

**Installation and Operation
Guide**

**EURON 24/30HG
EURON 30 HSG**

MHS
BOILERS



Manual Ref: L307

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General Information, Regulations

Conditions of warranty

General Information

Installation, assembly, gas connection, electrical connection and first commissioning must be carried out by, and is the responsibility of, a competent specialist(s).

Operator/End user Information

To ensure the continuing safety, reliability and efficient functioning of the boiler, the equipment must be regularly serviced by a competent specialist.

To ensure regular and essential Servicing and Maintenance we would recommend entering into a Service Contract (Please contact MHS Boilers Service Department for more details)

Clarification of Warranty conditions

Faults arising from the following are excluded from our warranty:

- Inappropriate or incorrect use
- incorrect installation i.e. not as per MHS installation requirements
- Commissioning not carried out by MHS – **Parts Only Warranty**
- use of non-genuine spare parts
- Poor system water quality and failure to maintain water treatment
- Use of inappropriate fuel
- Operation of boiler with excessive or insufficient water pressure
- Operation of boiler using incorrect power ratings
- Unauthorised modification or alteration
- Failure to observe the information in the manual and the instruction plate on the burner equipment

Instructions, data badge and warning labels on the boiler must never be removed or altered. If damaged or missing should be replaced as soon as possible.

This appliance manual must be handed to, and left with, the end user following successful completion of the installation.

This appliance should never be left to operate with the outer casing removed

Regulations and Standards

For safe, environmentally sustainable and energy saving operation, observe the following standards:

BS 5440-1:2008 Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net. Specification for installation of gas appliances to chimneys and for maintenance of chimneys

BS 5440-2:2000 Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net. Specification for installation and maintenance of ventilation for gas appliances.

BS 5449: Part 1 1977 Code of practice for central heating for domestic premises

BS 6798:2000 Specification for installation of gas –fired boilers of rated input not exceeding 70 kW net.

BS 7671. Requirements for electrical installations. IEE wiring regulations.

BS EN 12828: 2003 Heating systems in buildings. Design for water-based heating systems

Water Regulations (Water Fittings) Regulations 1999.
Gas Safety (Installation & Use) Regulations 1998.

Heating circuit water quality

Heating circuit water quality

The composition and quality of the system water have a direct influence on the performance of the whole system and the life of the boiler. On first filling, and any subsequent refilling, a pH balance of 7-8 should be maintained. Please see the table below

The system must be flushed, cleansed and treated with a good quality corrosion inhibitor suitable for all the materials in the system before the boiler is put into use.

Failure to do this may affect the boilers warranty.

No Chemical anti-corrosion medium should be introduced to the system

Recommended Water treatment Specialists:

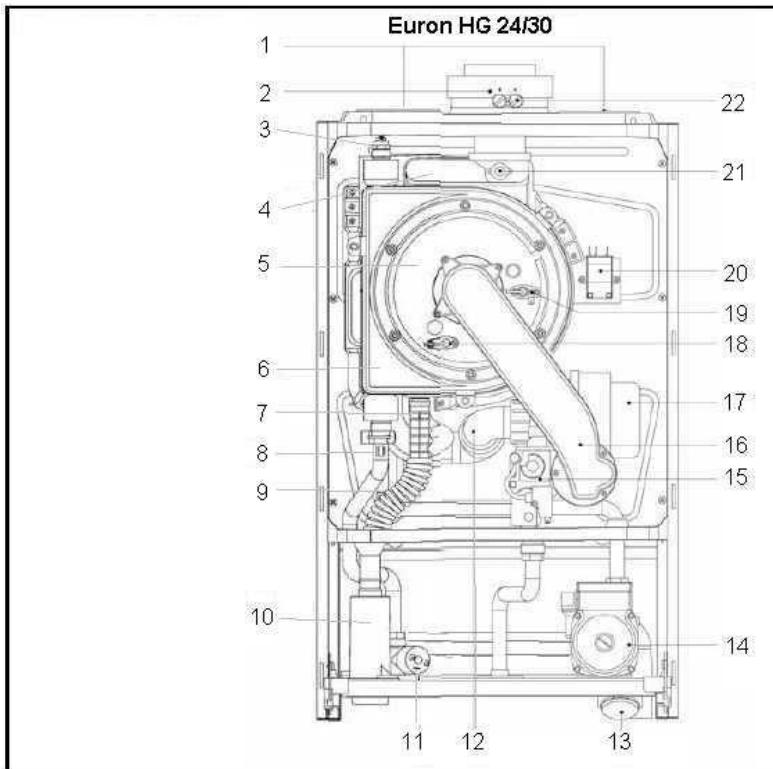
Fernox
Forsyth Road
Sheerwater
Woking
Surrey
GU21 5RZ

www.fernox.com

Office Tel: 01483 793200
Technical Support: 0870 870 0362

Criterion	Appropriate Value	Effect of Deviation
PH - balance	7 - 8	Danger of corrosion for boiler and system components.
Hardness	14 dH	- Raised calcium deposits - Low life expectancy of boiler
Chloride content	150 mg/l	Corrosion of alloyed materials

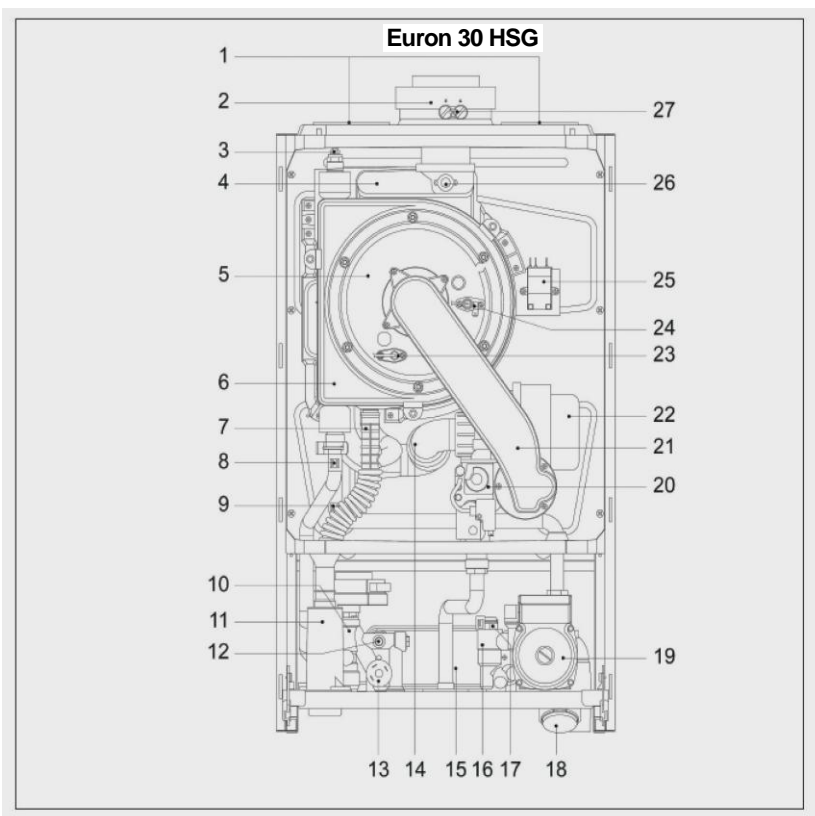
Product Description Overview



EURON HG

Legend

- 1 Air intake openings
- 2 Concentric air intake/flue gas connection
- 3 Manual air vent
- 4 Flue gas discharge / Flue hood
- 5 Burner Door / Burner
- 6 Stainless steel heat exchanger
- 7 Condensate drain hose
- 8 NTC Return sensor
- 9 NTC Flow Sensor
- 10 Condensate discharge Siphon
- 11 Low water pressure switch
- 12 Supply air hose
- 13 Heating system pressure gauge
- 14 Pump
- 15 Gas valve
- 16 Premix air/gas burner supply tube
- 17 Modulating burner fan
- 18 Ionisation electrode
- 19 Ignition electrode
- 20 Ignition transformer
- 21 STB flue gas 85 °C
- 22 Air/flue gas sampling points



EURON 30 HSG Combi

Legend

- 1 Air intake openings
- 2 Concentric air intake/flue gas connection
- 3 Manual air vent
- 4 Flue gas discharge connection
- 5 Burner
- 6 Stainless steel heat exchanger
- 7 Condensation drain hose
- 8 NTC Flow sensor
- 9 NTC Return sensor
- 10 3 way diverter valve
- 11 Condensate discharge Siphon
- 12 NTC domestic water sensor
- 13 Low water pressure switch
- 14 Supply air hose
- 15 Domestic hot water plate heat exchanger
- 16 Cold water inlet with filter
- 17 Hot water flow regulator
- 18 Heating system manometer
- 19 Pump
- 20 Gas valve
- 21 Premix air/gas burner supply tube
- 22 Modulating burner fan
- 23 Ionisation electrode
- 24 Ignition electrode
- 25 Ignition transformer
- 26 STB flue gas 85 °C
- 27 Air/flue gas sampling point

Product Description

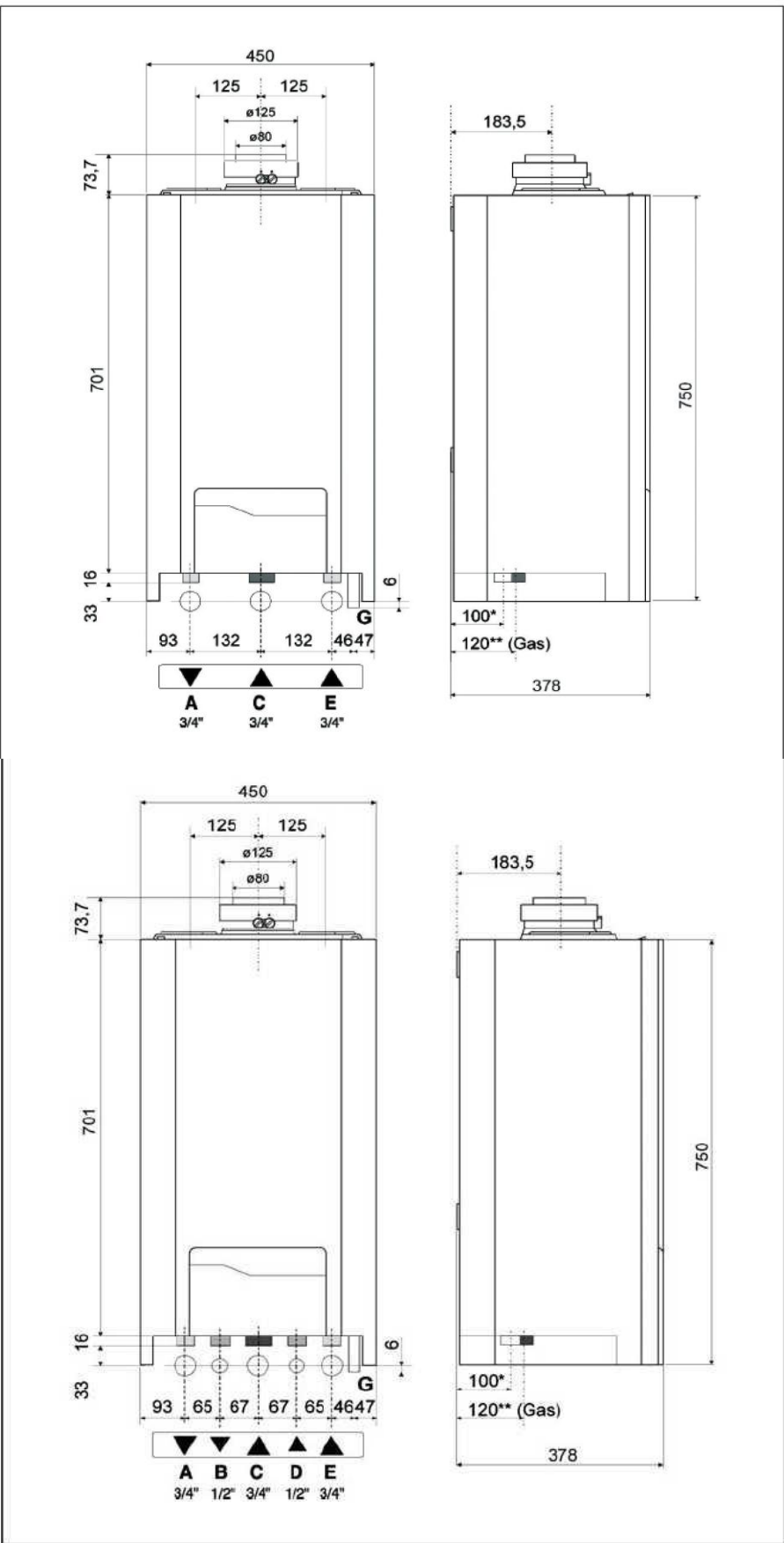
Technical Data – System Boiler	Units	HG 24	HG 30
Nominal Heat Output at 80° / 60° C	kW	5,8-22,8	6,9-28,1
Nominal Heat Output at 50° / 30° C	kW	6,1-23,6	7,2-29,2
Nominal Heat Input	kW	6,0-23,0	7,1-28,5
Normal supply level 75° / 60°C	%	107,2	107,1
Normal supply level 40° / 30°C	%	108,6	108,5
Standby loss TK = 70°C	%	0,1	0,1
Max. output pressure of Fan	Pa	110	90
Water content	L	1,8	2,5
Max. water pressure	bar	3.0	3.0
Max. flow temperature	°C	82	82
Condensate quantity at 40° / 30°C (22 kW)	ca. l/h	1,58	2,95
Gas Flow rate: Natural Gas G20	m ³ /h	2,43	3,01
Liquid Propane Gas LPG / G31	kg/h	1,81	2,25
Gas flow pressure: Nominal	mbar	20 Natural Gas 50 LPG	
Gas flow pressure: min / max.	mbar	18 / 25 Natural Gas 50 LPG	
Flue gas mass flow rate with Natural gas	g/s	10,19	12,47
Max Flue gas temperature	°C	74	71
Gas category	112H3B/P; 112E3P		
Flue Classification	(B23 C13x C33x C43x C53x C63x C83x)		
Electrical protection rating	IPX4D		
NOx	Class 5		
Ionisation min	uA	1	1
Connections: Air/flue gas hose	DN	80/125	80/125
Heating Flow / Return	mm	22	22
Gas connection	DN	3/4"	3/4"
Condensate hose connection	mm	28	28
pH balance - condensate	pH	3,2	3,2
Electrical Power consumption 230 V / VAC	W	129	129
CE - Identification number	0085BP0033		
Width x height x depth	mm	450 x 750 x 378	
Weight ca.	kg	35	37
Noise level Min./Max. load	dB (A)	36 -44	
Product variables in calculating installation costs according to DIN V4701-10:			
Rated heat capacity	Q _n (kW)	22,8	28,1
Efficiency at rated heat capacity	η _{io} ,% (%)	98,4	97,8
Part load efficiency	η ₃₀ ,% (%)	107,8	107,4
Return temp, on measurement of 30% part load efficiency	T _{30%} (C)	30	30
Standby heat loss	q _{B.70} (%)	2,6	2,2
Electrical Consumption Max	W	129	129

Product Description

Technical Data – Combi Boiler	Units	HSG 30 Combi
Nominal Heat Output at 80° / 60° C	kW	6,9-28,1
Nominal Heat Output at 50° / 30° C	kW	7,2-29,2
Nominal Heat Input	kW	7,1-28,5
Normal supply level 75° / 60°C	%	107,1
Normal supply level 40° / 30°C	%	108,5
Standby loss TK = 70°C	%	0,1
Max. output pressure of Fan	Pa	90
Service water temperature max./min.	°C	60/35
Hot water quantity AT=40°C	l/min./60°C	10,0
Minimum HWS Flow rate	l/min./60°C	2,5
Service water pressure max./min.	bar	6/0,8
Water content	l	2,5
max. water pressure	bar	3.0
max. flow temperature	°C	82
Condensate quantity at 40° / 30°C (22 kW)	ca. l/h	2,95
Gas Flow Rate: Natural Gas G20	m ³ /h	3,01
Liquid Propane Gas LPG / G31	Kg/h	2,25
Gas flow pressure norm	mbar	20 Natural Gas 50 LPG
Gas flow pressure min./max.	mbar	18 / 25 Natural Gas 50 LPG
Flue gas mass flow rate with Natural gas	g/s	12,47
Max Flue gas temperature	°C	71
Gas category	112H3B/P; 112E3P	
Flue Classification	(B23 C13x C33x C43x C53x C63x C83x)	
Electrical protection rating	IPX4D	
NOx	Class 5	
Ionisation flow min.	uA	1
Connections: Air/flue gas hose	DN	80/125
Heating Flow / Return	mm	22
Gas connection	DN	3/4"
Condensate hose connection	mm	28
pH balance - Condensate	pH	3,2
Electrical Power consumption 230 V / VAC	W	129
CE - identification number	0085BP0033	
Width x Height x Depth	mm	450 x 750 x 378
Weight ca.	kg	37
Noise level Min./Max. load	dB (A)	36 – 44
Product variables in calculating Installation costs according to DIN V4701-10:		
Rated heat capacity	Q _r (kW)	28,1
Efficiency at rated heat capacity	η ₁₀₀ % (%)	97,8
Part load efficiency	η ₃₀ % (%)	107,4
Return temp.on measurement of 30% part load efficiency	T 30% (C)	30
Standby heat loss	q B.70 (%)	2,2
Electrical Consumption max	W	129

Product description

Dimensions

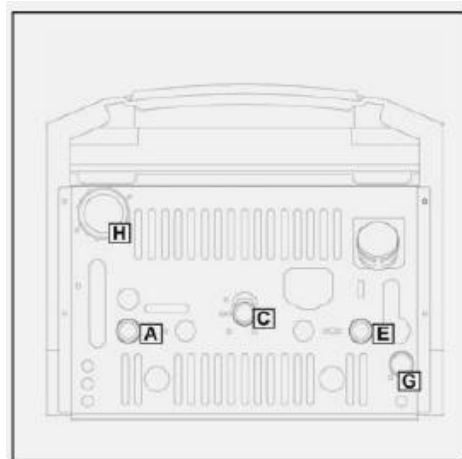


EURON24HG EURON 30 HG

Legend

- A Flow 3/4"
- C Gas inlet 3/4"
- E Return 3/4"
- G Condensation discharge 28 mm
- H Siphon

(*) Water connection
 (**) Gas connection

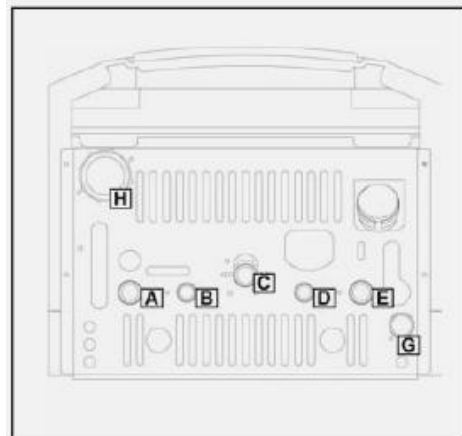


EURON 24 HSG Combi
 EURON 30 HSG Combi

Legend

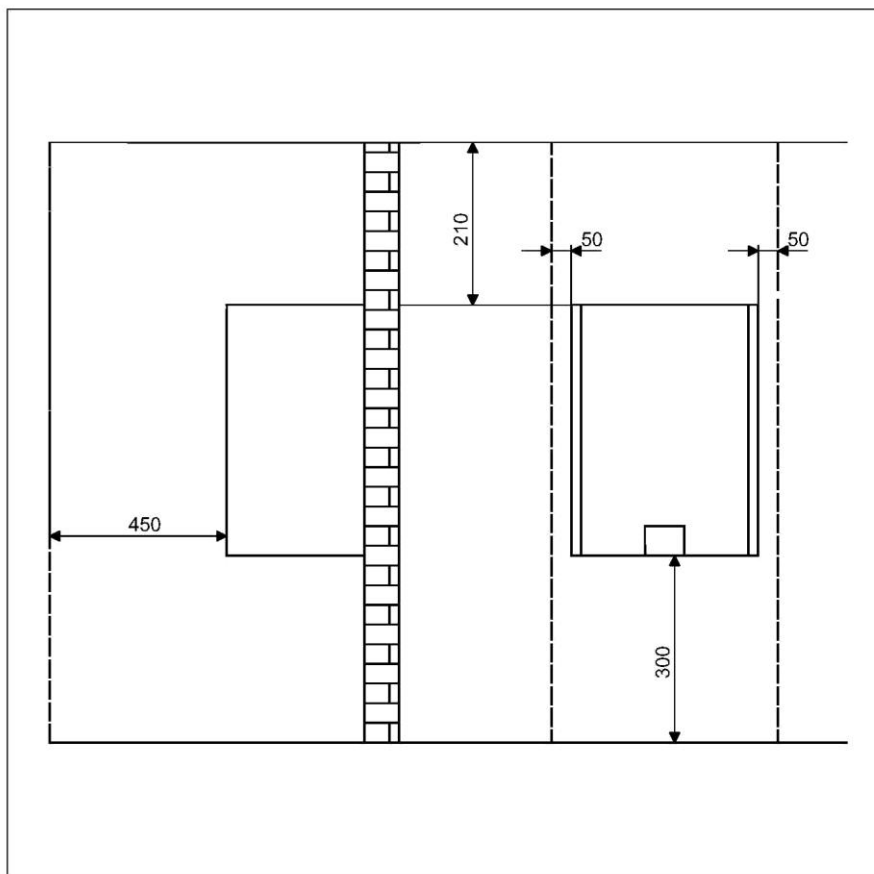
- A Flow 3/4"
- B Hot water outlet 1/2"
- C Gas inlet 3/4"
- D Cold water inlet 1/2"
- E Return 3/4"
- G Condensation discharge 28 mm
- H Siphon

(*) Water connection
 (**) Gas connection



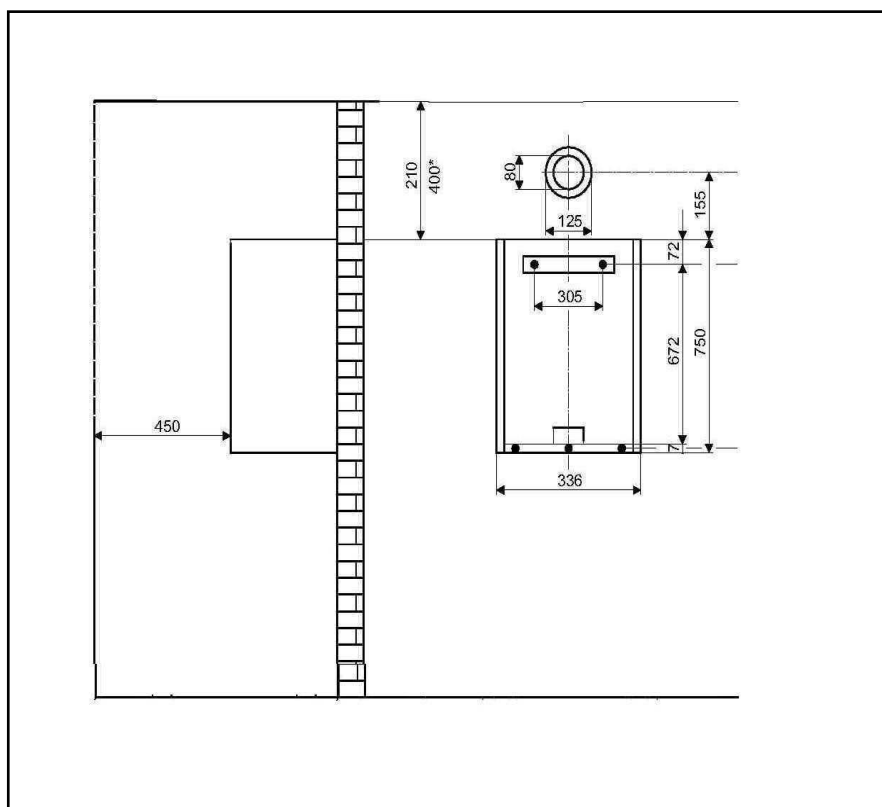
Installation

Minimum clearances



Minimum clearances

For servicing of Boiler the minimum clearances specified in the diagram must be observed.



Wall mounting

Fix to the wall using the mounting bracket and fixings supplied.

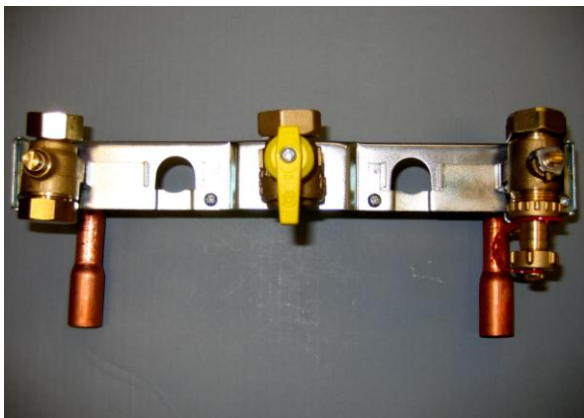
Installation

Connection Kits

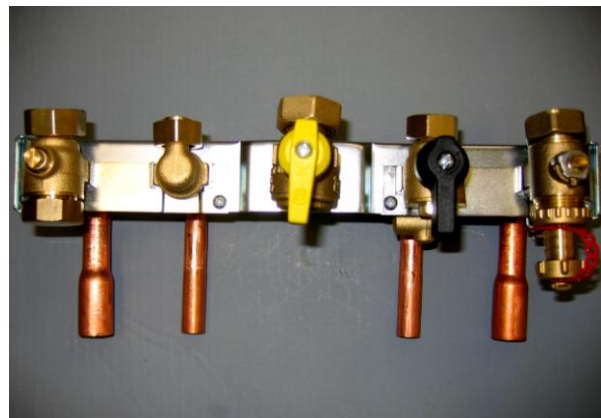
Connection Kit.

Each boiler comes with a connection kit for gas, flow and return connections on the system boiler and gas, flow, return and Hot water service connections for the Combi boiler.

These kits are there to aid installation and remove the need for the installer to provide isolation valves for the boiler



System Boiler Connection Kit



Combi Boiler Connection Kit

Important Note:

The Gas Isolation Valve, that is included as part of the connection bracket assembly (for Boiler versions), has a "fire safety feature" and is a thermally closing type device.

The slam shut action of the valve is activated at 100°C +/- 5K. Installers should therefore avoid the use of soldered fittings in the gas line which are in close proximity to the gas isolation valve.

If a fault occurs that indicates that no gas is able to pass through an isolation valve, then it should be suspected that the thermal shut-off feature has been triggered. There is no possibility to reset a triggered valve and it must be replaced.

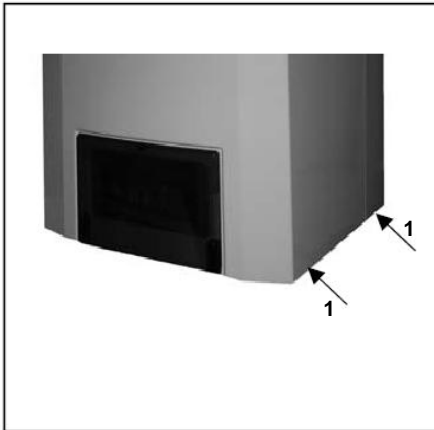
Installation

Access for Installation /Commissioning/ Servicing/Maintenance

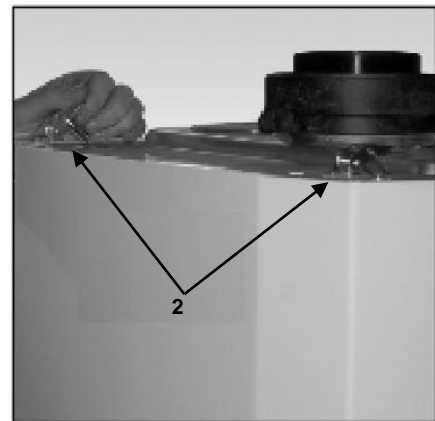
Access to the Boiler is as follows:

Ensure boiler is switched off at the mains and Isolated from gas supply

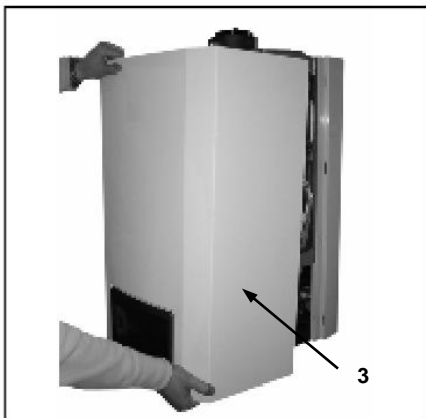
Then to gain access to inside the boiler, complete the following steps:



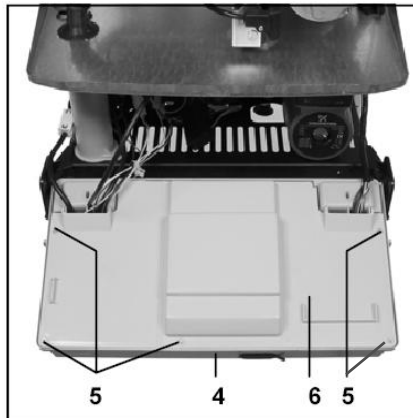
Remove the 4 screws (1) from the underside of the housing (2 either side)



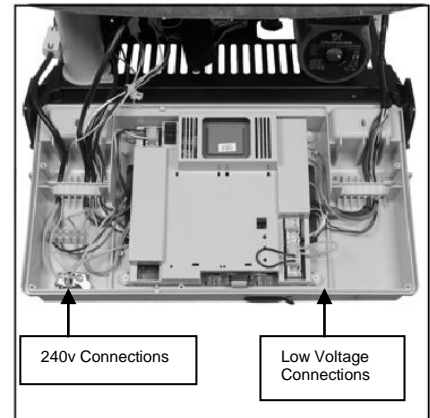
Open the Release clips on top of the boiler Casing



Pull the Boiler casing towards you. You will now have access to the internal components of the boiler



Hinge forward the Control panel (4) for access to the rear of the controller and wiring. Removing the 5 screws (5) will enable the rear cover (6) to be removed for access to wiring.



Installation

Connections

Gas connection

The Boiler is designed to belong to the following categories for the use of gas types.

Country	Categories
GB	I12H3P I12H3B/P

Please check the Boiler name plate and packaging to ensure that it is correct for UK Operation and that the gas category corresponds to one of the appropriate for the UK.

The gas inlet must be manufactured and measured according to the relevant specific country regulations as well as the maximum output of the equipment; check also the correct calculation and connection of the stop valve.

Before installation, the gas line should be thoroughly cleaned, so that any residue does not impair the functional efficiency of the heating appliance.

Also ensure that the boiler is for the correct type of gas to be used i.e. Natural Gas or LPG (check the name plate in the interior of the appliance).

Check the required gas pressure for either natural gas or LPG.

Water connection

All connections for water and gas are as per the illustration on page 8. Ensure that the cold water main pressure does not exceed 6 bar. If > 6 bar then a pressure limiter device must be fitted.

The minimum pressure needed by the appropriate devices for processing of hot service water is about 0.2 bar.

On sizing the pipes and the heating element of the Boiler, the residual head pressure must be considered depending on the required flow rate as per the pump circulation curve (see page 14)

With Combi Boiler (type HSG) flow limiters are built into the water switch. This ensures a constant flow of service water

(EURON 24 HSG = 8 Litre/Minute
EURON 30 HSG = 10 Litre/Minute).

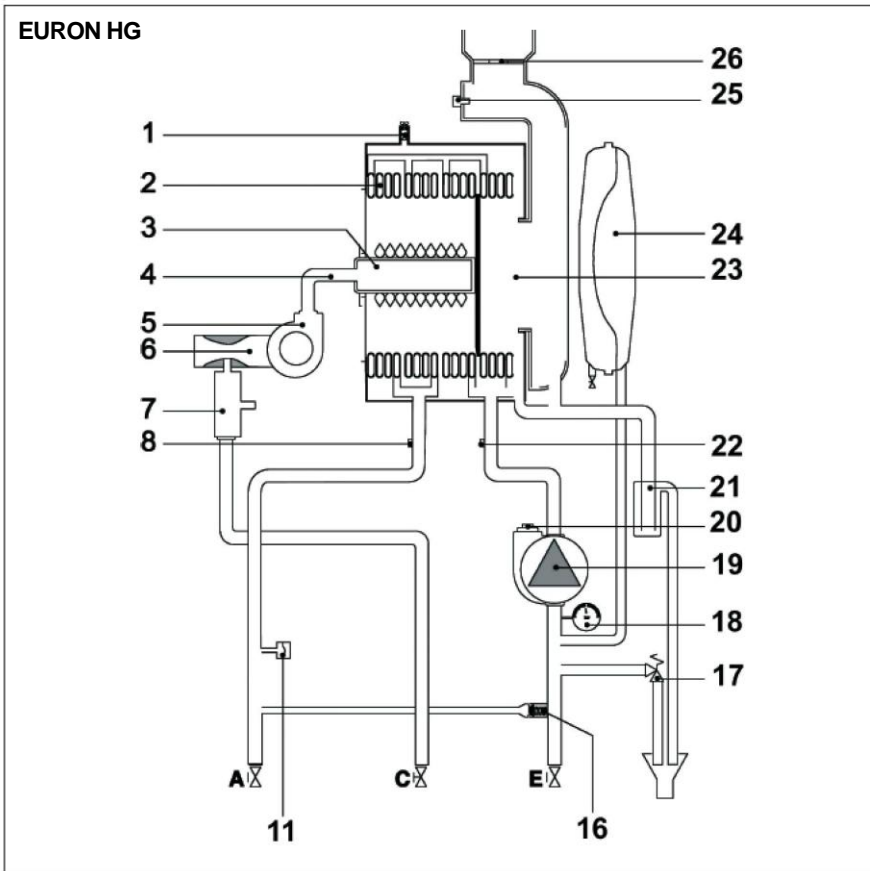
Underfloor heating

For underfloor heating, attach a suitable safety thermostat to the supply. (see page 15)

Note: High flow temperature leads to an operating lockout of the Boiler both in DHW and heating operation: The error code "110" appears on the display. Operation is resumed by pressing RESET (6) key (see page 22), after the flow temperature has dropped.

Installation

Hydraulic diagrams

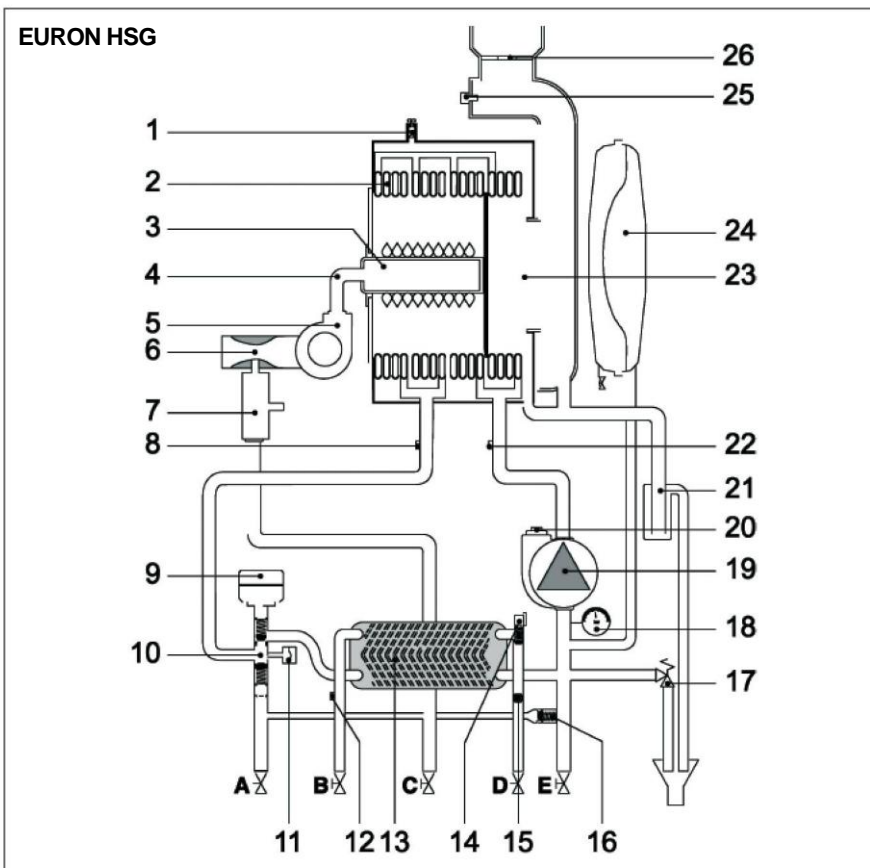


EURON HG/HSG

Legend

- 1 Manual bleed valve
- 2 Stainless steel heat exchanger
- 3 Burner
- 4 Mixing channel air/gas
- 5 Modulating Fan
- 6 Venturi
- 7 Gas valve
- 8 NTC-Appliance supply sensor
- 9 Motor of 3-way valve (Combi)
- 10 3-way valve (Combi)
- 11 Minimum pressure switch
- 12 NTC-Service water sensor (Combi)
- 13 Service water plate heat exchanger (Combi)
- 14 Service water flow control (Combi)
- 15 Cold water filter (Combi)
- 16 Automatic heating bypass
- 17 3 bar safety valve
- 18 Pressure Gauge
- 19 Circulation pump
- 20 Automatic bleed valve
- 21 Condensate syphon
- 22 NTC-appliance return sensor
- 23 Flue Gas Collection Hood
- 24 Expansion tank (optional)
- 25 Flue Gas STB

- A Flow 3/4"
- B **H**ot water outlet 1/2" (Combi)
- C **G**as intake 3/4"
- D **C**old water intake 1/2" (Combi)
- E Return 3/4"



Installation

Circulation pump

Residual head pressure of the circulation pump at pump speed 2 + 3

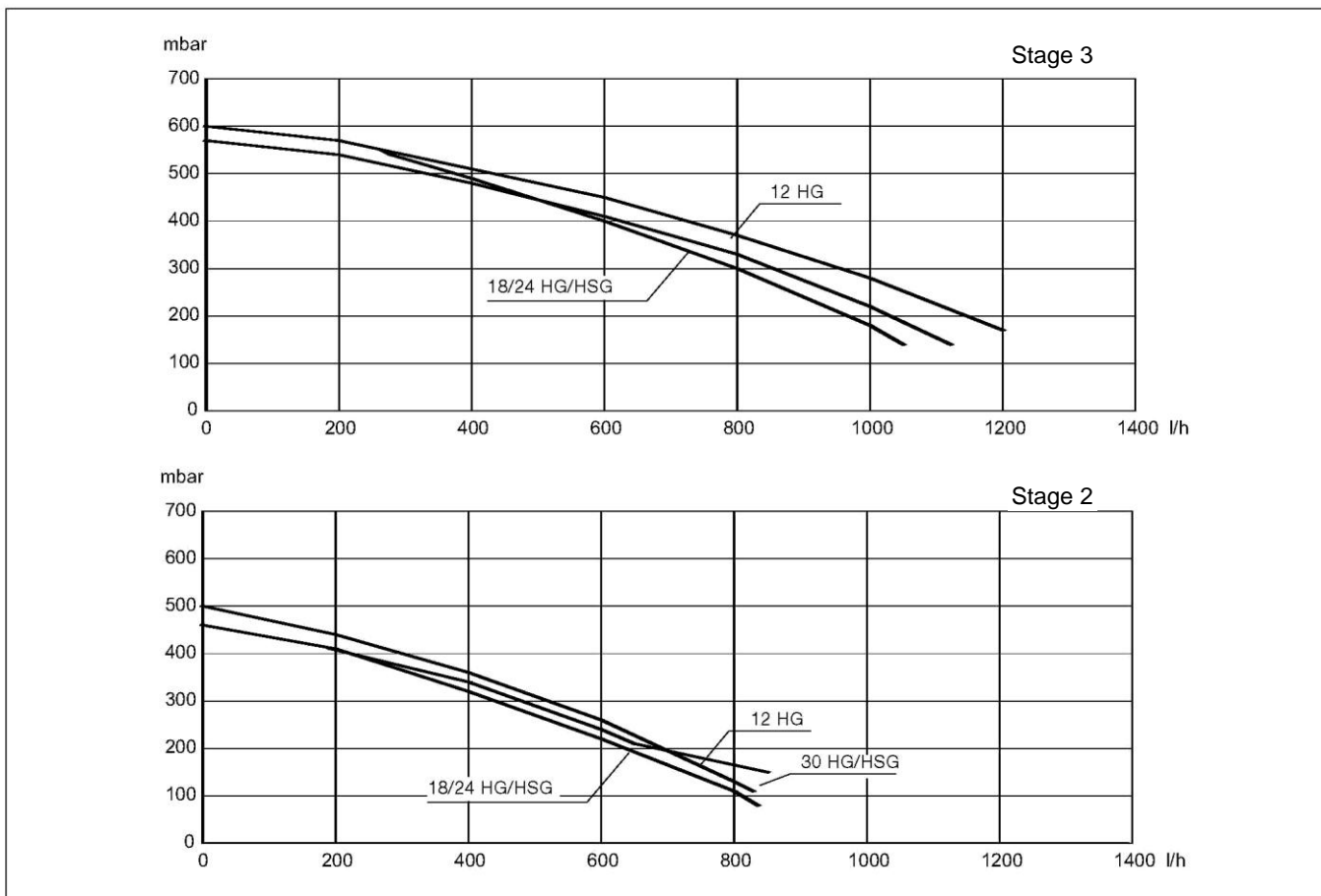
Flowrate	24 HG		30 HSG/HG	
	V3 (mbar)	V2 (mbar)	V3 (mbar)	V2 (mbar)
1300				
1200	127,5			
1100	162,5		119	
1000	221		190	
900	280	83	252	
800	325	142,5	308	102
700	373,5	207	361	165
600	419,5	269	409	231
500	459,5	320	463	287
400	491,5	365	503	343
300	522	408,5	548	394
200	547	440	561	440
100	568	470	588	467
0	584	494	601	491

Legend

V2 2. Pump stages

V3 3. Pump stages

Graphic representation of the residual head pressure of the circulation pump at pump speed 2 + 3 (please note that this graph includes models not covered by this manual)



Installation

Electrical connections

General Information

Electrical installation and connection must be carried out by an authorised installer in accordance with applicable National Standards, Local Standards and Regulations.

Mains connection and Customer wiring

The appliance is designed for permanent connection using cables NYM 3x1.5 mm² or H05W-F 3 x 1 mm². The connection cable should not be larger than 8 mm in diameter.

Connect the mains wiring to the respective terminals, on the Boiler Terminal strip, in the 240V section at the rear of the control panel. (See picture below)

A suitable mains isolator switch must be fitted in the power supply, to the boiler, and sited in the boiler room. This can be used to switch off power to the boiler for maintenance purposes or in the event of a problem.

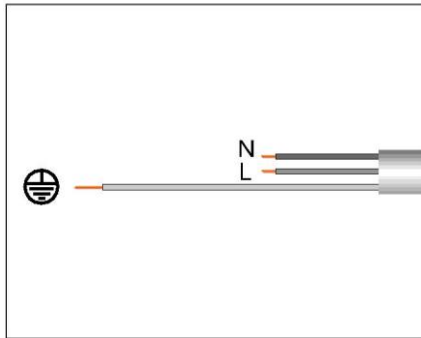
Mains voltage: 230 V, 50 Hz

Mains cable Connection

All external connection cables should be stripped to a max. 30 mm. All external Cables entering the Boiler must be firmly clamped in the Cable grip after connection

The length of the cables must be designed accordingly. Additional cables (e.g. for system integrations), which are attached to the terminal strip in the boiler, must be secured along with mains lead via the Cable grip.

When connecting the boiler, ensure the earth cable (yellow/green), which is longer than the supply wires (see illustration) is connected.



Multiple plug sockets, extension cable and adapter are not appropriate. For earthing of the appliance under no circumstances use the piping of the water supply installation, heating or gas installation.

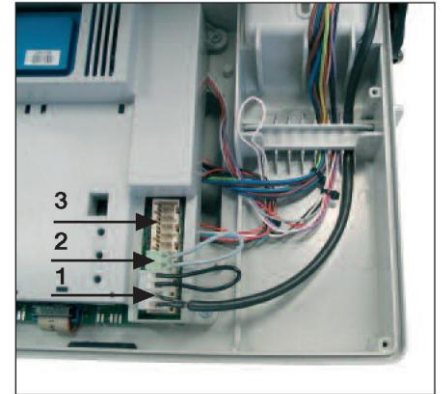
Please note the appliance is not protected against damage from lightning strikes.

If the mains fuses are to be changed, use 2A Quick Blow fuses.

Note before any connections are made below the boiler must be switched Off.

Remote Operation (Volt Free)

A volt free enable to the Boiler for a Thermostat, Time switch etc, is possible via X10-02 (2)



Remote Operation (QAA73)

Connection (1) for a QAA73 must be via a cable with at least. 2 x 0,5 mm².

The "Bus" cable of the QAA73 (20-30 V) must be installed and run separately from the 230 V/50 Hz cables. The QAA73 connects to the X10-01 connector using screened cable.

Note: If the QAA 73 remote control is being used, the thermostat bridge must be disconnected from the X10-02 (2) connection.

Note: Only one type of Boiler enable can be used via either X10-01 or X10-02

Ambient / External Sensor (QAC34)

Connect the Outside Air Temperature sensor (3), if required, using a Screened Cable with at least 2 x 0,5 mm², with a maximum length of 50m.

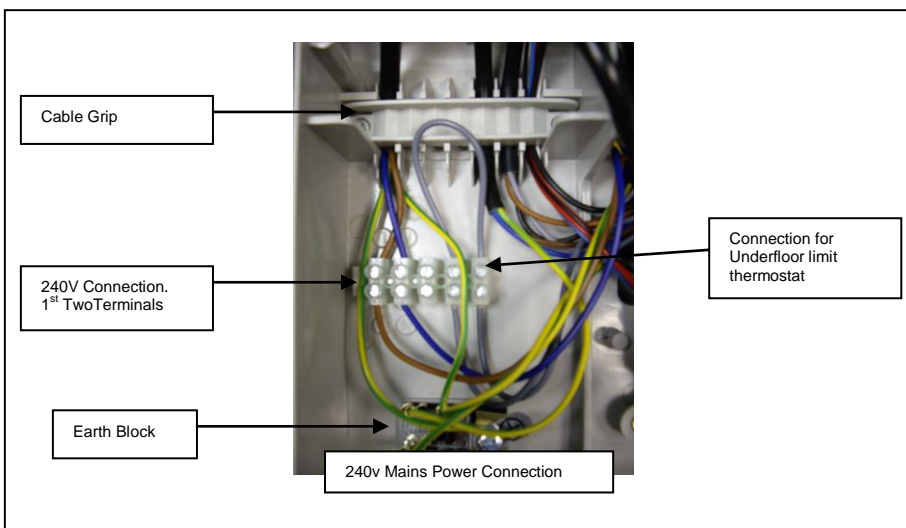
The sensor should be positioned on a North Facing Wall at a height of 2 –2.5 m above the floor. Under no circumstances must it be directly exposed to sunlight.

Connect the ambient/external sensor to the X10-06 (3) connector (using screened cable).

Safety Thermostat for Underfloor Heating

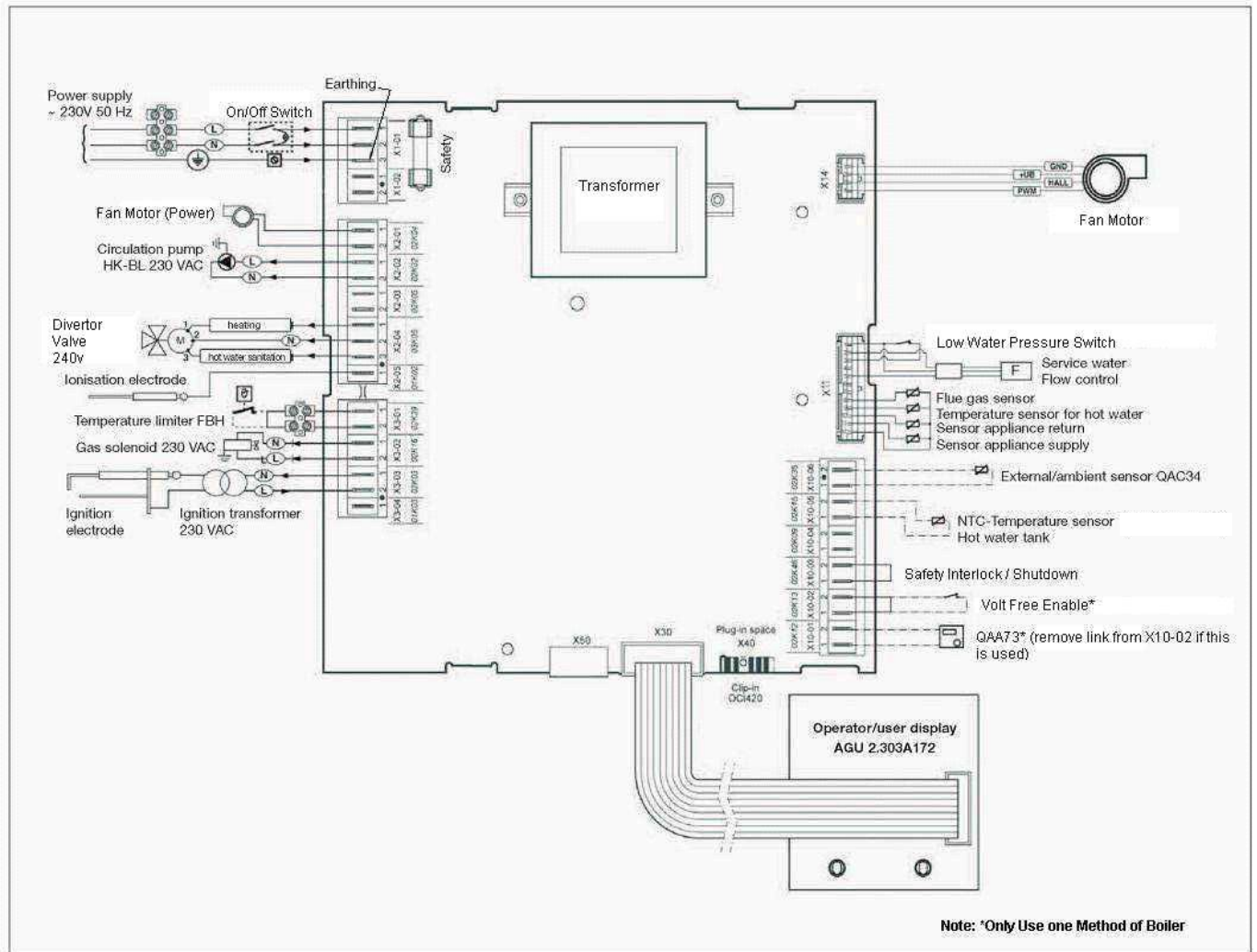
Remove the bridge loop from the terminals on the right hand side of the Terminal Block, on the 240v connection side, and connect the safety thermostat for the underfloor heating.

The Connections on the boiler wiring side will be pre-wired back to X3-01 on the LMU unit.



Installation

Electrical connections



Controls Options / Accessories

- OCI420** Clip in Module - For Multiple Boiler communication.
- AGU2.514** Clip in Module – For system incorporating pumped Heating circuit & Pumped HWS Primary (see P46 – scheme 1)
- AGU2.511** Clip in Module – BMS Run / Fault Indication & 0 -10v input Clip
- RVA47** Cascade Control - Cascade Controller for multiple boiler applications
- RVA46** Zone Control
- RVA63** Multi Zone Control

Installation

General Connection of air/flue gas pipes

Flue gas and supply air connection

The EURON is suitable for use as conventional or balanced Flue. The flue that is connected must be removable.

As with all flue systems, it must be ensured that there is no short circuit / cross-contamination between the supply air and flue gas.

For flue gas safety the EURON is fitted with an flue gas temperature safety limiter (set at 85°C), therefore this does not need to be provided for in the installation.

The combustion air supply must be ensured. In areas such as in a laundry or workshop, a hair salon, in areas with electroplating, printing or metalworking. In such or similar cases the supply air must be supplied from a outside the building.

Condensate connection

For every m³ of natural gas burnt, 0.7 to 1.0 litres of condensate is produced, as a consequence of the very high utilisation of energy. This of course must be discharged from the boiler.

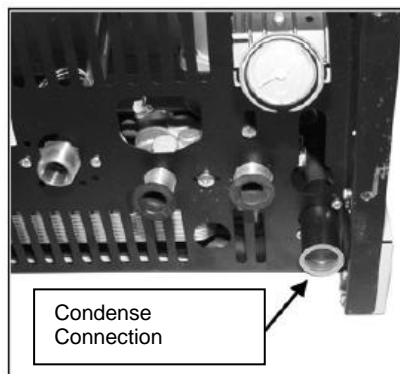
Due to its acidic nature, plastic piping must be used for draining the condensate. The condensate must be able to run off freely into a tundish (or neutralization tank), therefore avoiding a back-up of condensate into the boiler. Please Refer to BS6798:2000 for guidance.

(See picture to right)

Condensate created in the flue must also be allowed to drain away freely with the same considerations as for the boiler condensate. Local regulations must be observed. Prior to commissioning the siphon in the EURON must be filled with water .

Connection to air/flue gas routing

For concentric air/flue gas routing only original MHS accessory parts should be used.



Installation

Air-flue gas Installation

For the installation of concentric air/flue gas systems the use of original accessory parts by MHS is recommended.

Connection kits for fluing of the air/flue gas are supplied separately from the appliance depending on the various installation options.

This boiler comes ready for connection to a concentric air/flue gas system.

The flue connection to the boiler can be either using 80/125mm concentric flue or via double pipe 80/80mm flue.

Flue system

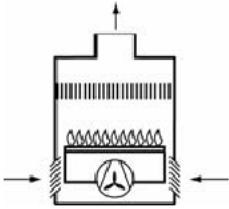

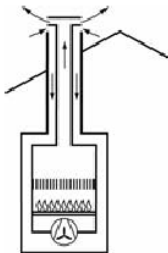
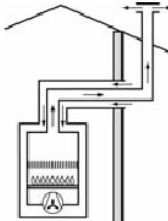
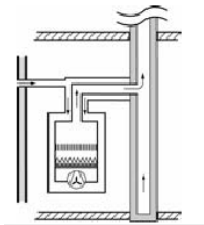
Calculating flue resistance

The adjacent table of flue component resistance will assist the system designer in calculating total flue system frictional loss. Providing that the proposed flue system is calculated as having a resistance of less than 110 Pa for the model 24 and 90 Pa for the model 30 boilers, then the system should perform satisfactorily with no effect on the output of the boiler.

Boiler Model Component Resistance	Euron HG24 Pa	Euron HG30 Pa	Euron HSG30 Pa
80/125 Concentric Wall Terminal	5	6	6
80/125 Concentric Roof Terminal	8	10	10
1m Length 80/125 Concentric Tube	3.75	4.5	4.5
93° 80/125 Concentric Bend	3.75	4.5	4.5
45° 80/125 Concentric Bend	1.75	2.5	2.5
1m Length DN80 PP Tube	1.5	2	2
93° DN80 PP Bend	1.5	2	2
45° DN80 PP Bend	1.25	1.5	1.5
DN80 Open Termination with Mesh	2	3	3
80/125 Concentric Wall Terminal with Vertical Discharge	8	9.5	9.5

Installation

Air/flue gas Installation

Combustion Air from the Boiler Room, Ø 80mm PPS		
B23	Open Flue Appliance – Air Supply from the room – Flue Gas discharge via roof.	
Room Sealed Appliance, Ø 80/125mm PPS / Alu		
C13	Room sealed appliance – Connected to Concentric supply / flue discharge through a wall	
C33	Room Sealed appliance – connected to concentric air supply / flue discharge through the roof	
C43	Room Sealed appliances, connected in cascade, connected to a common U shaped concentric supply / flue discharge at the appliance	
C53	Room sealed appliance, connected to a separate air supply and flue discharge pipe, opening into different pressure areas.	
C63	Room sealed appliance, sold without related connecting and/or discharge fittings.	
C83	Room sealed appliances in cascade, connected to separate air supplies but common flue discharge through the roof.	

Note: For Flue Gas Termination Guidance please refer to the diagram on page 44

Commissioning

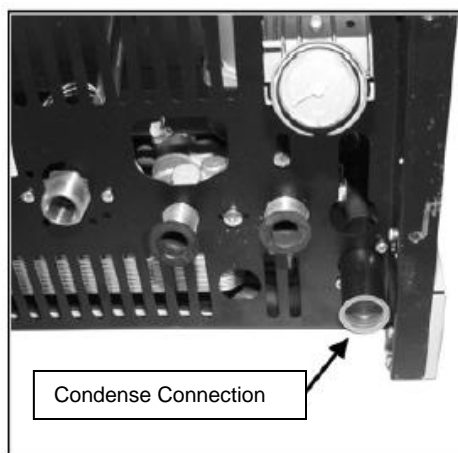
Preparation for operation

General

To ensure the safe and correct operation of the boiler, commissioning must be carried out by a suitably qualified specialist.

Monitoring

Ensure condensate connection is connected using the condensate drain hose supplied or using plastic piping. Ensure that the Condensate outlet is piped to a suitable drain. Please refer to BS6798 for ultimate guidance



First commissioning

Fill hydraulic circuits

Proceed as follows:

Open the boiler bleed valve and the valve above the stainless steel heat exchanger.

Loosen the closure of the automatic bleed valve on the circulation pump. Slowly open the system filling point and shut the bleed valve on the stainless steel heat exchanger, and the boiler, as soon as water is evident. Shut the filler valve, once the pressure shown on the water pressure gauge reaches 1.0 bar.

Ensure that:

The automatic bleed valve on the circulation pump is opened.
The boiler pressure, on the manometer is 1 bar. The gas valve is completely shut off. The electrical connection has been correctly made.

Ensure in every case, that the green/yellow earth wire is connected to a suitable earth.

To bleed the appliance, proceed as follows:

Switch on boiler (10). This sets the pump of the heating appliance in operation and there are three consecutive attempts to ignite the burner. After the third attempt the electronics lock the appliance, as the gas supply is cut; the display shows the readout "133". Allow the pump to work until all the air has left the appliance. Vent the boiler. Check the appliance pressure and refill with water in the case of a drop in pressure, until pressure again reaches 1 bar.

Check the flue gas system.

Ensure that any necessary room ventilation openings are open. Ensure the boiler condensation siphon is filled with water. (See illustration below centre).

If the appliance is unused for a long period, the siphon must be filled before switching on again. It is dangerous not to refill the siphon with water, as this can cause the flue gas to escape from the condensate drain.



Open the gas tap and check the tightness of all connections. Unlock the boiler by pressing the Reset key "6". The burner will ignite. Should this not happen, repeat the above procedure, until the burner ignites.

Gas supply

Proceed as follows:

Ensure that the type of gas used corresponds to the type of gas indicated on the nameplate of the boiler.

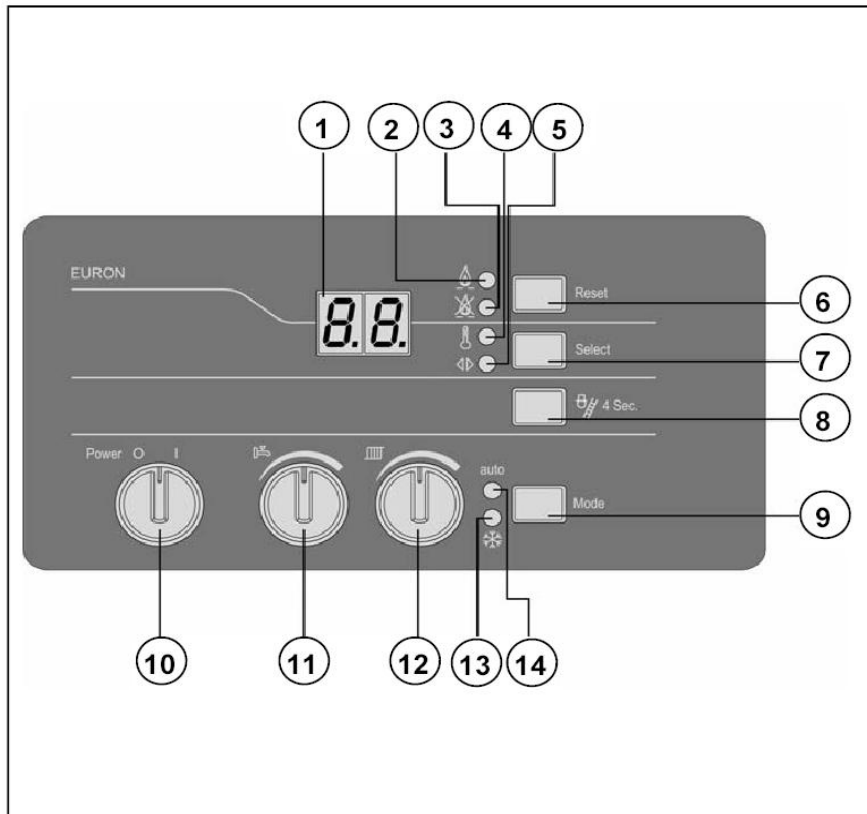
Power supply

Ensure that the voltage and frequency of the power supply conform to the data on the name plate of the boiler.

Ensure that the live and neutral connections have been made and to the correct terminals. Check that the earth is connected.

Commissioning

Preparation for operation



Legend

- 1 Display
- 2 LED (green) Burner operation
- 3 LED (red) Alarm appliance lock
- 4 LED (green) flow temperature readout on display
- 5 LED (green) operating phase/diagnosis of Boiler
- 6 Reset Button
- 7 Display adjustment Button
- 8 Flue cleaner function Button
- 9 Summer/winter/automatic operation Button
- 10 Power on/off
- 11 Hot water temperature Adjustment
- 12 Heating flow temperature Adjustment
- 13 LED illuminates winter operation
- 14 LED (green) automatic Boiler operation

Commissioning

Switch on the POWER (10) – 0 = Off; 1 = On 1. The display will illuminate, then after a few seconds the heating appliance is ready to operate.

Winter and summer operation

Use MODE (9) button to change changed between winter and summer operation and vice versa. When LED (13) is illuminated the boiler is on winter operation.

If an outside air temperature sensor is fitted to the boiler, the changeover from winter operation (heating and hot service water) to summer operation (only hot service water) can occur automatically, if the outside temperature measured is higher than 20 °C.

This can be achieved by pressing the MODE Button (9), until the LED AUTO (14) is illuminated. To deactivate the automatic changeover press the MODE key, until the LED AUTO (14) is no longer illuminated.

Note:

Adjustments made to the heating temperature and the service water temperatures remain unchanged after a power cut.

Adjustment of the heating temperature and service water temperature is undertaken using a QAA73. (see page 23)

Commissioning

Preparation for operation

Display readout

Whilst the Boiler is in operation the digital display (1) shows the flow temperature of the Boiler whilst at the same time LED (4) is illuminated.

By pressing SELECT button (7) the following options are displayed in succession:

- LED (4) Flashing – Display shows Hot Water Temperature
- No readout (Display shows -.-)
- LED (5) Lit Shows operational Status of Boiler – LED's (4) and (5) are off - Sequence Status of the boiler shown as follows:

- 0 Pause
- 1 No Heat Demand
- 2 Fan Ramp Up
- 3 Pre Purge
- 4 Changeover of Pre Purge to ignition
- 5 Ignition
- 6 Flame Stabilisation / Rectification
- 10 Heating operation mode
- 11 Service water mode
- 20 Venting
- 22 Fan Run Down
- 99 Boiler Locked Out for safety reasons
Locking code or information relating to operating conditions of heating appliance

Pressing Key (7) again will again show the service water temperature reading on the display. After a few minutes the display returns to boiler temperature.

Boiler Lock Out

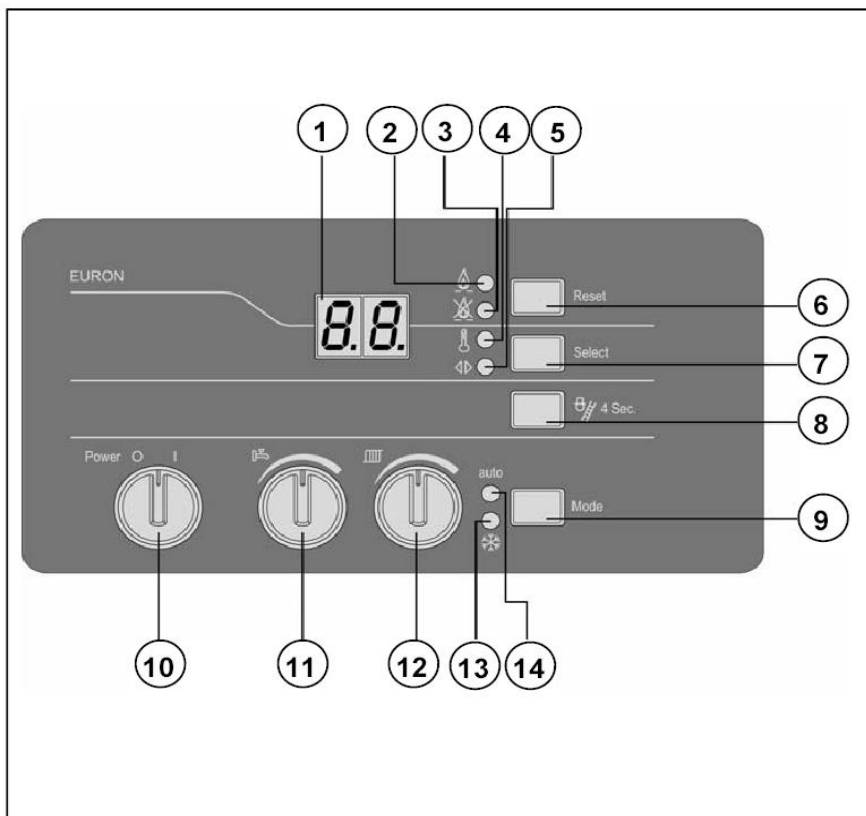
If a malfunction occurs the Boiler will Lock Out for safety reasons, the fault is displayed by illumination of the LED (3).

To restart the boiler: press RESET (6) for approx 2 seconds. If the lock out reoccurs, then check the gas supply to the boiler, and/or the Flow / Return Water isolation valves are open and the boiler is above or below pressure limitations.

If the lockout persists, contact MHS Service department.

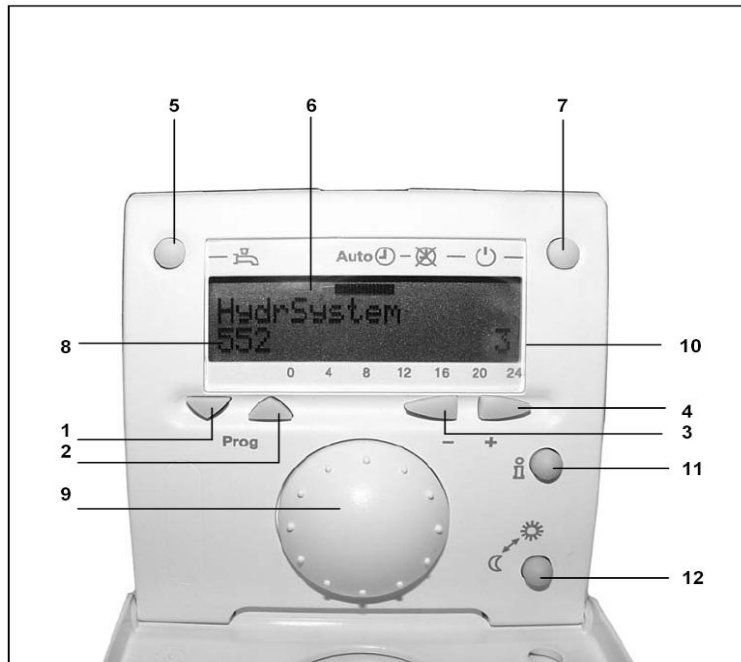
Use of flue cleaner key

The flue cleaner key (8) is only used by a qualified specialist responsible for maintenance, to undertake calibration and carry out all checks necessary for the correct operation of the appliance. If the key is inadvertently pressed, do not press any other keys, but switch off the appliance by means of adjusting knob (10) and then switch on again.



Commissioning

Parameter adjustment on control unit QAA73



Prerequisites for control unit QAA73 function

- The EURON must be put into "winter" mode via the 'Mode' function key (see Page 21)

Legend

- 1 Program key 'Down'
- 2 Program key 'Up'
- 3 Minus Key Adjustment
- 4 Plus Key Adjustment
- 5 Service water standby Key
- 6 LCD Display
- 7 Heating circuit standby key
- 8 Parameter Code appears here
- 9 Rated temperature adjusting knob
- 10 Parameter value
- 11 Info Key
- 12 On/Off key



Application level	Key operation	Parameter range
QAA73 - User	Press program key 2 – Scroll through Parameters	End User / Operator Parameter 1 – 50 (see Page 40)
QAA73 - Engineer	Press and Hold program keys 1 and 2 for approx 5 secs.	Specialist Parameter 51 – 98 (see page 41)

Back via "INFO" key

LMU	Key operation in this order: Press and Hold Keys 4 and 1 for approx 5 secs.	Engineer LMU Parameter 516 – 727 (See Page 42)
	Then for the next level (whilst in Parameters 516 – 727) Keep program keys 1 and 2 pressed simultaneously for approx a further 5 secs.	Specialist Engineer Parameter 501 – 755 (See Page 43 & 44)

In the corresponding parameter range

- Parameters are selected using keys 1 and 2
- Values are changed using keys 3 and 4

Press "INFO" key to return to normal operational / display mode

Commissioning

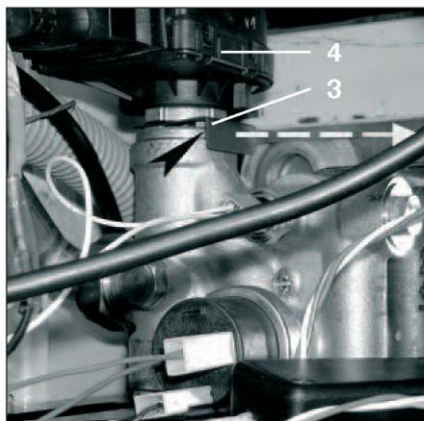
Flue gas quantities and adjustment

Flue gas measurement and adjustment

Combustion settings need to be set with the boiler in commissioning mode (via Flue Cleaner button (8)), setting the boiler at Maximum load / Minimum load and making adjustments at the gas valves Max Output and MinM output as required. (Ref P24 & 25)
When in the commissioning mode the 3-way valve (Combi Only) is diverted to heating mode, the temperature limit values of the boiler are disabled and only the maximum safety temperature remains activated (Q5°C)

Whilst in commissioning mode to put Boiler at max output turn Service Water adjustment (11) fully clockwise, to put boiler into minm output trun service water adjustment (11) fully anti-clockwise

If an HG model boiler (heating operation only) is used with underfloor heating, interrupt the operation of the boiler if the temperature exceeds 45°C. Resume operation after the boiler has cooled.



Access for Analyser Readings

First unscrew the locking screw (1) between the flue gas test points.

The test point plugs (E= emission, A= intake air) can be removed with a 90° anti-clockwise turn (bayonet closure).

Place the analyser Sensor into the appropriate Test point for measurement. Flue gas measurement is carried out in heat mode. Analyser sensor to go in approx 75mm for Emission checking.

On a Combi If system load is difficult to achieve, for example during the summer, the hot water circuit can also be used as follows:

With the aid of a screwdriver disconnect the fixing clamps, 3, of the motor, 4, of the 3-way valve. Steady the motor with your hand meanwhile detach the motor, open one or more hot water taps to let off the heat generated during the measurement of the heating appliance and carry out the measurement.

When measuring is completed, shut the taps again, attach the motor, push it down and replace the fixing clamps.

Commissioning

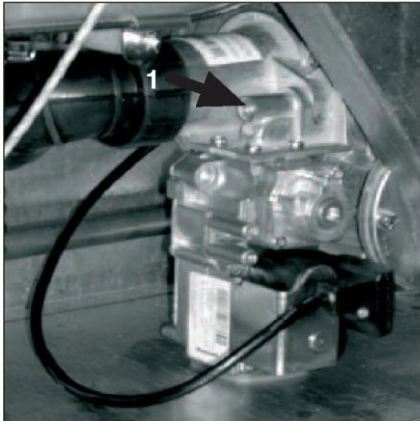
Flue gas quantity and adjustment

Maximum output

Flue gas measuring and adjustment

Switch the boiler to commissioning mode, while keeping flue cleaner key (8) pressed, until the red LED (3) starts to flash (double flash). The display shows alternately the figures 1 and 00. With Hot Water temperature Adjustment (11) turned fully clockwise, the boiler is working in heating mode at 100% output. i.e. maximum output

Wait until the boiler stabilises and then check the combustion settings, checking for CO₂ value in conjunction with the chart below.



To adjust the combustion, proceed as follows:

Remove plastic cap and then adjust High fire (1) on gas valve using a flat bladed screw driver: anticlockwise to increase and clockwise to decrease the CO₂ value. Ensure correct settings for correct fuel type is observed.

Note: Because of the sensitivity of the adjustment, minimum adjustments should only be made. Wait a few seconds, until the CO₂ value has stabilised, if applicable repeat adjustment.

	24 HG	30 HSG/HG
	CO ₂ [%]	CO ₂ [%]
G20 Natural gas H	8,7-9,1	8,8 - 9,2
G31 Propane	10,7- 11,1	10,8 - 11,2

The measurement of CO₂ values must take place with appliance casing fitted.

Commissioning

Flue gas quantity and adjustment

Minimum output

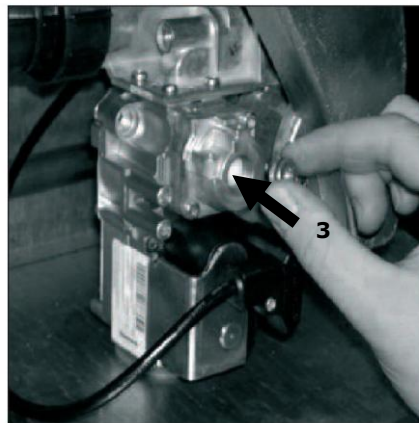
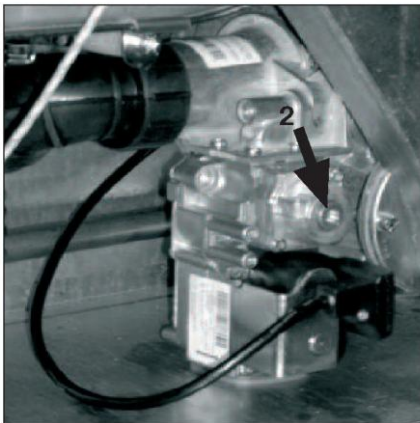
Switch the boiler to commissioning mode, while keeping flue cleaner key (8) pressed, until the red LED (3) starts to flash (double flash). The display shows alternately the figures 1 and 00. With Hot Water Temperature Adjustment (11) turned fully clockwise, the boiler is working in heating mode at 100% output. i.e. maximum output

The boiler needs to be set for operation at minimum load. Turn the Hot water temperature adjustment (11) anticlockwise as far as it will go (the flow temperature of the boiler and the figure 0 flash alternately on the display). From this moment, the boiler is working at minimum output.

Wait until the boiler stabilises and then carry out the flue gas measurement. Check the CO₂ value at the same time by means of the following chart.

	24 HG	30 HSG/HG
	CO ₂ [%]	CO ₂ [%]
G20 Natural gas H	9,3 - 9,7	9,0 - 9,4
G31 Propane	10,9 - 11,3	10,8 - 11,2

The measurement of CO₂ values must take place with appliance casing fitted.



If values remain within the limits given in the chart, no further regulation is necessary.

After these measures the gas flow rate on the counter should be checked, taking into account the specifications contained in the table of technical data.

If the checks are completed, the heating appliance must be re-set manually to normal operation. For this, keep the flue cleaner key (8) pressed until the red LED (3) goes out

If the measured values differ from the values stated, proceed as follows: (Numbers in the following text relate to pictures above)

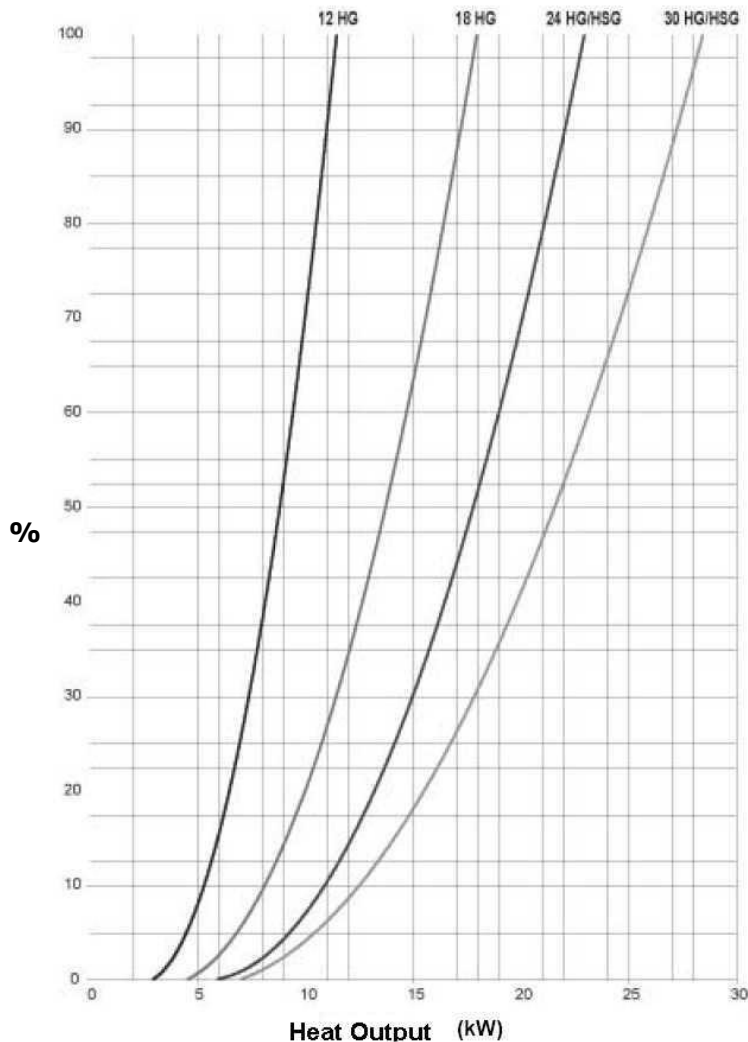
- Remove the cap (2) using a Torque T-40 bit then adjust the Low Fire adjustment (3) on the gas using the same T-40 bit: clockwise to increase and anticlockwise to decrease the CO₂ value of the reading (because of the sensitivity of the screw, minimum rotations are sufficient)

Note: Because of the sensitivity of the adjustment, minimum adjustments should only be made, wait a few seconds, until the CO₂ value has stabilised, then if applicable repeat adjustment.

After measuring, check again the CO₂ values at High Fire. If High fire requires any readjustment also check and readjust Low Fire as required.

Commissioning

Flue gas quantities and adjustment



Setting the Boiler for maximum heat output (%)

The maximum heat output can be set between the highest and lowest values appropriate for the appliance or application. The Boilers are preset in the factory at 100%.

The following steps can be followed to adjust the output, set the appliance's operation at the highest output

Press the Flue Cleaner Key (8), until the red LED (3) **starts to flash** (double flash)

The display will now alternate between the flow temperature of the boiler followed by the figure 1 and then figure 00.

Using knob (11), service water temperature adjustment, the maximum heat output, as a percentage, can now be set to the required value (see graph).

To store the adjustment, keep key (8) pressed until the red LED (3) goes out.

Via the Parameter "d6" the the maximum RPM of the fan for this setting in heating operation can be shown (ref p29)

(Please note that this graph includes models not covered by this manual)

Commissioning

Safety check of heating appliance

Monitoring of the safety device of the heating appliance

Checking the safety devices of the boiler can be carried out using the Flue Cleaner Key (8).

Press and hold the Flue Cleaner Key (8) until the red LED (3) light is illuminated then release immediately.

Note: If the button is pressed for too long i.e. until the Red LED flashes with a double flash then the boiler has been put into Commissioning mode. You will then need to reset and start again.

Once in this mode the LED (3) will flash and display will alternately flash between "SF" and the boiler flow temperature.

The boiler is now working at maximum output in heating mode, and will continue to do so until the safety devices of the boiler are activated. (On exceeding the temperature limit, the appliance locks, the red LED (3) flashes continually and the display shows safety code 111.)

To resume operation, after cooling of the appliance press RESET (6) key.

Protection system of heating appliance

The boiler is protected from operating faults by internal monitors in the microprocessor circuit board, which when necessary lock the appliance for safety reasons. In the case of an appliance being locked, a code is shown on the display which gives the type of locking and its cause. Two types of locking can occur:

Safety Shut-Off

This type of fault is "temporary", i.e. the fault is automatically corrected, as soon as its cause is corrected. Thereupon the appliance switches itself on again and resumes its normal operation. While the appliance is in safety stop, you can try to set it going again by switching off and then on again.

If safety switch-off occurs repeatedly, please contact MHS Service / Technical Support.

Locking

This type of fault is "Permanent", the heating appliance can be reset by pressing Key (6).

There follows a list with possible operating messages and the corresponding codes shown on the display.

Commissioning

Parameters

Reading parameters only

Reading of the boiler parameters is done by means of the SELECT (7) key

- Keep the SELECT key (7) pressed until "[]" appears on the display (about 5 secs)
- release the key.
- Press the key again until "bO" appears on the display (approx 5 secs.)
- Release the key.
- Now each time the key is pressed, the display shows the parameters shown on the right.
- When finished Keep the key pressed till for approx 4 secs, until the display shows "-.-."
- Release the key.
- The display now reverts to the standard readout (heating flow temperature).

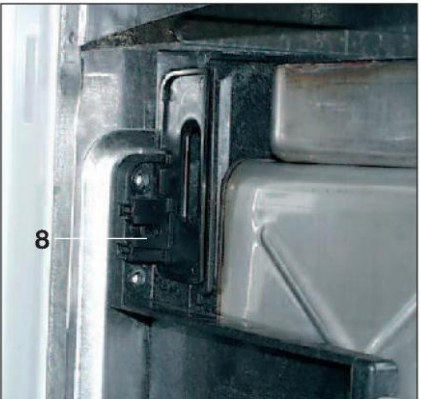
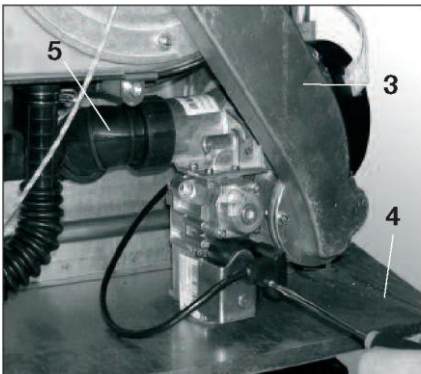
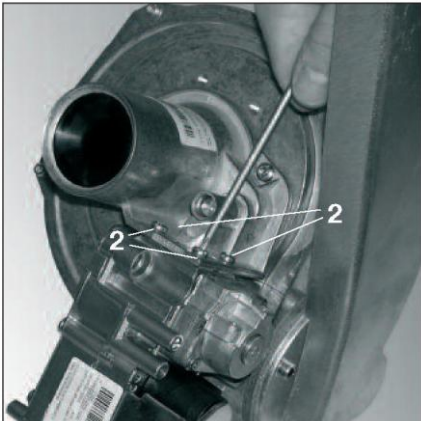
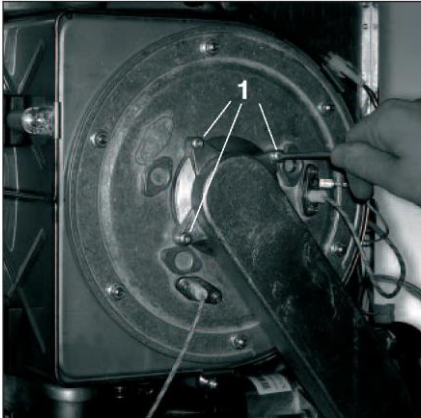
Note: The display reverts to the normal readout if no buttons are pressed or adjustments made for approx 8 minutes.

The only accessible reading parameters are the following:

- A0 Current fault readouts
- A1 Boiler flow temperature reading (°C)
- A2 Service water temperature reading(°C)
- A3 not used
- A4 Reading for operating phase of boiler.
- b0 Internal code in case of fault.
- b1 Boiler return temperature reading (°C)
- b3 Reading of flue gas sensor temperature
- b4 Reading of outside temperature (°C)
- b5 not used
- b6 not used
- b7 Temperature of circuit of second zone (°C)
- b8 not used
- b9 not used
- C1 Reading for ionisation current (u.)
- C2 Reading for ventilator revolutions figure (thousands and hundreds)
- C3 PWM fan (%)
- C4 Reading of relative heating appliance heat output (%)
- C5 not used
- C6 not used
- C7 not used
- d1 Setpoint, calculated according to type of operation, service water or heating operation.
- d2 Value of calculated heating flow temperatures (°C)
- d3 Readout of set room temperature value (°C) If no external/ambient sensor is available, the value is set at 20 °C
- d4 Adjustment of value of service water temperature (°C)
- d5 not used
- d6 Maximum fan speed in heating operation (thousands and hundreds)
- d7 not used
- d8 not used

Commissioning

Gas changeover



Changeover from natural gas to liquid gas (LPG)

1. Disconnect the boiler from the mains.
2. Shut the gas Isolation valve
3. Removing the boiler casing
4. Dismantle the mixing channel by loosening the 3 screws (1). Disconnect the electrical Connections of the fan (3) and the gas valve (4). Remove the air intake hose (5).
5. Separate the gas valve from the venturi by removing the 4 screws.
6. Install the gas injector (contained in changeover kit), as shown in the preceding illustrations.
7. Reinstall the ventilator/venturi gauge/gas valve group in the boiler.
8. Install the air screen (see chart page 31) for liquid gas (contained in changeover kit) on the left of the heat exchanger.
9. Connect the appliance to the mains.
10. Open the gas isolation valve
11. Put the appliance into operation according to the information in the Instruction manual.
12. Check the gas seals.
13. Replace the front panel of the combustion chamber.
14. Carry out a combustion analysis and a calibration of the maximum heat load.
15. Replace gas shield.

The air screen is on the left of the heat exchanger.

Commissioning

Gas changeover

Chart for gas changeover

Output	Gas type	Screen for gas	Screen for air
24 HG	G20/G25 Natural gas H/LL	None	None
	G31 /Propane	0 4.6 mm	53/8mm
30 HSG/HG	G20/G25 Natural gas H/LL	None	None
	G31 /Propane	0 4.6 mm	57/12,5mm

Commissioning

Chart for gas changeover

Gas changeover

			G20 Natural Gas H	G20/G25 Natural Gas H/LL	G25 Natural Gas LL	G30 Butane	G30/G31 Butane/ Propane	G31 Propane
O I CM	Lower Wobbe index (15 °C, 1013 mbar) (MJ/m ³)		45,67		37,38	80,58		70,69
	Consumption (15 °C, 1013 mbar) (Natural gas = m ³ /h) (Liquid gas = kg/h)	max.	1,22	1,22	1,41	0,91	0,91	0,89
		min.	0,32	0,32	0,37	0,24	0,24	0,23
	Gas consumption after 10 Min. (at 70% of max. output) (Natural gas = m ³ /h) (Liquid gas = kg/h)		0,14	0,14	0,16	0,11	0,11	0,10
O I OO	Lower Wobbe index (15 °C, 1013 mbar) (MJ/m ³)		45,67		37,38	80,58		70,69
	Consumption (15 °C, 1013 mbar) (Natural gas = m ³ /h) (Liquid gas = kg/h)	max.	1,90	1,90	2,21	1,42	1,42	1,40
		min.	0,49	0,49	0,57	0,36	0,36	0,36
	Gas consumption after 10 Min. (at 70% of max. output) (Natural gas = m ³ /h) (Liquid gas = kg/h)		0,22	0,22	0,26	0,17	0,17	0,16
O CO I — O I CM	Lower Wobbe index (15 °C, 1013 mbar) (MJ/m ³)		45,67		37,38	80,58		70,69
	Consumption (15 °C, 1013 mbar) (Natural gas = m ³ /h) (Liquid gas = kg/h)	max.	2,43	2,43	2,83	1,81	1,81	1,79
		min.	0,63	0,63	0,74	0,47	0,47	0,47
	Gas consumption after 10 Min. (at 70% of max. output)		0,28	0,28	0,33	0,21	0,21	0,21
O CO I — O I CO CO	Lower Wobbe index (15 °C, 1013 mbar) (MJ/m ³)		45,7	45,7	37,38	80,58	80,58	70,69
	Consumption (15 °C, 1013 mbar) (Natural gas = m ³ /h) (Liquid gas = kg/h)	max.	3,01	3,01	3,50	2,25	2,25	2,21
		min.	0,75	0,75	0,87	0,56	0,56	0,55
	Gas consumption after 10 Min. (at 70% of max. output) (Natural gas = m ³ /h) (Liquid gas = kg/h)		0,35	0,35	0,41	0,26	0,26	0,26

Service and maintenance

Monitoring and checking

Maintenance is fundamentally essential for the safe and correct operation and long life of the boiler. It is recommended, that combustion analysis be carried out at regular intervals, in order to monitor the load and pollutant emissions of the boiler.

If the boiler is decommissioned in an area where the room temperature in winter can fall below 0°C, it is advised to mix the water of the boiler with antifreeze, to avoid frequent evacuation.

Check carefully when using antifreeze if this is suitable for stainless steel, from which the inner part of the heating appliance is made.

The manufacturer is not liable for damage to the appliance or the equipment caused by use of unsuitable antifreeze or additives

Before starting servicing

Before performing any servicing and cleaning, the appliance must be disconnected from the mains.

Gas supply isolator and Water Isolation valves closed for both heating and Hot water

Service and maintenance

Monitoring and checking

General remarks

At least once a year the appliance should undergo the following monitoring:

1. Check seals of water pipes and if applicable replace.
2. Check seals of gas pipes and if applicable replace as required.
3. Visual check of condition of all boiler components.
4. Visual check of burner.
5. Cleaning of main heat exchanger
6. Check functional efficiency of safety system:
i.e. Temperature protection.
7. Check functional efficiency of gas feed safety system:
Gas and flame failure protection (ionisation)
8. For Combi Boiler monitoring of service water production efficiency (checking through flow and temperature).
9. Checking general functional efficiency of boiler.
10. Remove any oxidization on the electrode with the aid of an emery cloth.
11. Check correct positioning / spark gaps of the ignition and ionisation electrodes as per the adjacent picture.
12. Check the combustion fan blades for debris build up. Remove any debris with a soft bristle brush or compressed air.

Cleaning of stainless steel heat exchangers

For Cleaning the interior/dry side of the heat exchanger coils, the burner / burner door assembly must be removed.

For cleaning you may use water, a cleaning agent (citric acid*) and use a non-metal brush. Afterwards flush with water.

Note: Never Clean the Burner itself

Cleaning of the Siphon

To gain access to the siphon, unscrew the Condense collecting glass clockwise, which is on the bottom left of the underside of the boiler. Allow water to drain out safely. Pour 2 litres of clean tap water into the heat exchanger and allow to drain safely through to the cleaning point.

Refit the Condense Collecting Glass and pour a further 2 litres of clean tap water into the heat exchanger to ensure the siphon is full of water.

If the appliance has not been used for a long time, the siphon must be filled before switching on again.

It is dangerous not to refill the siphon with water, as in this case flue gas can escape into the atmosphere.

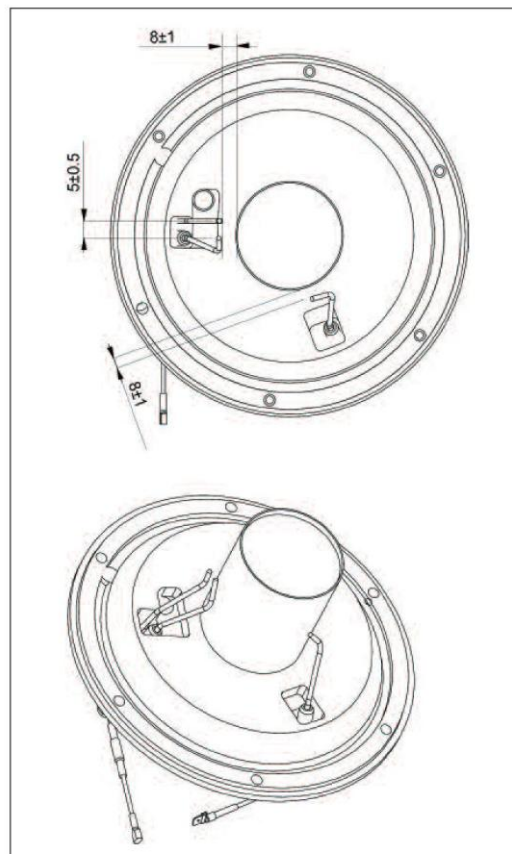
Function checking

After completing the maintenance work fill the heating circuit with a pressure of around 1,0 bar and bleed the appliance of air.

Also fill the service water appliance.

Set the appliance in operation. If necessary, bleed the heating appliance again. Check the adjustments and correct operation of all operator, calibration and monitoring elements.

Check that the flue gas connection is completely sealed with no cross contamination to the combustion air and is functioning correctly.



* Cleaning Granules available from MHS Spares Department

Service and Maintenance

Locking

Error Codes

Display	Internal Code (bO)	Cause
91		EEPROM failure
92		Hardware failure of electronic circuit board
110	129	Activation of thermostats for underfloor heating
110	422	Locking because of over heating
113	506	Activation of flue gas sensor
133	102	Locking because of gas failure
151		Internal locking of circuit board
151	97	Flame at atart of reset phase
152		Failure in programming
153	259	Reset Button pressed when boiler not in fault
154	425	Flow temperature rising too rapidly or no circulation
160	83	On ignition necessary fan speed not achieved
160	282	Blocked Fan
161	110	Measured fan speed above upper limit
183	105	Circuit board in programming mode

Safety cut-off

Display	Internal Code (bO)	Cause
20	142	Short circuit in heating supply sensor
20	143	Heating supply sensor circuit open
40	144	Short circuit in heating return sensor
40	145	Heating return sensor circuit open
50	146	Short circuit in service water or water tank sensor
50	147	Service water or tank sensors circuit open
111	141	Flow temperature above temperature limit (90 °C)
119	140	Low Water Pressure
135	84	Quantity of fan revolutions not correct
154	401	Return temperature greater than flow temperature
154	433	At Supply and return too high

Service and Maintenance

Information code

Error Codes

Display	Internal Code (bO)	Cause
10	150	Short circuit in external/ambient sensor
10	151	External/ambient sensor circuit open
61		Remote control or room temperature sensor signal disturbed
62		Connection of an incompatible remote control or time switch
92		Failure of electronic hardware
133	101	Flame attend of safety period not detected
134	98	Extinguishing of flame during operation
180	168	Flue cleaner function active

Maintenance and Service

Removing appliance cover

Bringing appliance into service position

Maintenance, Service and cleaning must be carried out by trained and approved Personnel. This person shall be responsible for correct implementation of Maintenance activities.

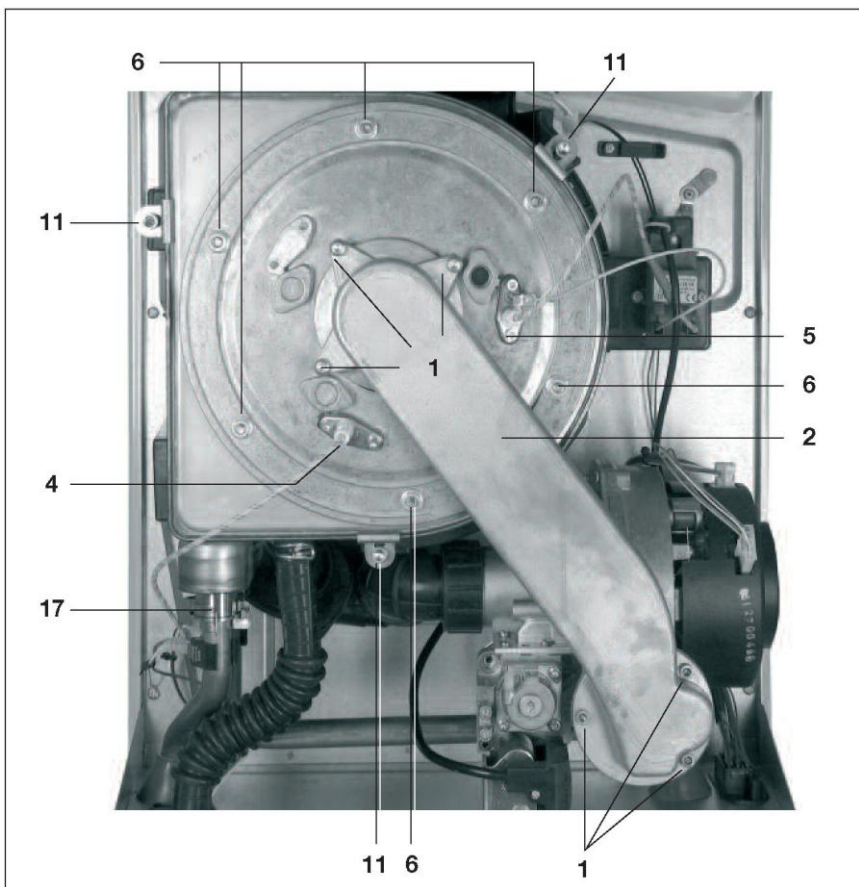
Prior to maintenance work, the appliance must be isolated from the Electrical Mains Supply, Gas Supply, and Water Flow and Return connections shut off.

It is recommended that Maintenance / Service works are carried out once a year.
See P39

See Page 11 for cover removal details

Maintenance and Service

Dismantling burner and heat exchanger

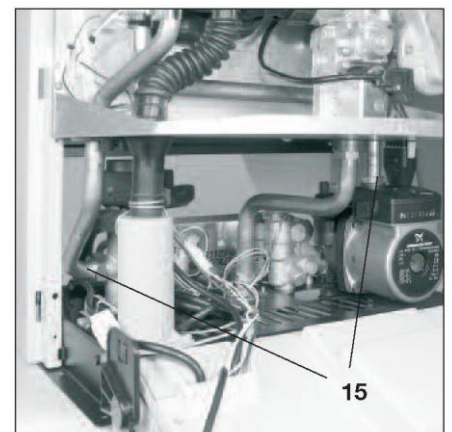
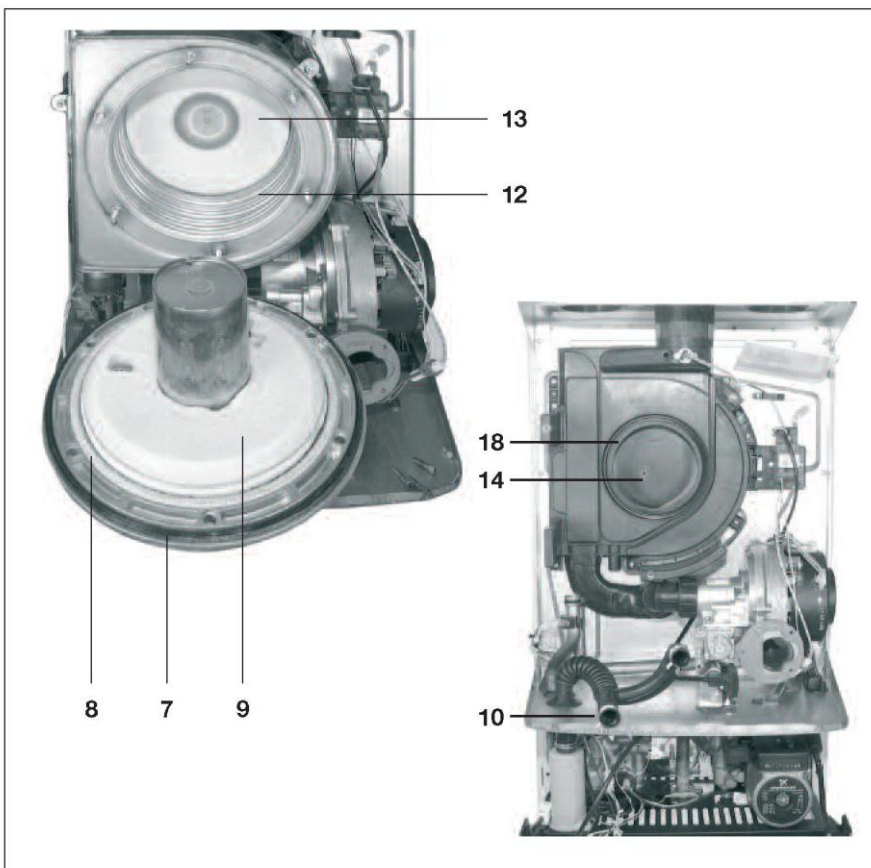


Dismantling Burner Door

- Remove all electrical connections
- Disconnect the screws (1) of the mixing tube (2)
- Pull out ionisation electrode (4) and ignition electrode (5) after loosening fixing screws
- Loosen fixing screws (6) on burner
- Remove complete burner unit (7) from heat exchanger
- Check surrounding seal (8) of burner plate as well as the ceramic fibre seal (9) for damage and replace if necessary

Dismantling Heat exchanger

- Empty appliance of water
- Disconnect condensate drainage hoses (10)
- Disconnect supply and return connections (15)
- Remove both fixing clips (17)
- Loosen fixing screws (11) for heat exchanger (12)
- Detach heat exchanger forwards
- Disconnect combustion chamber insulation (13)
- Flush out heat exchanger (12) with pure water (remove obstinate impurities with fine synthetic brush and flush out)
- Clean flue gas collection unit (14) and check all seals (18)
- Reassemble all components in reverse order.



Service and Maintenance

Maintenance, Service and cleaning must be carried out by trained and approved Personnel. This person shall be responsible for correct implementation of Maintenance activities.

It is recommended that Maintenance/Service works should be carried out once a year. Cleaning of the heat exchanger coils, as long there is only minor contamination of the coils, should be carried out at least every 2 years.

- Measuring and recording of preset emission values
- Switch off heating circuit breaker and secure against coming on again, or separate the appliance on all poles from the mains
- Isolate the Gas Supply
- Dismantle appliance casing, bring control panel into service position
- Dismantle compressor, gas valve and burner unit
- Disconnect ignition cable. Check ignition plugs for breaks, moisture (damp/moist ignition plugs cause malfunction messages - replace ignition plugs)
- Visual check of burner (if necessary clean with brush/nylon brush or vacuum cleaner)
- Visual check of Fan and venturi burner (if necessary clean with brush/nylon brush or vacuum cleaner)
- Disconnect combustion chamber insulation
- Flush out heat exchanger with pure water (remove obstinate impurities with fine synthetic brush and flush out)
- Clean siphon and refill with water before assembly
- Check all connections of condensate-carrying parts for watertightness. Remove any leaking condensate or other dampness
- Check fixing screws, replace if necessary.
- The dismantled seals for gas and water carrying parts should be replaced with new seals when reassembling; this applies especially for O rings on the gas valve and all burner seals
- Reassemble appliance ready for operation
- Open gas pipe and check for watertightness
- Switch on heating circuit breaker
- Carry out function monitoring with emissions measurement
- Values according to factory specifications, readjust if necessary

Service manual

Appendix

QAA 73 (End User Parameters)

Scroll through Parameters using key 2 (Up Button) – ref Page 22

Parameter Number	Description	Options / Range	Recommended Default
1	Current Time of Day.	00:00 – 24:00	Actual Time.
2	Current Date (Day / Month)	1 Jan – 31 Dec	Actual Date.
3	Year	2000 - 2094	Actual Year.
5	Reduced Room Temperature Set Point.	Frost - Day	16°C
6	Frost Protection Set Point (Room)	4 - Reduced	10°C
7	HWS Target Temperature	20 - 60°C	55°C
10	Heating Zone - Day Selection	Mo – Su & Week	Day Required
11	Time Switch Heating Zone - First ON	00:00 – 24:00	06:00
12	Time Switch Heating Zone - First OFF	00:00 – 24:00	22:00
13	Time Switch Heating Zone - Second ON	00:00 – 24:00	--:--
14	Time Switch Heating Zone - Second OFF	00:00 – 24:00	--:--
15	Time Switch Heating Zone - Third ON	00:00 – 24:00	--:--
16	Time Switch Heating Zone - Third OFF	00:00 – 24:00	--:--
30	DHW Zone – Day Selection	Mo – Su & Week	Day Required
31	Time Switch Hot Water Zone - First ON	00:00 – 24:00	06:00
32	Time Switch Hot Water Zone - First OFF	00:00 – 24:00	22:00
33	Time Switch Hot Water Zone - Second ON	00:00 – 24:00	--:--
34	Time Switch Hot Water Zone - Second OFF	00:00 – 24:00	--:--
35	Time Switch Hot Water Zone - Third ON	00:00 – 24:00	--:--
36	Time Switch Hot Water Zone - Third OFF	00:00 – 24:00	--:--
40	Holiday Start Date	1 Jan – 31 Dec & Inactive	Inactive
41	Holiday End Date	1 Jan – 31 Dec & Inactive	Inactive
42	Room Temperature Operating Level During Holiday Period.	Frost / Reduced	Frost
45	Default Reset of Time Switch Settings	YES / NO	NO
46	External Summer/Winter Changeover Temperature.	8.....30°C	
47	Display Language	English.....	English
50	Fault Code	0.....255	Review Only

Service manual

Appendix

QAA 73 (Engineer Parameters)

Press and Hold program keys 1 (**Down** button) and 2 (**Up** button) for approx 5 secs. Ref Page 22

* Lines are only displayed if the unit is operating in Open Therm Plus mode and if the boiler controller supports its function.

Parameter Number	Description	Options / Range	Recommended Default
Service Values			
51	Current Room Temperature Set Point (Heating Zone 1)	4...35	#
52*	Current Room Temperature Set Point (Heating Zone 2)	4...35	#
53*	Outside Air Temperature (Attenuated)	-50...+50	#
54*	Outside Air Temperature (Composite)	-50...+50	#
55*	Actual Value of HWS	0...127	#
56*	HWS Flow Rate	0...16	#
57*	Actual Boiler Return Temperature	-40...127	#
58*	Actual Flue Gas Temperature	-40...500	#
59*	Actual Solar Panel Temperature	-40...250	#
61*	Actual solar Storage Tank Temperature	-40...127	#
62	QAA73 Communication Mode (Open Therm Mode)	Lite / Plus	Plus
Heating Zone Temperature Set Points			
70	Compensation Curves Set Point for Time Switch 1	2.5...40	32
71	Minimum Boiler Flow Temperature for Time Switch 1	8...Max	8
72	Maximum Boiler Flow Temperature for Time Switch 1	Min...90	80
73	Compensation Slope Parallel Displacement for Time Switch 1	-4.5...+4.5	0.0
74*	Build Construction Type	Heavy / Light	Light
75*	Influence of Room Temperature on Boiler Operation	None / HC1	On HC1
76	Pump Switching Differential	0.5...4.0	0.5
77	Compensation Slope Auto Adaptation	Inactive/Active	Inactive
78	Optimum Start Time Maximum Shift Limitation (Minutes)	0...360	100
79	Optimum Stop Time Maximum Shift Limitation (Minutes)	0...360	30
80*	Compensation Curves Set Point for Time Switch 2	2.5...40	0 (32 if AGU used)
81*	Minimum Boiler Flow Temperature for Time Switch 2	8...Max	8
82*	Maximum Boiler Flow Temperature for Time Switch 2	Min...90	8 (80 if AGU used)
83*	Compensation Slope Parallel Displacement for Time Switch 2	-4.5...+4.5	0.0
HWS Set Points			
90*	Reduced HWS Set Point	8...60	40
91	HWS Enable Switching	TSP DHW..	TSP DHW
92*	Anti Legionella Function (Monday Morning 2,5 Hours Max)	Off...On	On
93*	Operating mode for HWS (Eco setting)	With Eco / Without Eco	Without Eco
General			
95	Operational Lock	Off / On	Off
96*	Clock Operation	QAA73 / Boiler	QAA73
97	Summer Time Start	1 Jan...31 Dec	25 March
98	Summer Time End	1 Jan ...31 Dec	25 Oct

For Access to the LMU level: Access QAA73 Engineer Parameters as detailed above

For Access to LMU Parameters (i.e Line 100 upwards)

Press and Hold program keys 1 (**Down** button) and 2 (**Up** button) for approx 10 secs

Service manual

Appendix

LMU (Engineer Parameters)

To Access parameters 516 – 727 from QAA73
Press and Hold Keys 4 (+ Button) and 1(Down Button) for approx 5 secs. Ref page 22

Parameter	Name	Setting	Unit	Description
516	THG	25	°C	Summer / Winter changeover temperature (30 °C: Summer / Winter changeover disabled/not active)
520	dTrAbsenk	10	K	Drawdown of the room setpoint at timer connection ("dTrAbsenk" = 0: timer works directly off heating demand)
532	Sth1	15		Steepness of heat characteristic curve heating circuit 1
533	Sth2	8		Steepness of heat characteristic curve heating circuit 2
534	DtR1	0	K	Room setpoint adjustment heating circuit 1
535	DtR2	0	K	Room setpoint adjustment heating circuit 2
727	Diagnose Code			

Service manual

Appendix

LMU (Specialist Engineer Parameters)

For Access to the next level (whilst in Parameters 516 – 727)

Keep program keys 1 (**Down** Button) and 2 (**Up** Button) pressed simultaneously for approx a further 5 secs. Ref page 22

Parameter	Name	Setting	Unit	Description
504	TkSmax	85	°C	Maximum boiler setpoint temperature (\geq "TkSmin" and \leq 90 °C) must be at least 3 K less than for "TkMax"
505	TkS standard	80	°C	Boiler setpoint at standard outside air temperature
506	TvSmin	20	°C	Minimum flow setpoint temperature (\geq 20 °C and \leq "TvSmax")
507	TvSmax	80	°C	Maximum flow setpoint temperature (\geq TvSmin and \leq 90°C)
521	dTkTrNenn	20	K	Delta T Control: flow and return at standard Outside air Temperature (\geq 2,5 K and \leq maximum "dTkTrMax")
522	dTkTrMax	25	K	Delta-T-control: maximum differential of the supply/return temperature at standard Outside Air temperature
537	NqmodNenn	30		Speed level of boiler pump in design point of heating installation ("NqmodNenn" \leq "QmodDrehzStufen")
538	NqmodMin	40	%	Minimum pump speed permitted for the heating installation
541	PhzMax	100	%	Maximum modulation rate in heating mode (\geq "LmodTL" and \leq "LmodVL")
551	Kon	2		Constant for rapid power fluctuation without ambient effect
552	Hydraulic System	6		Hydraulic system adjustment
553	KonfigHks	553		Configuration of heating circuit (position YX, X for heating circuit 1, Y for heating circuit 2 of LMU...)[Value: 0 no room unit effect, 1 heating circuit 1 of room unit, 2 heating circuit 2 of room unit]
555	KonfigRg1	0010000		Installation options for: DHW priority, installation frost protection, modem function, {room thermostat input, timer switch}; ({} not LMU7...)
558	KonfigRg4	1000000		Installation options for: DHW thermostat, water pressure sensor, function changeover valve outlet {heat demand Q8, construction} ({} not LMU7...)
561	KonfigRg7	0001000		installation options for: Pump modulation, Regulator delay
596	ZeitAufZu	135	s	Operating time of mixer engine (time off / time on)
605	LPBAdrGerNr	1		LPB unit number of the LMU...
606	LPBAdrSegNr	0		LPB segment number of the LMU...
610	LmodVL_QAA	100	%	Setpoint operation: Modulation air in normal load, upper limit modulation area
614	KonfigEingang	1		Installation options (function) of programmable input of the LMU...-Base
615	Konfigoutlet	0		Installation options (function) of relay outlet K2 of the LMU... - Base
618	KonfigEingangR	0		Installation options (function) of programmable input of relay ClipIn
619	Konfigoutlet1R	0001010		Installation options function) of relay outlet 1 of the relay ClipIn
620	Konfigoutlet2R	0000001		Installation options (function) of relay outlet 2 of the relay ClipIn

For Access to the OEM level: Access Specialist Engineer Parameters as detailed above

Keep program keys 1 (**Down** Button) and 2 (**Up** Button) pressed simultaneously for approx 10 secs.

When asked for OEM code, Password = 1 (**Down** Button), 2 (**Up** Button), 4 (**Plus** Button), 3 (**Minus** Button), 4 (**Plus** Button)

Service manual

Appendix

LMU (Specialist Engineer Parameters) - continued

Parameter	Name	Setting	Unit	Description
621	Konfigoutlet3R	0000010		Installation options (function) of relay outlet 3 of the relay ClipIn
639	dTUeberhBegr	40	%	Limit of temperature super-elevation via the Delta Tcontrol (0 %: no elevation, 100 %: fully measured elevation)
646	LmodNull	0	%	Modulation air if automatic firing not in operation
656	KonfigRg10	0		Installation options for: burner block, drinking water DLH cycle protection, DHW lag, blower/fan switch-off ({} not LMU7...)
657	TbwSollAleg	0	°C	Setpoint of free-wheeling anti-legionella function (0 °C: legionella function not active)
658	Estrichfunction Rh1	0		Operating mode of the floor drying function for heating circuit 1
659	Estrichfunction Rh2	0		Operating mode of the floor drying out function for heating circuit 2
700	Stoer1			1 st Historical Fault – N ^o of Occurances
701	StrPn1			1 st Historical Fault – Operating Phase
702	StrDia1			1 st Historical Fault – Operating Error Code
703	Stoer2			2 nd Historical Fault – N ^o of Occurances
704	StrPn2			2 nd Historical Fault – Operating Phase
705	StrDia2			2 nd Historical Fault – Operating Error Code
706	Stoer3			3 rd Historical Fault – N ^o of Occurances
707	StrPn3			3 rd Historical Fault – Operating Phase
708	StrDia3			3 rd Historical Fault – Operating Error Code
709	Stoer4			4 th Historical Fault – N ^o of Occurances
710	StrPn4			4 th Historical Fault – Operating Phase
711	StrDia4			4 th Historical Fault – Operating Error Code
712	Stoer5			5 th Historical Fault – N ^o of Occurances
713	StrPn5			5 th Historical Fault – Operating Phase
714	StrDia5			5 th Historical Fault – Operating Error Code
715	Stör_akt			Current Historical fault – N ^o of Occurances
716	StrPn_akt			Current Historical fault – Operating Phase
717	StrDia_akt			Current Historical fault – Operating Error Code
718	BetrStd	0	std	Burner operating time (total time burner On)
719	BetrStdHz	0	std	Operating time Heating mode
720	BetrStdBw	0	std	Operating time DHW mode
721	BetrStdZone	0	std	Zone operating time
722	InbetrSetz	0		Burner startup meter
724	MmiStatus	0000101		Operating mode adjustment: automatik, summer, winter
725	Sw Version LMU	-		LMU Software version
728	StrAlba1			1 st Historical Fault
729	StrAlba2			2 nd Historical Fault
730	StrAlba3			3 rd Historical Fault
731	StrAlba4			4 th Historical Fault
732	StrAlba5			5 th Historical Fault
733	StrAlba6			Current Historical Fault
755	IonStrom			Measured value of ionisation current

Service manual

Appendix

Flue Termination Guidelines

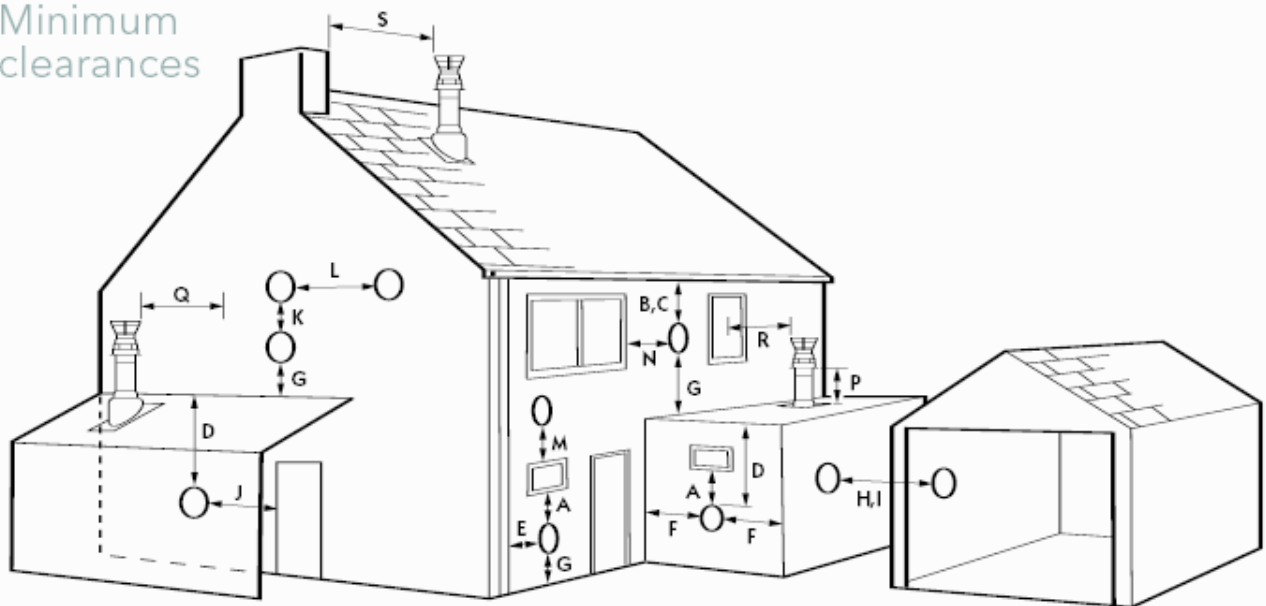
Please note that this diagram is only intended for reference purposes only and that definitive guidance should be sought from BS 5440-2:2000, BS6644:2005:2005 and/or IGE/UP/10 as appropriate.

Terminal Position	Minimum Distance
A - Below an opening window etc.	300mm
B - Below gutter, soil pipes etc.	75mm
C - Below eaves.	200mm
D - Below balconies or car port roof.	200mm
E - From vertical drain or soil pipe etc.	150mm
F - From internal or external corners.	300mm
G - Above ground or balcony level.	300mm
H - From a surface facing the terminal.	2000mm
I - From a terminal facing the terminal.	2000mm

Terminal Position	Minimum Distance
J - From opening in a carport into dwelling.	1200mm
K - Vertically from a terminal, same wall.	1500mm
L - horizontally from a terminal, same wall.	300mm
M - Above an opening, window etc.	500mm
N - Horizontally to an opening, window etc	300mm
P - Above a level roof (base of terminal)	500mm
Q - From adjacent wall (edge of terminal)	500mm
R - From adjacent opening window	1000mm
S - From any other flue terminal	600mm

Dimensions highlighted in BOLD are not recommended locations

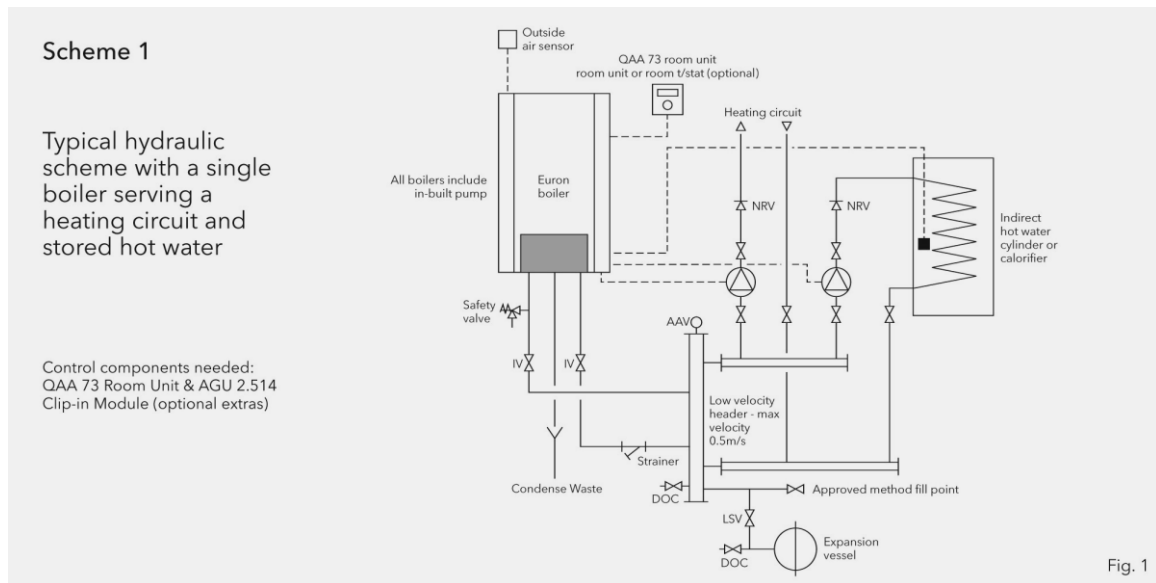
Minimum clearances



Service manual

Appendix

Typical Hydraulic Schemes



Power for additional Heating Circulation Pump using AGU2.514 clip in module (Optional Extra)

Parameter Changes (Using QAA73)

552 = 51

558 = Bit 2 – Set to **0** for HWS Sensor or **1** for HWS Volt free Enable (if used for Hot Water)

618 = 6

619 = 10

Note: QAA73 is required to enable required Parameter changes

For Hot Water Pump - Use Divertor valve connection in Boiler.

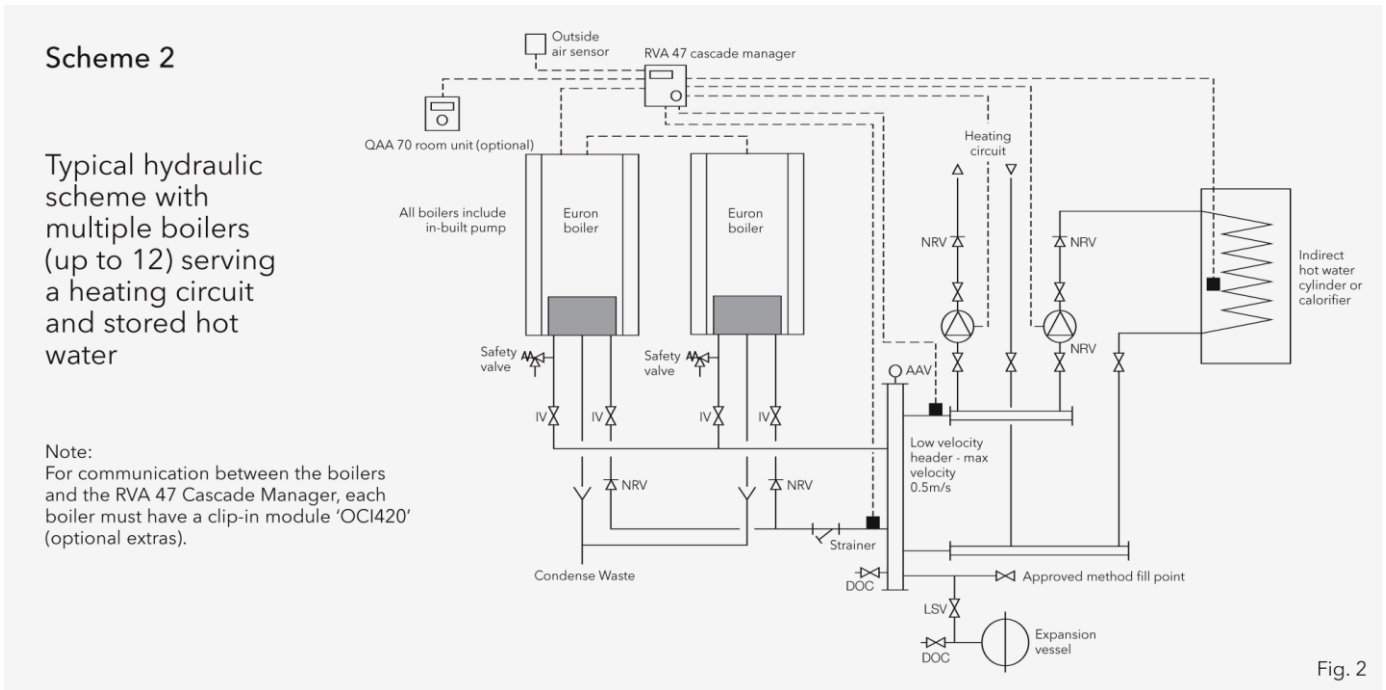
Cut off Connector and remake suitable connections for connection to HWS Pump wiring.

QAD36 Flow sensor wired to X51-01, terminals 1 & 2 on AGU2.514 clip in Module.

Service manual

Appendix

Typical Hydraulic Schemes



Parameters required for Euron Boilers In cascade using RVA47. OCI420 clip must be fitted for cascade LPB communication.

RVA 47:

Para 16 = 30
 Para 140 = 1
 Para 141 = 0
 Para 142 = 1

Euron 1: (Changes made using QAA73)

Para 516 = 30
 Para 543 = 1
 Para 552 = 80
 Para 604 = Bit 4 – Set to 1 (should already be at at 1) all others should be Zero
 Para 605 = 2
 Para 606 = 0

Euron 2: (Changes made using QAA73)

Para 516 = 30
 Para 543 = 1
 Para 552 = 80
 Para 604 = Bit 4 – Set to 1 (should already be at at 1) all others should be Zero
 Para 605 = 3
 Para 606 = 0

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