Remeha Avanta Plus

Installation and service manual

Remeha Avanta Plus

- Remeha Avanta Plus 28c
- Remeha Avanta Plus 35c
- Remeha Avanta Plus 39c
- Remeha Avanta Plus 24s

remeha

INTRODUCTION

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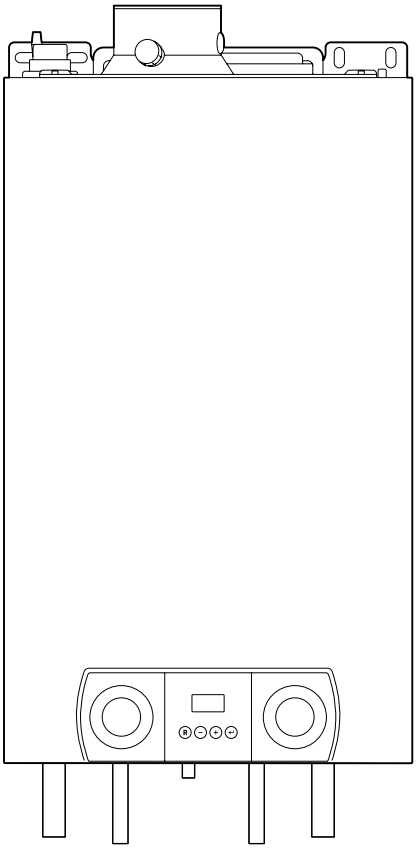

LT.AL.W7H.000.001

The Remeha Avanta Plus is a series of high-efficiency fully condensing central heating boilers, for wall mounting, available in the following types:

- Remeha Avanta Plus 28c, 35c and 39c
  - with integrated domestic hot water system (**C**ombi-type)
- Remeha Avanta Plus 24s
  - without integrated domestic hot water system (**S**ystem-type)

These technical instructions contain useful and important information for the correct installation, operation and maintenance of the Remeha Avanta Plus combi and system boilers.

Read these instructions carefully before putting the boiler into operation, familiarise yourself with their control functions and operation, strictly observing the instructions given. Failure to do so may invalidate warranty or prevent the boiler from operating correctly.

The installation, commissioning, inspection and servicing of the boiler must be carried out by a competent Corgi registered engineer who holds valid ACOPS certification and in accordance with current gas safety (installation and use) regulations, the building regulations and all other relevant codes of practice.
All electrical work must be carried out by a competent engineer and to be installed in accordance with the current IEE regulations.

On commissioning the certificate in the Boiler Service Log book (supplied with the boiler) must be completed and left on site with a copy send on to Broag Ltd for registration purposes.

If you have any questions, require an engineer to call on site, or if you need more information about specific subjects relating to this boiler, or it's installation please do not hesitate to contact our technical help line 0118 978 3434.

When contacting Broag with a problem on the boiler, please have available the boiler type, Serial No (located on the bottom of the casing), and the symptoms or fault code (the fault code is a series of flashing red digits in the display panel).

The data published in these technical instructions is based on the latest information (at date of publication) and may be subject to revisions.
We reserve the right to continuous development in both design and manufacture, therefore any changes to the materials or technology employed may not be retrospective nor may we be obliged to adjust earlier supplies accordingly.

1 SAFETY

1.1 General safety

The following pictograms are used in this Installation and Service manual to specifically draw certain points to your attention:

Tip  Useful tip or practical advice.

Indication  Important instruction in carrying out a particular operation.

Warning  Possible danger of personal injury or material damage to the regulator, building or environment.

Danger  Serious personal injury can occur because of risk of electric shocks.

1.2 Safety during assembly and installation

Observe the appropriate safety measures, as given in these instructions.

Can you smell gas? What to do:

- do not smoke and do not create any flame or sparks;
- do not use any electric switches;
- turn off the gas tap;
- open windows and doors;
- trace possible leaks and seal them.

Warning! If the leak is before the gas meter, alert your gas supplier, TRANSCO, tel. 0800 111 999

Can you smell smoke or flue gasses? What to do:

- isolate power supply.
- open windows and doors;
- trace possible leaks and seal them.

1.3 Safety during installation, inspection and maintenance

Under the current Gas Safety (Installation & Use) Regulations, the Remeha Avanta Plus, in common with all gas appliances, must be installed by a competent person in accordance with that regulation.
Statutory regulations in any country, cannot be overridden by any of the notes or instructions from the manufacturer. Compliance with National Standards does not provide any degree of immunity from legal obligations. In the UK, the installation must be in accordance with the national and local norms and requirements.

For any issues or circumstances not addressed within these instructions, please call our Customer Care Department.

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The Remeha Avanta Plus (combi and system) is a WRAS (Water regulations) approved product.

Remeha Avanta Plus (combi and system) - PIN: 0063BQ3009

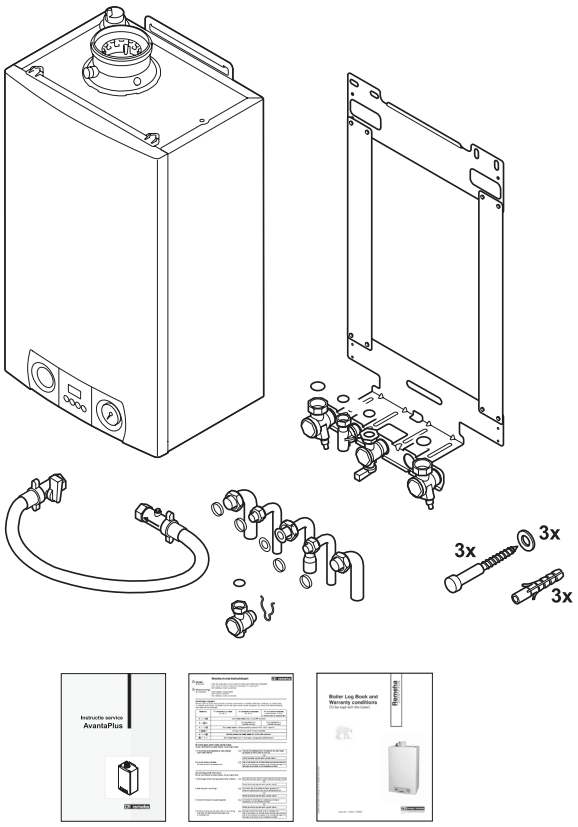
Gas Council numbers: Remeha Avanta Plus 28c: 47-673-02
Remeha Avanta Plus 35c : 47-673-03
Remeha Avanta Plus 39c: 47-673-04
Remeha Avanta Plus 24s: 41-288-05

Classification type for evacuation of the combustion products; according EN 483: *see Par. 8.1.*

Health and safety information

- The weight of the Avanta Plus system and combi boilers exceed the maximum lift weight for one person.
- All sealants and gaskets are free from harmful products. On first firing the boiler, a smell from the sealants and gaskets may be present and should cease after a short period.

2 INSTALLATION



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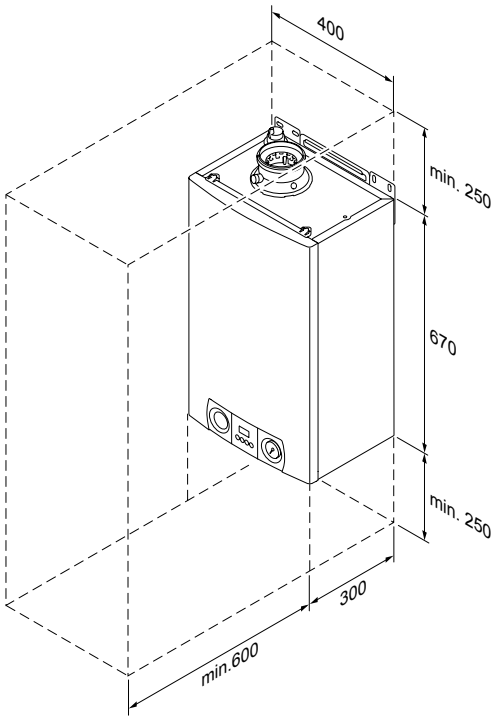

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2.1 Scope of delivery

The standard delivery of the Remeha Avanta Plus boiler includes:

- the boiler (including pressure gauge and safety valve);
- mounting plate (including isolation valve set and washers);
- nylon plugs and screws for fixing mounting plate;
- copper tails 15/22 mm;
- mounting template;
- filling loop;
- Boiler Service Log Book;
- Installation and Service manual and Users guide.

This Installation and Service manual deals with the standard supplied boiler only. For the installation or assembly of any optional accessories supplied with the boiler, such as stand off frame, pipework kits, cover plate, control kits, etc, please refer to the Assembly Instructions supplied with these accessories.

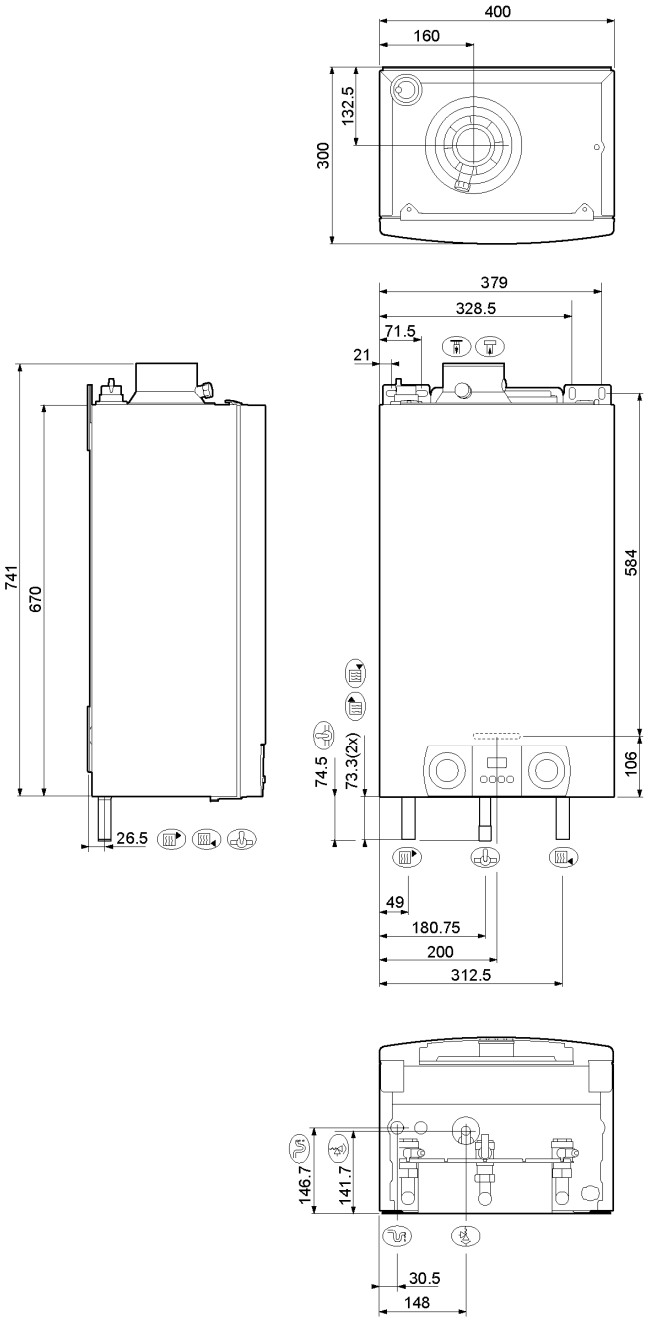
2.2 Mounting the boiler

Packed in the box with the Remeha Avanta Plus box is this Installation and Service manual. Read instructions and remarks carefully. This section includes the guidelines and instructions for the connection of gas, water, electricity, safety devices, the regulator, control unit, flue discharge and air supply.

2.2.1 Clearance requirements

The gas and water connections are located on the bottom of the boiler whilst the air in and flue gas outlet is located on the top of the boiler. The boiler is supplied as standard with pipework tails to allow connections facing downwards.
Optional stand off frame and pipework kits are available to enable the pipework to run upwards behind the boiler if required. For installation, servicing and inspection min. 600 mm in front of the boiler is required. If this free space is obtained by opening a door or removing a panel, the boiler may be installed for instance in a closed cupboard.
We do recommend a side clearance of 0.5 cm so that the unit is easy to open, with a free space of 25 cm under the appliance and 25 cm above the appliance, as the minimum requirement.

2.2.2 Dimensions and connection points.



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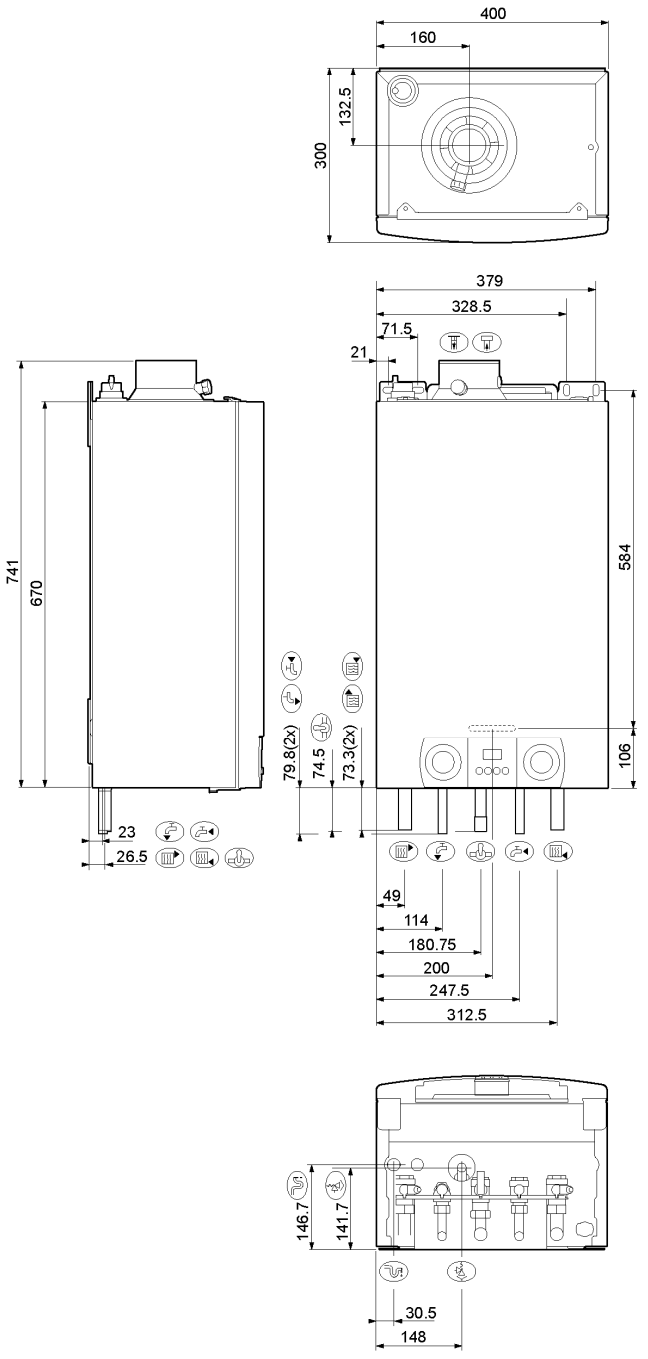
System-type

- *Return connection Ø 22 mm*
- *Flow connection Ø 22 mm*
- *Gas connection Ø 22 mm*
- *Combustion air inlet Ø 100 mm (concentric)*
- *Flue duct Ø 60 mm (concentric)*
- *Condensate drain connection ¾" (standard overflow pipe size)*
- *Connection safety valve Ø 15 mm*



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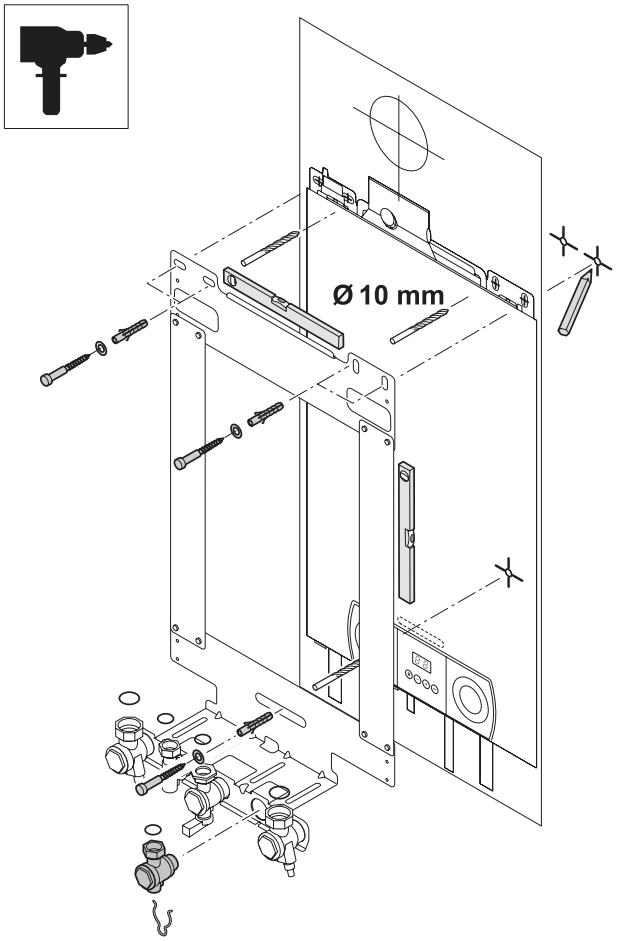
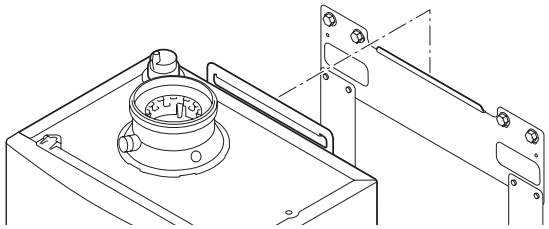
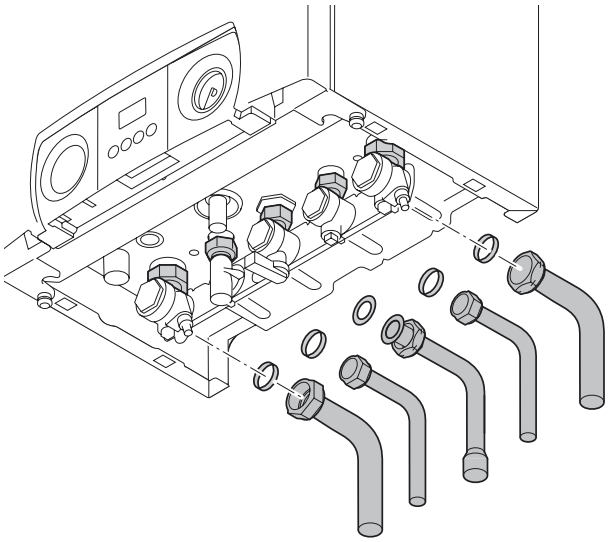
Combi-type

- *Return connection Ø 22 mm*
- *Flow connection Ø 22 mm*
- *Gas connection Ø 22 mm*
- *Combustion air inlet Ø 100 mm (concentric)*
- *Flue duct Ø 60 mm (concentric)*
- *DHW inlet (cold) connection Ø 15 mm*
- *DHW outlet (hot) connection Ø 15 mm*
- *Condensate drain connection ¾" (standard overflow pipe size)*
- *Connection safety valve Ø 15 mm*

- Based on the guidelines and the required installation space, determine where to mount the Remeha Avanta Plus.
- In determining the boiler position, consider carefully the flue outlet position and any pluming consequences.







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2.2.3 Mounting the Remeha Avanta Plus

- Remove the mounting plate and template from the box.
- Using the template determine and mark the position of the three mounting holes and center line of flue, making sure the plate is absolutely level.
- Drill the (Ø 10 mm) holes.
- Fit the (Ø 10 mm) plugs.
- Fit (Ø 8 mm) screws into the plugs.
- Check the mounting plate is level and tighten the screws.
- Fit the valve set to the mounting plate.
- Fit fibre washers on the CH valves.
- Remove boiler from the box and suspend it on mounting plate.
- Connect the valves to the boiler remembering to fit fibre washers supplied.
- Connect the supplied copper tails to the isolating valves.

⚠

- The boiler should be mounted on a suitable vertical wall which is able to support the weight of the boiler.
- The boiler should be mounted in a room which, even during severe cold weather, remains frost-free.
- If the boiler is to be installed in a timber framed building, please refer to British Gas publication: 'Guide for Gas Installations in Timber frame Housing', reference DM2.
- In a new installation it is possible to fit just the wall plate and valve set to enable the system pipework to be completed and tested before fitting the boiler at a later date (place fibre washers supplied in a safe place for use when fitting the boiler).

☞

- Make sure the boiler and any open connections are protected from building etc. dust during the installation.
- There must be a 3 amp fused switched spur within 1m of the boiler.
- Provision must be made for the condensate discharge.

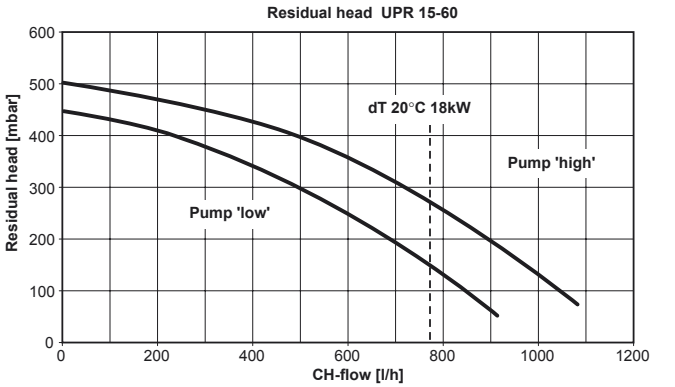
2.3 Water-side connections

2.3.1 Water flow

An internal automatic flow by-pass is supplied in the Avanta Plus to ensure correct operation on systems fitted with TRV's on all heat emitters. The '**abc**®' control also monitors the temperature difference across the flow and return connections and the rate of temperature rise and will automatically regulate the boiler output to ensure that it remains operational for as long as possible without the need to 'lock out' requiring a manual re-set.

2.3.2 Circulation pumps

The Remeha Avanta Plus 24s and 28c are fitted with the Grundfos UPR 15-60 and the Avanta Plus 35c and 39c with the UPR 15-70, two-speed circulation pumps. The control unit ensures that when the hot-water function is active, the pump runs at 'high'. The factory setting of the pump for CH function is 'low.' If necessary, the service installer can adjust this to 'high' by switching parameter [2][1] (from [0] to [1]) *see par. 2.9.8.*



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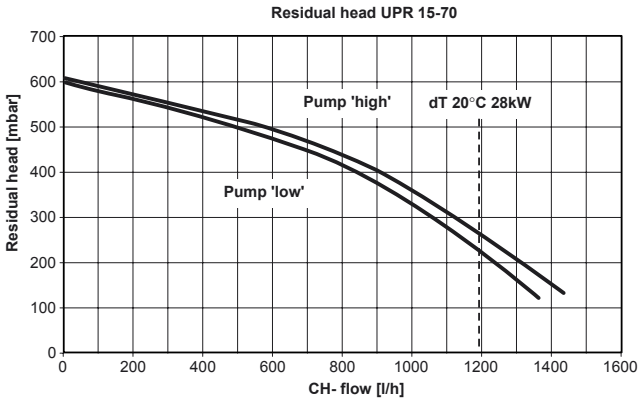

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2.3.3 Additional guidelines for the domestic and CH water

- The system should be filled with mains cold water (for the UK this will usually have a pH of between 7 and 8).
- Power flush the pipes and radiators thoroughly to remove all fluxes and debris before connecting the boiler to the central heating system in accordance with BS 7593 (1992).

⚠

- The temperature of the central heating pipes and the radiators can rise to 95°C.
- Use untreated tap water only to fill the CH system.
- The pH value of the system water must be between 6 and 9.
- In case inhibitors are being used, please follow the instructions given in *par. 2.3.4.*

2.3.4 Water treatment

If used correctly water treatment can improve the boilers efficiency and increase the anticipated life expectancy of the boiler. For further information a special document "Quality requirements CH water" is available from Broag.

As most systems contain a variety of metals, it is considered good practice to provide some form of water treatment in order to prevent or reduce the following:

- Metallic corrosion
- Formation of scale and sludge
- Microbiological contamination
- Chemical changes in the untreated system water

⚠

All scale deposits however small will reduce the efficiency of the boiler and should be prevented.

Suitable chemicals and their use should be discussed with a specialist water treatment company prior to carrying out any work (environmental aspects, health aspects). The specification of the system and manufacturers recommendations must be taken into account, along with the age and condition of the system. New systems should be flushed thoroughly to BS 7593(1992) to remove all traces of flux, debris, grease and metal swarf generated during installation. Care to be taken with old systems to ensure any black metallic iron oxide sludge and other corrosive residues are removed, again by power flushing, ensuring that the system is drained completely from all low points.

☞
Please ensure that the new boiler plant is not in circuit when the flushing takes place, especially if cleansing chemicals are used to assist the process.

It is important to check the inhibitor concentration after installation, system modifications, filling the system and every service in accordance with these instructions.

For the correct dosage and the suitability of inhibitors for use with our boilers and for further information on water treatment or system cleaning we advise direct contact with either of the following companies:

'Copal®' manufactured by:
Fernox, Cookson Electronics
Forsyth Road
Sheerwater
Woking
Surrey GU21 5RZ
Tel No: 01483 793200
Fax No: 01483 793201
Email: sales@fernox.com
Web site: www.fernox.com

or:
Sentinal 'X100®' manufactured by:
BetzDearborn Ltd
Sentinal
Foundry Lane
Widnes
Cheshire WA8 8UD
Tel No: 0151 424 5351
Fax No: 0151 420 5447

2.3.5 Safety valve discharge

A pressure relief safety valve is fitted in the boiler set to the maximum operating pressure of the boiler at 3 bar.
If the pressure in the boiler becomes too high the pressure is relieved by releasing water outside via the safety valve discharge pipe. The safety valve discharge pipe must be at least 15 mm Ø. The discharge should be terminated facing downwards exterior to the building in a position where discharging water will not create danger or nuisance but remains in a visible position.

2.3.6 Expansion vessel

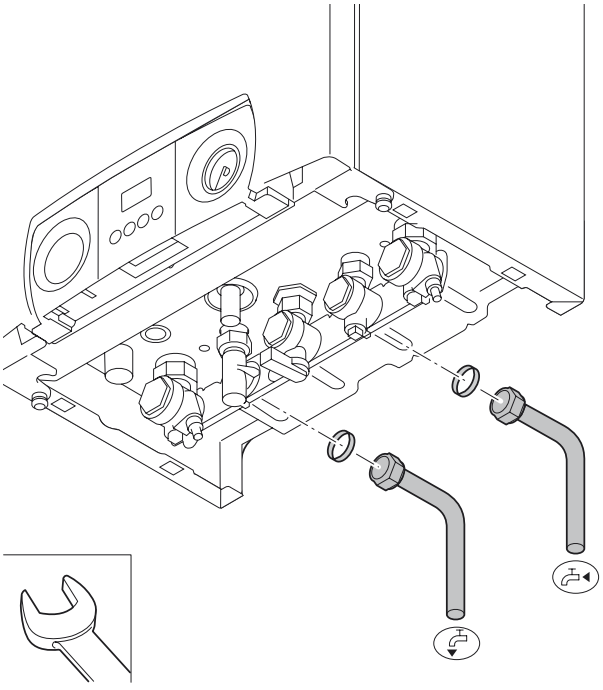
An 8 litre expansion vessel (with the vessel charge set to 1.0 bar) is fitted as standard within the boiler case and is suitable for use in a heating system with a water content up to 100 litres, operating at a flow temperature of 80°C, a maximum pressure of 3 bar and a maximum system static head of 5 metres above the boiler. If the system water content is greater than 100 litres, or the system static head above the boiler is greater than 5 m, an additional vessel must be installed in the system to allow for the increase in expansion, *see table 01.*

⚠
Install additional vessel according BS 5449, part1.

Boiler Safety Valve Setting (Bar)	**3.0**		
Vessel Charge (Bar)	0.5	1	1.5
Heating System Water Content (Litres)	**Expansion Vessel Size (Litres)**		
100	4.8	8.0	13.3
125	6.0	10.0	16.6
150	7.2	12.0	20.0
175	8.4	14.0	23.3
200	9.6	16.0	26.6
250	12.0	20.0	33.3
300	14.4	24.0	39.9
For other system volumes, multiply the system volume by the factor across:	0.048	0.080	0.133

table 01 Expansion Vessel Size

2.3.7 Connecting DHW pipes (Combi-type only)



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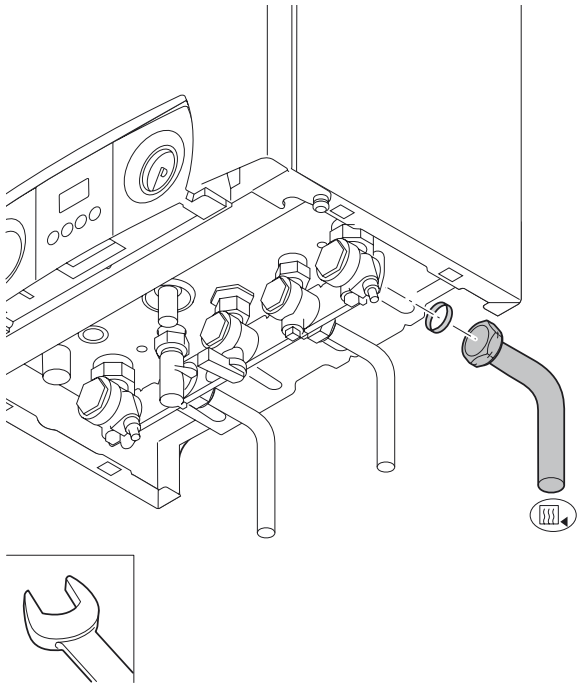
- Fit the outlet pipe for hot water to the DHW outlet 15 mm Ø connection.
- Fit the inlet pipe for cold water to the DHW inlet 15 mm Ø connection.

☞
- The DHW pipes must be connected in accordance with current regulations.
- For plastic pipes, follow the manufacturer's instructions (for connection).

2.3.8 Connecting the 'CH return'



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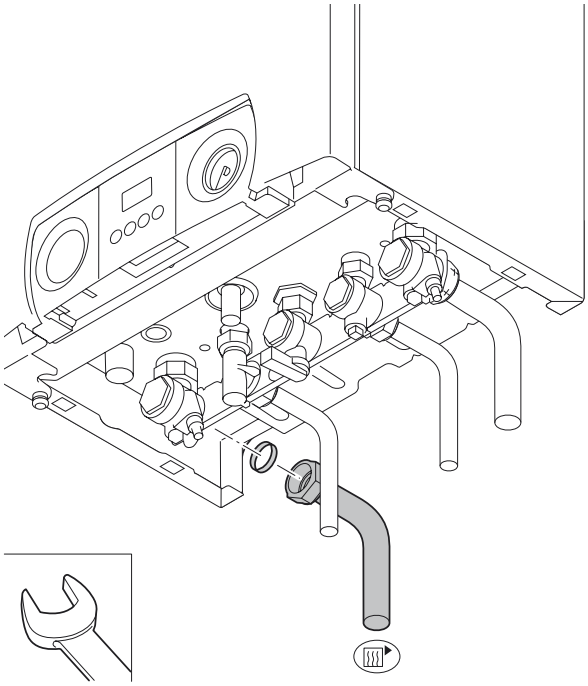
- Fit the inlet pipe for CH water to the 'CH return' 22 mm Ø connection.

The Remeha Avanta Plus has a drain cock built into the return isolating valve
It is considered good practice to install an air separator / dirt removal device in the return to the boiler.

2.3.9 Connecting 'CH flow'



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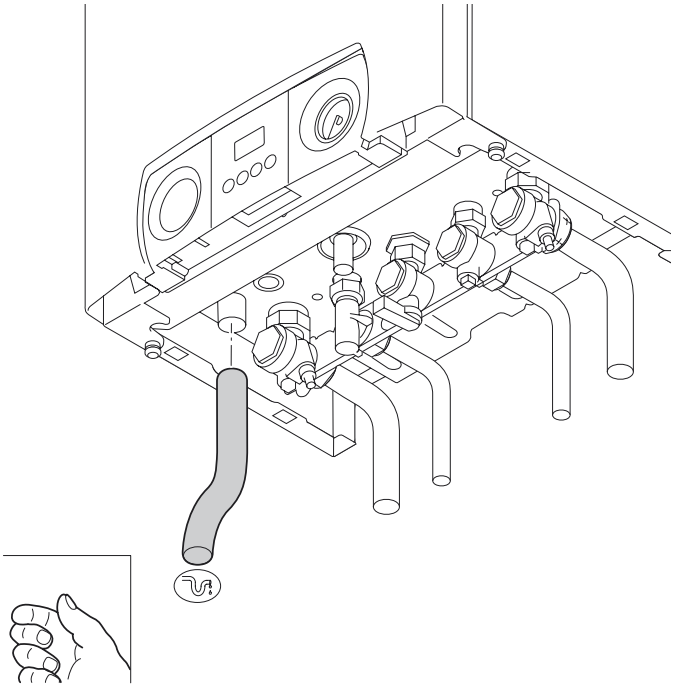
- Fit the outlet pipe for CH water to the 'CH flow' 22 mm Ø connection.

The Remeha Avanta Plus has a drain cock built into the flow isolating valve.



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2.3.10 Connecting condensate drain

- Connect the condensate drain outlet to a suitable waste water drain point using acid resisting pipe work (i.e. - ¾" overflow). To enable the siphon in the boiler to be removed / serviced, the connection should not be a permanent one (i.e. "push fit" system).
- To prevent the risk of freezing connect the condensate into an internal vertical soil pipe using a tundish (air break) c/w a min 75 mm water seal trap.
- If the condensate pipe has to run externally make sure this is done by realizing the shortest possible route, and increase the diameter to at least 1¼" or insulate it with weather resistant insulation.
- The drain should slope at least 3 cm per meter, with a maximum horizontal length of 5 m.

- If connecting into an internal discharge branch (i.e. sink waste etc) the connection must be down stream of the existing waste trap.
- Fill the boiler siphon with water before operation, to prevent flue gasses discharging into the room.
- The condensate drain must be connected in accordance with current regulations.

2.3.11 Connecting under floor heating

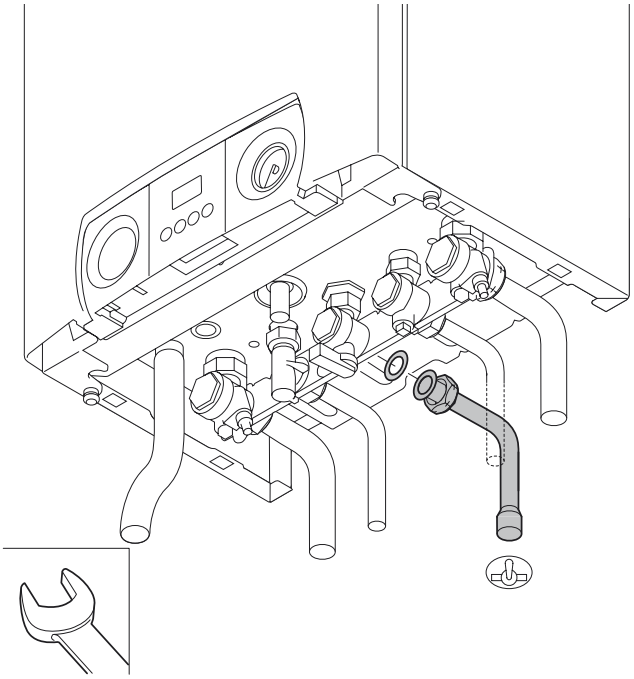
The Remeha Avanta Plus can be connected directly to an under floor heating system.
If plastic pipes have been used they must be made oxygen diffusion proof in compliance with DIN 4726/4729.
When installing under floor heating with a separate pump, the layout should be such that the under floor heating pump cannot cause a flow to the boiler if there is no heat demand. A low loss header should therefore be fitted between the system and the boiler.

Please ensure that the residual pump duty of the boiler is sufficient for the resistance of the under floor system. If not a low loss header should be used to separate the boiler from the under floor circuit to allow a separate pump sized for the resistance of the under floor system to be used.

2.4 Gas-side connections

2.4.1 Additional guidelines for gas connections

Before installation, check that the gas meter has sufficient capacity for the demand. Remember to consider the consumption of all household appliances.



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2.4.2 Adjusting boiler to other gas-type

The Avanta Plus boilers are suitable for both natural gas and propane firing. For the Avanta Plus 39c an optional LPG-set is needed. The boilers are supplied as standard set for natural gas (H), therefore the following procedure must be carried out BEFORE the boilers are fired and commissioned for the first time on propane: Adjust the fan speed (*see Par. 2.9.8*) and adjust the gas/air ratio (*see Par. 2.9.3*).

2.4.3 Connecting the gas supply

- Before starting any work on the gas supply, turn off the main isolation valve.
- Connect the gas supply to the 22 mm Ø boiler connection.

⚠

- Make sure there is no dirt in the gas pipe. Blow through the pipe before installation or tap well to purge.
- Make sure that the minimum gas service pressure is high enough (in full load > 17 mbar).
- Preferably install a gas filter in the gas pipe to prevent the gas block from getting dirty.
- The gas supply must be connected, tested for soundness and purged by a qualified Engineer and in accordance with BS6891.

2.5 Flue terminal and air supply connections

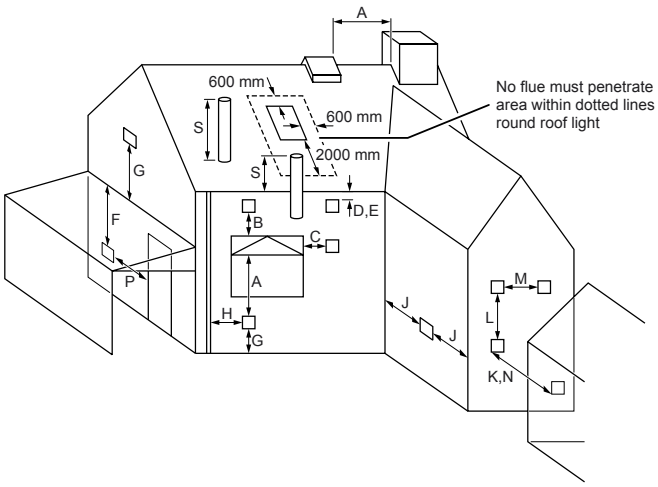
The Remeha Avanta Plus is only suitable for room sealed operation with a standard concentric connection 60/100 mm Ø or the optional 80/125 mm Ø connection.
Detailed recommendations for air supply and flue terminals are given in BS 5440.

2.5.1 Flue terminal positions

The flue terminal must be located with care to ensure that the products of combustion are dispersed properly in all weather conditions and cause minimum nuisance to the building user or any adjacent buildings. If the terminal is positioned less than 2 m above the ground, balcony, or flat roof where access by persons is possible a suitable guard must be employed.

☞
The boiler will produce a water vapour plume during normal operation.

Positions for the Remeha Avanta Plus are shown in the figure and *table 02.*



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Dimen-sions	Terminal location	Minimum distance (in mm) to terminal (room sealed)
A	Directly below an opening, air brick, opening window, etc.	300
B	Above an opening, air brick, opening window, etc.	300
C	Horizontally to an opening, air brick, opening window, etc.	300
D	Below a gutter or sanitary pipe work	40 [1)]
E	Below the eaves	40 [1)]
F	Below a balcony or carport roof	40 [1)]
G	Above ground, roof or balcony level	300
H	From vertical drain/soil pipe work	40 [1)]
J	From an internal or external corner	40 [1)]
K	From a surface or boundary facing the terminal	600 [2)]
L	Vertically from a terminal on same wall	1500
M	Horizontally from a terminal on same wall	300
N	From a terminal facing the terminal	1200
P	From an opening in a carport (e.g. door, window) into the building	1200
R	From a vertical structure on the roof	n/a
S	Above an intersection with the roof	n/a

table 02 Minimum distances to terminal

[1)] = We advise to use deflectors in case of these small distances.

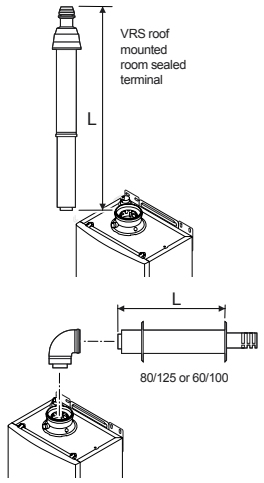
[2)] = Where the terminal is positioned directly opposite an opening in the facing wall the min will be 2 m.

n/a = not applicable.

2.5.2 Room sealed flue

See *table 03* for the maximum pipe length of flue ducts and air supply pipes for this 'room sealed' application.

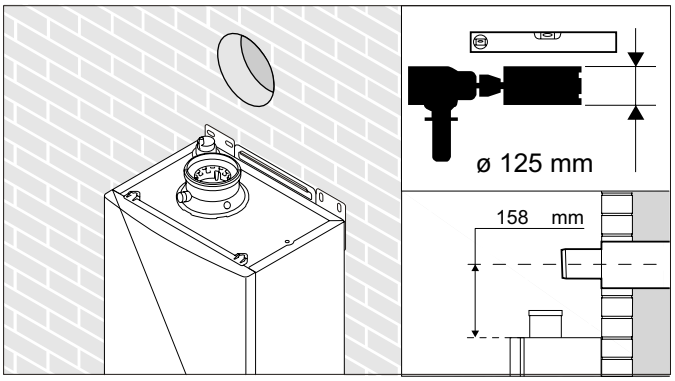
It is not necessary to provide combustion air to the room or internal space in which the boiler is installed.

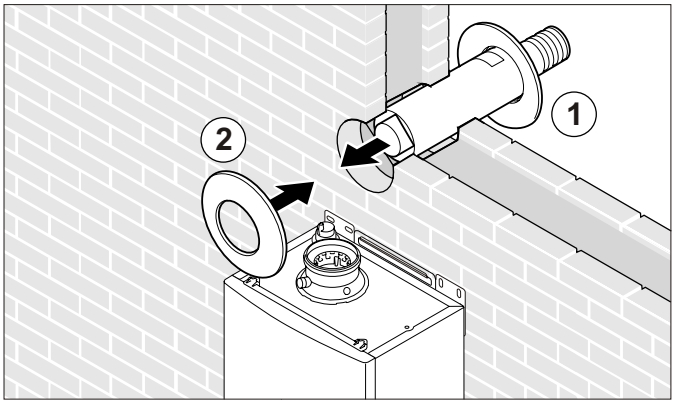


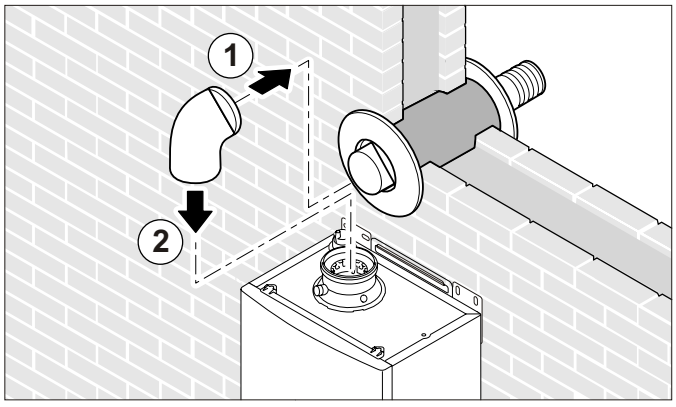
	24s		28c		35c		39c	
Diameter in mm Ø	**60/100**	**80/125**	**60/100**	**80/125**	**60/100**	**80/125**	**60/100**	**80/125**
Maximum length 'L' allowed [m]	6	29	6	29	7	30	5	25
Eq. Length of 90° elbow 	1.4							
Eq. Length of 45° elbow 	0.65							

table 03 Maximum pipe lengths for flue duct and air supply in room sealed application

For flue installations not covered by this booklet, please contact our technical help line 0118 978 3434.







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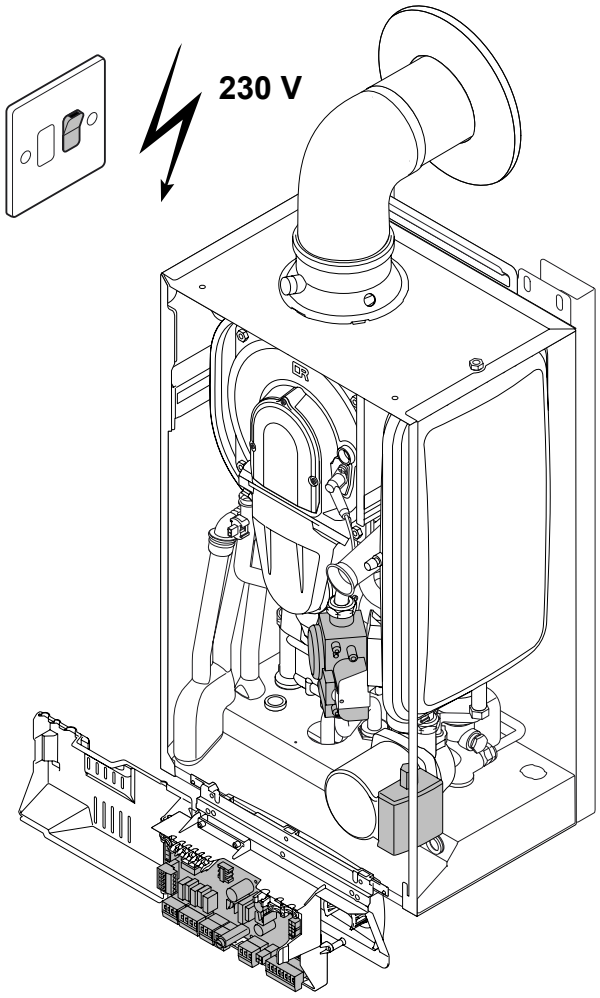
2.5.3 Connecting the flue terminal and air supply

- Check the depth of the wall and cut the terminal to suit – taking note of the cutting instructions supplied with it
- Core drill a 125 mm Ø hole in the wall, fit the rubber closure plate at the exit end and slide the terminal through the wall until the closure plate is clear of the outer edge of the wall – pull back the terminal till the closure plate is flush then fit inner wall closure to secure.

- All connections must be airtight and waterproof.
- Horizontal extension sections should slope towards the boiler (at least 3 cm per metre).

2.6 Electrical connection

- Connect the boiler to the fused (3 amp) switch spur unit adjacent to boiler.
- The switch unit must always be accessible.

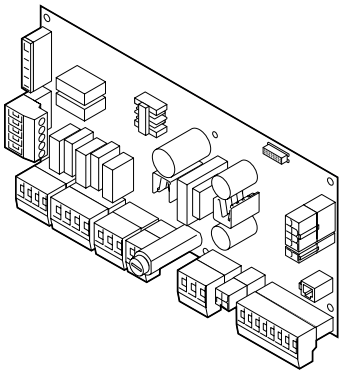


LT.AL.W7H.000.022

⚠

When the switch spur is on the following components of this appliance can be live (230 V):

- electrical connection pump;
- electrical connection gas combination block;
- electrical connection three-way valve;
- most parts of the control unit;
- ignition transformer;
- X1, X2, X4, X5, X6 and X7 terminal strip;
- 230 V supply cable connection.



LT.AL.W7H.000.023

2.6.1 The control unit

The Remeha Avanta Plus has an electronic regulation and control unit with an integrated ionisation flame detector. The heart of the boiler control unit is a microprocessor, the **'abc**®', which controls and protects the boiler.

The boiler is not phase sensitive. The maximum rated input is between 115 and 180 W (depending on boiler type).
The boiler is fully pre-wired internally, all external connections can be made using the terminal strips X5 - X7 - X9 and 230 V input (X2 terminal). See the diagram for the position of the connectors and fuse (F2) on the control unit.
The most important properties of the control unit are summarized in *table 04.*

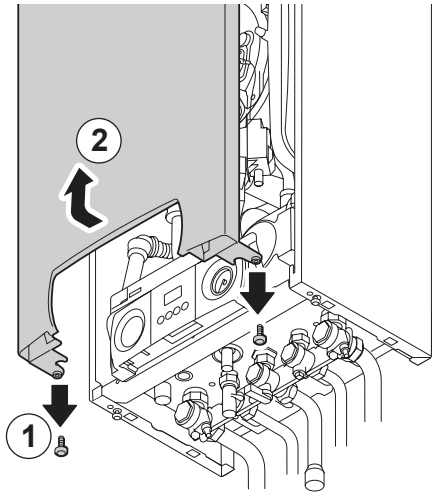
Manufacturer	Sit Controls
Supply voltage	230 V – 1ph – 50 Hz
Pre-purge time	3 s
Post-purge time	5 s
Ignition time	2.5 s
Safety time	5 s
Anti-cycling time	3 till 10 min.
Fuse value F1 (230 V)	2 AT
DC fan (for 24s, 35c and 28c)	24 VDC
AC fan (for 39c only)	230 VAC

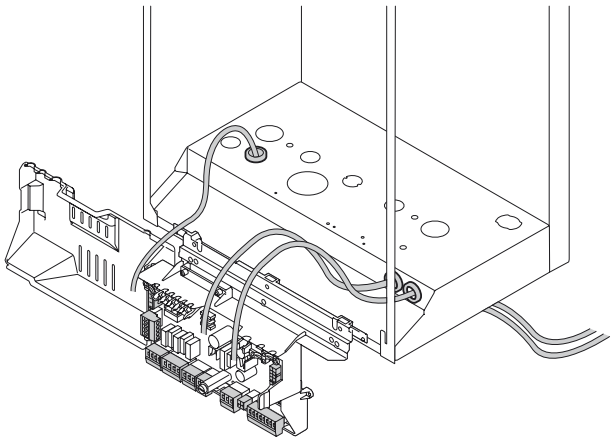
table 04 Control unit characteristics

⚠
Any loads other than those specified above are only allowed if an isolating transformer is used.

The output of the Remeha Avanta Plus can be controlled in the following ways:
On/off control – volt free switching - The boilers internal control will modulate the output to achieve the flow temperature set point of the boiler. This contact is on the X9 terminal strip (low voltage only).
Modulated control – Open Therm - The external controls will modulate the boiler's output to achieve the flow temperature determined by the modulating regulator. This contact is on the X9 terminal strip (low voltage only).
On/off control – 230 V switching - The boilers internal control will modulate the output to achieve the flow temperature set point of the boiler. This contact is on the X2 terminal strip (230 VAC only).
Modulated control – Open Therm in combination with an externally mounted simple 230 V switching time clock - The boiler will provide room compensated heating and time control over CH and DHW (System boiler).

- All connections on terminal X1, X2, X4, X5, X6 and X7 are 230 VAC.
- All connections on terminal X9 are low voltage only.





LT.AL.W7H.000.024

2.7 Connecting external controls

- Release the two screws at the bottom of the front casing and remove the front casing.
- Feed the cables through the grommet in the base of the boiler.
- Connect the cables to the relevant connectors, as shown in the diagrams.

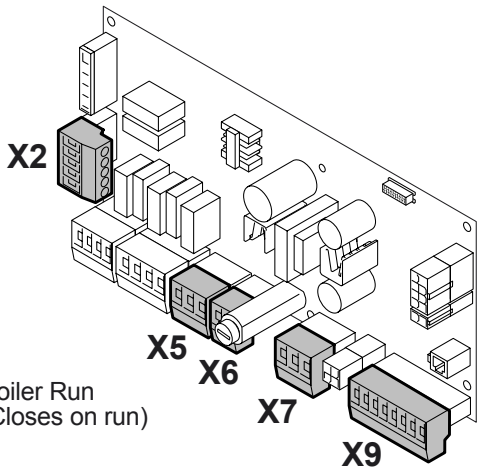
⚠
- Isolate power supply at the fused spur before carrying out any work on the boiler controls.

Terminal Block X6

L
N

230v - 3 Amp Power Supply

E



Terminal Block X7

1 – Common Alarm (Closes on alarm)
2
3 – Boiler Run (Closes on run)

Terminal Block X5

1 – Neutral
2 – Open valve to DHW (230v)
3 – Open valve to HTG (230v)

For external DHW priority diverting valve on System boiler when used in conjunction with "Open Therm" compensation

Terminal Block X9

1, 2 – Outside sensor (red band) for direct boiler weather compensation or when used in conjuction with a compatable Open Therm control eg: Chronotherm or Celcia 20

3, 4 – DHW sensor (red band) or volt free thermostat (make on temp fall) Remove existing link to use this function

Exist links

5, 6 – External interlock (volt free) Remove existing link to use function

7, 8 – Modulating - using Open Therm control eg: Honeywell Chronotherm or Celcia 20
On / Off - using volt free switching control eg: Celcia 10 or low volt room thermostat

Terminal Block X2

5 – N, 4 – L – Power supply to external time clock -230v

3 – Switch live (230v) from external time clock DHW demand Remove existing link 4-3 to use this function

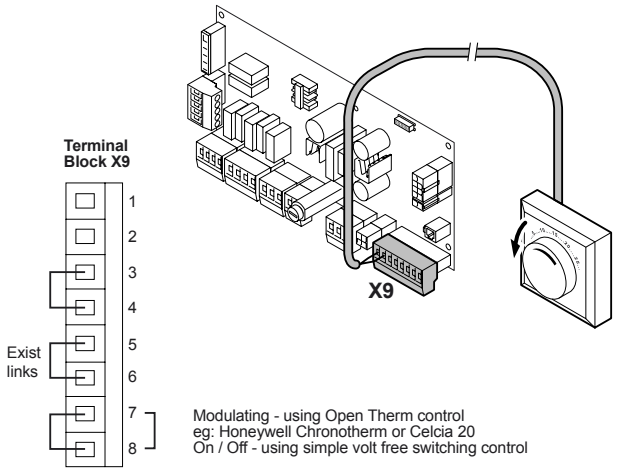
Exist links

2

1 – Switch live (230v) from external time clock HTG demand Remove existing link 4-1 to use this function

NOTE: Terminal blocks are not in line as shown - diagramatic only

2.7.1 On/off control – room temperature (volt free switching)



LT.AL.W7H.000.026

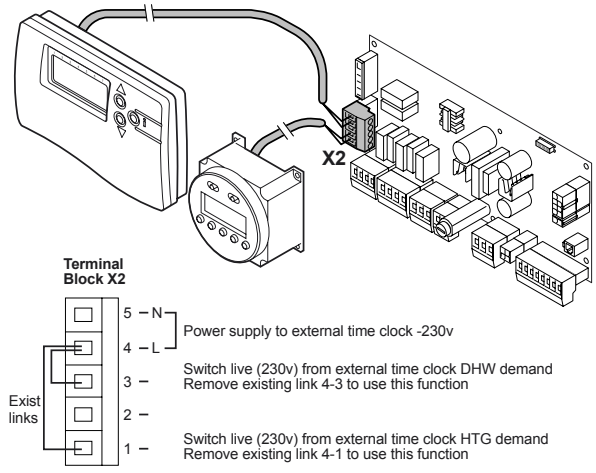
The Remeha Avanta Plus can be connected to a 2-wire on/off thermostat, such as the Remeha Celcia 10.
Mount the thermostat in a reference room (usually the living room).

- Remove existing link between connectors 7 and 8 of the X9 terminal strip before use;
- Connect the 2-wire 24 V room thermostat to connectors 7 and 8 of the X9 terminal strip.

If a room thermostat with an anticipation resistor is being used, parameter p5 should be changed from 0 to 1, see par. 2.9.8.

2.7.2 Time control using an internal or external 230 V clock

When the switch spur is on, the terminal strip X2 will be live (230 V).



LT.AL.W7H.000.027

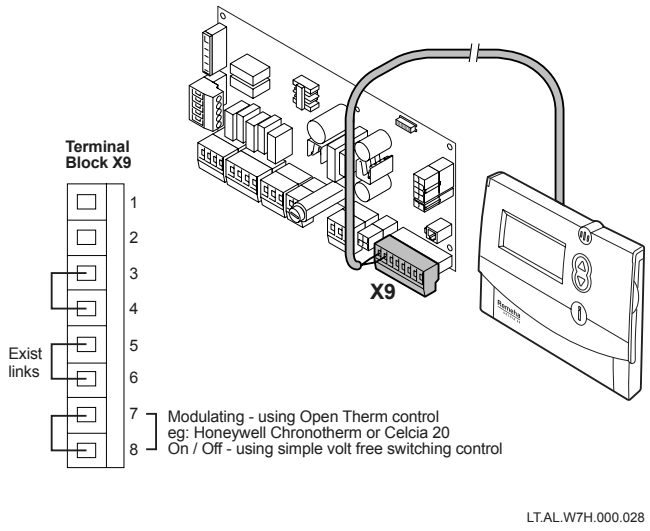
- A 230 V two channel time clock for CH and DHW control can be connected to the Remeha Avanta Plus
  Live 230 V supply for the time clock - connect to connectors 4 (N) and 5 (L) on X2 terminal strip.
- For CH - remove existing link between connectors 4 and 1 of the X2 terminal strip and connect the 230 V output from the time clock to terminal 1 on the terminal strip X2.
- For DHW - remove existing link between connectors 4 and 3 of the X2 terminal strip and connect the 230 V output from the time clock to terminal 3 on the terminal strip X2.

For this option to function correctly a link or room control must be fitted between connectors 7 and 8 of X9 terminal strip (Remove existing link before use).

2.7.3 Connecting a 230 V time clock in combination with a modulating room control

With an externally mounted simple 230 V switching time clock connected to connectors on X2 terminal strip and a Celcia 15 connected to connectors 7 and 8 of X9 terminal strip (remove existing link between connectors 7 and 8 before use), the Remeha Avanta Plus will provide room compensated heating and time control over CH and DHW (System boiler).

An OpenTherm® room modulating control (Celcia 15) used in conjunction with a simple external 230 V time clock will provide easy to set up and operate - timed room compensation heating



2.7.4 Modulating control – room or outside compensation

The Remeha Avanta Plus has an OpenTherm® interface. This enables our modulating range of OpenTherm® room controls (e.g. the Remeha Celcia 15 or 20) to be connected without any further modifications.

- Mount the control in a reference room (usually the living room).
- Connect the two-wire interface cables to connectors 7 and 8 of the X9 terminal strip (remove existing link between connectors 7 and 8 before use).
- When using the Celcia 20 it is possible to add the outside sensor to provide weather compensation with room adjustment. Connect the outside sensor to connectors 1 and 2 of the X9 terminal strip.

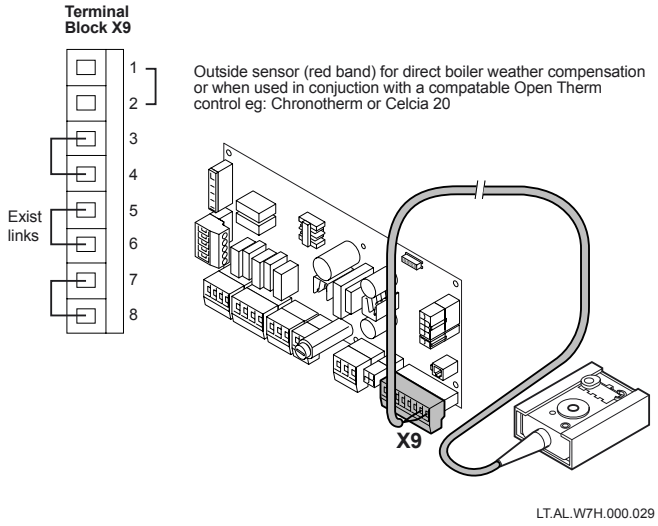
If the DHW water temperature on the OpenTherm® control can be adjusted, then the Remeha Avanta Plus will supply water at the temperature determined at the OpenTherm® with the maximum being set in the boiler.
OpenTherm® is an industry standard modulating control available from several control manufacturers.

The Remeha Avanta Plus can therefore be controlled directly by any other controls with this OpenTherm® logo

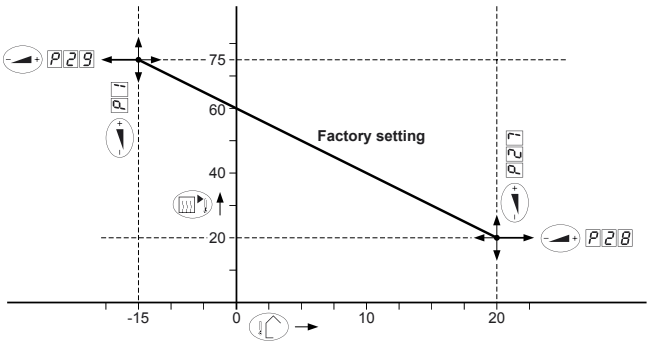
2.7.5 Connecting an outside temperature sensor

An outside temperature sensor can be connected to connectors 1 and 2 of the X9 terminal strip.
The boiler will regulate the output using the set point of the internal heat curve.
This can be set as follows:

- Outside temperature minimum set point = -15°C (adjustable with parameter P29 to between 0 and -30°C)
- Outside temperature maximum set point = 20°C (adjustable with parameter P28 to between 0 and 40°C)
- Flow temperature set point at maximum outside temperature = 20°C (adjustable with parameter P27 to between 0 and 60°C)
- Flow temperature set point at minimum outside temperature = 20°C (adjustable with parameter P1 to between 20 and 85°C)



LT.AL.W7H.000.029

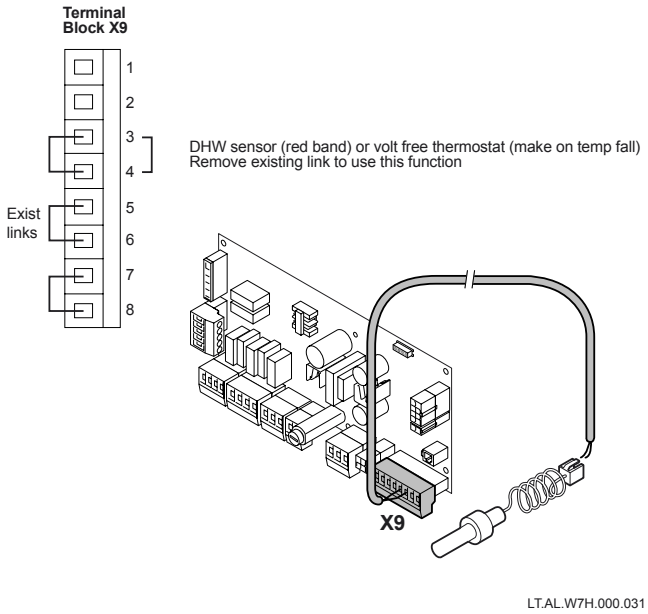


LT.AL.W7H.000.030

An outside sensor used in conjunction with a simple 230 V time clock will provide easy to set up and operate - timed weather compensation heating based on the above graph.

2.7.6 Connecting the DHW sensor/thermostat

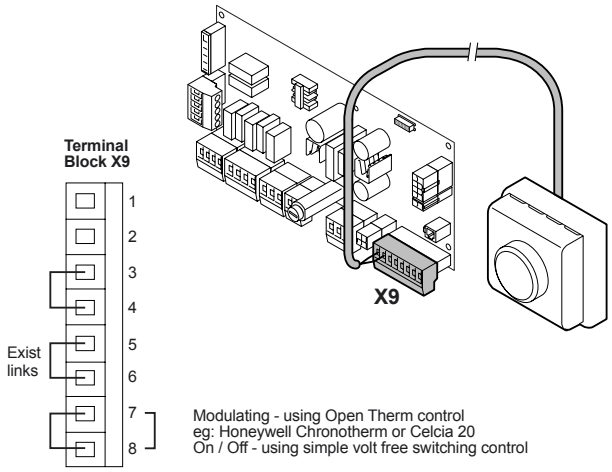
- If an external DHW calorifier is being used with the Avanta Plus system boiler a volt-free DHW control sensor or thermostat can be connected to connectors 3 and 4 of the X9 terminal strip after removing the existing link. The control will automatically detect whether a sensor or a thermostat has been connected.



LT.AL.W7H.000.031

2.7.7 Connecting a frost thermostat

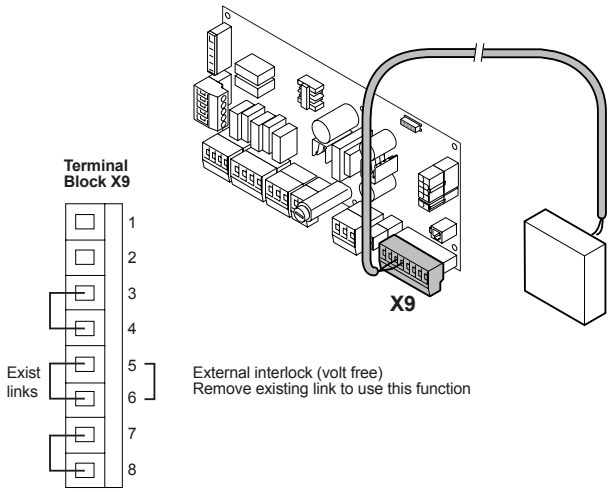
The boiler must be installed in a frost-free area to prevent the condensate drain from freezing. However if the temperature of the CH water in the boiler drops too low, the integrated boiler protection device is activated as follows:
- at a water temperature below 7°C: the circulation pump is switched on;
- at a water temperature below 3°C: the boiler is switched on;
- when the water temperature is above 10°C: the boiler is switched off and the circulation pump runs for another 15 minutes.



- A frost thermostat should preferably be installed in rooms with a high frost risk.
- Connect the frost thermostat in parallel to the room thermo stat - connectors 7 and 8 of the X9 terminal strip (remove existing link between connectors 7 and 8 before use).

- This function is a protection device for the boiler only, not for the system or building fabric.
- If a frost thermostat or a modulating room control, connected across connectors 7 and 8 is activated, the boiler will operate continuously to achieve the flow set point.
- If the Celcia 20 control has been fitted, with an outside sensor the boiler and building fabric will be protected. See the installation documentation supplied with the control.

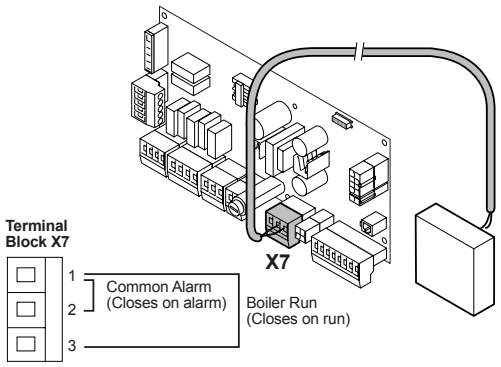
2.7.8 Connecting an external interlock



LT.AL.W7H.000.033

The Remeha Avanta Plus is supplied with an external interlock function. A volt free switching device (i.e. external gas pressure switch, safety thermostat for under floor heating) can be connected to connectors 5 and 6 of the X9 terminal strip after removing the existing link. When this circuit is open the boiler will shut down with the display showing (code [9]) and will restart when the circuit is closed.

2.7.9 Connecting remote alarm and boiler run indication

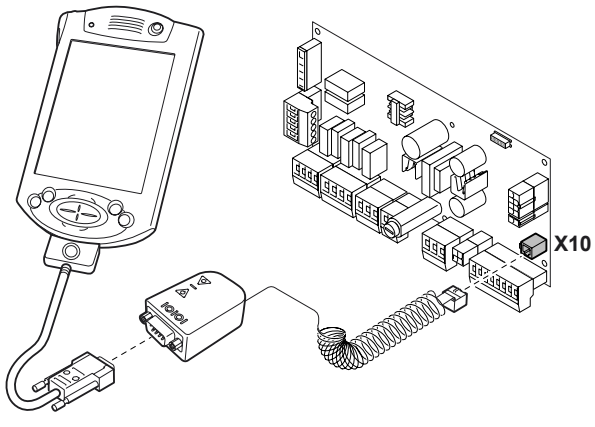


LT.AL.W7H.000.034

As standard the boiler is supplied with 3 volt free connectors on terminal X7. They can be used for an external gas valve, remote alarm and boiler run indication.

- Common alarm signal connect to connectors 1 and 2 on terminal X7. Contact closes on lock out. For this purpose set parameter [24] from [0] to [1].
- Boiler run signal connect to connectors 1 and 3 on terminal X7. Contact closes on heat demand. For this purpose set parameter [24] from [0] to [2].
- Connect an external gas valve to connectors 1 and 3 on terminal X7. Contact closes when the gas valve is activated. For this purpose set parameter [24] from [0] to [3].

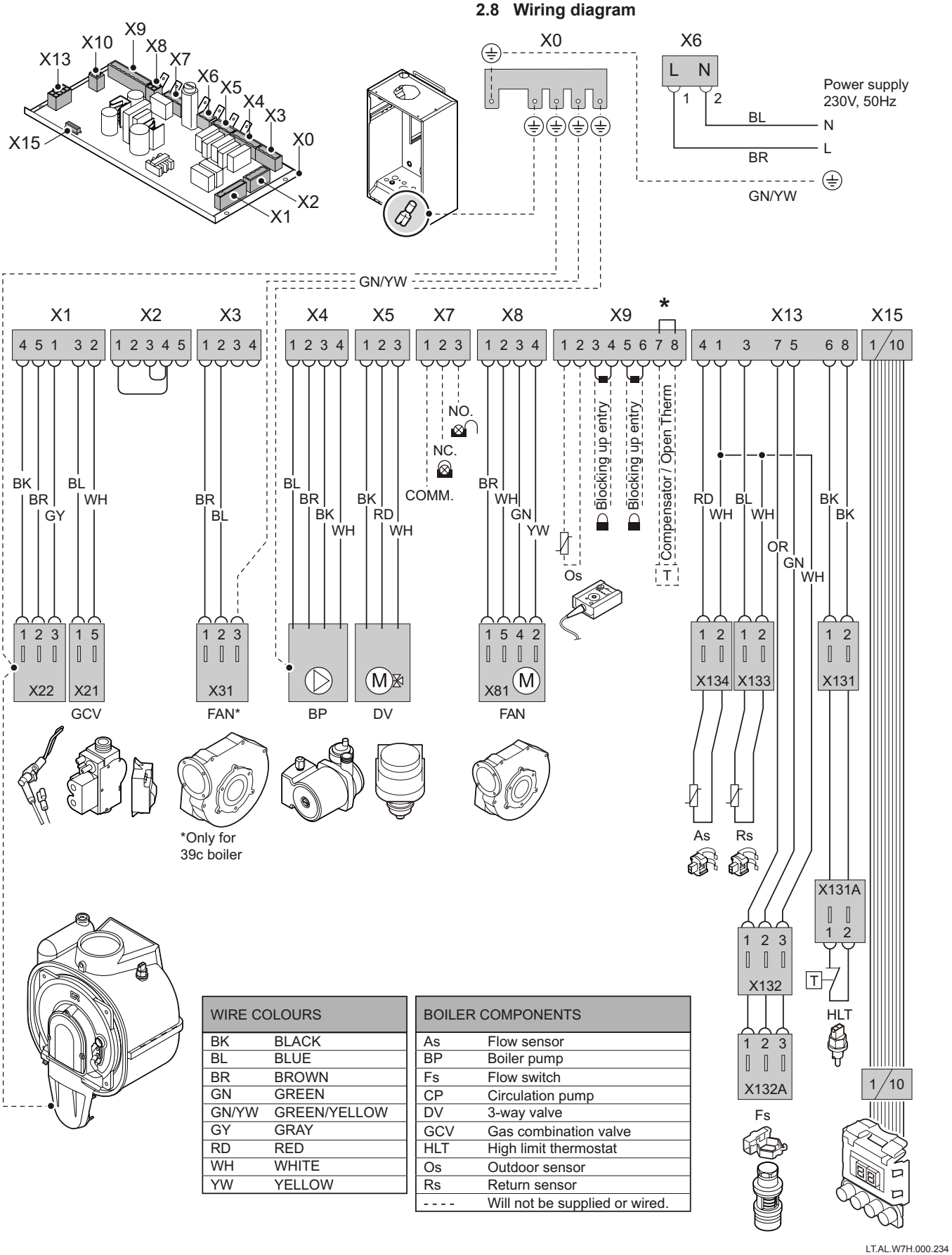
2.7.10 Connecting a PC/PDA



LT.AL.W7H.000.035

Using the optional Recom interface package a PC or PDA can be connected to the X10 “telephone connector”. Using the Recom PDA service software you can load, change and download various boiler settings and readings. See the user instructions supplied with the software/hardware.

2.8 Wiring diagram



WIRE COLOURS	
BK	BLACK
BL	BLUE
BR	BROWN
GN	GREEN
GN/YW	GREEN/YELLOW
GY	GRAY
RD	RED
WH	WHITE
YW	YELLOW

BOILER COMPONENTS	
As	Flow sensor
BP	Boiler pump
Fs	Flow switch
CP	Circulation pump
DV	3-way valve
GCV	Gas combination valve
HLT	High limit thermostat
Os	Outdoor sensor
Rs	Return sensor
- - - -	Will not be supplied or wired.

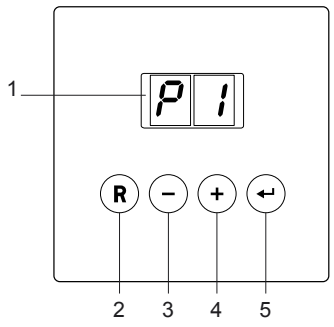
LT.AL.W7H.000.234

** Remove existing link between connectors 7 and 8 before use*

2.9 Commissioning

2.9.1 Control Panel

The control panel of the Remeha Avanta Plus has 4 function keys and a LED display. The function keys are used to read or change the settings and temperatures.



LT.AL.W7H.000.036

1 = display
*2 = **[reset]** key*
*3 = **[-]** key*
*4 = **[+]** key*
*5 = **[enter]** key*

The display has two positions and displays information on the current operating status of the boiler and any errors. Numbers, dots and/or letters can appear in the display. The symbols above the function keys indicate what the function of that particular key then is.

If no key is pressed for longer than three minutes with the “boiler in stand-by mode”, only one dot is lit. With the “boiler operating”, two dots are displayed.

- Press any key and the current boiler status and operation code will appear in the display.
- In the event of a fault, the fault code is displayed instead of the dots.

2.9.2 Additional guidelines for commissioning

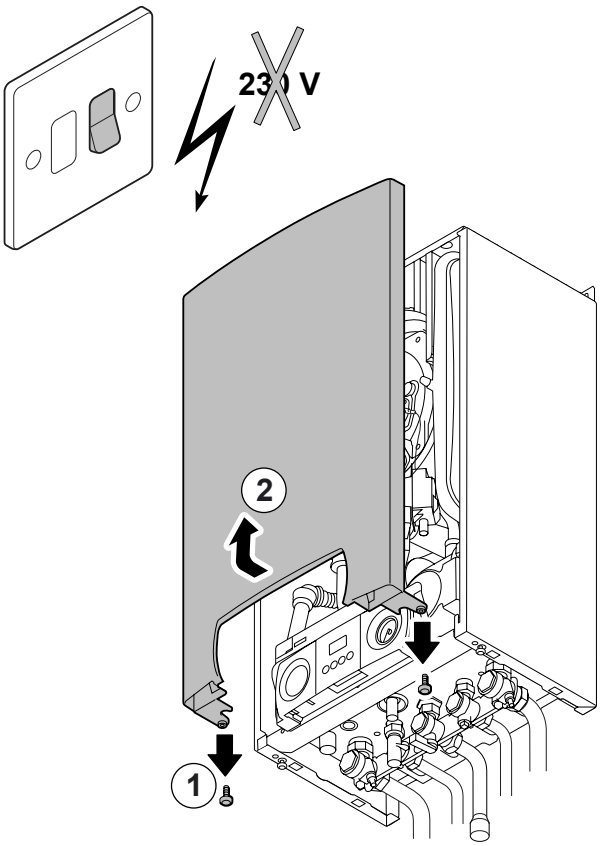
- When commissioning, use the Boiler Log Book.
- Work through all the stages of this section, complete the commissioning details in the supplied Boiler Log Book and send a copy of the completed documents to Broag to register the boiler.
- The boiler is supplied as standard for use with Natural Gas and tested at an operating pressure of 20 mbar.

⚠
The boiler must not be put into operation with a different type of gas without reference to Broag.

2.9.3 Putting the boiler into operation

This section details the procedure for putting the boiler into operation. There are 7 stages to the procedure:

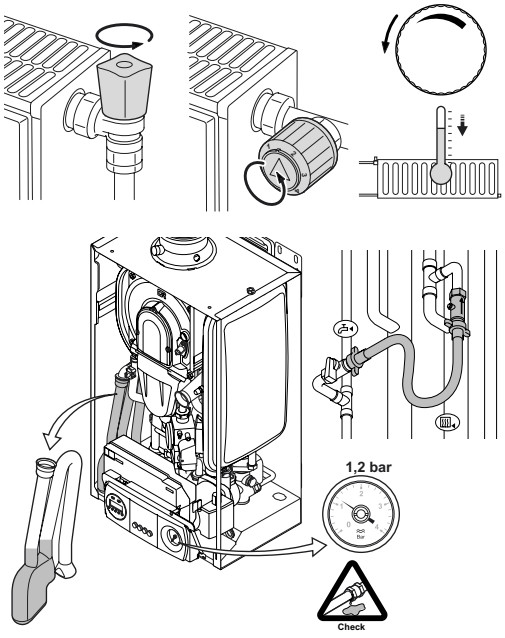
1. Isolating the power supply and opening the front cover;
2. Checking the connections and making the boiler operational;
3. Switching the boiler on and setting the controls;
4. Checking/setting the gas/air ratio at full load;
5. Checking/setting the gas/air ratio at low load;
6. Making the boiler ready for use;
7. Instructing the user.



LT.AL.W7H.000.037

1. Isolating the power supply and opening the front cover

- Switch off the boiler at the fused spur and remove the fuse;
- Remove the front panel (release the two screws at the bottom of the front panel, pull the bottom of the panel; forward and lift off the two pins on the top of the main casing).



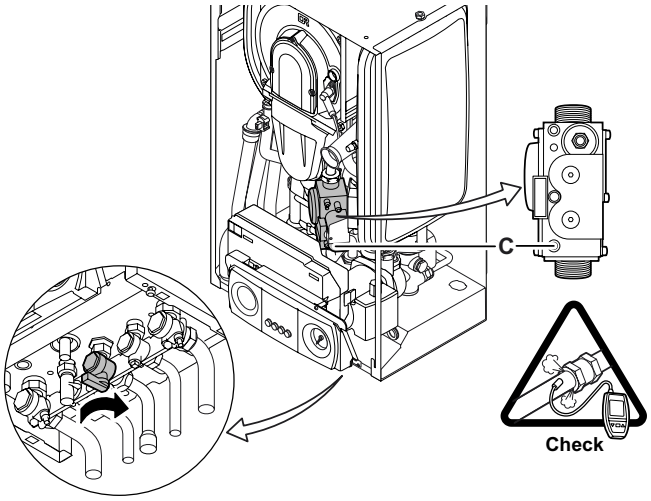
LT.AL.W7H.000.038

2. Checking the connections and making the boiler operational

Open the valves on all the radiators connected to the central heating system before filling the system with water.

- Open the valves on all the radiators connected to the central heating system;
- Fill the system with water to the design operating pressure (normal for a one/two storey house 1.2 bar, minimum pressure 1 bar, maximum pressure 2.5 bar);
- Whilst filling, air from the system will escape through the automatic air vents and the pump.

- When the vent caps start leaking water, close them with the vents caps supplied.
- Avoid water getting into the boiler.
- Check the condensate siphon. This should be filled to the mark with clean water if necessary.



LT.AL.W7H.000.039

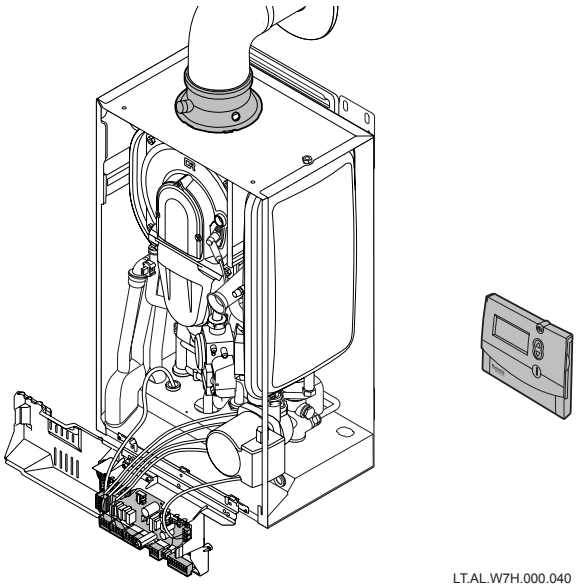
- Check the integral boiler pump – remove chrome centre screw to vent pump and spin the shaft to check that the impellor can move freely;
- Check that all boiler connections are watertight;

- Open the boiler gas valve and check the static pressure to the boiler at the measurement point (C) on the gas block.

⚠

The boiler has been factory tested for natural gas at 20 mbar. The minimum gas inlet pressure is 17 mbar for natural gas.

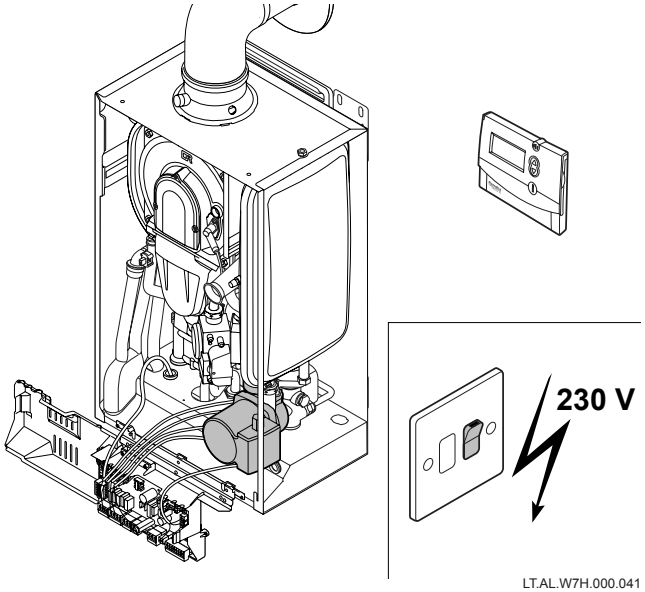
- Check that the gas supply to the boiler is gas tight (in compliance with the current regulations, see *Chapter* ***7*** the maximum test pressure at the gas pipe inlet, with the boiler gas valve open, is 60 mbar.
- Vent the gas pipe by unscrewing the measurement point (C) on the gas block (tighten it again as soon as the pipe is fully vented).
- Check that the gas connections in the boiler are sealed.
- Check that all electrical connections, including the earth connection, have been made correctly.
- Check the electrical connections to the thermostat and other external controls.
- Check that the flue-gas and air-supply connections are sealed.



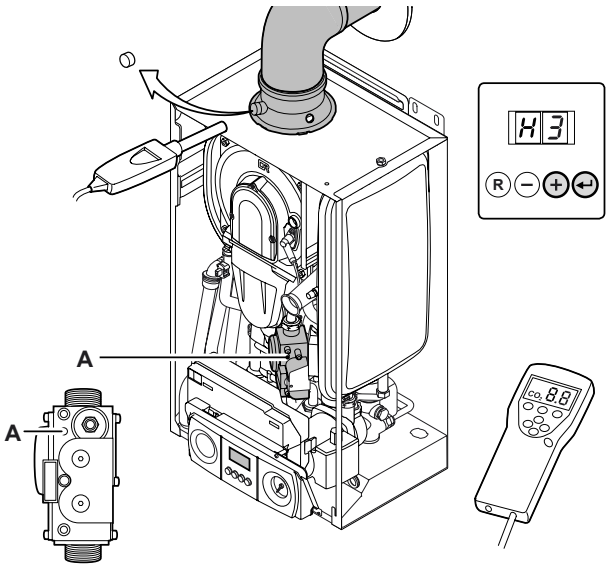
LT.AL.W7H.000.040

3. Switching the boiler on and setting the controls

- Replace the fuse in the spur and switch on the 230 V power supply.
- Set the controls to heat demand.
- The boiler will begin an automatic venting-programme (which lasts approx. 3 minutes) and will do this every time the power supply is isolated.
- The boiler now starts to run. The operational status is shown in the display. The normal operating status finally shows [0] in the display.



LT.AL.W7H.000.041



4. Checking/setting the gas/air ratio at full load

The Avanta Plus boilers are suitable for both natural gas and propane firing. For the Avanta Plus 39c an optional propane-set is needed.
The boilers are supplied as standard set for natural gas (H), therefore the following procedure must be carried out BEFORE the boilers are fired and commissioned for the first time on propane:

- adjust the fan speed (*for procedure; see Par. 2.9.8, for values; see table 06 and* table 08) and;
- adjust the gas/air ratio (*for values; see table 06 and table 08*).

Setting values O_2/CO_2 for natural gas H / L			
Boiler type	Fan speed (rpm)	O_2	CO_2
	Full load H3 *)	%	%
24s	approx. 4300	5.2 ± 0.1	8.8 ± 0.1
28c	approx. 5500	5.2 ± 0.1	8.8 ± 0.1
35c	approx. 6300	5.2 ± 0.1	8.8 ± 0.1
39c	approx. 6700	5.2 ± 0.1	8.8 ± 0.1

table 05 Setting values full load CO_2 and O_2 (front panel not fitted)

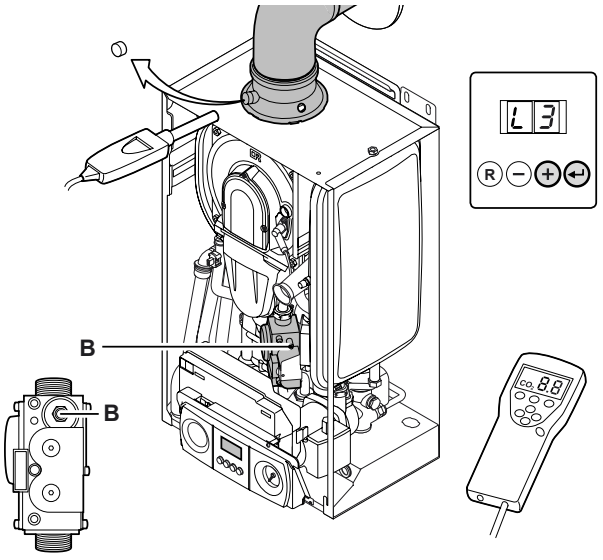
Setting values O_2/CO_2 for LPG (propane)			
Boiler type	Fan speed (rpm)	O_2	CO_2
	Full load H3 *)	%	%
24s	approx. 4100	5.1 ± 0.3	10.5 ± 0.3
28c	approx. 5200	5.1 ± 0.1	10.5 ± 0.3
35c	approx. 5800	5.1 ± 0.3	10.5 ± 0.3
39c	approx. 6500	5.1 ± 0.3	10.5 ± 0.3

table 06 Setting values full load CO_2 and O_2 (front panel not fitted)

*) On forced full load, the 2nd digit indicates the operating code

- Unscrew the flue gas sampling cap and connect the flue gas analyser.
- Set boiler to full load.
- Press the **[enter]-** key, keep it pressed and also press the **[+]-**key until H3 appears in the display; full load has been set.
- Once the unit has reached the full-load fan speed, measure the O_2/CO_2-percentage and compare this to the values in *table 05.*
- If the values are not in accordance with the table then correct the gas /air ratio controls using the adjusting screw A on the gas block.
- If the value is too low turn the screw A anti clockwise; this increases the gas rate – if the value is too high turn the screw clockwise which decreases the gas rate.
- Check the flame through the sight glass which should be stable with a regular blue distribution.

Ensure that the analysing probe has a gas tight seal in the sampling point with the probe end in the centre of the flue duct.



5. Checking/setting the gas/air ratio at part load

Setting values O_2/CO_2 for natural gas H / L			
Boiler type	Fan speed (rpm)	O_2	CO_2
	Part load L3 *)	%	%
24s	approx. 1300	5.2 ± 0,1	8.8 ± 0,1
28c	approx. 1300	5.2 ± 0,1	8.8 ± 0,1
35c	approx. 1300	5.2 ± 0,1	8.8 ± 0,1
39c	approx. 1300	5.2 ± 0,1	8.8 ± 0,1

table 07 Setting values part load CO_2 and O_2 (front panel not fitted)

Setting values O_2/CO_2 for LPG (propane)			
Boiler type	Fan speed (rpm)	O_2	CO_2
	Part load L3 *)	%	%
24s	approx. 2000	5.1 ± 0.1	10.5 ± 0.1
28c	approx. 2000	5.1 ± 0.1	10.5 ± 0.1
35c	approx. 2000	5.1 ± 0.1	10.5 ± 0.1
39c	approx. 2000	5.1 ± 0.1	10.5 ± 0.1

table 08 Setting values part load CO_2 and O_2 (front panel not fitted)

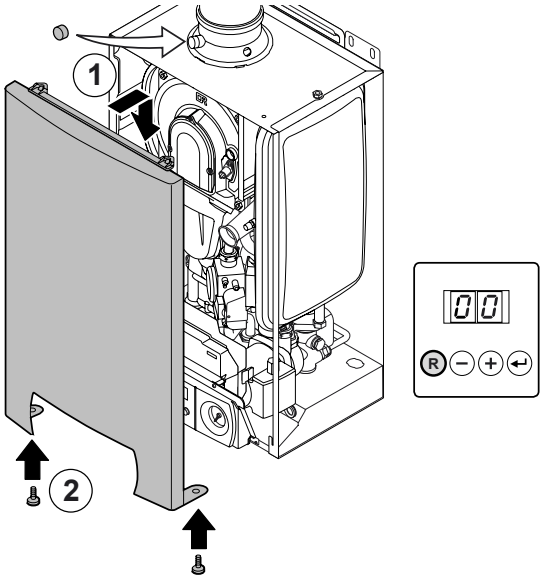
*) On forced part load, the 2nd digit indicates the operating code.

- Set boiler to part load:
- Press the **[enter]-** key until L3 appears in the display, part load has been set.
- Once the unit has reached the part load fan speed, measure the O_2/CO_2-percentage and compare this to the value in *table 07*.
- If the values are not in accordance with the table then correct the gas /air ratio controls using the adjusting screw B on the gas block.
- If the value is too low turn the screw B clockwise; this increases the gas rate – if the value is too high turn the screw B anti clockwise which decreases the gas rate

Check the flame through the sight glass which should be stable with a regular orange distribution. Once the unit has been set to part load, the 'test at full load' should be repeated.

Ensure that the analysing probe has a gas tight seal in the sampling point with the probe end in the centre of the flue duct.

- Repeat the 'test at full load' and 'test at part load' as often as necessary until the correct values are achieved without further adjustments



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6. Preparing the boiler for use

- Remove the analysing probe and replace the cap on the flue gas sampling point.
- Refit the front panel and secure with the two screws again.
- Press **[reset]**-key for the boiler to return to the normal operating mode.

Following a manual override the boiler will return to normal operating mode if no keys are pressed for 15 minutes.

- Run the boiler on heating until the system reaches approx 70°C.
- Switch the boiler off (using the controls i.e. thermostat or time clock).
- Once the pump has turned off vent the system once again.
- Check the water pressure and add more water through the mains fill loop if necessary.
- Complete the type plate in the boiler by adding the gas type.
- Fill in commissioning sheet and log book data.

The boiler is now ready for operation.

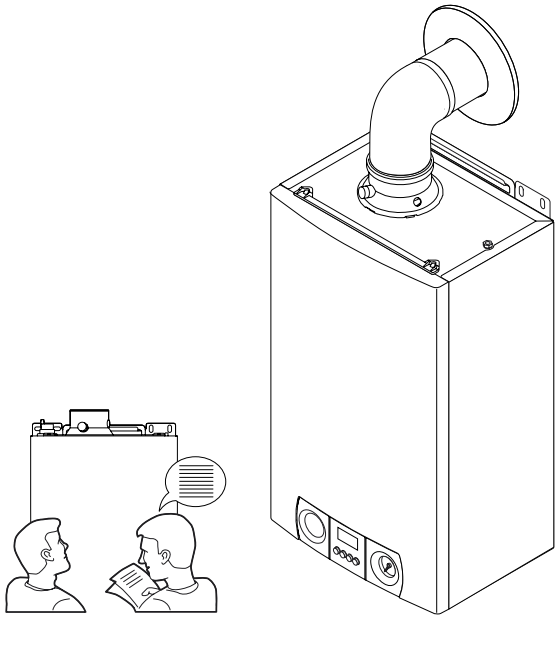
The Remeha Avanta Plus is delivered pre-tested and operating parameters set up with standard factory settings to suit the most common systems. These setting can be adjusted to suit specific site conditions but must not be changed without reference to Broag or one of our approved contractors.

7. Instructing the user

- It is the responsibility of the installer as part of the commissioning procedure to instruct the user in the day to day operation of the boiler and controls fitted to the system and to hand over the completed Boiler Log Book and appropriate documentation.

2.9.4 Normal start-up procedure

- Switch on the boiler at the fused spur unit and ensure that the time control is in the on position and any other controls (i.e. room thermostat etc) calling for heat.
- The boiler will begin its start sequence.
  The following sequence will appear in the display:
  - A display test will briefly appear showing all segments of the display:
    F XX software version
    P XX parameter version
  - A venting cycle of 3 minutes now follows, the version numbers will be displayed alternately.
  - Next, the following will appear in the display:
    1 ; pre-purge stage
    2 ; Ignition stage
    4 ; operating in DHW mode
    7 ; pump run on after CH or DHW is satisfied
    0 ; stand-by mode



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2.9.5 Error during the start-up procedure

- If the display is blank (should show dots or letters), check:
  - 230 V main supply available to switch spur
  - switch spur fuse
  - cable and connections between the switched spur and the boiler control unit
  - fuse on the boiler control unit (F2 = 2AT, 230V)

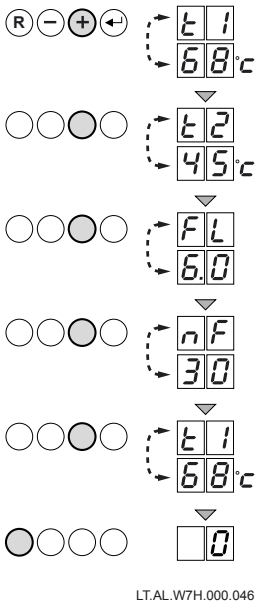
- An error code appearing in the display can be recognised as follows:
  E 10, (the display alternately shows an E and a number e.g. 10). The meaning of this error codes can be found in the error table, see *Chapter 4*.
- Resolve the error first if possible.
- Press the **[reset]**- key and hold for at least 1 second to restart the boiler.

☞
After any error E 1, E 2, E 7, E 10 or E 13 ; the 3 minute venting cycle will run first before starting the boiler.

- Checking **DHW** function;
  - Turn on a hot water tap, the display shows:
    1 ; pre-purge stage
    2 ; Ignition stage
    4 ; operating in DHW mode
  - Close the hot water tap, after a short time the display shows:
    1 ; pre-purge stage
    7 ; pump run on after CH or DHW is satisfied
    0 ; stand-by mode

- Checking **CH** function;
  - Ensure the time control is in the CH on position
  - Set the room thermostat on a high demanding temperature and, the display shows
    1 ; pre-purge stage
    2 ; Ignition stage
    3 ; operating in CH mode.
  - Set the room thermostat back to a lower temperature (no more heat demand), the display shows:
    4 ; operating in DHW mode (boost to DHW plate on minimum load)
    5 ; waiting-time: 3 to 10 minutes (only when flow temperature has already been reached and heating demand is still existing)
    1 ; pre-purge stage
    7 ; pump run on after CH or DHW is satisfied
    0 ; stand-by mode

- If the boiler is set to the economy setting (see par. 2.9.8), it will not supply a boost to DHW after CH is satisfied. The display then shows; [1 ; pre-purge stage [6 ; pump run on after CH [0 ; stand-by mode.
- If a two channel time clock is fitted and connected to a combi boiler and the time control for DHW is in the “OFF” position, the DHW production will be disabled unless the link between connectors 2 and 3 on the X2 terminal is fitted (normally factory fitted).



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2.9.6 Read out settings

The following settings can be read out in the ‘user menu’:
- t1 = flow temperature [°C];
- t2 = return temperature [°C];
- t3 = boiler temperature [°C];
- t4 = outside temperature [°C];
- FL = ionisation current [µA];
- nF = fan speed [rpm] ;

- Press the **[+]** key, until t1 appears and, for example, 68 (68°C), the current flow temperature;
- Press the **[+]** key again until t2 appears and, for example, 45 (45°C), the current return temperature;
- Press the **[+]** key again until t3 appears and, for example, 50 (50°C), the current boiler temperature;
- Press the **[+]** key again until t4 appears and, for example, 18 (18°C), the current outside temperature;
- Press **[+]** key again until FL appears and e.g. 6.0 (6uA), the present ionisation current;
- Press **[+]** key again until nF appears and e.g. 30 (3000 rpm), the present fan speed;
- Press **[+]** key again and the read-out cycle will start again with t1, etc.;
- Press **[reset]** key to return to the display with the current operating status.

2.9.7 Adjust the boiler according to the system

The operating parameters of the Remeha Avanta Plus have been factory set to suit most systems. However it is possible to adjust some of the parameters to enable the Remeha Avanta Plus to operate more efficiently to match specific system designs and site conditions. These parameters are split into two specific sections

1. User level – Parameters P 1 to P 6; can be changed by the user to suit CH and DHW comfort conditions
2. Service level – P 17 to dF. ; must only be changed by Broag approved Engineer after consultation with the system designer.

How to change the parameters at user level can be read in the "User manual" provided and therefore will not be detailed in this Installation and Service manual.

2.9.8 Changing the parameters at service level (with access code)

To avoid non authorised adjustments, some parameter settings can only be changed once the special access code 12 has been entered. This code may only be used by qualified installers. The following settings can be changed at user and service level:

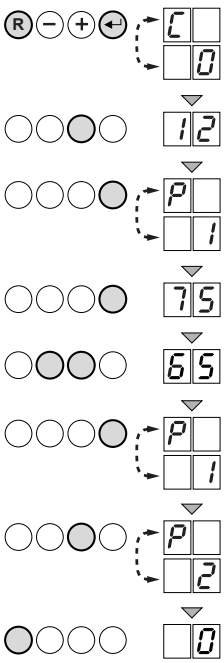
Codes in display		Description	Setting range and notes where applicable	Factory settings			
				24c	28c	35c	39c
Can also be changed by users	P 1	T_{set} flow	20 - 85°C	75°C			
	P 2	T_{set} DHW	40 - 65°C	55°C			
	P 3	Boiler regulation	0 = CH_{off} and DHW_{off} 1 = CH_{on} and DHW_{on} 2 = CH_{on} and DHW_{off} 3 = CH_{off} and DHW_{on}	2	1	1	1
	P 4	Eco or comfort setting	0 = comfort setting 1 = eco mode* 2 = regulated by controller	2			
	P 5	Anticipated current	0 = no anticipated current for thermostat on/off 1 = anticipated current for thermostat on/off	0			
	P 6	Display off automatically	0 = display stays off 1 = display stays on 2 = displaylight switches off automatically after 3 minutes	2			

Codes in display		Description	Setting range and notes where applicable	Factory settings			
				24c	28c	35c	39c
To be changed by installer only	P 17	Maximum fan speed CH	10 – 70 X 100 rpm	37	37	41	50
	P 18	Maximum fan speed DHW	**Do not change**	43	55	63	67
	P 19	Minimum fan speed (CH and DHW)	**Do not change**	13			
	P 20	Starting fan speed	**Do not change**	25	25	30	30
	P 21	Pump setting CH	0 = low 1 = high	0			
	P 22	Pump running time after CH	1 - 99 minutes	2			
	P 23	Connection with Heat Recovery Unit (HRU)	0 = no connection with HRU 1 = connection with HRU	0			
	P 24	State remote alarm (X7 terminal)	0 = off (connectors 1 and 2 closed) 1 = alarm signal (connectors 1 and 2 closed) 2 = run indication (connectors 1 and 3 closed) 3 = ext. gas valve (connectors 1 and 3 closed)	0			
	P 25	Legionella protection	0 = off 1 = on 2 = automatic (after putting boiler into operation, it will run for DHW operation 65°C once a week)	1	0	0	0
	P 26	DHW cut-in temperature	2 - 15°C	5			
	P 27	Heat curve set point flow temperature	0 - 60 °C	20			
	P 28	Heat curve set point outside temperature (min)	0 - 30 °C	20			
	P 29	Heat curve set point outside temperature (max)	-40 - 0 °C	- 15**			
	P 30	Boiler type	0 = combi 1 = system	1	0	0	0
	P. 31	DHW control stop	0 - 20 °C	15			
	P dF (P dU. is shown later)	Restore factory settings	On identification plate dF setting X is shown. Change parameter into X will restore the factory settings, *see par. 2.9.10*	X			
			On identification plate dU. setting Y is shown. Change parameter into Y will restore the factory settings, *see par. 2.9.10*	Y			

table 09 Settings at service level

* the system boiler in combination with an external calorifier will not warm up the calorifier in the Eco-mode.

** minus character is not shown in display



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Changing the factory settings could result in the boiler not working properly.

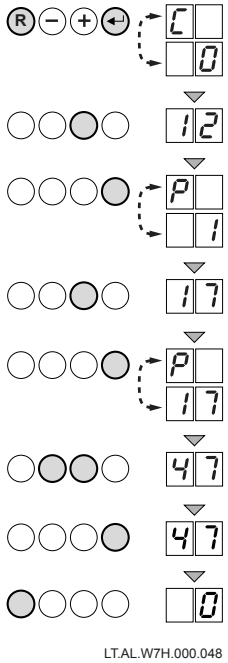
The parameters can be changed from the stand-by status as follows:

- Press the **[enter]**-key and briefly the **[reset]-** key until codes C and 0 appear alternately in the display.
- Press the **[+]**-key until access code 12 is displayed.
- Press the **[enter]**-key until P 1 appears (codes P and 1 are displayed alternately);
- This parameter can now be changed as follows;
- Press the **[enter]**-key; the set value for the maximum flow temperature now appears e.g.; 75 (75°C).
- Press the **[+]** or **[-]**-key to change this value, for example to 65 (65°C).
- Press **[enter]**-key to confirm the value; codes P and 1 are displayed alternately.
- Press the **[+]**-key to change the next parameter, etc.
- Press **[reset]**-key to return to the operating mode.

The boiler will automatically return to the normal operating mode if no keys are pressed for 10 minutes.

2.9.9 Changing the maximum output (Hi) for CH operation

The maximum output for CH operation can be changed with parameter P 17 (maximum fan speed) and is set standard to a speed of 3700, 4100 or 5000 rpm. See the speed-input ratio figures.



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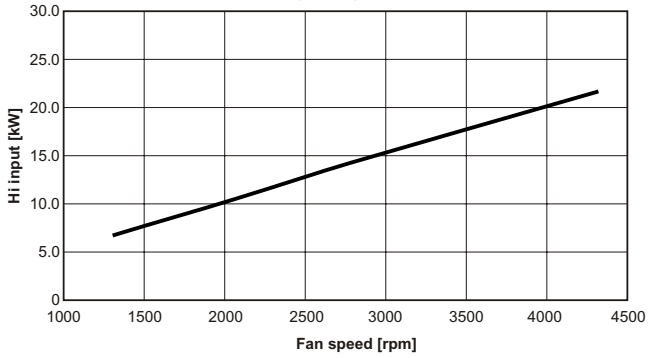
This parameter can be changed from the stand-by status as follows:

- Press the **[enter]**-key and briefly the **[reset]-** key until codes C and 0 appear alternately in the display.
- Press the **[+]**-key until access code 12 is displayed.
- Press the **[enter]**-key until P 1 appears (codes P and 1 are displayed alternately);
- Press the **[+]**-key to go to parameter 17.
- Press the **[enter]**-key until P 17 appears (codes P and 17 are displayed alternately);
- Press the **[+]** or **[-]**-key to change this value for Avanta Plus 28c, for example to 46 (4600 rpm corresponds with 22 kW).
- Press **[enter]**-key to confirm the value.
- Press **[reset]**-key to return to the operating mode.

Avanta Plus 24s
Speed-input ratio



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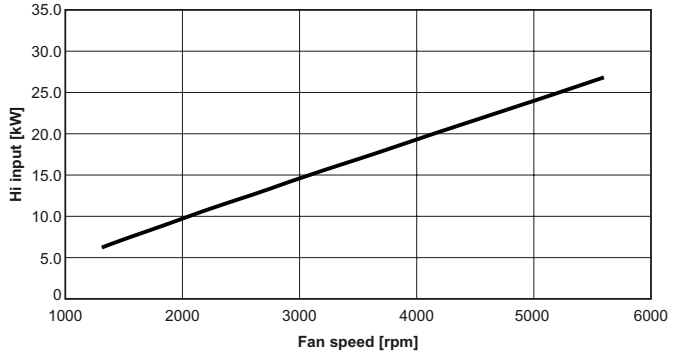
Avanta Plus 28c
Speed-input ratio



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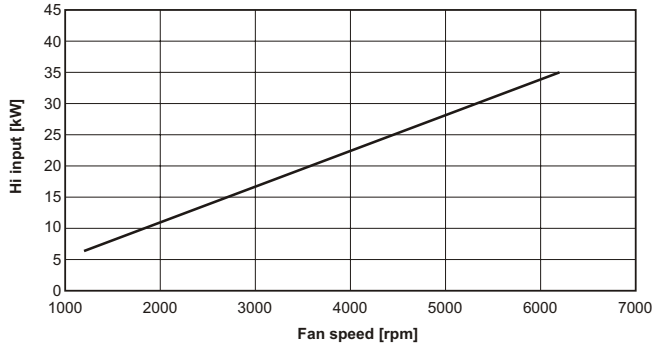
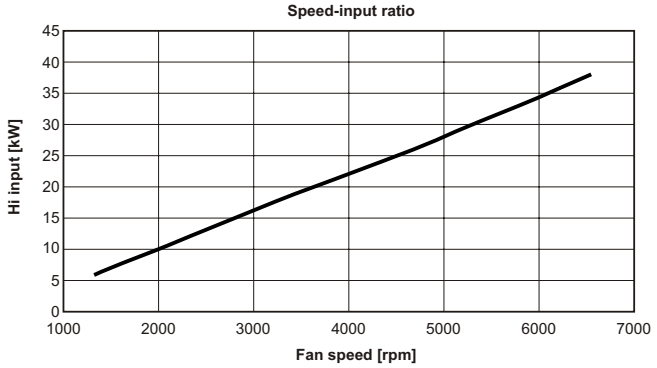
Avanta Plus 35c
Speed-input ratio



SPEED RATIO 35C

Avanta Plus 39c
Speed-input ratio



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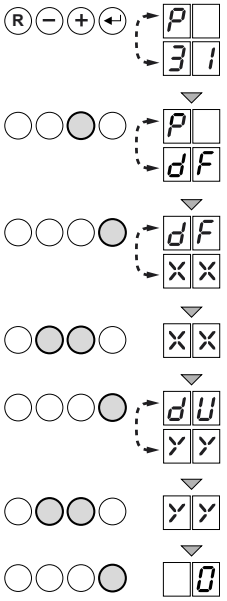
2.9.10 Restore factory settings

The factory settings can be restored in the service level as follows:



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1. After parameter P31 has shown, press the **[+]**-key; dF and XX appear alternately;
2. Press ↵-key; XX appears;
3. Read boiler identification plate for value of dF ; press **[+]** or **[-]** key to reach this value;
4. Press ↵-key to confirm; dU and YY appear alternately;
5. Read boiler identification plate for value of dU ; press **[+]** or **[-]** key to reach this value;
6. Press ↵-key to confirm; boiler restarts with original factory settings.

2.10 Putting the boiler out of operation

The boiler must be switched off and allowed to cool down before any maintenance or repairs are carried out. If the central heating system is not going to be used for a long time (during the holidays, for instance, or frost-free periods) it is advisable to put the boiler out of operation.

2.10.1 Boiler with frost protection, during longer periods of non-use

- Set the room thermostat to a low temperature, e.g. 10°C,
- Switch setting P4 to 1 (Eco mode), this will switch off the heat retention function.
  Now the boiler will only start working to protect itself against freezing.
  With external frost protection, the boiler can also prevent the central heating system from freezing.

2.10.2 Boiler without frost protection, during longer periods of non-use

- Turn time clock off and allow system to cool down then isolate mains power supply at the fused spur unit.
- Isolate the gas supply at the boiler valve.

⚠

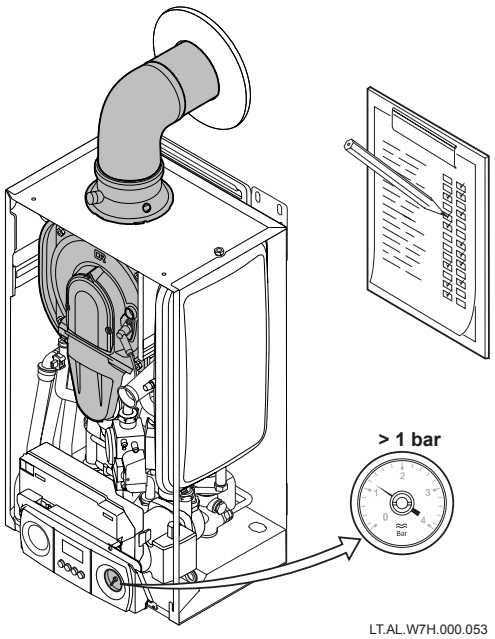
Drain the boiler and central heating system if you will not be using the home for a long period and there is a chance of night frost.

3 INSPECTION AND MAINTENANCE

The Remeha Avanta Plus is practically maintenance free but should be inspected annually.

If during the annual inspection the flue gas analysis indicates that the values are outside the figures given *in table 10*, maintenance work should be carried out as described in *par.3.2.* Also carry out maintenance if the ionisation read-out value is lower than 3 or higher than 9µA, or when the flame core is not satisfying.

Only Remeha spare parts/materials should be used.
All service and maintenance must be carried out by a qualified Engineer with the relevant training and certification (i.e. CORGI - ACS - IEE registrations etc).



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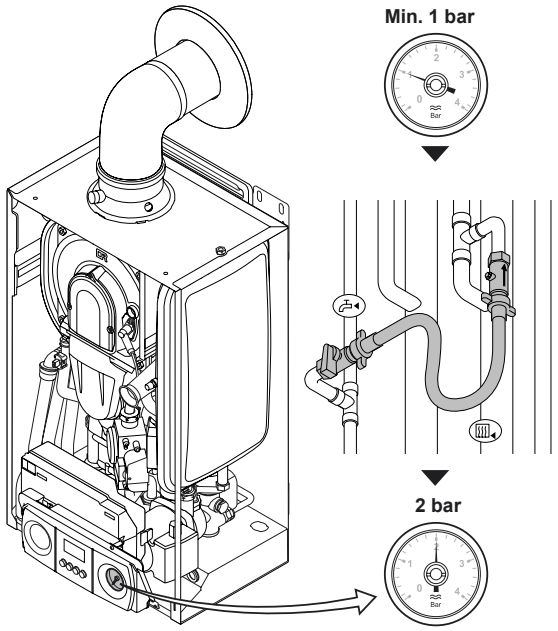
3.1 Inspection

The annual inspection of the Remeha Avanta Plus can be limited to the following checks:
- check the water pressure, *see par. 3.1.1;*
- check the flue pipes and air supply pipes for leaks, *see par. 3.1.2.;*
- check and clean (if necessary) the condensate siphon, *see par.3.1.3.;*
- check the ignition electrode and ionisation, *see par. 3.1.3;*
- check the combustion and flame colour, *see par. 3.1.5;*
- fill in the Boiler Log Book.



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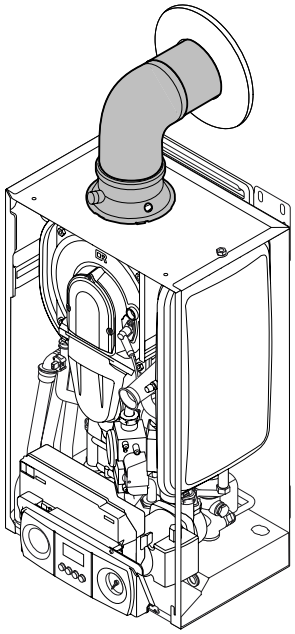
3.1.1 Checking the water pressure

The water pressure should be checked against the commissioning entry in the Boiler Log Book (min 1 bar)

- If necessary, re-fill system to design pressure and re-set red pointer to match fill pressure 2 bar.

Check system for leaks if the system needs re-filling more than 3 times per year.



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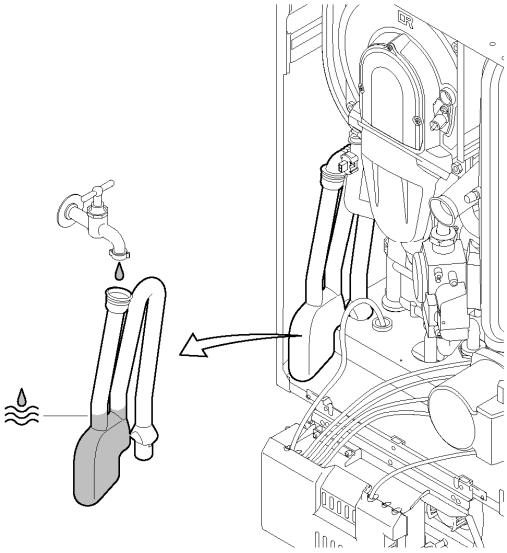
3.1.2 Checking the flue pipes and air supply pipes for leaks

- Check that the flue and air-supply connections and pipes are sealed and the terminal exit is clear.



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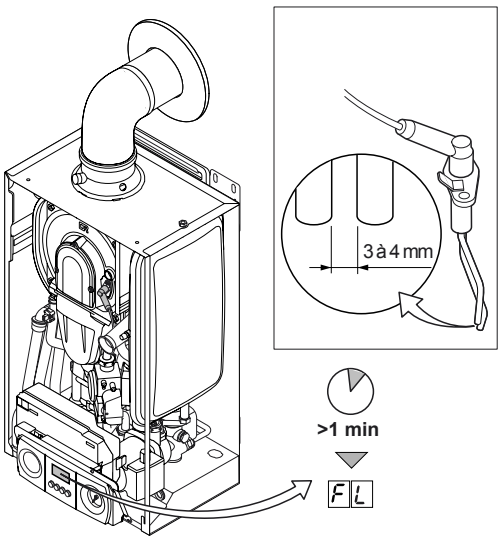
3.1.3 Checking the condensate siphon

- Check the condensate siphon. Remove any dirt residues and refill with clean water to the mark.



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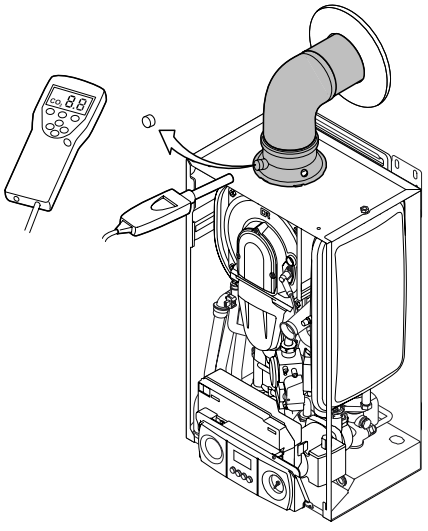
3.1.4 Checking the ignition electrode

- Check the ionisation /ignition electrode for:
  - deposits (remove any white deposits with abrasive cloth);
  - the adjustment of the ignition electrode (between 3 and 4 mm);
  - the quality of the gasket and condition of the porcelain (this should not be cracked);
- Check the ionisation current after 1 minute on the display code FL, *see par. 2.9.6.*
  If the read-out value is lower than 3 or higher than 9µA, check cable and connections are sound if OK replace the ignition electrode.

The ignition cap is fixed on the ignition electrode and therefore cannot be removed.



LT.AL.W7H.000.057

3.1.5 Checking the combustion

- Measure the O_2/CO_2 percentage and the flue gas temperature at the flue gas sample point.

Do this as follows:

- heat the water temperature in the boiler to approx. 70°C;
- unscrew the top of the flue gas point of measurement;
- measure the O_2/CO_2 percentage and compare this to the check values in *table 10.*

Ensure that the analysing probe has a gas tight seal in the sampling point with the probe end in the centre of the flue duct.

Checking values O_2/CO_2 for natural gas H / L				
Boilertype	Fan speed (rpm)		O_2	CO_2
	Full load H 3	Part load L. 3	%	%
24s	ca. 4300	ca. 1300	5.2 ± 0.2	8.8 ± 0.3
28c	ca. 5500	ca. 1300	5.2 ± 0.2	8.8 ± 0.3
35c	ca. 6300	ca. 1300	5.2 ± 0.2	8.8 ± 0.3
39c	ca. 6700	ca. 1300	5.2 ± 0.2	8.8 ± 0.3

table 10 Checking values O_2/CO_2 (front panel not fitted)

Checking values O_2/CO_2 for LPG (propane)				
Boilertype	Fan speed (rpm)		O_2	CO_2
	Full load H 3	Part load L. 3	%	%
24s	ca. 4100	ca. 2000	5.1 ± 0.2	10.5 ± 0.3
28c	ca. 5200	ca. 2000	5.1 ± 0.2	10.5 ± 0.3
35c	ca. 5800	ca. 2000	5.1 ± 0.2	10.5 ± 0.3
39c	ca. 6500	ca. 2000	5.1 ± 0.2	10.5 ± 0.3

table 11 Checking values O_2/CO_2 (front panel not fitted

The O_2/CO_2 - values *in table 10* are **checking** values. For **setting** values see *table 05 and table 07.*

If the flue gas analysis readings are within the values *in table 10* the boiler combustion is OK. However if the readings are outside the given values, then adjust the gas air ratio control to the given values, *see table 05 and table 07 in par.2.9.3*.
If the adjustments cannot achieve the mentioned values, the boiler will require a full service please refer to the maintenance instructions in *par. 3.2.*

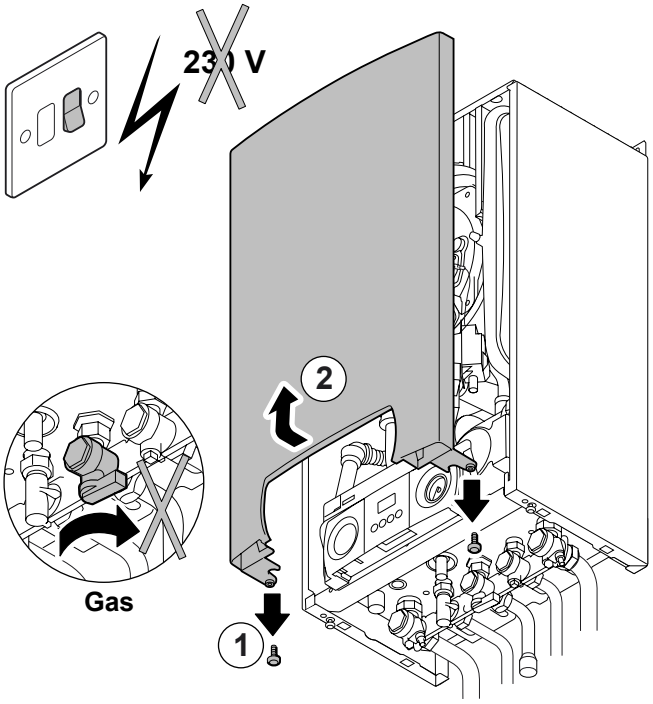
- check the flame via the inspection glass; in full load the flame should be stable with an even blue colour and in part load should be stable with an even orange colour.

3.2 Maintenance

To conduct maintenance:

Ensure that a service gasket set and new ignition/ionisation electrode is available before carrying out this procedure.

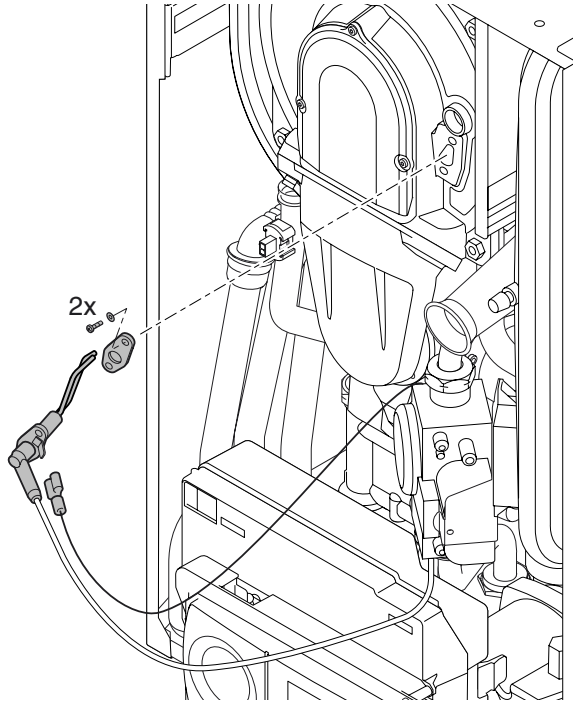
- Isolate power supply at the fused spur before carrying out any work on the boiler.



LT.AL.W7H.000.058

1. Open the boiler

- Isolate the 230 V supply at the switched spur and remove the fuse
- Isolate the gas supply at the boiler gas valve
- Remove the front panel (release the two screws at the bottom of the front panel, pull the bottom of the panel forward and lift off the two pins on the top of the main casing).



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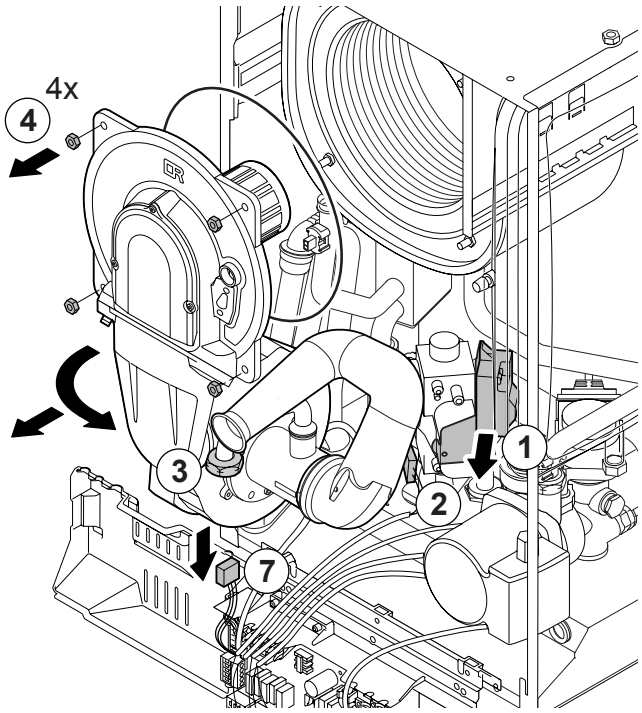
2. Maintenance of the ignition/ionisation electrode

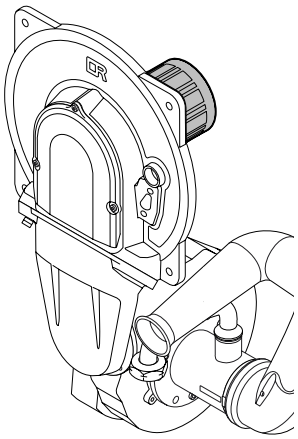
- Disconnect the earth wire from the electrode mounting plate.
- Release the two screws on the electrode and remove the assembly.
- Inspect, clean re-gap or replace the electrode, *see par 3.1.3*.

3. Dismantling the front plate of the heat exchanger



LT.AL.W7H.000.060

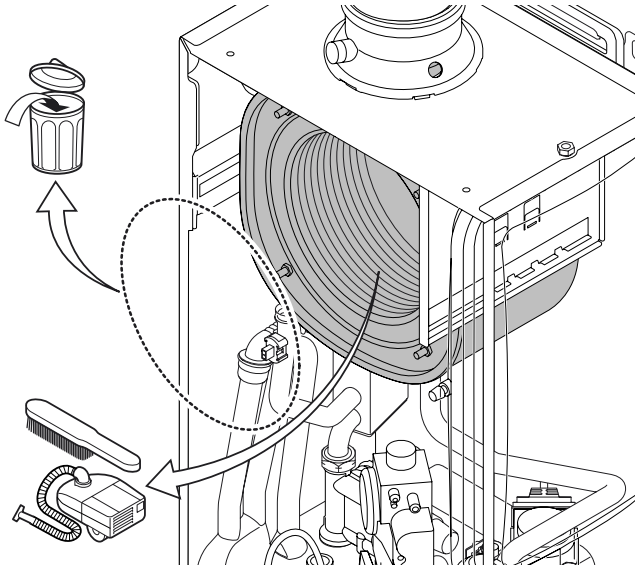
- Release the ignition transformer mounting plate and remove it completely.
- Disconnect the electrical connection on the gas block.
- Release the union nut from the gas pipe on the outlet to the gas block.
- (Disconnect the 230 V fan plug; Avanta Plus 39c only)
- Release the four nuts on the heat exchanger front plate
- Carefully pull the front plate assembly c/w fan, gas block, venturi pipe and burner unit away from the heat exchanger by approx. 10 cm.
- Disconnect the electrical plug on the back of the fan, so it becomes accessible.
- Remove the front plate assembly completely.



LT.AL.W7H.000.061

4. Maintenance to the burner

- Carefully clean the burner with pressured air (do not keep the nozzle to close to the surface).
- Visual inspection of the burner for any damages or cracks on the surface. If you see any damages, then replace the burner.



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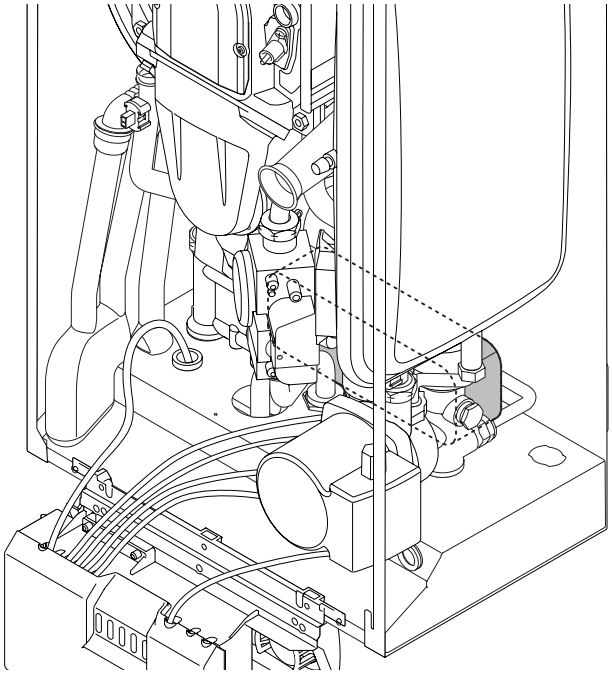
5. Maintenance to the heat exchanger (CH)

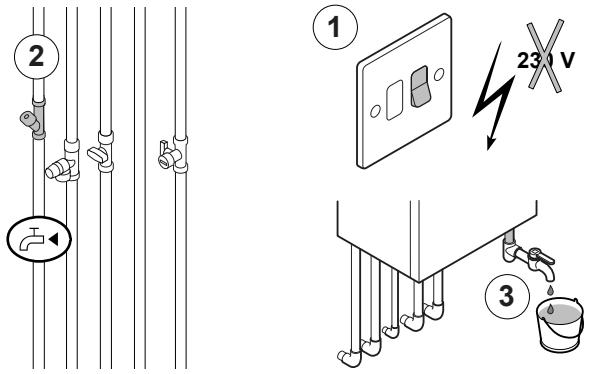
- Check the seal between the front plate and the heat exchanger and the insulation section. Replace sealing.
- Handle the fragile front-plate insulation and the back-plate insulation of the heat exchanger with great care and do not let them get wet.
- Visual inspection of the heat exchanger for scale or dirt. If you see obvious deposits, than clean the heat exchanger carefully. Carefully remove any loose dirt with a vacuum cleaner.
- Then brush the coils of the heat exchanger (if required a cleaning brush is available as an accessory) and remove the loosened particles with a vacuum cleaner.

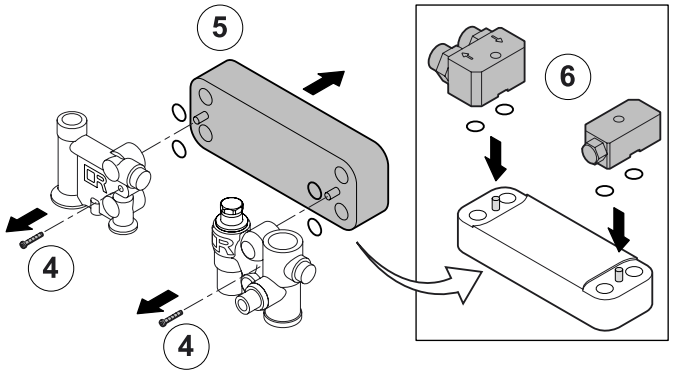
6. Cleaning plate heat exchanger (DHW) and non return valve with filter

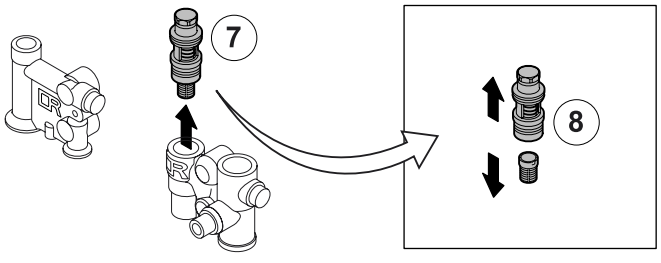
Scale deposits on the plate heat exchanger cannot be totally excluded, depending on such variables as tap water quality and operation mode.
We recommend annual inspections under standard circumstances. Please note that following factors may influence the frequency of inspection:

- Water hardness
- Chemical composition of scale deposit
- Boiler operation hours
- DHW usage pattern
- DHW set temperature





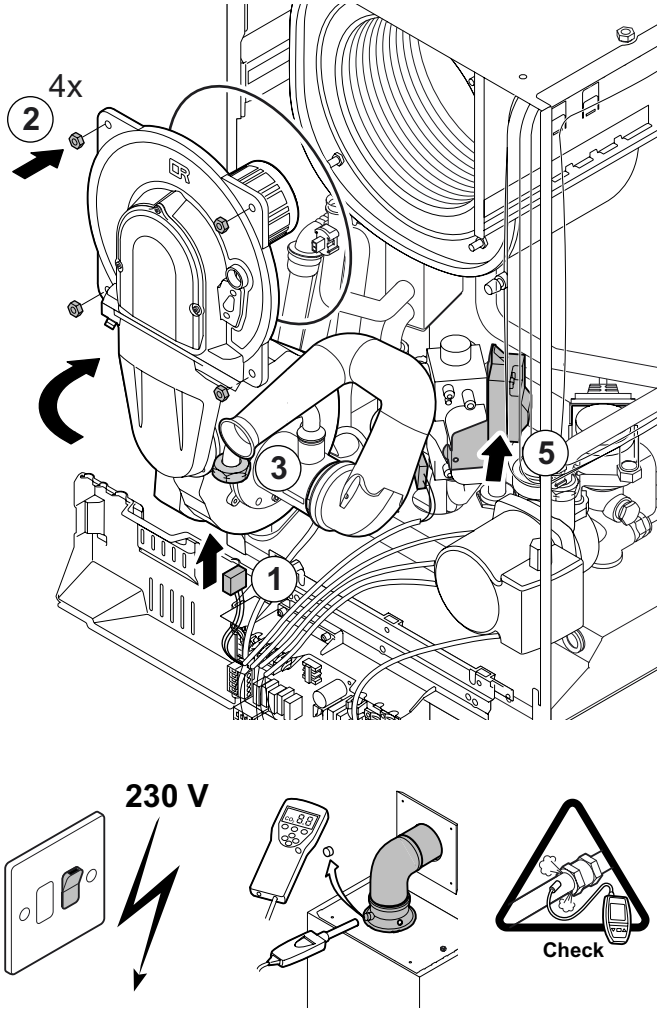




LT. AL.W7H.000.231 + LT.AL.W7H..000.232

If a cleaning operation becomes necessary, please proceed as follows:

- Turn off the mains cold water supply and drain off the residual DHW;
- Release two socket head screws and remove plate heat exchanger;
- Clean plate heat exchanger with scale solvent (e.g. citric acid, pH 3); a special cleaning tool (optional accessory) can be used;
- Thoroughly cleaning afterwards with clean water;
- Remove non return valve with filter from on the right hand side of the hydro block and also clean with the scale solvent; afterwards thoroughly cleaning with clean water.



7. Re-Assembling the boiler and checking the combustion

- Re-assemble all the components in reverse order.

- Remember to connect the fan plug again before it is completely home on the front of the heat exchanger.
- Check that the packing between the front plate and the heat exchanger has been fitted correctly.

- Fill the system with water.
- Switch the boiler back on.
- Check the CO_2/O_2-percentage, *2.9.3, point 4.*
- Check the ionisation current by reading the display, *see par.3.1.3.*
- Check the connections on the gas block on gas-leaking.

Fill in the Boiler Log Book after conducting any maintenance.

4 ERRORS

4.1 General

The Remeha Avanta Plus has an advanced control unit. The heart of this control unit is a microprocessor, the **abc®**-control which both controls and protects the boiler. If an error is detected anywhere in the boiler, it will lock-out and an error code will appear in the display.

4.2 Error codes

The Remeha Avanta Plus displays the error codes as follows: E 2 (the display alternately shows an E and a number e.g. 2) The meaning of the various error codes can be found in the error table, *see table 11.*

How to deal with errors:

- Make a note of the displayed error code.

The error code is important for the correct and swift detection of the nature of the error and for possible support from our technical help line 0118 978 3434.

- Press the **'reset'** key for 3 seconds. If the error code continues to appear, look for the cause in the error table below and resolve it.

Error code	Description	Possible cause	Check / solution
E0	Flow or return sensor fault.	Short circuit in the flow, return or boiler temperature sensor.	Check the wiring and the connections of the sensors visually: are the plugs all correctly in position? With a multimeter: measure the resistance in the wiring and connection.
		Defective or not (properly) connected flow, return or boiler temperature sensor.	Check that the sensors are working; take the sensors out * and measure the resistance with a multimeter at room temperature (20 - 25°C); the sensor is working properly if the resistance is between 12 and 15 kΩ.
E1	Flow temperature is higher than the set maximum temperature.	Insufficient water.	Check the minimum water pressure, read off the gauge.
		No through flow.	Check that the pump is working; turn the spindle with a screwdriver, if that works but the pump still does not respond, check the wiring; if that is in order the pump is faulty.
		Too much air in the system.	Vent the system.
		Deviation in the flow or return temperature sensor.	Check that the sensors are working; take the sensors out * and measure the resistance with a multimeter at room temperature (20 - 25°C); the sensor is working properly if the resistance is between 12 and 15 kΩ.
E2	Return temperature is higher than the flow temperature.	Insufficient water.	Check the minimum water pressure, read off the gauge.
		No through flow.	Check that the pump is working; turn the spindle with a screwdriver, if that works but the pump still does not respond, check the wiring; that is in order the pump is faulty.
		Too much air in the system.	Vent the system.
		Sensors not wired correctly.	Check the wiring between sensors and control unit.
		Deviation in the flow or return temperature sensor.	Check that the sensors are working; take the sensors out * and measure the resistance with a multimeter at room temperature (20 - 25°C); the sensor is working properly if the resistance is between 12 and 15 kΩ.

Error code	Description	Possible cause	Check / solution
E3	Control unit or earth fault.	Mains supply not correctly earthed. Control unit faulty.	Check that the power supply from the switch spur is properly earthed, if that is the case the control unit is faulty.
E4	More than 5 start attempts without any flame formation.	No ignition spark.	Check: • the connection between the ignition wire and the ignition trafo; • the ignition wire and electrode for 'dielectric breakdown'; • the inter-electrode distance, this should be 3-4 mm; that the ignition electrode is properly earthed.
		A spark but no flame.	Check that: • the gas tap is open; • the gas pre-pressure is sufficient; • the gas pipe is de-aerated; • the gas valve is energised during ignition and opens; • the electrode is correctly fitted and clean; • the CO_2 adjustment at low and full load; • there is no obstruction / fitting fault in the gas pipe; • there is no obstruction in the air supply or flue (e.g. a blocked siphon); there is no recirculation of flue gasses (either inside or outside the boiler).
		There is a flame but no, or insufficient ionisation (lower than 3 or higher than 9 μA).	Check: • the flame, is the heart of the flame visible and the flame stable? • the CO_2 adjustment at low and full load; • that the ignition electrode is correctly earthed; • visual check of the ignition/ionisation electrode: look for white oxide film (remove with sandpaper or a screwdriver); look at the shape (are the pins still the original shape and is the distance between the two ends of the pins between 3 and 4 mm).
E5	No ionisation or ionisation failure more than 5 times during one heat demand.	CO_2 wrongly adjusted.	Check: • CO_2 adjustment on the gas block; • ignition/ionisation pin; • flue/air-supply connections; • gas flow at full load; • if there is no recirculation of flue gasses (either inside or outside the boiler).
E6	Unwanted flame formation.		Faulty control unit, replace control unit.
E7	No water in the boiler or the pump is not working.	Insufficient water.	Check the minimum water pressure, read off the gauge and check for leaks.
		No through flow.	Check that the pump is working; turn the spindle with a screwdriver, if that works but the pump still does not respond, check the wiring; that is in order the pump is faulty.
		Too much air in the system.	Vent the system.
		Wrong pump wiring.	Check wiring from and to control unit.
E8	Fan fault.	Fan is not working.	Check: • fan function; • fan wiring and connection.
		Fan does not stop.	Check: • fan function; • fan wiring and connection; • excess chimney draught.

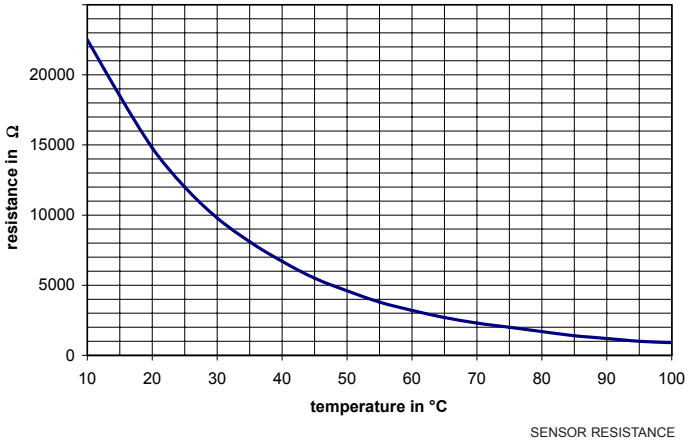
Error code	Description	Possible cause	Check / solution
E10	No through flow during venting cycle.	Insufficient water.	Check the minimum water pressure, read off the gauge and check for leaks.
		No through flow.	Check that the pump is working; turn the spindle with a screwdriver, if that works but the pump still does not respond, check the wiring; that is in order the pump is faulty.
		Too much air in the system.	Vent the system.
		Wrong pump wiring.	Check wiring from and to control unit.
E13	Heat-exchanger fuse protection has responded; replace the heat exchanger after finding and solving the cause.	Heat exchanger faulty.	Check wiring between heat exchanger fuse.
		Insufficient water.	Check the minimum water pressure, read off the gauge and check for leaks.
		No through flow.	Check that the pump is working; turn the spindle with a screwdriver, if that works but the pump still does not respond, check the wiring; that is in order the pump is faulty.
E43	Parameter limits.	Automation settings.	Replace dF / dU settings, *see Par. 2.9.10* If this error code still returns after resetting; please contact Broag.
E44	Parameter check.	Automation settings.	Replace dF / dU settings, *see Par. 2.9.10* If this error code still returns after resetting; please contact Broag.
E45	Default parameters.	Automation settings.	Replace boiler control unit.

table 12 Error codes

* When sensors have been taken out, be sure to replace them max. 40 mm underneath heat exchanger.

If you read out a not listed error, please report to Broag.

Temperature/resistance diagram



4.3 Control stop or lock-out

The code 8 , 5 or 9 can appear in the display.

- Code 8 is a control stop and will appear if the measured flow temperature (t1) is higher than the flow temperature set (T_{set} flow). The boiler will start working again automatically once the flow temperature falls below the flow temperature set.
- Code 5 is a control stop from 3 till 10 minutes and appears if the set flow temperature (t1) has already been reached and the heating demand still exists.
- Code 9 is a lock-out and appears if the maximum temperature rise is exceeded or if the ΔT between the supply and return temperature $\geq$ 45°C or a rate of rise in the flow temperature > 1°C/sec. And also at a boiler-start with no through flow or insufficient water. The boiler will try to restart after 10 minutes.

☞
Every 10 minutes the boiler will try to restart until the cause has been removed.

- Code 9 is a lock-out and can appear in the following situation:
  - the lock-out down input (between terminals 5 and 6 on X9) has been activated (= opened).

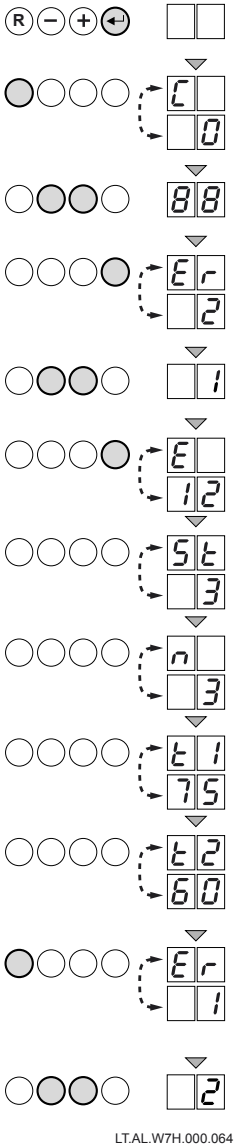
☞
The lock-out will disappear once the cause has been removed!

4.4 Error memory

The Remeha Avanta Plus control unit has an error memory, in which the last 16 errors are stored. In addition to the error code (E and a number XX).
The following data is also stored:

- the number of times the error occurred (n and a number XX)
- the operating status of the boiler (St and a number XX)
- the flow temperature (t1 and the value XX) return temperature (t2 and the value XX) at the time the error occurred.

To get access to the error memory, access code must be entered.



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4.4.1 Error read outs

- Press the **[enter]**-key and keep it pressed;
- Press the **[reset]**-key until codes C and 0 appear alternately in the display;
- Enter the special access code 88 with the **[+]** or **[-]-** key;
- Press the **[enter]**-key; the display shows Er and the number of the last error alternately, for example 02.
- Press the **[+]** or **[-]-**key to go forwards or backwards in the list of errors.
- Press the **[enter]**-key to take a closer look ot the error. The display shows the error code as follows;
  - first error code E with error number e.g. 12
  - then status code St with status number e.g. 3 (burning for central heating)
  - then number of time that the error has occurred n and a number e.g. 3
  - then the flow temperature when the error occurred t1 and temperature e.g. 75
  - final the return temperature when the error occurred t2 and temperature e.g. 60

  This cycle continues to repeat itself.
- Press the **[reset]**-key to stop the cycle; the following appears in the display;
  Er and the last viewed errors e.g the numbers 1 and 8.
- Press the **[+]** or **[-]-**key to look at the following error data.

4.4.2 Deleting errors

The last message in the list, Er followed by CL will appear in the display;

- Press the **[enter]**-key again, and the following will appear in the display: 0
- Press the **[+]**-key to set the parameter to 1.
- Press the **[enter]**-key, to delete the error memory:
- Press the **[escape]**-key twice to exit the error memory.

When tracing an error, the cause can often be found more quickly if the operating status at the time the error occurred can be retrieved from the error memory.

5 SERVICE PARTS

5.1 General

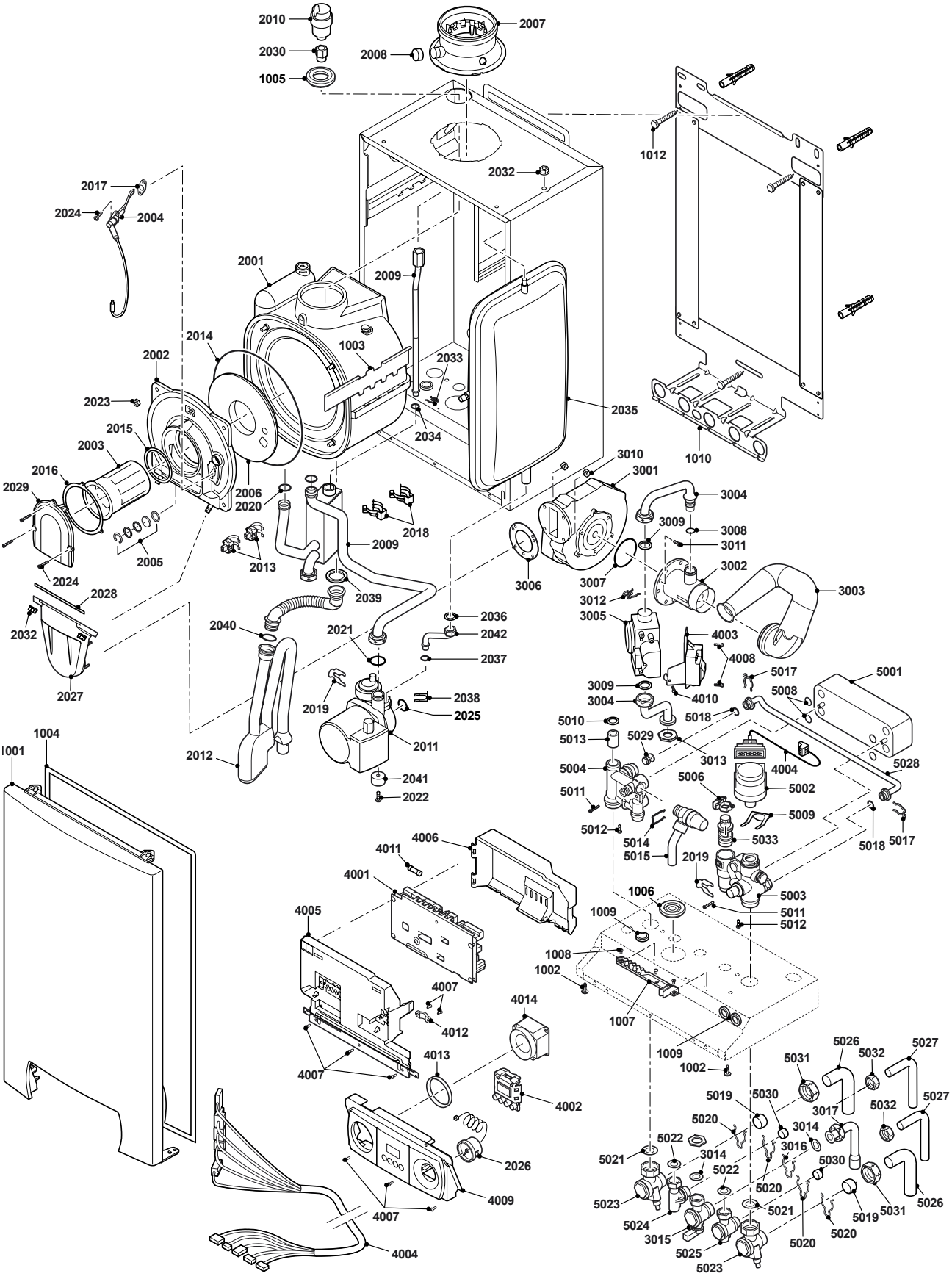
If, following the annual inspection or maintenance any part of the boiler is found to need replacing, use Remeha spare parts only or spare parts and materials recommended by Remeha.

If the component to be replaced is covered by the Remeha guarantee terms (see the Remeha General Terms of Sale and Delivery) send the component to the Remeha Quality department. Always enclose a fully completed return form, see example below. This will enable Remeha to meet its guarantee obligations more quickly and efficiently.

The enclosed (returned) component comes from boiler:	**model***	**year/day/serialnr.***	
	Avanta Plus *24s*	*05 094 000 000 087*	
Installation date of the boiler	*June 2005*		
Description (returned) component	**sort**	**Brand**	**type**
	Three-way valve	*Elbi*	*VC 1650/1000*
Problem description	*motor does not respond*		
Description (returned) component	**sort**	**Brand**	**type**
Problem description			
Description (returned) component	**sort**	**Brand**	**type**
Problem description			
Your details			
Company name	*Smit*		
Address	*Londonstreet 1, London*		
Telephone			
Reference	*Mr. Johnson*		
Your order number	*530002004*		
Job number	-		
Project number	*14 (Canal flats)*		

table 13 Return form example

* These details can be found on the boiler type plate; the type plate is stuck to the bottom of the boiler.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1002
LT.AL.W7H.000.065

Break down parts kit		
Part No	**Description**	**Position**
S62743	Electrode ignition/ionisation	2004
S62728	Vent auto air bleed device	2010
S62746	Pump for 24s and 28c	2011
S62747	Pump for 35c and 39c	2011
S58733	Sensor temperature (2 pcs.)	2013
S62733	Gauge pressure c/w capilliary	2026
S62745	Fan assembly 230VAC (for 39c)	3001
S58684	Fan assembly 24VDC (for 24s, 28c, 39c)	3001
S58685	Gas combination block	3005
S62734	Control board	4001
S62739	Display print board	4002
S62750	Transformer ignition	4003
S43561	Fuse glass 2 amp slow (10 pcs.)	4011
S59132	Actuator three way valve	5002
S59133	Sensor DHW flow	5006
S62763	Safety pressure relief valve with pipe	5015
S62781	Three way valve inner assembly	5033

table 14 Break down parts kit

6 EC DECLARATION

EC – DECLARATION OF CONFORMITY

Manufacturer	: Remeha B.V.
Address	: Kanaal Zuid 110
Town, Country	: Postbus 32, NL-7300 AA Apeldoorn
- hereby declares that the appliance(s)	: Remeha Avanta Plus

comply / complies with the specifications of the following EEC directives:

EEG Directive:	90/396/EEG	applied standards:
		(pr)EN 297(1994), 483(1999), 625(1995), 677(1998)
	73/23/EEG	(pr)EN 50165(1997), 60335-1(1994)
	92/42/EEG	
	89/336/EEG	EN 50165(1997), 55014-1(2000), 55014-2(1997) EN 61000-3-2(2000), 61000-3-3(1995)
	97/23/EG (Art.3, sub 3)	

Apeldoorn, July 2005

W.F. Tijhuis
Approval Manager

7 REGULATIONS

7.1 EC regulations

The boiler meets the requirements of the EC regulations at the following directives:

- 90/396EEC Gas appliances directive
- 92/42/EEC Efficiency directive
- 73/23/EEC Electrical low voltage directive
- 89/336/EEC EMC directive
- 97/23/EEC Pressure equipment directive (art. 3, sub. 3)

Classification type for evacuation of the combustion products; according EN 483

7.2 Remeha factory test

Before it leaves the factory, each Remeha Avanta Plus boiler is optimally adjusted and tested for:

- electrical safety;
- CO2- adjustment;
- hot water function
- water tightness;
- gas tightness;
- automation parameters.

7.3 Additional guidelines

In addition to the regulations and guidelines as mentioned in par.*7.1* the following guidelines in this documentation should also be observed.

It applies for all regulations and guidelines, mentioned in this Installation and Service manual, that any additions or new regulations and guidelines at the time of installation will also apply.

8 TECHNICAL SPECIFICATIONS AND WORKING PRINCIPLE

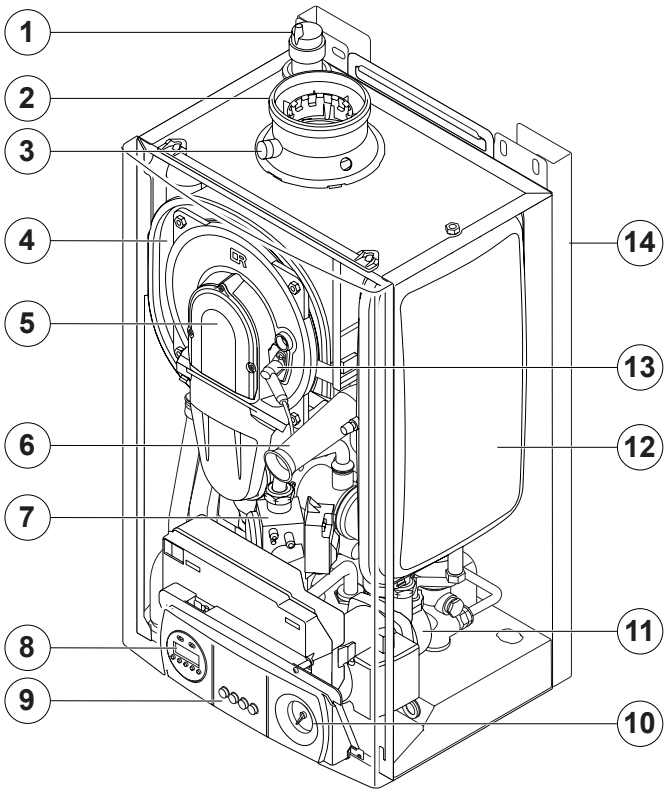
8.1 Technical data

Appliance type Remeha Avanta Plus		**24s system**	**28c combi**	**35c combi**	**39c combi**
General					
Boiler control		modulating or on/off			
Nominal output **Pn** (80/60°C) (CH)	kW	21.6	21.6	29.4	33.3
Nominal output **Pn** (50/30°C) (CH)	kW	23.0	23.0	31.3	35.5
Nominal input **Qn** Hi	kW	5.8 - 22	5.8 - 22	6.1 - 30	6.3 - 34
Nominal input **Qnw** Hi	kW	-	28.0	35.0	39.0
Assembly dry weight	kg	29.0	30.5	32	34.5
Noise level at distance of 1m from the boiler (at full load)	dB(A)	< 44			
Gas and flue details					
Classification due to discharging flue gases	-	C13, C33, C83			
Gas type permitted	-	$II_{2H\ 3P}$ (natural gas and propane)			
Gas inlet pressure natural gas	mbar	20 - 30			
Gas consumption natural gas maximum	m_n^3/h	2.3	3.0	3.5	3.9
Gas flue rate	kg/h	37	47	57	62
Gas inlet pressure propane	mbar	37 - 50			
Gas consumption propane maximum	m_n^3/h	0.85	1.2	1.3	1.6
NO_x Class [2])	-	5 [1])			
NO_x annual emission (n = 1)	ppm	< 30			
	mg/kWh	< 53			
Residual fan duty (full load)	Pa	50	100	100	140
CH side					
Water capacity heat exchanger and piping	l	1.8	1.8	2.0	2.2
Expansion vessel size	l	8			
Minimum operating water pressure	bar	1			
Maximum operating water pressure **PMS**	bar	2.5			
Water temperature maximum	°C	110			
Operating temperature maximum	°C	95			
Residual head ΔT = 20°C	mbar	> 250	> 250	> 250	> 200
Domestic hot water side [2])					
Tap capacity **D** (35°C)	l/min	-	11.4	14.2	15.9
Minimum tap flow	l/min	-	1.2	1.2	1.2
Operating pressure P_{MW} min. - max.	bar		0.5 - 8	0.5 - 8	0.5 - 8
Water resistance (nom. output) incl. flow restrictor	bar	-	1.3	-	-
Water resistance (nom. output) excl. flow restrictor	bar	-	0.1	0.1	0.1
Electrical					
Main supply	V/Hz	230 / 50			
Power consumption **W** maximum	W	115	115	150	180
in stand-by status	W	< 3			
Degree of protection	IP	X4D			

table 15 Summary of technical data

[1]) Measured according EN 483 (Class 5 complies with a limited concentration of NO_x < 70 mg/kWh)

[2]) This data applies for natural gas.



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8.2 The boiler components

1. *Automatic air vent*
2. *Flue / Air inlet connection*
3. *Flue gas measuring point*
4. *Heat exchanger*
5. *Front plate heat exchanger*
6. *Air inlet tube*
7. *Gas combination block*
8. *Two channel time clock (optional)*
9. *Control panel*
10. *Pressure gauge*
11. *Circulation pump*
12. *Expansion vessel*
13. *Ignition/ionization electrode*
14. *Stand off frame (optional)*

8.3 Working principle

The Remeha Avanta Plus casing serves as a sealed air box, with air drawn in by the fan. On the outlet side of the fan is a venturi, into which a measured quantity of gas is injected based on the volume of air available. The fan speed control is dependent on the settings of the external control, the advanced boiler controller '**abc®**' and the prevailing temperatures (measured by the temperature sensors).

This method of gas/air ratio control ensures that the gas quantity is precisely adjusted to the air quantity. Thus creating optimum combustion over the whole heat input range. The gas and air is mixed in the venturi and then passes into the specially designed pre-mix burner. After combustion, the hot flue gas is directed through a specially designed, high efficiency helicoil stainless steel heat exchanger with a large surface area, and transfers it's heat to the system water circulating around the coils. In the condensing part of the exchanger the water vapour in the flue gas condenses within it and the heat released during this process (the so-called latent or condensing heat) is also transferred to the system water. The condensate water so formed is discharged from the heat exchanger via a siphon.

In normal operation, the boiler's flue gas discharge will produce a visible white condensing "plume" and therefore care should be taken when choosing a location for the terminal.

Combi boiler operation
The Remeha Avanta Plus 28c, 35c and 39c are combination boilers with an integral plate heat exchanger providing instant domestic hot water. On opening a hot water tap, detected by a flow sensor, which is located on the cold water inlet side of the heat exchanger detects the demand. This sensor then activates the motorised three-way valve to divert primary flow to the plate heat exchanger which raises the temperature of the cold water supply by a minimum of 35°C to provide domestic hot water. Once the demand for hot water stops the motorised valve automatically returns to the DHW position. This three-way valve is electrically controlled by the '**abc®**' control and only consumes power when it is changing to a different position.
The plate heat exchanger is protected from debris by two filters one in the cold water supply and one in the primary flow to the diverting valve – Note: the primary flow filter self cleans when the flow reverts back to heating mode.

System boiler operation
The Remeha Avanta Plus 24s the same design and layout as the combi range without the DHW components (three way valve and plate heat exchanger).

8.3.1 Regulating
The Remeha Avanta Plus is a fully modulating boiler and can be regulated using one or more of the following methods;
1. Open Therm – 2 wire interface compatible with the Remeha Celcia 15 room compensator and the Remeha Celcia 20 outside weather compensator or with any other proprietor's OpenTherm® controls.
2. Open Therm thermostat in combination with an external time clock.
3. On/Off room thermostat – volt free (on the X9 terminal strip).
4. On/Off room thermostat – 230 V (on the X2 terminal strip).
5. 230 V Switching time clock - compatible with the Remeha two channel time clock or with any other proprietor's time clock. For further details see *par. 2.8.*

8.3.2 Advanced boiler control ('abc®'-control)
An intelligent advanced boiler control ('**abc®**') continuously monitors the boiler conditions and ensures a very reliable supply of heat. This control system is adept at dealing with negative influences from the system such as flow reduction, airflow problems and alike. In the event of such influences, the boiler will not go to "lock-out" failure mode, but will in the first instance modulate back, and if necessary, depending on the nature of the circumstances, will temporarily switch off (shut-down or control stop), and then after a short while simply try again.

Provided that the situation is not actually hazardous, the Remeha Avanta Plus will always try to supply heat.
The '**abc®**'- control prevents unnecessary additional call outs.

8.3.3 Regulating the water temperature

The Remeha Avanta Plus is fitted with an electronic temperature regulator with flow and return temperature sensors. The flow temperature can be set to between 20 and 85°C, *see 2.9.8 (factory setting* 75°C). The boiler modulates it's output up and down to match the flow set point from internal or external control. When the boiler is at it's at minimum output and the flow temperature still continues to rise, once the flow set point is exceeded by 5°C the boiler will shut down on a controlled stop (code 8).

8.3.4 Low flow / water protection

The Remeha Avanta Plus has a low-water protection based on temperature readings. By modulating down as soon as there is a risk of an insufficient water flow, the boiler will keep working for as long as possible. An insufficient water flow, however caused, - indicated by a flow/return $\Delta t \geq 45$°C or a rate of rise in the flow temperature > 1°C/sec – will be sensed by the **'abc®'** control which will shut the boiler down in a blocking mode with the display showing (code 9) for 10 minutes and before re-starting.
If there is no water in the boiler or if the pump is not running, it will go to lock out (code E7) and require manual re-set.

8.3.5 High Limit temperature protection

If the flow temperature exceeds 110°C the high limit temperature protection device switches off the boiler in a lock out mode with the display showing (code E1) This mode will require a manual re-set.
When the fault is corrected, the boiler can be restarted by pressing the **reset**-key on the control panel and holding for 3 seconds.

9 EFFICIENCY DATA AND GAS EFFICIENCY LABELS

9.1 Annual efficiency

Up to 110.5 % in relation to Hi at a load of 30% and a return temperature of 30°C.

9.2 Water-side efficiency

Up to 98,3 % in relation to Hi at full load and an average water temperature of 70°C (80/60°C).
Up to 104.4 % in relation to Hi at full load and an average water temperature of 40°C (50/30°C).

Remeha Avanta Plus

SEDBUK 'A'

112952-0406 Subject to alterations

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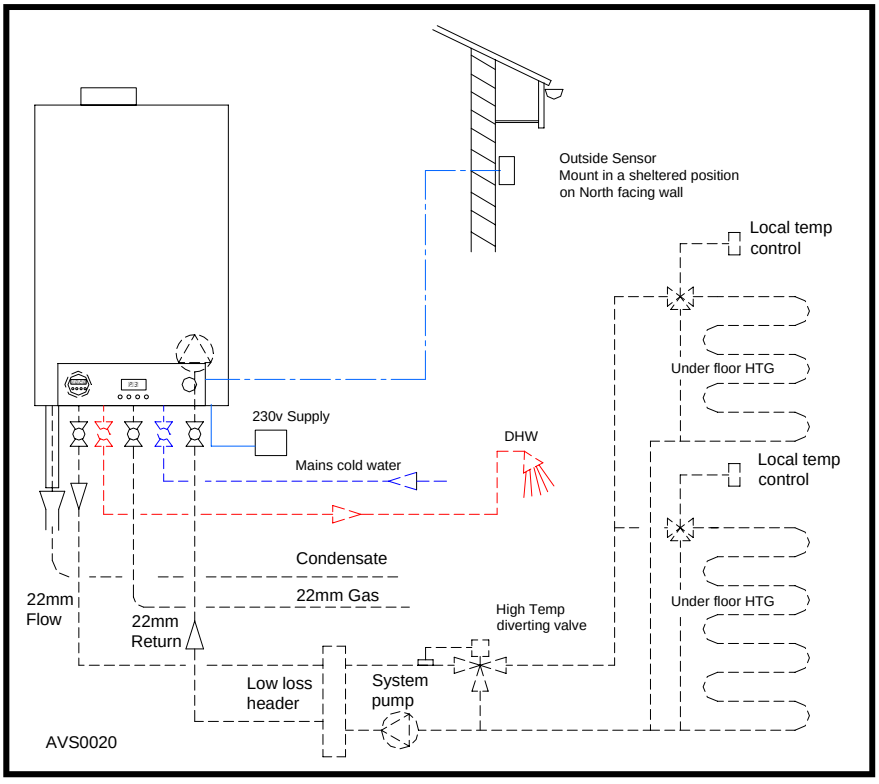
Suggested Schematics with Control and Power Wiring details

Remeha AVANTA PLUS



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Advanced boiler technology

Issue No. 5 Date: 06/06/06

Remeha AVANTA PLUS

Page No

AVANTA PLUS System Options

AVANTA PLUS Combi Options

AVANTA PLUS Underfloor Heating Options (Combi & System)

AVANTA 18v “Open Vented” Options (System only)

IMPORTANT NOTE:
The layouts illustrated in this brochure are for guidance only and do not constitute a full system design. All Mechanical and Electrical equipment must be installed in accordance with the instructions supplied, by a suitably qualified Engineer and to the current regulations.

Controls for the AVANTA PLUS and AVANTA 18v Boilers

The AVANTA series are fully condensing boilers using gas / air ratio controls to provide full modulation and can be operated in the following modes:
All boilers require a permanent 230v single phase 3 amp fused power supply plus controls as below:

NOTE: The boiler is phase / neutral sensitive when used with external 230v controls

ON / OFF Control - fixed flow temperature where the boiler modulates it's output to match a fixed flow set point using simple 230v switching controls

- Single or Two channel time clock (internal only available on the 24s / 28c / 35c and 39c)
- Room thermostat
- Cylinder thermostat
- Diverting / mixing or isolating valves

MODULATING Control - flow temperature is directly controlled by the outside weather or inside room compensator to provide comfort conditions at all times using "OpenTherm®" controls:

- Outside sensor
- DHW sensor or cylinder thermostat
- Room compensator
- Digital time/weather or room compensator
- Mechanical time/ analogue weather or room compensator

==========

Controls available from Broag as optional extras

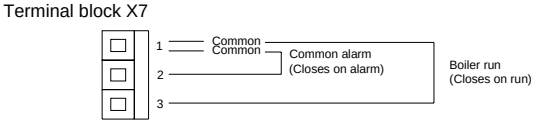
- S62432 Internally mounted two channel digital time clock kit (not for the Avanta 18v)
- S62432c Internally mounted single channel digital time clock (for the Combi series only)
- 50153 Outside sensor
- S43946 DHW sensor
- TBA DHW strap on thermostat
- TBA DHW three way diverting valve and sensor kit
- S59475 Room thermostat - Celcia 10
- S59161 Room compensator - Celcia 15
- 58222 Externally mounted Digital Time / Weather compensator - Celcia 20
- TG001 Externally mounted Analog Time / Weather compensator - Theben
- DA001 Externally mounted two channel 24 hour time clock (230v switching)
- DA002 Externally mounted two channel 7 day time clock (230v switching)
- TBA Externally mounted wireless room thermostat set

Typical controls by others

- External mounted simple two channel time clock providing, 230v switched supplies to time control heating and domestic hot water eg. typical Honeywell ST699 or similar
- Cylinder thermostat eg. typical Honeywell L641 or similar
- Room thermostat eg. typical Honeywell T6360 or similar
- HTG and DHW zone valves c/w a single end switch (closes on valve fully open) eg. Honeywell V4043H or similar
- Wiring centre
- 'Y' : 'W' : 'S' Plan—complete kits
- Other manufacturer's compatible 'OpenTherm®' time and temperature controls

When using the AVANTA PLUS Combi boiler, DHW is always set for constant operation (not timed) but can if required be changed to allow for time restriction using a two channel time clock

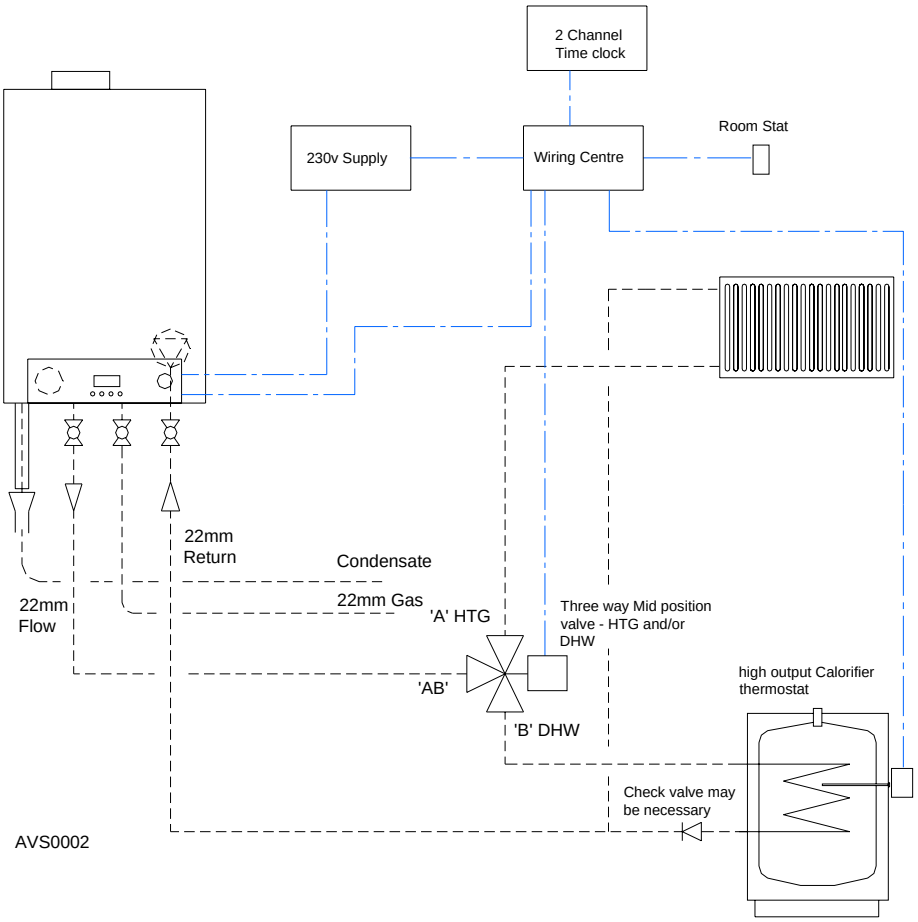
If required the AVANTA series can report a common alarm or boiler run condition to an external control panel or BMS by using the connections on terminal block X7

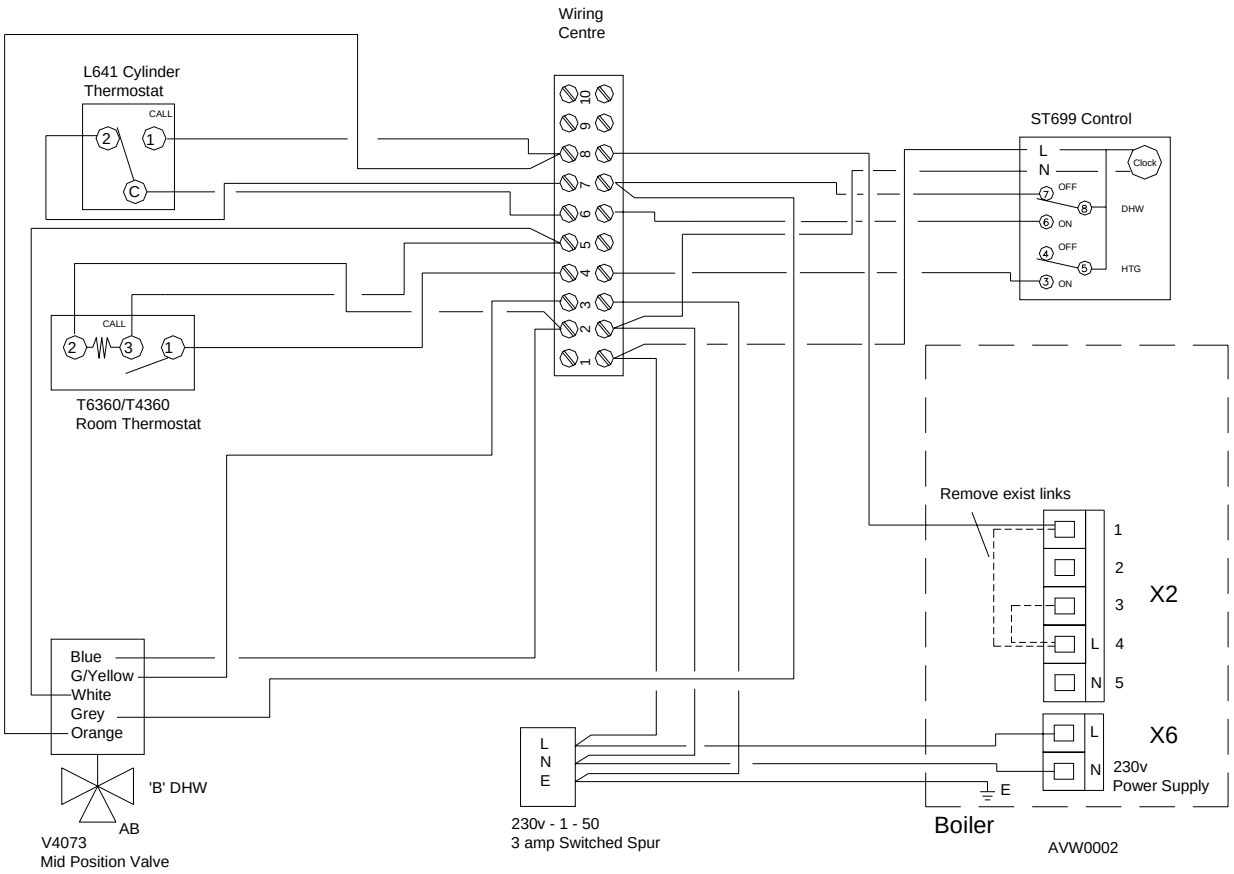


Terminals 1 and 2 - **Common alarm**
Terminals 1 and 3 - **Boiler run**
These are both - volt free (max capacity 230v 1 amp) and are open contacts which close on common alarm or boiler run respectively

AVANTA PLUS System Option 1

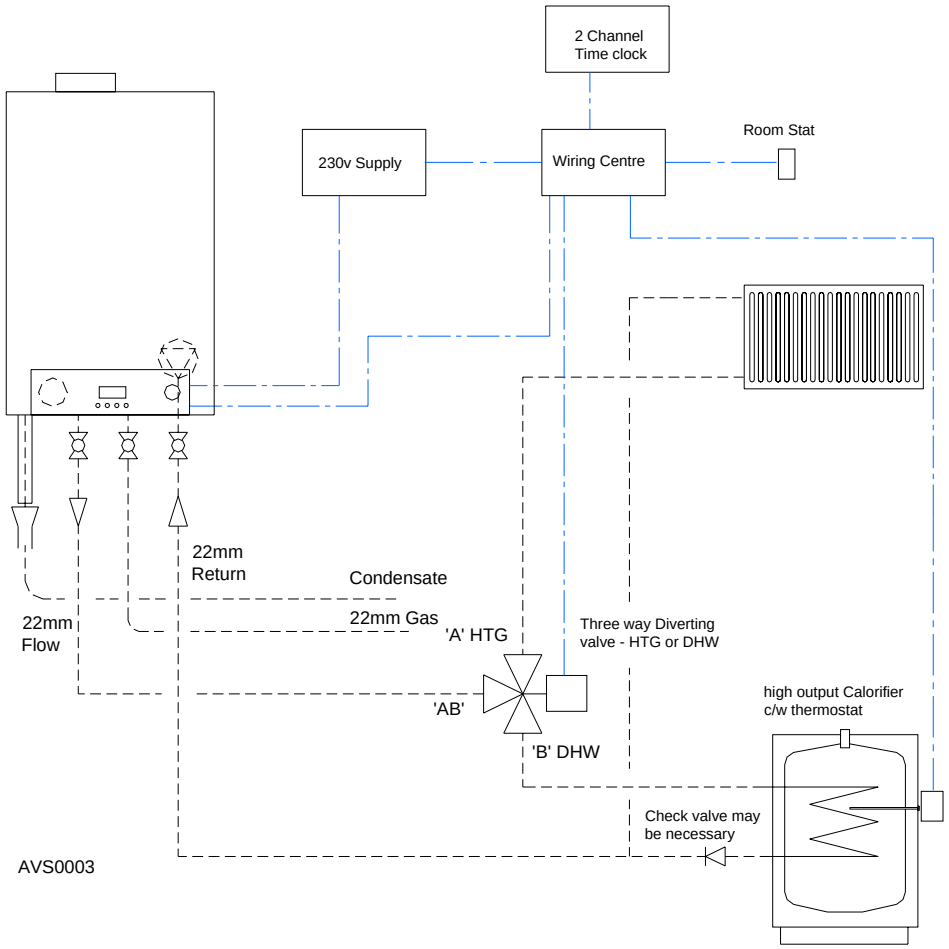
Typical “Y” plan Heating and DHW using 230v controls

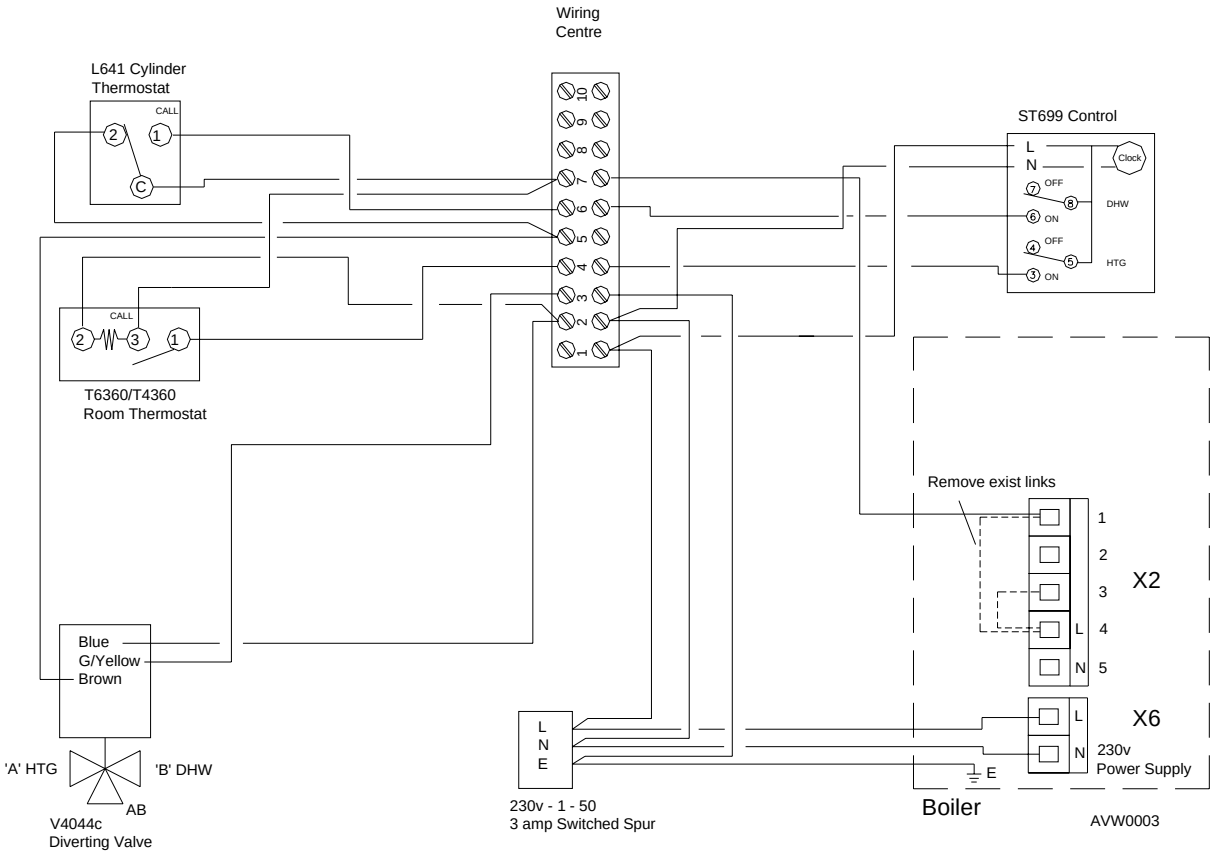




AVANTA PLUS System Option 2

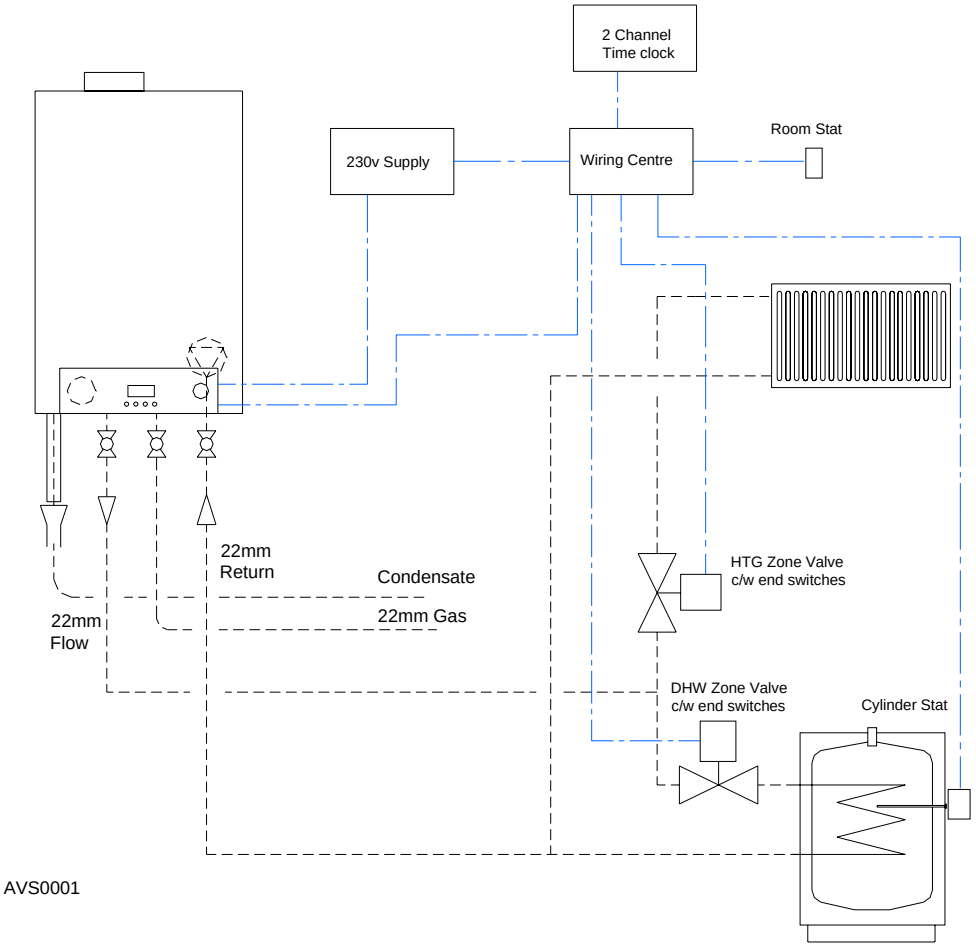
Typical “W” plan Heating and Priority DHW using 230v controls



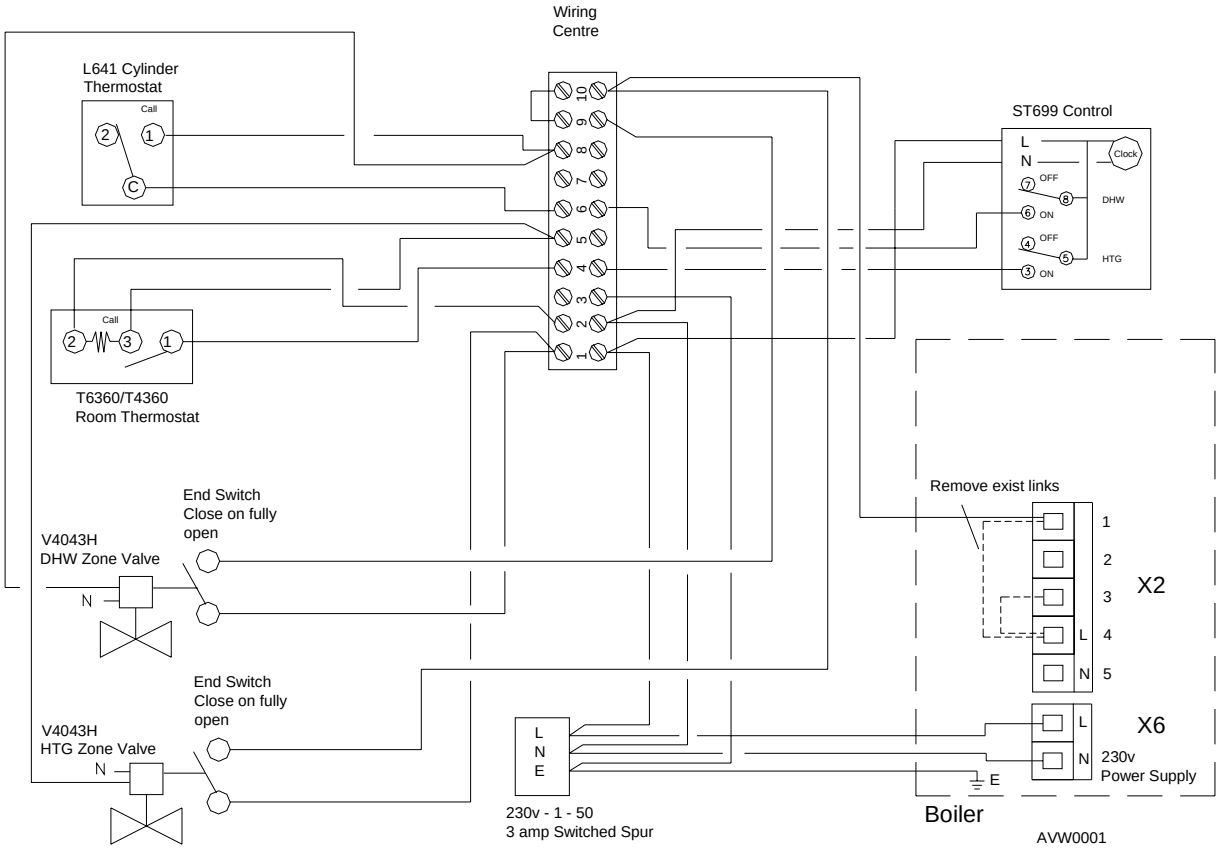


AVANTA PLUS System Option 3

Typical “S” plan Heating and DHW using 230v controls



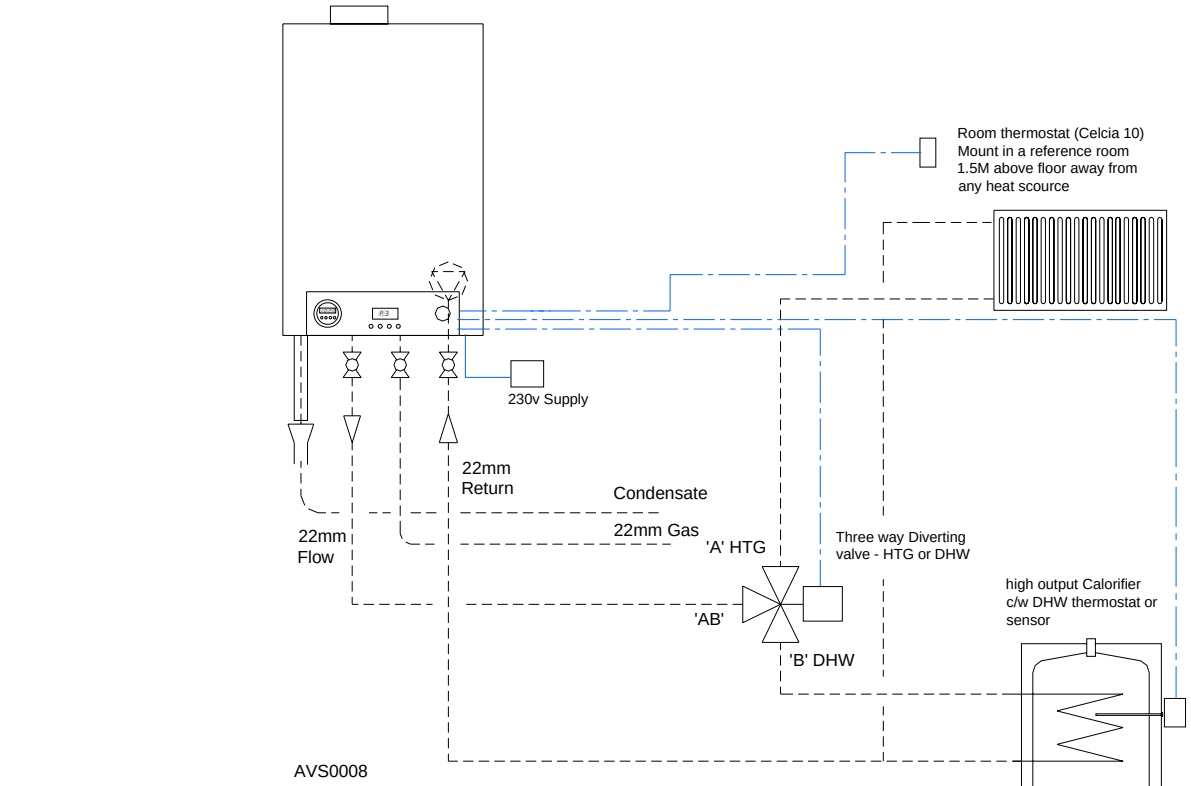
AVS0001

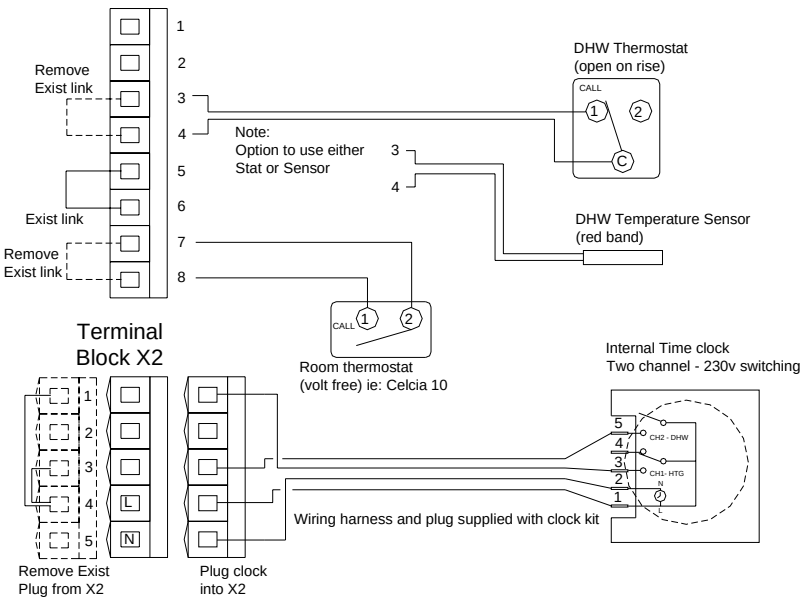


AVW0001

AVANTA PLUS System Option 4

Internal time clock - Heating and Priority DHW using Celcia 10 and 3 way diverting valve kit



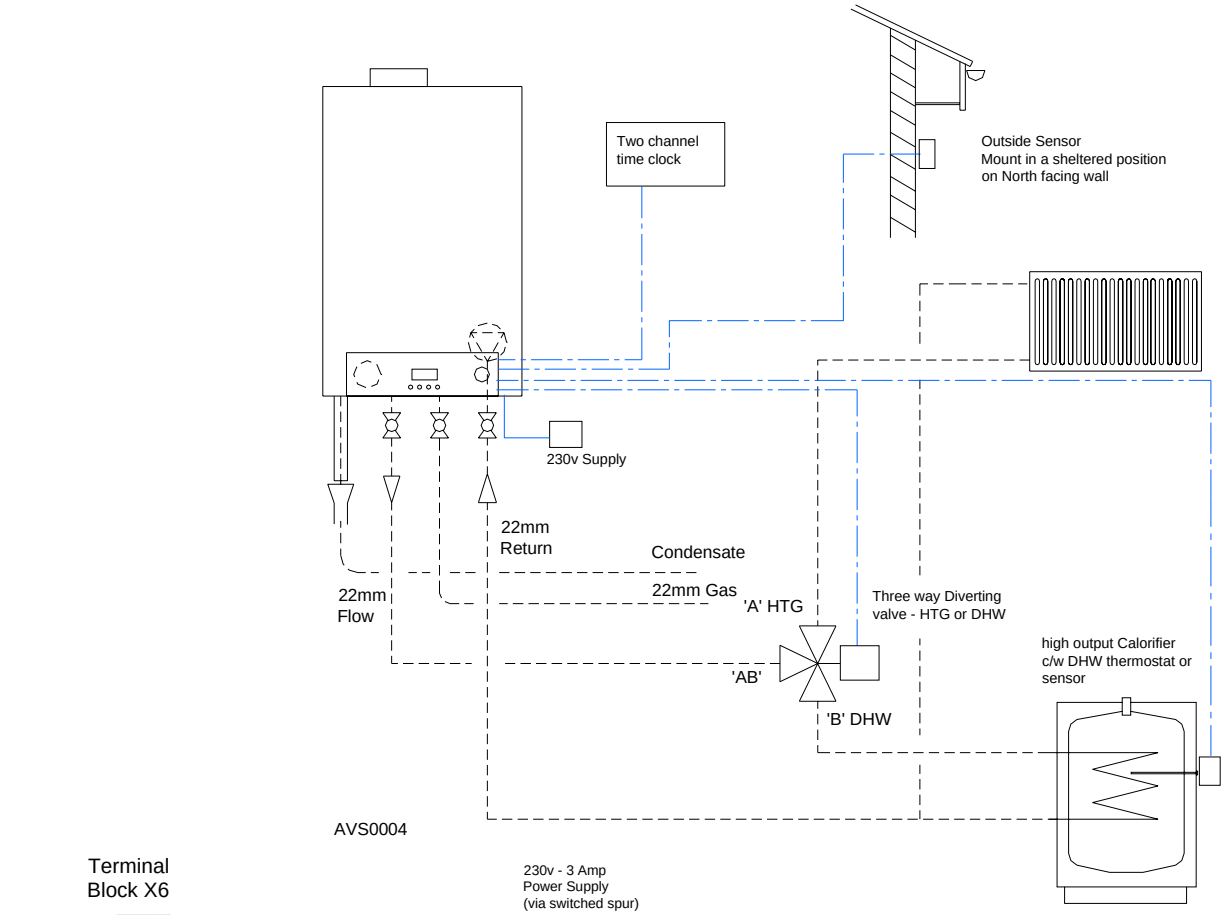


AVW0008

NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA PLUS System Option 5

Simple weather compensated Heating with Priority DHW



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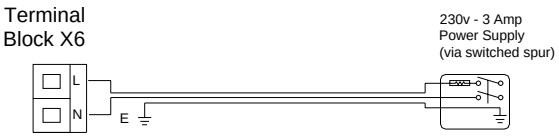
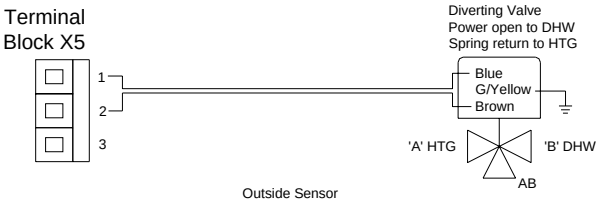
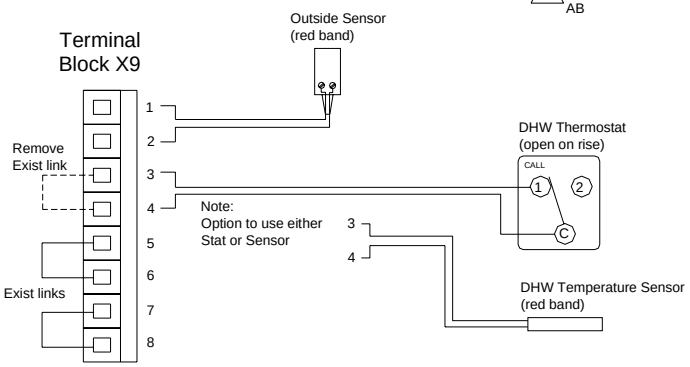




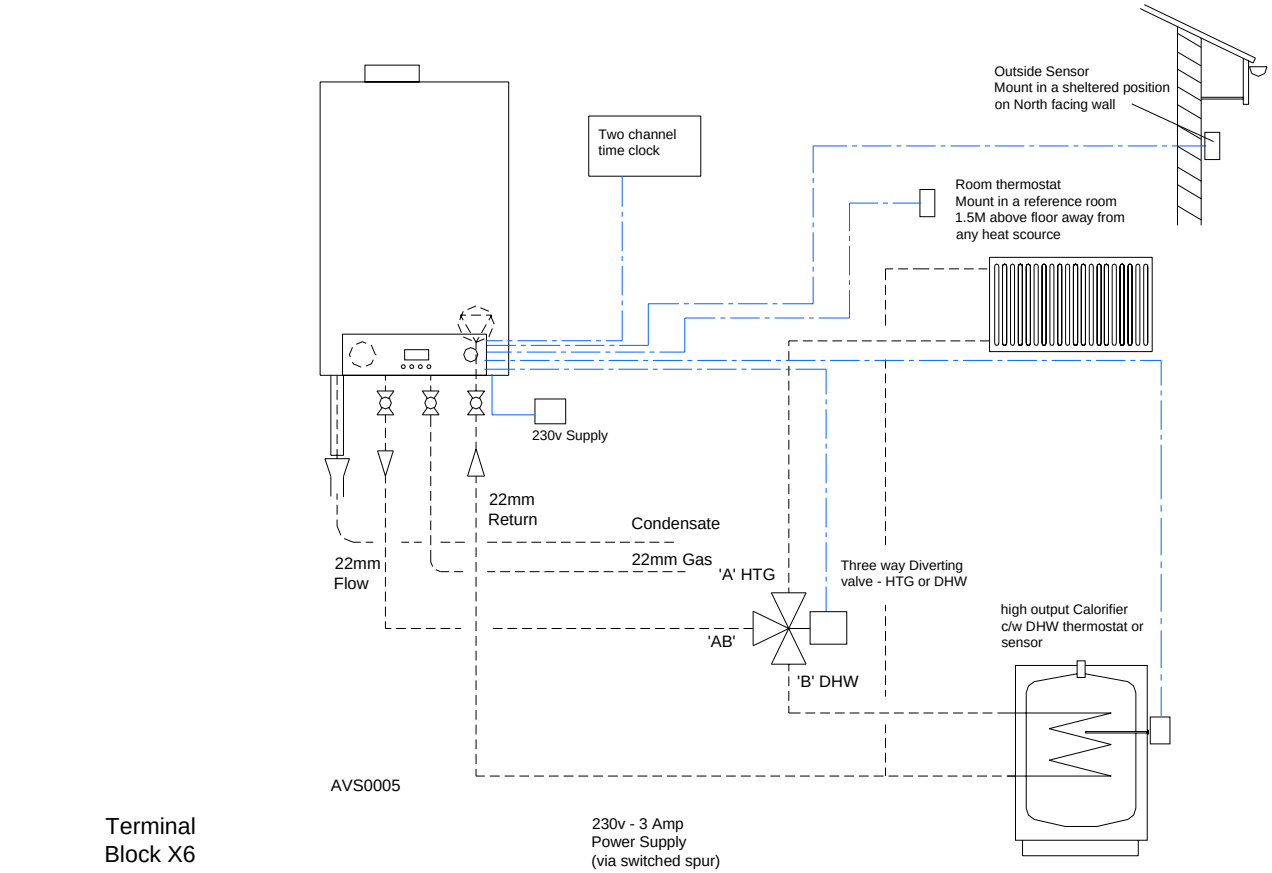


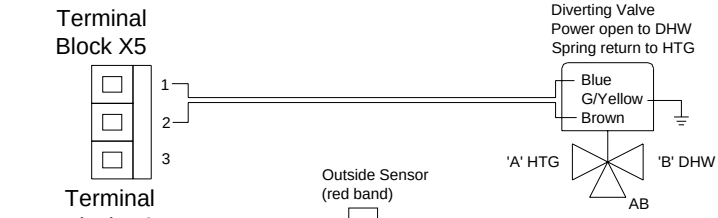
AVW0004

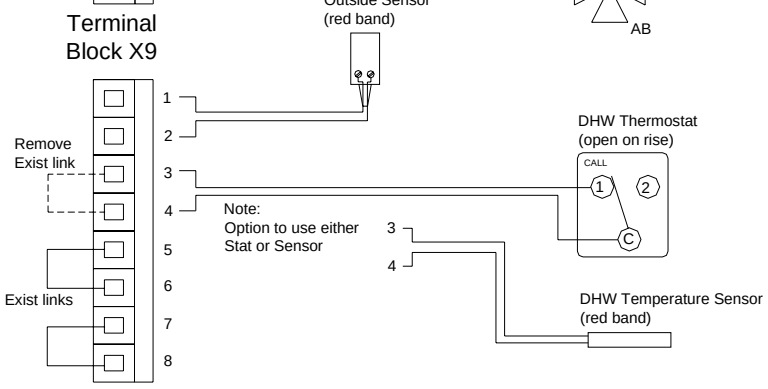
NOTE: Terminal blocks are not in line as shown - diagramatic only

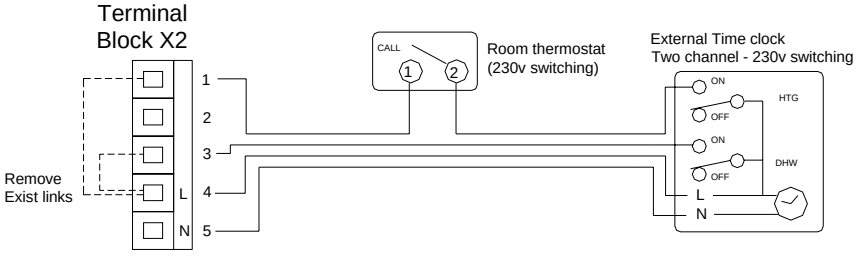
AVANTA PLUS System Option 6

Simple weather compensated Heating with room thermostat override (230v) and Priority DHW







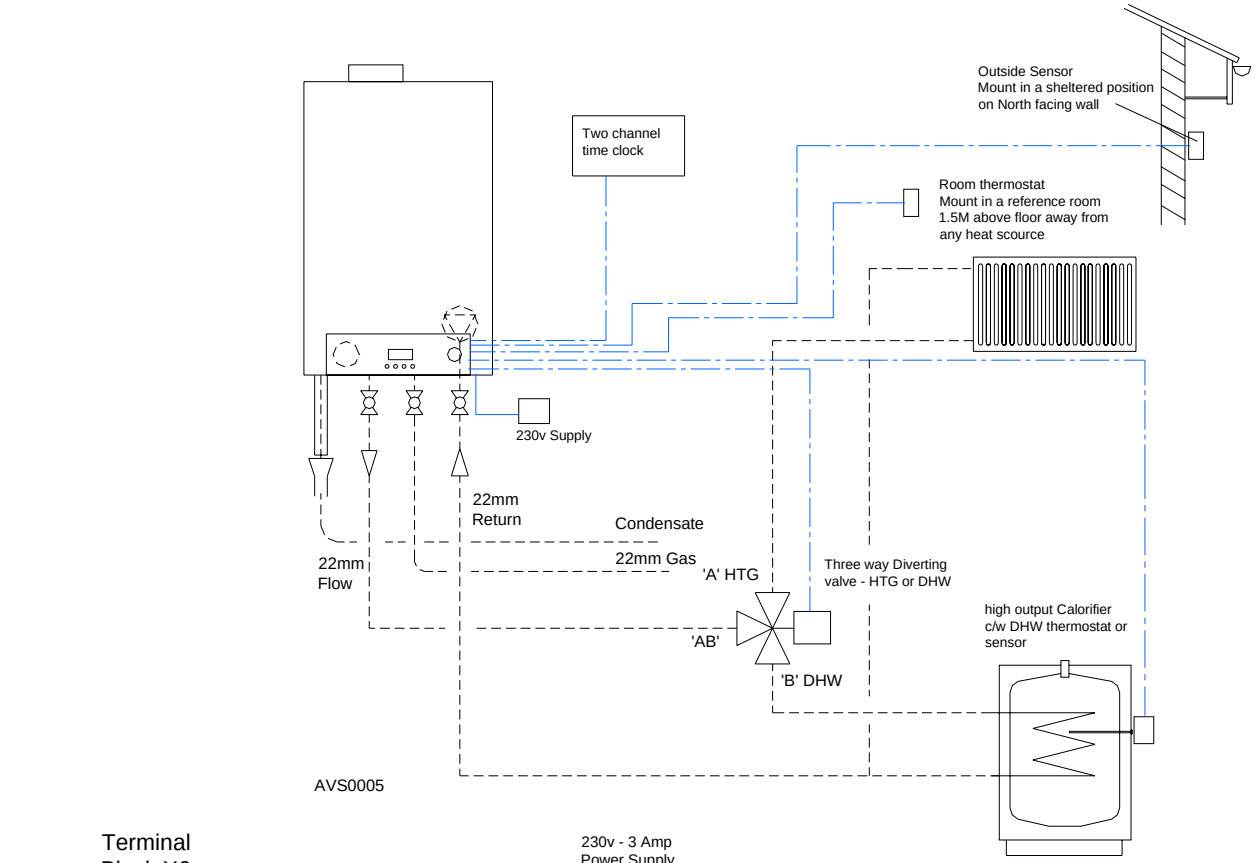


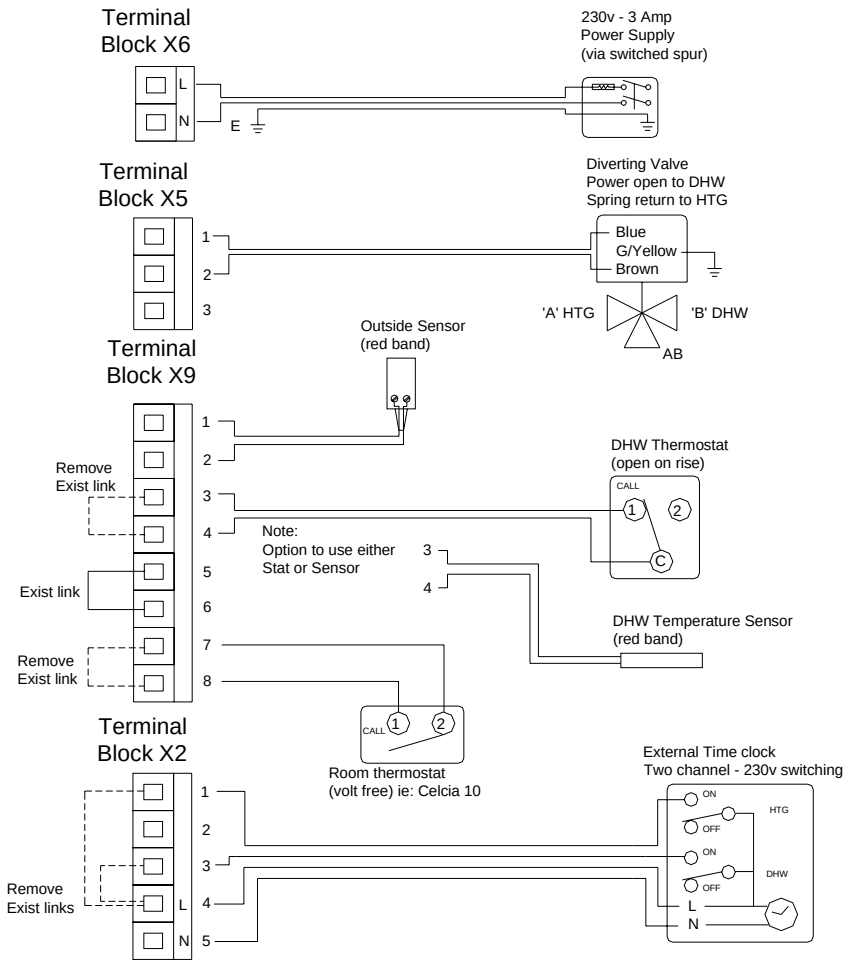
AVW0005

NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA PLUS System Option 7

Simple weather compensated Heating with room thermostat override (Celcia 10) and Priority DHW

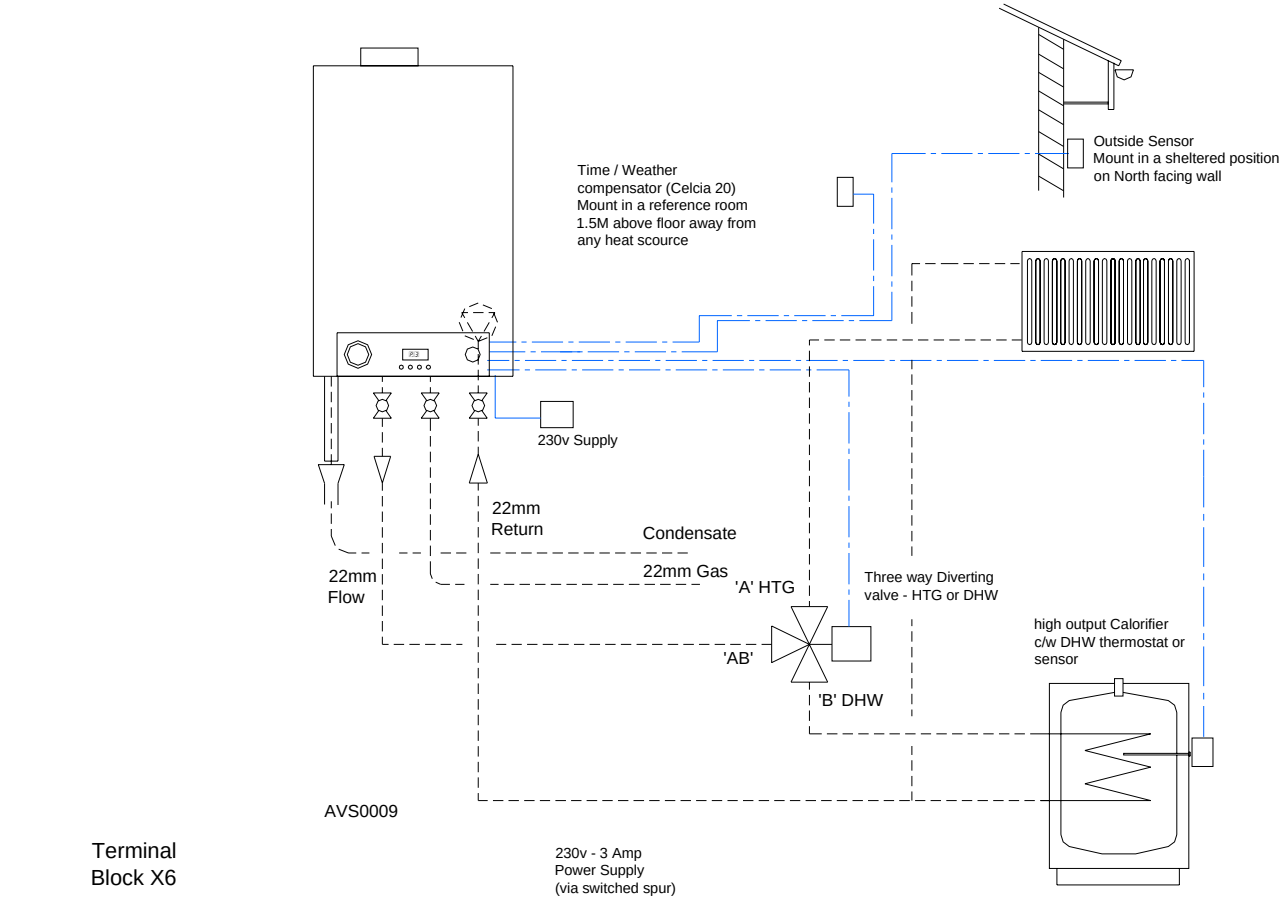




NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA PLUS System Option 8

Time / Weather compensated Heating with Priority DHW (Celcia 20 - Digital clock)



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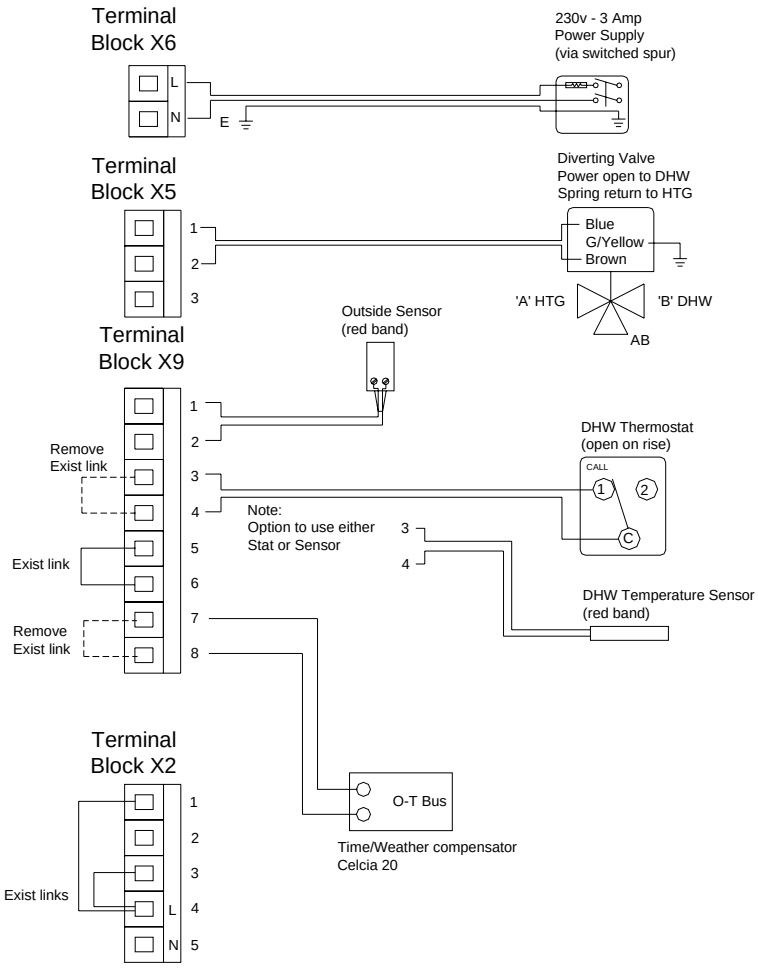
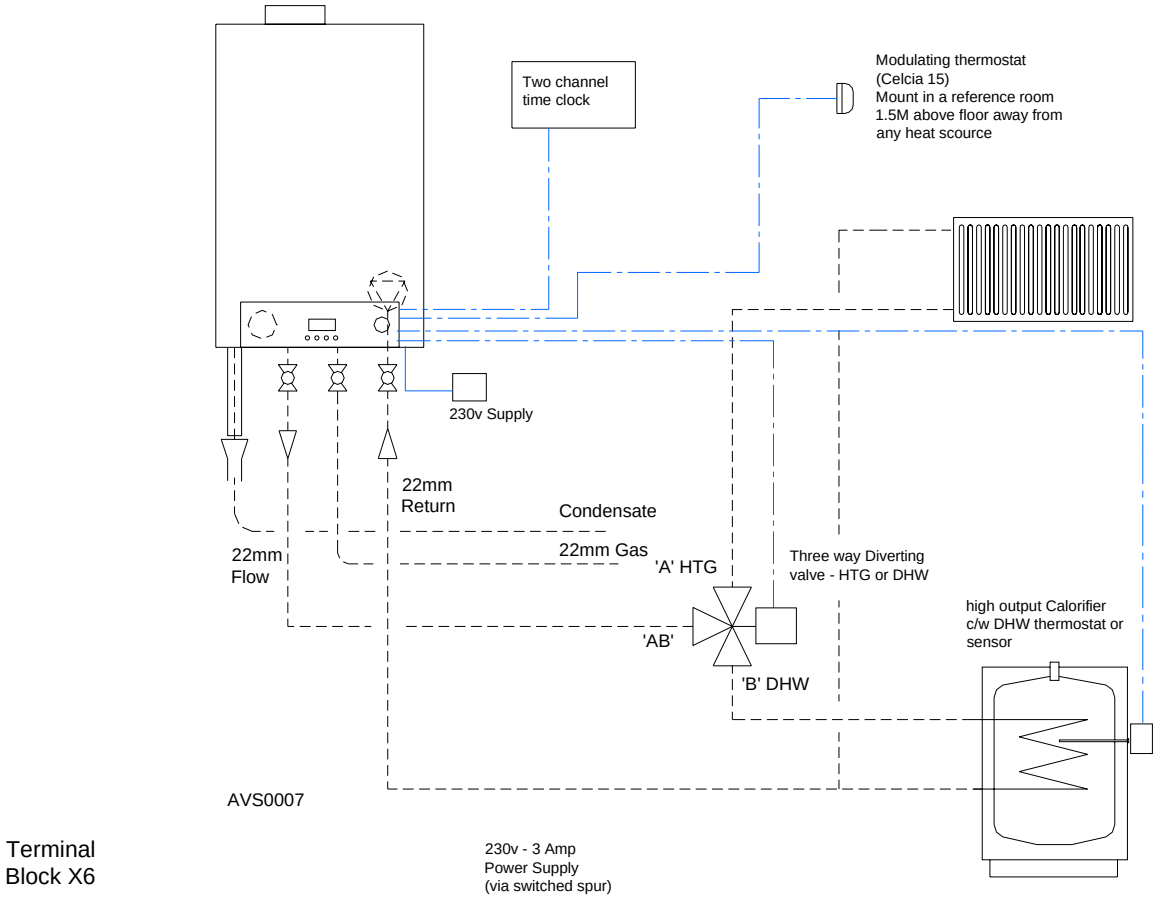


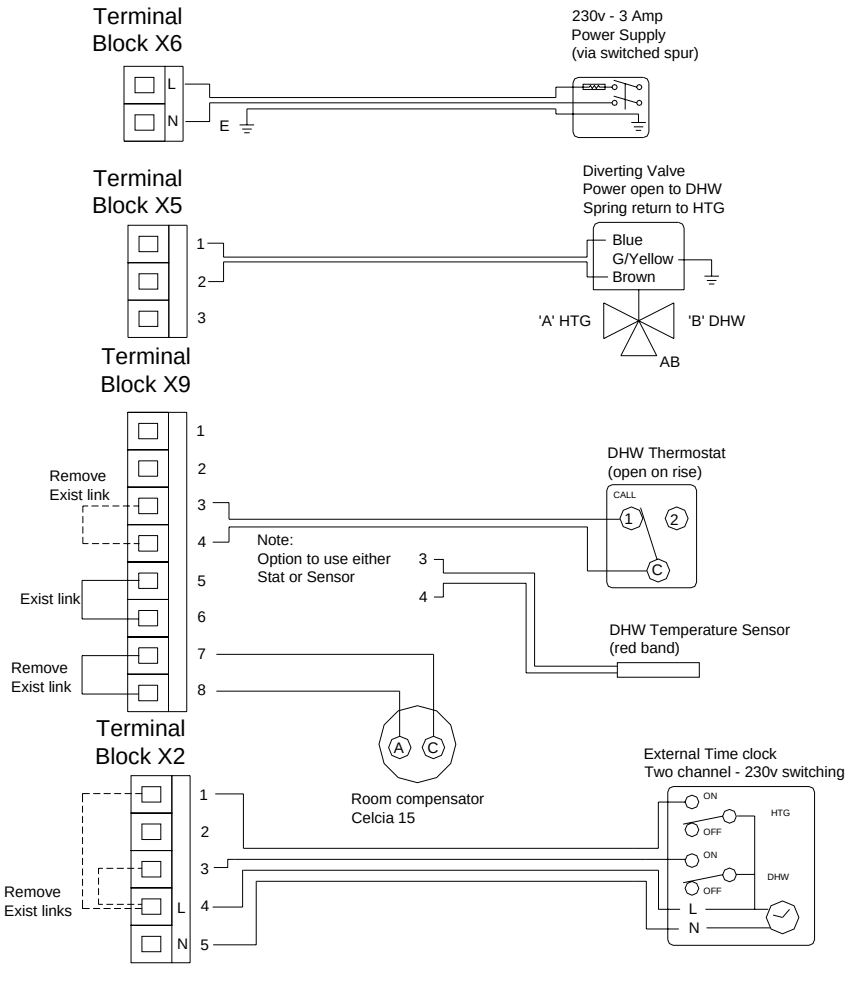
AVW0009

NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA PLUS System Option 9

Simple room compensated Heating using the Celcia 15 and Priority DHW





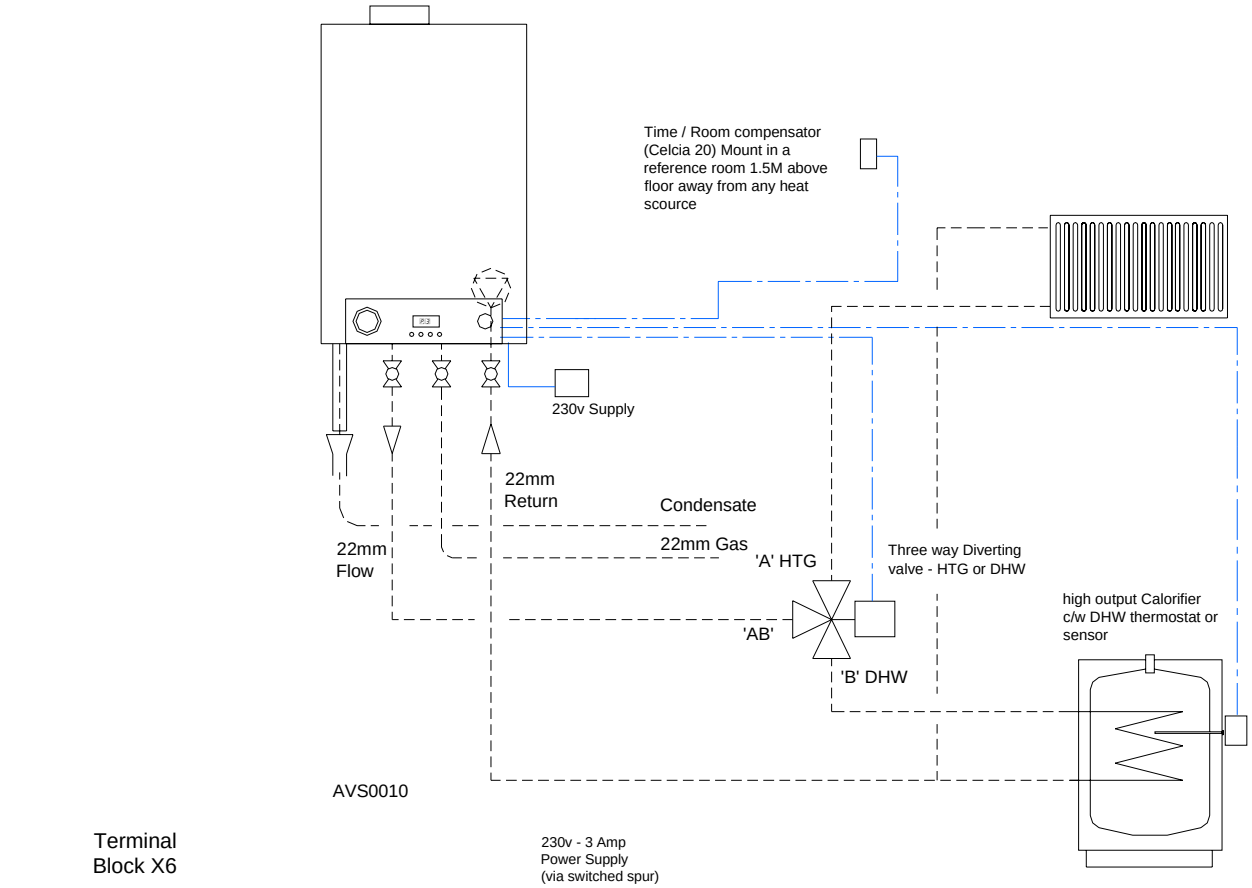
NOTE: Terminal blocks are not in line as shown - diagramatic only

NOTE:

With a 230v switching time clock a frost thermostat, if required, must be connected in parallel with the time clock on terminal strip X2 connectors 1 and 4 (frost stat contacts to close on temperature fall)

AVANTA PLUS System Option 10

Time / Room compensated Heating with Priority DHW (Celcia 20 - Digital clock)



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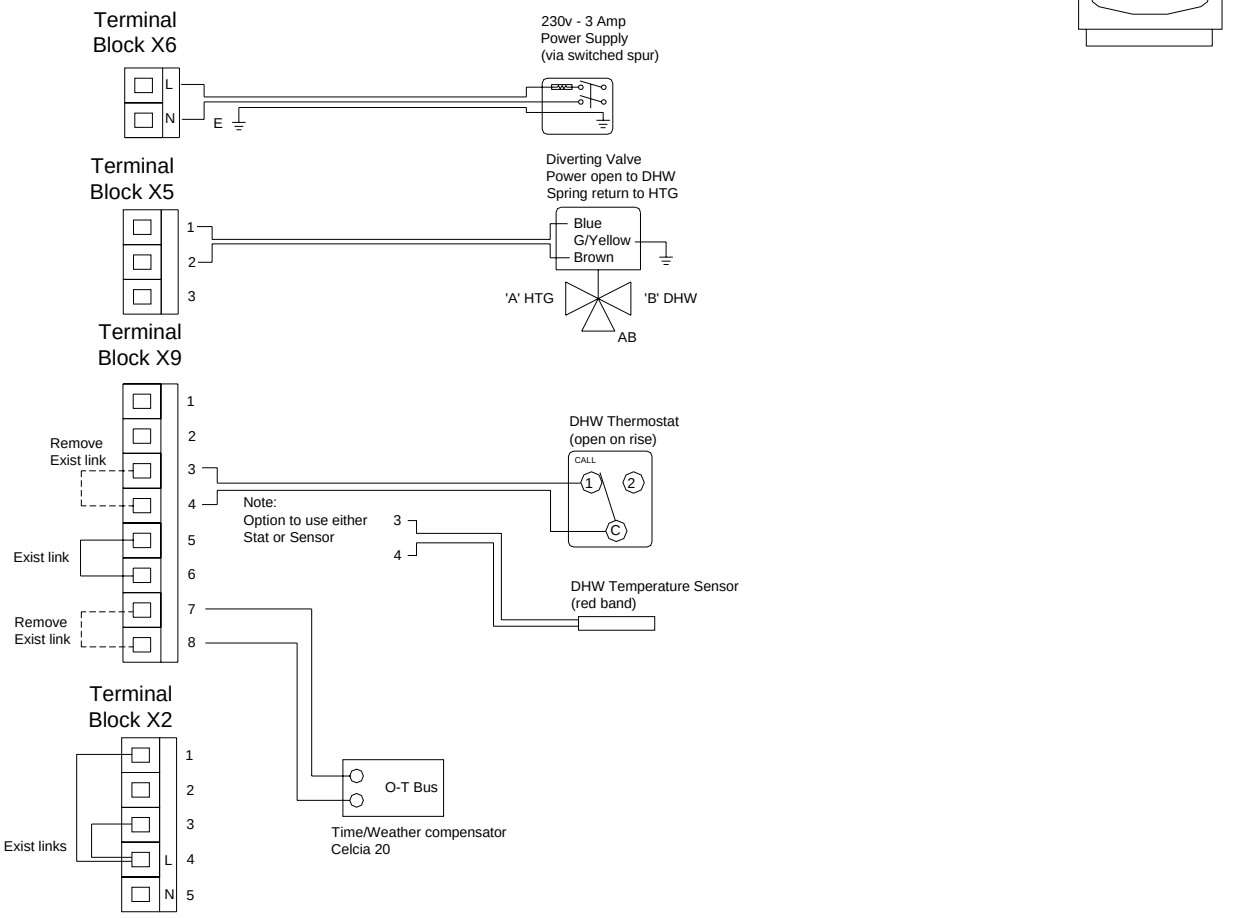
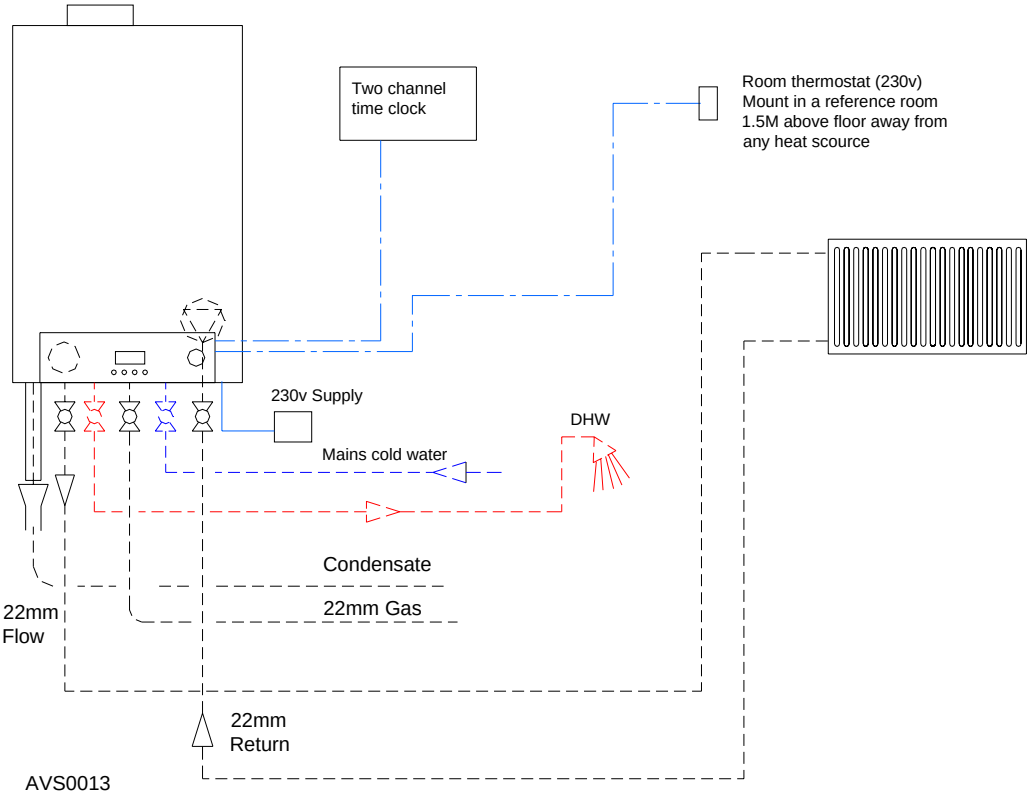


AVW0010

NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA PLUS Combi Option 11

Timed heating with constant DHW using external time clock and room thermostat (230v)



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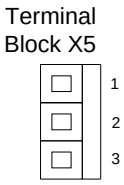
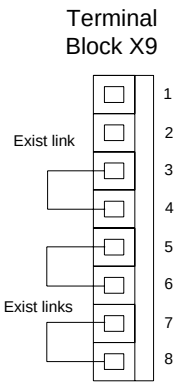
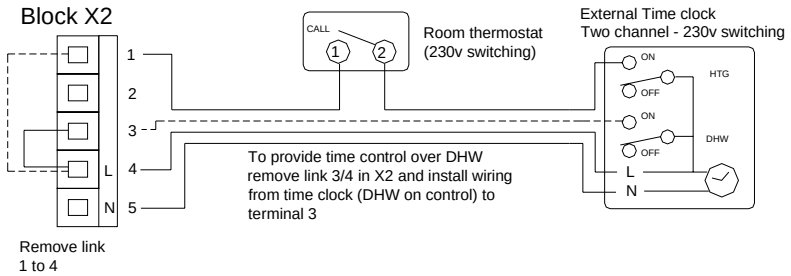






AVW0013

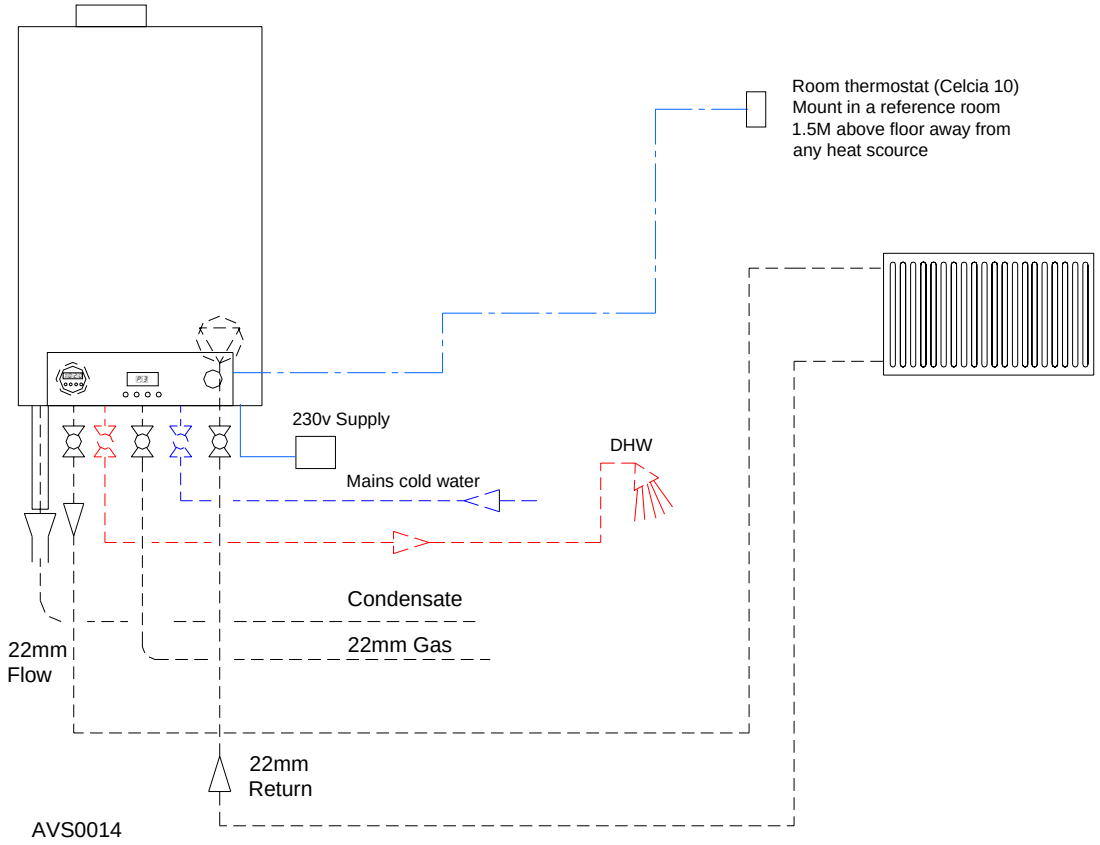
NOTE: Terminal blocks are not in line as shown - diagramatic only

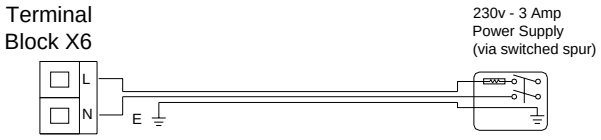
NOTE:

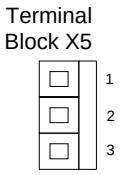
With a 230v switching time clock a frost thermostat, if required, must be connected in parallel with the time clock on terminal strip X2 connectors 1 and 4 (frost stat contacts to close on temperature fall)

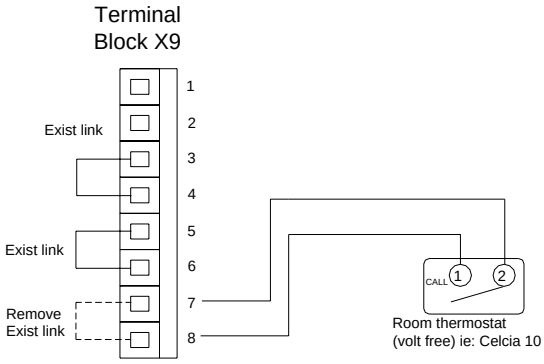
AVANTA PLUS Combi Option 12

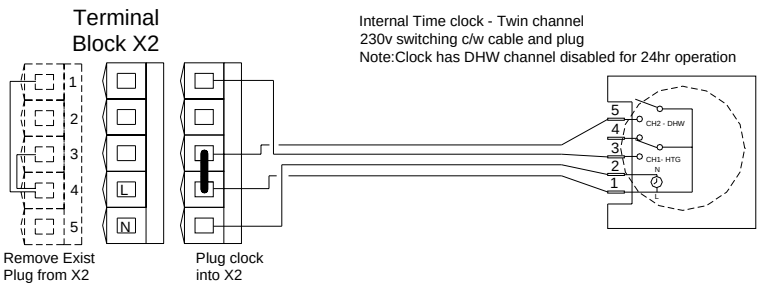
Timed heating with constant DHW using internal time clock (230v) and room thermostat (Celcia 10)











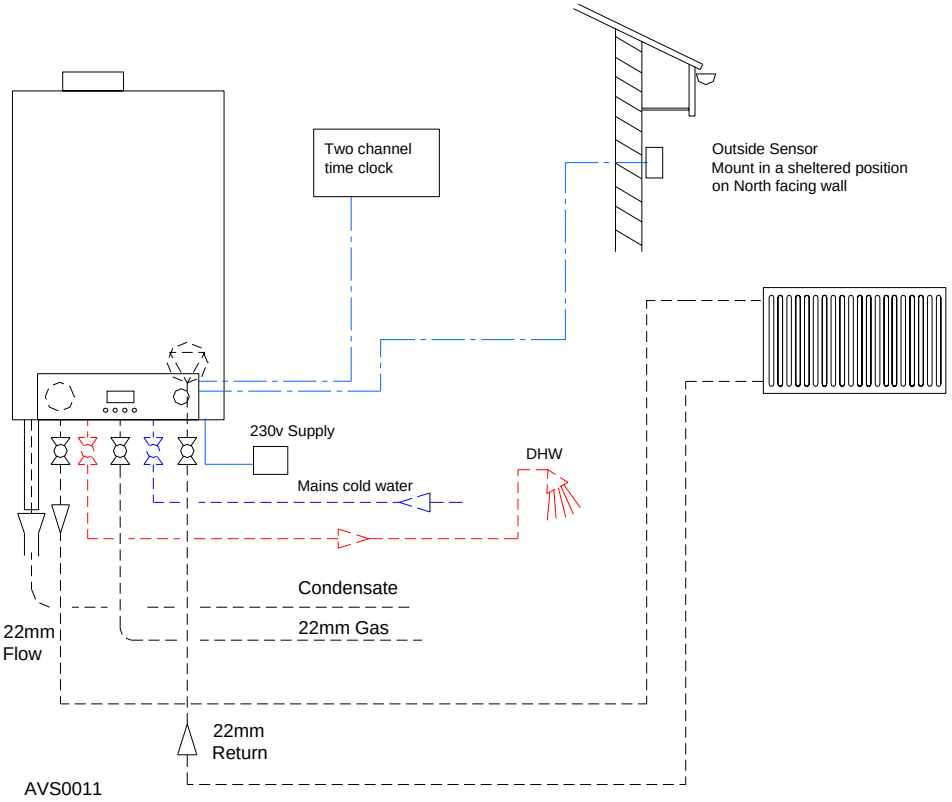
NOTE:
With a 230v switching time clock a frost thermostat, if required, must be connected in parallel with the time clock on terminal strip X2 connectors 1 and 4 (frost stat contacts to close on temperature fall)

AVW0014

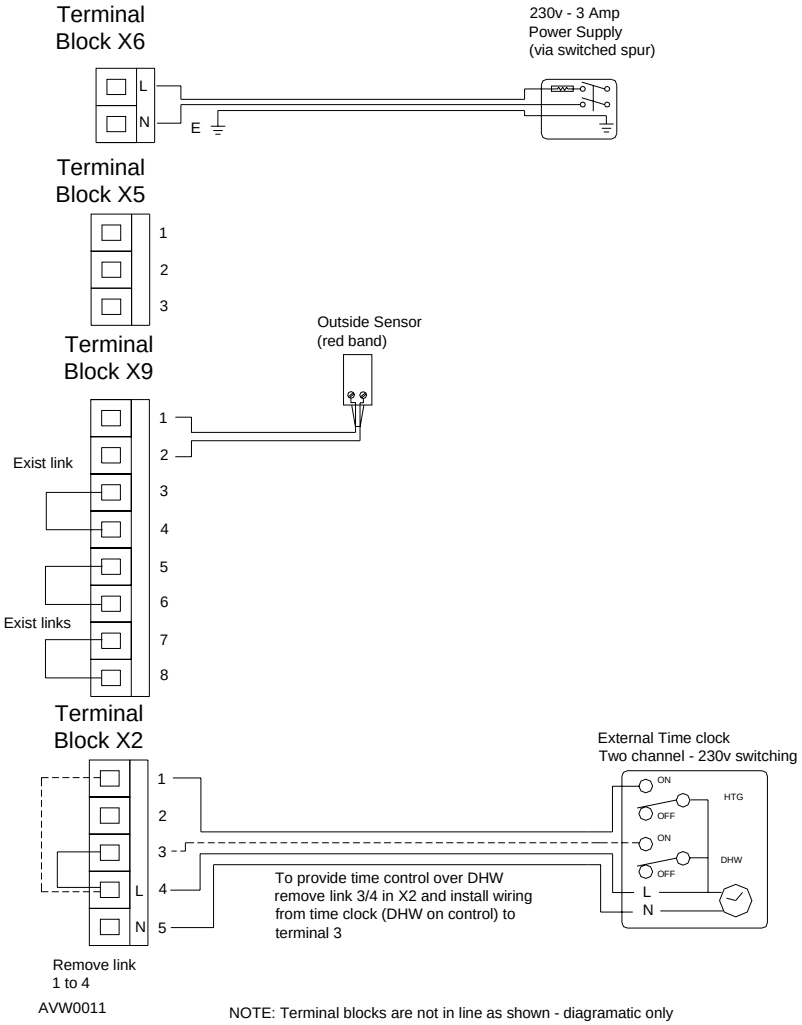
NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA PLUS Combi Option 13

External time clock with simple weather compensated Heating and constant DHW



AVS0011

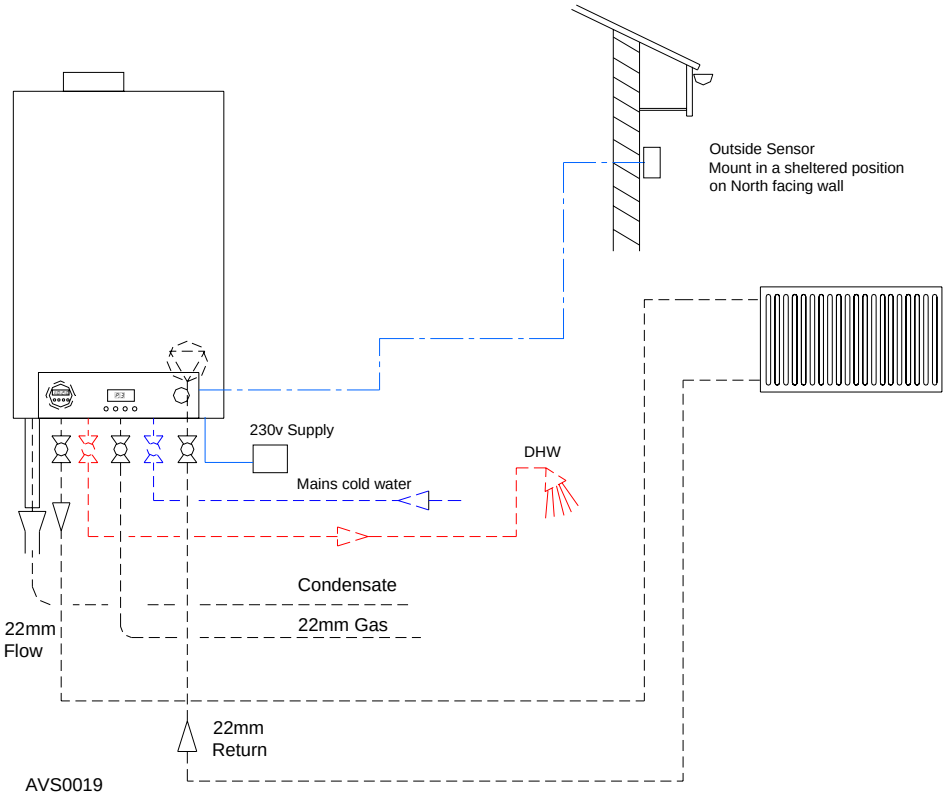


AVW0011

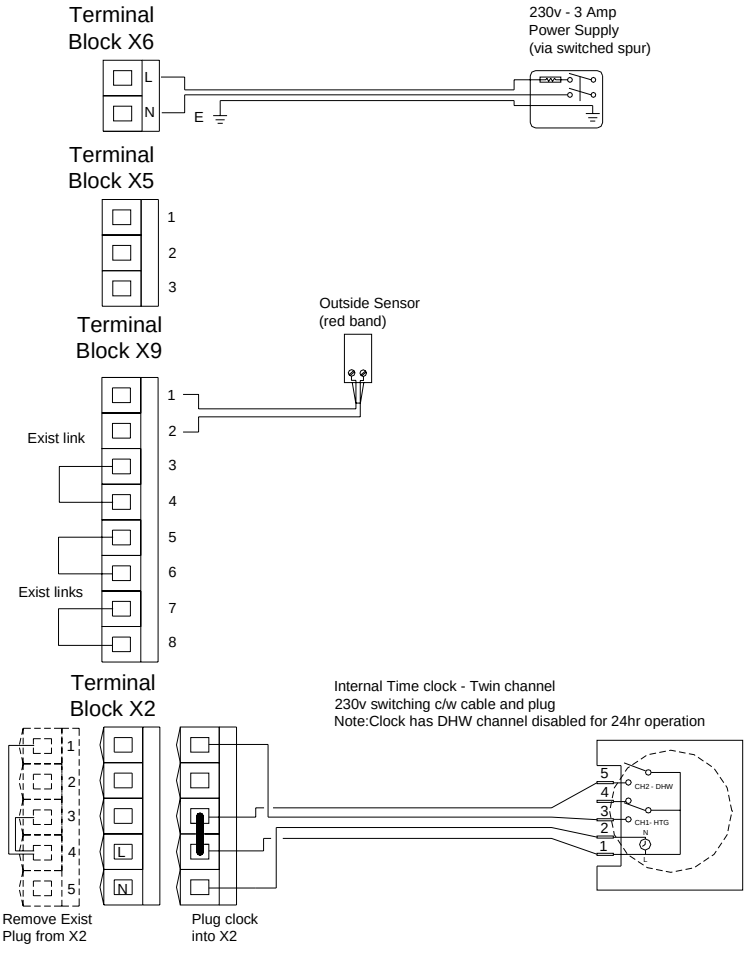
NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA PLUS Combi Option 14

Internal time clock with simple weather compensated Heating and constant DHW



AVS0019

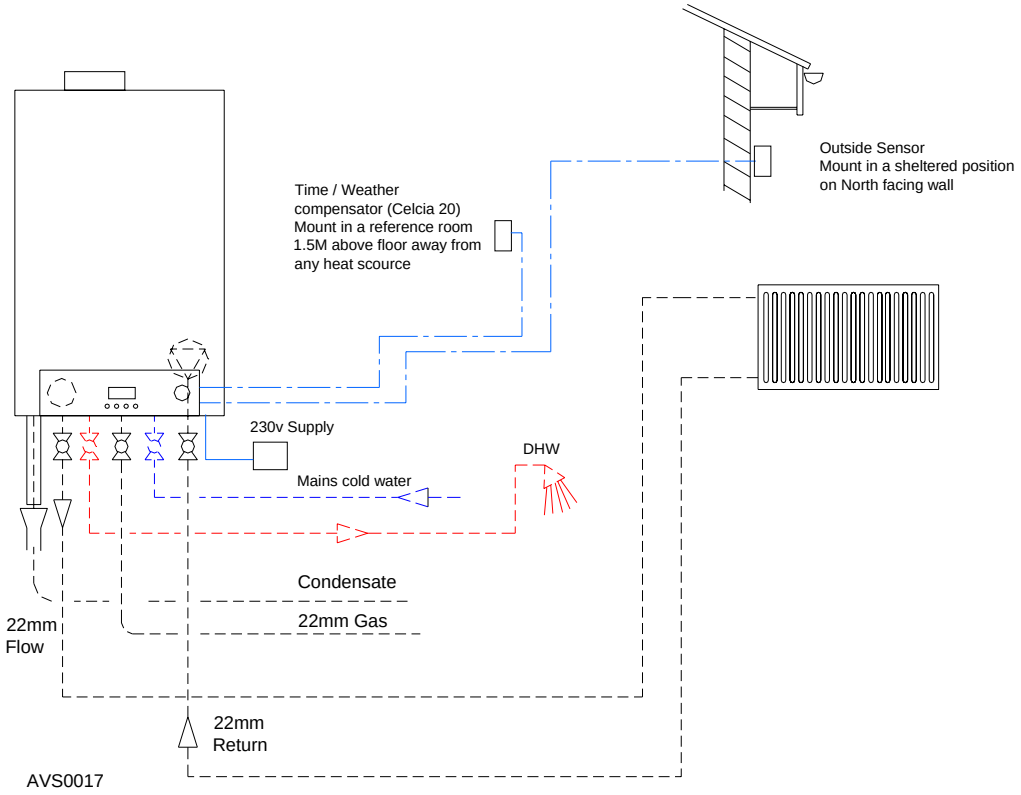


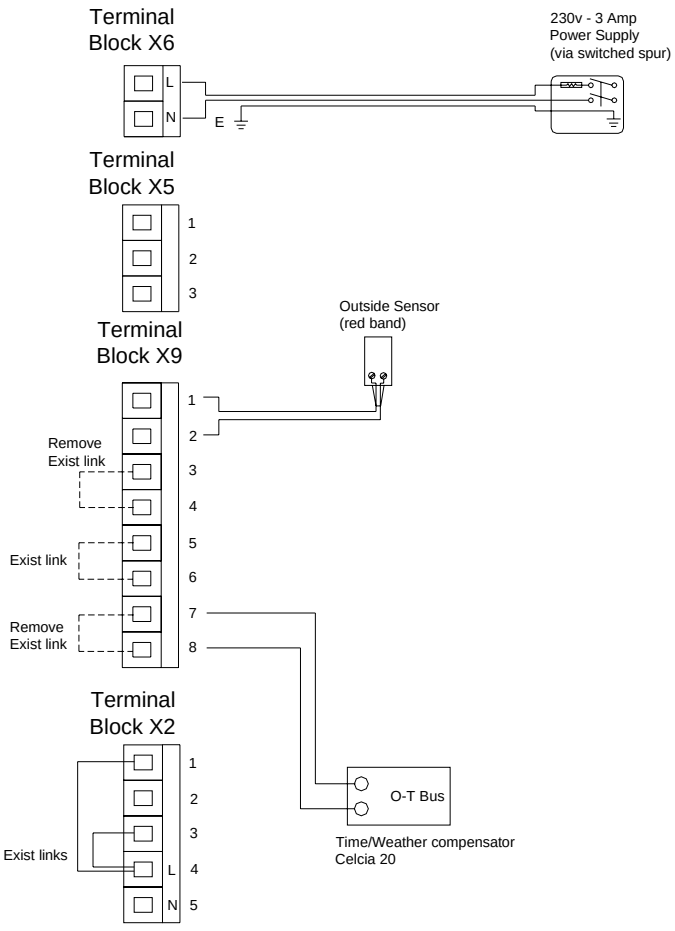
AVW0019

NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA PLUS Combi Option 15

Time / Room compensated Heating using the Celcia 20 (Digital clock) and constant DHW



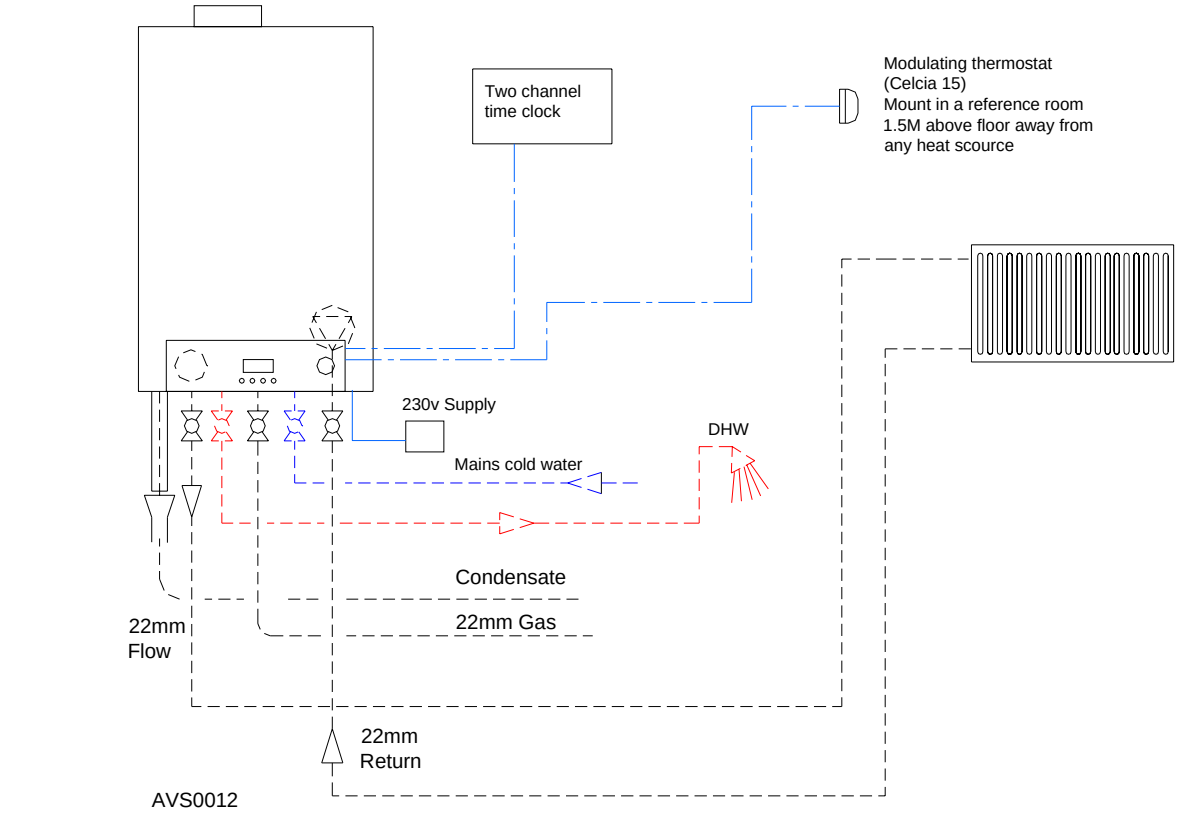


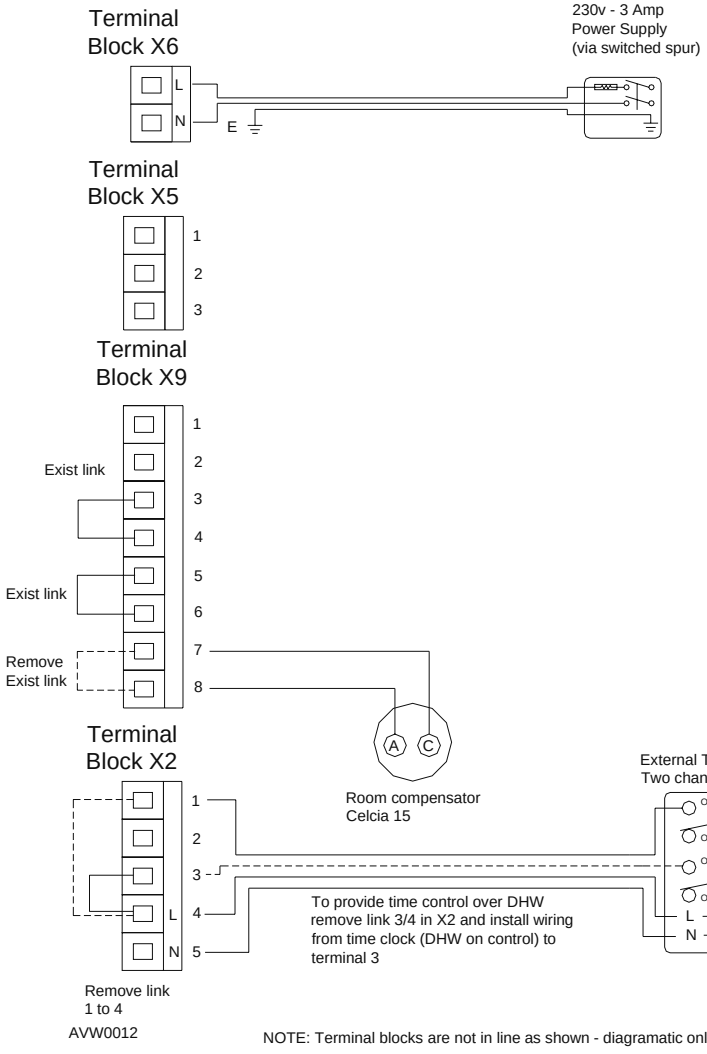
AVW0017

NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA PLUS Combi Option 16

External time clock with simple room compensated Heating using the Celcia 15 and constant DHW





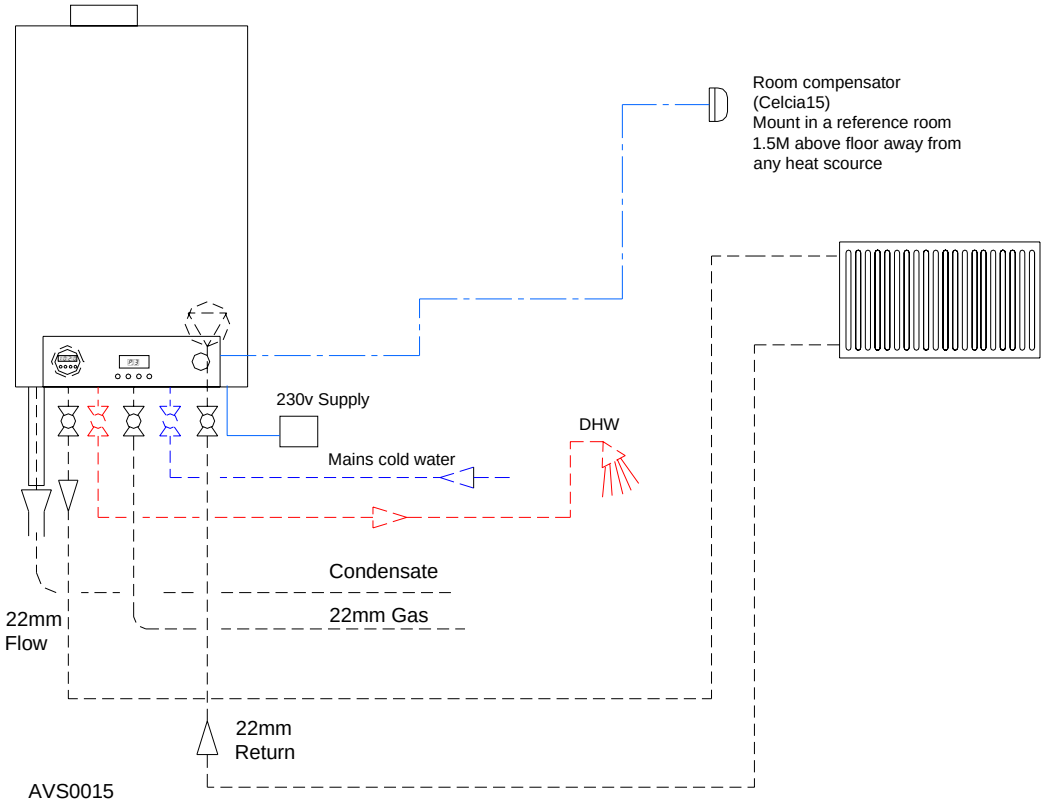
NOTE: Terminal blocks are not in line as shown - diagramatic only

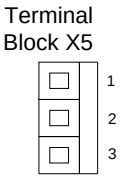
OTE:

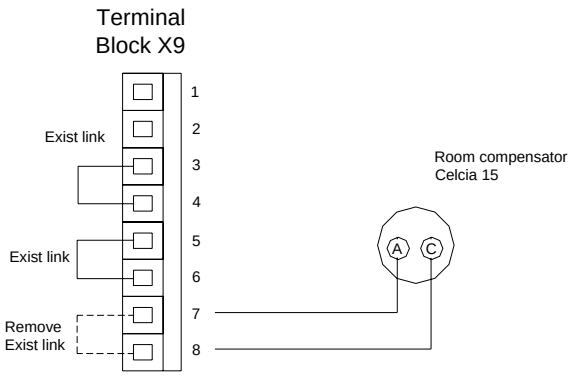
With a 230v switching time clock a frost thermostat, if required, must be connected in parallel with the time clock on terminal strip X2 connectors 1 and 4 (frost stat contacts to close on temperature fall)

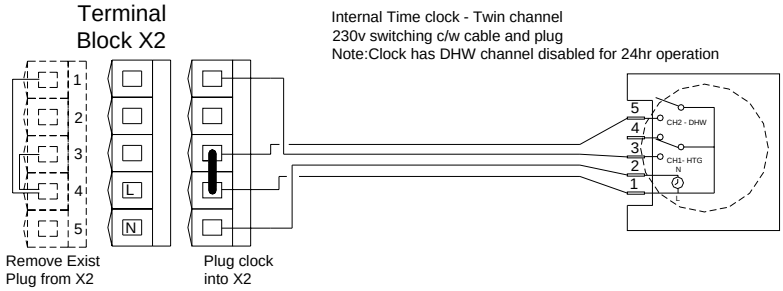
AVANTA PLUS Combi Option 17

Internal time clock with simple room compensated Heating using the Celcia 15 and constant DHW









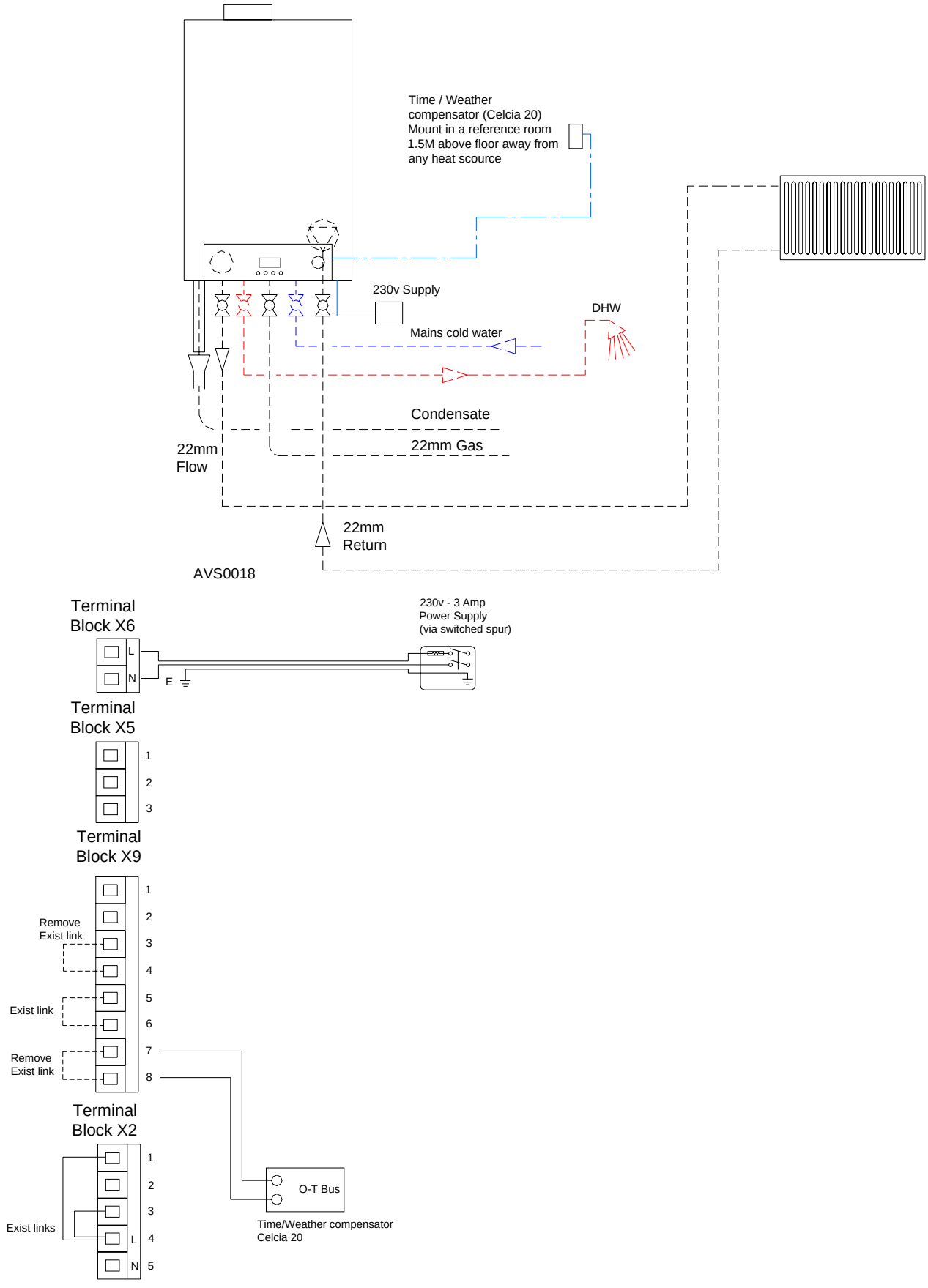
OTE:
With a 230v switching time clock a frost thermostat, if required, must be connected in parallel with the time clock on terminal strip X2 connectors 1 and 4 (frost stat contacts to close on temperature fall)

AVW0015

NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA PLUS Combi Option 18

Time / Room compensated Heating with Priority DHW (Celcia 20 - Digital clock)

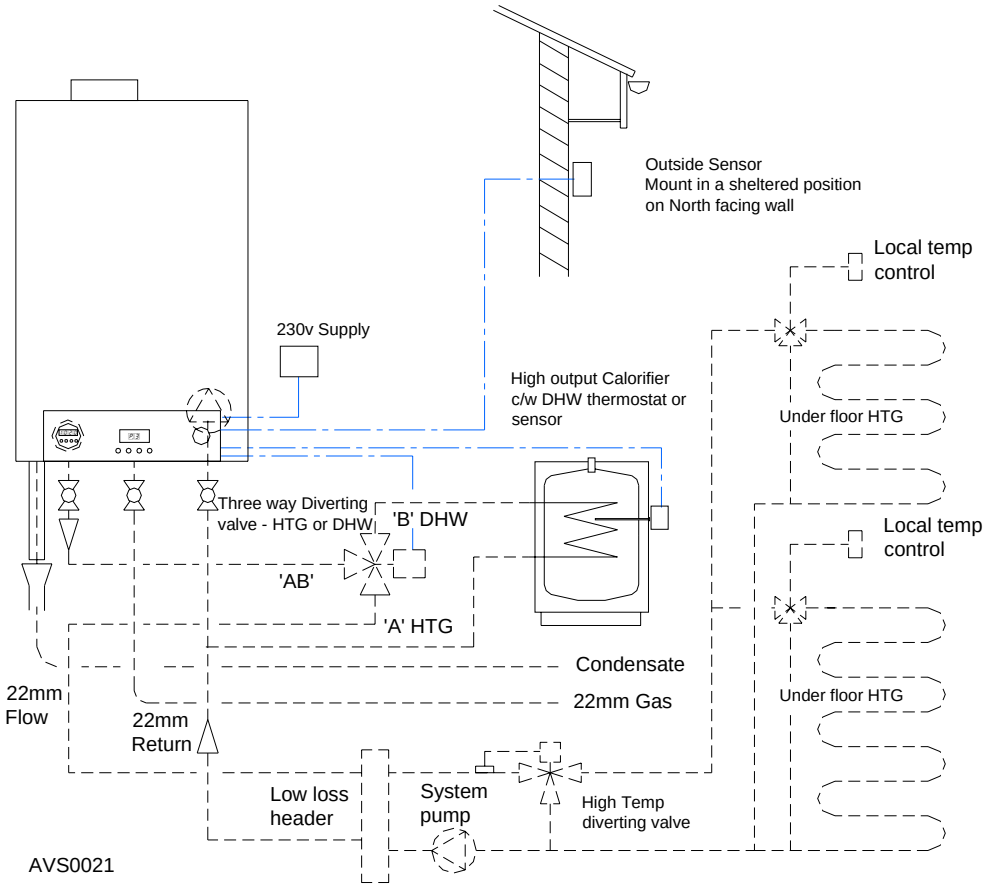


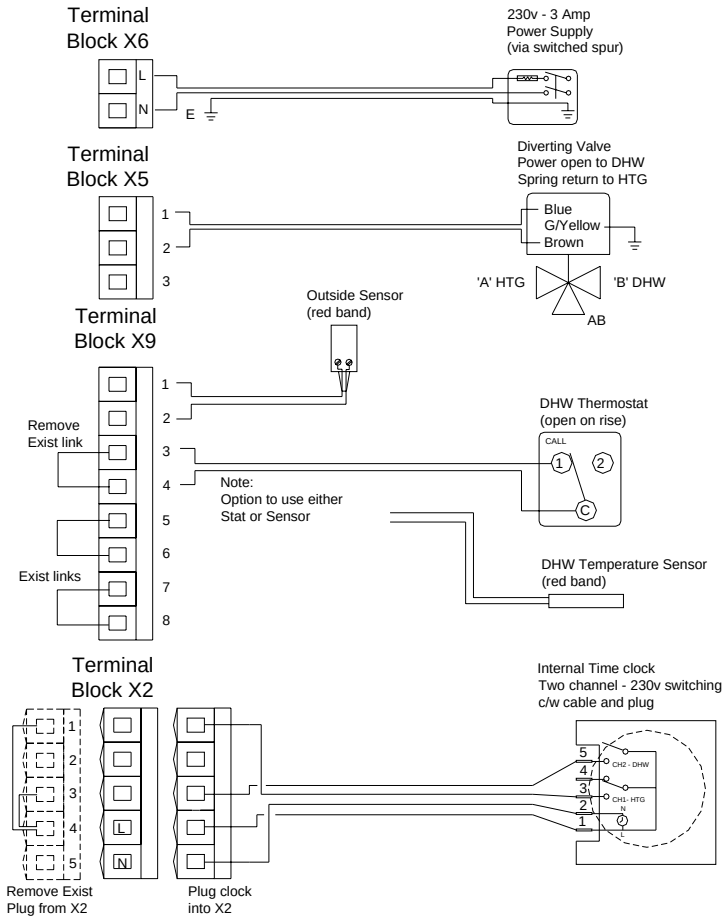
AVW0018

NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA PLUS System Option 19

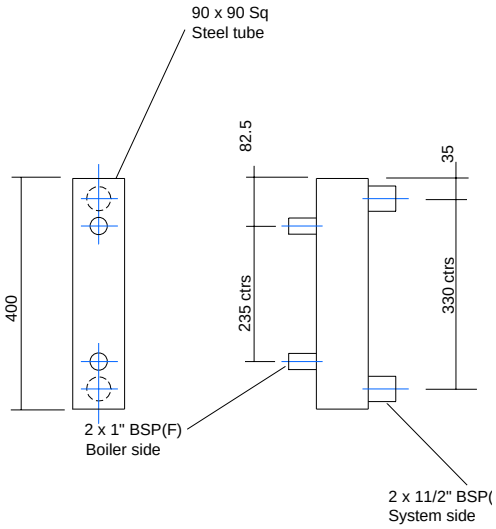
System boiler - Internal time clock with simple weather compensated UF Heating and priority DHW





NOTE: Terminal blocks are not in line as shown - diagramatic only

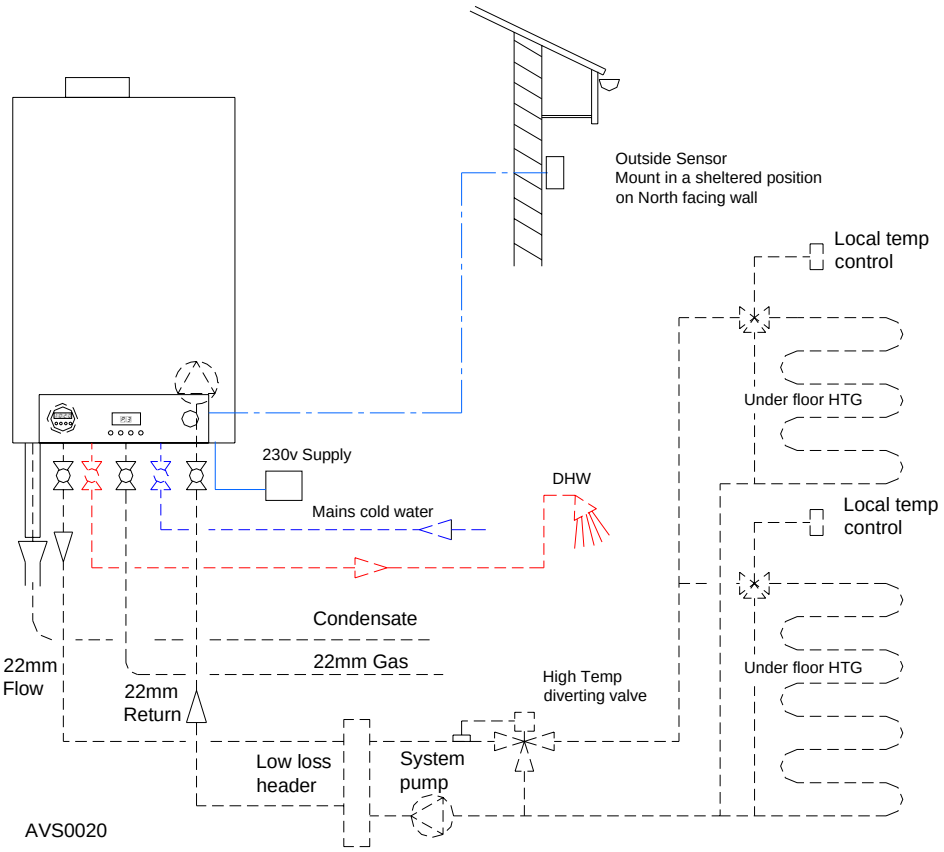
NOTE:
High temperature protection and local temperature controls for the under floor heating system not supplied by Broag

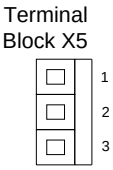


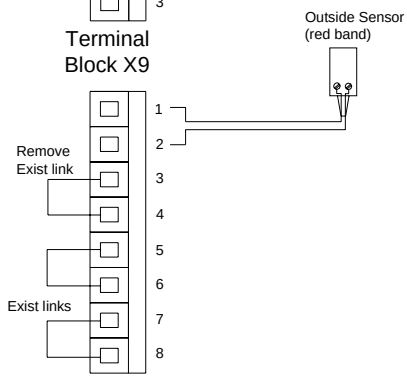
Suggested design of a low loss header
Broag part No : GL001

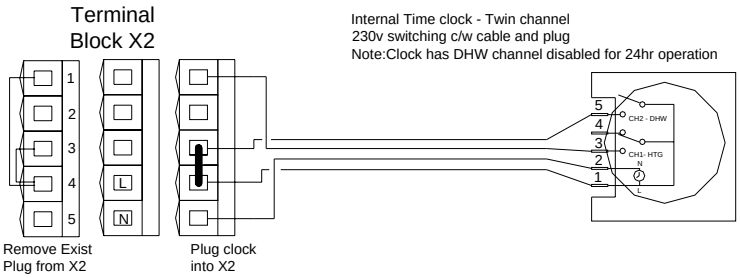
AVANTA PLUS Combi Option 20

Combi boiler - Internal time clock with simple weather compensated UF Heating and constant DHW

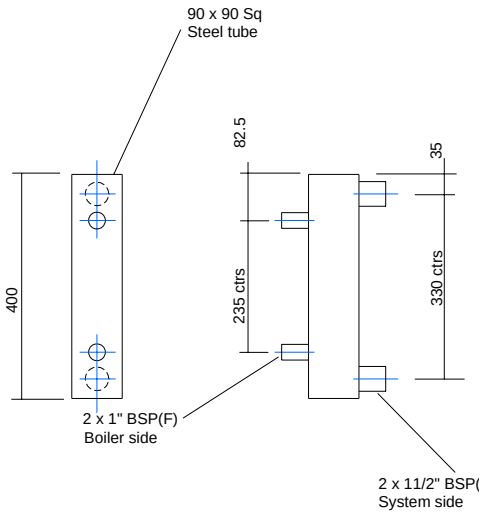








NOTE:
High temperature protection and local temperature controls for the under floor heating system not supplied by Broag



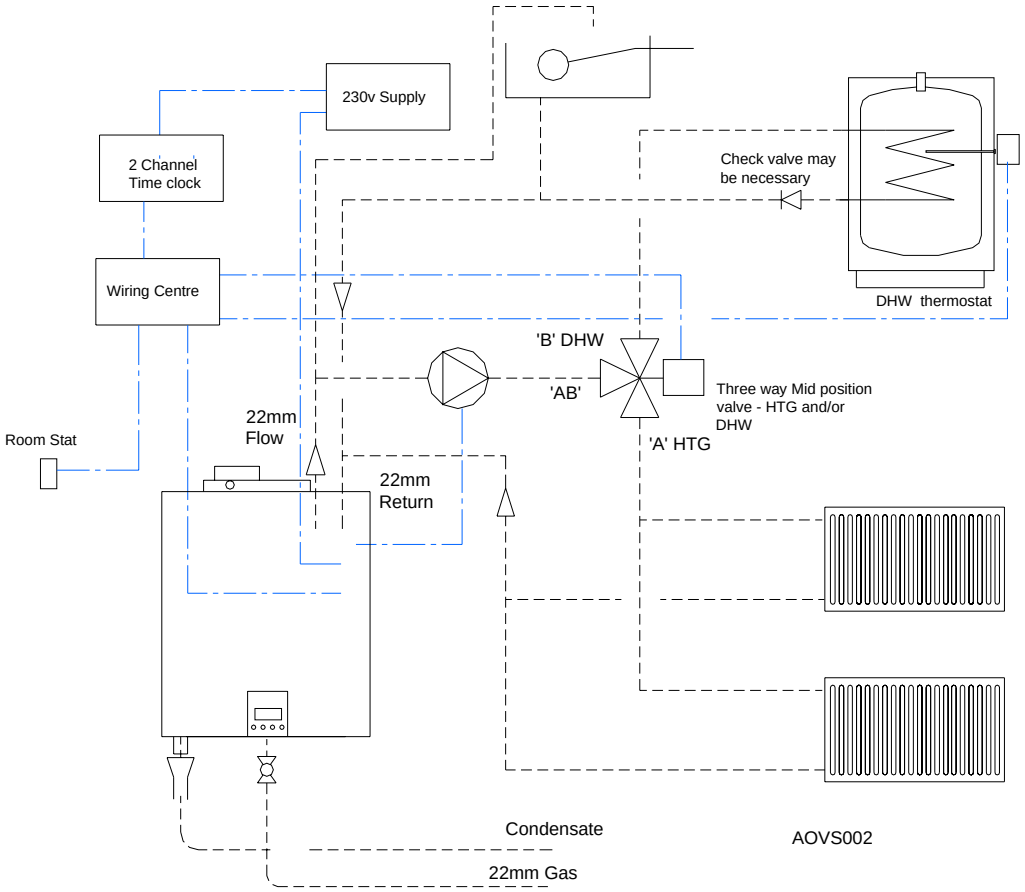
Suggested design of a low loss header
Broag part No : GL001

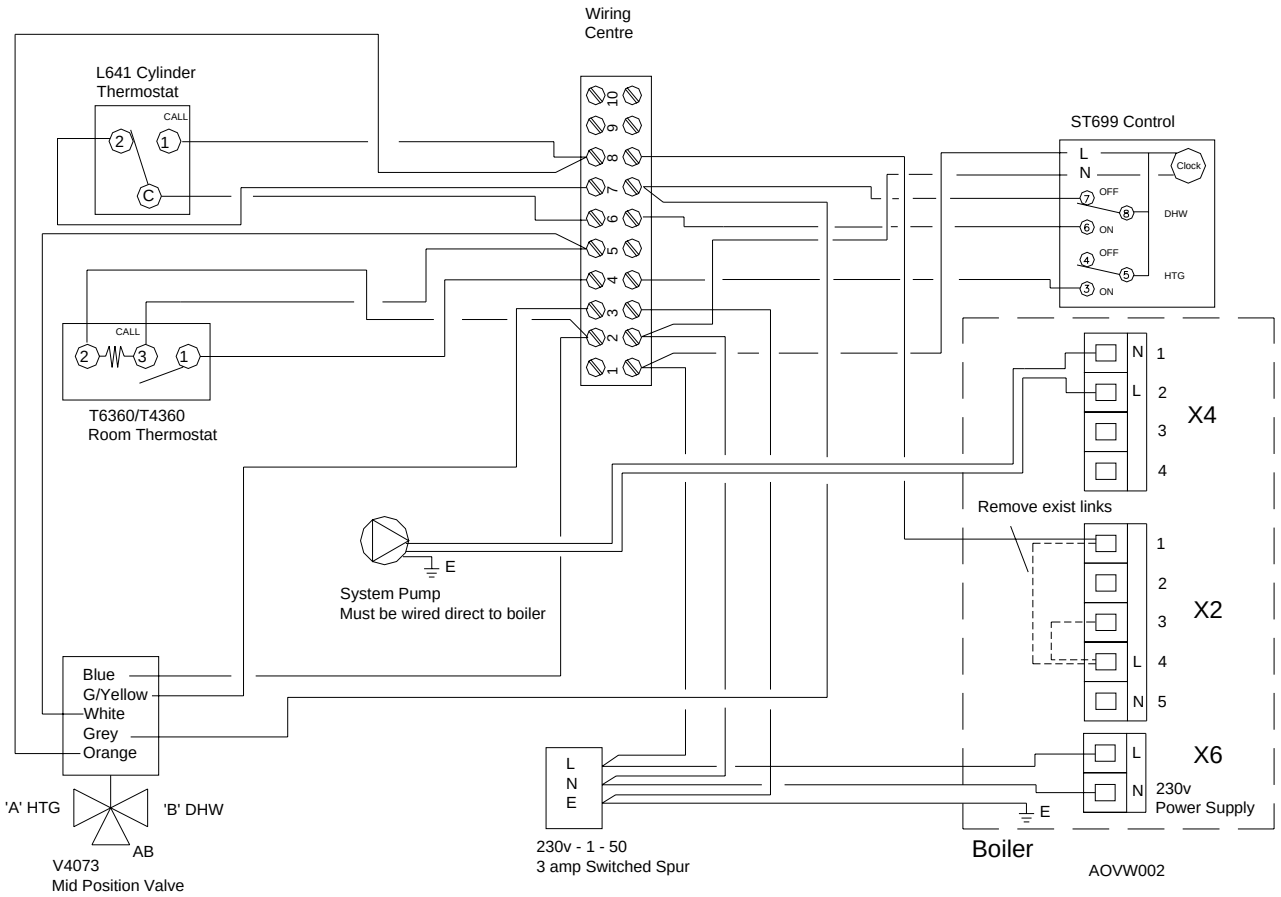
AVW0021

NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA 18v System Only - Option 1

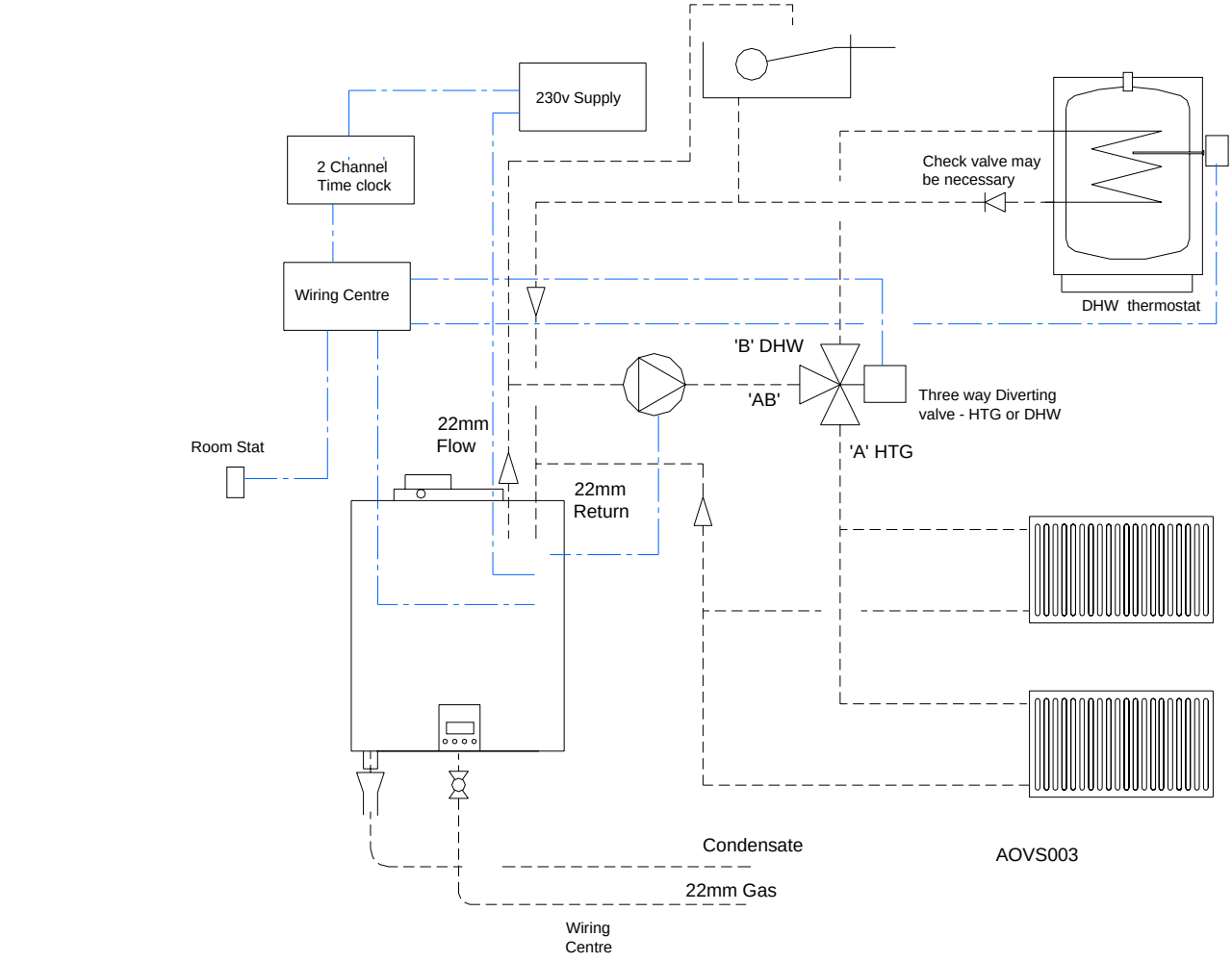
Typical “Y” plan Heating and DHW using 230v controls

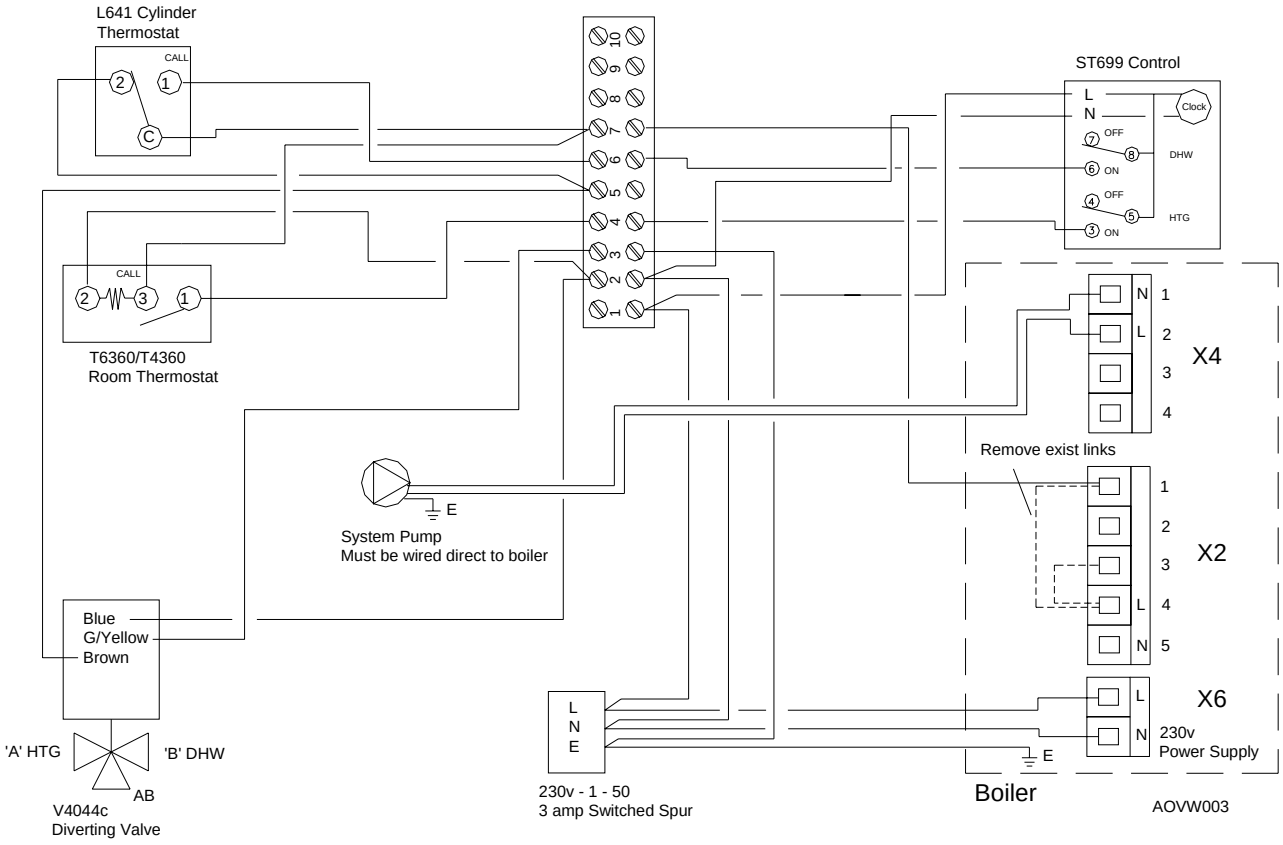




AVANTA 18v System Only - Option 2

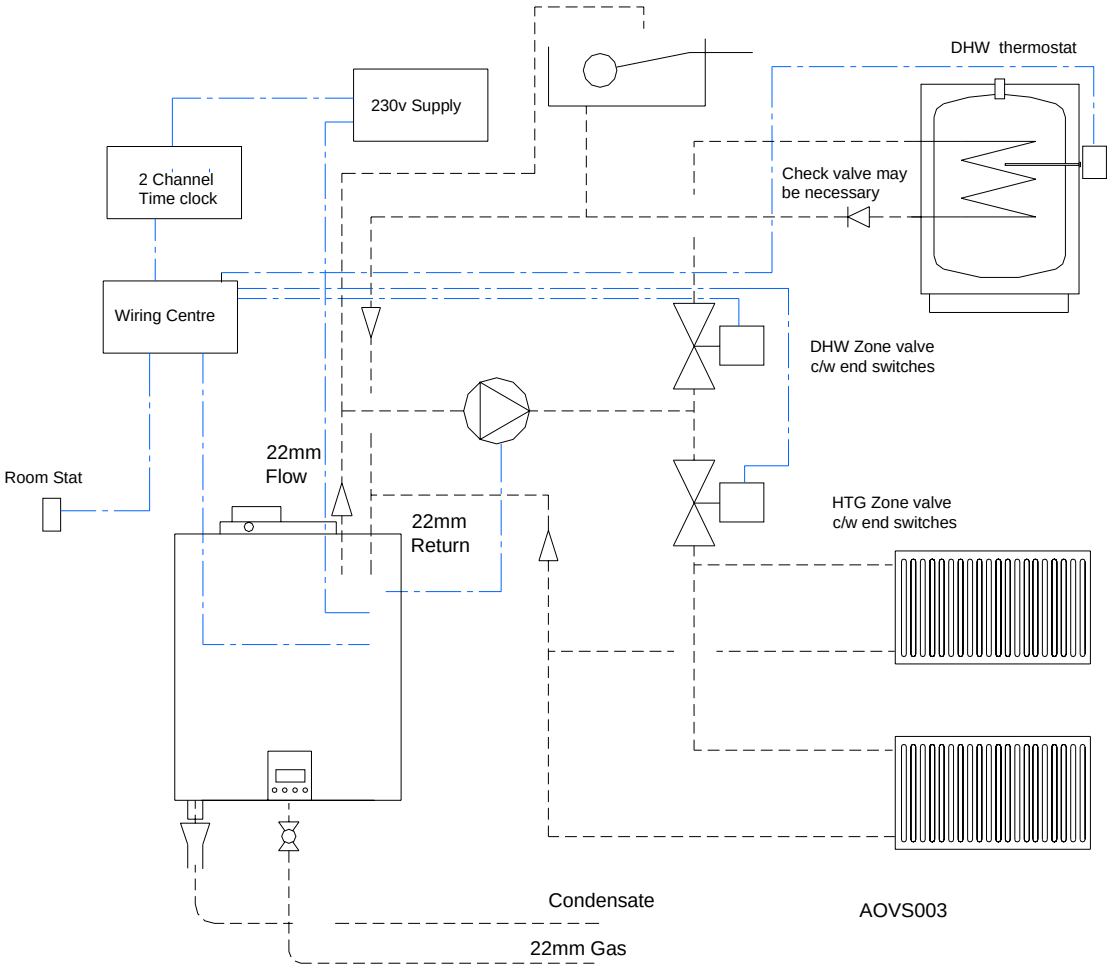
Typical “W” plan Heating and Priority DHW using 230v controls

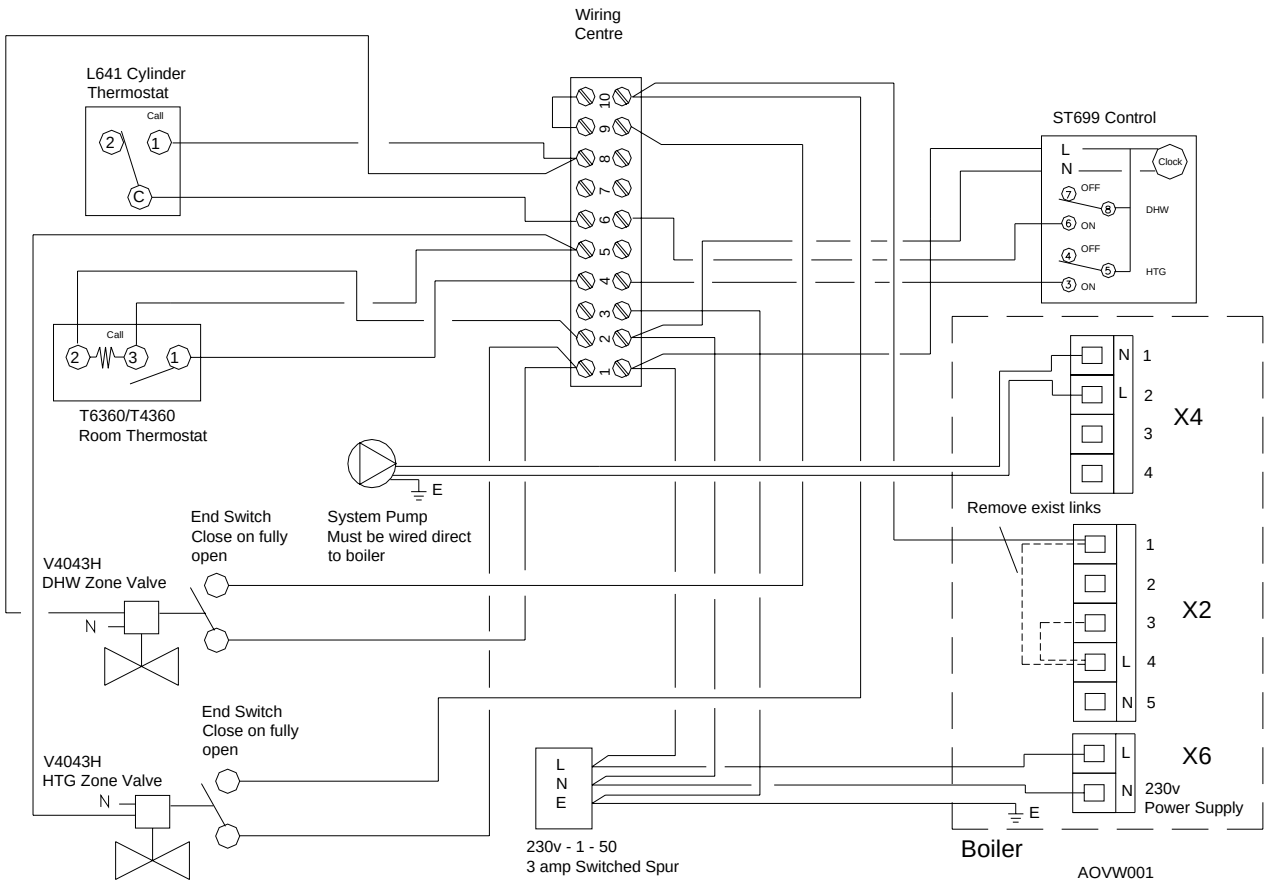




AVANTA 18v System Only - Option 3

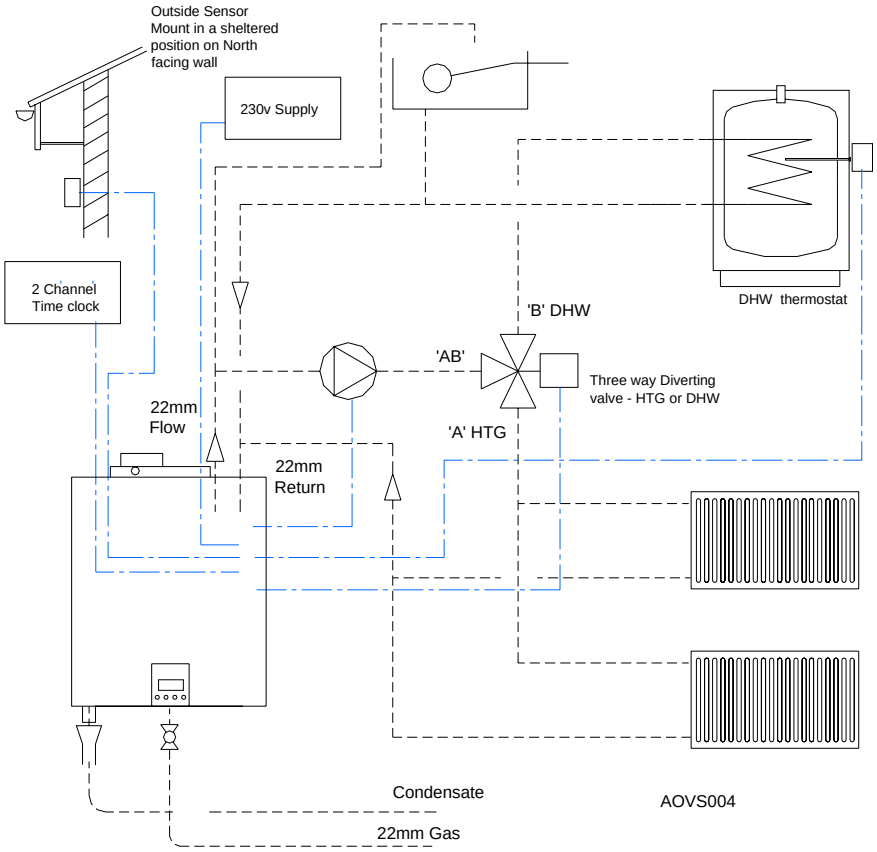
Typical “S” plan Heating and DHW using 230v controls

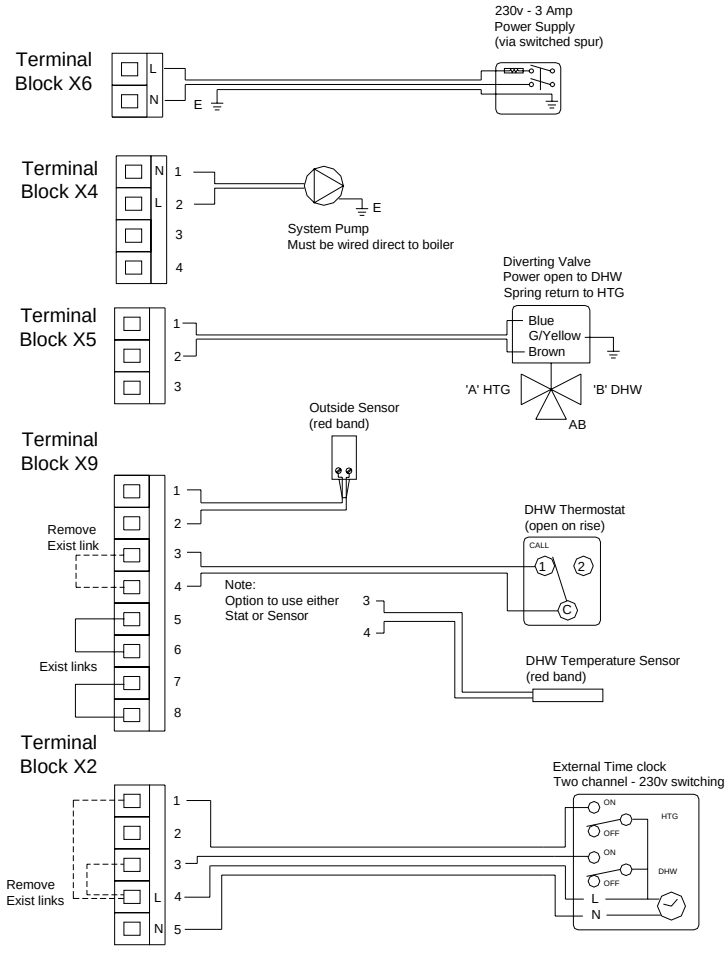




AVANTA 18v System Only Option 4

Simple weather compensated Heating with Priority DHW



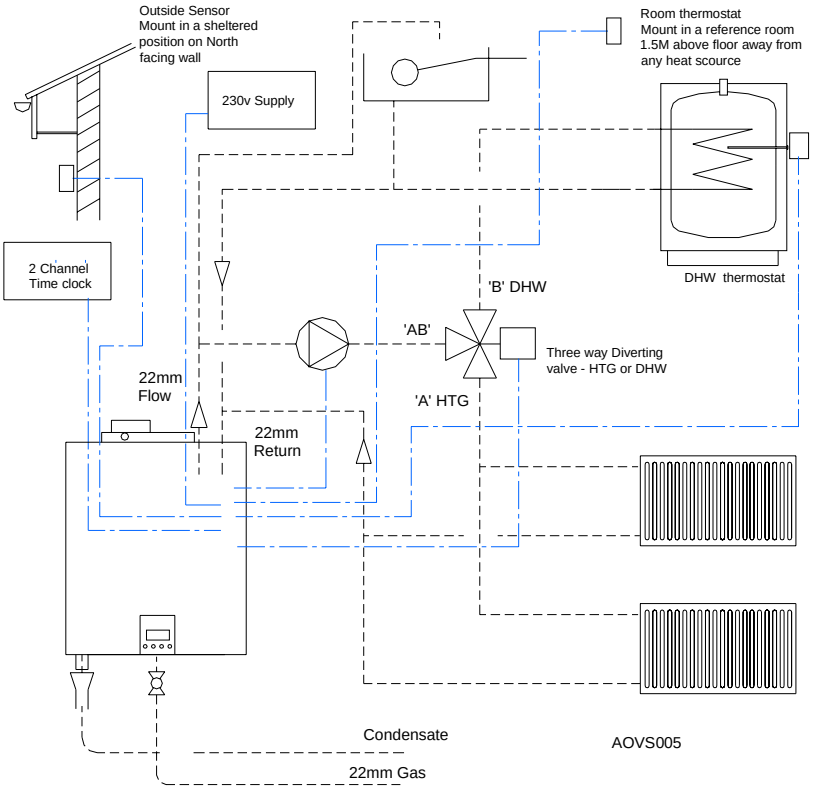


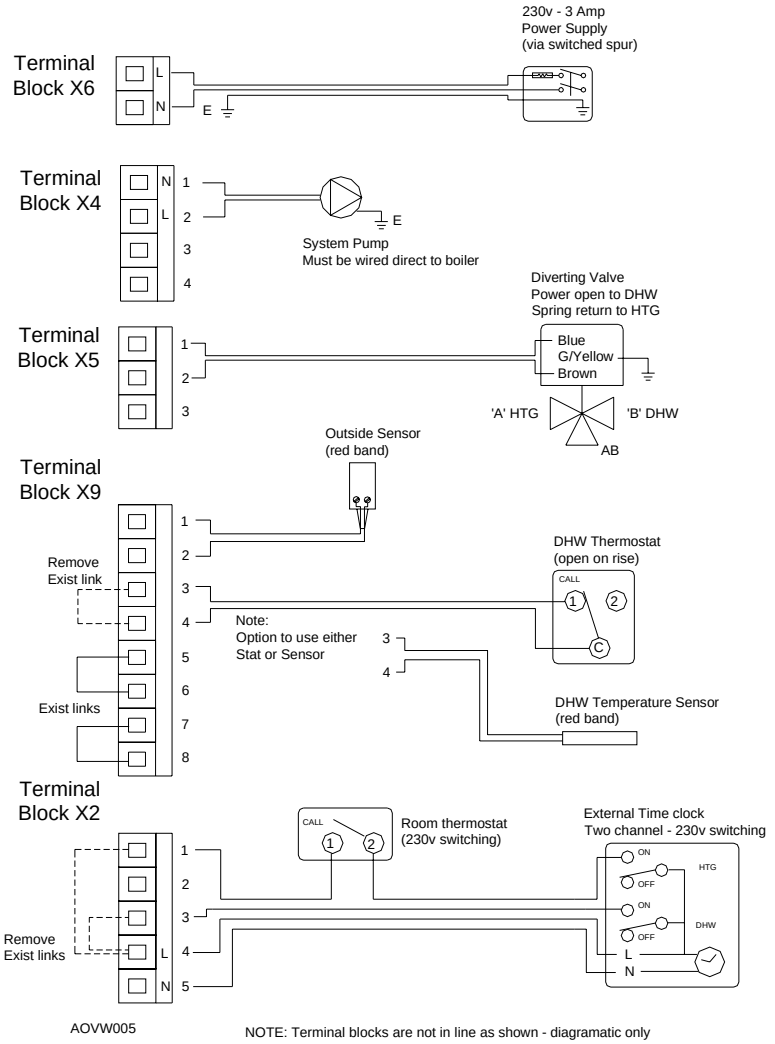
AOVW004

NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA 18v System Only Option 5

Simple weather compensated Heating with 230v room thermostat override and Priority DHW

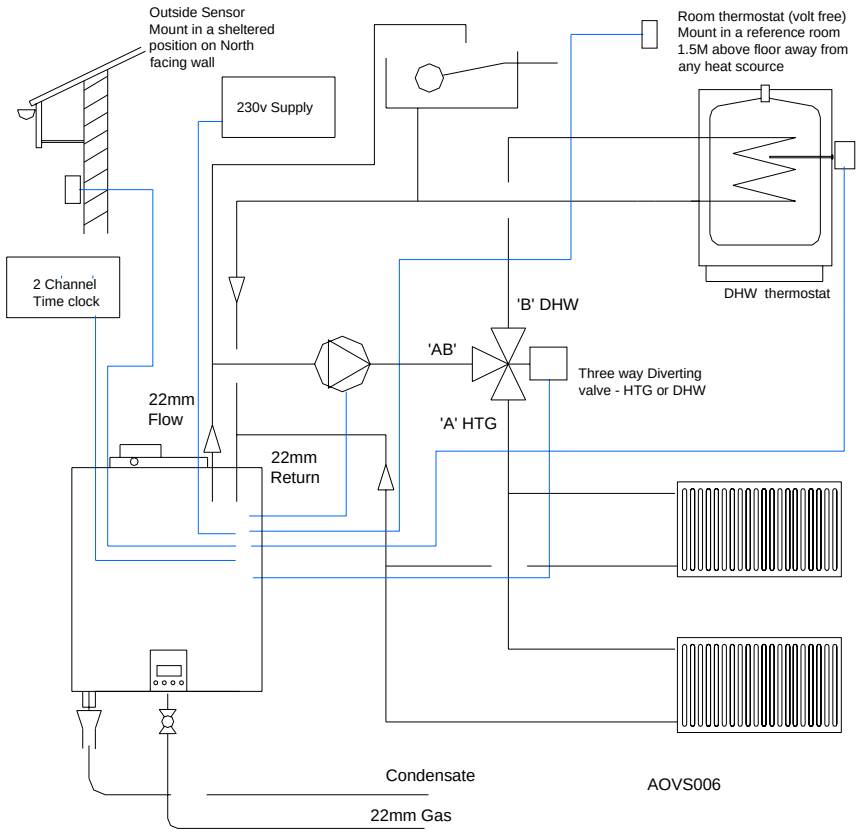


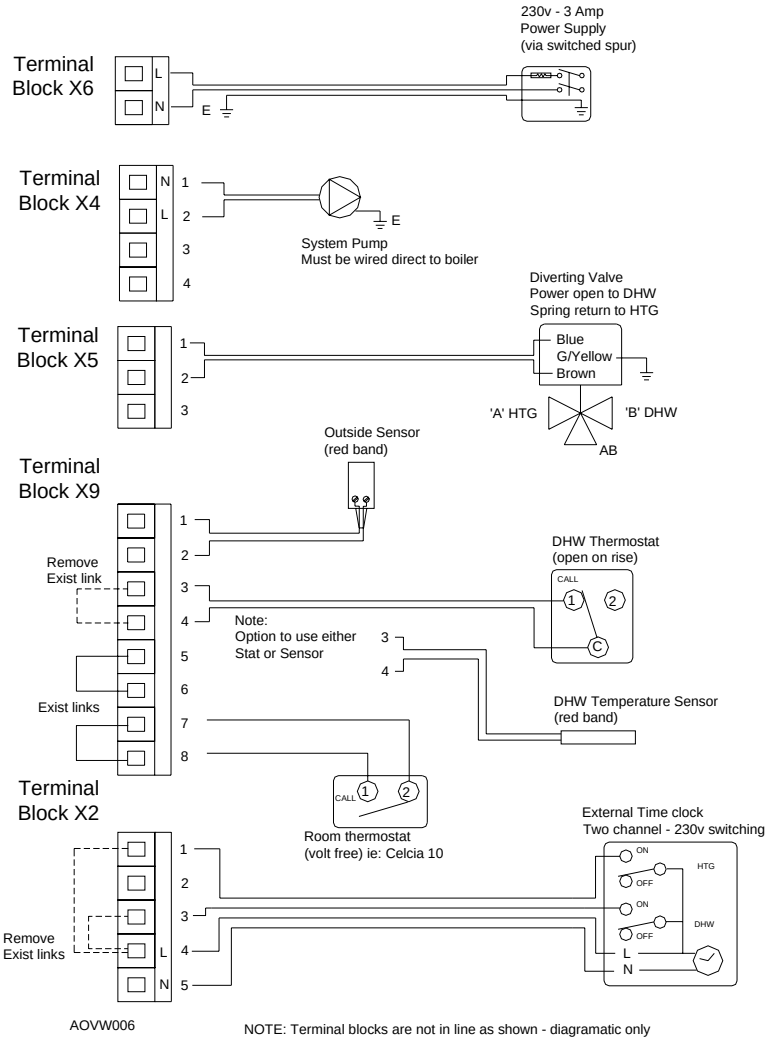


NOTE: Terminal blocks are not in line as shown - diagramatic only

AVANTA 18v System Only Option 6

Simple weather compensated Heating with volt free room thermostat override and Priority DHW





NOTE: Terminal blocks are not in line as shown - diagramatic only

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AVANTA PLUS

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Art No : 113046

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Advanced boiler technology

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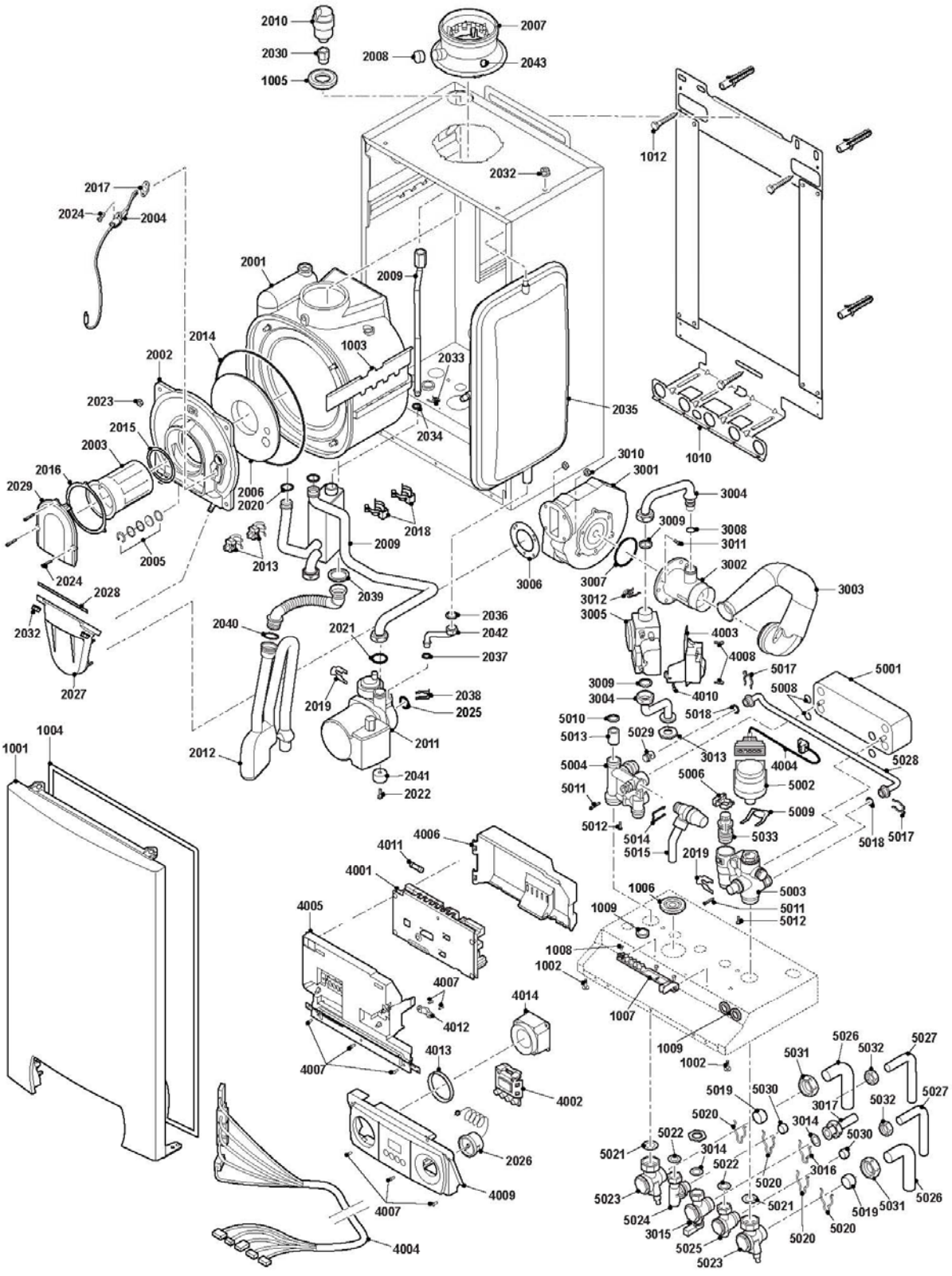
AVANTA PLUS

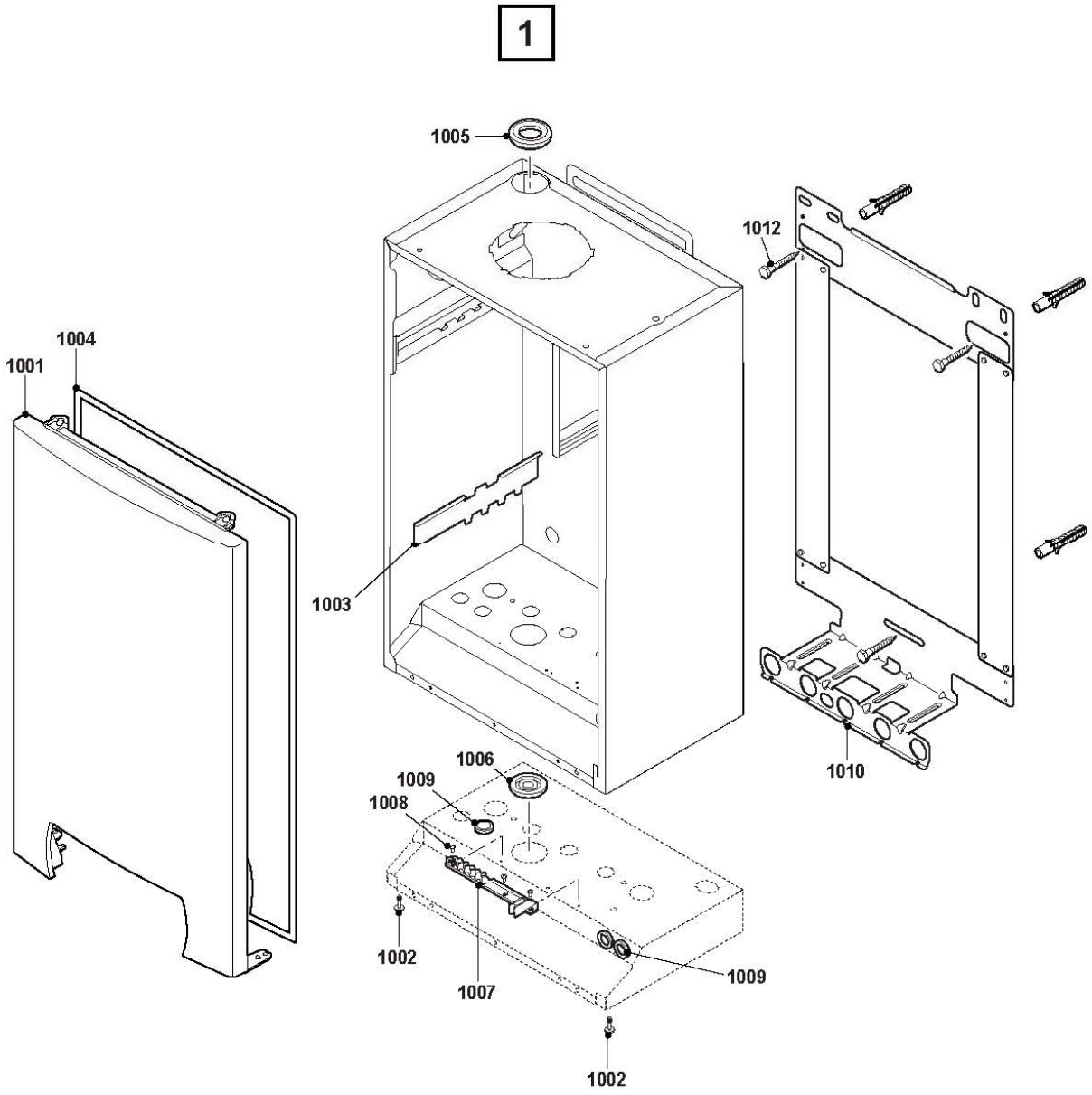
28 Combi - Gas Council No 47-673-02

39 Combi - Gas Council No 47-673-04

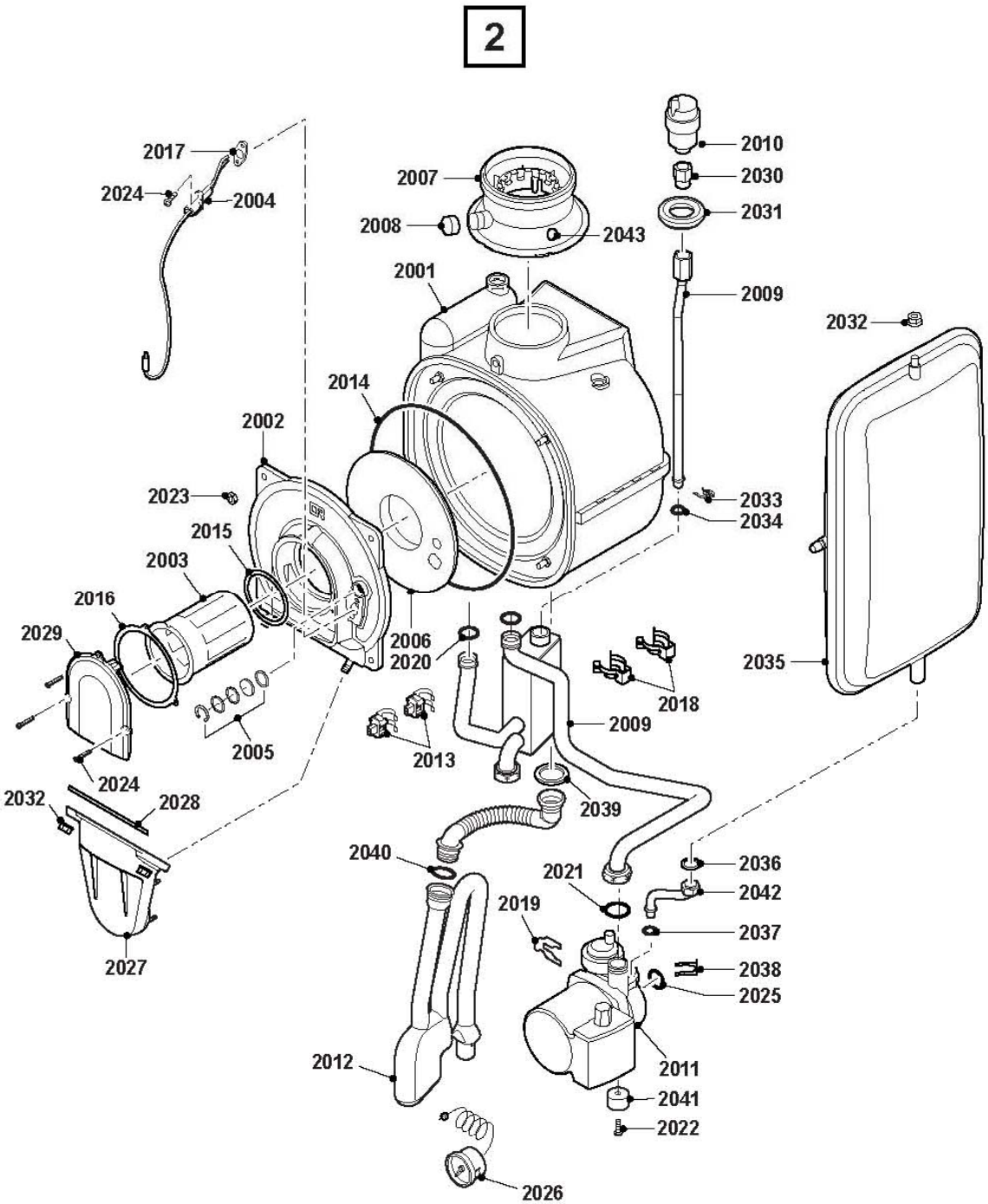


EVALW7H000001d

Remeha Avanta plus Combi 1		
Part No.	Description	Position
S62748	Casing front panel	1001
S62708	Screw M5 x 20 (20 pcs.)	1002
S62724	Fixing strip heat exchanger 24/28kW	1003
S62723	Fixing strip heat exchanger 30/39kW	1003
S62709	Sealing for front casing (10 m.)	1004
S62711	Grommet 15mm id x 48mm od (5 pcs)	1005
S62720	Grommet feed through 15mm id x 46mm od (10 pcs)	1006
S62736	Cable clamp	1007
S62721	Self tapping screw K3.5 x 6.5 (15 pcs)	1008
S62727	Grommet 20 mm. (15 pcs)	1009
S62788	Mounting plate	1010
S62791	Mounting set for Boiler	1012



Remeha Avanta plus Combi 2		
Part No.	Description	Posi-tion
S62778	Heat exchanger 30/39kW	2001
S62777	Heat exchanger 24/28kW	2001
S62780	Heat exchanger front plate 30/39kW	2002
S62779	Heat exchanger front plate 24/28kW	2002
S62740	Burner 30/39 kW	2003
S62741	Burner 24/28kW	2003
S62743	Electrode ignition/ionisation	2004
S59118	Glass inspection set	2005
S62744	Insulation front plate heat exchanger	2006
S62768	Flue gas pipe / Air inlet connection pipe	2007
S62232	Screw cap flue gas measure point (5 pcs)	2008
S62755	Piping set hydraulic 24/28 kW	2009
S62756	Piping set hydraulic 30/39 kW	2009
S62728	Vent auto air bleed device	2010
S62746	Pump for 24/28 kW	2011
S62747	Pump for 30/39 kW	2011
S62749	Siphon assembly	2012
S58733	Sensor temperature (2 pcs.)	2013
S59596	Gasket for coverplate heatexchanger (10 pcs.)	2014
S62717	O-ring 69.5Ø x 3 (10 pcs.)	2015
S62718	O-ring 94Ø x 2 (10 pcs.)	2016
S62105	Gasket for electrode (10 pcs.)	2017
S59586	Hairpin spring 18 mm (10 pcs.)	2018
S58731	Hairpin spring pump 18mm (10 pcs.)	2019
S59597	O-ring 18 x 2.8 (10 pcs.)	2020
S56155	Gasket 23.8mm o/d x 17.2mm i/d x 2mm (20 pcs.)	2021
S59578	Screw M5 x 8 (20 pcs.)	2022
S54755	Nut flange M6 (20 pcs.)	2023
S62716	Screw torx M4 x 10 (15 pcs.)	2024
S48950	Screw M4 x 10 (50 pcs.)	2024
S58730	O-ring 17x 4 (10 pcs.)	2025
S62733	Gauge pressure c/w capilliary	2026
S62751	Cover gas/air chamber	2027
S62719	Gasket between front plate and mixing chamber (10 pcs.)	2028
S62742	Cover plate for burner	2029
S62729	Valve Non Return (for auto air vent) (5 pcs.)	2030
S62711	Grommet 15mm id x 48mm od (5 pcs)	2031
S44483	Nut M 8 (10 pcs.)	2032
S58757	Hairpin spring 17mm(10 pcs.)	2033
S62433	O-ring 16Ø x 3.6 (10 pcs.)	2034
S62753	Expansion Vessel	2035
S62715	Gasket 14.5Ø x8 .5 x 2 (10 pcs.)	2036
S62714	O-ring 9.19Ø x 2.62 (10 pcs.)	2037
S62712	Hairpin spring 10 (10 pcs.)	2038
S62394	Sealing ring syphon	2039
S62713	O-ring 20Ø x 2.5 (10 pcs.)	2040
S62793	Spacer h=15mm (5 pcs.)	2041
S62757	Pipe between pump and expansion vessel	2042
S62233	Cap measure point air inlet (5 pcs)	2043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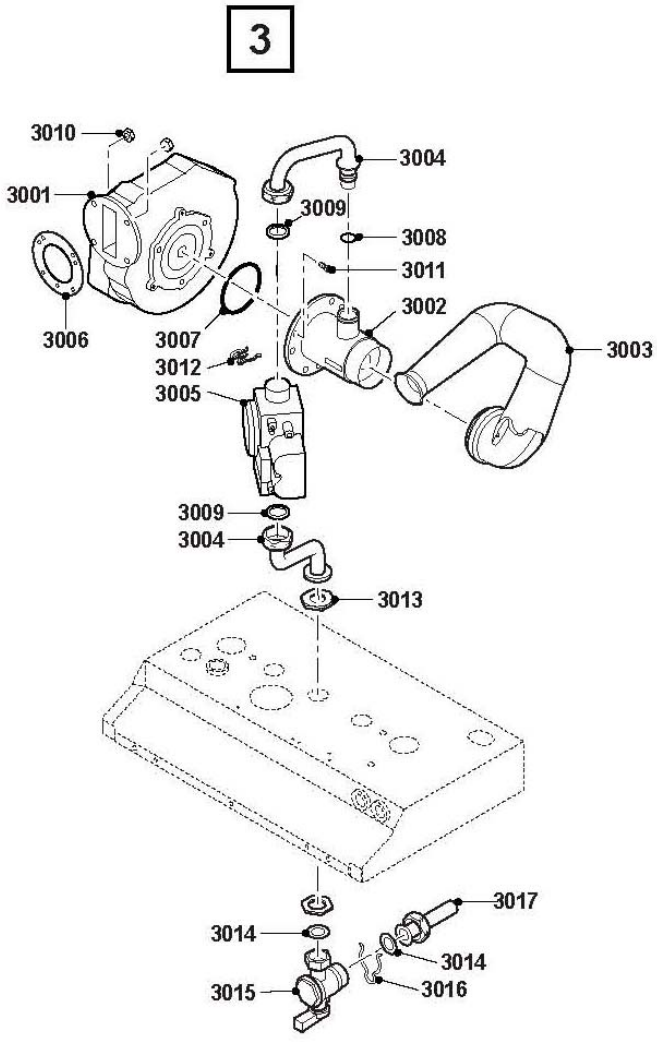
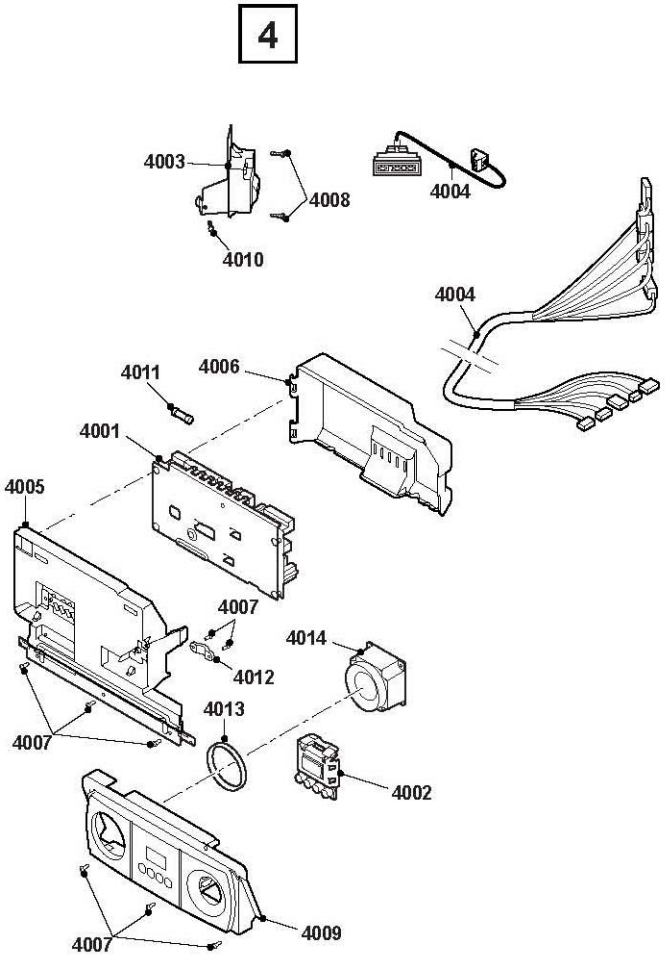
2026

Remeha Avanta plus Combi 3		
Part No.	Description	Posi-tion
S62745	Fan assembly 230V	3001
S58684	Fan assembly 24V	3001
S58683	Venturi	3002
S62767	Air supply silencer	3003
S62758	Piping set gas 24/28kW	3004
S62759	Piping set gas 30/39 kW	3004
S58685	Gas combination block	3005
S45182	Gasket for flue fan (10 pcs.)	3006
S58739	O-ring 63Ø x 3 (10 pcs.)	3007
S58762	O-ring 14.5Ø x 2 (10 pcs.)	3008
S56155	Gasket 23.8mm o/d x 17.2mm I/d x 2mm (20 pcs.)	3009
S46687	Nut flange M5 (10 pcs.)	3010
S59149	Screw M6x12 (15 pcs.)	3011
S58757	Hairpin spring 17mm(10 pcs.)	3012
S62794	Nut ½"(5 pcs.)	3013
S56157	Gasket 18.3 x 12.7 x 2 mm. (10 pcs.)	3014
S62752	Gas cock	3015
S62725	Hairpin spring 22 mm(25 pcs.)	3016
S62760	Pipe and nut gas	3017



Remeha Avanta plus Combi 4		
Part No.	Description	Position
S62734	Control board	4001
S62739	Display print board	4002
S62750	Transformer ignition	4003
S62769	Cable set	4004
S62737	Control panel front	4005
S62735	Controlpanel back	4006
S62710	Self tapping screw 3.5 x 10 (50 pcs.)	4007
S14254	Sheet-metal screw 4.2 x 9.5 (20 pcs.)	4008
S62738	Cover display	4009
S33974	Screw M4 x 16 (10 pcs.)	4010
S43561	Fuse glass 2 amp slow (10 pcs.)	4011
S59372	Cable clamp	4012
S62726	Gasket clock blank (5 pcs.)	4013
S62732	Cover plate clock blank	4014



Remeha Avanta plus Combi 5		
Part No.	Description	Posi-tion
S62776	Plate heat exchanger 30/39	5001
S62775	Plate heat exchanger 24/28	5001
S59132	Actuator three way valve	5002
S62773	Hydro block right C30/39	5003
S62774	Hydro block right C24/28	5003
S62772	Hydro block left combi	5004
S59133	Sensor DHW flow	5006
S58730	O-ring 17Ø x 4 (10 pcs.)	5007
S59131	O-ring 25Ø x 3 (20 pcs.)	5008
S59135	Hairpin spring 15.2mm (10 pcs.)	5009
S62715	Gasket 14.5Ø x 8.5 x 2 (10 pcs.)	5010
S59578	Screw M5 x 8 (20 pcs.)	5011
S59141	Screw M5 x 18 (15 pcs.)	5012
S59143	Filter system or plate X primary flow	5013
S62722	Hairpin spring 16.5 (10 pcs.)	5014
S62763	Safety pressure relief valve with pipe	5015
S62720	Grommet feed through 15mm id x 46mm od (10 pcs)	5016
S58757	Hairpin spring 17mm (10 pcs.)	5017
S62433	O-ring 16Ø x 3.6 (10 pcs.)	5018
S40824	Olive ring 22mm (10 pcs.)	5019
S62725	Hairpin spring 22 mm(25 pcs.)	5020
S62730	Gasket 27.4Ø x 18.2 x 2 (20 pcs.)	5021
S56157	Gasket 18.3 x 12.7 x 2 mm. (10 pcs.)	5022
S62765	Valve for 22mm Flow & Return	5023
S62766	DHW flow fitting 15mm	5024
S62764	Valve for 15 mm main cold water	5025
S62761	Connection tail HTG 22mm	5026
S62762	Connection tail DHW 15mm	5027
S62754	Pipe F/R bypass	5028
S62532	Valve press relief for R/F by-pass	5029
S37365	Olive ring 15mm (10 pcs.)	5030
S46023	Nut for 22mm copper olive (10 pcs.)	5031
S58766	Nut for 15mm copper olive (10 pcs.)	5032
S62781	Three way valve inner assembly	5033

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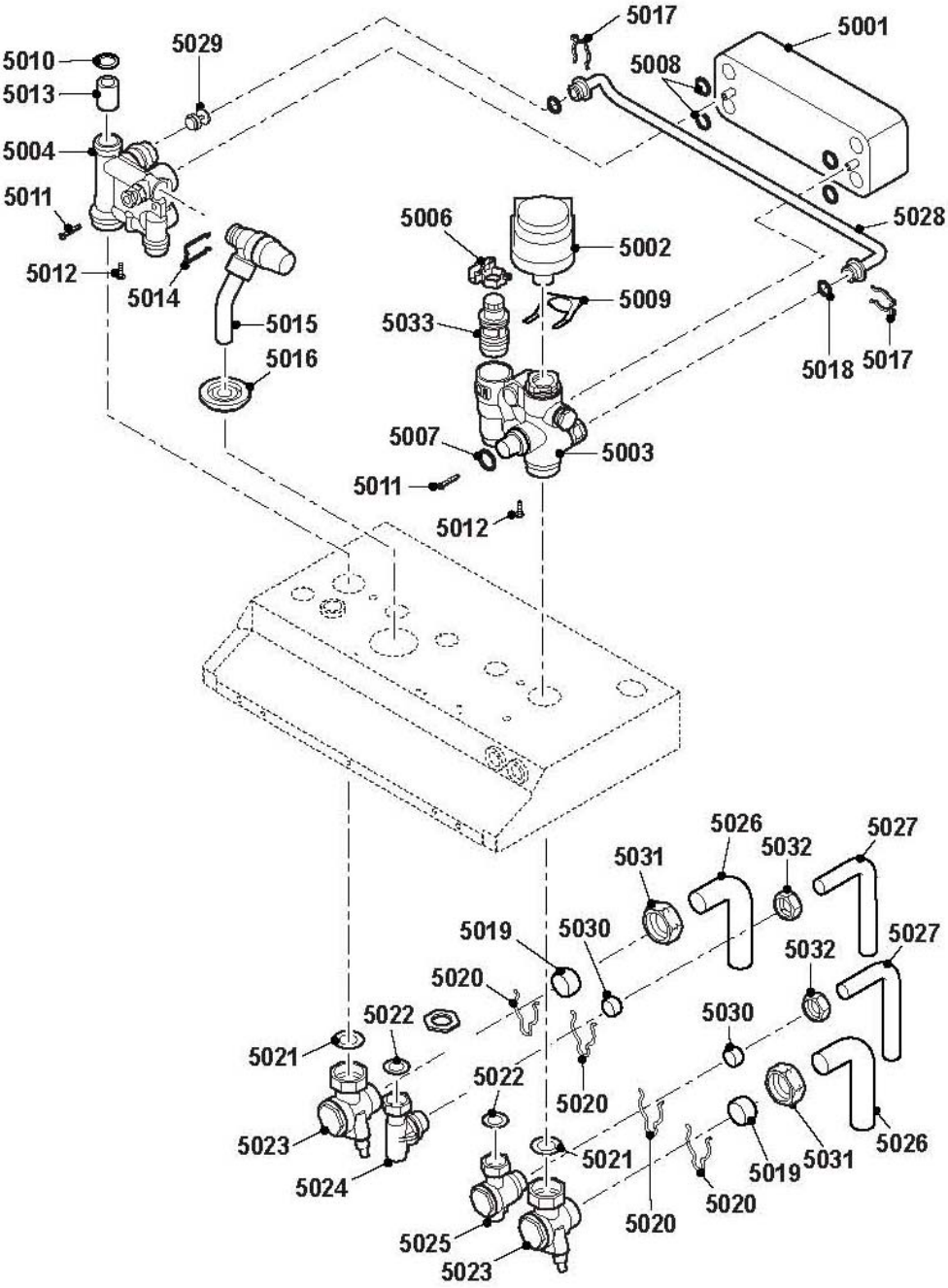
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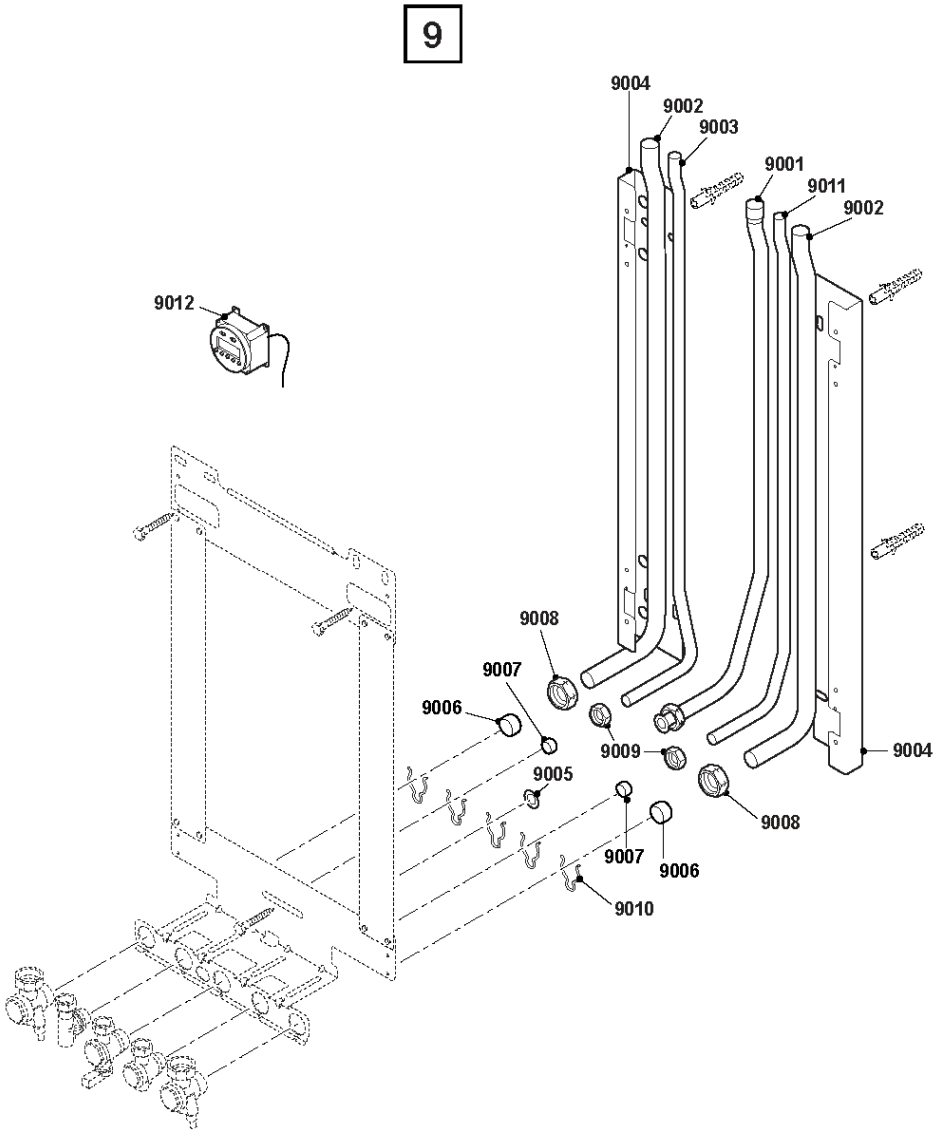
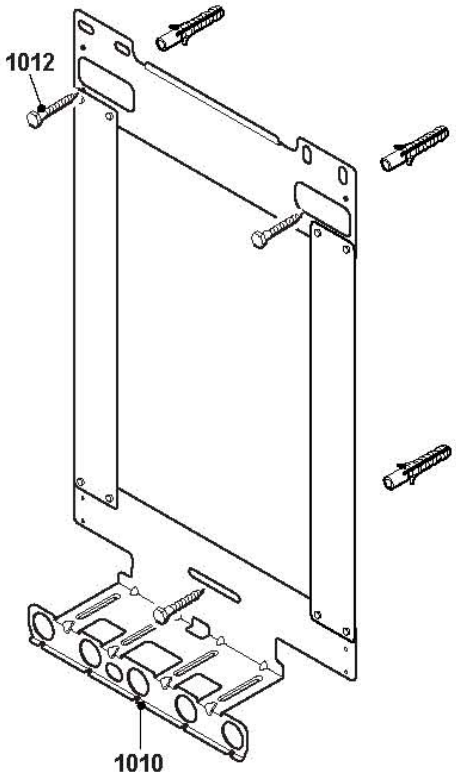
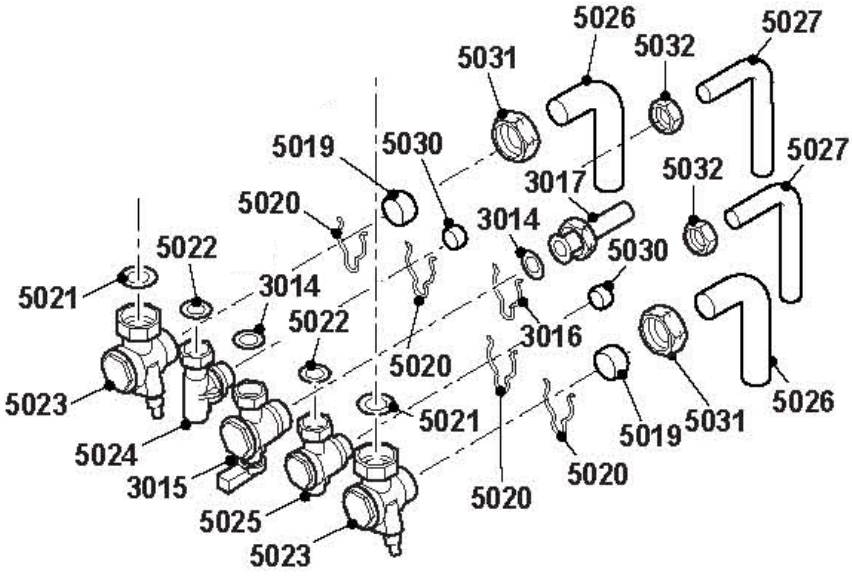
Remeha Avanta plus Combi 9		
Part No.	Description	Posi-tion
S62784	Gas pipe for stand off frame 22mm	9001
S62785	Pipe HTG F/R connections 22mm	9002
S62787	Pipe DHW return connection 15mm	9003
S62790	Stand off frame (sparepart)	9004
S56157	Gasket 18.3 x 12.7 x 2 mm. (10 pcs.)	9005
S40824	Olive ring 22mm (10 pcs.)	9006
S37365	Olive ring 15mm (10 pcs.)	9007
S46023	Nut for 22mm copper olive (10 pcs.)	9008
S58766	Nut for 15mm copper olive (10 pcs.)	9009
S62725	Hairpin spring 22 mm (25 pcs.)	9010
S62786	Pipe DHW Flow connctions 15mm	9011
S62432	Timer clock kit -two channel c/w cable	9012
S62731	Cable for Timer	
S62782	Maintenance set (not illustrated)	
	Breakdown Parts Kit (see page 21)	



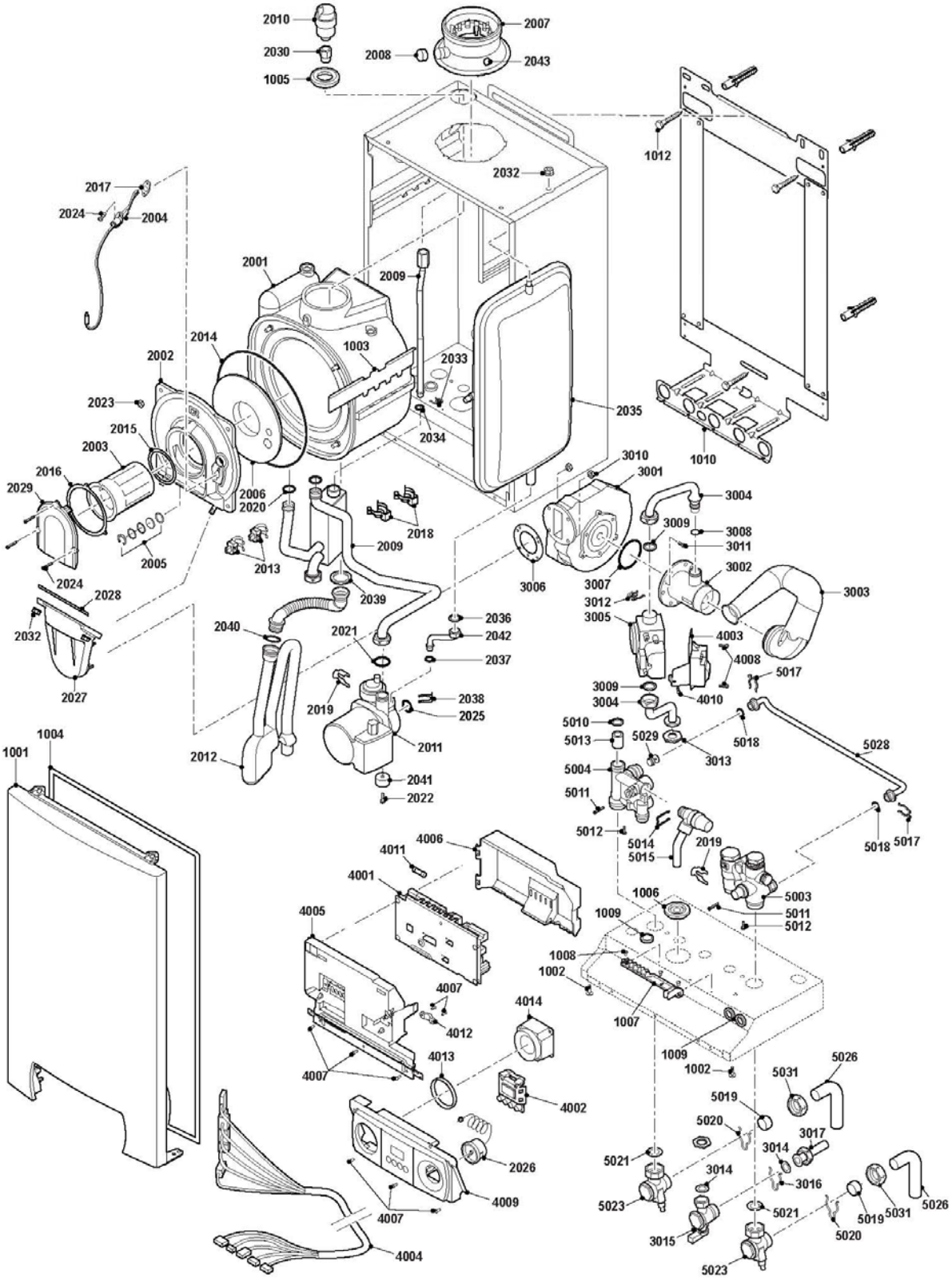
Wall mounting plate and valve set KT397			
Part No	Description	Position	Qty in kit
S56157	Gasket 18.3 X 12.7 X2 mm. (10 pcs.)	5022	1
S62730	Gasket 27.4x18.2x2 (20 pcs.)	5021	1
S62752	Gas cock	3015	1
S62760	Pipe and nut gas	3017	1
S62761	Connection tail HTG 22mm	5026	2
S62762	Connection tail DHW 15mm	5027	2
S62764	Valve for 15 mm main cold water	5025	1
S62765	Valve for 22mm Flow & Return	5023	2
S62766	DHW flow fitting 15mm	5024	1
S62788	Mounting plate	1010	1
S62791	Mounting set for Boiler	1012	1





AVANTA PLUS

24 System - Gas Council No 41-288-05



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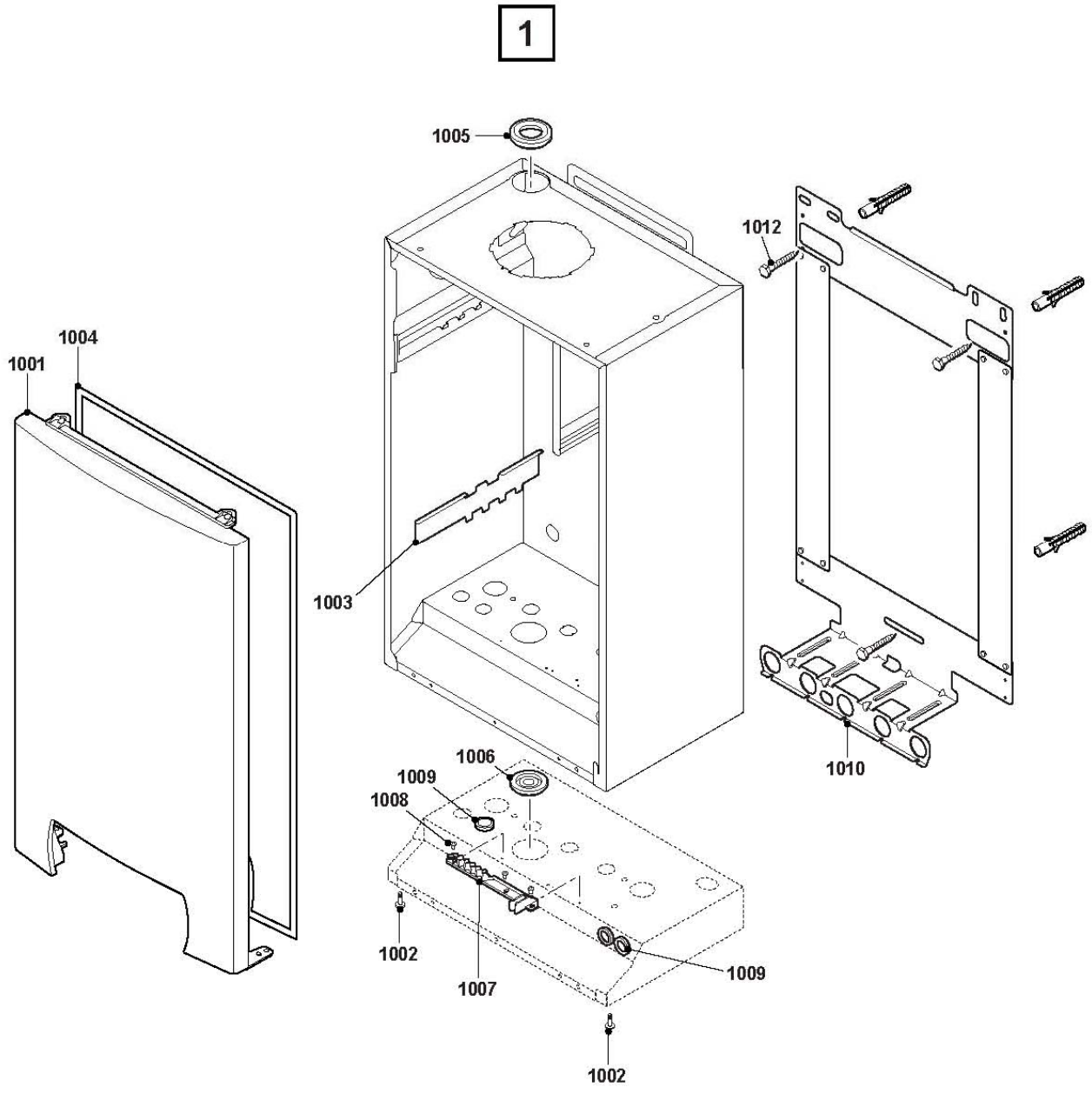
Remeha Avanta plus System 1		
Part No.	Description	Position
S62748	Casing front panel	1001
S62708	Screw M5 x 20 (20 pcs.)	1002
S62724	Fixing strip heat exchanger 24/28kW	1003
S62709	Sealing for front casing (10 m.)	1004
S62711	Grommet 15mm id x 48mm od (5 pcs)	1005
S62720	Grommet feed through 15mm id x 46mm od (10 pcs)	1006
S62736	Cable clamp	1007
S62721	Self tapping screw K3.5 x 6.5 (15 pcs)	1008
S62727	Grommet 20 mm. (15 pcs)	1009
S62788	Mounting plate	1010
S62791	Mounting set for Boiler	1012



Remeha Avanta plus System 2		
Part No.	Description	Posi-tion
S62777	Heat exchanger 24/28kW	2001
S62779	Heat exchanger front plate 24/28kW	2002
S62741	Burner 24/28kW	2003
S62743	Electrode ignition/ionisation	2004
S59118	Glass inspection set	2005
S62744	Insulation front plate heat exchanger	2006
S62768	Flue gas pipe / Air inlet connection pipe	2007
S62232	Screw cap flue gas measure point (5 pcs)	2008
S62755	Piping set hydraulic 24/28 kW	2009
S62728	Vent auto air bleed device	2010
S62746	Pump for 24/28 kW	2011
S62749	Siphon assembly	2012
S58733	Sensor temperature (2 pcs.)	2013
S59596	Gasket for coverplate heatexchanger (10 pcs.)	2014
S62717	O-ring 69.5Ø x 3 (10 pcs.)	2015
S62718	O-ring 94Ø x 2 (10 pcs.)	2016
S62105	Gasket for electrode (10 pcs.)	2017
S59586	Hairpin spring 18 mm (10 pcs.)	2018
S58731	Hairpin spring pump 18mm (10 pcs.)	2019
S59597	O-ring 18 x 2.8 (10 pcs.)	2020
S62715	Gasket 14.5Ø x 8.5x 2 (10 pcs.)	2021
S59578	Screw M5 x 8 (20 pcs.)	2022
S54755	Nut flange M6 (20 pcs.)	2023
S62716	Screw torx M4 x 10 (15 pcs.)	2024
S58730	O-ring 17 x 4 (10 pcs.)	2025
S62733	Gauge pressure c/w capilliary	2026
S62751	Cover gas/air chamber	2027
S62719	Gasket between front plate and mixing chamber (10 pcs.)	2028
S62742	Cover plate for burner	2029
S62729	Valve Non Return (for auto air vent) (5 pcs.)	2030
S62711	Grommet 15mm id x 48mm od (5 pcs)	2031
S44483	Nut M 8 (10 pcs.)	2032
S58757	Hairpin spring 17mm(10 pcs.)	2033
S62433	O-ring 16Ø x 3.6 (10 pcs.)	2034
S62753	Expansion Vessel	2035
S62714	O-ring 9.19Ø x 2.62 (10 pcs.)	2037
S62712	Hairpin spring 10 (10 pcs.)	2038
S62394	Sealing ring syphon	2039
S62713	O-ring 20Ø x 2.5 (10 pcs.)	2040
S62793	Spacer h=15mm (5 pcs.)	2041
S62757	Pipe between pump and expansion vessel	2042
S62233	Cap measure point air inlet (5 pcs)	2043

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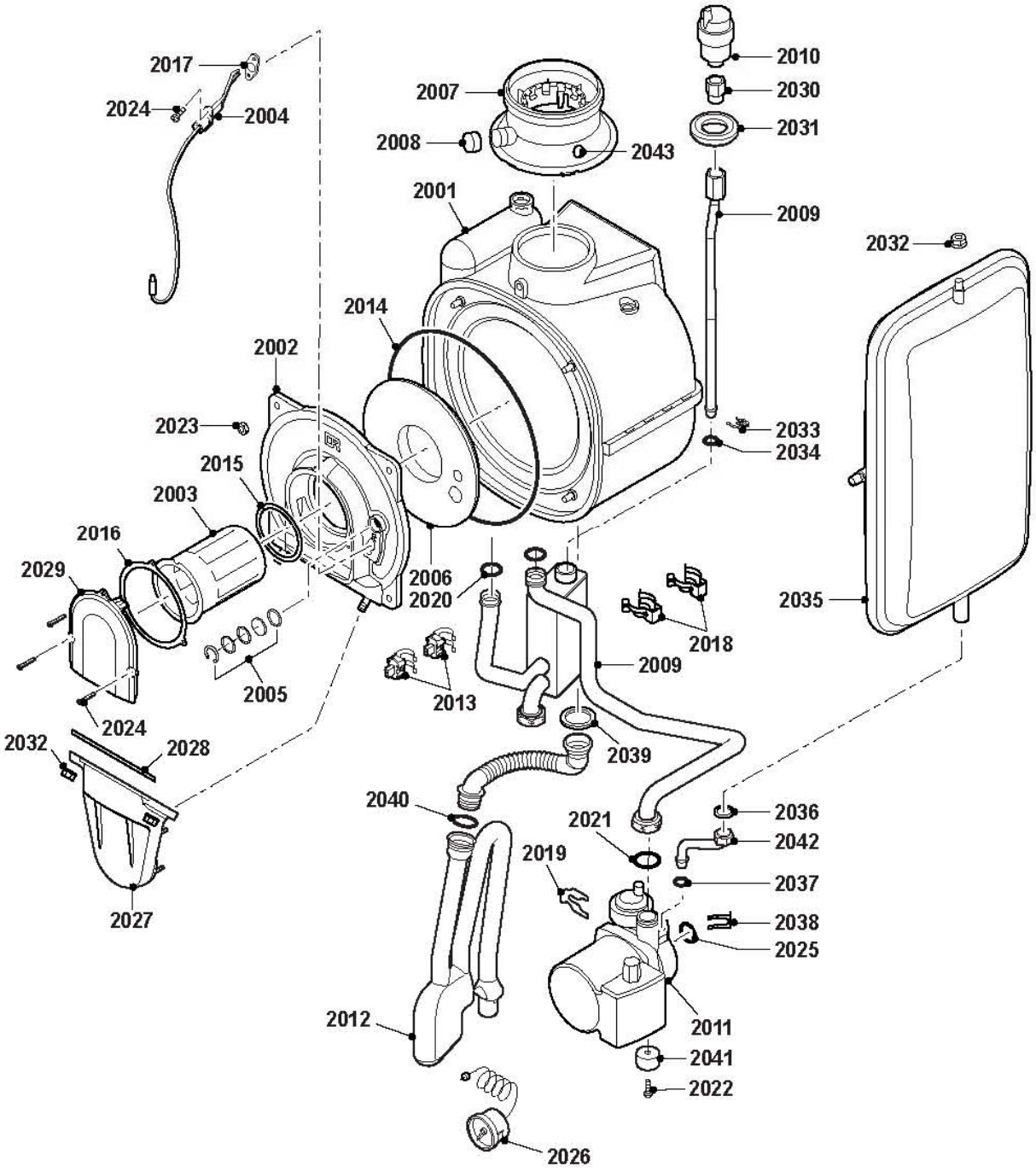
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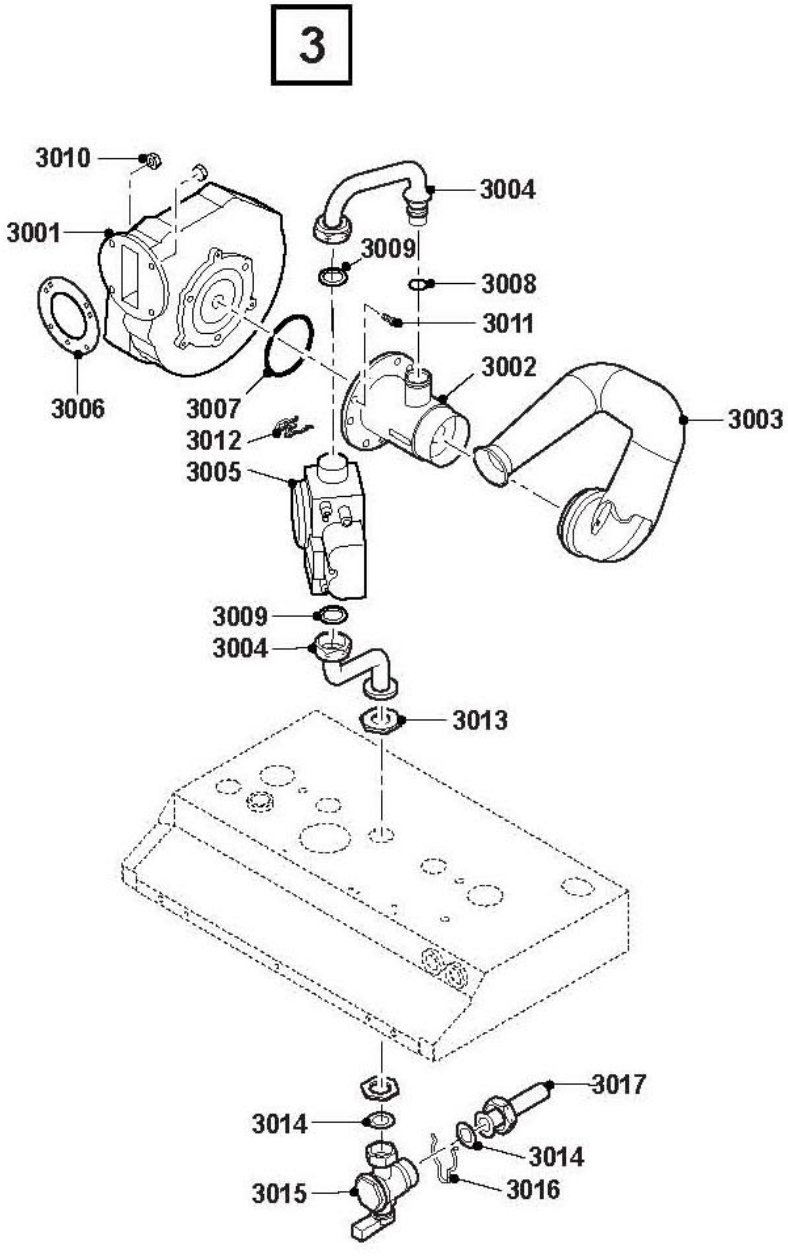
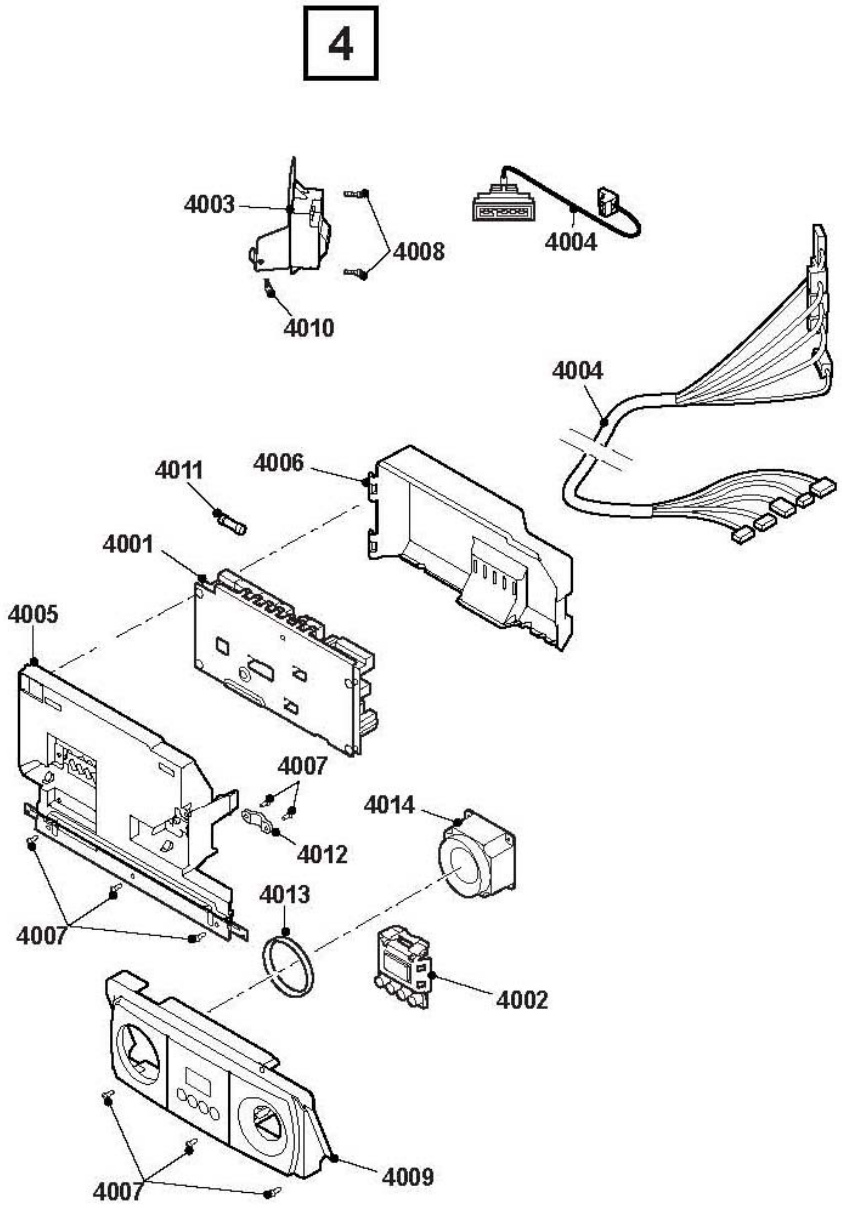
Remeha Avanta plus System 3		
Part No.	Description	Position
S58684	Fan assembly 24V	3001
S58683	Venturi	3002
S62767	Air supply silencer	3003
S62758	Piping set gas 24/28kW	3004
S58685	Gas combination block	3005
S45182	Gasket for flue fan (10 pcs.)	3006
S58739	O-ring 63Ø x 3 (10 pcs.)	3007
S58762	O-ring 14.5Ø x 2 (10 pcs.)	3008
S62715	Gasket 14.5Ø x 8.5 x 2 (10 pcs.)	3009
S46687	Nut flange M5 (10 pcs.)	3010
S59149	Screw M6 x 12 (15 pcs.)	3011
S58757	Hairpin spring 17mm (10 pcs.)	3012
S62794	Nut ½"(5 pcs.)	3013
S56157	Gasket 18.3 x 12.7 x 2 mm. (10 pcs.)	3014
S62752	Gas cock	3015
S62725	Hairpin spring 22 mm(25 pcs.)	3016
S62760	Pipe and nut gas	3017



Remeha Avanta plus System 4		
Part No.	Description	Position
S62734	Control board	4001
S62739	Display print board	4002
S62750	Transformer ignition	4003
S62769	Cable set	4004
S62737	Control panel front	4005
S62735	Controlpanel back	4006
S62710	Self tapping screw 3.5 x 10 (50 pcs.)	4007
S14254	Sheet-metal screw 4.2 x 9.5 (20 pcs.)	4008
S62738	Cover display	4009
S33974	Screw M4 x 16 (10 pcs.)	4010
S43561	Fuse glass 2 amp slow (10 pcs.)	4011
S59372	Cable clamp	4012
S62726	Gasket clock blank (5 pcs.)	4013
S62732	Cover plate clock blank	4014



Remeha Avanta plus System 5		
Part No.	Description	Posi-tion
S62771	Hydro block right system	5003
S62770	Hydro block left system	5004
S58730	O-ring 17Ø x 4 (10 pcs.)	5007
S62715	Gasket 14.5Ø x 8.5 x 2 (10 pcs.)	5010
S59141	Screw M5 x 18 (15 pcs.)	5012
S59143	Filter system or plate X primary flow	5013
S62722	Hairpin spring 16.5 (10 pcs.)	5014
S62763	Safety pressure relief valve with pipe	5015
S62720	Grommet feed through 15mm id x 46mm od (10 pcs)	5016
S58757	Hairpin spring 17mm (10 pcs.)	5017
S62433	O-ring 16Ø x 3.6 (10 pcs.)	5018
S40824	Olive ring 22mm (10 pcs.)	5019
S62725	Hairpin spring 22 mm (25 pcs.)	5020
S62730	Gasket 27.4 x 18.2 x 2 (20 pcs.)	5021
S56157	Gasket 18.3 x 12.7 x 2 mm. (10 pcs.)	5022
S62765	Valve for 22mm Flow & Return	5023
S62761	Connection tail HTG 22mm	5026
S62754	Pipe F/R bypass	5028
S62532	Valve press relief for R/F by-pass	5029
S46023	Nut for 22mm copper olive (10 pcs.)	5031

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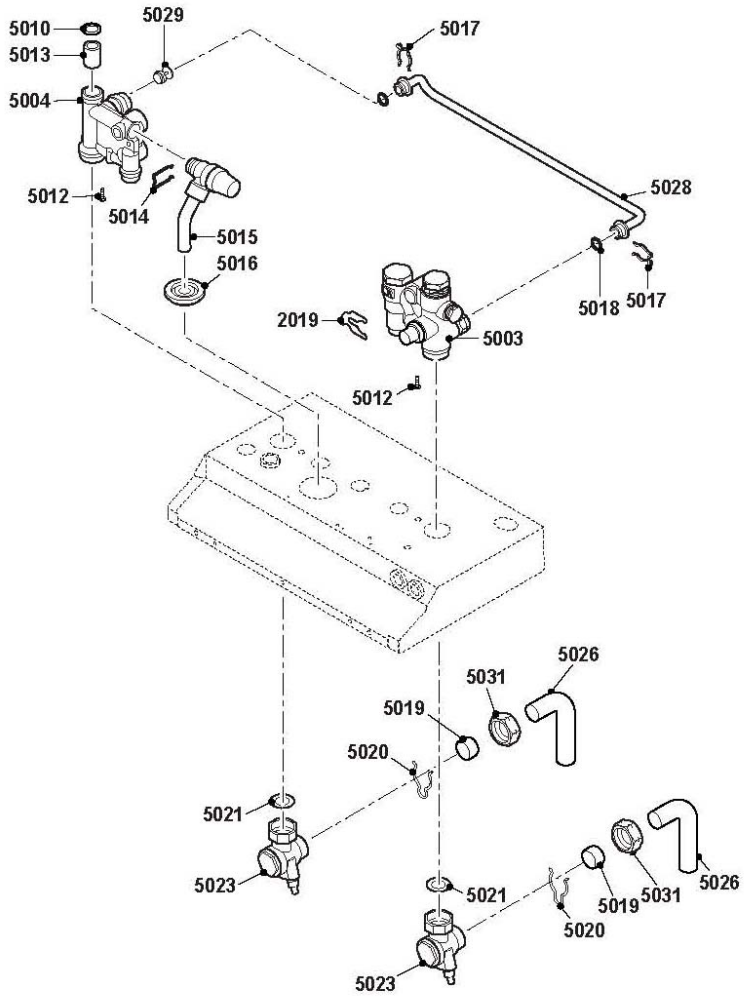
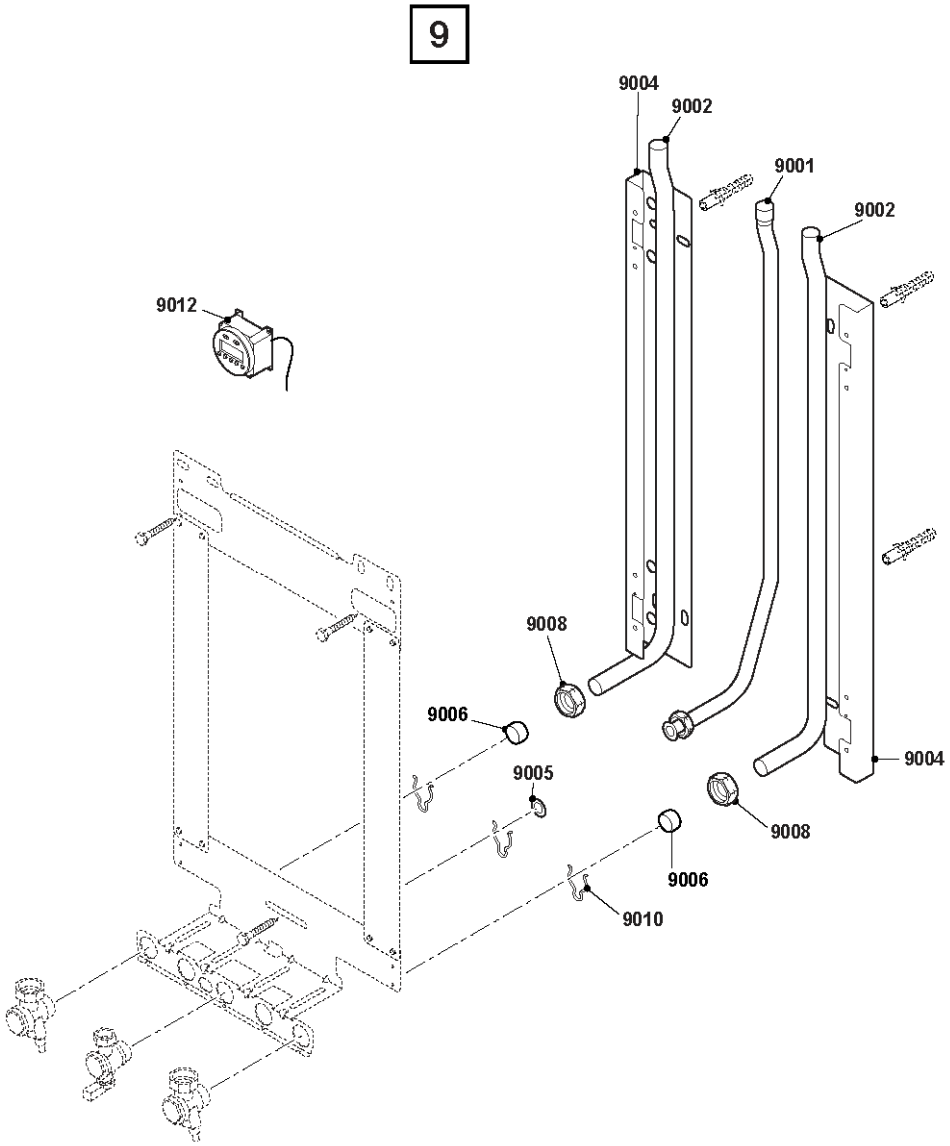


Remeha Avanta plus System 9		
Part No.	Description	Posi-tion
S62784	Gas pipe for stand off frame 22mm	9001
S62785	Pipe HTG F/R connections 22mm	9002
S62790	Stand off frame (spare part)	9004
S56157	Gasket 18.3 x 12.7 x 2 mm. (10 pcs.)	9005
S40824	Olive ring 22mm (10 pcs.)	9006
S46023	Nut for 22mm copper olive (10 pcs.)	9008
S62725	Hairpin spring 22 mm (25 pcs.)	9010
S62432	Timer clock kit -two channel c/w cable	9012
S62731	Cable for Timer	
S62782	Maintenance set (not illustrated)	
	Breakdown Parts Kit (see page 21)	



Inspection / Service and Breakdown Parts

Inspection visit - No parts should be necessary

Service visit - Maintenance Set (Gasket and seal kit)
Part No S62782

Breakdown visit - Major components kit s
Part No : KT398 covers all boilers
Part No : S100034 covers 24s & 28c
Part No : S100035 covers 39c

S62782	Service/Maintenance set for Avanta Plus range	Not illustrated

Contents of Maintenance set S62782		
Part No	Description	Position
62435	Electrode ignition/ionisation	2004
59120	Gasket for cover plate heat exchanger	2014
62434	O-ring 69,5Ø x 3	2015
62256	O-ring 94Ø x 2	2016
62437	Gasket between front plate and mixing chamber	2028
58732	O-ring 18Ø x 2,8	2020
59586	Hair spring heat X 18mm	2018
45182	Gasket for flue fan	3006
59784	Gasket 14,5Ø x 8,5 x 2	2036/3009/5010
58730	O-ring 17Øx 4	5007
58739	O-ring 63Ø x 3	3007
58757	Hair spring vent pipe 17mm	2033
58731	Hair spring pump 18mm	2019
62394	Sealing ring syphon	2039
62463	Hairpin spring 16,5	5014
62459	Gasket 27,4Ø x 18,2 x 2	5021
58762	O-ring 14,5Ø x 2	3008
62337	Hairpin spring 22 mm	3016
54755	Nut flange M6	2023
44483	Nut M 8	2032
46687	Nut flange M5	3010
59131	O-ring 25Ø x 3	5008
62973	Screw torx M4x10	2024
49833	Automatic air vent ¼", excl. Water-seal <46834>	2010
62586	O-ring 9.19Ø x 2.62	2037
63206	O-ring 16Ø x 3.6	2034/5018
62585	Hair spring pump 10mm	2038
59933	O-ring 20Ø x 2,5	2040
40824	Olive ring 22mm	5019/9006
37365	Olive ring 15mm	5030/9007
62105	Gasket for electrode	2017
56155	Gasket 14,5Ø x 8,5 x 2	3009
56157	Gasket 18.3Ø x 12.7 x 2 mm.	9005
62888	Instructions	
62666	Packaging	

KT398	Breakdown Parts Kit for Avanta Plus - 24s / 28c and 39c	Not illustrated

Breakdown Parts Kit for Avanta Plus -- Broag Part No KT398 - Contents		
Part No	Description	Position
S62743	Electrode ignition/ionisation	2004
S62728	Vent auto air bleed device	2010
S62746	Pump for 24/28 kW	2011
S62747	Pump for 30/39 kW	2011
S58733	Sensor temperature (2 pcs.)	2013
S62733	Gauge pressure c/w capilliary	2026
S62745	Fan assembly 230V	3001
S58684	Fan assembly 24V	3001
S58685	Gas combination block	3005
S62734	Control board	4001
S62739	Display print board	4002
S62750	Transformer ignition	4003
S43561	Fuse glass 2 amp slow (10 pcs.)	4011
S59132	Actuator three way valve	5002
S59133	Sensor DHW flow	5006
S62763	Safety pressure relief valve with pipe	5015
S62781	Three way valve inner assembly	5033

S100034	Breakdown Parts Kit for Avanta Plus 24s and 28c	Not illustrated

Breakdown Parts Kit for Avanta Plus -- Broag Part No S100034 - Contents		
Part No	Description	Position
S62743	Electrode ignition/ionisation	2004
S62728	Vent auto air bleed device	2010
S62746	Pump for 24/28 kW	2011
S58733	Sensor temperature (2 pcs.)	2013
S62733	Gauge pressure c/w capilliary	2026
S58684	Fan assembly 24V	3001
S58685	Gas combination block	3005
S62734	Control board	4001
S62739	Display print board	4002
S62750	Transformer ignition	4003
S43561	Fuse glass 2 amp slow (10 pcs.)	4011
S59132	Actuator three way valve	5002
S59133	Sensor DHW flow	5006
S62763	Safety pressure relief valve with pipe	5015
S62781	Three way valve inner assembly	5033

S100035	Breakdown Parts Kit for Avanta Plus 39c	Not illustrated

Breakdown Parts Kit for Avanta Plus -- Broag Part No S100035 - Contents		
Part No	Description	Position
S62743	Electrode ignition/ionisation	2004
S62728	Vent auto air bleed device	2010
S62747	Pump for 30/39 kW	2011
S58733	Sensor temperature (2 pcs.)	2013
S62733	Gauge pressure c/w capilliary	2026
S62745	Fan assembly 230V	3001
S58685	Gas combination block	3005
S62734	Control board	4001
S62739	Display print board	4002
S62750	Transformer ignition	4003
S43561	Fuse glass 2 amp slow (10 pcs.)	4011
S59132	Actuator three way valve	5002
S59133	Sensor DHW flow	5006
S62763	Safety pressure relief valve with pipe	5015
S62781	Three way valve inner assembly	5033

Remeha
AVANTA PLUS

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broag - remeha
Advanced boiler technology

Remeha Avanta Plus 28c
Remeha Avanta Plus 39c
Remeha Avanta Plus 24s

User guide

Remeha Avanta Plus

remeha

INTRODUCTION

The Remeha Avanta Plus range are a series of fully condensing high-efficiency central heating boilers, available in the following types:

- Remeha Avanta Plus 28c and 39c
  - with integrated domestic hot water system (**c**ombi-type)
- Remeha Avanta Plus 24s
  - without integrated domestic hot water system (**s**ystem-type)

The Avanta Plus series ensures optimum domestic hot water heating and space heating in your home.

Apart from instructions on operation / maintenance and tips on how to achieve lower energy consumption, this User Guide contains information on options for operating the boiler with various types of controls, for use with conventional or under floor heating and in conjunction with solar panels.

This User Guide represents the documentation for the **end user**.

- Apart from the documents for the end user, the following are provided for the installer:
- Installation and Service Manual.

- Keep this User Guide with the boiler.
- Broag Ltd. will not be liable for any damage resulting from the instructions in this User Guide not being followed.
- Broag provides a 2-year warranty on parts for the Remeha Avanta Plus and a 10-year warranty on the heat exchanger. Please ensure that your installer hands over the completed Boiler Log Book and that the warranty card returned to Broag to register the boiler. Also ensure that the relevant sections are completed at each service visit. The Log Book will be required in event of any warranty work, therefore keep it in a safe place.

We continually seek to improve our products. The data published in this User guide is based on the most recent information and is issued subject to later modifications. We reserve the right to modify the construction and/or finish of our products at any given time without any obligation to adapt earlier supplies accordingly.
Please do not hesitate to contact us if you have any suggestions to improve this documentation.

Broag Ltd, Head Office, Molly Millars Lane, Wokingham, Berkshire RG41 2QP, telephone: 0118 9783434, Email: boilers@broag.ltd.uk

1 SAFETY

This User Guide uses specific terms and pictograms to draw particular attention to instructions. Broag does this to enhance the user's safety, to prevent problems and ensure the technical reliability of the boiler.

1.1 General safety

The following pictograms are used in this Installation and User manual to specifically draw certain points to your attention:

Tip		Useful tip or practical advice.
Indication		Important instruction in carrying out a particular operation.
Warning		Possible danger of personal injury or material damage to the regulator, building or environment.
Danger		Serious personal injury can occur because of risk of electric shocks.

Can you smell gas? What to do:

- Do not smoke and do not create any flame or sparks.
- Do not use any electric switches.
- Turn off the main gas stop cock.
- Open windows and doors.
- Warn those present and leave the building together.
- Call your gas suppliers / installer once you are outside the building, TRANSCO tel. 0800 111 999.

Can you smell smoke or flue gases? What to do:

- Switch off the boiler.
- Open windows and doors.
- Warn those present and leave the building together.
- Call your installer once you are outside the building.

Installation location for the boiler!

- Do not store or use any flammable materials, aggressive substance and/or aerosols near the boiler.
- The installation area must be frost-free.
- The switched spur unit for the boiler must always be accessible.

Water and pipe temperatures!

- The factory setting for the tap water temperature is 55°C; this temperature can be set to 65°C.
- The maximum water temperature in the Avanta Plus can reach 90°C. This means that pipes and/or radiators can reach this temperature.
- If the boiler is running, the flue duct can reach a high temperature.

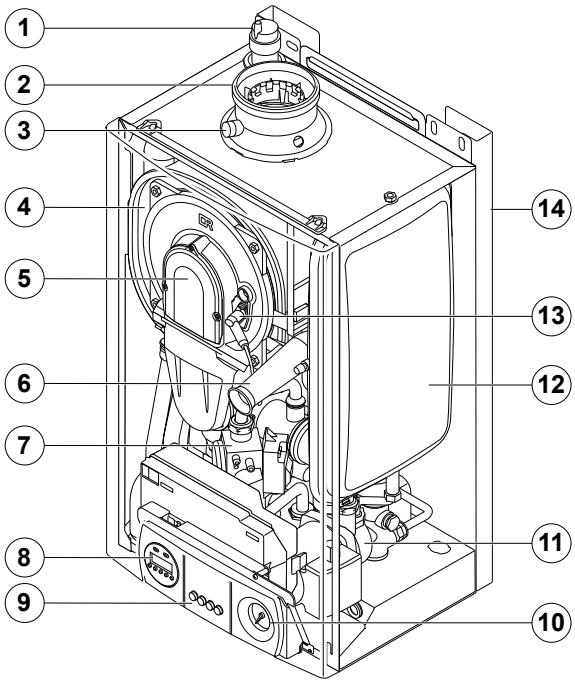
Service once a year
The boiler must be inspected once a year by a qualified engineer to ensure optimum, safe operation.

Repairs
Repairs to the Avanta Plus must only be carried out by a qualified engineer and in accordance with the applicable regulations and (safety) requirements.

2 BOILER

2.1 Operation and components

The Avanta Plus is a high-efficiency system or combi boiler for domestic space heating and hot water production.
The combi boiler provides space heating and contains a plate heat exchanger, three way diverting valve and additional components to supply instant DHW direct from the boiler on a priority basis without the need for storage
The system boiler provides space heating and can be used in conjunction with a cylinder/calorifier and other external controls to provide DHW indirectly
Both models have helical stainless steel heat exchanger's c/w a premix burner ensuring high heat transfer efficiency with flue gases being discharged via the concentric flue system.
Condensation which forms during the combustion process is discharged via the siphon on the underside of the boiler.
An intelligent advanced boiler control unit ('**abc®**') provides all the necessary safety and operational safeguards using internal and external sensors etc to ensure that the boiler operates reliably with maximum efficiency



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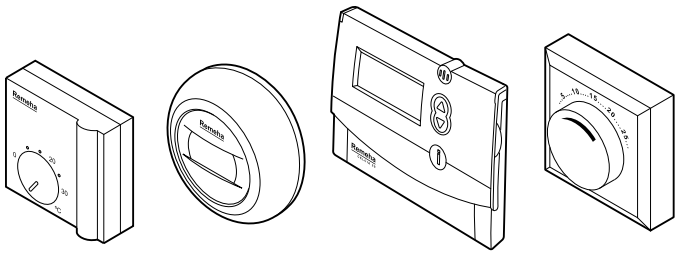
1. Automatic air vent
2. Flue/ Air inlet connection
3. Flue gas measuring point
4. Heat exchanger
5. Front plate heat exchanger
6. Air inlet tube
7. Gas combination block
8. Two channel time clock (optional)
9. Control panel
10. Pressure gauge
11. Circulation pump
12. Expansion vessel
13. Ignition/ionization electrode
14. Stand off frame (optional)



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2.2 Controls

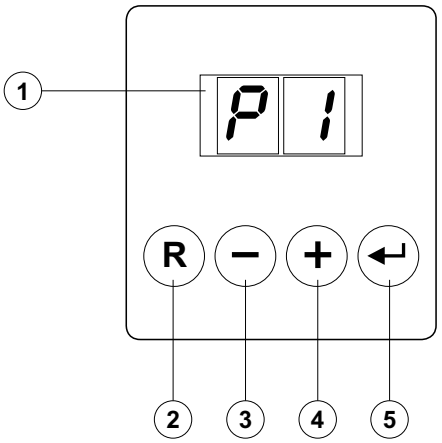
The Remeha Avanta Plus is a fully modulating boiler and can be controlled using one or more of the following methods;

1. Open Therm – 2 wire interface compatible with the Remeha Celcia 15 room compensator and the Remeha Celcia 20 outside weather compensator or with any other OpenTherm control.
2. Open Therm thermostat in combination with 230 V time clock.
3. On/Off room thermostat – volt free (Celcia 10)
4. On/Off room thermostat – 230 V
5. 230 V Switching time clock - Internal 230 V Broag option or any other external two channel 230 V switching clock.

2.2.1 Advanced boiler control ('abc® ' -control)

An intelligent advanced boiler control ('**abc®**') continuously monitors the boiler conditions and ensures a very reliable supply of heat. In the event of problems with water and air flow, the boiler will temporarily switch off (depending on the nature of the circumstances), and then after a short while simply try again.

3 OPERATING THE BOILER



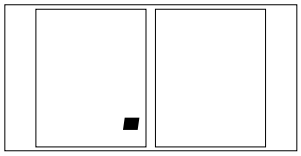
LT.AL.W7H.000.203

The control panel of the Avanta Plus has 4 function keys and a display. The function keys are used to read or change settings and temperatures (see *par.**3.3**; 'Changing settings*').

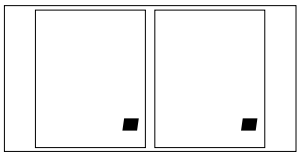
1 Display
*2 **'Reset'**-key*
*3 **[-]** key*
*4 **[+]** key*
*5 **'Enter'** key*

The display has two positions and displays information on the current operating status of the boiler and any errors. Numbers, dots and/or letters can appear in the display. The symbols above the function keys indicate what the function of that particular key then is. If no key is pressed for longer than three minutes with the "boiler in stand-by mode", only one dot is lit. With the "boiler operating", two dots are displayed.

- Press any key and the current boiler status and operation code will appear in the display.
- In the event of a fault, the fault code is displayed instead of the dots.



LT.NL.W6H.000.066

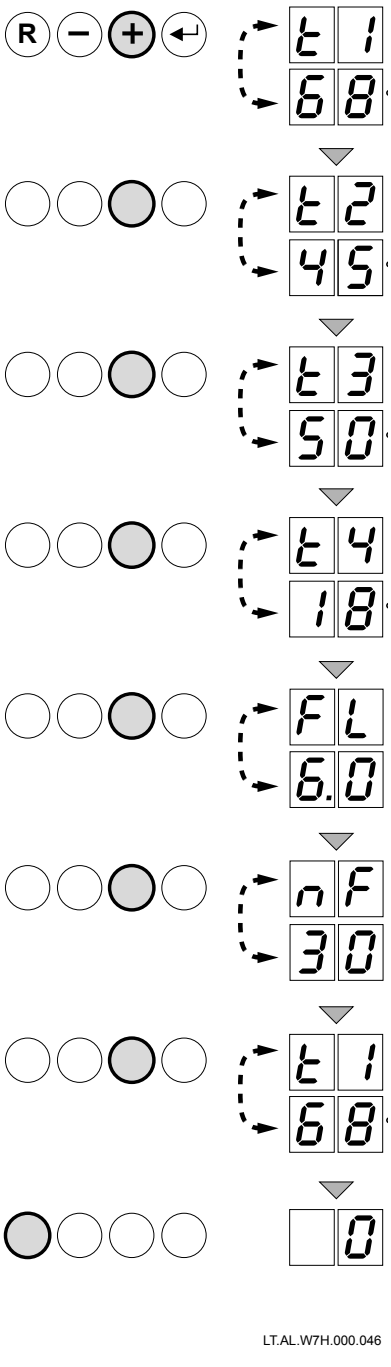


LT.NL.W6H.000.067

3.1 Normal start-up procedure

Activate the switch on the spur unit for mains supply; the boiler will run the start-up program.

- A display test will briefly appear showing all segments of the display.
- F XX software version;
- P XX parameter version;
- A venting cycle of 2 minutes now follows, the version numbers will be displayed alternately;
- Next, the following will appear in the display;
- 1 ; boiler is ventilating;
- 2 ; boiler is igniting;
- 4 ; boiler is operating for DHW;
- 7 ; boiler pump is running after heating DHW;
- 0 ; boiler is stand-by.



LT.AL.W7H.000.046

3.2 Reading operating codes and settings

Reading operating codes

The display can show the following operating codes if one of the keys is pressed.

Operating status	**Display shows consecutively**
Hot water tap open (DHW demand)	1 2 4
Hot water tap closed (DHW satisfied)	1 7 0
Room thermostat set higher	1 2 3
Room thermostat set lower	4 1 7 (boiler already heating up)
Room thermostat set lower	1 6 0 (boiler not yet heating up)
Boiler checking water temperature	8 (once water temperature has fallen sufficiently, it auto matically starts running again)
Boiler waiting time	5 (boiler will start again within 3 till 10 minutes)
Boiler temporarily non-operational	9 (automatic restart attempt after 10 minutes)
Boiler stand-by	0 (boiler running normally)

Read out settings

The following settings can be read out in the 'user menu':

- t1 = flow temperature [°C];
- t2 = return temperature [°C];
- t3 = boiler temperature [°C];
- t4 = outside temperature [°C];
- FL = ionisation current [µA];
- nF = fan speed [t/min] (rpm);

Proceed as follows to read the settings:

- Press the **[+]** key, until t1 appears and, for example, 68 (68°C), the current flow temperature;
- Press the **[+]** key again until t2 appears and, for exam ple, 45 (45°C), the current return temperature;
- Press the **[+]** key again until t3 appears and, for exam-ple, 50 (50°C), the current boiler temperature;

- Press the **[+]** key again until [t4] appears and, for example, [18] (18°C), the current outside temperature;
- Press **[+]** key again until [FL] appears and e.g. [6.0] (6uA), the present ionisation current;
- Press **[+]** key again until [nF] appears and e.g. [30] (3000 rpm), the present fan speed;
- Press **[+]** key again and the read-out cycle will start again with [t1], etc.;
- Press **'Reset'- key** to return to the display with the current operating status.

3.3 Changing settings

The user can change the following settings:

[P1] Maximum flow temperature (= water temperature that leaves the boiler) [°C], adjustable between 20 and 85°C (factory setting = 75°C)

[P2] Maximum domestic hot water temperature [°C], adjustable between 40 and 65°C (factory setting = 55°C)

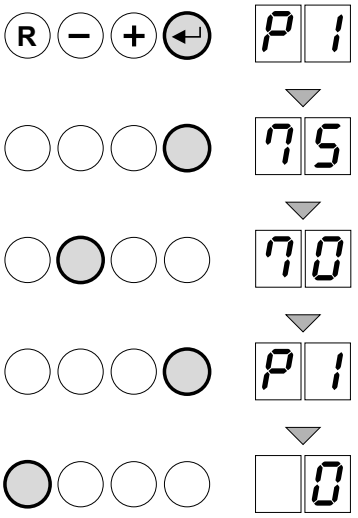
[P3] Boiler regulation; central heating and domestic hot water mode adjustable at four levels:
0 = central heating OFF and domestic hot water OFF
1 = central heating ON and domestic hot water ON (= factory setting)
2 = central heating ON and domestic hot water OFF
3 = central heating OFF and domestic hot water ON

[P4] Eco or comfort mode adjustable at 3 levels:
0 = comfort setting
1 = eco mode
2 = regulated by controller (= factory setting)

[P5] Anticipated current for on/off thermostat (ask your service engineer for further details)
0 = no anticipated current (= factory setting)
1 = anticipated current

[P6] Display off automatically
0 = display stays off
1 = display stays on
2 = display switches off automatically after 3 minutes (= factory setting)

Changing P1 setting: flow temperature of water in central heating system



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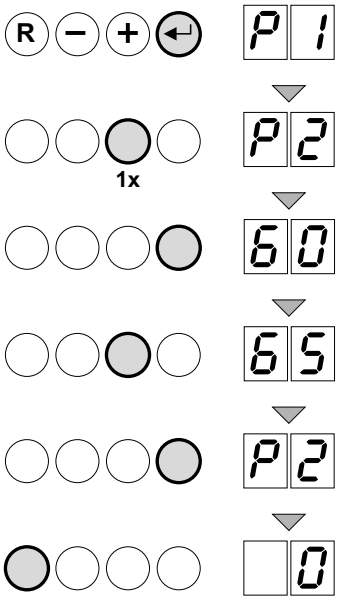
Reduce the flow temperature as follows:

- Press **'Enter'- key** until codes [P] [ ] and [ ] [1] are displayed alternately.
- Press **'Enter'- key** again; set value for maximum flow temperature is displayed: 75°C (factory setting).
- Press **[+]** or **[-] -key** to change this value, for example to 70°C.
- Press **'Enter'- key** to confirm value; codes [P] [ ] and [ ] [1] are displayed alternately.
- Press **'Reset'- key** to switch boiler to operating mode.

Summer holidays

In summer a reduced flow temperature setting may be adequate for your heat requirement. Reduce the flow temperature and save energy.



LT.NL.W6H.000.071

Changing P2 setting: domestic hot water temperature

Increase the domestic hot water temperature as follows:

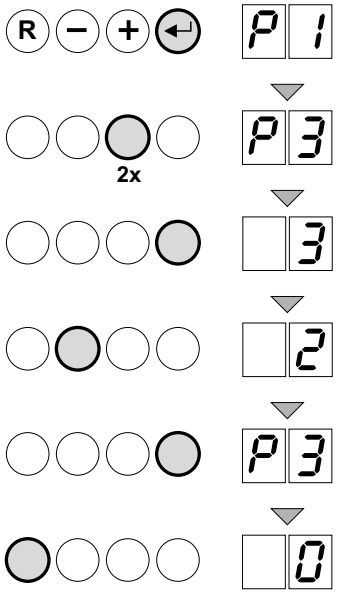
- Press **'Enter'- key** until codes P ☐ and ☐ 1 are displayed alternately.
- Press **'[+]- key** until codes P ☐ and ☐ 2 are displayed alternately.
- Press **'Enter'- key**; set value for domestic hot water temperature is displayed: 55°C (= factory setting).
- Press **[+]** or **[-]- key** to change this value, for example to 65°C.
- Press **'Enter'- key** to confirm value; codes P ☐ and ☐ 2 are displayed alternately.
- Press **'Reset'- key** to switch boiler to operating mode.

Changing P3 setting: boiler regulation (domestic hot water and central heating mode)

DHW use only
If the Remeha Avanta Plus is, for example, only being used to provide domestic hot water, switch the boiler regulation system for the central heating system off.

0 = CH $_{off}$ / DHW $_{off}$
1 = CH $_{on}$ / DHW $_{on}$ (factory setting)
2 = CH $_{on}$ / DHW $_{off}$
3 = CH $_{off}$ / DHW $_{on}$

Change the boiler regulation as follows:



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- Press **'Enter'- key** until codes P ☐ and ☐ 1 are displayed alternately.
- Press **[+]- key** 2x until codes P ☐ and ☐ 3 are displayed alternately.
- Press **'Enter'-key**: central heating and domestic hot water mode setting is displayed.
- Press **[-]** or **[+]- key** to change this mode, e.g. level 3 (= central heating OFF and domestic hot water ON).
- Press **'Enter'- key** to confirm this mode; codes P ☐ and ☐ 3 are displayed alternately.
- Press **'Reset'- key** to switch boiler to operating mode.

Changing P4 setting: Eco or comfort mode

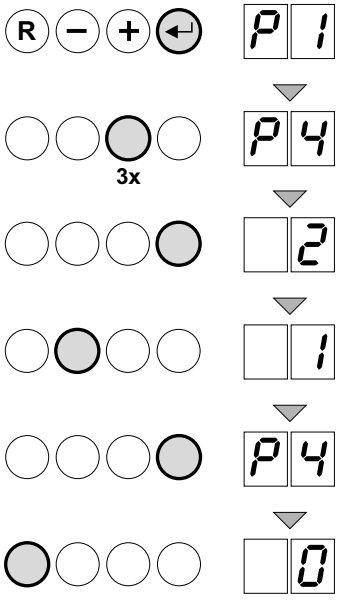
Tip: Comfort mode offers DHW on the combi boiler to be maintained at a min temperature (the boiler will top up the plate heat exchanger even when there is no DHW demand) to ensure faster response. The Eco mode disables this option therefore uses less energy.

No hot water
Beware; the system boiler in combination with an external calorifier will not warm up the calorifier in the Eco-mode.
So, if the calorifier is empty, the tap water will be cold.

In the comfort mode the boiler will be seen to run occasionally even if time clocks are in the off position.

0 = Comfort mode
1 = Eco mode
2 = regulated by controller (= factory setting)

Change the mode as follows:



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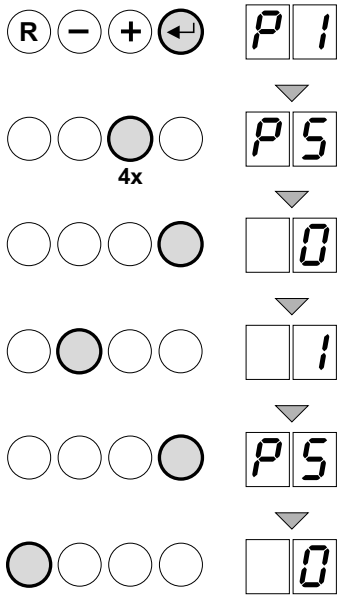
- Press **'Enter'- key** until codes P and 1 are displayed alternately.
- Press **[+]- key** 3x until codes P and 4 are displayed alternately.
- Press **'Enter'- key**; setting of 'eco or heat retention' mode is displayed (mode 2 = heat retention and regulator-dependent, factory setting).
- Press **[-]- key** to change this mode, for example mode 1 (=eco mode).
- Press **'Enter'- key** to confirm this mode; codes P and 4 are displayed alternately.
- Press **'Reset'- key** to switch boiler to operating mode.

Changing P5 setting: (no) anticipated current

Boiler responds to temperature changes after a certain time, input via on/off thermostat. Response time can be reduced by enabling 'Anticipated current' option (only when the on/off thermostat has an anticipation current setting device). When the boiler is installed this setting has been already been adjusted. Ask your service engineer for further details.

Change the anticipated current (if necessary) setting as follows:



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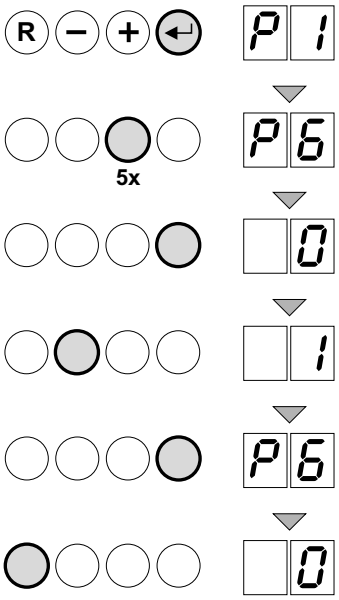
- Press **'Enter'- key** for 1 second until codes P and 1 are displayed alternately.
- Press **[+]- key** 4x until codes P and 5 are displayed alternately.
- Press **'Enter'- key**; (no) anticipated current setting is displayed (mode 0 = no anticipated current, factory setting).
- Press **[-]- key** to change this mode, for example mode 1 (=anticipated current).
- Press **'Enter'- key** to confirm this mode; codes P and 5 are displayed alternately.
- Press **'Reset'- key** to switch boiler to operating mode.

P6 setting: display on/off

Display off
Operating codes on display change constantly as a result of different operating modes. If boiler is in visible location, this can be annoying. Display is therefore set to ‘Automatically off’. Display goes off after 3 minutes, i.e. one or two dots remain visible to indicate that boiler is operational (two dots) or non-operational (one dot). You can change display to ‘Display on’ so that you can always read operating codes.

Change the display setting as follows:



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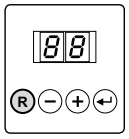
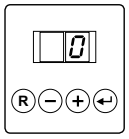
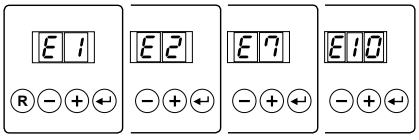
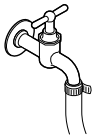
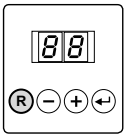
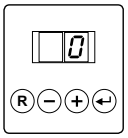
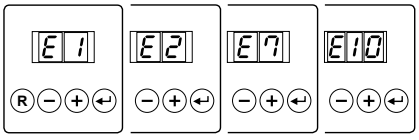
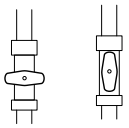
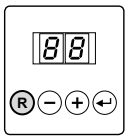
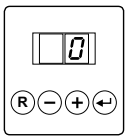
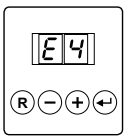
- Press **‘Enter’- key** until codes P and 1 are displayed alternately.
- Press **[+]- key** 5x until codes P and 6 are displayed alternately.
- Press **‘Enter’- key**; you will see mode 2 (= ‘Display automatically off’, factory setting).
- Press **[-]- key** to change this mode to mode 1 (= ‘Display remains on’).
- Press **‘Enter’- key** to confirm this mode; codes P and 6 are displayed alternately.
- Press **‘Reset’- key** to switch boiler to operating mode.

Access code
Changing settings for which an access code is required can only be carried out by the installer.

4 PROBLEMS WITH BOILER AND/OR CENTRAL HEATING SYSTEM

See par. ***4.1*** for problems with the boiler and/or central heating system which the user can resolve himself. *See par.****4.2*** for error codes which have to be remedied by the installer. Other problems are listed in the error table *in par.* ***4.3***.

4.1 Error codes – errors which can be resolved by the user

	 Check water pressure: water pressure is greater or equal to 1 bar.	 Press R-key	 Wait for recovery; display shows 0, boiler functions properly.		Or  Wait for recovery; display shows 0, boiler functions properly.
E1 / E2 E7 / E10	 Check water pressure: water pressure is greater or equal to 1 bar.	 Top up your central heating system (see par. 5.1 for details)	 Press R-key	 Wait for recovery; display shows 0, boiler functions properly.	Or  Display shows E1, E2, E7 or E10 again: note down the error code and boiler type and call your installer.
E4	 Closed Opened Check gas valve: gas valve must be open, if necessary open valve.	 Press R-key	 Wait for recovery; display shows 0, boiler functions properly.	Or  Display shows E4 again: note down the error code and boiler type and call your installer.	

4.2 Error codes – errors which have to be remedied by the installer

If the display indicates a different error code from that described above, note down the error code and boiler type and call your installer. Contact your installer also in the event of a water leak.

4.3 Other problems

Problem or error	Possible cause	Solution/points to check
A. No hot water when tap is turned on	Boiler is not running	Check whether the boiler is switched on check whether a fuse has blown; check whether the gas tap is properly open.
	Water pressure is too low (less than 1 bar)	Check mains cold water pressure
	Economy shower head is letting too little water through	Remove the shower head and clean; fit a new shower head if necessary
B. Radiators are not (properly) hot	Room thermostat is set too low	Set room thermostat higher
	Radiator valve is not open	Open radiator valve (further)
	Boiler is not running	Check whether the boiler is switched on check whether a fuse has blown; check whether the gas tap is properly open.
	System pressure too low	Top up central heating; *see par.5.1*
C. Boiler not working	Room thermostat is set too low	Set room thermostat higher
	Boiler is not running	Check whether the boiler is switched on check whether a fuse has blown; check whether the gas tap is properly open.
	System pressure is too low	Top up central heating, *see par. 5.1*
	Boiler has a fault	Reset the boiler (using the 'Reset' key); remedy the fault (*see par. 4.1*) or consult your installer (*see par. 4.2*).
	Gas pressure is too low	Check gas pressure at boiler and meter
D. System water pressure is too low (less than 1 bar)	Insufficient water in central heating system	Top up central heating; *see par 5.1*
	Water leak	Consult installer
E. Major temperature fluctuations in the DHW	Water supply insufficient	Check supply pressure : Open water tap further
F. Ticking noises from central heating pipes	Central heating pipes clipped too tightly	Loosen clips; lubricate clips with grease; enlarge sleeves (in walls and/or floors).
G. Gurgling noises in central heating pipes and/or radiators	Air in central heating system	Bleed central heating and top up system afterwards; *see par.**5.2***
H. Flow noises in central heating pipes	Water in central heating system flowing too quickly	Consult installer
I. Serious leak under or near boiler	Boiler or central heating pipes are faulty or damaged	Consult installer

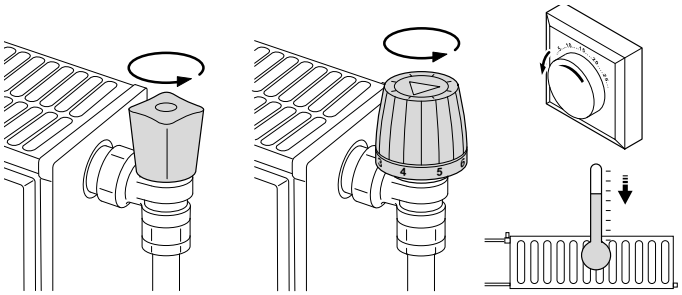
Error codes
When contacting your installer, please have details of the error code on the display, the serial number, year of manufacture and type of the boiler (see label on base of the boiler).

5 TOPPING UP, BLEEDING AND DRAINING SYSTEM

It may be necessary to bleed the central heating system or top it up with water to ensure optimum operation of the boiler and central heating system. If the water pressure is less than 1 bar, the system has to be topped up with water. This section provides information on topping up, bleeding and draining.

5.1 Topping up the central heating system

Disabling the boiler
Before the central heating system can be topped up, the boiler must be disabled. Proceed as follows:



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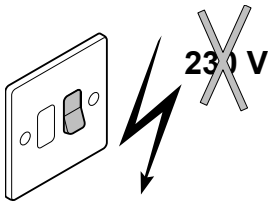
- Open radiator valves and set the room thermostat as low as possible.



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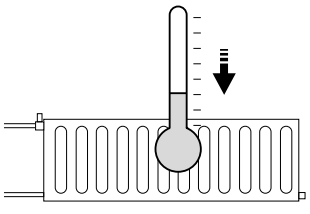
- Switch off the boiler.

Topping up the central heating system
The Remeha Avanta Plus runs best with a water pressure of between 1.5 and 2 bar (see the water-pressure meter at the bottom of the boiler). If the water pressure falls below 1 bar, the system has to be topped up with water.

⚠ **Boiler off**
Ensure that the boiler is disabled.



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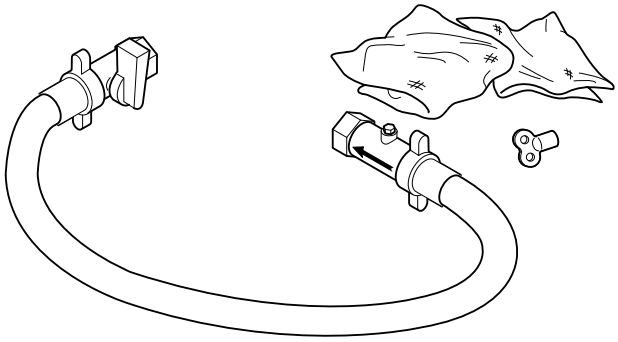
- Wait until the temperature is below 40°C (the radiators feel cold) before topping up.



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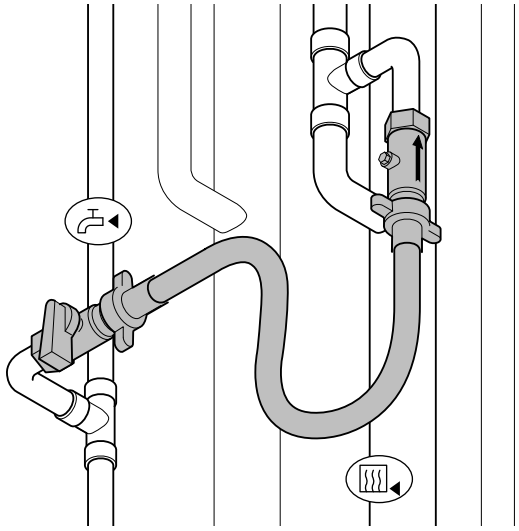
- When topping up, use a filling loop, a cloth and a bleed key.

Top the Avanta Plus up as follows:



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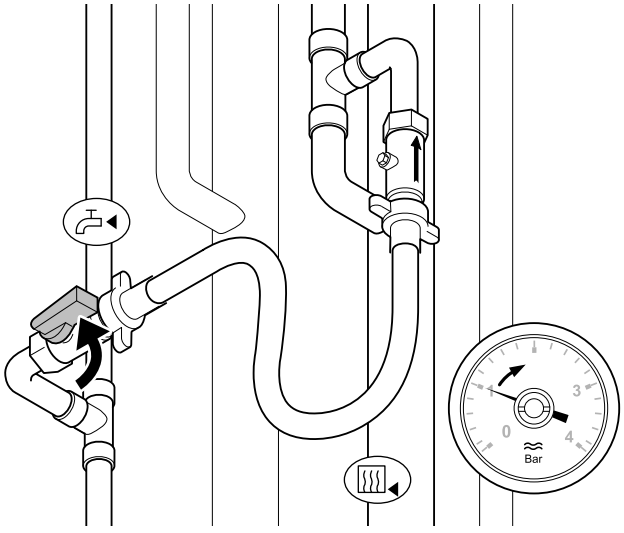
- Attach the filling loop between mains cold water inlet and CH return.



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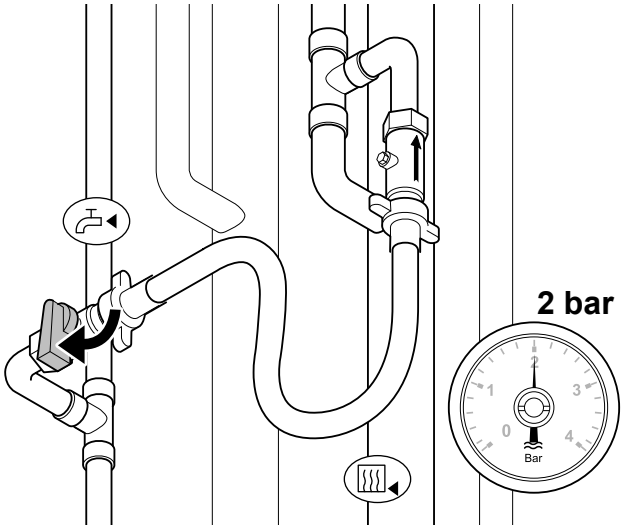
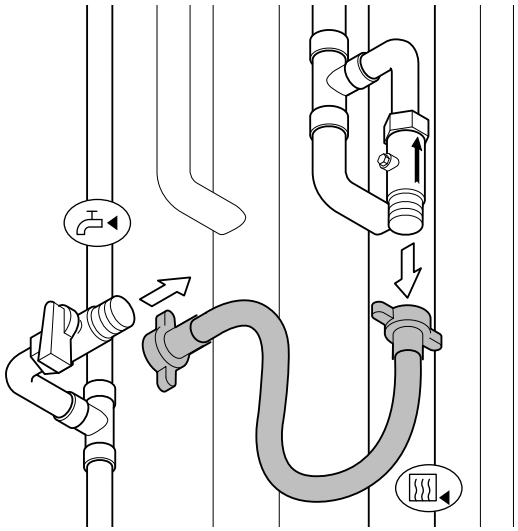
- Turn the filling loop valve open by a quarter turn.

Drain cock
The filling loop does not have to be near the boiler.

- Turn the filling loop valve off again once the water-pressure meter shows 2 bar.
- Remove the filling loop after topping up the system.



LT.AL.W7H.000.237



LT.AL.W7H.000.238

Air gets into the central heating system when topping up with water. Bleed the central heating system as described *in par. **5.2***. After bleeding, the water pressure may be below the required level again, so the system has to be topped up with water. Topping up and bleeding twice ought to be sufficient to reach the correct water pressure.

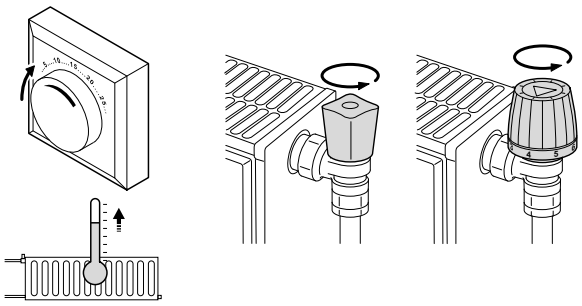
Consult the installer if the central heating system has to be topped up more than three times a year.

Enabling the boiler
Once the central heating system has been topped up, enable the boiler again, *see section **7***.

5.2 Bleeding the central heating system

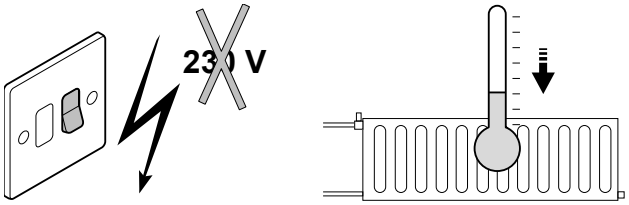
A gurgling noise in pipes and/or radiators which only partially heat up indicate(s) air in pipes and radiators. The central heating system has to be bled.

Before bleeding, the following preparations have to be made:



LT.NL.WH7.000.210 + LT.NL.CZ1.000.098

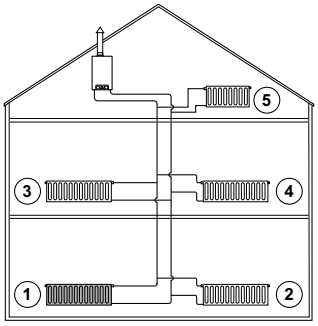
- Open all radiator valves and set the room thermostat as high as possible; wait until the radiators feel hot.



LT.AL.W7H.000.224 + LT.PER.000.005

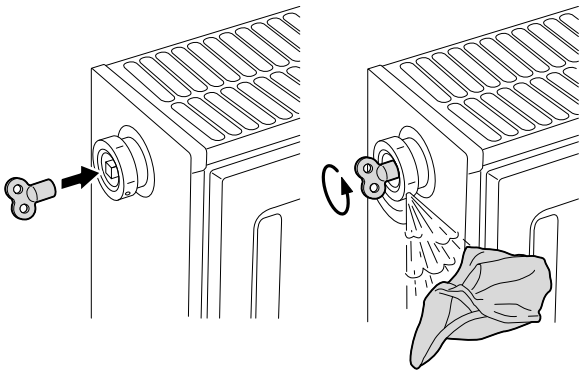
- Switch off the boiler and wait approx. 10 minutes until the radiators feel cold.

Bleed the central heating system as follows:



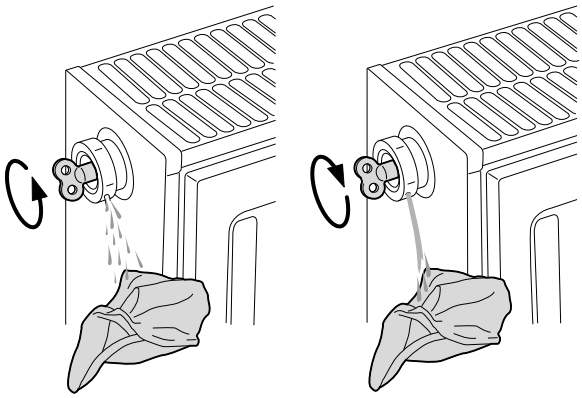
LT.AL.W7H.000.214

- Bleed the lowest radiator first and then work towards the highest radiator.



LT.NL.PER.000.017 + LT.NL.PER.000.018

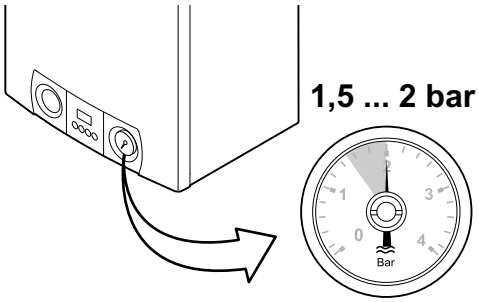
- Hold a cloth against the bleed nipple, open the nipple with a bleed key and allow air to escape slowly.



LT.NL.PER.000.019 + LT.NL.PER.000.020

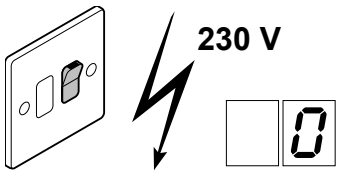
- Wait until water comes out of the bleed valve (without spluttering) and then close the bleed nipple.

Hot water
The water may still be hot.



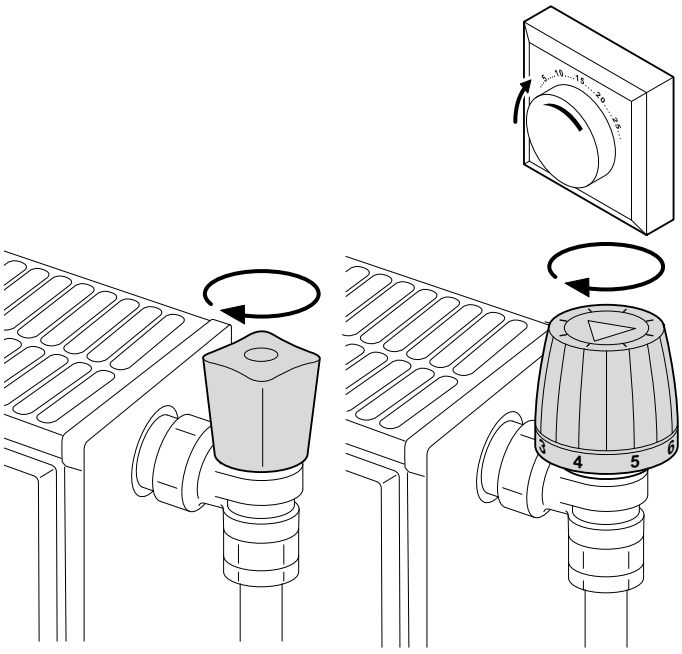
LT.AL.W7H.000.211

- After bleeding, check whether the water pressure in the central heating system is still adequate; if not, top up. *See par.5.1.*



LT.AL.W7H.000.226

- Plug the boiler back in. The boiler starts up automatically. The boiler will now run through a bleed cycle for approx. 2 minutes, after which normal operation will start. *See par. **3.2*** for an explanation of the codes on the display.



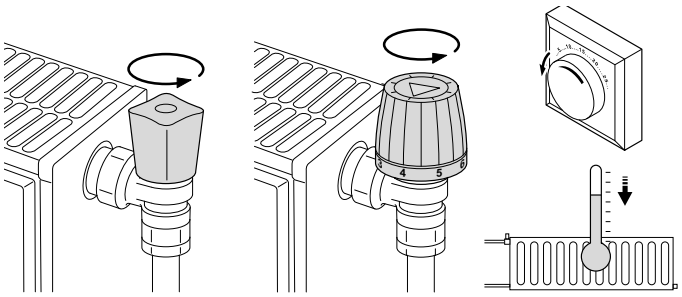
LT.AL.W7H.000.212 + LT.NL.PER.000.024 + LT.NL.PER.000.025

- Set the room thermostat to the desired temperature and close the radiator valves in those rooms which do not have to be heated.

5.3 Draining the central heating system

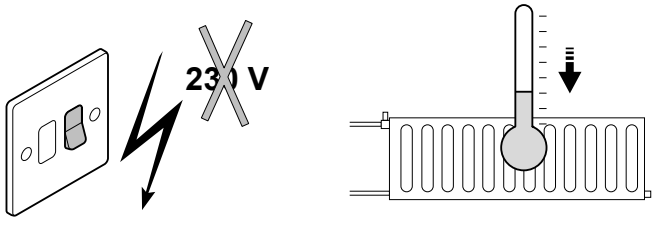
Draining the central heating system may be necessary if the radiators have to be replaced, if there is a serious leak, or if there is a risk of freezing.

Drain the central heating system as follows:



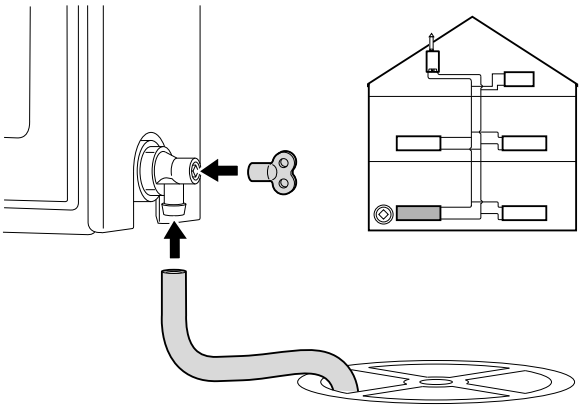
LT.NL.CZ1.000.098 + LT.AL.W7H.000.005

- Open radiator valves and set the room thermostat as low as possible.



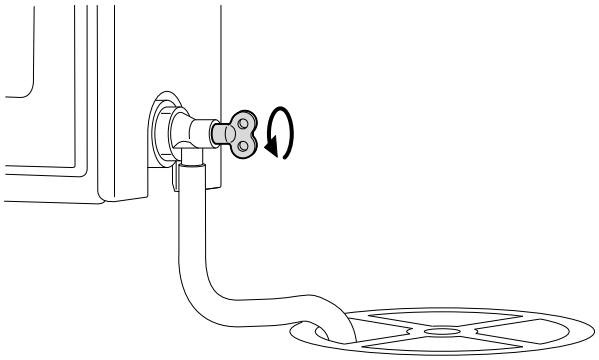
LT.AL.W7H.000.224 + LT.NL.PER.000.005

- Switch off the boiler and wait until the radiators feel cold.



LT.AL.W7H.000.216

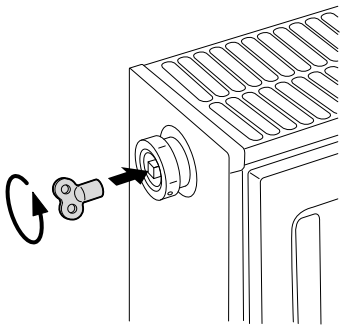
- Connect a drain hose to the lowest drainage valve; place the other end of the hose in a drain or in a place where drained system water will not cause any damage.



LT.NL.PER.000.027

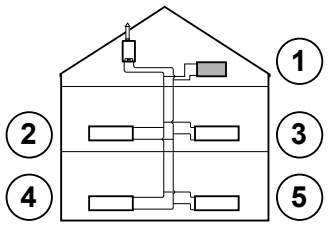
- Open the drainage valve by turning it through a quarter-turn and allow the central heating system to empty.

Stains
Drained water can be warm and can cause stains.



LT.NL.PER.000.028

- Open the radiator valves and bleed nipples of all the radiators, starting with the highest radiator. Carefully open the bleed nipple. If water is still running out of it, close the bleed nipple again and try again later.



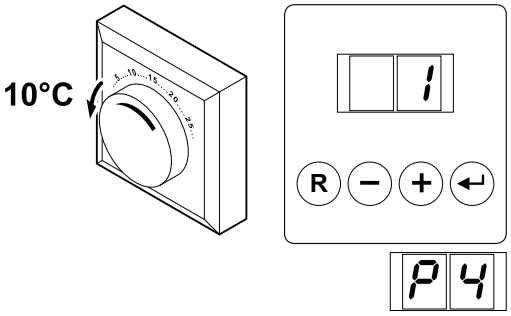
LT.NL.PER.000.029

- Once no more water is coming out of the drainage valve, close the drainage valve, radiator valves and bleed nipples.

6 DISABLING THE BOILER

The boiler must be disabled before any maintenance or repairs are carried out. If the central heating system is not used for a long time (during the holidays, for instance, or periods of milder weather) it is advisable to disable the boiler.

Boiler with frost protection, during longer periods of non-use

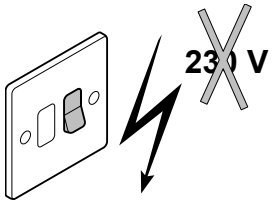


LT.AL.W7H.000.217 + LT.AL.W7H.000.218

- Set the room thermostat to a low temperature, e.g. 10°C,
- Switch setting P 4 to 1 (Eco mode), this will switch off the heat retention function.

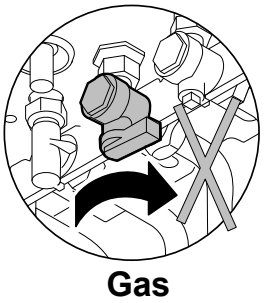
Now the boiler will only start working to protect itself against freezing.
With an external frost protection connected, the boiler can also prevent the central heating system from freezing.

Boiler without frost protection, during longer periods of non-use



LT.AL.W7H.000.224

- Switch off the boiler.

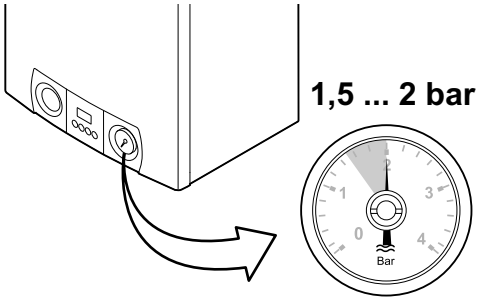


LT.AL.W7H.000.228

- Turn off the boiler gas tap.

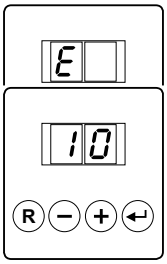
⚠ Drain boiler
Drain the boiler and central heating system if you will not be using the home for a long period and there is a chance of night frost.

7 ENABLING THE BOILER



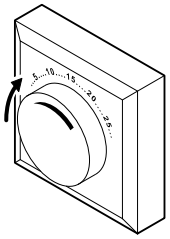
LT.AL.W7H.000.211

- Check the boiler water pressure. If the water pressure is less than 1 bar, the system has to be topped up with water, *see par.**5.1**.*



LT.AL.W7H.000.223

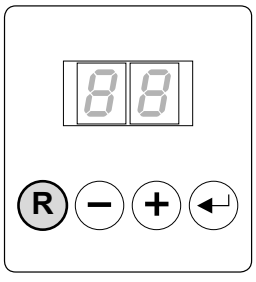
- Switch on the boiler at the fused spur unit; the boiler will run the start-up program.
  - A display test will briefly appear showing all segments of the display.
  - F XX software version;
  - P XX parameter version;
  - A venting cycle of 2 minutes now follows, the version numbers will be displayed alternately;
  - Next, the following will appear in the display;
  - 1 ; boiler is ventilating;
  - 2 ; boiler is igniting;
  - 4 ; boiler is operating for DHW;
  - 7 ; boiler pump is running after heating DHW;
  - 0 ; boiler is stand-by.



LT.AL.W7H.000.212

- Set the room thermostat to the desired room temperature.

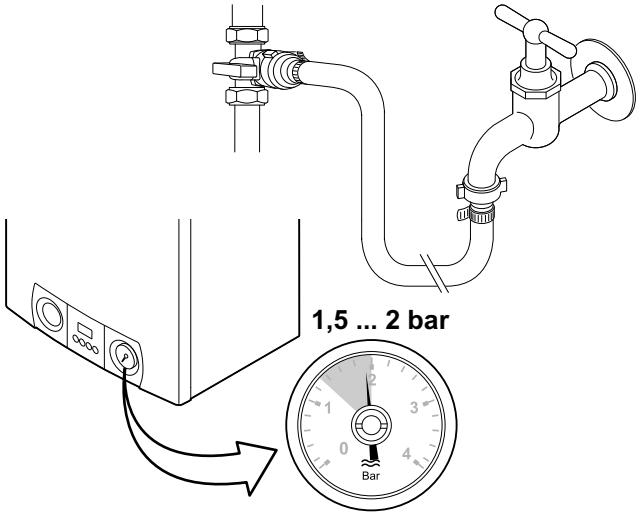
The boiler will now automatically start operating. *See par. **3.2*** for an explanation of the codes on the display.



LT.NL.W6H.000.079

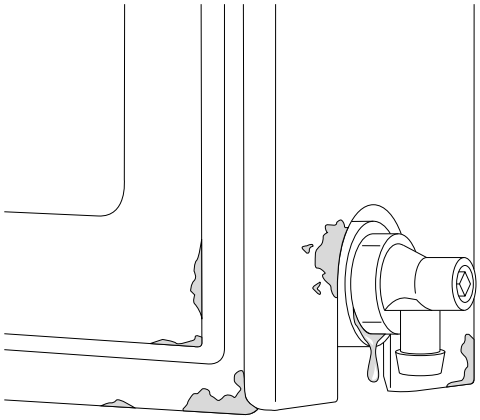
Error message
If the boiler does not start operating and an error message is displayed, consult the error table in *par. **4.1*** and, if necessary, consult the installer.

8 TIPS FOR MAINTAINING THE BOILER AND CENTRAL HEATING SYSTEM



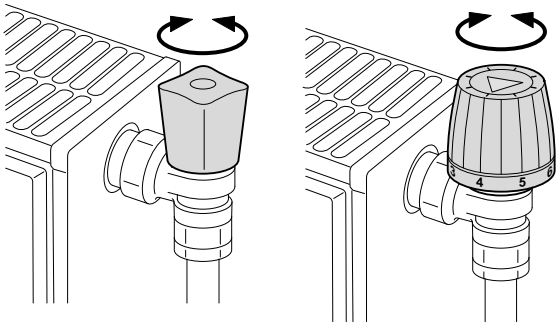
LT.AL.W7H.000.220

- Check the water pressure of the central heating system several times a year. If the water pressure is too low, top up with water (*see par.* ***5.2***). The optimum pressure is between 1.5 and 2 bar.



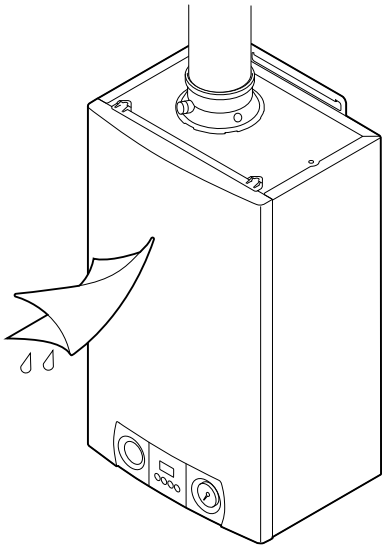
LT.NL.PER.000.033

- Check radiators for leaks and (particularly in damp rooms) for rust. Treat patches of rust as early as possible.



LT.NL.PER.000.034 + LT.NL.PER.000.035

- Open and close radiator valves fully several times a year. This ensures that valves continue to turn smoothly.



LT.AL.W7H.000.221

- Clean the outside of the boiler with a damp cloth and mild detergent.

Cleaning
The inside of the boiler may only be cleaned by the installer.

Service contract
Soiling may reduce the performance of boiler components. For this reason the boiler and central heating system must be inspected once a year by the installer. Ask the installer or the utility company about taking out a service contract.

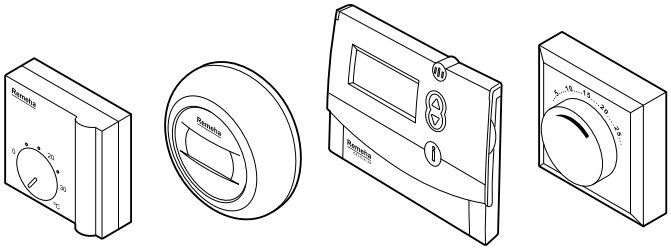
9 ENERGY SAVINGS AND ENVIRONMENTAL PROTECTION

Comfort, cost savings and environmentally-aware use can go hand-in-hand. This sections contains:

- tips on saving energy
- tips on correctly setting the room thermostat.

9.1 Tips on saving energy

- Ensure that the room in which the Remeha Avanta Plus is fitted is well ventilated. Do not seal up ventilation openings.
- Place radiator foil on walls behind radiators; this reflects heat which is otherwise wasted.
- Do not box radiators in or hang curtains in front of them.
- Insulate pipes in rooms which do not have to be heated (cellars and crawl spaces).
- Close radiator valves in rooms which people are not using.
- Do not let hot (and cold) water flow unnecessarily.
- Fit an economy shower head; this can save up to 40% energy.
- Take a shower instead of a bath; a bath uses twice as much water and energy.



LT.AL.W7H.000.222

9.2 Room thermostats and settings

The room thermostat is available in the following designs:

- 2-wire on/off thermostat
- Modulating thermostat (in combination with a timer clock)
- Timer-operated and programmable thermostat

The thermostat type and settings affect the total energy consumption.

A few tips:

- A modulating thermostat, possibly in combination with thermostatic radiator valves, is energy-efficient and offers a high level of comfort; this combination enables the temperature to be set individually for each room. However, do not fit a thermostatic radiator valve in the room where the room thermostat is located.
- Opening and/or closing thermostatic radiator valves fully results in undesirable temperature fluctuations; turn the thermostat control or valve up or down in small steps.
- Set the thermostat to its night-time level (approx. 15°C) half an hour before going to bed. This saves fuel costs and energy.
- Set the thermostat to a lower level well before leaving a room.
- Set the water temperature [P][1] lower in summer than in winter (e.g. 60° and 80°C, respectively) if an on/off thermostat is being used.
- When setting a timer-operated and programmable thermostat, don't forget to take account of holidays and days when no one is at home.

10 EXPANDING THE CENTRAL HEATING SYSTEM

Connecting thermostats
A 2-wire on/off thermostat (e.g. the Remeha Celcia 10) or to a modulating thermostat (e.g. the Remeha Celcia 15 or 20) can be connected to the Avanta Plus. Consult the installer about connecting the thermostat you have chosen.

Connecting an under floor heating system
A under floor heating system can be directly connected to the Avanta Plus (provided it is sealed to prevent oxygen diffusion). Consult the installer about connecting to a floor heating system.

Use of solar panels
The Remeha Avanta Plus is suitable for use as a post-heater for solar panels. Consult the installer about installing a solar panel.

11 TECHNICAL DATA

Appliance type Remeha Avanta Plus		**24s system**	**28c combi**	**39c combi**
General				
Boiler control		on/off or modulating [1]		
Nominal central heating capacity (80/60°C)	kW	21.6	21.6	33.3
Assembly dry weight	kg	29.0	30.5	34.5
Noise level at distance of 1m from the boiler (at full load)	dB(A)	< 44[4]		
Gas and flue details				
Gas consumption natural gas maximum	m_n^3/h	2.3	3.0	3.9
Gas flue rate	kg/h	37	47	62
CH side				
Water capacity heat exchanger and piping	l	1.8	1.8	2.2
Minimum operating water pressure	bar	0.8		
Maximum operating water pressure **PMS**	bar	3.0		
Water temperature maximum	°C	110		
Operating temperature maximum	°C	95		
Domestic hot water side [1])				
Tap capacity (35°C)	l/min	-	11.4	15.9
Minimum tap flow [2]	l/min	-	1.2	1.2
Electrical				
Main supply	V/Hz	230 / 50		
Power consumption **W** maximum	W	115	115	180
Degree of protection	IP	X4D [3]		

[1] = a modulating boiler permits infinitely adjustable matching of heat production to heat demand.
[2] = minimum flow rate of water from the tap to start the boiler running.
[3] = splash proof; under certain circumstances the boiler may be installed in damp rooms such as bathrooms. Check with your installer.
[4] = noise level of a quiet conversation.

12 APPENDICES

12.1 Remeha factory test

Before it leaves the factory, each Remeha Avanta Plus boiler is optimally adjusted and tested for:
- electrical safety;
- CO2- adjustment;
- hot water function;
- water tightness;
- gas tightness;
- automation parameters.

12.2 EC regulations

The Remeha Avanta Plus is certified in accordance with the requirements of the CE-marking directives. See also the CE Declaration of Conformity.

EC – DECLARATION OF CONFORMITY

Manufacturer	: Remeha B.V.
Address	: Kanaal Zuid 110
Town, Country	: Postbus 32, NL-7300 AA Apeldoorn
- hereby declares that the appliance(s)	: Remeha Avanta Plus

comply / complies with the specifications of the following EEC directives:

EEG Directive:	90/396/EEG	applied standards: (pr)EN 297(1994), 483(1999), 625(1995), 677(1998)
	73/23/EEG	(pr)EN 50165(1997), 60335-1(1994)
	92/42/EEG	
	89/336/EEG	EN 50165(1997), 55014-1(2000), 55014-2(1997) EN 61000-3-2(2000), 61000-3-3(1995)
	97/23/EG	(Art.3, sub 3)

Apeldoorn, July 2005

W.F. Tijhuis
Approval Manager

SEDBUK 'A'

Broag Ltd. Remeha House, Molly Millars Lane, RG41 2QP WOKINGHAM, Berks.
Tel: +44 118 9783434, Fax: +44 118 9786977
E-mail: boilers@broag-remeha.com, Internet: uk.remeha.com

59749-1005

Operating instructions for the built in Two Channel Digital electronic time clock

Remeha AVANTA PLUS

broag - remeha
Advanced boiler technology

Issue No. 1 Date: 8 December 2005

Remeha
AVANTA PLUS

1. Factory set default times

Program P1

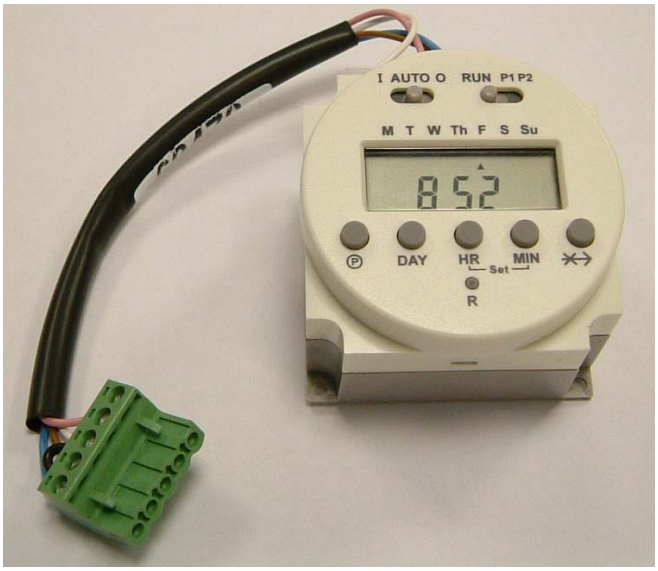
Days	ON	OFF
M to F	6:30 (1 1)	8:30 (1 2)
M to F	16:30 (1 3)	22:30 (1 4)
S to Su	7:00 (1 5)	9:00 (1 6)
S to Su	16:00 (1 7)	23:00 (1 8)

Program P2

Days	ON	OFF
M to F	6:30 (2 1)	8:30 (2 2)
M to F	16:30 (2 3)	22:30 (2 4)
S to Su	7:00 (2 5)	9:00 (2 6)
S to Su	16:00 (2 7)	23:00 (2 8)

P1 and P2 - Programs 9 to 16 set to 0.00 (flashing)

Internal time clock for the AVANTA PLUS Boilers



Built in Two Channel Timer Kit for System Boiler - Part No S62432
Built in Two Channel Timer Kit for Combi Boiler - Part No S62432C

Electronic digital timer with Day/Week programe function enables operation on individual days or groups of days (e.g. Monday to Friday or Saturday to Sunday)
each with up to 8 pairs of ON/OFF switchable times on each channel (P1 and P2)

Channel P1 for Heating (System and Combi boilers)
Channel P2 for Domestic Hot Water (system boiler only - dissabled on the Combi version)

==========

2. General

Please read this setting and operating instruction carefully before installing, connecting or using this digital electronic timer.

3. Safety Notes

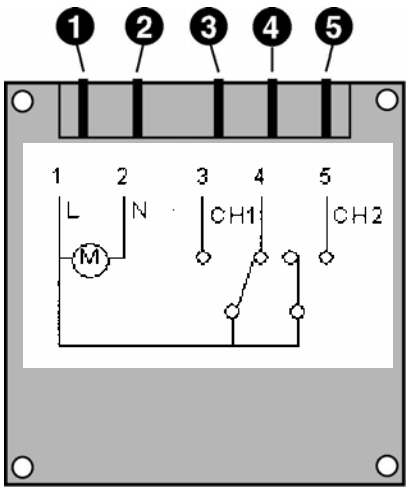
- Power supply to boiler must be isolated before fitting Timer and connecting harness
- The timer is powered by the boiler's 230v supply voltage.
- Never touch the live contacts at the back of the timer.
- Avoid contact with water.

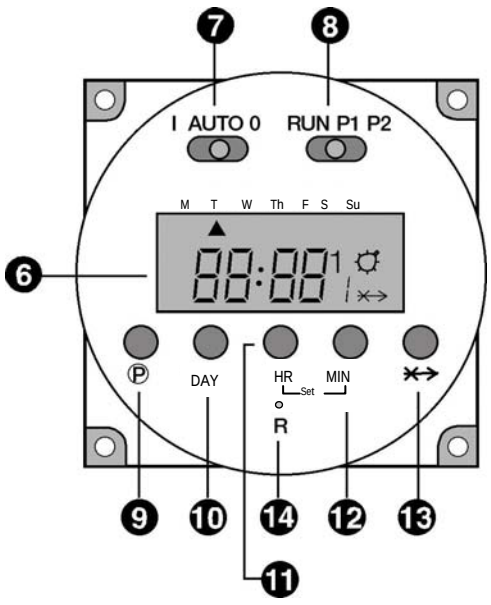
4. Main Timer Features

- Individual and groups of days can be selected
- 8 pairs of ON/OFF switching times possible per day on each channel
- Simple installation with supplied wiring harness and plug set
- Simple button and switch selections for programming
- Large, clear digital display
- Symbols in display to indicate the function of the programmed time
- Time format in 24 hour mode
- Battery backup to retain times and programs in the event of a mains power failure
- Re-set function to return timer to factory defaults

5. Position of Timer in boiler when fitted

6. Description of setting buttons and display





1 to 5 Power and switch connections (cable and plug X2 supplied as std)

6 LCD Display

Sliding three position Switches

7 Three position sliding switch to set operating mode

- I Permanently ON (Current time of day must be set before this is active)
- AUTO Switches ON and OFF in accordance with programmed switch times
- O Permanently OFF

8 Three position sliding switch to set Current time/day and switching times

- RUN Switch program and clock run
- P1 Input switch times for Channel 1(Heating)
- P2 Input switch times for Channel 2 (Domestic Hot Water)

Setting Buttons

9 P Button for activating in sequence the 16 available switch points
When time switch points 1, 3, 5, 7, 9, 11, 13, 15, (ON times) are selected, the bulb symbol - will appear in the right of the display.
If time switch points 2, 4, 6, 8, 10, 12, 14, 16 (OFF times) are selected, there will be no bulb symbol.

10 DAY Button to scroll between days (current day and switching days). Indicated with Δ below the day or days set
When programming, individual days and the following block day programs are possible:

M-F (Monday to Friday)	M-S (Monday to Saturday)
S-Su (Saturday to Sunday)	M-Su (Monday to Sunday)

11 H Button to set time in hours
(for current time and switching times)

12 MIN Button to set time in minutes
(for current time and switching times)

11+12 H+MIN Simultaneously pressing both buttons for 2-3 seconds enables the actual time and day to be set or edited

13 -X-> Skip-Function
Pressing the Skip button reverses the current function mode
ie: If the timer is ON it will be switched OFF and vice-versa.

14 R Reset button will return the timer to factory default times and delete current time, day and all changed switching times.

Display will show flashing **0:00** - Timer will need to be re-programmed

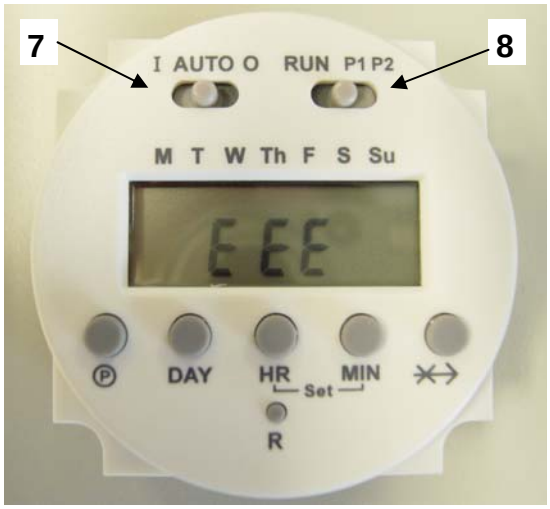
Note: When setting times

Pressing the buttons momentarily - changes the display one digit at a time

Pressing the buttons for longer than 1 second - changes the display more rapidly

If you overshoot the time or day required continue to press the button until it scrolls around

7. Initialising Timer



On removal from box the display will appear as shown above and MUST be Initialised before it can be used in any of the modes including manual override using switch 7 to I

To initialise timer set with the day pointer under **M**

1. Set program switches 7 to **AUTO** and 8 to **RUN**
2. Press **HR** and **MIN** buttons together for 3 seconds - display changes to **0:00**
3. Set current time - button **HR** for the hour and **MIN** for minutes
4. Set current day - button **DAY** until pointer is under correct day (**M-Su**)

Note: if time is not set within 15 seconds the **:** flashes and timer starts from **0:00** (midnight)

5. Repeat 2 - 4

8. Setting switching programs P1 - Heating

⇒ Set program switches 7 to **AUTO** and 8 to **P1** for Heating times - the display will show factory default times with a ^{1} to the right of the time and $_{I}$ below it (ie: **6:30**$^{1}_{I}$) with the bulb symbol confirming channel **P1** and first ON switching position

⇒ Set day or group of days using **DAY** button - use button to scroll between set choices, individual days or groups of days to suit needs (**M** to **F** or **S** to **Su** etc)

⇒ Edit first on time required for that day or group of days using **HR** and **MIN** buttons

⇒ Button P to select first off time - again factory default time is displayed with a ^{1} to the right of the time and $_{2}$ below it (ie: **8:30**$^{1}_{2}$) without the bulb symbol confirming channel P1 and first OFF switching position

Repeat process for up to 8 pairs of ON/OFF switching times

NOTE :

1. Odd numbers are ON and even numbers are OFF times - a “light bulb” symbol will also appear during the ON time setting
2. Any unused switching times should be checked and deleted to avoid them overriding any of your set times - press buttons **–X->** and **P** together for 3-4 seconds, the display will change to 0.00 flashing confirming that the switching setting is deleted

9. Setting switching programs P2 - Domestic Hot Water

⇒ Set program switches 7 to **AUTO** and 8 to **P2** for DHW times - the display will show factory default times with a ^{2} to the right of the time and $_{I}$ below it (ie: **6:30**$^{2}_{I}$) with a light bulb symbol confirming channel **P2** and first ON switching position

⇒ Repeat process described above for channel **P1**

Set program switch back to **RUN**

Timer will now operate the boiler in accordance with the switch times set

10. Checking the Timer settings

To check and edit existing times or to add new times

⇒ Set program switches 7 to **AUTO** and 8 to **P1 or P2** - the display will show the first ON time set with the day or group of days it applies to

⇒ Button P to select first off time - again the display will show the first OFF time set with the day or group of days it applies to

Repeat button P to scroll through each ON and Off setting time editing where necessary

Note: See section 11. for programming errors

11. Skip Function - Timer override

The skip or override function changes the current switching mode of the timer channel P1 or P2 from ON to OFF or from OFF to ON until the next programmed switching time

⇒ Set program switches 7 to **AUTO** and 8 to **RUN**

To override channel P1 - Heating

⇒ Button **–X->** once [1] will appear to the right of the time display (ie: 6.30[1]) with the light bulb and override symbol displayed - if the override was to ON and not if it was to OFF - (symbols can take 2-4 seconds to appear and disappear)

⇒ Button **–X->** again to cancel the override if necessary

To override channel P2 - DHW

⇒ Button **–X->** twice [2] will appear to the right of the time display (ie:6.30[2]) with the light bulb and override symbol displayed if the override was to ON and not if it was to OFF

⇒ Button **–X->** again twice to cancel the override

Note:

1. The [1] returns on the first press but both disappear after 2-4 seconds
2. When overriding the timer to OFF there is a 2-4 second delay before the [1] and [2] and light bulb disappear from the display

To override both channels P1 and P2 to ON

⇒ Press button **–X->** twice and the [2] appears with the light bulb and override symbol

⇒ Press button **–X->** again and the [1] appears

Both channels are now ON

To override both channels P1 and P2 to OFF

⇒ Press button once and the [1] disappears

⇒ Press button twice and the [2] disappears along with the light bulb and override symbol

Both channels are now OFF - The [1] returns on the first press but both disappear after 2-4 seconds

12. Programming Errors

Each ON switching point is linked to the next in sequence OFF switching time therefore the following combinations of ON/OFF switching can lead to errors preventing the timer working or creating unexpected switching times - If in doubt re-set timer and program again

Switch ON time	**Switch OFF time**
ON time set	Next OFF time not set
No time set	Next switch OFF time set
Day block ie: M to F	Different day block ie: S to Su
On time set to eg: W - 08.00	Next OFF time set before ON time eg: W - 07.30
On time set to eg: Su - 09.00	OFF time set same eg: Su - 09.00

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