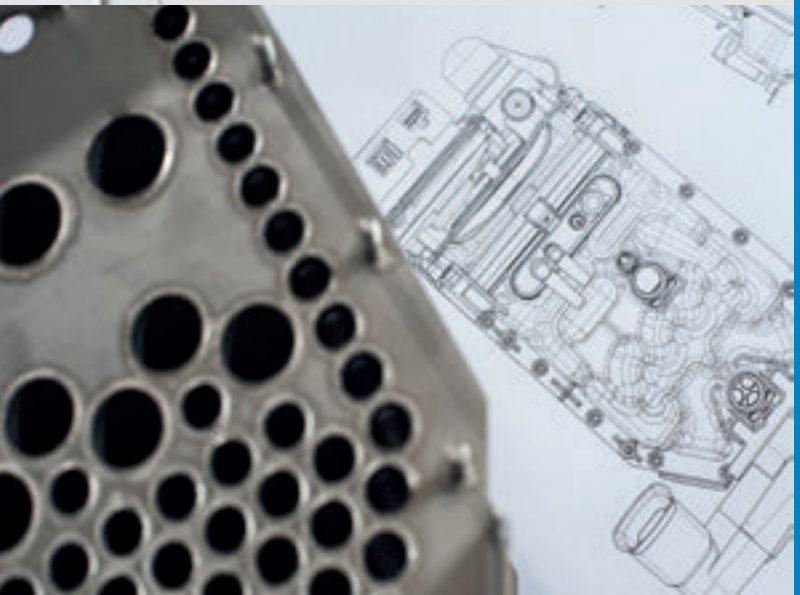

Appliance Technical Guide

SERVICE ENGINEER EDITION

ATAG
HEATING TECHNOLOGY

The heating industry has just had an upgrade

Now you have too

We will help you grow and protect your business.

Contents

Appliances covered and serial number

MODEL	GC NUMBER
iC 24 Combination Boiler	47-310-19
iC 28 Combination Boiler	47-310-21
iC 36 Combination Boiler	47-310-23
iC 40 Combination Boiler	47-310-25
iC 24 Combination Boiler LPG	47-310-20
iC 28 Combination Boiler LPG	47-310-22
iC 36 Combination Boiler LPG	47-310-24
iC 40 Combination Boiler LPG	47-310-26
iC Economiser 27 Combination Boiler	47-310-27
iC Economiser 35 Combination Boiler	47-310-29
iC Economiser 39 Combination Boiler	47-310-31
iC Economiser 27 Combination Boiler LPG	47-310-28
iC Economiser 35 Combination Boiler LPG	47-310-30
iC Economiser 39 Combination Boiler LPG	47-310-32
iS 15 System boiler	41-310-20
iS 18 System boiler	41-310-22
iS 24 System boiler	41-310-24
iS 32 System boiler	41-310-26
iS 40 System boiler	41-310-28
iS 15 System boiler LPG	41-310-21
iS 18 System boiler LPG	41-310-23
iS 24 System boiler LPG	41-310-25
iS 32 System boiler LPG	41-310-27
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iR 15 Regular boiler	41-310-32
iR 18 Regular boiler	41-310-34
iR 24 Regular boiler	41-310-36
iR 32 Regular boiler	41-310-38
iR 40 Regular boiler	41-310-40
iR 15 Regular boiler LPG	41-310-33
iR 18 Regular boiler LPG	41-310-35
iR 24 Regular boiler LPG	41-310-37
iR 32 Regular boiler LPG	41-310-39
iR 40 Regular boiler LPG	41-310-41

SERIAL NUMBER: P144040766				
P	14	40	4	0766
	YEAR	WEEK	DAY	No.

iC & iC Economiser combination boilers technical data

iC COMBINATION BOILERS	iC24	iC28	iC36	iC40
Part number	BC100124	BC100128	BC100136	BC100140
ErP Seasonal space heating energy efficiency class	A	A	A	A
ErP Seasonal space heating energy efficiency (%)	94	94	94	94
ErP Water heating energy efficiency class	A	A	A	A
ErP Water heating energy efficiency (%)	85	84	90	90
ErP Declared load profile DHW	XL	XL	XL	XL
DHW input (kW)	26.6	30.3	39.3	42.0
CH output (kW)	23.2	23.2	31.2	31.2
Hot water flow rate @ 35°C rise (l/min)	10.1	11.5	14.9	16.2
SEDBUK 2009 (%)	89.7	89.7	89.7	89.7
Dimensions (H x W x D) (mm)	700 x 440 x 355	700 x 440 x 355	700 x 440 x 355	700 x 440 x 355
Boiler lift weight with jig (Kg)	41	41	44	44
Standard warranty (years)	10	10	10	10
LPG conversion kit available	Yes	Yes	Yes	Yes
NOx class	6	6	6	6
Ingress protection (IP)	IPX4D	IPX4D	IPX4D	IPX4D
Maximum equivalent horizontal flue length (m) 60/100mm	18	18	6	6
Maximum equivalent vertical flue length (m) 60/100mm	18	18	6	6
Maximum equivalent horizontal flue length (m) 80/125mm	50	50	45	45
Maximum equivalent vertical flue length (m) 80/125mm	50	50	45	45

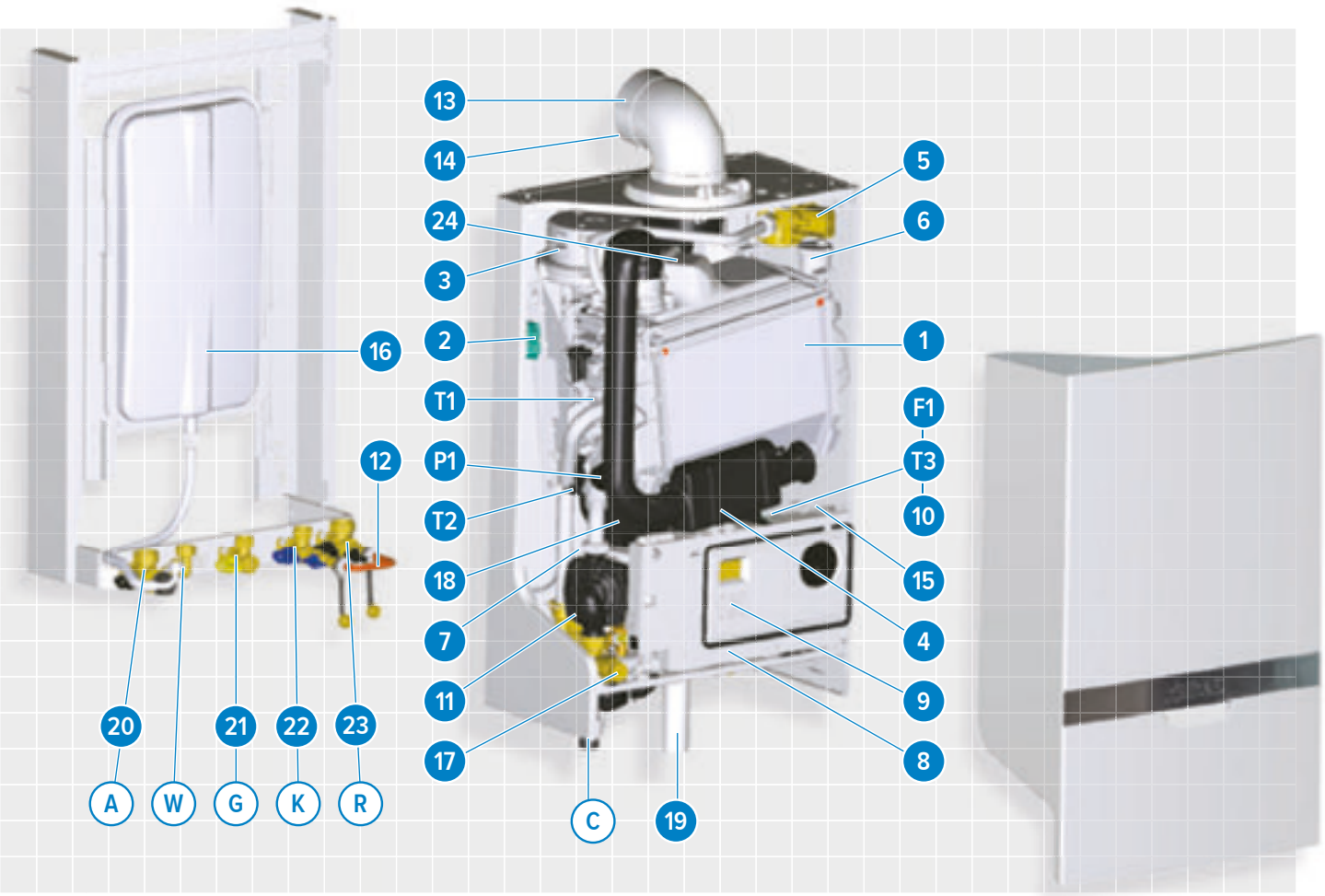
iC ECONOMISER COMBINATION BOILERS	iC Economiser 27	iC Economiser 35	iC Economiser 39
Part number	BE200127	BE200135	BE200139
ErP Seasonal space heating energy efficiency class	A	A	A
ErP Seasonal space heating energy efficiency (%)	94	94	94
ErP Water heating energy efficiency class	A	A	A
ErP Water heating energy efficiency (%)	94	96	96
ErP Declared load profile DHW	XXL	XXL	XXL
DHW input (kW)	29.8	40.3	42.5
CH output (kW)	23.2	31.2	31.2
Hot water flow rate @ 35°C rise (l/min)	12.6	16.1	17.0
SEDBUK 2009 (%)	89.7	89.7	89.7
Dimensions (H x W x D) (mm)	700 x 440 x 355	700 x 440 x 355	700 x 440 x 355
Boiler lift weight with jig (Kg)	43	46	46
Standard warranty (years)	10	10	10
LPG conversion kit available	Yes	Yes	Yes
NOx class	6	6	6
Ingress protection (IP)	IPX4D	IPX4D	IPX4D
Maximum equivalent horizontal flue length (m) 60/100mm	18	6	6
Maximum equivalent vertical flue length (m) 60/100mm	18	6	6
Maximum equivalent horizontal flue length (m) 80/125mm	50	45	45
Maximum equivalent vertical flue length (m) 80/125mm	50	45	45

iS system and iR regular boilers technical data

iS SYSTEM BOILERS	iS15	iS18	iS24	iS32	iS40
Part number	BS300115	BS300118	BS300124	BS300132	BS300140
ErP Seasonal space heating energy efficiency class	A	A	A	A	A
ErP Seasonal space heating energy efficiency (%)	93	93	94	94	94
CH output kW (50/30°C)	14.7	17.5	23.2	31.2	38.8
SEDBUK 2009 (%)	89.8	89.8	89.8	89.8	89.8
Dimensions (H x W x D) (mm)	700 x 440 x 355	700 x 440 x 355	700 x 440 x 355	700 x 440 x 355	700 x 440 x 355
Boiler lift weight with jig (Kg)	39	39	39	42	42
Standard warranty (years)	10	10	10	10	10
LPG conversion kit available	Yes	Yes	Yes	Yes	Yes
Solar compatible	Yes	Yes	Yes	Yes	Yes
NOx class	6	6	6	6	6
Ingress protection (IP)	IPX4D	IPX4D	IPX4D	IPX4D	IPX4D
Maximum equivalent horizontal flue length (m) 60/100mm	18	18	18	6	6
Maximum equivalent vertical flue length (m) 60/100mm	18	18	18	6	6
Maximum equivalent horizontal flue length (m) 80/125mm	50	50	50	45	45
Maximum equivalent vertical flue length (m) 80/125mm	50	50	50	45	45

iR REGULAR BOILERS	iR15	iR18	iR24	iR32	iR40
Part number	BR400115	BR400118	BR400124	BR400132	BR400140
ErP Seasonal space heating energy efficiency class	A	A	A	A	A
ErP Seasonal space heating energy efficiency (%)	94	94	94	94	94
CH output kW (50/30°C)	14.7	17.5	23.2	31.2	38.8
SEDBUK 2009 (%)	89.8	89.8	89.8	89.8	89.8
Dimensions (H x W x D) (mm)	700 x 440 x 355	700 x 440 x 355	700 x 440 x 355	700 x 440 x 355	700 x 440 x 355
Boiler lift weight with jig (Kg)	32	32	32	35	35
Standard warranty (years)	10	10	10	10	10
LPG conversion kit available	Yes	Yes	Yes	Yes	Yes
Solar compatible	Yes	Yes	Yes	Yes	Yes
NOx class	6	6	6	6	6
Ingress protection (IP)	IPX4D	IPX4D	IPX4D	IPX4D	IPX4D
Maximum equivalent horizontal flue length (m) 60/100mm	18	18	18	6	6
Maximum equivalent vertical flue length (m) 60/100mm	18	18	18	6	6
Maximum equivalent horizontal flue length (m) 80/125mm	50	50	50	45	45
Maximum equivalent vertical flue length (m) 80/125mm	50	50	50	45	45

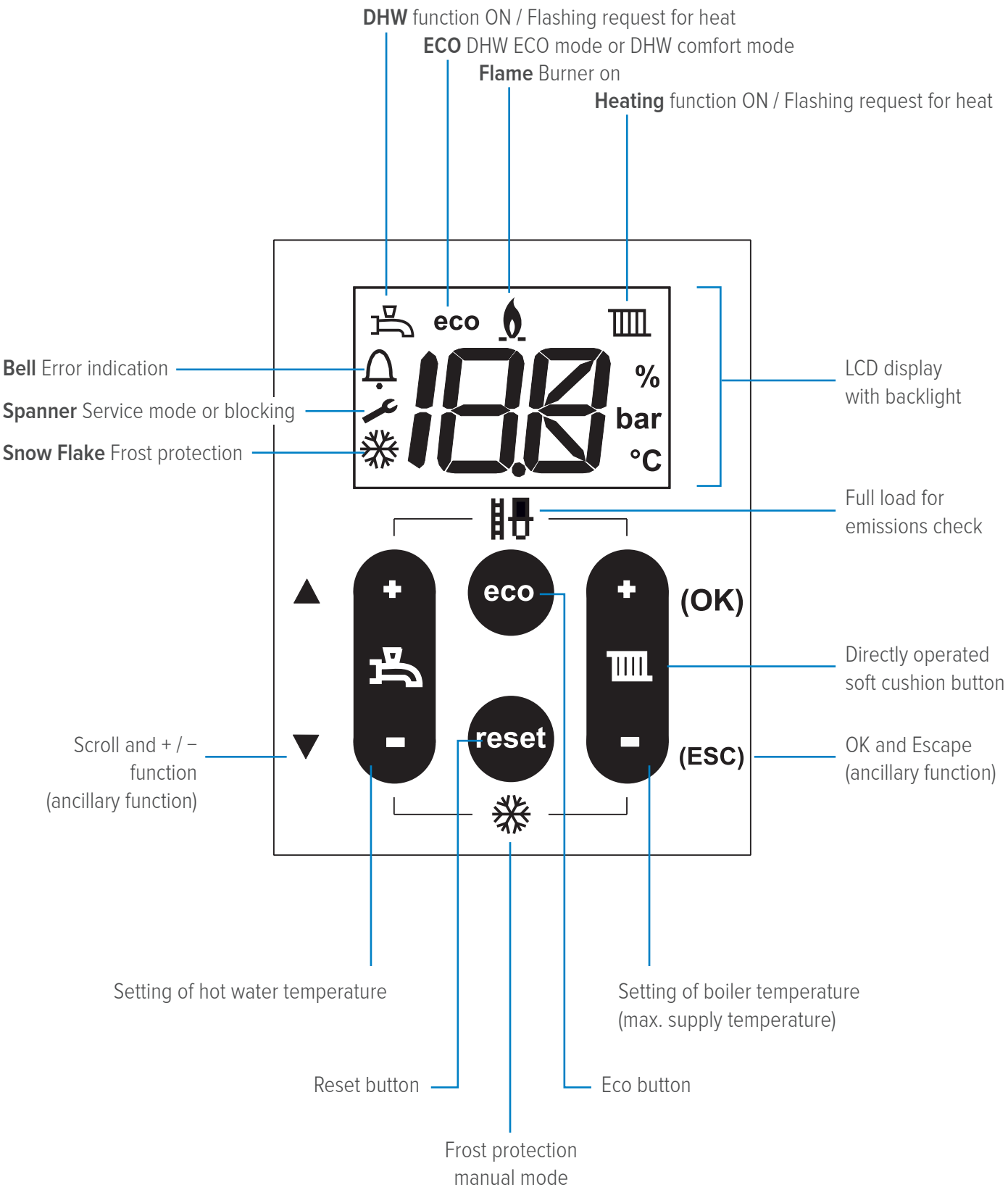
Boiler layout



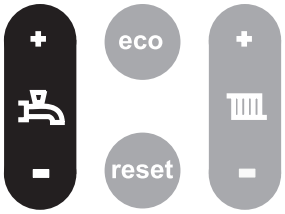
iC ECONOMISER COMBINATION BOILER LAYOUT					
1	Heat exchanger	9	Control panel	17	Safety valve
2	Ignition unit	10	Three-way valve	18	DHW Economiser
3	Fan unit	11	Circulation pump	19	Siphon
4	Air supply damper	12	Filling loop	20	Isolation valve flow CH
5	Gas valve	13	Flue gas exhaust	21	Isolation valve gas
6	Automatic de-aerator	14	Combustion air supply	22	Isolation valve cold water
7	DHW plate heat exchanger	15	Boiler data plate	23	Isolation valve return CH
8	Control unit	16	Expansion vessel	24	Flue non return valve

T1	Flow sensor	P1	Water pressure	C	Condensation pipe
T2	Return sensor	G	Gas pipe	K	Cold water pipe
T3	Hot water sensor	A	Flow pipe CH	W	Hot water pipe
F1	DHW flow sensor	R	Return pipe CH		

Control panel (All ATAG boiler range)

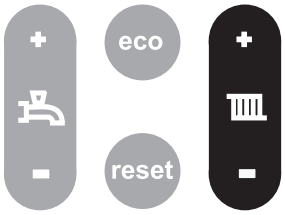


Controls and explanation of the functions



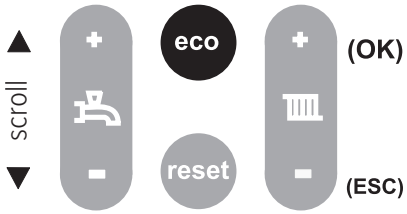
Hot water temperature

Setting the hot water temperature:
Briefly press **+** or **-** ; the display will show the flashing pre-set value;
Briefly press **+** or **-** to change the set value. Each change becomes active directly.
Hot water program OFF: Press **-** until the lowest value is reached and then press **-** again, **--** appears in the display.
The will disappear from the display
Switching on works in reverse order.
(combi boiler only)



Central heating temperature

Setting the CH water temperature:
Briefly press **+** or **-** ; the display will show the flashing pre-set value;
Briefly press **+** or **-** to change the set value. Each change becomes active directly.
CH program OFF: Press **-** until the lowest value is reached and then press **-** again, **--** appears in the display.
The will disappear from the display
Switching on works in reverse order.

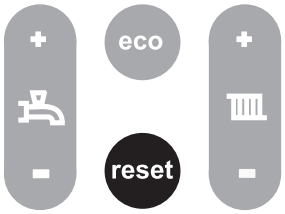


Boiler Information

By pressing the **eco** button for 6 seconds the display changes to info mode

A0: Flow water temperature in °C
A1: Return water temperature in °C
A2: DHW temperature in °C (combi or system boiler with 3-port kit only)
A3: T-set temperature (calculated) in °C
A4: Flue gas temperature (only if a flue gas sensor is connected) in °C
A5: Outside temperature (only if an outside sensor is connected) in °C
A6: Water pressure in bar (combi & system boilers only)
A7: DHW flow rate in l/min (combi only)
A8: Ionisation current in µA.
A9: rpm of fan (x100)

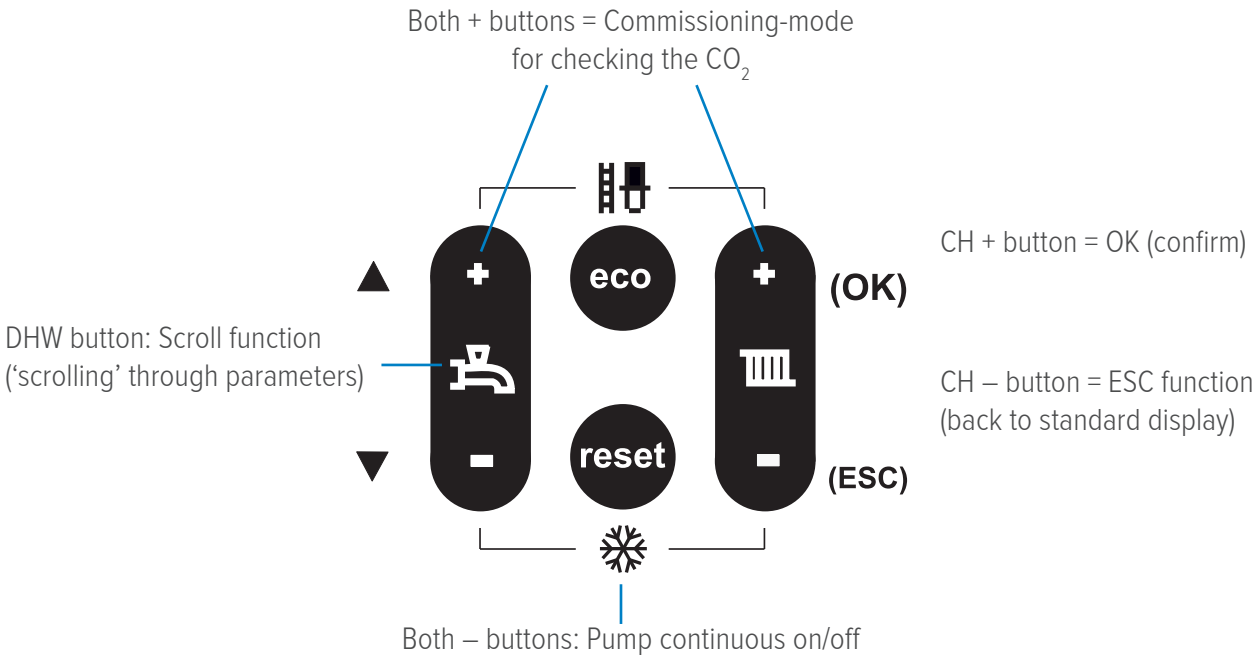
To return to the standard view press **ESC**.



Reset button

The reset button allows the boiler to restart if an error has occurred.
In case of an error the symbol is displayed with a XXX code.
In other cases the reset button does not function and will not respond to operation.

Ancillary functions



Hot water supply

The DHW program is always active after start-up.
This is indicated by a solid . The boiler will fire up for DHW because of the comfort setting.
If there is hot water request, this is indicated by a flashing and the hot water supply will be activated. The circulation pump will start circulating and the burner will switch on .
(combi boiler or system boilers with ATAG 3-port diverter kit)

Comfort and eco

By default the hot water supply is set to comfort
(keep hot facility 50°C).
A change to eco is possible by means of pressing the **eco** button.
On the display appears '**eco**'.
The eco-position will result in a possible longer DHW waiting time, because the boiler will not being fired up for pre-heating the hot water supply.

CH system

The CH program is always active after start-up.
This is indicated by a solid .
If there is heat request, it is indicated by a flashing and the heating will be put into operation .
The circulation pump will switch on and the boiler will switch on after 1 to 2 minutes.
When there is no more heat requested the radiator symbol may be solid or flashing, but the flame symbol will disappear.
The pump will continue to run for 60 seconds due to the pump over run feature.

Frost protection

Danger of frost

If there is danger of frost damage to the CH installation and there is no outside sensor connected, it is advisable to let the pump run continuously.
By pressing both **-** buttons at the same time for 6 seconds the pump can be switched on continuously.
If the pump is set to continuously this is displayed by a solid .

Installation frost protection

If an outside sensor is connected, then the controls will regulate the pump:
- In case of outside temperatures between +1.5 and -5°C the pump will run for 10 minutes every 6 hours.
- In case of outside temperatures below -5°C the pump will run in frost protection mode.

Boiler frost protection

If there is no outside sensor connected, and if the (T1) flow sensor registers a temperature of 5°C or below in the boiler, the boiler will fire up. The boiler keeps on firing until the temperature reaches 10°C (measured on the flow sensor) and the boiler switches off again.
In this mode the symbol will flash.

Pump kick and diverter valve kick

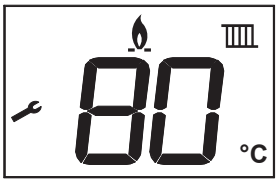
Every 24 hours, if there is no heat demand from heating or DHW the pump will be started for 10 seconds and the diverter valve will be opened and closed again.
This is done to prevent the pump and diverter valve from sticking.

Boiler anti-cycle time

If during a demand for central heating the burner switches off, because the desired flow temperature is exceeded, there will be an anti-cycle time in operation for 5 minutes. This means that the burner switches on again after 5 minutes if there is still a demand for the heating.

Pump overrun

After the heating demand the burner will shut down and the pump will run for a further 60 seconds.



Service chimney sweep mode

To enter the service chimney sweep mode you hold the two **+** buttons for 6 seconds
When the flame symbol appears in the display, press both **+** buttons again for 6 seconds.

- The display shows the supply water temperature (appears in the display)

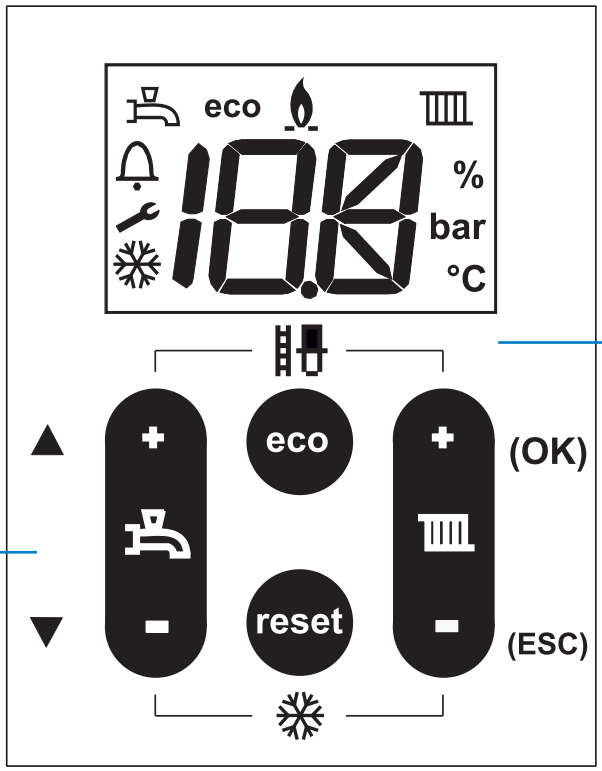
Press 1x the **eco** button; the display shows XX% (heating capacity)

Then with the **+ / -** button for DHW you can go to a different load, anything between full (100%) and low load (0%)

Turning off chimney sweep mode:

- Press the **ESC** button (button)
- The device switches off
- The display shows for 2 seconds code 180 or 181

The chimney sweep mode lasts for 8 minutes



Full load for emissions check

Scroll and **+ / –** function (ancillary function)

Boiler de-aeration program

Combi boiler
The boiler is equipped with an automatic boiler de-aeration program.

The installation system needs to be filled with water and bled free of air before turning power onto the boiler. Then the automatic de-aeration program will ensure that the boiler is free of air before firing up.

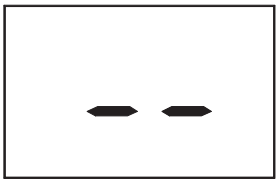
The automatic de-aeration program starts when the water pressure in the boiler gets to 1.1 bar. The complete program for the boiler de-aeration takes 7 minutes.

During this 7 minutes, the pump is started and stopped and the three way diverter valve is alternately sent to the heating and to the DHW position several times and with short pauses to make sure that the air inside the boiler leaves through the automatic air vent.

System boiler
Same as combi, but there is no internal diverter valve to move.

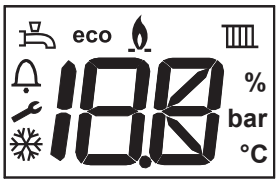
Regular boiler
Same as combi, but there is no diverter valve to move or a pressure reading and there is a feed & expansion tank.

Commissioning function

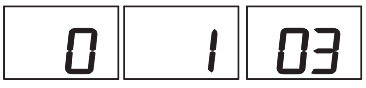


1. Turn on the boiler electrical supply
2. When the boiler starts up for the first time the following will be shown:

- - (power on)



All digits (segment test)



0 (parameter 9: from factory 0)
1 (boiler type: parameter 8)
03 followed by 07 (software version part 1 and software version part 2)

3. The code 105 appears on the display; The 7 minute de-aeration cycle starts
4. Vent the entire heating installation starting at the lowest point
5. Check the water pressure and top up if necessary to 1.0 – 1.2 bar
6. Check the filling loop if it is closed

Water pressure sensor

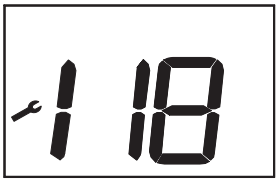
The iC, iC Economiser & iS boilers are supplied with a pressure sensor. This sensor control has following settings:

Prior to P1627xxxxx the reading are:

0.7 bar: below this pressure the burner is blocked for operation
0.7 to 1.0 bar: boiler output reduced to 80%
1.0 to 3.0 bar: boiler fully functional
3.0 bar: above this pressure the boiler is blocked for operation.

After P1628xxxxx the reading are:

0.5 bar: below this pressure the burner is blocked for operation
0.5 to 0.8 bar: boiler output reduced to 80%
0.8 to 3.0 bar: boiler fully functional
3.0 bar: above this pressure the boiler is blocked for operation.



If the water pressure drops below 0.8 bar code 118 will appear in the display; The boiler will stay in operation with a limited output (80%) until the pressure drops below 0.5 bar where the boiler will then shut down.

This will disappear again the moment the water pressure is higher than 1.1 bar and the de-aeration program will start (code 105).

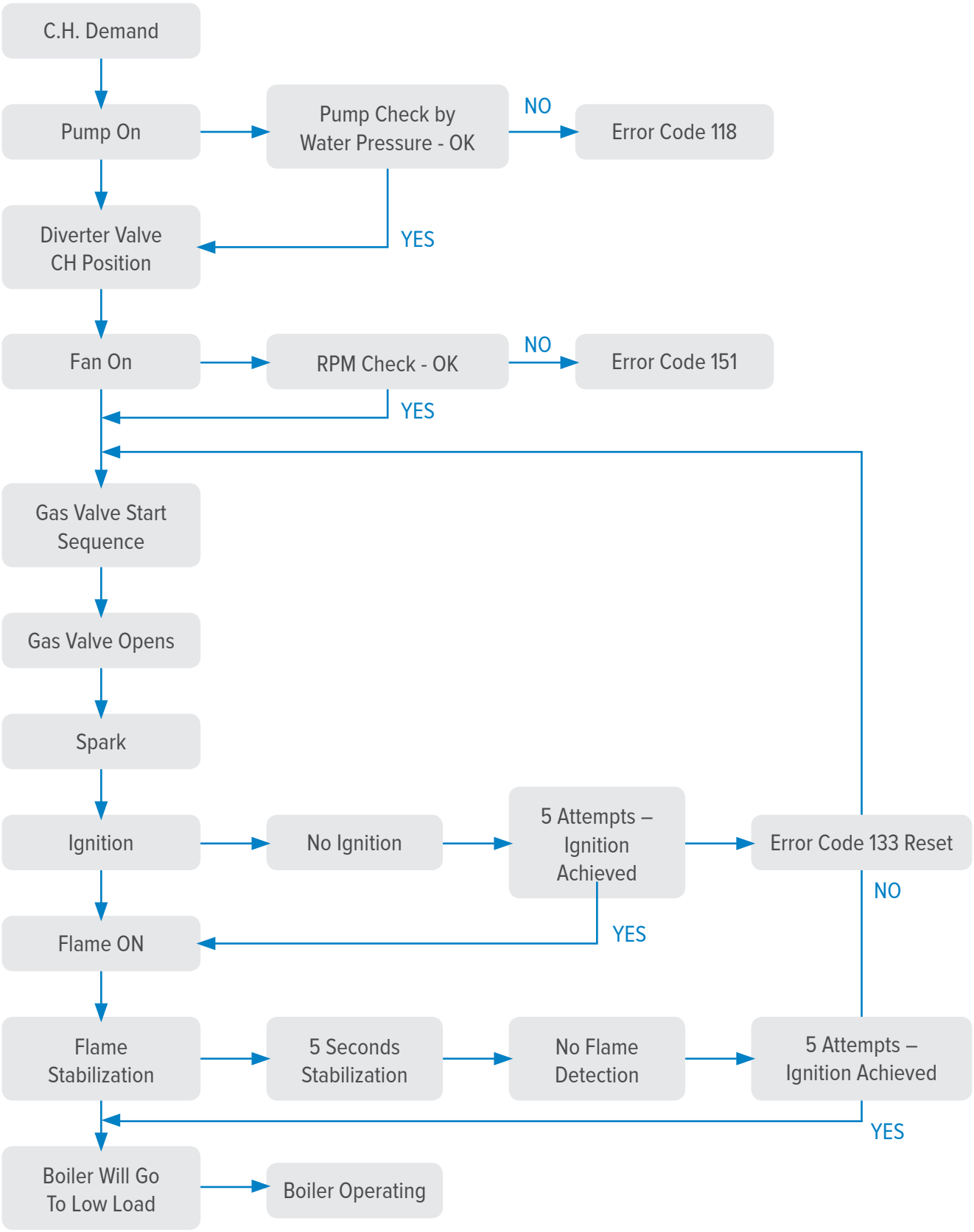
This will take approx. 7 minutes and will be followed by the default display (**OK**).

The boiler will switch on immediately to reach the desired pre-heat temperature (approx. 50°C) of the hot water supply (comfort setting).

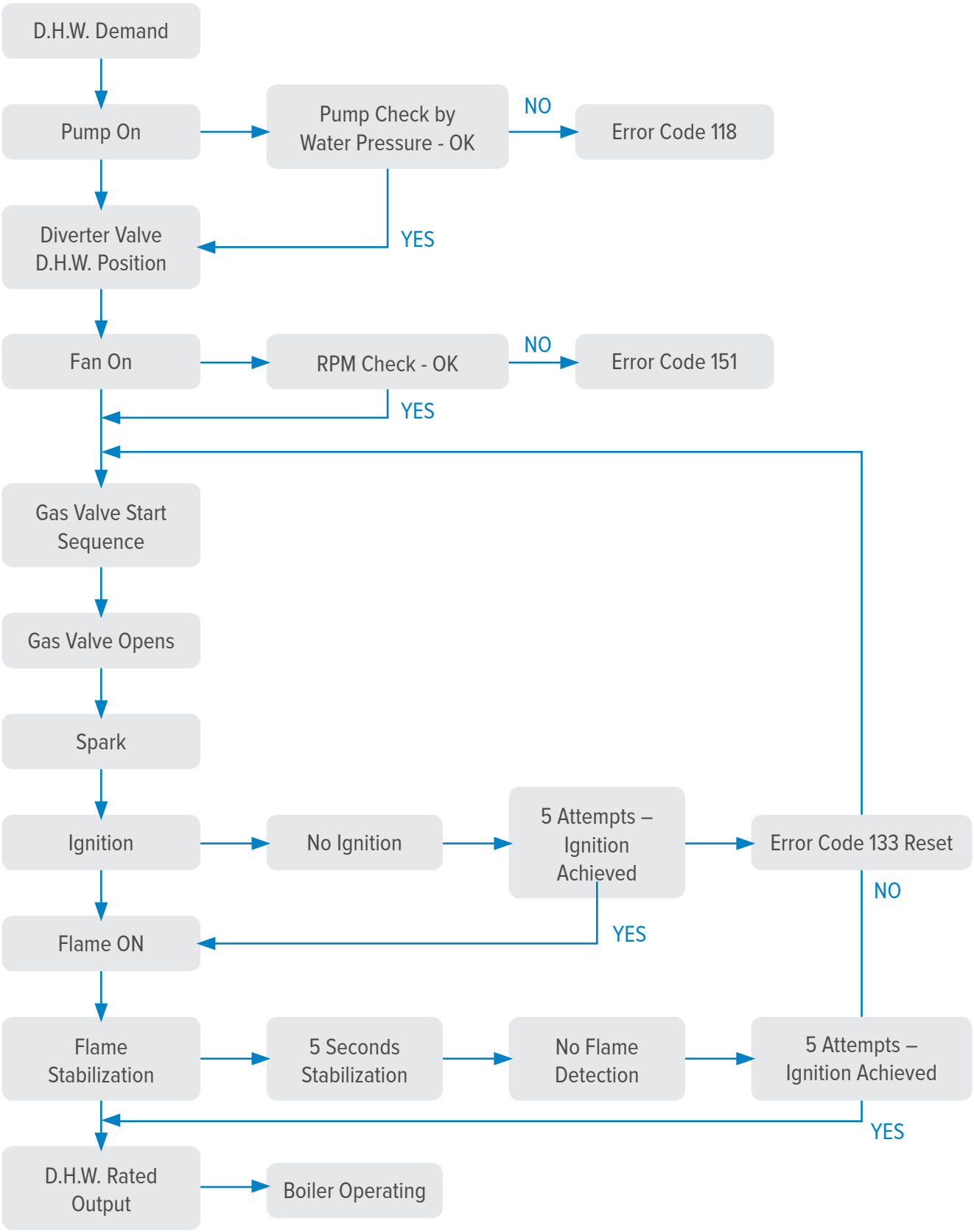
Flow switch (regular boiler)

In the regular boiler there is no pump inside and because of the low pressure there is no pressure sensor inside as well. To register if the system pump is working and there is water in the system there is a flow switch and this flow switch sets the burner free.

Combi boiler central heating mode (CH)



Combi boiler hot water mode (DHW)



Combi boiler CH mode

CH controls
With a demand from the heating controls after DHW demand, the boiler activates its 1 minute delay period. This is to prevent the heat exchanger from losing its heat too quickly in the event of a hot water demand.

Then the pump starts and after 30 seconds the gradient control becomes active and the boiler fires up. The starting point of the gradient control is the currently existing flow temperature. A Delta-T control (25K) ensures a stable control according to heat request.

If the flow temperature is below the T-set value of 20°C the boiler will immediately start.
If during a demand from the heating the burner switches off, because the desired flow temperature is exceeded, there will be an anti-cycle time in operation for 5 minutes.

This means that the burner switches on again after 5 minutes if there is still a demand from the heating.

Combi boiler DHW mode

DHW controls (combination boilers)
If a hot water tap is opened the flow sensor measures (F1) the amount drawn off.

Depending on the desired DHW temperature and volume the controls will calculate an output. This realises the desired water temperature in an efficient way. The hot water sensor (T3) will adjust any minor deviations caused by temperature fluctuations so that even under these circumstances the desired temperature is constant.

System & regular boiler central heating mode

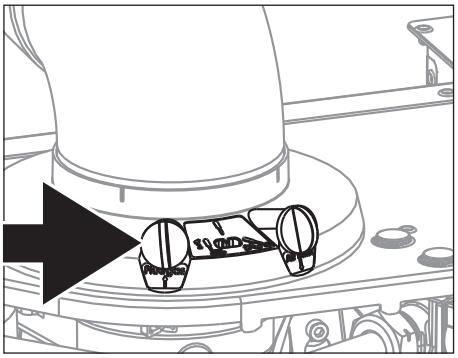
CH controls
With a demand from the heating controls, the boiler activates its 1 minute delay period. This is to prevent the heat exchanger from losing its heat too quickly in the event of a hot water demand.

Then the pump starts and after 30 seconds the gradient control becomes active and the boiler fires up. The starting point of the gradient control is the currently existing flow temperature. A Delta-T control (25K) ensures a stable control according to heat request.

If the flow temperature is below the T-set value of 20°C the boiler will immediately start.
If during a demand from the heating the burner switches off, because the desired flow temperature is exceeded, there will be an anti-cycle time in operation for 5 minutes.

This means that the burner switches on again after 5 minutes if there is still a demand from the heating.

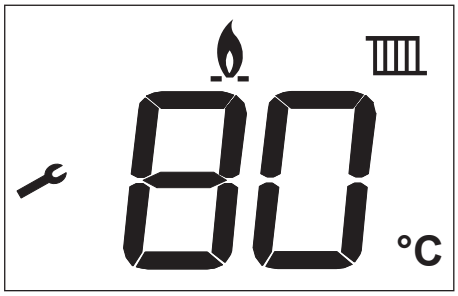
Checking combustion CO_2



The CO_2 percentage is set in the factory. This has to be checked during commissioning, inspection, maintenance and in case of a failure.

This can be verified by means of the following action:

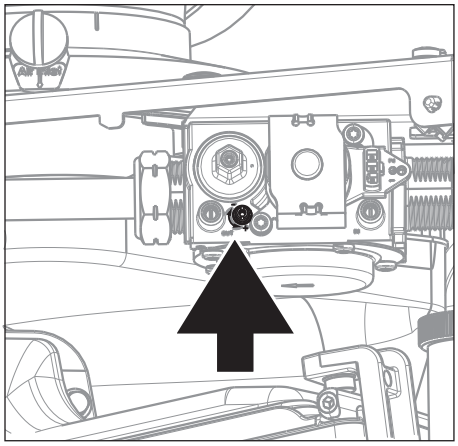
- Set the external controls to call for heat
- Make sure the boiler is operational and can get rid of the heat it produces
- Calibrate the flue gas analyser
- Place the lance of the flue gas analyser into the flue gas test point



- Press both **+** buttons for 6 seconds
  When the flame symbol and supply water temperature appears in the display the boiler will be in **max heat output CH**.

- Press 1x the **eco** - button; the display shows:
  1. Flow temp
  2. Fan speed

- Press both **+** buttons again for 6 seconds;
  The boiler will switch to **max heat output DHW** for iC range or again **max heat output CH** for iS & iR range.



- Press 1x the **eco** - button; the display shows:
  1. Flow temp
  2. XX% (heat capacity)
  3. Fan speed

Then with the **+ / -** button for DHW you can go to a different load, anything between full (100%) and low load (0%)

CO_2 High Load reading

FULL LOAD	NATURAL GAS (G20)	PROPANE GAS (G31)
CO_2	Nominal 9.0%	Nominal 10.3%
	Minimum 8.6% – Maximum 9.6%	Minimum 9.9% – Maximum 11.0%

If required, you may turn the setting screw to set the correct CO_2 percentage.

CO_2 Low Load reading

Finally, the CO_2 percentage at low load must be checked:
- Press on the **DHW** - button until the minimum value (0%) has been reached (low load)

End of measuring:

- Press the **ESC** button (▥ button).

The device switches off. The display shows for 2 seconds code 180 or 181.
This complete the procedure.

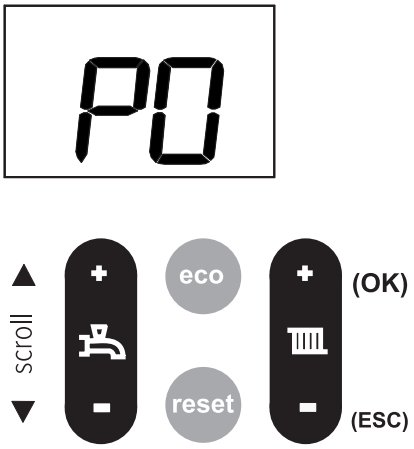
NATURAL GAS (G20)		LPG (G31)	
Full load recorded	Accepted low load range	Full load recorded	Accepted low load range
9.6%	9.3% – 7.5%	11.0%	10.9% – 8.9%
9.5%	9.2% – 7.5%	10.9%	10.8% – 8.9%
9.4%	9.1% – 7.5%	10.8%	10.7% – 8.9%
9.3%	9.0% – 7.5%	10.7%	10.6% – 8.9%
9.2%	8.9% – 7.5%	10.6%	10.5% – 8.9%
9.1%	8.8% – 7.5%	10.5%	10.4% – 8.9%
9.0%	8.7% – 7.5%	10.4%	10.3% – 8.9%
8.9%	8.6% – 7.5%	10.3%	10.2% – 8.9%
8.8%	8.5% – 7.5%	10.2%	10.1% – 8.9%
8.7%	8.4% – 7.5%	10.1%	10.0% – 8.9%
8.6%	8.3% – 7.5%	10.0%	9.9% – 8.9%
		9.9%	9.8% – 8.9%

NOTE: UNDER ALL CIRCUMSTANCES THE CO_2 AT LOW LOAD MUST BE LOWER THAN THE CO_2 AT FULL LOAD.

Boiler parameters

To check or change parameters settings, proceed as follows:

1. Press the **OK** button for 3 seconds. The display shows '**P0**'.
2. Press the **OK** button for 3 seconds again. The display shows 'on' shortly followed by '**P0**'.
3. Press the Scroll button up or down to select another parameter.
4. Press the **OK** button if you want to change the selected parameter.
5. Adjust the value if desired / possible with the **+** or **-** button (DHW button).
6. Briefly press the **OK** button to confirm the new setting.
7. The display shows the selected parameter again.
8. Press the **ESC** button until the default display is shown again.
9. If during 8 minutes no button is used, the default display is automatically shown on the screen.



PAR	FACTORY SETTING	DESCRIPTION	RANGE
PO	1	1. CH Tmax: 80°C; Gradient: 5; Heating line 24 2. CH Tmax: 70°C; Gradient: 5; Heating line 19 3. CH Tmax: 60°C; Gradient: 4; Heating line 15 4. CH Tmax: 50°C; Gradient: 3; Heating line 11	1 - 4
P1	Max	Maximum power CH in % Can only be reduced. 0 = low load	0 - max
P2	Max	Pump, max. percentage	XX - 100%
P3	Min	Pump, min. percentage	Min - XX / XX*
P4	0%	Correction factor fan speed. **DO NOT CHANGE!**	
P5	5 (NG) 0 (LPG)	Gradient speed CH	0 - 15 (0 = off)
P6	24	Heating line CH-water temperature (see also heating line graph on page 21)	1 - 30
P7	25	Summer-eco temperature (only when outside sensor is connected) Heating program switch off at set outside temperature	8 - 30
P8	2	Boiler type. **DO NOT CHANGE!** 1 = Natural gas fired boiler, 2 = Boiler with flue non-return valve, 3 = Propane gas fired boiler	1 - 3
P9	0	Service-parameter. **DO NOT CHANGE!**	

*Depending on connected type of boiler control.

Gradient speed CH

The gradient allows the boiler to increase the CH water temperature with a pre-set (parameter 5) number of degrees per minute. The number of degrees can be set between 1 and 15 per minute (factory set to 5).

The Gradient control is a calculated increase of the T-Set value. When the flow temperature is 5 degrees higher than the T-set temperature, the boiler will switch off. So if you set the max flow temperature to 80 the boiler will switch off at 85.

Scenario:
Boiler set with parameter 5 with a gradient speed CH of 5 = 5°C per minute increase.
CH T-max 80°C

If the boiler starts with 35°C flow temperature the boiler will calculate a T-set temperature using the gradient line. This will look to raise the flow temperature to 40°C after 1 minute and look to raise it a further 5°C the minute after, as an on ongoing gradient line, which is recalculated as the boiler is working. If the boiler goes past this gradient line T-set temperature by more than 5°C the boiler will switch off. The boiler 5 minute anti-cycle feature will operate. When the boiler comes back on again it will start the process off again with the new flow temperature.

A boiler / system that cannot get rid of this heat effectively will see a rapid increase in the flow temperature (more than the 5°C per minute it has been set up to do). The flow temperature will quickly go over the calculated T-set temperature (gradient) by the 5°C and would switch off.

The following gradient speed settings are recommended for each type of heating system:
1 – 2 underfloor heating
4 – 5 Radiator convectors
7 – 8 Indirect heated air heater

Setting the gradient parameter to P5 = 0

If you set this to 0, you switch off the gradient control and the T-set is the temperature set with the CH button (normally 80°C).

In this case there is no limit to the number of degrees temperature increase per minute and the boiler will try to reach its set point as quickly as possible.

So the boiler will go to full load and try to reach the set water temperature set under the CH button.
There is no restriction to the number of degrees temperature increase per minute (The brake is off). The boiler will then modulate, because the delta T is reached. The boiler will try and maintain the delta T across the heat exchanger around 20°C.

Heating line

The heating line is used when an outside sensor or ONE controller is used via a Wi-Fi connection to give an outside temperature. The boiler takes into account the outside temperature to give a calculated flow temperature to the heating system. The ONE is an OpenTherm thermostat and will overrule some settings in the boiler.
This is shown in the weather compensator section.

Summer-eco temperature

If an outside sensor is fitted, then the summer eco mode becomes active.
The summer-eco temperature is at what temperature the boiler stops operating for heating, because the temperature is higher than the set summer-eco temperature. This is based on the average outside temperature, with the calculation of the average outside temperature (Factory setting 25°C).

Weather compensator

A weather compensator can be fitted to any combi boiler in the range. It can also be fitted on a system boiler with a 3-port diverter valve and ONE controller kit. The ONE is an OpenTherm thermostat and will overrule some settings in the boiler.

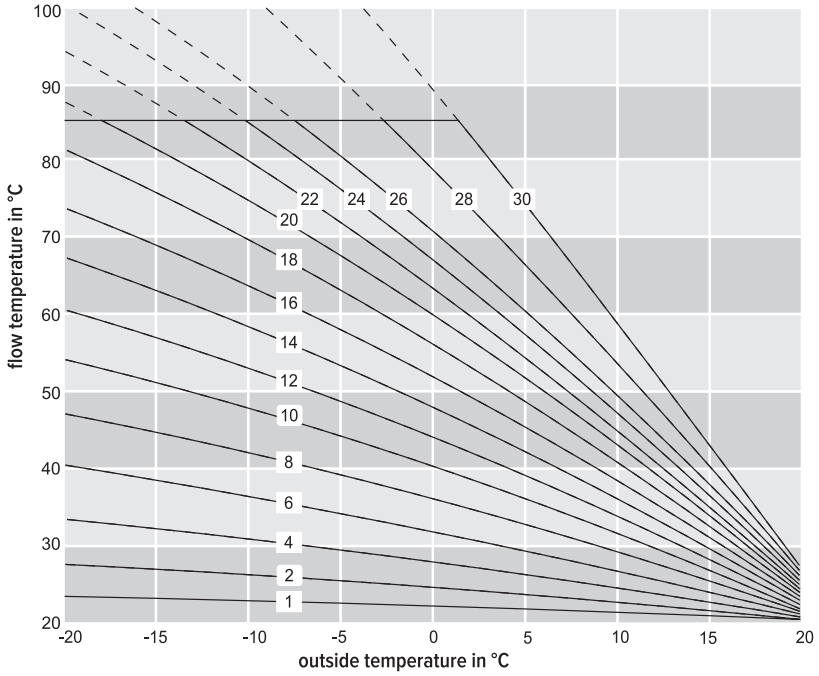
The external weather compensation probe controls the maximum primary flow temperature output to the heating circuit according to the outside temperature.

Operation:
During a central heating on period the weather compensation sensor monitors the external temperature and modulates the boiler heating output to give the correct flow temperature to maintain the required room temperature.

If the external temperature drops, then the flow temperature will increase and if the external temperature increases, then the flow temperature will decrease. This improves efficiency which reduces the amount of wasted energy and reduces gas consumption.

The radiator temperature will vary and on mild day the radiators will not feel as hot as on a cold day, this is normal and not a fault with the boiler or heating circuit. The room temperature will still be maintained as set by the room thermostat.

Installing the probe
The external probe must be installed on a North or North West facing wall (if possible) at a height of at least 3 meters from the ground. It must be in a position where it is not exposed to direct sunlight, warm air currents and cannot be tampered with. The probe can be installed horizontally or vertically to a wall or under the eaves of a roof.



Flue lengths

Concentric Flue system Ø 60 / 100mm & 80 / 125mm

BOILER	MAXIMUM HORIZONTAL OR VERTICAL EQUIVALENT FLUE LENGTH	
	(Ø 60/100mm)	(Ø 80/125mm)
iC24, iC28, iC Economiser 27 iR12, iR15, iR18, iR24 iS12, iS15, iS18, iS24	18m	50m
iC36, iC40 iC Economiser 35, iC Economiser 39 iR32, iR40 iS32, iS40	6m	45m

Dimensions flue gas system and air supply system.
Maximum equivalent flue length = distance between boiler (from elbow or vertical adapter) and the end of terminal.

FLUE BEND	EQUIVALENT FLUE LENGTH	
	(Ø 60/100mm)	(Ø 80/125mm)
87° bend resistance length	1.6m	3.0m
45° bend resistance length	1.0m	1.9m

Error codes

A detected failure is indicated on the display in blocking or error messages.

Blocking code with spanner symbol
Error is temporary and will cancel itself or will lock the boiler after several attempts (error).

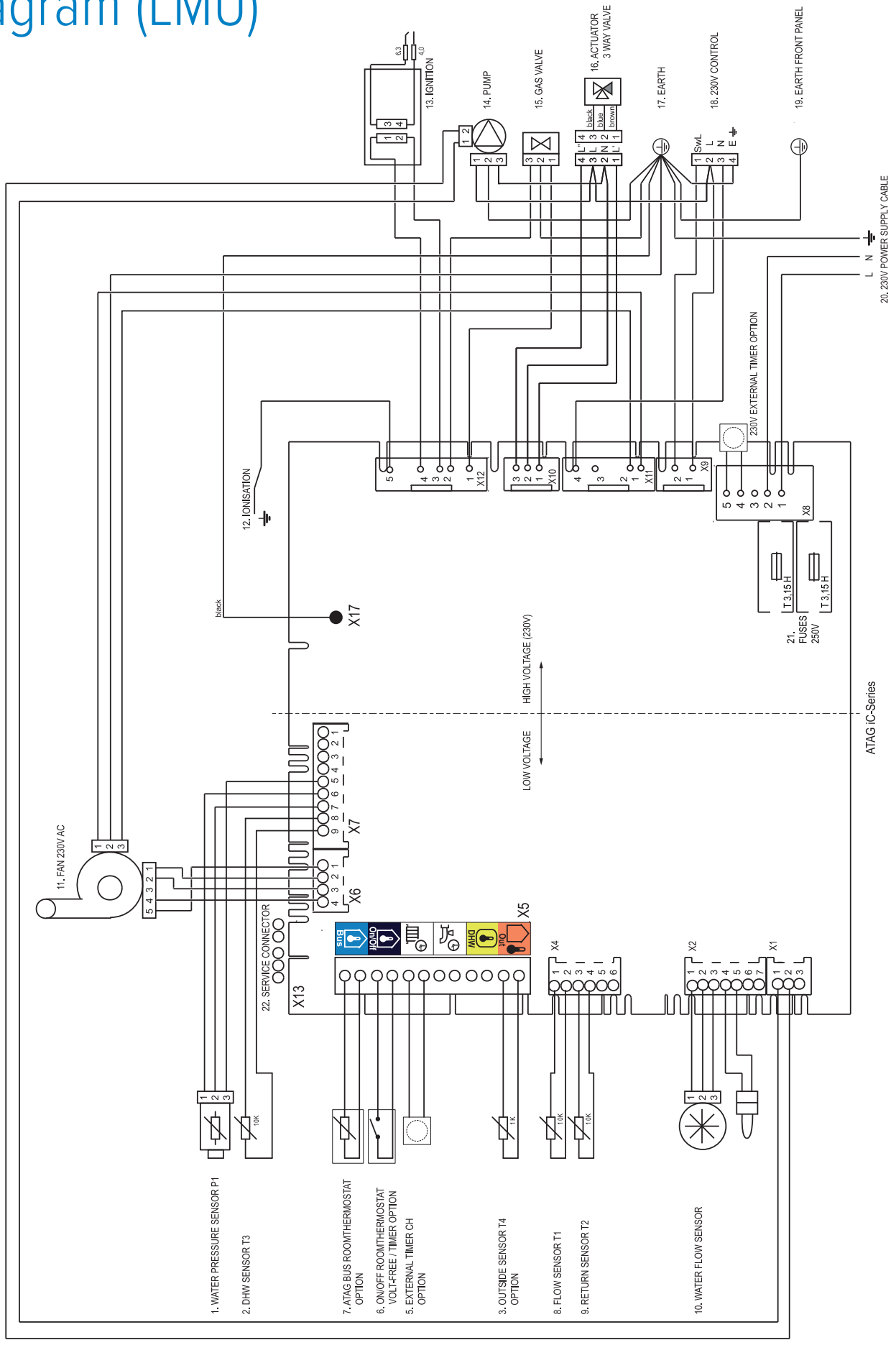
Error code with bell symbol
Error means a lock on the boiler and can only be remedied by a reset and/or intervention by a service technician.

ERROR CODE	ERROR DESCRIPTION	CHECKS
10	Outside sensor error (e.g. open, short circuit, out of range)	Check the sensor Check the wiring harness for continuity Check wiring harness not shorting to earth Check no water leaks affecting wiring harness Check connection on PCB are connected properly
20	Flow sensor error (e.g. open, short circuit, out of range)	Check the sensor not short or open circuit Check wiring harness connections between sensor & PCB
40	Return sensor error (e.g. open, short circuit, out of range)	Check the sensor not short or open circuit Check wiring harness connections between sensor & PCB
50	T3 (DHW) sensor error (e.g. open, short circuit, out of range)	Check the sensor not short or open circuit Check wiring harness connections between sensor & PCB
61	Bus communication error (contact open)	Check connection on blue connector on PCB Check connection on ONE controller back plate Check cable between ONE controller and PCB
78	Water pressure outside of range or not connected (combi & system boiler)	Check water pressure on analogue gauge Check the sensor Check wiring harness not shorting to earth Check the connection plug on top of sensor and PCB If boiler does not see a pressure rise after 6 attempts (x 10min) C118 with spanner will go to C78 with bell
105	Venting program active when power turned on or interrupted (runs approx. 7 mins.)	Wait for venting programme to finish (runs approx. 7 mins.)
110	Safety temperature exceeded	Temperature rise too fast. Check correct circulation of the water and pump
111	Maximum temperature exceeded	Check the flow sensor not short or open circuit Check correct circulation of the water and pump
117	Pressure too high (> 3 bar) or pump pressure increase too high (combi & system boiler)	Check water pressure on analogue gauge
118	Pressure too low (< 1 bar) or pump pressure increase too low (no pump detection) (combi & system boiler)	Check water pressure on analogue gauge Check 230V to pump Check pump is spinning via de-blocking centre screw Check PWM pump connection pins, cable and PCB connection X1
119	Link on X2 position 4 and 5 missing (combi & system boiler)	Check link and link connection to wiring harness Check wiring harness Check connection onto PCB X2 4 & 5
129	Fan error (fan does not start up)	Check fan and cable
133	No flame after 5 ignition attempts	Check gas supply and flue system correct (in. condensate) Check connection between gas valve and PCB Check connection between spark generator and PCB Check connections between spark generator and electrode Check sensing lead connection between electrode and PCB
151	Fan error (speed control is not achieved or is out of range) or control unit defective	Check fan and cable Check PCB
154	Flow increases too fast ΔT too large, return > flow	Check correct circulation of the water and pump Check gradient setting
164	Flow switch not closed at heat demand (system pump not running) (regular boiler)	Check flow and return are the right way round Check correct circulation of the water and pump
180	No error: shortly visible when leaving chimney sweep function	
181	No error: shortly visible when leaving commissioning mode	

Resistance table sensors

RESISTANCE TABLE SENSORS			
Outside Sensor		Flow Sensor, Return Sensor, DHW Sensor	
NTC 1k (25°C)		NTC 10k (25°C)	
Temperature (°C)	**Resistance (KΩ)**	**Temperature (°C)**	**Resistance (KΩ)**
-10	4.574	-10	55.047
-9	4.358	0	32.555
-8	4.152	10	19.873
-7	3.958	12	18.069
-6	3.774	14	16.447
-5	3.600	16	14.988
-4	3.435	18	13.674
-3	3.279	20	12.488
-2	3.131	22	11.417
-1	2.990	24	10.449
0	2.857	26	9.573
1	2.730	28	8.779
2	2.610	30	8.059
3	2.496	32	7.406
4	2.387	34	6.811
5	2.284	36	6.271
6	2.186	38	5.779
7	2.093	40	5.330
8	2.004	42	4.921
9	1.920	44	4.547
10	1.840	46	4.205
11	1.763	48	3.892
12	1.690	50	3.605
13	1.621	52	3.343
14	1.555	54	3.102
15	1.492	56	2.880
16	1.433	58	2.677
17	1.375	60	2.490
18	1.320	62	2.318
19	1.268	64	2.159
20	1.218	66	2.013
21	1.170	68	1.878
22	1.125	70	1.753
23	1.081	72	1.638
24	1.040	74	1.531
25	1.000	76	1.433
26	0.962	78	1.341
27	0.926	80	1.256
28	0.892	82	1.178
29	0.858	84	1.105
30	0.827	86	1.037
35	0.687	88	0.974
40	0.575	90	0.915

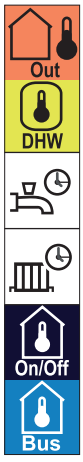
PCB electrical diagram (LMU)



PLUG	FUNCTION	PINS	VOLTAGE	RESISTANCE
X1	Pump (PWM) pulse-width modulation	1 - 2	0.6 – 4.9v DC	
X2	Water flow sensor No demand	1 – 2	4v DC	
		1 – 3	0v DC	
		2 - 3	4v DC	
	Water flow sensor DHW demand	1 – 2	4v DC	
		1 – 3	1v DC	
		2 – 3	2v DC	
	Link	4 - 5		0Ω
x4	Flow sensor T1	1 – 2		10KΩ@ 25°C
	Return sensor T2	3 - 4		10KΩ@ 25°C
x5	ATAG BUS OpenTherm controller / room thermostat option	Blue (BUS)	34v DC	
	On / Off room thermostat volt free / timer option	Black (On / Off)		
	External timer CH option	White (CH timer)		
	External timer HW option	White (HW timer)		
	DHW cylinder sensor	Yellow (DHW)		10KΩ@ 25°C
	Outside sensor T4 option	Peach (Out)		1KΩ@ 25°C
X6	Fan control			
X7	DHW sensor T3	8 – 9		10KΩ@ 25°C
	Water pressure sensor P1 (@ + 1.0bar)	5 – 6	32v DC	
		5 – 7	22v DC	
		6 - 7	11v DC	
X8	230v Power supply	1 – 2	230v	
	230v External timer option	4 – 5	230v	
X9	230v control	1 – Neutral	230v	12.4
		2 – Neutral	230v (SWL in)	
X10			DHW on / CH on	
		1 – 2	230v / 14v	
		1 – 3	30v / 230v	
		2 – 3	230v / 230v	
X11	Fan	1 – 2	230v	
	Neutral	4		
X12	Gas valve	1 - 2	100v	
	Spark generator (ignition)	3 - 4	230v	
	Ionisation probe	5		
X13	Service connector			
X17	Earth			

Volt free connections

DO NOT CONNECT 230V



COLOUR	DESCRIPTION
Peach	ATAG outside sensor (1KΩ@ 25°C)
Yellow	DHW cylinder sensor (Used with 3 port diverter kit on system boiler)
White (DHW)	ATAG programmer for DHW timer
White (CH)	ATAG programmer for CH timer
Black	On / Off room thermostat volt free / timer option
Blue	ATAG BUS OpenTherm controller / room thermostat option

ATAG 3-port external diverter valve

and ONE controller kit - CT500111 or CT500112 (iS system boiler only)

Vented hot water cylinders

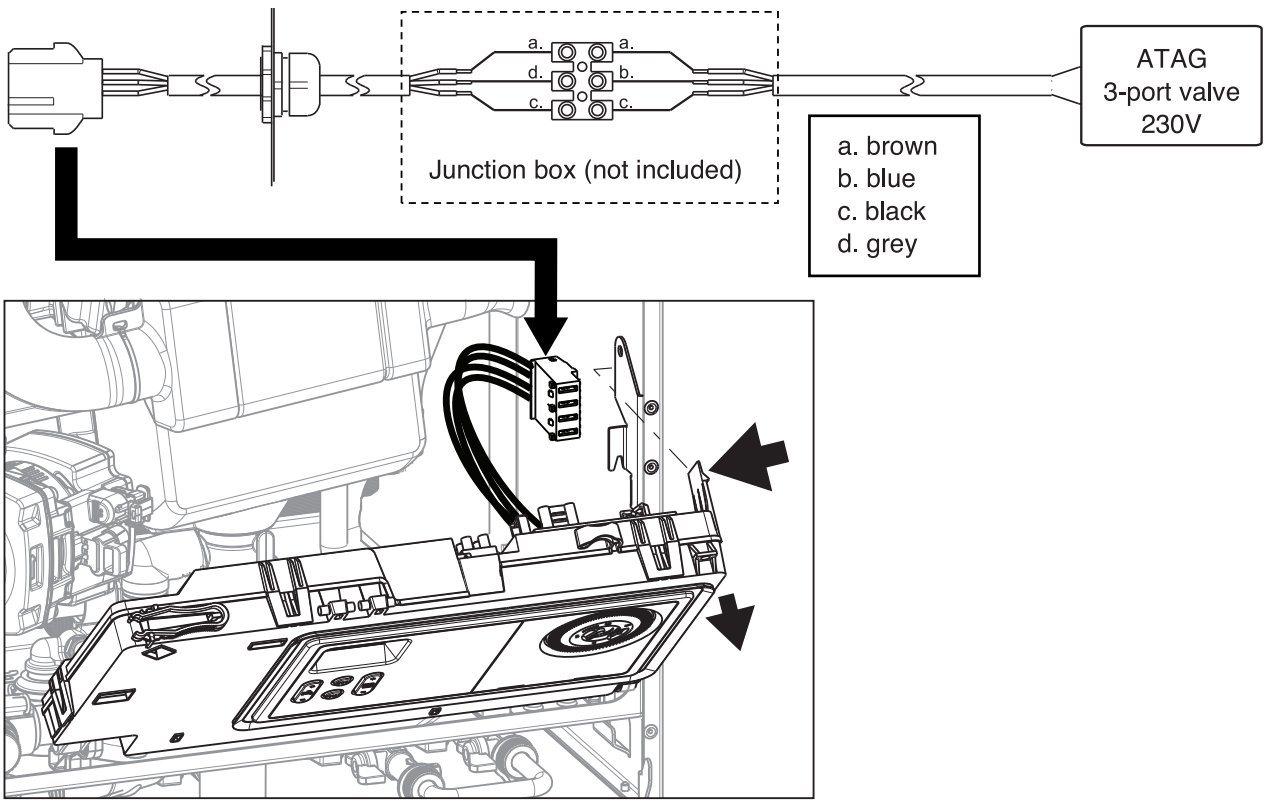
The 3-port diverted kit can only be fitted to a system boiler. The 3-port kit is fitted external to the iS system boiler and is controlled by the ONE controller to give priority to hot water. Once the cylinder stat senses the required hot water temperature and there is a call for heat the diverter valve will move to provide central heating.

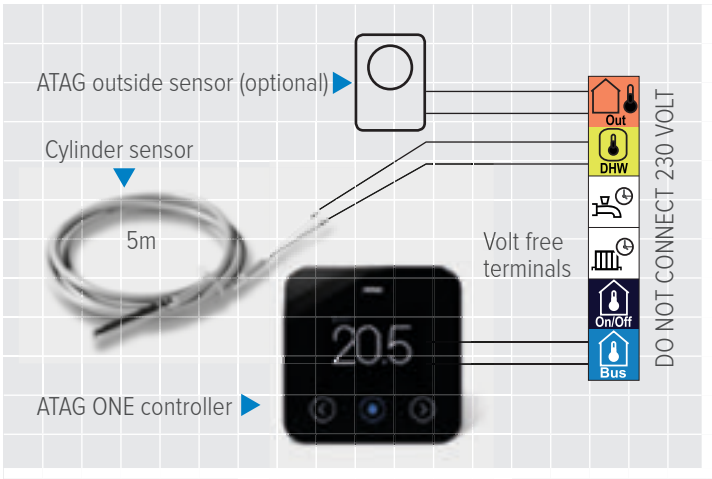
The installation will use the cylinder sensor supplied within the 3-port diverter valve kit to control the hot water temperature. Therefore no other cylinder thermostat is required.

The ONE controller will control the heating and hot water time and temperature requirements.

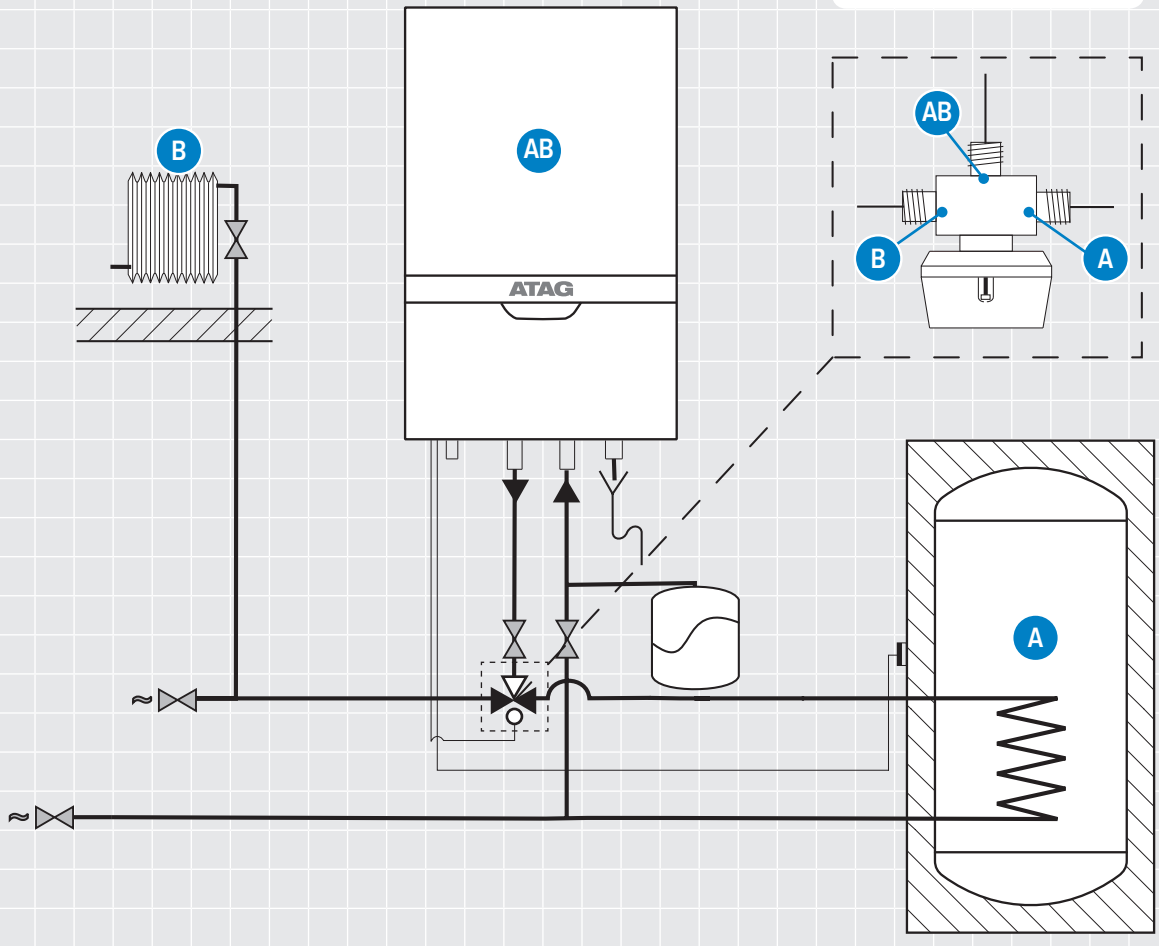
The weather compensation for heating will be controlled by the boiler and ONE controller via the internet connection and postal code weather data. An optional outside sensor (ARZ0055U) can be added to the 3-port diverter valve kit to sense the outside temperature specifically for the individual property.

When put into heating mode there the diverter is powered.
Brown & Blue 230V, Black & Blue 0V.
When put in hot water mode there is a switch of power.
Brown & Blue 230V, Black & Blue 230V.
So, hot water power put on Black & Blue, heating power taken off Black & Blue.





AB: iS system boiler
A: DHW cylinder
B: Heating system



ATAG 3-port external diverter valve kit

and ONE controller kit - CT500111 or CT500112 (iS system boiler only)

Unvented hot water cylinders

The installation may have altered wiring of the dual thermostat (depending on the cylinder manufacturer) to only use the high limit thermal cut-out of the dual thermostat.

The high limit thermal cut-out of the dual thermostat MUST be wired to interrupt the power to the 2-port valve supplied with the unvented cylinder.

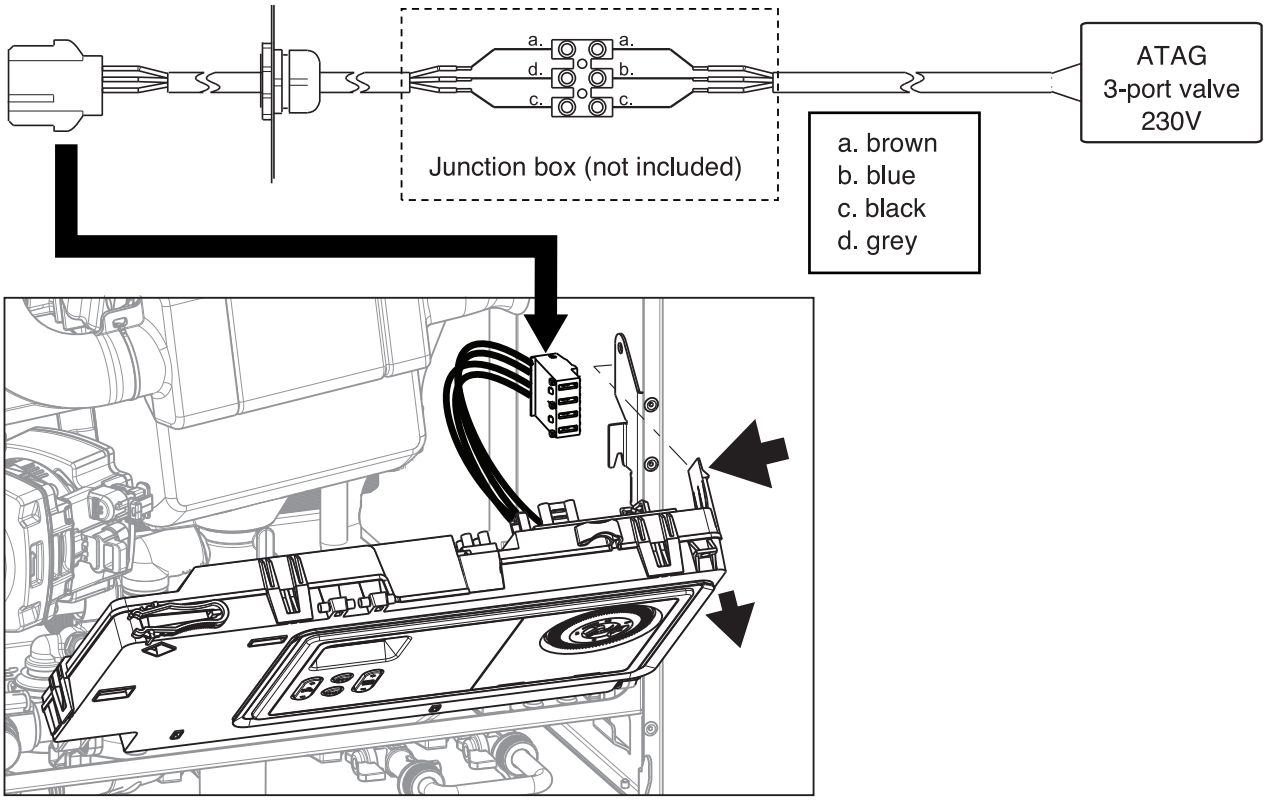
Fitting of the cylinder temperature sensor
The cylinder sensor is to be fitted into a sensor pocket of the unvented cylinder along with the dual thermostat supplied with the unvented cylinder.

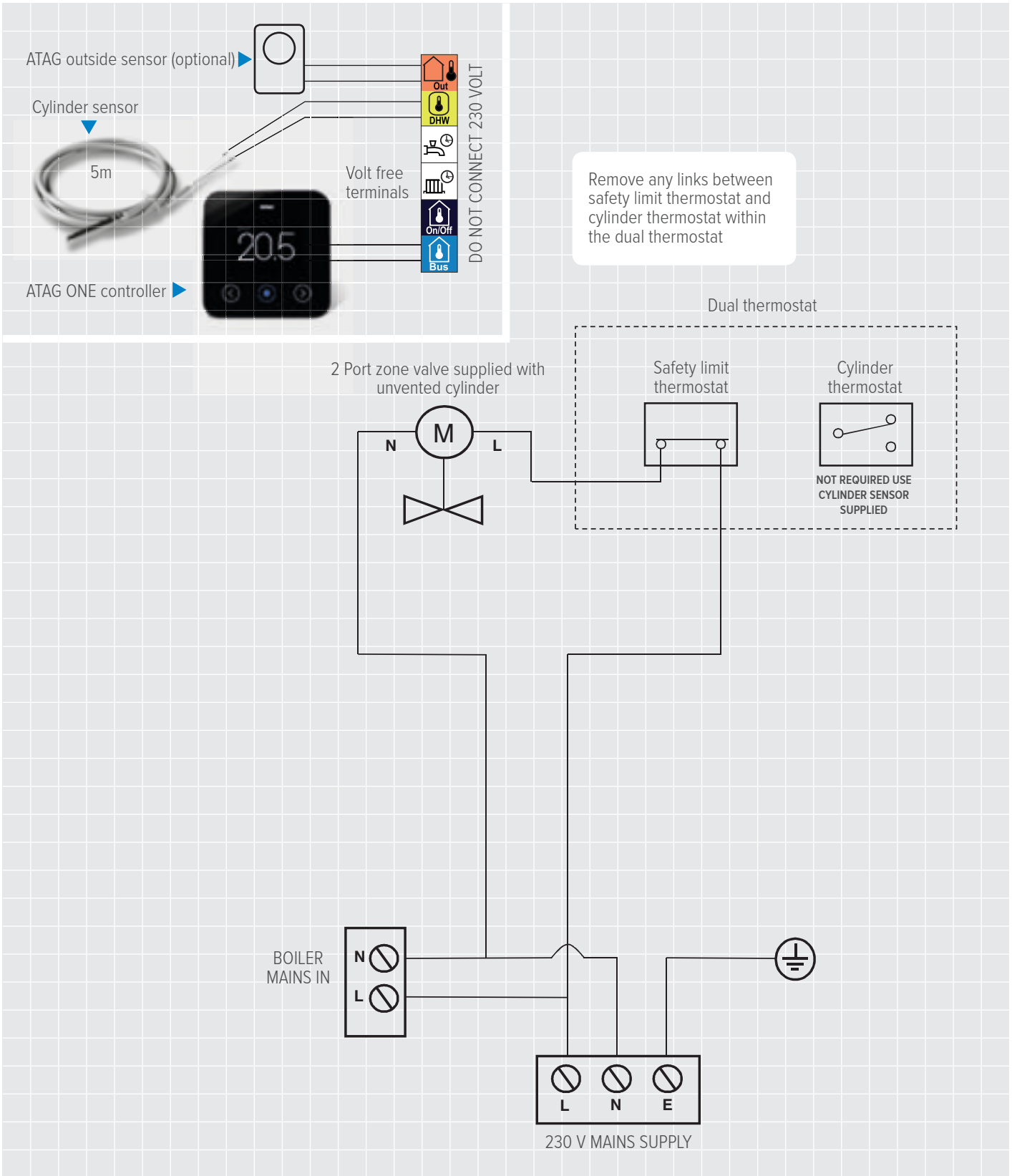
Wiring of components
The 3-port diverter valve will be connected to the spare 3-port valve connector on the wiring loom.

The cylinder sensor will be connected to the yellow connector of the DHW volt free position and the ONE control wires with the blue connector to the blue BUS volt free position on the back of the control panel.

2 port zone valve & dual thermostat (supplied with unvented cylinder)
The 2-port zone valve must be installed in the primary flow pipework between the 3-port valve and the cylinder connection as per the following diagram and G3 unvented hot water requirements.

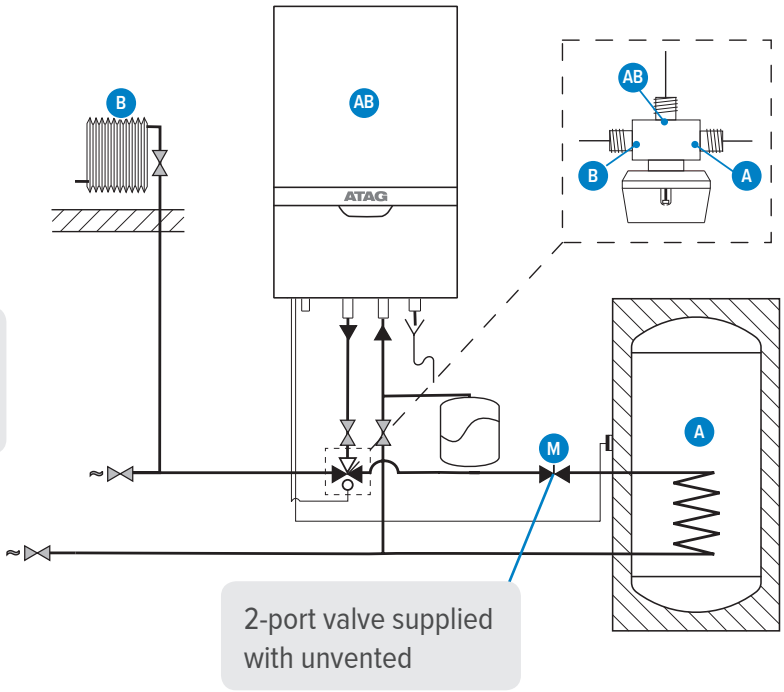
The 230v mains power supply MUST be wired only to the high limit thermal cut-out of the dual thermostat and be wired to interrupt the power to the motor of the 2-port valve as per electrical diagram below.




ATAG outside sensor (optional)
Cylinder sensor
5m
Volt free terminals
Out
DHW
On/Off
Bus
DO NOT CONNECT 230 VOLT
20.5
ATAG ONE controller
Remove any links between safety limit thermostat and cylinder thermostat within the dual thermostat
Dual thermostat
2 Port zone valve supplied with unvented cylinder
Safety limit thermostat
Cylinder thermostat
NOT REQUIRED USE CYLINDER SENSOR SUPPLIED
N
M
L
BOILER MAINS IN
N
L
L
N
E
230 V MAINS SUPPLY

3-port diverter valve

The 3-port diverter valve on the system pipework with the valve ports is the following orientation, (**AB**) port iS System boiler, (**A**) port hot water cylinder & (**B**) port heating system.



AB: iS System boiler
A: DHW cylinder
B: Heating system

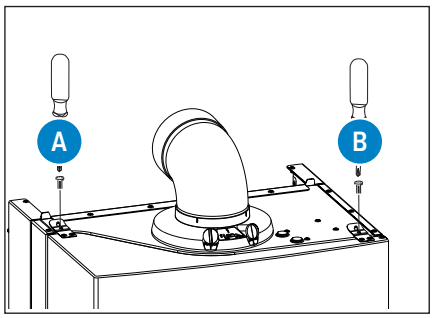
Routine servicing

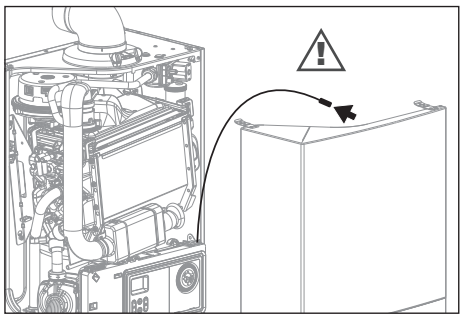
ATAG Heating Technology advises on an interim service inspection with a flue gas analyser. A full strip down service is recommended at regular intervals or where analyser readings are not within correct safety standards.

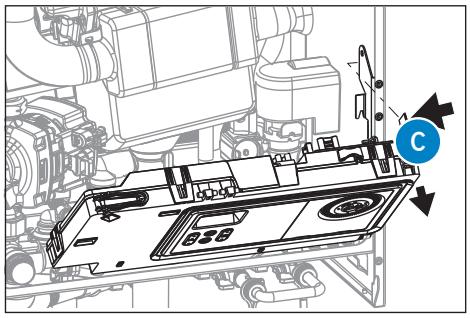
In order to perform maintenance, the following actions have to be taken:
- Switch off the electrical power to the boiler
- Remove the screws from the 2 fasteners (**A**) and (**B**)
- Unlock the fasteners (**A**) and (**B**) and remove the cover in a forward motion and remove the earth cable from the cover

⚠

NOTE THAT THERE IS AN EARTH CABLE (WHEN PRESENT) TO DISCONNECT WHEN REMOVING THE BOILER FRONT PANEL. FREE SPACE FOR REMOVING THE CONNECTOR IS ABOUT 400 MM. REMEMBER TO CONNECT THIS EARTH CABLE (WHEN PRESENT) WHEN PLACING BACK THE BOILER FRONT PANEL AND TAKE CARE THE WIRE DOES NOT GET STUCK BETWEEN FRONT PANEL AND BOILER.







Air box/cover

The cover also doubles as air box:
- Clean the air box/cover with a cloth and a non-abrasive cleaner

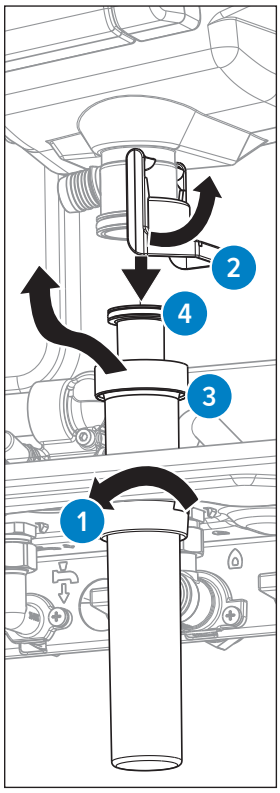
Siphon

The degree of pollution residue in the siphon is an important indication for the need of maintenance

- Turn the control unit forwards by moving the handle (**C**) slightly to the left
- Turn/pull the sealing ring (**1**) downwards
- Turn the siphon securing clip (**2**) anti-clockwise
- Pull the siphon cup (**3**) and siphon pipe (**4**) out of the heat exchanger
- Take the siphon cup and pipe out of the boiler by moving it downwards or turn it in forward motion upwards along the heat exchanger
- Clean the parts by rinsing them with water
- Check the O-ring of the siphon cup and replace it if necessary
- Grease the O-ring again with acid-free O-ring grease to simplify the reassembly

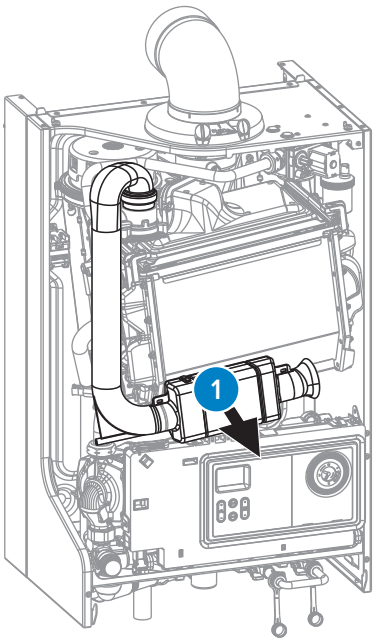
Reassembly takes place in reverse order

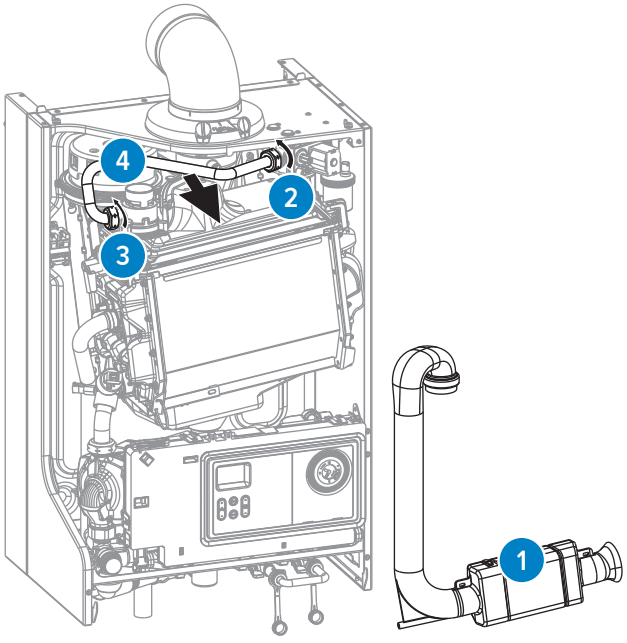
- Fill the siphon with 150 ml of water
- If a leakage has occurred to the siphon, replace the entire siphon

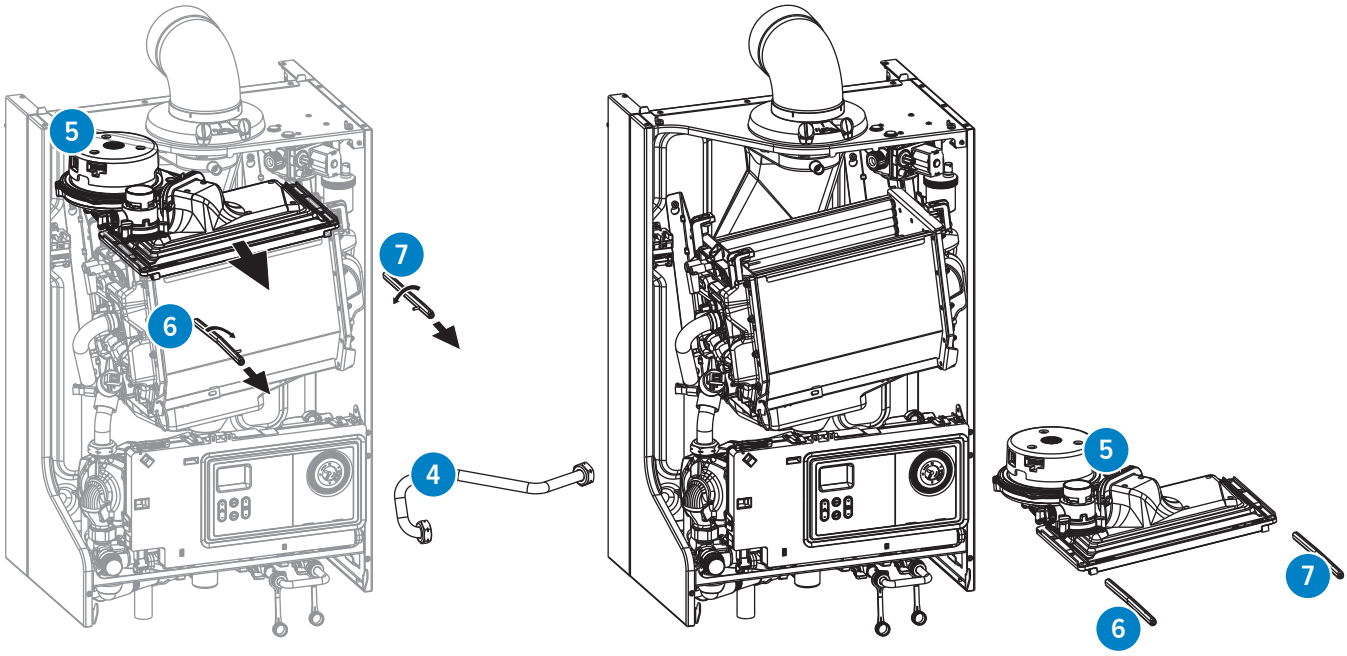


Fan unit and burner cassette

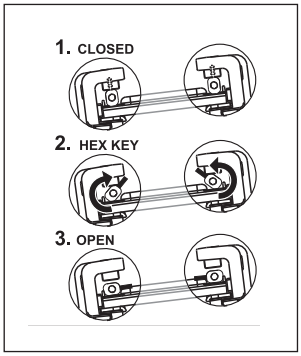
- Remove the Velcro from the silencer and remove the silencer (**1**)
- Unscrew the coupling (**2**) of the gas block and the coupling on the venturi (**3**) and remove the gas line (**4**)





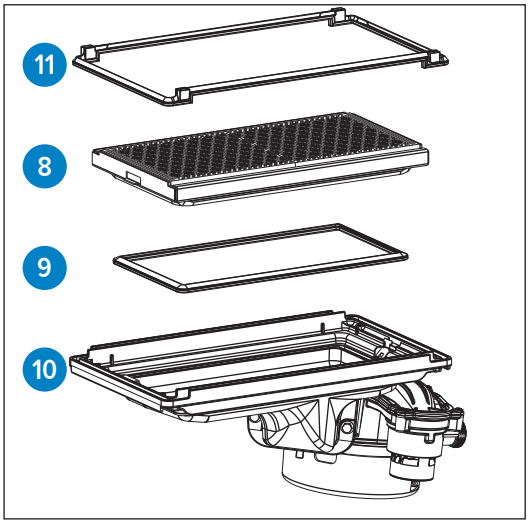


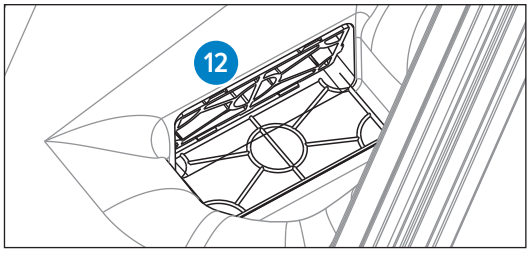
- Disconnect the electrical connections from the fan (**5**)
- Turn the left (**6**) and right (**7**) clamp bars a quarter turn with a 4mm Allen key and pull these out in a forward motion. Mind the direction of rotation (red control cams);
- Now lift the complete fan unit (**5**) with the upper tray of the heat exchanger and remove it in a forward-motion
- Turn the unit upside down and remove the burner cassette (**8**) from the ventilator unit
- Check the burner cassette for wear and tear, pollution and any breakages. Clean the burner cassette with a soft brush and vacuum cleaner
- In the case of breakages, always replace the complete burner cassette (**8**)

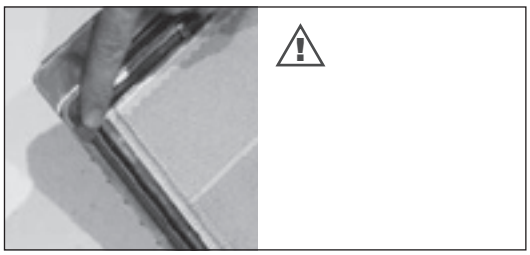


The following operations must be performed carefully in relation to the vulnerability of the non return valve.

- After removing the burner cassette (**8**) the non return valve (**12**) becomes visible. Check that the non return valve entire circumference closes / seals completely. The valve should be able to move freely from fully open to fully closed. Replace the non return valve if the valve does not seal properly.





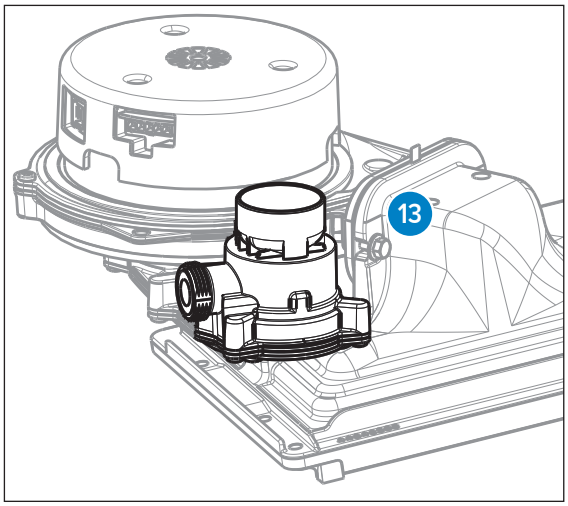


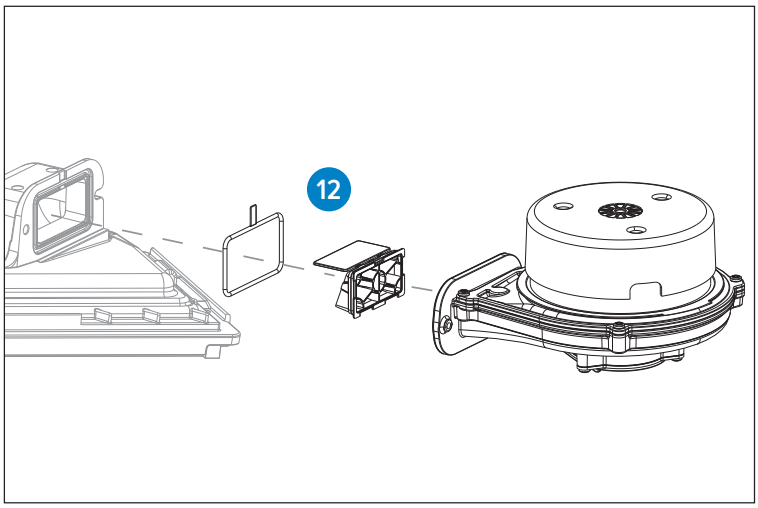
- Replace the gasket (**9**) between the burner (**8**) and upper casing (**10**)
- Replace the gasket (**11**) between the upper casing (**10**) and exchanger

- Check the venturi (**13**) for pollution and clean them with a soft brush in combination with a vacuum cleaner, if necessary

If the inside of the boiler casing is heavily polluted with dust, it is likely that the fan impeller is also polluted.

To clean the fan, it has to be removed from the upper tray and the venturi. Clean the impeller with a soft brush and a vacuum cleaner. Replace the gasket and take care that the new gasket is installed properly when reassembling the fan parts.





Reassembly takes place in reverse order.

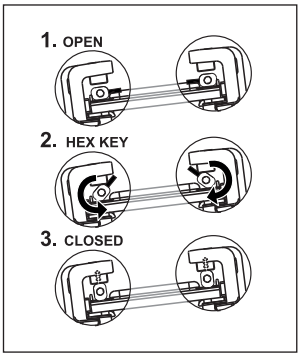
Heat exchanger

- Check the heat exchanger for pollution. Clean it, if necessary, with a soft brush and a vacuum cleaner. Avoid any pollution falling down

⚠ **TOP-FLUSHING THE EXCHANGER WITH WATER IS NOT ALLOWED.**

Reassembly takes place in reverse order.

⚠ **DURING INSTALLATION PAY ATTENTION TO THE CORRECT POSITION OF THE CLAMP BARS. THESE HAVE TO BE IN A VERTICAL POSITION.**

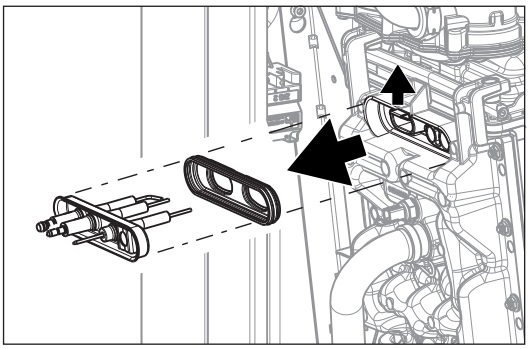


Ignition electrode

Replacing the ignition electrode is necessary when the pins are worn.
If the inspection hole is damaged, the entire ignition electrode has to be replaced.
It is replaced as follows:

- Take away the plug connections on the ignition electrode
- Push the clip on top of the electrode upwards and take away the electrode
- Remove and replace the gasket

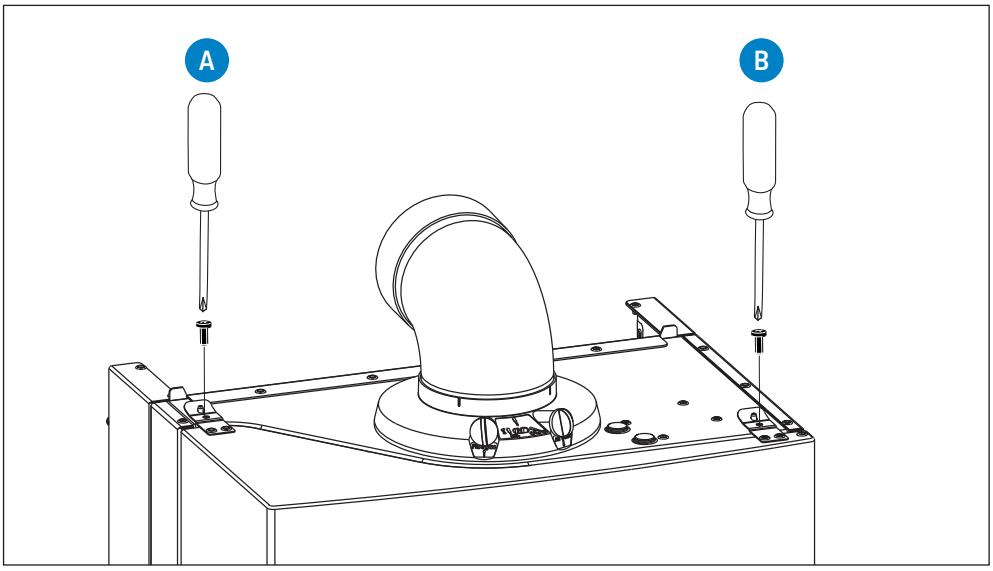
Reassembly takes place in reverse order.



⚠ **ALWAYS REPLACE THE GASKETS OF THE REMOVED PARTS DURING MAINTENANCE.**

Put the boiler back into operation and carry out a flue gas analysis.

⚠ **ALWAYS PUT BACK THE COVER AFTER MAINTENANCE WORK AND SECURE IT WITH SCREWS A AND B. REMEMBER TO CONNECT THE EARTH CABLE (WHEN PRESENT) WHEN PLACING BACK THE BOILER FRONT PANEL AND TAKE CARE THE WIRE DOES NOT GET STUCK BETWEEN FRONT PANEL AND BOILER.**



⚠ **AFTER SERVICING, COMPLETE THE RELEVANT SERVICE INTERVAL RECORD SECTION OF THE BENCHMARK CHECKLIST LOCATED ON THE INSIDE BACK PAGE OF THE INSTALLATION AND SERVICING INSTRUCTIONS.**

Notes

Why are so many installers switching to ATAG?

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