Gas 320/620 Ace.

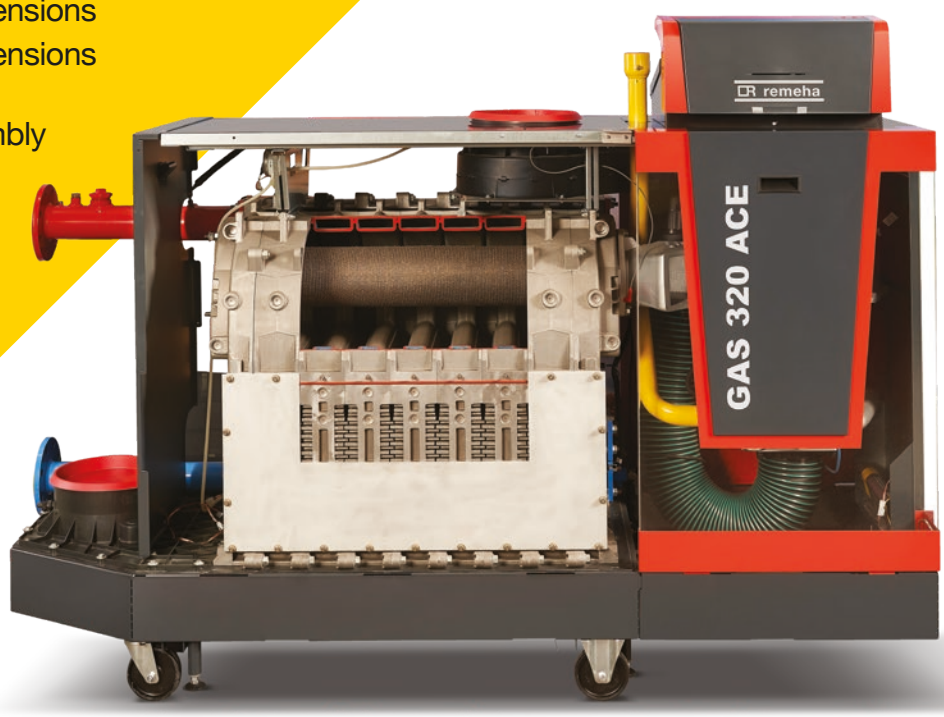
Specification guide

20% Hydrogen

remeha

What's inside.

20% Hydrogen



Remeha, the expert choice.

Complete commercial solutions from the experts in sustainable heating and hot water.

Choose Remeha's advanced commercial boilers for your next commercial project. We invest heavily in research and development which enables our specialist teams to design high performance products at every level.

From using the latest materials and manufacturing techniques to meticulously designing and engineering each boiler, we ensure they're efficient to specify, install, run and maintain. All our boilers share the same simple design – so they're expandable, adaptable and future-proofed.

We're the experts in heating and hot water solutions, built with sustainable technology. Our teams will guide you through the right choices for your commercial heating and hot water project. So from specification to design, through to supply and installation, our customer service and product support is second to none.

Introducing the Remeha Gas 320/360 Ace Range.

The Gas 320/620 Ace range features compact, floor-standing, gas-fired high efficiency condensing boilers (available in five to ten section models from 285 to 1300).

Their small footprint and ability to be installed side-to-side makes them ideally suited for modular configuration.

An optional optimising weather compensating control package can also ensure maximum efficiency.

These boilers are suitable for both new and retrofit applications. With conventional and room-sealed capability, they can be installed in most situations.

Features and benefits

Operates from 10* to 40* ΔT	More flexibility in design flow and return temperatures (from 10-40 ΔT) Maximising bi and tri-generation capacity Reduced pumping energy and pipe sizes
Low water content with zero to low flow operation	Low water content, quick acting performance with low to zero flow operation and monitoring
Modbus for connection to BMS	Full remote monitoring to the front end BMS. Simplification of BMS point schedule. The boiler control configuration can be adjusted remotely via the BMS
Bluetooth for enhanced connectivity	Easier servicing and maintenance
Low NO_2 levels (BREEAM POL 02 CLASS 6)	Low pollutant emissions that meet environmental regulations
Condensing efficiency up to 106.8%. Non-condensing efficiency up to 98.5%	Class leading efficiency
Multiple boiler configuration	Ease of installation especially where access is restricted
Compact, lightweight construction	Easy to install in smaller spaces; particularly suitable for retrofit applications
Internal LED lighting	Illuminates all serviceable areas of the product providing a safe and comfortable working environment for routine maintenance
Integral flue gas non-return valve	Multiple flues can use the same header without risk of cross-contamination
Remeha's boiler control includes: › Fully modulating 18-100% › Open Therm compatible › 0-10V VFC control	Built-in flexibility for easy installation and efficient reliable heat delivery

20% Hydrogen

Gas 320/620 Ace
boiler construction.

Fig. 1 General – Front

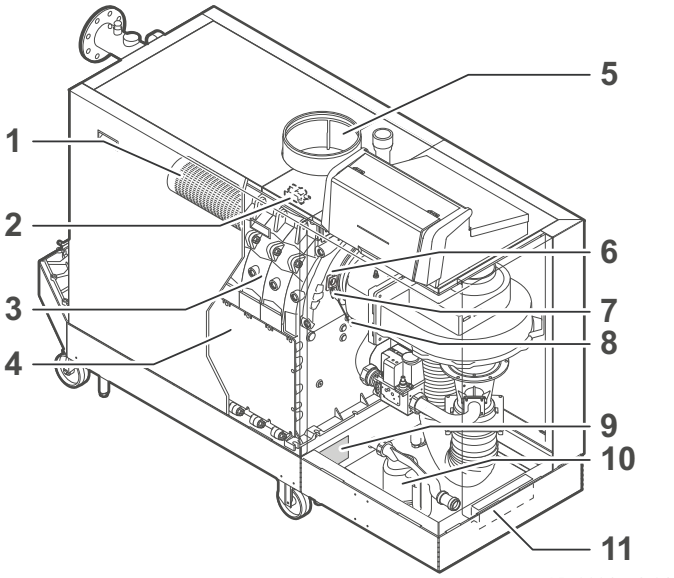


Fig. 1 Key

1	Burner
2	Ignition / ionisation transformer
3	Heat exchanger
4	Inspection hatch
5	Air inlet connection
6	Flame inspection glass
7	Ignition / ionisation electrode
8	Heat exchanger temperature sensor
9	Data plate
10	Siphon
11	Document holder

Fig. 2 Gas 320 Ace – Flue and pipe connections

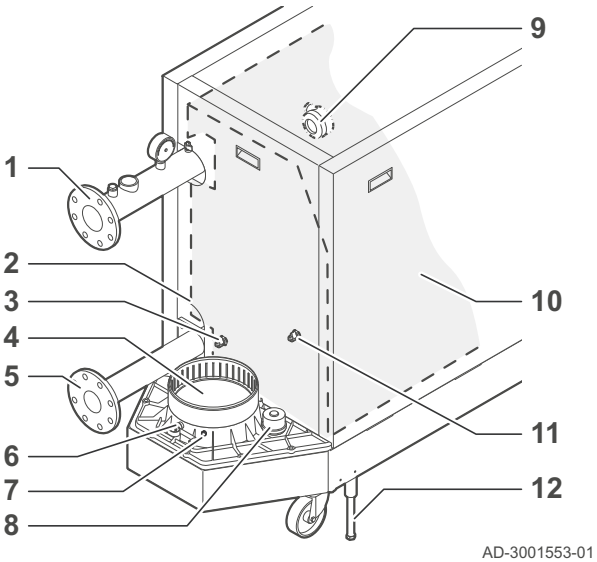


Fig. 2 Key

1	Flow connection
2	Second return connection
3	Return temperature sensor (when no second return is fitted)
4	Flue gas outlet connection
5	Return connection
6	Flue gas measuring point
7	Flue gas temperature sensor
8	Condensate collector cap
9	Air pressure differential switch
10	Heat exchanger insulation kit (optional)
11	Return temperature sensor (when a second return is fitted)

Gas 320/620 Ace
boiler construction.

Fig. 3 Gas 620 – Flue and pipe connection

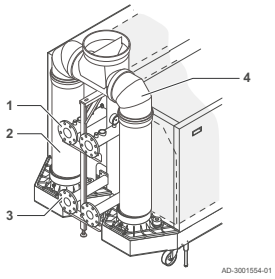


Fig. 3 Key

1	Flow connection
2	Flue gas outlet
3	Return connection
4	Flue gas collector

Fig. 4 - Gas – Air unit

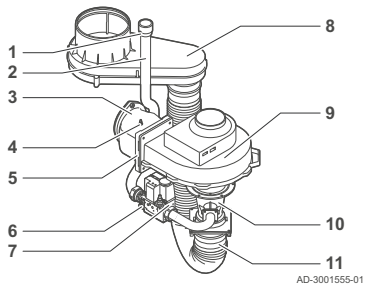


Fig. 4 Key

1	Gas pressure measuring point
2	Gas supply tube
3	Gas – air connection piece
4	Pressure measurement point
5	Gas pressure measuring point
6	Gas supply tube
7	Gas – air connection piece
8	Pressure measurement point
9	Gas – air connection piece
10	Venturi
11	Air supply hose

Fig. 5 Gas 620 – Control box

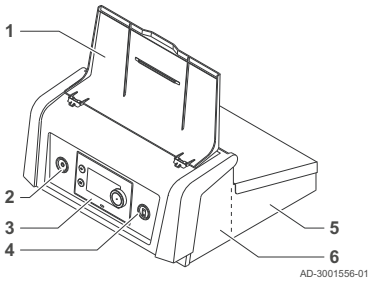


Fig. 5 Key

1	Display cover
2	Power button
3	Control panel
4	Service connector
5	Control box rear part – for expansion PCBs with wire connections
6	Control box front part – for the control unit and connectivity expansion PCBs

Fig. 6 Flow pipe

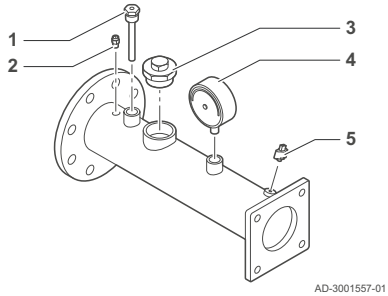


Fig. 6 Key

1	Temperature sensor (external control) immersion tube (½")
2	Air vent (⅛")
3	Safety valve connection (1½")
4	Pressure gauge (½")
5	Flow temperature sensor (M6)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GAS 320 ACE

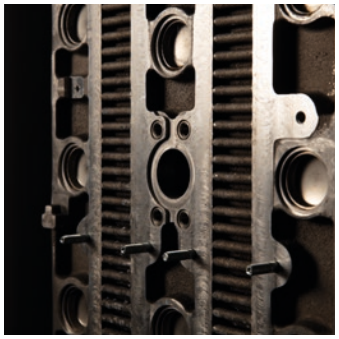
Gas 320/620 Ace
operating principle.

Combustion air is drawn into the inlet connection from the plant room (conventionally flued) or from outside via the concentric flue system (room-sealed) by an air supply fan. On the inlet side of the fan is a specially designed chamber (venturi unit) which takes gas from the multiblock and mixes it in the correct proportions with the incoming air.

This mixing system ensures that the correct gas/air ratio is delivered to the pre-mix burner at all times. Depending on demand (under the dictates of flow/return sensor and other external/internal control inputs) the burner control system determines the required boiler output. The burner control then varies the speed of the air supply fan which alters the volume of air being drawn into the venturi. This change in volume is measured using air pressure differential which directly controls the volume of gas also being delivered to the venturi. The resultant controlled mixture is delivered to the premix burner.

This mixture is initially ignited by the combined ignition/ ionisation probe, which monitors the state of the flame. If the flame is unstable or doesn't ignite within the pre-set safety time cycle, the controls will, after five attempts, shut the boiler down requiring manual intervention to reset the boiler. The digital display will indicate a flashing fault code confirming the reason for the failure. The products of combustion in the form of hot flue gases are forced through the heat exchanger transferring their heat to the system water (the flue gas temperature is reduced to approximately 5-8°C above the temperature of the system return water) then discharged via the condensate collector, to the flue gas outlet connection – and then into the atmosphere.

A vapour cloud will form at the flue gas terminal due to the low flue gas exit temperature – this isn't smoke, simply water vapour formed during the combustion process. When the flue gas temperature falls below dew point (55°C), water vapour created during the combustion process will begin to condense out in the boiler, transferring its latent heat into the system water, increasing the output of the boiler without increasing the gas consumption. Condensation formed within the boiler and flue system is discharged from the boiler to an external drain via the drain pan and siphon supplied.



Gas 320 Ace
technical information.

	285/5	355/6	430/7	500/8	575/9	650/10
Performance						
Nominal heat output central heating operation @ 80/60°C kW (min-max)	51.1-260.7	64.8-326.7	78.6-394.8	91.5-461.0	105.5-530.4	118.7-600.9
Nominal heat output central heating operation @ 50/30°C kW (max)	278.8	350.3	424.5	497.1	573.5	651.5
Nominal input (Hi) (min-max)	54-266	68-333	82-402	95-469	109-539	122-610
Efficiency						
SBEM seasonal efficiency GCV	96.48	96.34	96.19	96.05	95.89	95.75
Efficiency – full load 100% NCV	98%	98.1%	98.2%	98.3%	98.4%	98.5%
Efficiency – part load 30% NCV	109.2%	109%	108.8%	108.6%	108.3%	108.1%
Seasonal space heating efficiency at rated heat output	88.3	88.4	88.5	88.6	88.7	88.7
Seasonal space heating efficiency at 30% rated heat output	98.4	98.2	98	97.8	97.6	97.4
Gas						
Standard fuel	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Max gas consumption m^3/h	5.7-28.1	7.2-35.2	8.7-42.5	10.1-49.6	11.5-57.0	12.9-64.6
Min/max gas inlet pressure mbar	17-25	17-25	17-25	17-25	17-25	17-25
Flue (supplied as standard for conventional flue, option for room-sealed available)						
Flue diameter mm I/D	250	250	250	250	250	250
Air inlet diameter mm I/D	250	250	250	250	250	250
Flue gas mass flow rate kg/h	91-448	115-561	138-677	160-790	184-907	205-1027
Residual fan duty Pa	130	120	130	150	150	150
Hydraulics						
Water content litres	49	60	71	82	93	104
Hydraulic resistance @ 40°C ΔT mbar (kPa)	34 (3.4 kPa)	33 (3.3 kPa)	36 (3.6 kPa)	33 (3.3 kPa)	38 (3.8 kPa)	39 (3.9 kPa)
Hydraulic resistance @ 30°C ΔT mbar (kPa)	60 (6 kPa)	59 (5.9 kPa)	64 (6.4 kPa)	59 (5.9 kPa)	67 (6.7 kPa)	69 (6.9 kPa)
Hydraulic resistance @ 20°C ΔT mbar (kPa)	113 (11.3 kPa)	110 (11.0 kPa)	120 (12.0 kPa)	110 (11.0 kPa)	125 (12.5 kPa)	130 (13.0 kPa)
Hydraulic Resistance @ 11°C ΔT mbar (kPa)	374 (37.4 kPa)	364 (37.4 kPa)	397 (39.7 kPa)	364 (36.4 kPa)	413 (41.3 kPa)	435 (43.5 kPa)

Gas 320 Ace
technical information.

	285/5	355/6	430/7	500/8	575/9	650/10
Hydraulics						
Nominal flow rate @ 40°C ΔT l/s	1.6	1.9	2.3	2.7	3.2	3.6
Nominal flow rate @ 30°C ΔT l/s	2.1	2.6	3.1	3.6	4.2	4.8
Nominal flow rate @ 20°C ΔT l/s	3.1	3.9	4.7	5.5	6.3	7.1
Nominal flow rate @ 11°C ΔT l/s	5.6	7.1	8.5	9.9	11.5	13.0
Standard operating temperature °C	20-90	20-90	20-90	20-90	20-90	20-90
Max operating temperature °C	90*	90*	90*	90*	90*	90*
High limit temperature °C	110	110	110	110	110	110
Max water operating pressure bar	7	7	7	7	7	7
Min water operating pressure bar	1	1	1	1	1	1
General						
Dry weight kg without packaging incl. control box	366	400	435	497	533	570
Dimensions (WxHxD)	707 x 1550 x 1862	707 x 1550 x 1862	707 x 1550 x 1862	707 x 1550 x 2172	707 x 1550 x 2172	707 x 1550 x 2172
NO_2 Annual Emissions EN15502 G20	43	43	44	45	46	47
NO_2 Annual Emissions BREEAM G20	15	16	16	17	18	18
Noise levels dB(A) @ 1m	55.7	55.7	55.7	55.7	55.7	55.7
Electrical (excluding pump)						
Nominal power supply	230v-1ph-50hz	230v-1ph-50hz	230v-1ph-50hz	230v-1ph-50hz	230v-1ph-50hz	230v-1ph-50hz
Power consumption (w)	10-280	10-345	10-450	10-576	10-768	10-720
Modulating input (V dc)	0-10	0-10	0-10	0-10	0-10	0-10
Start current amps	4	4	4	4	4	4
Fuse main (power connector)	10	10	10	10	10	10
Insulation class IP	X1	X1	X1	X1	X1	X1
Fuse main (power connector)	1.4	1.4	1.4	1.4	1.4	1.4

*When operating at >25°C ΔT maximum flow temperature is limited to 80°C

Gas 620 Ace
technical information.

	570 (2x5 sections)	710 (2x6 sections)	860 (2x7 sections)	1000 (2x8 sections)	1150 (2x9 sections)	1300 (2x10 sections)
Performance						
Nominal heat output central heating operation @ 80/60°C kW (min-max)	75.8-521.4	86.7-653.3	122.6-789.5	122.3-922.1	148.1-1060.8	165.4-1201.7
Nominal heat output central heating operation @ 50/30°C kW (max)	557.5	700.6	849	994.3	1147	1303
Nominal input (Hi) (min-max)	80-532	91-666	128-804	127-938	153-1078	170-1220
Efficiency						
SBEM seasonal efficiency GCV	96.48	96.34	96.19	96.05	95.89	95.75
Efficiency – full load 100% NCV	98%	98.1%	98.2%	98.3%	98.4%	98.5%
Efficiency – part load 30% NCV	109.2%	109%	108.8%	108.6%	108.3%	108.1%
Seasonal space heating efficiency at rated heat output	N/a	N/a	N/a	N/a	N/a	N/a
Seasonal space heating efficiency at 30% rated heat output	N/a	N/a	N/a	N/a	N/a	N/a
Gas						
Standard fuel	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Max gas consumption m^3/h	8.5-56.3	9.6-70.5	13.5-85.1	13.4-99.3	16.2-114.1	18-129.1
Min/max gas inlet pressure mbar	17-25	17-25	17-25	17-25	17-25	17-25
Flue (supplied as standard for conventional flue, option for room-sealed available)						
Flue diameter mm I/D	350	350	350	350	350	350
Air inlet diameter mm I/D	250/350	250/350	250/350	250/350	250/350	250/350
Flue gas mass flow rate kg/h	135-896	153-1121	216-1354	214-1579	258-1815	286-2054
Flue gas temperature (80/60°C)	30-60	30-61	30-64	30-63	30-66	30-65
Residual fan duty Pa	130	120	130	150	150	150
Hydraulics						
Water content litres (per module)	49	60	71	82	93	104
Hydraulic resistance @ 40°C ΔT mbar (kPa)	34 (3.4 kPa)	33 (3.3 kPa)	36 (3.6 kPa)	33 (3.3 kPa)	38 (3.8 kPa)	39 (3.9 kPa)
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Hydraulic resistance @ 20°C ΔT mbar (kPa)	113 (11.3 kPa)	110 (11.0 kPa)	120 (12.0 kPa)	110 (11.0 kPa)	125 (12.5 kPa)	130 (13.0 kPa)
Hydraulic Resistance @ 11°C ΔT mbar (kPa)	374 (37.4 kPa)	364 (37.4 kPa)	397 (39.7 kPa)	364 (36.4 kPa)	413 (41.3 kPa)	435 (43.5 kPa)

Gas 620 Ace
technical information.

	570 (2x5 sections)	710 (2x6 sections)	860 (2x7 sections)	1000 (2x8 sections)	1150 (2x9 sections)	1300 (2x10 sections)
Hydraulics						
Nominal flow rate @ 40°C ΔT l/s per module	1.6	1.9	2.3	2.7	3.2	3.6
Nominal flow rate @ 30°C ΔT l/s per module	2.1	2.6	3.1	3.6	4.2	4.8
Nominal flow rate @ 20°C ΔT l/s per module	3.1	3.9	4.7	5.5	6.3	7.1
Nominal flow rate @ 11°C ΔT l/s per module	5.6	7.1	8.5	9.9	11.5	13.0
Standard operating temperature °C*	20-90	20-90	20-90	20-90	20-90	20-90
Max operating temperature °C*	90	90	90	90	90	90*
High limit temperature °C	110	110	110	110	110	110
Max water operating pressure bar	7	7	7	7	7	7
Min water operating pressure bar	1	1	1	1	1	1
General						
Dry weight kg without packaging incl. control box	711	775	841	961	1029	1099
Dimensions (WxHxD)	1442 x 1550 x 1862	1442 x 1550 x 1862	1442 x 1550 x 1862	1442 x 1550 x 2172	1442 x 1550 x 2172	1442 x 1550 x 2172
NO_2 Annual Emissions EN15502 G20	43	43	44	45	46	47
NO_2 Annual Emissions BREEAM G20	15	15	16	17	18	18
Noise levels dB(A) @ 1m	58.1	58.1	58.1	57.8	57.8	57.8
Electrical						
Nominal power supply	2 x 230v-1ph-50hz	2 x 230v-1ph-50hz	2 x 230v-1ph-50hz	2 x 230v-1ph-50hz	2 x 230v-1ph-50hz	2 x 230v-1ph-50hz
Power consumption (w)	20-560	18-690	20-900	20-1152	20-1536	20-1440
Modulating input (V dc)	2 x 0.10	2 x 0.10	2 x 0.10	2 x 0.10	2 x 0.10	2 x 0.10
Start current amps	2 x 4	2 x 4	2 x 4	2 x 4	2 x 4	2 x 4
Fuse rating amps	2 x 10	2 x 10	2 x 10	2 x 10	2 x 10	2 x 10
Controls voltage	2 x 24 (max 4va)	2 x 24 (max 4va)	2 x 24 (max 4va)	2 x 24 (max 4va)	2 x 24 (max 4va)	2 x 24 (max 4va)
Installation class IP	X1	X1	X1	X1	X1	X1
Run current amps	2 x 14	2 x 14	2 x 38	2 x 38	2 x 38	2 x 38

*When operating at >25°C ΔT maximum flow temperature is limited to 80°C

Gas 320 Ace
suggested engineering specification.

Construction

The boiler consists of a sectional cast aluminium heat exchanger with other major components contained within a rigid steel frame with removable casing parts for maintenance purposes. The boiler comes complete with wheels to enable the assembled unit to be easily manoeuvred into position within the plant room on site with the minimum of effort. All major electrical and electronic controls are contained within the instrument panel mounted on top of the boiler at the opposite end to the connections facing to the front (long side) but can be rotated 90˚ towards the short side to suit site location. The boiler can pass through a 720mm standard door and shall be delivered fully assembled.

Hydraulic, Gas and Flue Connections

The boiler will be available with flow and return connections on the left or right hand end of the boiler (this must be decided when ordering the boiler) with the gas connection on the top of the boiler. The flue gas outlet, complete with a condensate connection shall be at a low level on the same end as the F/R connections. The combustion air inlet is located at the top of the boiler. The boiler will be suitable for room-sealed or conventional flue applications and designed to operate at working pressures not exceeding seven bar.

Operation

The boiler comes complete with a modulating control system that limits the maximum difference in temperature between the heating flow and return and the maximum speed at which the flow temperature increases. The boiler comes complete with a pre-mix burner (NG) with the gas/air ratio control system controlled internally. An intelligent, advanced boiler control continuously monitors the boiler conditions, varying the heat output to suit the system load. The controls can react to external negative influences in the rest of the system maintaining boiler output for as long as possible without resorting to a lock out condition. Should a negative effect happen in the system the boiler will reduce its output and/or shuts down (shut-off mode), awaiting the negative conditions to return to normal before restarting.

The boiler is equipped with multiple sensors to detect and respond on low to no-flow conditions. Using an in-built PI control, the boiler maintains active control during flow variations. This ensures that during temperature related stop conditions the boiler immediately responds when heat is required. This also protects the heat exchanger if a zero flow condition occurs during normal operation. The control cannot override the standard flame safety controls. Standard frost protection activates below 6°C with stage one activating the system/shunt pump. Stage two activates below 3°C with boiler switching on to 10°C flow.

Controls

The boiler includes a controls package that allows the actual and set values to be read and adjusted on the built-in digital display, which also provides normal operating and fault code indication. The controls come as standard with the following:

- 0-10V input (flow or load control)
- Common alarm
- High limit lock out
- External gas valve control (optional)
- Low water protection (optional)
- Frost protection
- External pump control
- Hydraulic pressure sensor (optional)
- Shutdown interlock
- Min gas pressure switch (optional)
- Release input
- Volt free (enable signal)
- Open therm control
  - Cascade control (optional)
  - System zone, valve and pump control (optional)
  - Modbus connectivity (optional)
  - Bluetooth connectivity

Features

- Ultra-low NO_2 from 15mg/kWh
- Fully modulating
- Supplied on fully built-in wheels
- Air pressure differential sensor (LDS)
- ErP compliant
- Digital diagnostic display
- Pre-mix burner
- Left or right hand versions available
- In-built passive flue gas non-return valve

Dimensions and connections

The small footprint of this range alongside its easy disassembly and its space saving configurations, makes it ideal for modular arrangement and particularly suitable for retrofit applications.

Gas 620 Ace
suggested engineering specification.

Construction

The boiler consists of a sectional cast aluminium heat exchanger with other major components contained within a rigid steel frame with removable casing parts for maintenance purposes. The boiler consists of two modules connected together to share the same air-box. Each section is able to perform independently to each other and should one module go to fault, the other will remain operational. The boiler is complete with wheels to enable the assembled unit to be easily manoeuvred into position within the plant room on site with the minimum effort. All major electrical and electronic controls are contained in the instrument panel mounted on top of the boiler at the opposite end to the connections facing to the front (long side) but can be rotated 90˚ towards the short side to suit site location. The boiler can pass through a 720mm wide standard door fully assembled in two modules to allow ease of positioning.

Hydraulic, Gas and Flue Connections

The boiler is available with flow and return connections on the left or right hand end of the boiler (this must be decided during coordination), with the gas connection on the top of the boiler. The combustion air inlet is located at the top of the boiler. The boiler is suitable for room-sealed or conventional flue applications and designed to operate at working pressures not exceeding seven bar. The boiler has two flows and returns at one end with a combined flue gas outlet. The control panel can be rotated to enable the boiler connections to be on the left or right hand side

Operation

The boiler comes complete with a modulating control system that limits the maximum difference in temperature between the heating flow and return and the maximum speed at which the flow temperature increases. The boiler comes complete with a pre-mix burner (NG) with the gas/air ratio control system controlled internally. An intelligent, advanced boiler control continuously monitors the boiler conditions, varying the heat output to suit the system load. The controls can react to external negative influences in the rest of the system maintaining boiler output for as long as possible without resorting to a lock out condition. Should a negative effect happen in the system the boiler will reduce its output and/or shuts down (shut-off mode), awaiting the negative conditions to return to normal before restarting.

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Controls

The boiler includes a controls package that allows the actual and set values to be read and adjusted on the built-in digital display, which also provides normal operating and fault code indication. The controls come as standard with the following inputs/outputs:

- 0-10V input (flow or load control)
- Common alarm
- High limit lock out
- External gas valve control (optional)
- Low water protection (optional)
- Frost protection
- External pump control
- Hydraulic pressure sensor (optional)
- Shutdown interlock
- Min gas pressure switch (optional)
- Release input
- Volt free (enable signal)
- Open therm control
  - Cascade control (optional)
  - System zone, valve and pump control (optional)
  - Modbus connectivity (optional)
  - Bluetooth connectivity

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- In-built passive flue gas non-return valve

Dimensions and connections

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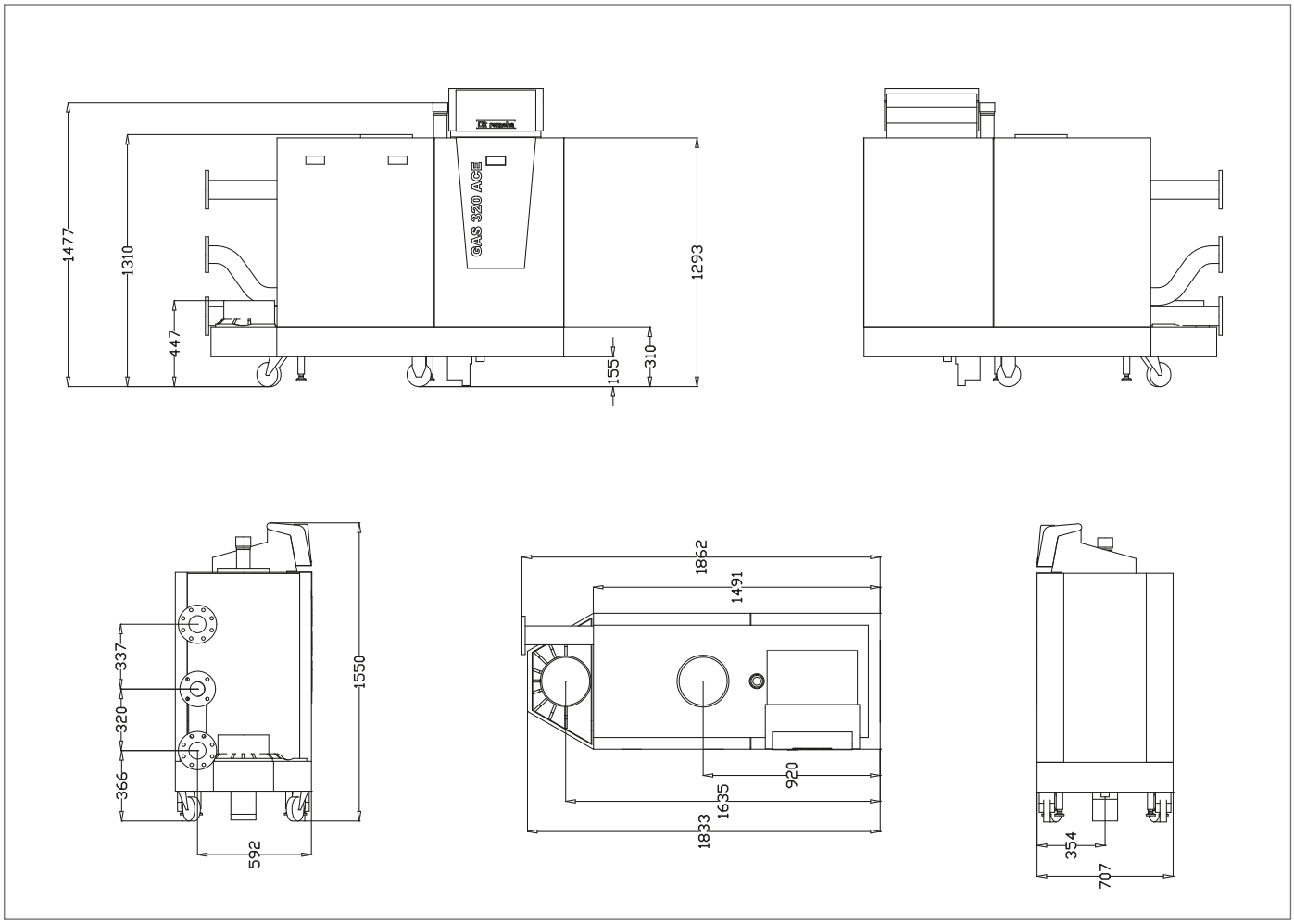
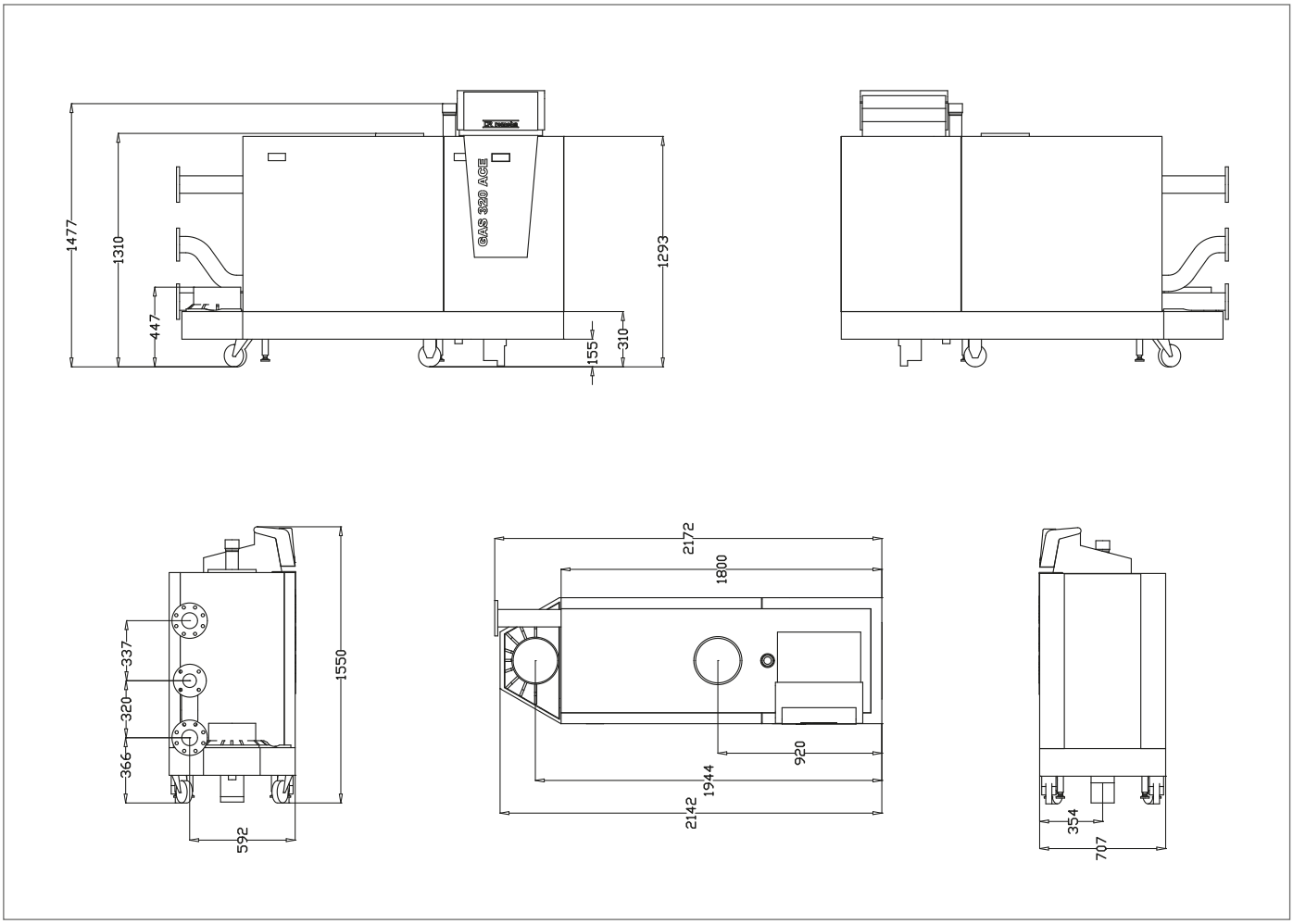
Gas 320 Ace
dimensions for the 285, 355 and 430 models.



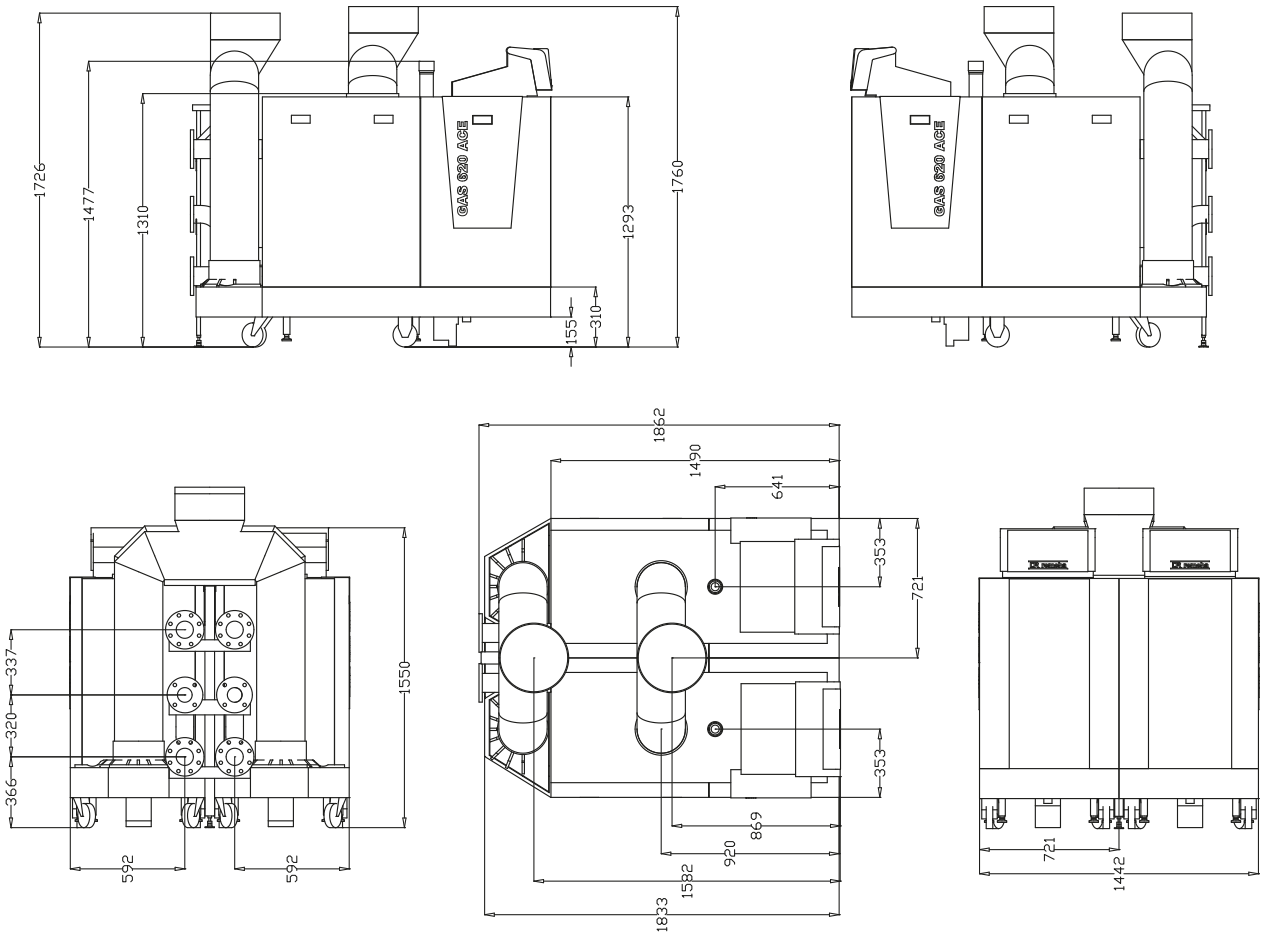
Secondary return shown is an optional extra and does not come as standard.

Gas 320 Ace
dimensions for the 500, 575 and 650 models.



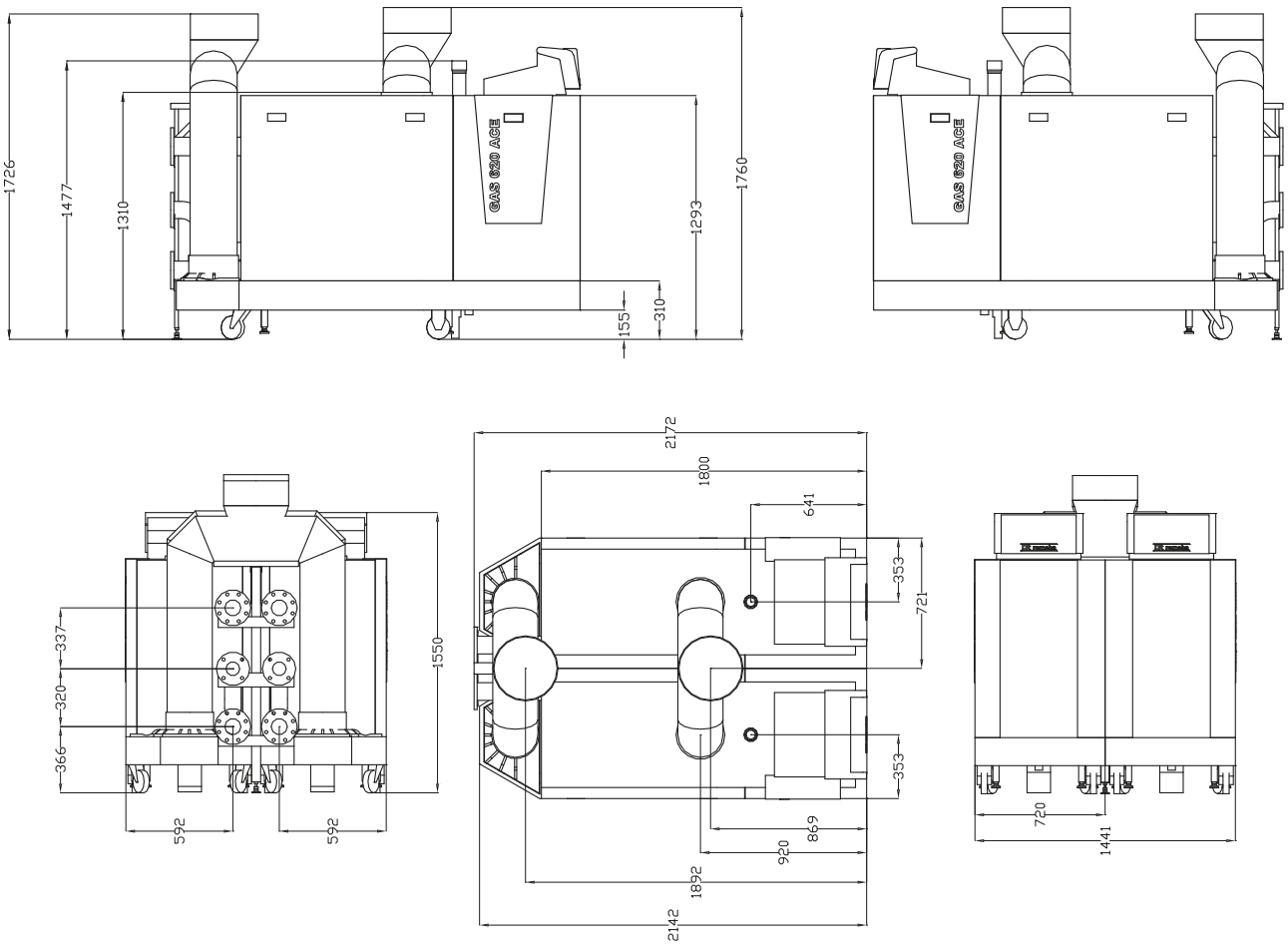
Secondary return shown is an optional extra and does not come as standard.

Gas 620 Ace
dimensions for the 570, 710 and 860 models.



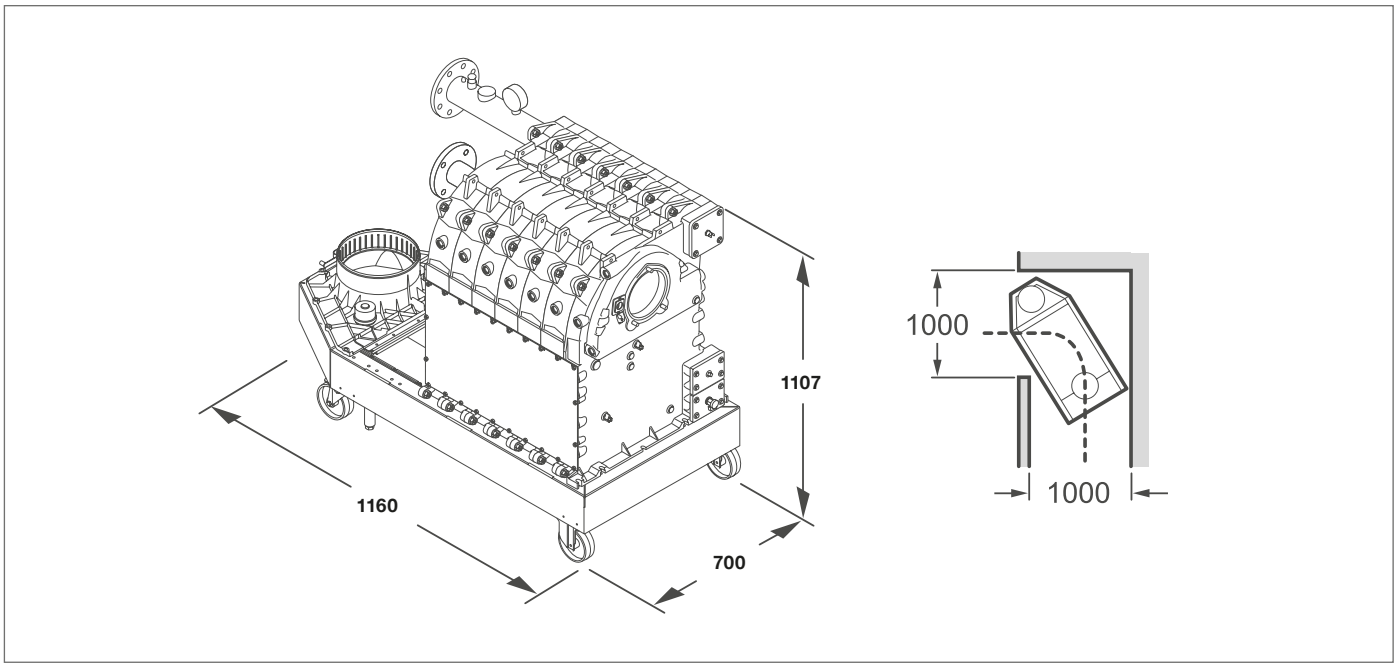
Air inlet adaptor shown optional item.
Secondary return shown is an optional extra and does not come as standard.

Gas 620 Ace
dimensions for the 1000, 1150 and 1300 models.

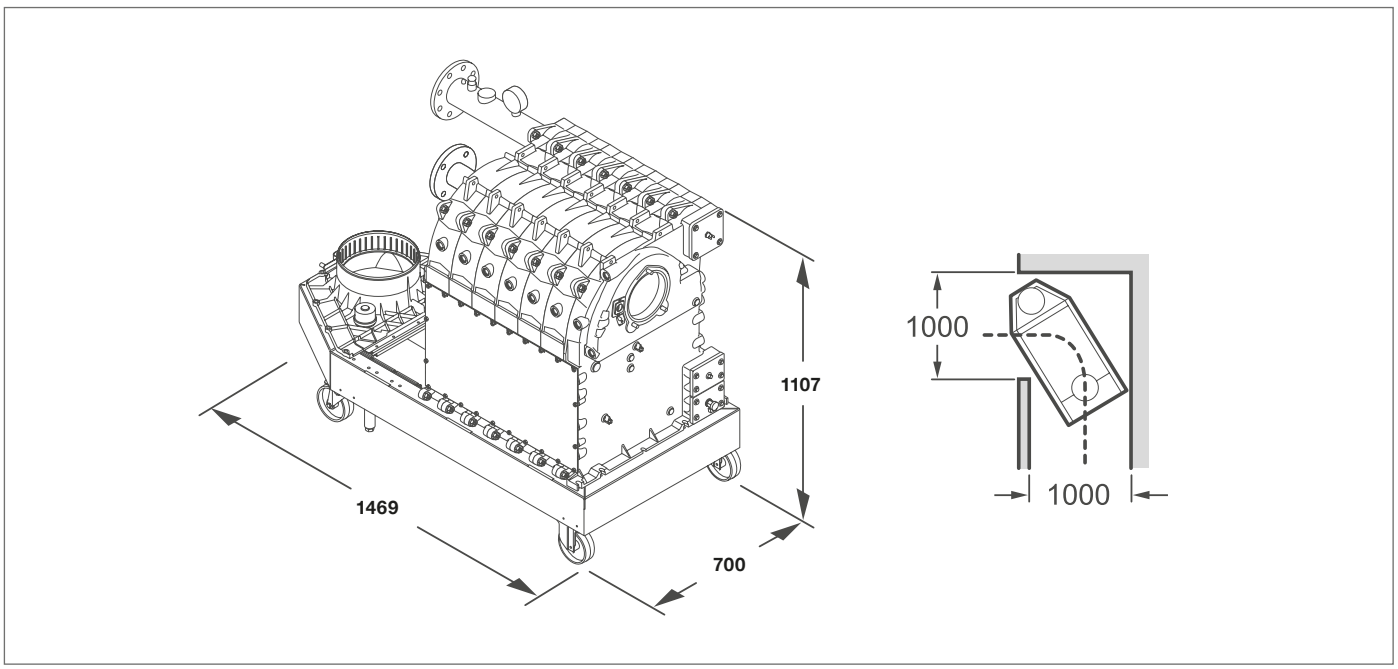


Gas 320/620 Ace
module partial disassembly – for restricted access.

Gas 320 Ace 5-7 sections



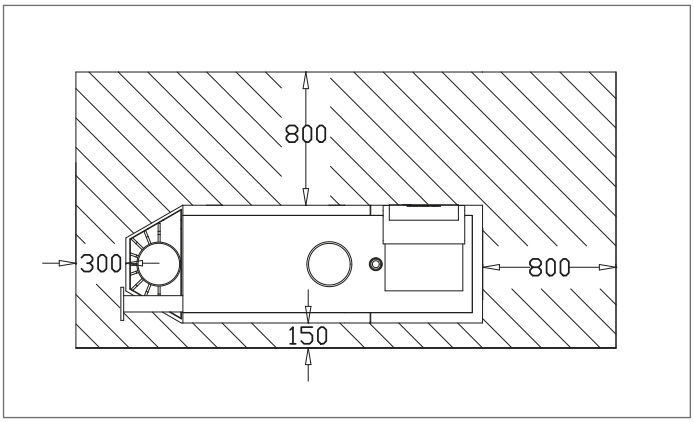
Gas 320 Ace 8-10 sections



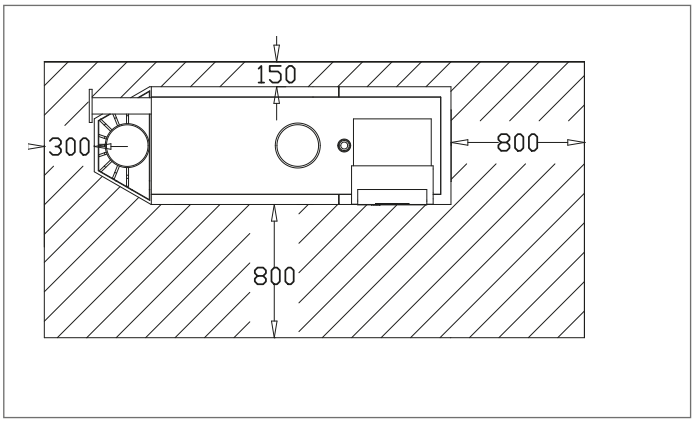
Gas 320 Ace
configurations.

The service side with the inspection hatch on the heat exchanger is considered to be the front of the boiler. This boiler is available in both a left-hand and right-hand version. This means that the hydraulic connections and the flue gas discharge are situated on either the left or the right-hand side of the boiler. The control panel is on the front as standard, but can easily be rotated so that it is on the short side. To make the boiler level and to raise the wheels off the floor, the adjustment jacks must be used. Turn the adjustment bolts out as soon as the boiler is placed in the correct position. The picture shows the support surface of the boiler.
This is the position of the adjustment bolts.

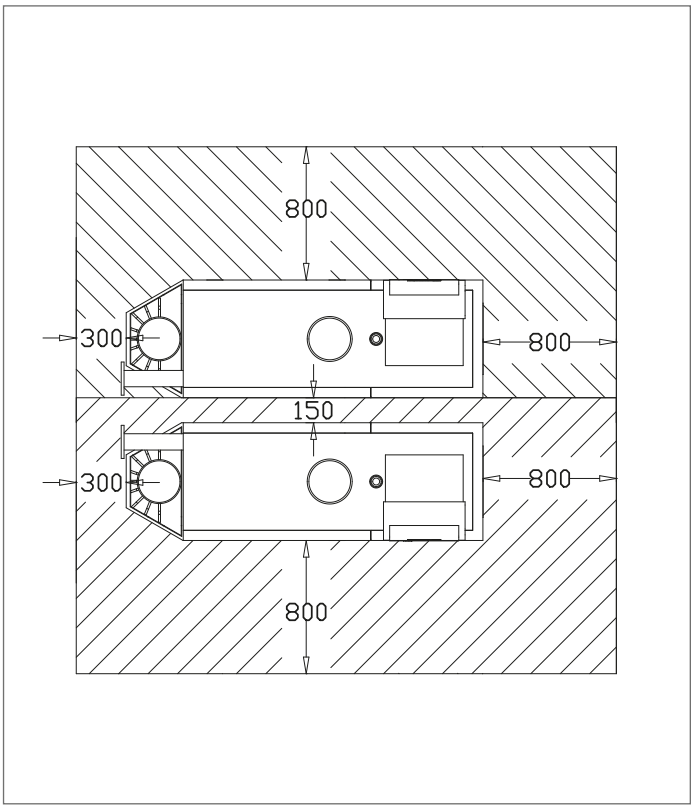
Right hand configuration



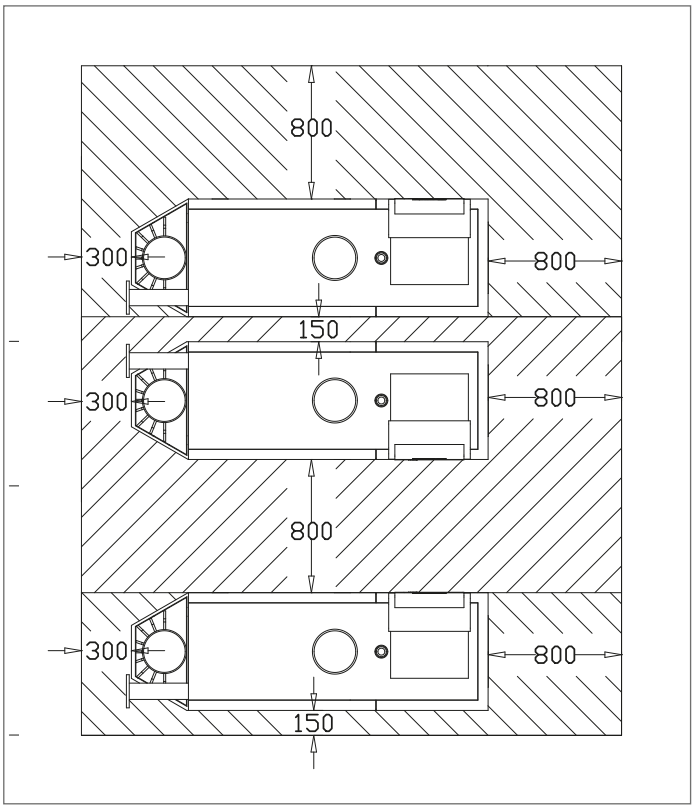
Left hand configuration



Right hand configuration

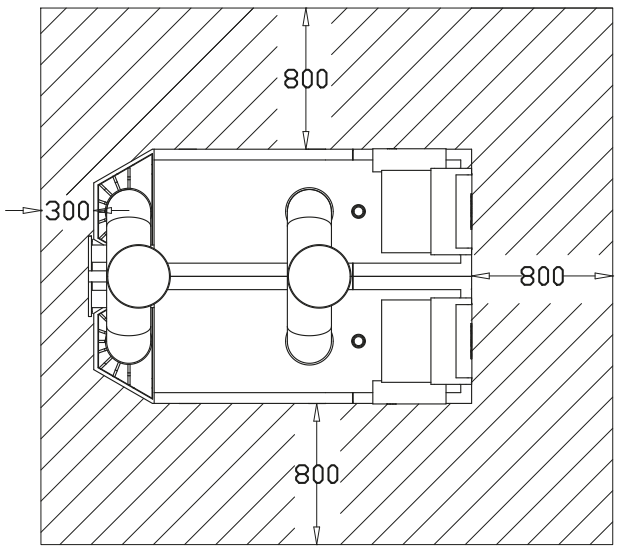


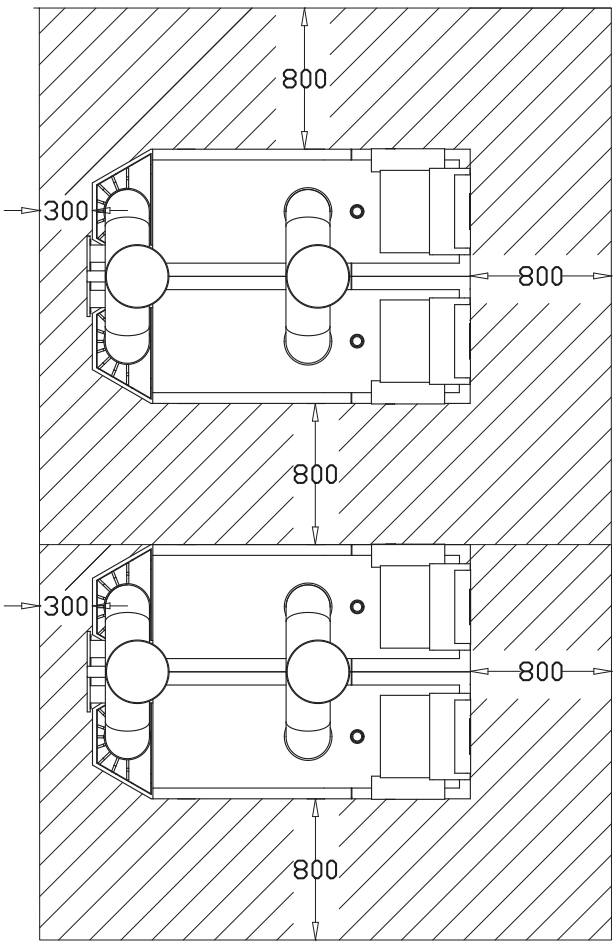
Multiple configuration



Gas 620 Ace
configurations.

The Gas 620 Ace boiler is not available with a choice between left or right hand versions, but the control panel can easily be rotated to enable the boiler connections to be on the left or right hand side. To make the boiler level and to raise the wheels off the floor, the adjustment bolts must be used. Turn the adjustment bolts out as soon as the boiler is placed in the correct position. The picture shows the support surface of the boiler. This is the position of the adjustment bolts.

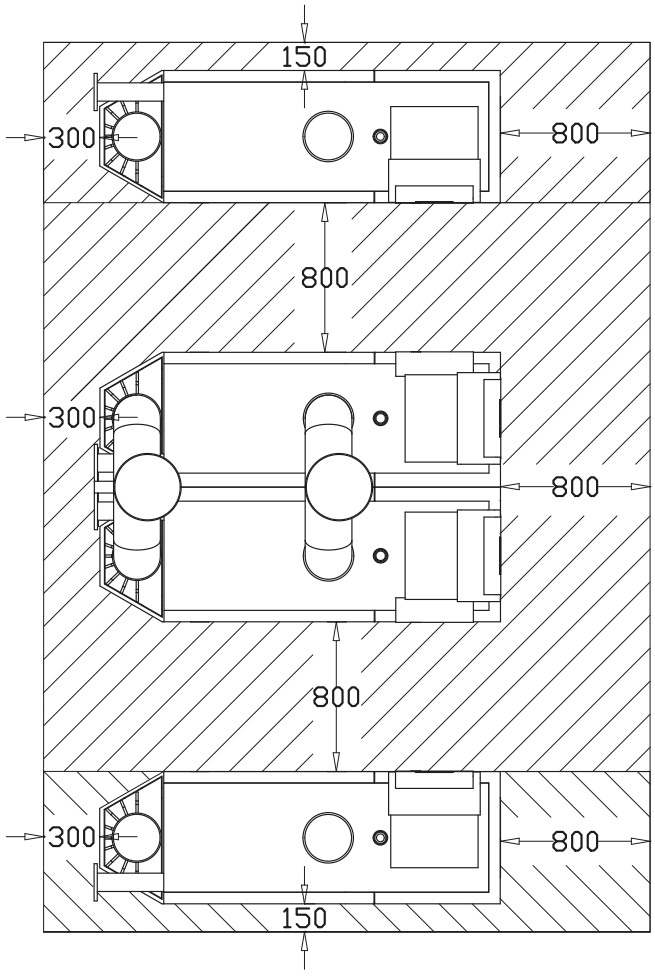




Gas 320/620 Ace
configurations.

Typical clearances are shown below on the schematic.
We recommend a clearance of at least 45cm above the boiler.
If the air supply filter is used, there must be a clearance of at least 65cm.

These clearances apply to the gas 320/620 Ace models when used in combination



Electrical connections and controls.

General

General specifications apply to the Gas 320 Ace and to the Gas 620 Ace. The Gas 320/620 Ace boilers are supplied as standard with electronic operating and flame ionisation safety controls with a specially designed microprocessor at the heart of the system. The boilers are pre-wired. All external connections can be made on the terminal strips.

Power supply

The boilers are suitable for a 230V-50Hz supply with phase/neutral/earth. Other connection values are only acceptable if an isolating transformer is installed. The boilers are sensitive to phase/neutral and therefore have a facility to ensure that phase and neutral are correctly connected.

Automatic controls

The Gas 320/620 Ace has a unique boiler code. This together with other data (incl. boiler type, counter readings, etc.) is stored in a code-key that belongs to the boiler. If the control unit is replaced, the counter readings remain stored in the code-key.

Temperature control

The boiler is equipped with electronic temperature control based on flow, return, and boiler block temperature sensors. The flow temperature can be set between 20 and 90°C. The boiler reduces its power when the set outlet-temperature is attained. The cut-out temperature is the set heating outlet temperature + 5°C.

Low water level protection (flow and content)

The boiler is fitted with a low water pressure safety device to protect the boiler from a shortage of water. The boiler is inhibited when the system pressure drops to 0.8 bar and will not operate again until it achieves 1 bar.

The boiler shall be equipped with multiple sensors to detect and respond on low to no-flow conditions. Using an in-built PI control, the boiler maintains active control during flow variations. This ensures that during temperature related stop conditions the boiler will immediately respond when heat is required. This also protects the heat exchanger if a zero flow condition occurs during normal operation.

High limit protection

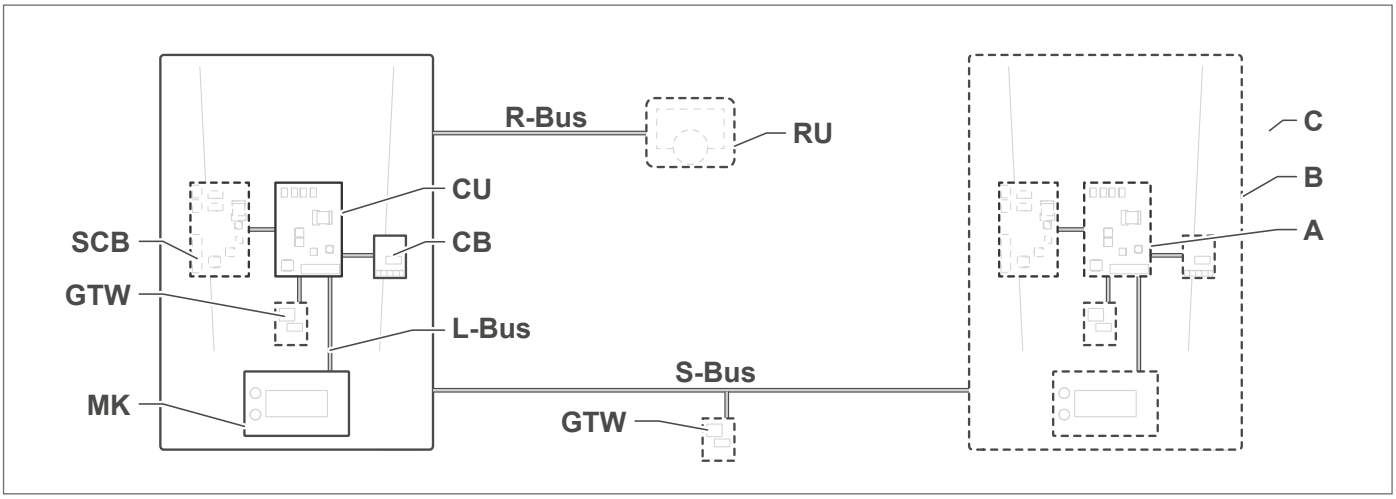
The maximum protection switches the boiler off if the water temperature is too high (110°C) and locks it on the control box (the minimum off time is preset to a fixed value (*1 second). Once the fault has been rectified, the boiler can be reset by pressing the reset button for two seconds.

For further information please refer to the Installation and User Manual at **remeha.co.uk**

Electrical connections and controls
wiring layout.

The Gas 320/620 Ace boiler is equipped with the e-Smart controls platform. This is a modular system, and offers compatibility and connectivity between all products that make use of the same platform.

Electrical diagram



Item	Description	Function
CU	Control Unit	The control unit handles all basic functionality of the appliance
CB	Connection Board: Connection PCB	The connection PCB provides easy access to all connectors of the control unit
SCB	Smart Control Board: Expansion PCB	An expansion PCB provides extra functionality, like an internal calorifizone
GTW	Gateway: Conversion PCB	A gateway can be fitted to an appliance or system, to provide one of the following: › Extra (wireless) connectivity › Service connections › Communication with other platforms
MK	Control Panel: Control panel and display	The control panel is the user interface to the appliance calorifizones
RU	Room Unit: (for example, a thermostat)	A room unit measures the temperature in a reference room
L-Bus	Local Bus: Connection between devices	The local bus provides communication between devices
S-Bus	System Bus: Connection between appliances	The system bus provides communication between appliances
R-Bus	Room Unit Bus: Connection to a room unit	The room unit bus provides communication to a room unit
A	Device	A device is a PCB, control panel or a room unit
B	Appliance	An appliance is a set of devices connected via the same L-Bus
C	System	A system is a set of appliances connected via the same S-Bus

Specific devices delivered with the Gas 320/620 Ace boiler can be found within the installation and user manual located at **remeha.co.uk**

Gas 320/620 Ace
fault reporting/outputs.

The Gas 320/620 Ace are complete with the SCB-01 as standard. This board allows for fault reporting via the 2 x status relays and pump control or modular reporting via the 1 x 0-10V output.

Status relay

The status relay can be used in a normally open (NO) or normally closed (NC) configuration for activation. The main functions are as follows (please see the installation manual for more options):

- Boiler alarm
- Burner on/off
- Service required
- Boiler on (run)
- Boiler is in locking or blocking state

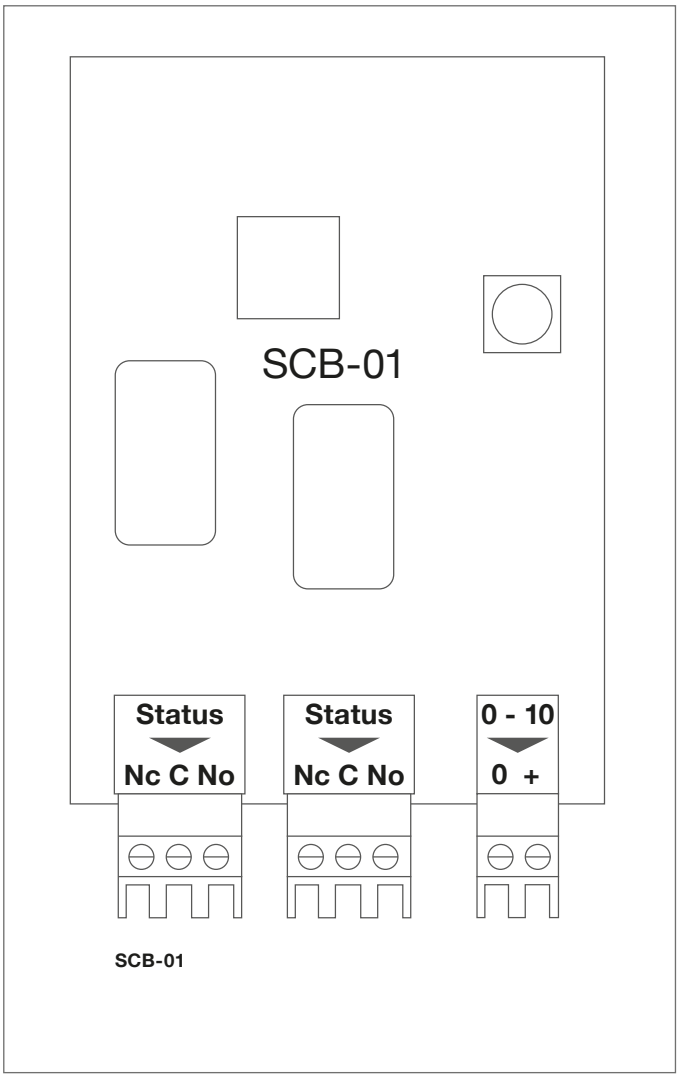
0-10V output

The 0-10V output can be used to control:

- Modulate Wilo/Grundfos pump speed
- PWM signal for UPMXL pump

0-10V output can also report:

- Boiler PWM
- Boiler actual power %



SCB-01

Safety interlocks.

This applies to the Gas 320 Ace and to each module on the Gas 620 Ace.
The boilers are supplied with two interlocks as standard.

Blocking input

The boiler has a blocking input. A potential-free contact can be connected to the BL terminals of the connector. If the contact is opened, the boiler will be blocked from firing:

Change the function of the input using parameter AP001. The parameter has the following 3 configuration options:

1 Complete blocking: no frost protection with the outdoor sensor and no boiler frost protection (no pump and no burner start)

2 If the contact is closed when there is no heat demand, the boiler will be blocked after a waiting time. The waiting time of the input can be changed using Parameter AP008.

3 Lock out: no frost protection (similar to 1) requires a manual reset

Release input

The boiler has a release input. A potential-free contact can be connected to the RL terminals of the connector:

1 If the contact is closed during a heat demand, the boiler will be blocked immediately

2 If the contact is closed when there is no heat demand, the boiler will be blocked after a waiting time. The waiting time of the input can be changed using Parameter AP008

Hydraulic pressure sensor

The hydraulic pressure sensor registers the water pressure and can shut the boiler down when the minimum water pressure is reached. To activate this blocking option, a minimum pressure must be set with the boiler parameters.

SCB-01

The boiler is supplied as standard with an SCB-01, the SCB-01 has the following features:

1 Two potential-free contacts for status notifications

2 0-10V output connection for a PWM pump

The two potential-free contacts can be configured as required by using Parameters EP018 and EP019.

Maximum voltage 230vac maximum current 1 amp.

Optional accessories

- Hydraulic pressure sensor
- Minimum gas pressure switch
- Second return
- Cleaning tool
- Water pressure sensor
- Gas leak switch (VPS)
- Air filter
- Recom kit
- Combined roof flue kit

Boiler Pump Control

The Gas 320/620 Ace boilers have terminals which can be used to connect an external boiler pump. This pump is run once every 24 hours to prevent sticking (24-hour pump operation).

Installation shutdown

If the central heating system is not used for a long period, we recommend switching the boiler off:

- Switch the On/Off switch to Off
- Switch off the boiler electrical power supply
- Shut off the gas supply
- Ensure that the boiler and system are protected against frost damage

CAUTION: In the event of low temperatures, we recommend that the installation continues to operate at a lower temperature. This prevents freezing.

Frost protection

CAUTION: Drain the boiler and central heating system if you are not going to use the building for a long time and there is a chance of frost.

Set the temperature control low, for example at 10°C.
If there is no demand for heat, the boiler will only switch on in order to prevent frost damage. When the heating water temperature in the boiler falls by too much, the integrated protection system in the boiler starts up. This protection functions as follows:

1 The circulation pump switches on if the water temperature is <6°C (if pump is electrically connected to the boiler)

2. If the water temperature is <3°C, the boiler starts up. The inbuilt frost protection programme is for the sole use of the heat exchanger protection

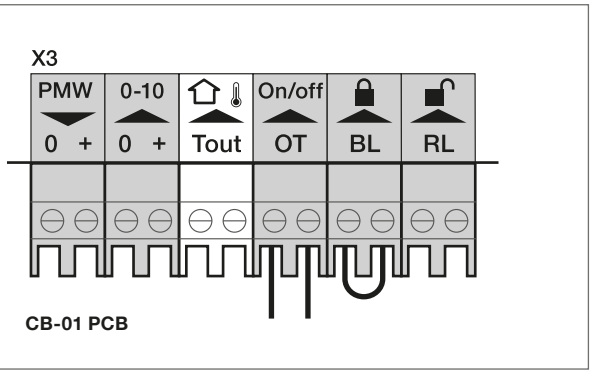
3. If the water temperature is >10°C, the boiler shuts down and the heating pump continues to run for a short time

CAUTION: The integrated protection system only protects the boiler, not the installation.

Boiler controls.

On/off control

Using a VFC (Volt Free Contact), the boiler is enabled via the OT connection. Once enabled (and all safety conditions achieved) the boiler fires and modulates to achieve and control a pre-set temperature set point.



This is defined as on/off control.

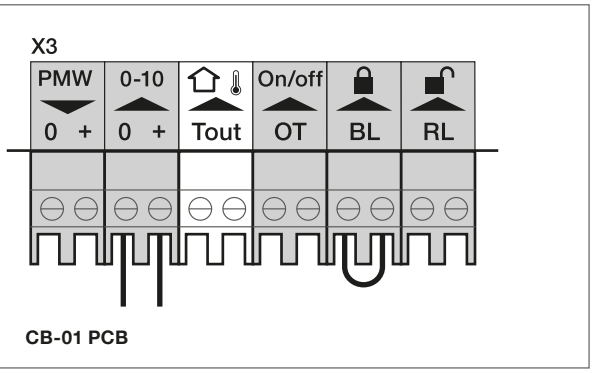
During on/off control the output modulates between the minimum and maximum value. Modulation is based on the required flow temperature, internal temperature sensing, return temperature and using the ΔT dependent output control.

The Gas 320 Ace requires 1 x VFC and the Gas 620 Ace requires 2x VFC (one of each module).

These are connected on the OT on/off control on PCB CB-01.

0-10V input control

Using a 0-10V input the boiler can be controlled directly. When 0-10V controls are configured, on/off control signals are ignored. Enable (via OT) and 0-10V control (via 0-10V input) is not possible. An input <1.5V disables the boiler, thus the 0-10V input becomes control and on/off signal.



There are two different methods of 0-10V input control:

- Analogue temperature control (preferred)
- Analogue modulation control

The Gas 320 Ace requires 1 x 0-10V and the Gas 620 Ace required 2x 0-10V (one of each module).

Analogue temperature control:

During analogue temperature control the 0-10V input defines the target flow temperature set point. Modulation is based on the required flow temperature, internal temperature sensing, return temperature and using the ΔT dependent output control.

Input Signal (v)	Temperature A	Description
0-1.5	0-15	Boiler off
1.5-1.8	15-18	Hysteresis
1.8-10	18-100	Temp required

Analogue temperature control %:

During analogue output control the 0-10V input controls the boiler output within the minimum and maximum modulation range. The output temperature is a function of control input, return temperature and flow rate.

Input Signal (v)	Heat output %	Description
0-2.0*	10-20	Boiler off
2.0-2.2	20-22	Hysteresis
2.0-10*	20-100	Heat output supplied

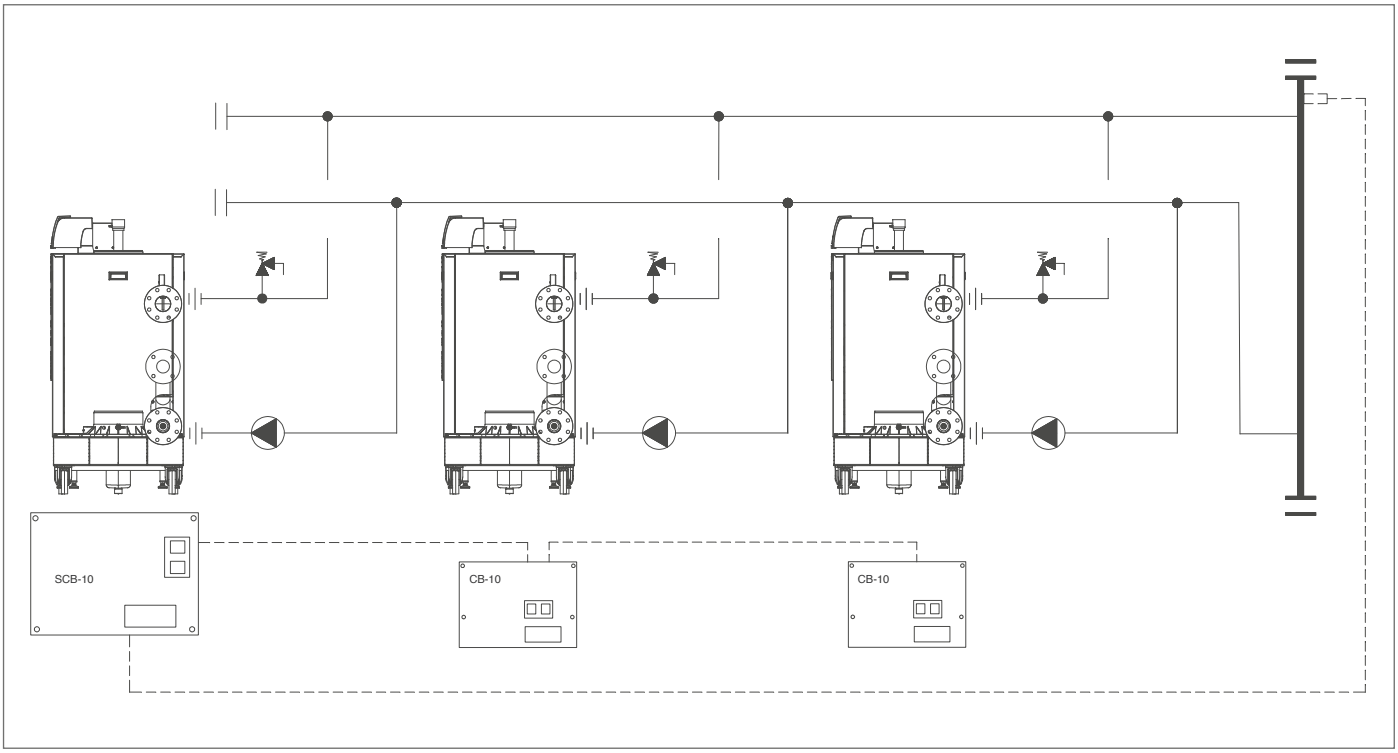
Boiler
controls.

Cascade control

Using the optional SCB-10 expansion board, the boilers can control their own cascade arrangement. The SCB-10 is mounted internally into the master boiler and connects using the S-Bus ports to slave boiler(s) via the CB-01 supplied as standard.

The supplied temperature sensor must be installed onto the common flow header or low loss header. The cascade can function stand alone using configurable parameters or using a 1 x 0-10V connection from the BMS allowing set point temperature control.

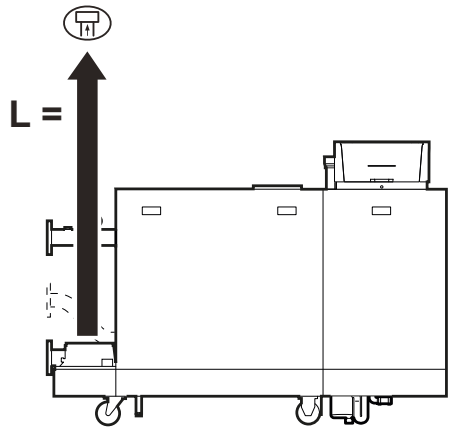
Typical cascade wiring arrangement



Gas 320 Ace
flue data.

Open flue (B23, B23[2])

With a room-ventilated system, only the flue is connected. The air supply is not connected and will draw the combustion air directly from the installation area.



L Length of the flue to roof terminal

Flue gas outlet connection

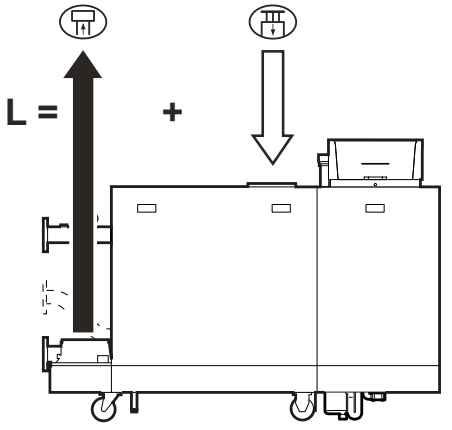
Maximum length (L)	
Boiler type	**Diameter 250MM**
Gas 320 Ace 285	50m[1]
Gas 320 Ace 335	50m[1]
Gas 320 Ace 430	50m[1]
Gas 320 Ace 500	50m[1]
Gas 320 Ace 575	50m[1]
Gas 320 Ace 650	50m

(1) While maintaining maximum length, additional 5 times 90° or 10 times 45° bends can be used (indicated for each boiler type and diameter).

(2) When installing a boiler with connection type B23 , B23P the IP rating of the boiler is lowered to IP20.

Room-sealed (C33, C63)

With a room-sealed system, both the flue and the air supply are connected.



L Combined length of the flue and air supply channel to the roof terminal

Flue gas outlet connection

Air supply connection

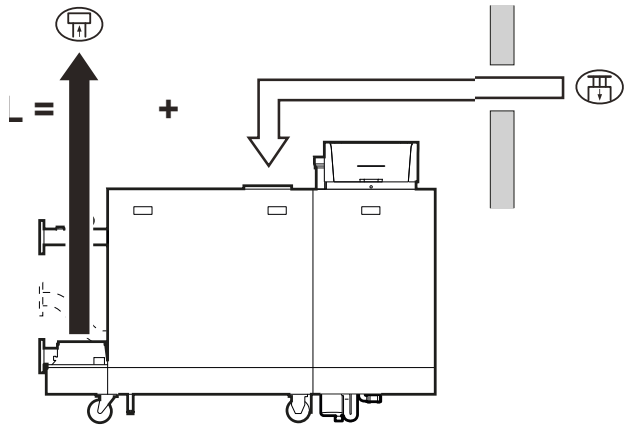
Maximum length (L)		
Boiler type	**Diameter 250MM**	**Diameter 300MM**
Gas 320 Ace 285	100m[1]	100m[1]
Gas 320 Ace 355	100m[1]	100m[1]
Gas 320 Ace 430	100m	100m[1]
Gas 320 Ace 500	100m	100m[1]
Gas 320 Ace 575	68m	100m[1]
Gas 320 Ace 650	48m	100m[1]

(1) While maintaining maximum length, additional 5 times 90° or 10 times 45° bends can be used (indicated for each boiler type and diameter).

Gas 320/620 Ace
flue data.

Different pressure zones

The maximum permitted height difference between the air supply terminal and the flue gas outlet is 36m.



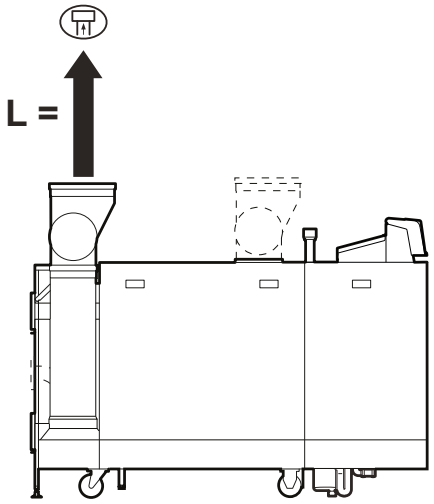
L Combined length of the flue and air supply channel
Flue gas outlet connection
Air supply connection

Maximum length (L)		
Boiler type	**Diameter 250MM**	**Diameter 300MM**
Gas 320 Ace 285	100m(1)	100m(1)
Gas 320 Ace 355	100m(1)	100m(1)
Gas 320 Ace 430	88m	100m(1)
Gas 320 Ace 500	76m	100m(1)
Gas 320 Ace 575	53m	100m(1)
Gas 320 Ace 650	38m	100m(1)

(1) While maintaining maximum length, additional 5 times 90° or 10 times 45° bends can be used (indicated for each boiler type and diameter).

Open flue (B23, B23(2))

With a room-ventilated system, only the flue is connected. The air supply is not connected and will draw the combustion air directly from the installation area.



L Length of the flue to roof terminal
Flue gas outlet connection

Maximum length (L)			
Boiler type	**Diameter 250MM**	**Diameter 300MM**	**Diameter 350MM**
Gas 620 Ace 570	50m(1)	50m(1)	50m(1)
Gas 620 Ace 710	31m	50m(1)	50m(1)
Gas 620 Ace 860	20m	50m(1)	50m(1)
Gas 620 Ace 1000	11m	39m	50m(1)
Gas 620 Ace 1150	5m	26m	50m
Gas 620 Ace 1300	3m	19m	50m

(1) While maintaining maximum length, additional 5 times 90° or 10 times 45° bends can be used (indicated for each boiler type and diameter).

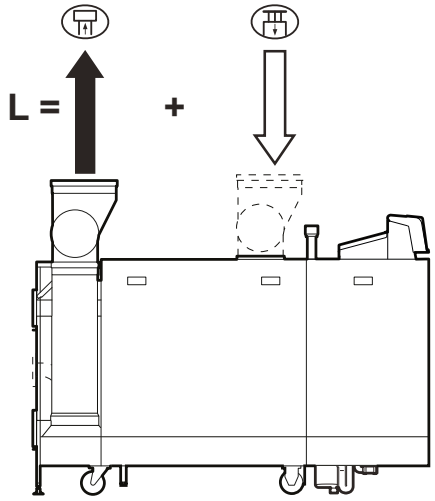
(2) When installing a boiler with connection type B23 , B23P the IP rating of the boiler is lowered to IP20.

Maximum length (L)				
	Diameter 250MM	**Diameter 300MM**	**Diameter 350MM**	**Diameter 400MM**
45° bend	2.0m	2.4m	2.8m	3.2m
90° bend	3.5m	4.2m	4.9m	5.6m

Gas 620 Ace
flue data.

Room sealed system

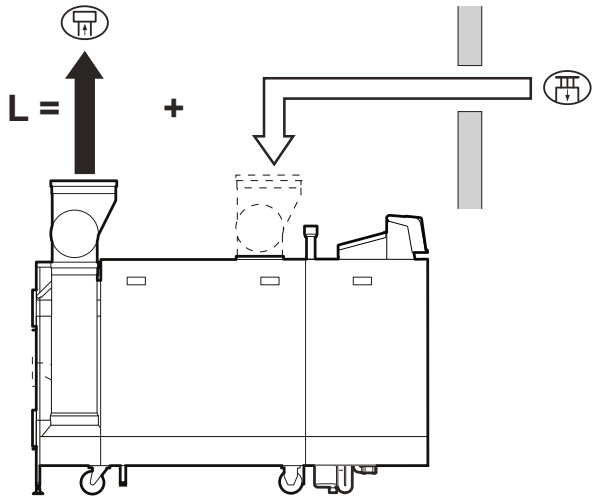
If using a room-sealed version, it is necessary to connect both the combustion gas exhaust and the air supply opening separately.



L Combined length of the flue and air supply channel to the roof terminal
Flue gas outlet connection
Air supply connection

Different pressure zones

Combustion air supply and combustion gas discharge are possible in various pressure zones, semi-CLV systems, with the exception of coastal areas. The maximum permissible difference in height between the combustion air supply and the combustion gas discharge is 36m.



L Combined length of the flue and air supply channel
Flue gas outlet connection
Air supply connection

Maximum length (L)			
Boiler type	**Diameter 300MM**	**Diameter 350MM**	**Diameter 400MM**
Gas 620 Ace 570	100m(1)	100m(1)	100m(1)
Gas 620 Ace 710	86m	100m(1)	100m(1)
Gas 620 Ace 860	52m	50m(1)	50m(1)
Gas 620 Ace 1000	26m	70m	50m(1)
Gas 620 Ace 1150	10m	32m	48m
Gas 620 Ace 1300	–	20m	24m

(1) While maintaining maximum length, additional 5 times 90° or 10 times 45° bends can be used (indicated for each boiler type and diameter).

Maximum length (L)			
Boiler type	**Diameter 250MM**	**Diameter 300MM**	
Gas 620 Ace 570	100m(1)	100m(1)	100m(1)
Gas 620 Ace 710	48m	100m(1)	100m(1)
Gas 620 Ace 860	24m	83m	100m(1)
Gas 620 1000	–	38m	90m
Gas 620 1150	–	–	28m
Gas 620 1300	–	–	–

(1) While maintaining maximum length, additional 5 times 90° or 10 times 45° bends can be used (indicated for each boiler type and diameter).

Technical support and declaration of compliance.

Technical support

From brochures to CAD drawings and BIM files, you can access all the information you need at **remeha.co.uk**

Or call our sales or technical departments on **0345 070 1055.**

We're always happy to help.

We can provide you with:

- Brochures
- Technical specification sheets
- Case studies
- Installation manuals
- BIM files
- CAD files
- Energy-related products directive data
- Commissioning
- Technical information
- Spare parts)

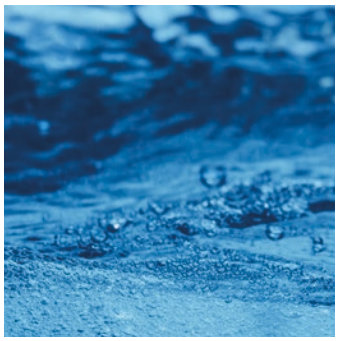
Declaration of compliance

We hereby certify that the series of appliances specified herein is in compliance with the standard model described in the EC declaration of compliance, and that it is manufactured and marketed in compliance with the requirements and standards of the following European Directives:

- EU Type Examination Certificate (GAR) Issue Date 13-10-2020
- EC Type Examination Certificate (BED/R813) 92/42/ ECC Efficiency Requirements
- 89/336/EEC E.M.C. Directive

And complies with the following requirements:

- 73/23/EEC Electrical Low Voltage Directive
- 97/23/EEC Pressure Equipment Directive
- CE Certification
- NO_2 Class Declaration EN15502-1:2012 + A1:2016 Gas Fired Heating Boilers – Part 1: General requirements and tests
- The unit has been inspected for compliance with the essential requirements of the following directives: CE identification number (PIN): 0063CU3937
- NO_2 Class: 6
- Boiler Efficiency Declaration Issue date 14-10-2020 to EN15502-1:2012+A1:2015



Content provided within this document is correct as of publication, subject to change without notice.
Please refer to the Installation, Operation and Maintenance Manual which can be found at **remeha.co.uk**

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