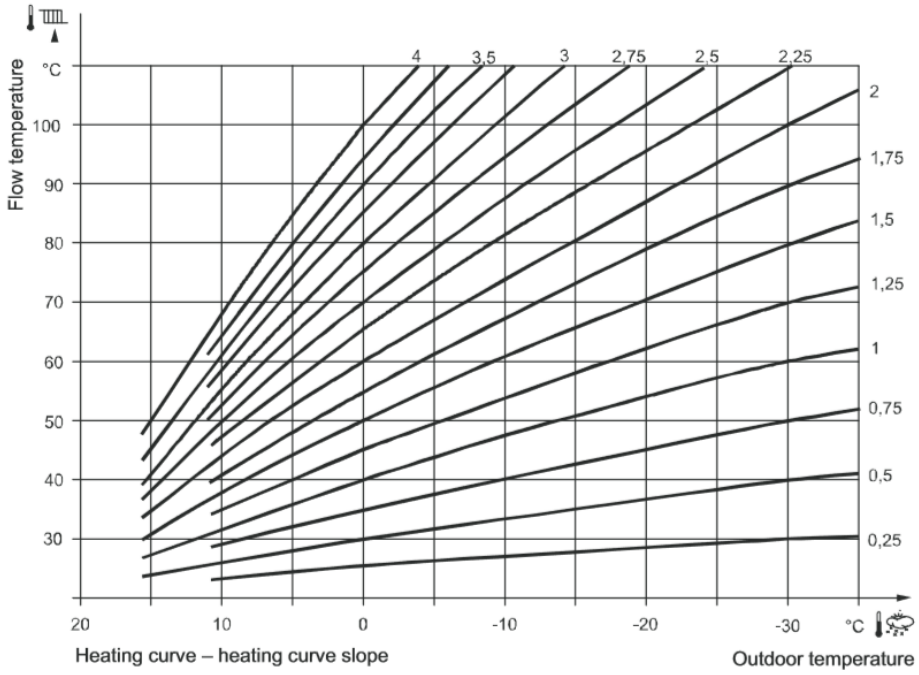


*Temperature measured T 25°C
*Resistance of the probes R 1000 Ω

The correct positioning of the outside temperature sensor is fundamental for the correct operation of the climate control function of the boilers.

The sensor must be installed on a North, North West facing wall and be away from flues, doors, windows and areas exposed to direct sunlight.

The maximum length of cable allowed between the sensor and the controller is 50m



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11.3 Controller Error Codes

Code	Description
10	Outside temperature, sensor error
20	Boiler temperature 1, sensor error
26	Common flow temperature, sensor error
28	Flue gas temperature, sensor error
30	Flow temperature 1, sensor error
32	Flow temperature 2, sensor error
38	Flow temperature, primary controller, sensor error
40	Return temperature 1, sensor error
46	Cascade return temperature, sensor error
47	Common return temperature, sensor error
50	DHW temperature 1 sensor error
52	DHW temperature 2 sensor error
54	Flow temperature DHW, sensor error
57	DHW, circulation sensor error
60	Room temperature 1, sensor error
65	Room temperature 2, sensor error
68	Room temperature 3, sensor error
70	Storage tank temperature 1 (top), sensor error
71	Storage tank temperature 2 (bottom), sensor error
72	Storage tank temperature 3 (center), sensor error
78	Water pressure, sensor error
81	LPB short circuit or no bus power supply
82	LPB address collision
83	BSB wire cross-sectional/no communication
84	BSB wire address collision
85	BSB RF communication error
91	Data overrun in EEPROM
98	Extension module 1, error
99	Extension module 2, error
100	2 clock time masters
102	Clock time master without backup
103	Communication error
105	Maintenance message
109	Supervision boiler temperature
110	STB (SLT) lockout
111	Temperature limiter safety shutdown
117	Water pressure too high
118	Water pressure too low
119	Water pressure switch has cut out
121	Flow temperature heating circuit 1 not reached
122	Flow temperature heating circuit 2 not reached
125	Maximum boiler temperature exceeded
126	DHW charging temperature not reached
127	DHW legionella temperature not reached
128	Loss of flame during operation
129	Wrong air supply
130	Flue gas temperature limit exceeded
132	Gas pressure switch safety shutdown

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133	Safety time for establishment of flame exceeded
146	Configuration error sensor/controlling elements
151	LMS14… error, internally
152	Parameterization error
153	Unit manually locked
160	Fan speed threshold not reached
162	Air pressure switch does not close
164	Flow/pressure switch, heating circuit error
166	Air pressure switch error, does not open
169	Sitherm Pro system error
170	Error water pressure sensor, primary side
171	Alarm contact 1 active
172	Alarm contact 2 active
173	Alarm contact 3 active
174	Alarm contact 4 active
176	Water pressure 2 too high
177	Water pressure 2 too low
178	Temperature limiter heating circuit 1
179	Temperature limiter heating circuit 2
183	Unit in parameterization mode
195	Maximum duration of the refill per charging exceeded
196	Maximum duration of the refill per week exceeded
209	Fault heating circuit
214	Monitoring of motor
215	Fault fan air diverting valve
216	Fault boiler
217	Sensor error
218	Pressure supervision
241	Flow sensor for yield measurement, error
242	Return sensor for yield measurement, error
243	Swimming pool sensor, error
260	217 Flow temperature 3, sensor error
270	215 Temperature difference, heat exchanger too large
317	214 Mains frequency outside permissible range
320	217 DHW charging temperature, sensor error
321	217 DHW outlet temperature, sensor error
322	218 Water pressure 3 too high
323	218 Water pressure 3 too low
324	146 Input BX, same sensors
325	146 Input BX/extension module, same sensors
326	146 Input BX/mixing group, same sensors
327	146 Extension module, same function
328	146 Mixing group, same function
329	146 Extension module/mixing group, same function
330	146 Sensor input BX1 without function
331	146 Sensor input BX2 without function
332	146 Sensor input BX3 without function
333	146 Sensor input BX4 without function
335	146 Sensor input BX21 without function
336	146 Sensor input BX22 without function
339	146 Collector pump Q5 missing

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340	146 Collector pump Q16 missing
341	146 Sensor B6 missing
349	146 Buffer storage tank return valve Y15 missing
350	146 Buffer storage tank address error
351	146 Primary controller/system pump, address error
352	146 Pressure-less header, address error
353	146 Sensor B10 missing
371	209 Flow temperature heating circuit 3
372	209 Temperature limiter heating circuit 3
373	103 Extension module 3
374	169 Sitherm Pro calculation
375	169 BV stepper motor
376	169 Drift test limit value
377	169 Drift test prevented
378	151 Internal repetition
382	129 Repetition speed
384	151 Extraneous light
385	151 Mains under-voltage
386	129 Fan speed tolerance
387	129 Air pressure tolerance
388	146 DHW sensor no function
426	151 Feedback flue gas damper
427	152 Configuration flue gas damper
429	218 Dynamic water pressure too high
430	218 Dynamic water pressure too low
431	217 Sensor primary heat exchanger
432	151 Function earth not connected
433	216 Temperature primary heat exchanger too high

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12.0 Commissioning The Appliance

12.1 Pre-Commissioning Checks

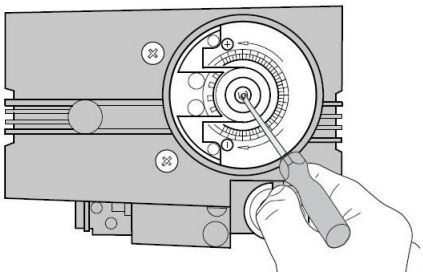
Prior to undertaking the commissioning of the unit please ensure that the system water has been cleansed and treated with a suitable inhibitor as detailed in Filling the system and system water quality.

A tightness test must be carried out from the appliance to the first isolation valve (or further if connected to untested pipe work).

12.2 Combustion System Commissioning

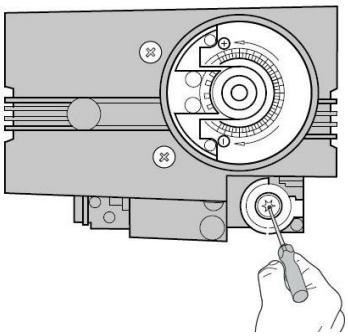
The combustion of the appliance must be commissioned by a suitably qualified engineer using a flue gas analyser.
The following steps must be followed to ensure the correct and complete commissioning of the combustion system has taken place.

1: On completion of a tightness test the boiler must first be fired and tested in Maximum output.
2: To operate the boiler in maximum output the MODE selection butting is to be pressed and held for at least 3 seconds. 'Control functio stop' will appear on the display.
3: Press the INFORMATION button once, the screen will now display the modulation rate of the boiler as %.
4: Adjust the setting to 100% using the NAVIGATION button, then press OK to set.
5: Set the CO2 value by turning the throttle screw shown in the image below.



Anticlockwise adjustment increases the CO2 reading
Clockwise adjustment decreases the CO2 reading

6: Adjustments are to be done in small increments and the combustion allowed to stabalise before re-adjusting.
7: Once the correct CO2 valve has been set at Maximum output press the OK button, the 100% will flash. Use the NAVIGATION button to alter the value to read 0%. Press the OK button to set the boiler into Minimum output.
8: Set the CO2 value by adjusting the zero point screw shown below.



Anticlockwise adjustment decreases the CO2 reading
Clockwise adjustment increases the CO2 reading

9: Adjustments are to be done in small increments and the combustion allowed to stabalise before re-adjusting.
10: Once the correct CO2 valve has been set at Minimum output the controller is returned to normal operation by pressing and holding the MODE selection button for at least 3 seconds.

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A flue gas analyser must be used to ensure that the correct combustion settings are achieved.
This is undertaken by inserting the analyser probe in to plugged hole within the flue collector of the appliance or in the tapping in the flue immediately after the boiler outlet.
The combustion setting required for all Superbox appliances are as detailed in the following tables.

Model		160		500		1000	
		Min.	Max.	Min.	Max.	Max	Min
CO_2 Emissions (G20)	%	9.2	9.4	8.9	9.1	8.9	9.2

Setting Slave Module Using Master Controller

To set the combustion of a slave module within a Superbox boiler the following steps need to be followed;
1: Isolate the boiler electrically and ensure no secondary supplies have been installed.
2: Remove all boiler casing.
3: Remove screws from controller plastic front case of the master control module.
4: Gently pull the front case forwards and away from the boiler.
5: Disconnect the wiring connections from the components mounted to the front case. Place front case to one side.
6:Rrepeat steps 3 to 5 for the Slave module.
7: Attached the wiring for the display module to the LMS controller. Wiring loom with correct plug already fitted.
8: Mount the front case onto the unit. Hold in place with one screw to ensue it can not move while settings are adjusted.
9: Fit the Slave boiler control cover over the Master controller to prevent damage and risk of electrocution.
10: Reinstate power to boiler. Check and set required settings. Once completed re fit controller covers to original positions.

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13.0 Routine Inspection and Servicing

Maintenance should be carried out in the appliance on at least an annual basis dependent on usage. during the servicing of the appliance any faults should be identified and remedied immediately to avoid further damage to the system.
The boiler should be inspected only by a qualified service engineer. in addition, the maintenance and care of the boiler designated and explained on the following pages must be performed to ensure maximum boiler efficiency and reliability. Failure to service and maintain the boiler as detailed could lead to equipment premature failure.

13.1 Maintenance Procedure

During maintenance the following points should be checked and/or part must be inspected and maintained.
Before undertaking any work on the appliance notes and comments from the customer should be taken and investigated if any faults are reported.

Servicing of heat exchanger;

1: Ensure electrical supply to boiler is isolated and made safe. Ensure that gas supply to boiler is isolated.
2: Allow time for the boiler to cool to a safe temperature to handle if it has been firing.
3: Remove the case from the boiler to allow access to the internal components.
4: Disconnect the internal gas pipe from the inlet pipe.
5: Disconnect the earth lead, HT cap and Lead from the ignition electrodes. Also removing rectification lead from probe
6: Disassemble the burner by removing the nuts around the burner door. Pull the burner forward and remove from the heat exchanger. Gently put to one side.
7: Once access has been gained to the combustion chamber and front section of the heat exchanger, inspect heat exchanger for any signs of overheating.
8: Using a NATURAL BRISTLE brush, and some MHG Heating boiler cleaning granules diluted in water, gently clean the heat exchanger ensuring all debris is removed and flushed through to the condensate drain.
9: Remove and clean out condensate syphon. Inspect condensate drain for any signs of leaks. If satisfied re assemble condensate syphon to boiler.
10: Inspect burner and burner door seals. If any signs of damage replace item.
11: Inspect ignition electrode and rectification probes. Replace on an annual basis or as required. Ensure gaskets are replaced along with probes to ensure a tight seal against burner door.
12: Inspect the fan and venturi assembly for any signs of damage or build-up of debris. Use compressed air or a brush to clean the venturi. Ensure the silicone tube between venturi and gas valve is clear and in good condition. If the fan blades have a build-up of debris a brush can be used to clean each blade in turn. Care must be taken to ensure the balance of the fan is not altered by the use of too much force.
13: Reinstall the burner, and burner door to heat exchanger ensuring all seals are intact.
14: Once the boiler is re assembled a gas tightness test must be carried out.
15: A Flue gas analysis must be completed on the completion of the tightness test.

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14.0 Troubleshooting

PROBLEM	REASON	SOLUTION
Smell of gas	Gas supply circuit	Check the tightness of the joints and that the pressure test points are closed
Smell of unburned gas	Flue gas circuit	Check: - The tightness of the joints - The absence of obstructions - The quality of combustion
Irregular combustion	Burner gas pressure	Check adjustment
	Diaphragm installed	Check diameter
	Condition of the burner and exchanger	Check they are clean
	Exchanger openings blocked	Check the openings are clean
	Fan fault	Check operation
Delays in ignition with pulsating operation of the burner	Burner gas pressure	Check adjustment
	Ignition electrode	Check positioning and condition
The boiler becomes dirty in a short time	Combustion	Check flame colour Check combustion adjustments
The burner does not start when recieiving the signal from the boiler controller	Gas valve	Check that 230 V AC is pr esent at the terminals on the gas valve; check wiring and con - nections
The boiler does not start	No power supply (the display is blank)	Check: - electrical connections - fuse
The pump does not start	Pump fault	Reset the pump Replace the pump Check the electrical connections of the pump

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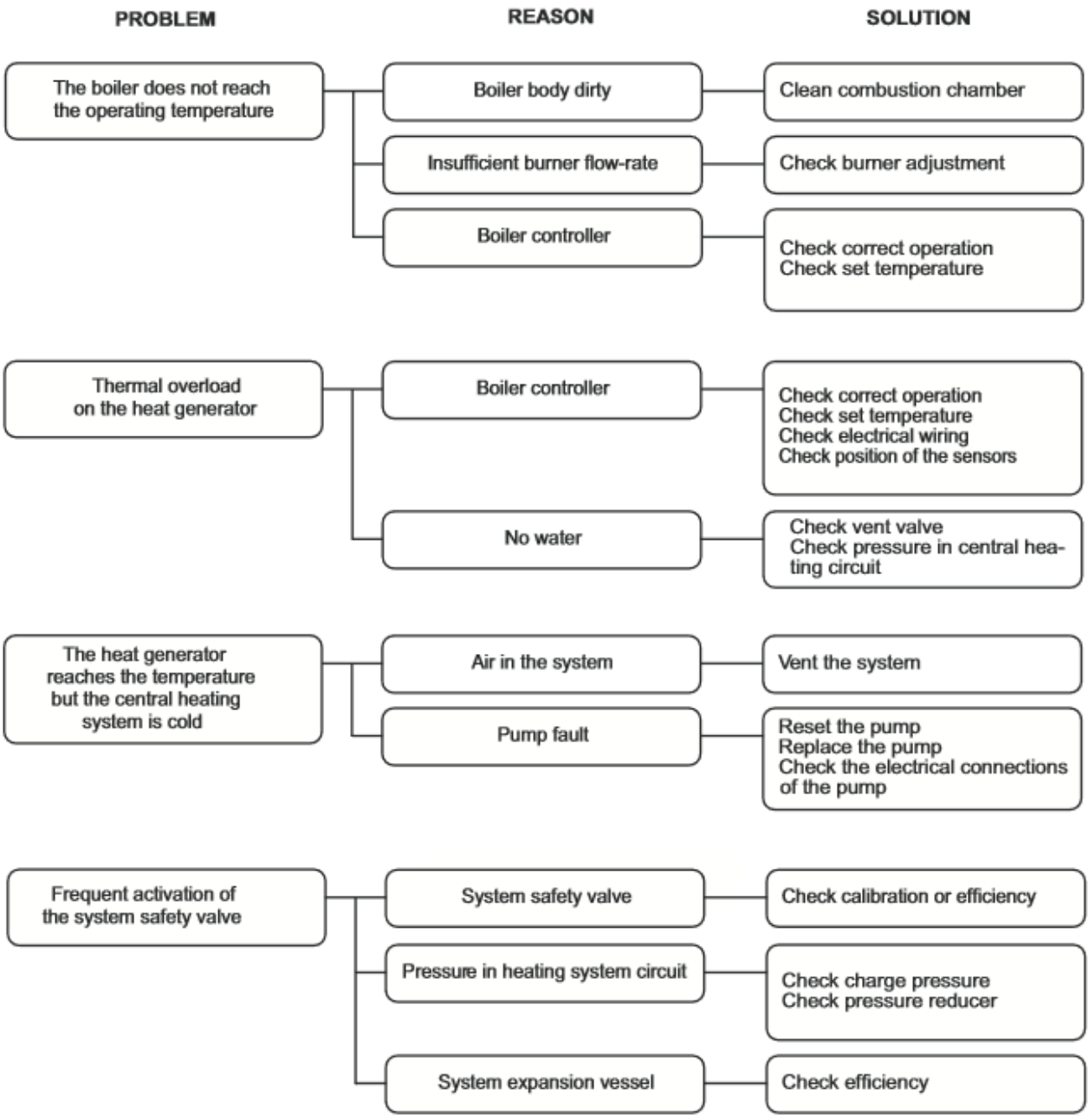
010717



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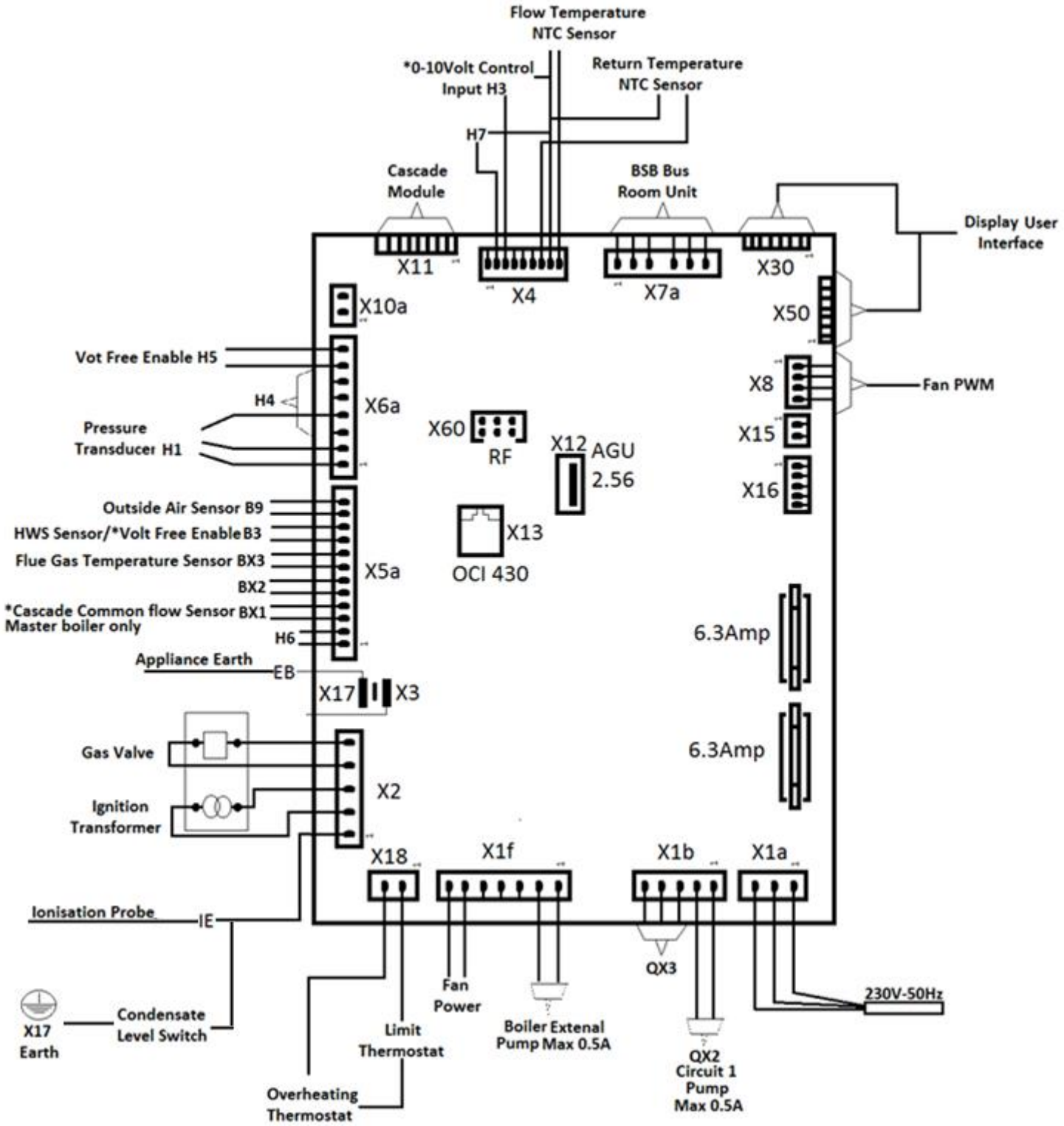
15.0 Internal Wiring Diagram



***Wiring loom and parameter adjustments required**

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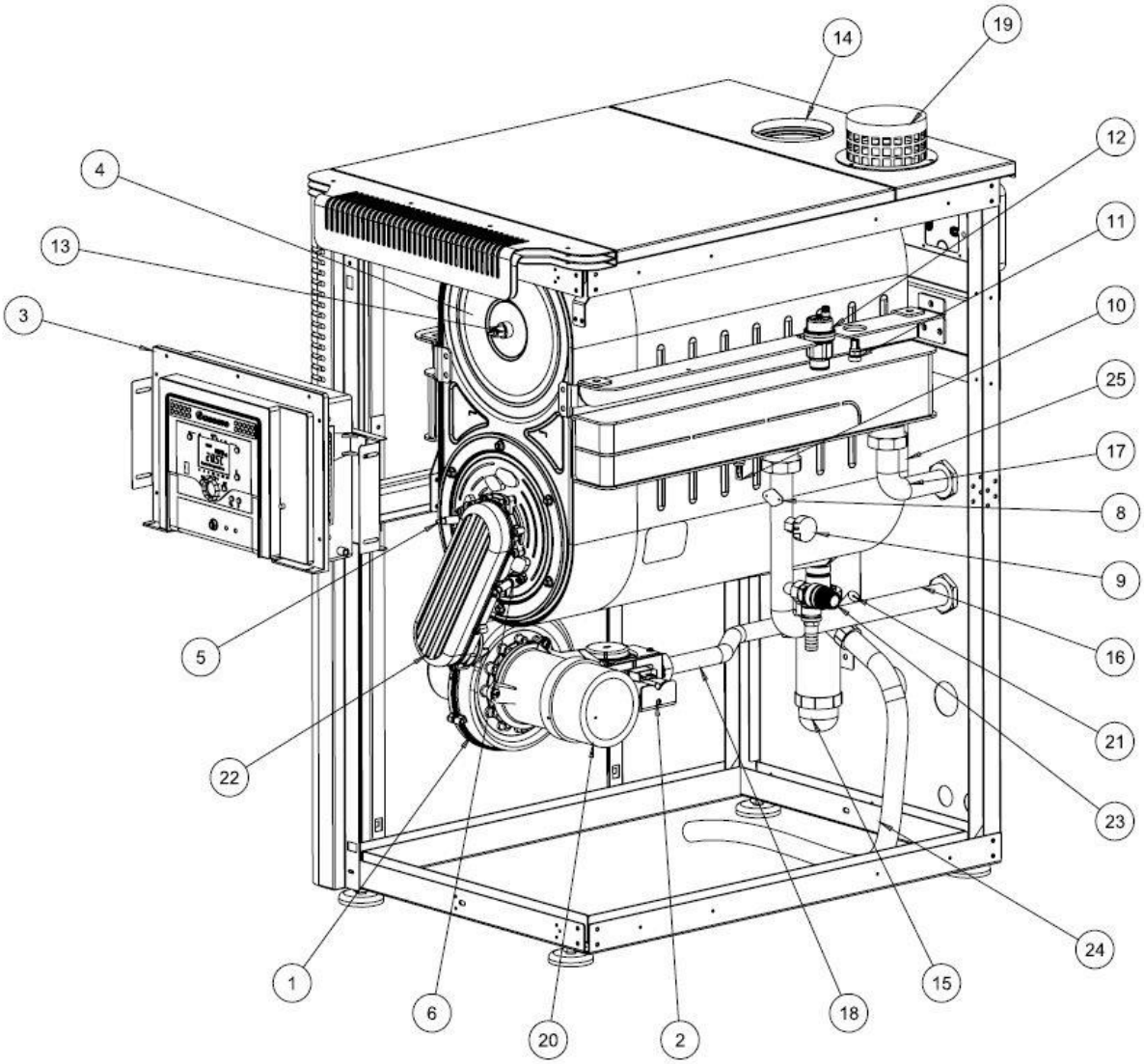
16.0 PartsDiagram Superbox 160



Label Number	Item Description	Label Number	Item Description
1	Combustion Fan	14	Flue Gas Outlet
2	Gas Valve	15	Condensate Syphon
3	Control Panel	16	Boiler Flow
4	Heat Exchanger	17	Boiler Return
5	Ionization Electrode	18	Gas Inlet
6	Ignition Electrode	19	Air Intake
8	Limit Thermostat	20	Venturi
9	Pressure Transducer	21	Condensate Syphon Level Switch
10	Flow temperature Sensor	22	Air Gas Mix Tube
11	Return Temperature Sensor	23	6 bar PRV
12	Automatic Air Vent	24	Condensate Drain Hose
13	Heat Exchanger Overheat Sensor	25	Heat Exchanger Overheat Clixon

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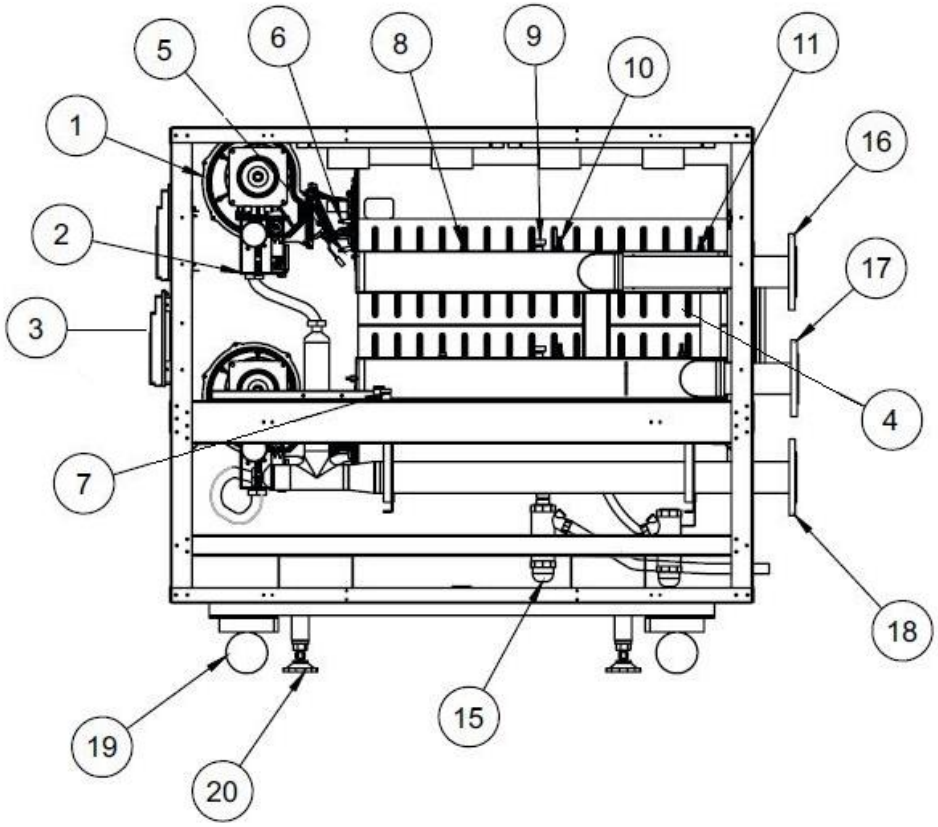
16.1 Parts Diagram Superbox 500



Label Number	Item Description	Label Number	Item Description
1	Combustion Fan	10	Flow Temperature Sensor
2	Gas Valve	11	Return Temperature Sensor
3	Control Panel	15	Condensate Syphon
4	Heat Exchanger	16	Boiler Flow
5	Ionization Probe	17	Boiler Return
6	Ignition Electrode	18	Gas Inlet
7	Ignition Transformer	19	Locating Wheels
8	Limit Thermostat	20	Fixing Feet
9	Pressure transducer		

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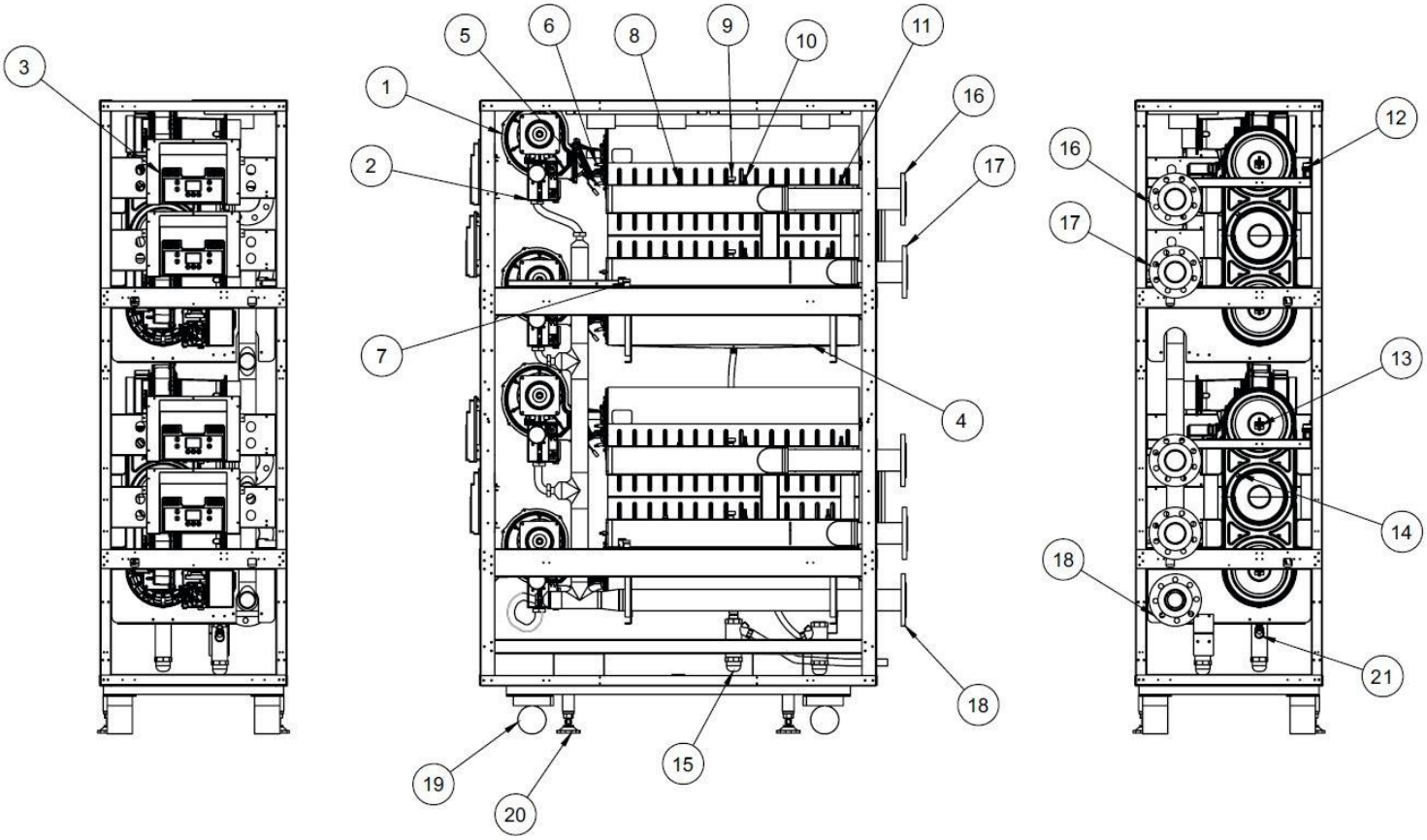
6.2 Parts Diagram Superbox 1000



Label Number	Item Description	Label Number	Item Description
1	Combustion Fan	12	Automatic Air Vent
2	Gas Valve	13	Heat Exchanger Overheat Clixon
3	Control Panel	14	Flue Gas Outlet
4	Heat Exchanger	15	Condensate Syphon
5	Ionization Probe	16	Boiler Flow
6	Ignition Electrode	17	Boiler Return
7	Ignition Transformer	18	Gas Inlet
8	Limit Thermostat	19	Locating Wheels
9	Pressure transducer	20	Fixing Feet
10	Flow Temperature Sensor	21	Condensate Syphon Switch
11	Return Temperature Sensor		

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Notes

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