Air Quality CONSULTANTS

Air Quality Assessment:
16 Avenue Road, Camden

January 2020

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Executive Summary

The air quality impacts associated with the development of a proposed high-end property located at 16 Avenue Road, Camden, have been assessed to discharge Condition 18 of the planning permission granted by the London Borough of Camden. An assessment of the emissions from the Combined Heat and Power and associated boiler has demonstrated that the emissions from the plant will comply with the emissions standards as set out in the Mayor's Sustainable Design and Construction SPG.

The Development has also been shown to meet the London Plan's requirement that new developments are at least 'air quality neutral'. Thus Condition 18 of the planning permission can be discharged.

Contents

Tables

Figures

1 Introduction

1.1 This report describes the potential air quality impacts associated with the proposed residential development of 16 Avenue Road, Camden (hereafter referred to as the 'Site'). The assessment has been carried out by Air Quality Consultants Ltd on behalf of Jackson Coles LLP. The proposed development involves the construction of a single high-end dwelling (hereafter referred to as the 'Development'). An air quality assessment is required to support discharge of Condition 18 of the planning permission, which states:

"Prior to commencement, full details of an air quality assessment must be submitted and approved by the Local Planning Authority. The assessment must show the development meets the Mayor's 'air quality neutral' requirements and that the proposed CHP plant complies with the emissions standards as set out in the Mayor's Sustainable Design and Construction SPG. Details of any necessary NO_2 abatement mechanisms shall be submitted to the Local Planning Authority and approved in writing. If the air quality assessment demonstrates that CHP is not suitable for the scheme then carbon reduction targets will need to be met through other means."

1.2 The Development will be provided with heat, hot water and some electricity using a small natural gas-fired Combined Heat and Power (CHP) and additional condensing natural gas-fired boiler (hereafter referred to as the "energy plant") to be located in the basement of the property. The emissions from the energy plant could impact upon air quality at existing residential properties, as well as at the new residential properties within the Development itself. The main air pollutant of concern related to gas-fired CHP and boiler plant is nitrogen dioxide.

1.3 The Greater London Authority's (GLA's) London Plan (GLA, 2016) requires new developments to be air quality neutral. The air quality neutrality of the Development has, therefore, been assessed following the methodology provided in the Greater London Authority's (GLA's) Supplementary Planning Guidance (SPG) on Sustainable Design and Construction (GLA, 2014a) (discussed in Section 3: Assessment Approach of this report).

2 Policy Context and Assessment Criteria

The London Plan

2.1 The London Plan (GLA, 2016) sets out the spatial development strategy for London consolidated with alterations made to the original plan since 2011. It brings together all relevant strategies, including those relating to air quality.

2.2 Policy 7.14, 'Improving Air Quality', addresses the spatial implications of the Mayor's Air Quality Strategy and how development and land use can help achieve its objectives. It recognises that Boroughs should have policies in place to reduce pollutant concentrations, having regard to the Mayor's Air Quality Strategy.

2.3 Policy 7.14B(c), requires that development proposals should be "*at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as designated Air Quality Management Areas (AQMAs))*". Further details of the London Plan in relation to planning decisions are provided in Appendix A1.

2.4 The latest version of the draft new London Plan was published in July 2019 (GLA, 2019a), and incorporates some consolidated changes to previous versions suggested by the Mayor of London. The current timescale is that the new London Plan will be adopted in March 2020. However, the draft London Plan is a material consideration in planning decisions, which will gain more weight as it moves through the process to adoption. Policy SI1 on 'Improving Air Quality' states that:

"Development plans, through relevant strategic, site specific and area-based policies should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality".

2.5 It goes on to detail that development proposals should not:

- *"lead to further deterioration of existing poor air quality*
- *create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits*
- *create unacceptable risk of high levels of exposure to poor air quality"*.

2.6 It also states that:

"Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating a) how proposals have considered ways to maximise benefits to local air quality, and b) what measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this."

GLA SPG: Sustainable Design and Construction

2.7 The GLA's SPG on Sustainable Design and Construction (GLA, 2014a) provides details on delivering some of the priorities in the London Plan. Section 4.3 covers Air Pollution. It defines when developers will be required to submit an air quality assessment, explains how location and transport measures can minimise emissions to air, and provides emission standards for gas-fired boilers, CHP and biomass plant. It also sets out, for the first time, guidance on how Policy 7.14B(c) of the London Plan relating to 'air quality neutral' (see Paragraph 2.3, above) should be implemented.

3 Assessment Approach

Compliance with Emissions Standard

3.1 The first step in considering the energy plant impacts has been to compare the emission rates with the requirements of the GLA's guidance on sustainable design and construction (GLA, 2014a). The gas boilers must conform to a maximum NOx emission of <40 mg/kWh, while the spark ignition CHP must have a maximum NOx emission of either 95 mg/Nm^3 (normalised conditions[1]), if the proposed development is in a Band B area or 250 mg/Nm^3 (normalised conditions[2]), if the proposed development is in a Band A area. Band A and B are defined as locations where annual mean nitrogen dioxide and PM_{10} concentrations are:

- Band A >5% below the national objective;
- Band B between 5% below or above national objective.

3.2 The SPG makes clear that the emission standards are 'end-of-pipe' concentrations expressed at specific reference conditions for temperature, pressure, oxygen and moisture content.

3.3 The second step has been to consider whether the design and location of the flue conforms with the criteria described in the GLA's guidance on sustainable design and construction (GLA, 2014a).

Existing Conditions

3.4 Existing conditions have been assessed to determine whether the CHP is required to meet the 'Band A' or 'Band B' emissions standards, as defined in paragraph 3.1. As discussed in Section 4: Site Description and Baseline Conditions of this report, existing sources of emissions within the study area have been defined using a number of approaches. Industrial and waste management sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register (Defra, 2020a).

3.5 Information on existing air quality has been obtained by collating the results of monitoring carried out by the London Borough of Camden. Background concentrations have been defined using the 2017-based national pollution maps published by Defra (2020b). These cover the whole of the UK on a 1x1 km grid.

3.6 Whether or not there are any exceedances of the annual mean EU limit value for nitrogen dioxide in the study area has been identified using the maps of roadside concentrations published by Defra (2019b), as well as from any nearby Automatic Urban and Rural Network (AURN) monitoring sites

[1] At 273K, 101.3kPa, 5% O2, dry gas, as specified in the Sustainable Design and Construction SPG for band B developments.

[2] At 273K, 101.3kPa, 5% O2, dry gas, as specified in the Sustainable Design and Construction SPG for band A developments.

(which operate to EU data quality standards). These maps are used by the UK Government, together with the AURN results, to report exceedances of the limit value to the EU. The national maps of roadside PM_{10} and $PM_{2.5}$ concentrations (Defra, 2020c), which are available for the years 2009 to 2018, show no exceedances of the limit values anywhere in the UK in 2018.

'Air Quality Neutral'

3.7 The guidance relating to air quality neutral follows a tiered approach, such that all developments are expected to comply with minimum standards for gas and biomass boilers and for CHP plant (GLA, 2014a). Compliance with 'air quality neutral' is then founded on emissions benchmarks that have been derived for both building (energy) use and road transport in different areas of London. Developments that exceed the benchmarks are required to implement on-site or off-site mitigation to offset the excess emissions (GLA, 2014a).

3.8 Appendix A4 sets out the emissions benchmarks. The approach has been to calculate the emissions from the development and to compare them with these benchmarks.

4 Site Description and Baseline Conditions

4.1 The Site is located in the London Borough of Camden in Inner London. The Site is bounded by Avenue Road to the southwest, residential flats to the northwest and southeast and a large garden to the northeast. It currently consists of a single high-end property.

Industrial sources

4.2 A search of the UK Pollutant Release and Transfer Register (Defra, 2020a) has not identified any significant industrial or waste management sources that are likely to affect the Development, in terms of air quality.

Air Quality Management Areas

4.3 The London Borough of Camden has investigated air quality within its area as part of its responsibilities under the LAQM regime. In September 2002 an AQMA was declared for the whole borough for exceedances of the annual mean nitrogen dioxide and 24-hour mean PM_{10} objectives.

Air Quality Focus Areas

4.4 The Development is located approximately 700 m southeast of the 'Swiss Cottage from South Hamstead to Finchley Road Station' air quality Focus Area, one of 187 air quality Focus Areas in London, these being locations that not only exceed the EU annual mean limit value for nitrogen dioxide but also locations with high levels of human exposure.

Local Air Quality Monitoring

4.5 The London Borough of Camden operates three automatic monitoring stations within its area, one of which is located at Swiss Cottage, approximately 1 km from the Site. Results for the years 2013 to 2018 are summarised in Table 1 and the monitoring locations are shown in Figure 1.

Table 1: Summary of Nitrogen Dioxide (NO_2) Monitoring (2013-2018) [a,b]

Site No.	Site Type	Location	2013	2014	2015	2016	2017	2018
Automatic Monitors - Annual Mean (µg/m³)								
CD1	Kerbside	Swiss Cottage	**63**	**66**	**61**	**66**	**53**	**54**
Objective			**40**					
Automatic Monitors - No. of Hours > 200 µg/m³								
CD1	Kerbside	Swiss Cottage	**42**	14	11	**37**	1	2
Objective			**18 (200) [c]**					
Objective			**40**					

[a] Exceedances of the objectives are shown in bold.

[b] Data taken from the Camden Council 2019 Annual Status Report (Camden Council, 2019).

4.6 Continued exceedances of the annual mean nitrogen dioxide objective have been measured at the automatic monitor. This monitoring is in a busy location, close to a junction whereas the Site is located along a busy road, but further from any junction and set back from the road by 15m. Given the difference in local site conditions, nitrogen dioxide concentrations at the Site are expected to be slightly lower than at the monitoring site, but are still likely to be close to or exceeding the annual mean nitrogen dioxide objective. A slight downward trend is seen in concentrations between 2013 and 2018.

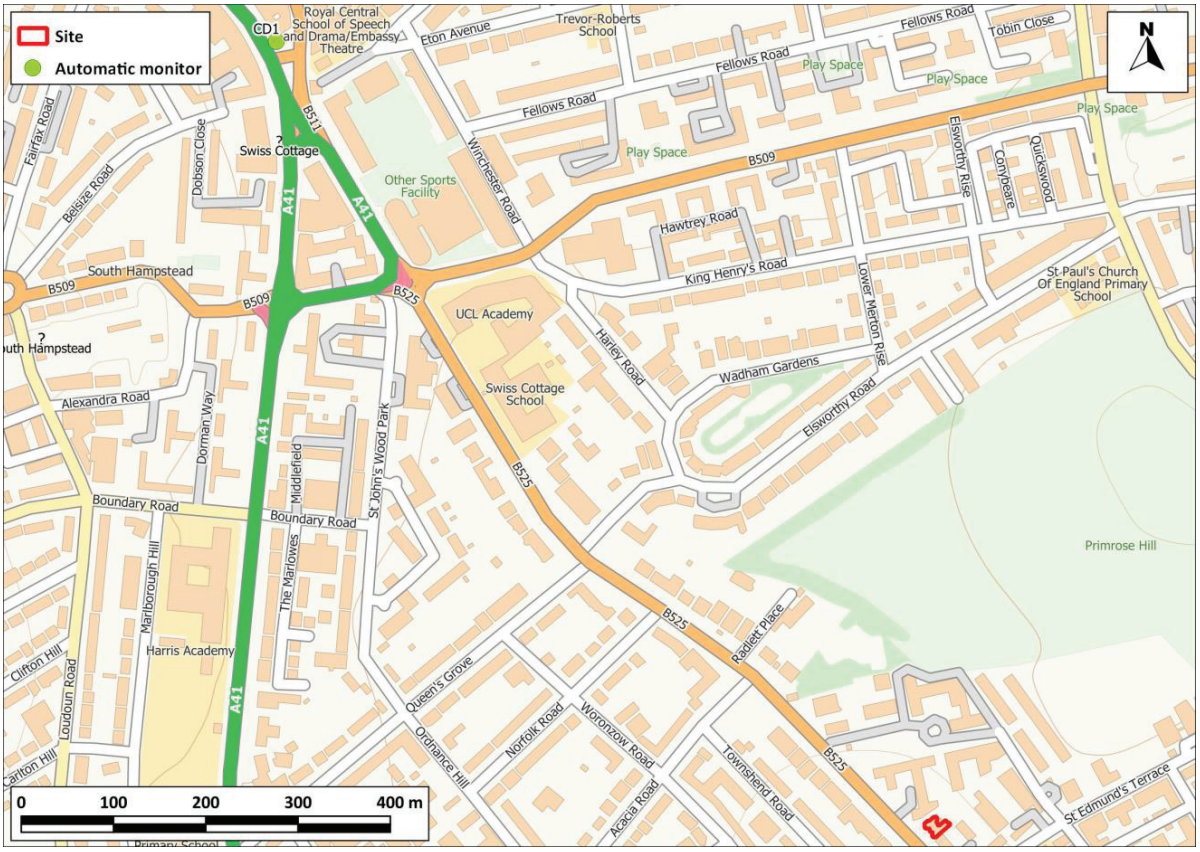

Figure 1: Monitoring Location

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4.7 The Swiss Cottage kerbside automatic monitoring station is also the closest station which measured PM_{10} and $PM_{2.5}$ concentrations in 2018. Results for the years 2013 to 2018 are summarised in Table 2 and show the objectives have been met in all years.

Table 2: Summary of PM_{10} and $PM_{2.5}$ Automatic Monitoring (2013-2018)

Site No.	Site Type	Location	2013	2014	2015	2016	2017	2018
PM_{10} Annual Mean (µg/m³)								
CD1	Kerbside	Swiss Cottage	21	22	20	21	20	21
Objective			**40**					
PM_{10} No. Days >50 µg/m³								
CD1	Kerbside	Swiss Cottage	8	12	8	7	8	4
Objective			**35 (50)**					
$PM_{2.5}$ Annual Mean (µg/m³)								
CD1	Kerbside	Swiss Cottage	-	-	12	15	16	11
Objective			**25 [a]**					

[a] The $PM_{2.5}$ objective, which is to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

Exceedances of EU Limit Value

4.8 There are several AURN monitoring sites within the Greater London Urban Area that have measured exceedances of the annual mean nitrogen dioxide limit value. Furthermore, Defra's roadside annual mean nitrogen dioxide concentrations (Defra, 2019b), which are used to report exceedances of the limit value to the EU, identify exceedances of this limit value in 2018 along many roads in London, including the A5205 near to the Development. The Greater London Urban Area has thus been reported to the EU as exceeding the limit value for annual mean nitrogen dioxide concentrations. Defra's predicted concentrations for 2020, also do not identify any exceedances within the study area. As such, there is considered to be no risk of a limit value exceedance in the vicinity of the proposed development by the time that it is operational.

4.9 Defra's Air Quality Plan requires the GLA to prepare an action plan that will *"deliver compliance in the shortest time possible"*, and the 2015 Plan assumed that a CAZ was required. The GLA has already implemented an LEZ and a ULEZ, thus the authority has effectively already implemented the required CAZ. These have been implemented as part of a package of measures including 12 Low Emission Bus Zones, Low Emission Neighbourhoods, the phasing out of diesel buses and taxis and other measures within the Mayors Transport Strategy.

Background Concentrations

4.10 Estimated background concentrations at the Development have been determined for 2018 and the opening year 2020 using Defra's 2017-based background maps (Defra, 2020b). The background concentrations are set out in Table 3. The background concentrations are all below the objectives.

Table 3: Estimated Annual Mean Background Pollutant Concentrations in 2018 and 2020 (µg/m^3)

Year	NO_2	PM_{10}	$PM_{2.5}$
2018	30.9	17.4	11.8
2020 [a]	27.3	16.8	11.4
Objectives	**40**	**40**	**25** [a]

[a] The $PM_{2.5}$ objective, which is to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

Summary

4.11 The monitoring data and proximity to Avenue Road indicates that annual mean nitrogen dioxide concentrations are likely to be above or close to the objective. Therefore the CHP will be required to conform with the Band B emissions standard.

5 Plant Emissions

5.1 The specifications for the energy plant, upon which the assessment is based, are set out in Appendix A3 and technical datasheets for the plant are provided in Appendix A5.

5.2 An XRGi9 CHP will be installed. This has a stated emission rate of 54 mg/Nm^3 NOx at 273K, 101.3kPa, 5% O2, dry gas (see Appendix A5 for full details). This is below the emission standard of <95 mg/Nm^3 NOx and is thus compliant with the Sustainable Design and Construction SPG.

5.3 The project M&E Consultants have advised that a Quinta Ace 90 boiler will be used within the Development, which have a maximum NOx emission of 29 mg/kWh. This is below the emission standard of <40 mg/kWh NOx and is thus compliant with the Sustainable Design and Construction SPG.

5.4 The location of the CHP and boiler flues are shown in Appendix A5. Emissions would exhaust via two flues located in the chimney, above roof level. The flues will exhaust at a point where dispersion will be good (terminating at 12.7 m above ground, 1.5 m above the roof level of the proposed and neighbouring properties). As such, dispersion will be good. Further details of the energy plant emissions are provided in Appendix A3.

6 'Air Quality Neutral'

6.1 The purpose of the London Plan's requirement that development proposals be 'air quality neutral' is to prevent the gradual deterioration of air quality throughout Greater London. The 'air quality neutrality' of a proposed development, as assessed in this section, does not directly indicate the potential of the proposed development to have significant impacts on human health (this has been assessed separately in the previous section).

Building Emissions

6.2 The property will contain a small domestic gas-fired boiler and a combined heat and power plant (CHP). The calculated total NOx emission from the proposed boiler will be 8.9 kg/annum based on an estimated 305,585 kWh heat annually.

6.3 Approximately 67,238 kWh heat annually will be provided by the CHP plant, which has higher NOx emissions than the boiler plant. This level of usage has been calculated to generate a total annual NOx emission of 3.7 kg/annum. The proposed development will generate a total annual NOx emission of 12.6 kg/annum from the boiler and the CHP.

6.4 Appendix A4 shows the Building Emissions Benchmarks (BEBs) for each land use category. Table 4 shows the calculation of the BEBs for this development.

Table 4: Calculation of Building Emissions Benchmark for the Development

Description		Value	Reference
A	**Gross Internal Floor Area of C3 Residential Units (m^2)**	1,743	M&E consultants
B	**NOx BEB for C3 Residential Units (g/m^2/annum)**	26.2	Table A4.1
Total BEB NOx Emissions (kg/annum)		45.7	(A x B) / 1000

6.5 The Total Building NOx Emission of 12.6 kg/annum is less than Total BEB NOx Emission of 45.7 kg/annum. The proposed development is thus better than air quality neutral in terms of building emissions.

7 Conclusions

7.1 Emissions from the proposed CHP and Boiler Plant within the development are below the relevant emissions standards and conform with the requirements of the SPG.

7.2 The building related emissions associated with the proposed development are below the relevant benchmark. The proposed development therefore complies with the requirement that all new developments in London should be at least air quality neutral. The development is compliant with Policy 7.14 of the London Plan.

8 References

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Technical Guidance Note D1 (Dispersion). (1993). HMSO.

9 Glossary

AQC	Air Quality Consultants
AQAL	Air Quality Assessment Level
AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural Network
BEB	Building Emissions Benchmark
CAZ	Clean Air Zone
CHP	Combined Heat and Power
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EPUK	Environmental Protection UK
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
EU	European Union
EV	Electric Vehicle
Focus Area	Location that not only exceeds the EU annual mean limit value for NO_2 but also has a high level of human exposure
GIA	Gross Internal Floor Area
GLA	Greater London Authority
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
JAQU	Joint Air Quality Unit
kW	Kilowatt
LAQM	Local Air Quality Management
LB	London Borough
LEZ	Low Emission Zone
LGV	Light Goods Vehicle
µg/m^3	Microgrammes per cubic metre
MCPD	Medium Combustion Plant Directive

MW_{th}	Megawatts Thermal
NO	Nitric oxide
NO_2	Nitrogen dioxide
NOx	Nitrogen oxides (taken to be NO_2 + NO)
NPPF	National Planning Policy Framework
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PM_{10}	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
$PM_{2.5}$	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
PPG	Planning Practice Guidance
SPG	Supplementary Planning Guidance
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
TfL	Transport for London
ULEZ	Ultra Low Emission Zone
WHO	World Health Organisation
ZEC	Zero Emission Capable

10 Appendices

A1 London-Specific Policies and Measures

London Plan

A1.1 The London Plan sets out the following points in relation to planning decisions:

"Development proposals should:

a) minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within AQMAs or where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) such by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans (see Policy 6.3);

b) promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the GLA and London Councils "The control, of dust and emissions form construction and demolition";

c) be at least "air quality neutral" and not lead to further deterioration of existing poor air quality (such as areas designated as Air Quality Management Areas (AQMAs));

d) ensure that where provision needs to made to reduce emissions from a development, these usually are made on site. Where it can be demonstrated that on-site provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area-based approaches;

e) where the development requires a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations. Permission should only be granted if no adverse air quality impacts from the biomass boiler are identified."

A2 Professional Experience

Penny Wilson, BSc (Hons) CSci MIEnvSc MIAQM

Ms Wilson is an Associate Director with AQC, with more than 19 years' relevant experience in the field of air quality. She has carried out numerous assessments for a range of infrastructure developments including power stations, road schemes, ports, airports and residential/commercial developments. The assessments have covered operational and construction impacts, including odours. She also provides services to local authorities in support of their LAQM duties, including the preparation of Review and Assessment and Action Plan reports, as well as audits of Air Quality Assessments submitted with planning applications. She has provided expert evidence to a number of Public Inquiries, and is a Member of the Institute of Air Quality Management and a Chartered Scientist.

Guido Pellizzaro, BSc (Hons) MIAQM MIEnvSc PIEMA

Mr Pellizzaro is an Associate Director with AQC, with more than 14 years' experience in the field of air quality management and assessment. His main experience relates to managing and delivering air quality assessments for major planning applications and EIA development. Guido is a Member of the Institute of Environmental Sciences and of the Institute of Air Quality Management, and a Practitioner of the Institute of Environmental Management and Assessment.

Isabel Stanley, MSci (Hons)

Miss Stanley is an Assistant Consultant with AQC, having joined the company in October 2019. Prior to joining AQC she completed an MSci degree in Geology at the University of Bristol, where her studies included modules focusing on GIS, dispersion modelling and environmental geochemistry. She is now gaining experience in the field of air quality monitoring and assessment.

A3 Energy Plant Specification

A3.1 The proposed development will be provided with heat, hot water and some electricity using a small natural gas-fired CHP unit and additional condensing natural gas-fired boiler to be located in the basement of the property.

A3.2 The restrictions set out should be adhered in order to ensure that the final plant design does not lead to impacts greater than those modelled. To further emphasise these, the final design should adhere to the following minimum specifications:

- the CHP must be designed such that it will operate with a minimum efflux velocity of 10 m/s to allow for good initial dispersion of emissions;
- a boiler system with a maximum total of 400 kW fuel input must share a common flue outlet with a maximum internal diameter of 0.4 m at the exit point, terminating at least 1 m above the roof level;
- all stacks should discharge vertically upwards and be unimpeded by any fixture on top of the stack (e.g., rain cowls or 'Chinaman's Hats');
- the system must be designed to conform to the requirements of the GLA's guidance on sustainable design and construction (GLA, 2014a). The gas boilers must conform to a maximum NOx emission of <40 mg/kWh, while the spark ignition CHP must have a maximum NOx emission of 95 mg/Nm^3 (normalised conditions[3]), as the proposed development is in a Band B area. The SPG makes clear that the emission standards are 'end-of-pipe' concentrations expressed at specific reference conditions for temperature, pressure, oxygen and moisture content. Compliance with these standards will be confirmed prior to occupation, based on:
  - monitoring undertaken on the actual installed plant; or
  - manufacturer guaranteed performance levels supported by type approval monitoring undertaken by the equipment supplier.
- in order to attain these values, relevant catalyst or alternative abatement may be required.

A3.3 If the design of the energy centre deviates significantly from the modelled specification, additional future modelling may be required in order to ensure that there are no significant adverse air quality impacts.

A3.4 The GLA's Sustainable Design and Construction SPG (GLA, 2014a) also states that the measures set out in Technical Guidance Note D1 (Dispersion) (1993) should also be adhered to in order to

[3] At 273K, 101.3kPa, 5% O2, dry gas, as specified in the Sustainable Design and Construction SPG for band B developments.

ensure adequate dispersion of emissions from discharging stacks and vents. These include the following, all of which are complied with for the proposed development:

- Discharges should be vertically upwards and unimpeded by cowls or any other fixtures on top of the stack. However, the use of coning or of flame traps at the tops of stacks is acceptable. In the case of discharge stacks (whether single or multiple stack) with shrouds or casings around the stack(s), the stack(s) alone should extend above the shroud or casing. This extension should be at least 50% of the shroud or casing's greatest lateral dimension;
- Irrespective of the pollutant discharge, there are minimum discharge stack heights based on the heat release and the discharge momentum. These can be calculated following calculations set out in the guidance note, but the absolute minimum value is 1 m;
- No discharge stack should be less than 3 m above the ground or any adjacent area to which there is general access. For example, roof areas and elevated walkways;
- A discharge stack should never be less than the height of any building within a distance of 5 times the stack height; and
- A discharge stack should be at least 3 m above any opening windows or ventilation air inlets within a distance of 5 times the stack height.

A4 'Air Quality Neutral'

A4.1 The GLA's SPG on Sustainable Design and Construction (GLA, 2014a), and its accompanying Air Quality Neutral methodology report (AQC, 2014), provide an approach to assessing whether a development is air quality neutral. The approach is to compare the expected emissions from the building energy use and the car use associated with the proposed development against defined emissions benchmarks for buildings and transport in London.

A4.2 The benchmarks for heating and energy plant (termed 'Building Emissions Benchmarks' or 'BEBs') are set out in Table A4.1. The information in Table A4.2 may be used if site-specific information are not available (AQC, 2014).

Table A4.1: Building Emissions Benchmarks (g/m^2 of Gross Internal Floor Area)

Land Use Class	NOx	PM_{10}
Class A1	22.6	1.29
Class A3 - A5	75.2	4.32
Class A2 and Class B1	30.8	1.77
Class B2 - B7	36.6	2.95
Class B8	23.6	1.90
Class C1	70.9	4.07
Class C2	68.5	5.97
Class C3	26.2	2.28
D1 (a)	43.0	2.47
D1 (b)	75.0	4.30
Class D1 (c -h)	31.0	1.78
Class D2 (a-d)	90.3	5.18
Class D2 (e)	284	16.3

Table A4.2: Average Emissions from Heating and Cooling Plant in Buildings in London in 2010

	Gas (kg/kWh)		Oil (kg/kWh)	
	NOx	PM_{10}	NOx	PM_{10}
Domestic	0.0000785	0.00000181	0.000369	0.000080
Industrial/Commercial	0.000194	0.00000314	0.000369	0.000080

A5 Energy Plant Technical Datasheets

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We're completely focused on commercial heating solutions and are at the forefront of condensing gas boiler technology – we don't manufacture boilers for anyone else.

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've tried to think of everything, so from specification to blueprint sign-off through to supply and installation, our customer service and product support is our number one priority.

REMEHA QUINTA ACE RANGE

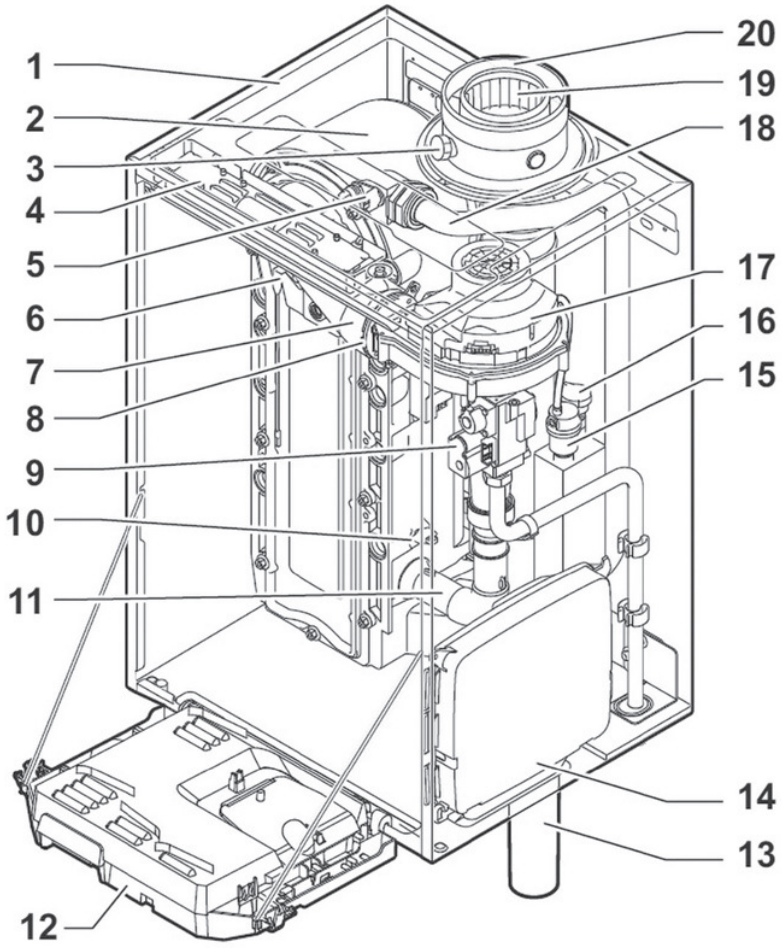
The Quinta Ace Range is a market-leading series of versatile, wall-hung condensing boilers designed for space heating and indirect hot water production. The Quinta Ace range is available in 30, 45, 55, 65, 90, 115 and 160 models.

With their extremely compact design, the Quinta Ace Range can be installed individually or as part of a multi-boiler cascade or rig system, for flexible design and reliable, high-quality performance. The Quinta Ace Range is suitable for use on sealed systems and open-vented installations (except the Quinta Ace 160).

FEATURES AND BENEFITS

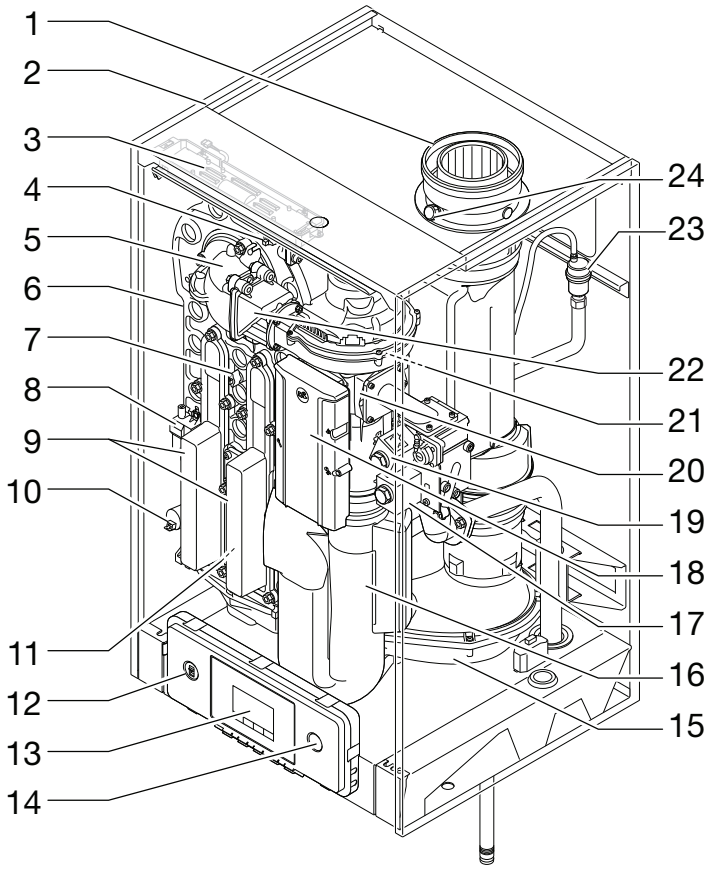
High efficiency boiler up to 97.6% GCV	Higher than average energy savings
Small dimensions and lightweight design	Easy to install in smaller spaces; highly suitable for cascade operation
Ultra-low, Class 6 NO_x emission levels of ≤ 36mg/kWh* 0% O_2 dry	Low pollutant emissions that meet ERP regulations and London plan targets (SPG 2014)
Premix down-firing gas burner and one-piece cast aluminium heat exchanger	Clean, trouble-free operation
LED illuminated casing air box, removable front panel, digital display, data file for storing information and remote signalling options	Improved ease of maintenance
Built-in advanced boiler control and calorifier control: • fully modulating 18-100% (5:1) • 0-10V operation • on/off (volt free enable).	Built-in flexibility for easy installation
Extremely compact cascade packages	Effective space saving solution for greater design flexibility
Quiet operation <52 dB(A)	Improved comfort
For use with natural gas and LPG	Flexible solution to energy-saving heating

QUINTA ACE 30 - 115 BOILER CONSTRUCTION



KEY					
1	Casing/air box	8	Non-return valve	15	Automatic air vent
2	Heat exchanger (CH)	9	Combined gas valve unit	16	Hydraulic pressure sensor
3	Flue gas measuring point	10	Return sensor	17	Fan
4	Interior light	11	Air intake silencer	18	Supply line
5	Flow sensor	12	Instrument box	19	Flue gas discharge pipe
6	Ionisation/ignition electrode	13	Siphon	20	Air supply
7	Mixing tube	14	Box for the control PCBs (= accessory)		

QUINTA ACE 160 BOILER CONSTRUCTION



KEY

1	Flue gas outlet/air intake	9	Inspection hatch for heat exchanger (x2)	17	Gas pressure measuring point
2	Casing/air box	10	Water pressure sensor	18	CU-GH control unit
3	Interior light	11	Return sensor	19	Gas valve unit
4	Flow sensor	12	PC/laptop connection point	20	Venturi
5	Adapter	13	Control panel	21	Fan
6	Heat exchanger	14	On/off switch	22	Non-return valve
7	Temperature sensor for heat exchanger	15	Condensate collector	23	Automatic air vent
8	Ignition transformer	16	Air inlet silencer	24	Flue gas measuring point

QUINTA ACE RANGE
OPERATING PRINCIPLE

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°C above the temperature of the system return water, then discharged vertically via the condensate collector, through the 80/125mm (Quinta Ace 30/45) or 100/150mm (Quinta Ace 55/65/90/115 and 160) combined flue/air connection to atmosphere.

Because of the low flue gas exit temperature, there will be a vapour cloud formed at the flue gas terminal. If the controls allow the flow and therefore return temperature to fall below dew point (55ºC), this water vapour will begin to condense out in the boiler, transferring its latent heat into the system water, increasing the output of the boiler without increasing gas consumption. Any condensate which is able to flow back into the boiler, from flue lengths greater than one metre, must be discharged via a condensate collector and drain system fitted within one metre of the boiler flue connection.

Combustion air is drawn into the closed air box by a variable speed fan, through the air inlet connection from the plant room (open-flued) or from outside via the concentric flue system (room-sealed). On the inlet side of the fan is a specially designed Venturi which is connected to the outlet side of the gas combi-block.

Depending on the demand (under the dictates of flow/return sensor and other external/internal control inputs), the electronic control unit directly monitors the volume of gas and air being delivered to the premix burner. This mixture is initially ignited by the combined ignition/ionisation probe which then monitors the state of the flame. Should the flame not ignite or be unstable within the pre-set safety time cycle, the controls will shut the boiler down (after five attempts) requiring manual intervention to reset the boiler. The digital display will also indicate a flashing fault code, confirming the reason for the failure.

QUINTA ACE
TECHNICAL INFORMATION

	QUINTA ACE 30	QUINTA ACE 45	QUINTA ACE 55	QUINTA ACE 65	QUINTA ACE 90	QUINTA ACE 115	QUINTA ACE 160
PERFORMANCE							
Nominal heat output central heating operation @ 80/60°C kW (min-max)*	8.0-29.8	8.0-40.8	11.1-55.3	12.0-61.5	14.1-84.2	18.9-103.9	31.5-152.1
Nominal heat output central heating operation @ 50/30°C kW (min-max)*	9.1-30.9	9.1-42.4	12.3-58.6	13.3-65.0	15.8-89.5	21.2-109.7	34.7-161.6
Nominal input (Hi) (min-max)	8.2-30	8.2-41.2	11.3-56.5	12.2-62.0	14.6-86.0	19.6-107.0	32-156
EFFICIENCY							
SBEM seasonal efficiency GCV	97.62%	97.64%	96.04%	97.58%	95.65%	95.44%	95.88%
Efficiency – full load 100% NCV	99.4%	99.1%	97.8%	99.2%	97.9%	97.1%	97.5%
Efficiency – part load 30% NCV	110.4%	110.6%	108.7%	110.4%	108.1%	108%	108.5%
Eco design useful efficiency @ 80/60°C (100% full load) GCV	89.6%	89.3%	88.1%	89.4%	88.2%	87.5%	87.8%
Eco design useful efficiency @ 50/30°C (30% part load) GCV	99.5%	99.6%	97.9%	99.5%	97.4%	97.3%	97.8%
Energy labelling seasonal space efficiency GCV	94%	94%	92%	94%	N/a	N/a	N/a
ErP efficiency rating	A	A	A	A	N/a	N/a	N/a
Annual energy consumption kWh	91	125	173	188	N/a	N/a	N/a
GAS							
Standard fuel	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas	Natural gas
Optional fuel adjustment – see installation and service manual	LPG (propane)	LPG (propane)	LPG (propane)	LPG (propane)	LPG (propane)	LPG (propane)	LPG (propane)
Gas consumption NG m^3/h	0.9-3.2	0.9-4.4	1.2-6.0	1.3-6.6	1.5-9.1	2.1-11.3	3.4-16.5
Max gas consumption LPG m^3/h	0.4-1.2	0.4-1.7	0.5-2.3	0.5-2.5	0.9-3.5	0.9-4.4	1.4-6.3
Min/max gas inlet pressure NG mbar	17-25	17-25	17-25	17-25	17-25	17-25	17-25
Min/max gas pressure LPG mbar	37-50	37-50	37-50	37-50	37-50	37-50	37-50
Gas connection size BSP inches	¾" Male thread (22mm)	¾" Male thread (22mm)	¾" Male thread (22mm)	¾" Male thread (22mm)	¾" Male thread (22mm)	¾" Male thread (22mm)	1" Male thread (28mm)
FLUE (CONCENTRIC CONNECTION SUPPLIED AS STANDARD)							
Flue diameter mm I/D	80	80	100	100	100	100	100
Air inlet diameter mm I/D	125	125	150	150	150	150	150
Min/max flue gas mass flow rate kg/h	14-50	14-69	19-93	21-104	28-138	36-178	57-277
Min/max flue gas temperature °C	30-65	30-67	30-68	30-68	30-68	30-72	32-66
Max counter pressure Pa	70	150	120	100	160	220	200

QUINTA ACE
TECHNICAL INFORMATION

	QUINTA ACE 30	QUINTA ACE 45	QUINTA ACE 55	QUINTA ACE 65	QUINTA ACE 90	QUINTA ACE 115	QUINTA ACE 160
HYDRAULICS							
Water content litres	4.3	4.3	6.4	6.4	9.4	9.4	17.0
Resistance @ 15°C ΔT mbar	124	203	231	290	272	444	302
Hydraulic resistance @ 20°C ΔT mbar	70	114	130	163	153	250	170
Nominal flow rate @ 15°C ΔT l/s	0.48	0.65	0.88	0.97	1.34	1.66	2.43
Nominal flow rate @ 20°C ΔT l/s	0.36	0.49	0.66	0.74	1.01	1.24	1.82
Condensate connection	32mm	32mm	32mm	32mm	32mm	32mm	32mm
Connection size BSP (32mm)	1¼" Male thread (32mm)	1¼" Male thread (32mm)	1¼" Male thread (32mm)	1¼" Male thread (32mm)	1¼" Male thread (32mm)	1¼" Male thread (32mm)	1¼" Male thread (32mm)
Standard operating temperature** °C	20-90	20-90	20-90	20-90	20-90	20-90	20-90
Max operating temperature °C	90	90	90	90	90	90	90
High limit temperature °C	110	110	110	110	110	110	110
Max water operating pressure bar	4	4	4	4	4	4	4
Min water operating pressure bar	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Min operating pressure bar (OV)**	0.3 o/v	0.3 o/v	0.3 o/v	0.3 o/v	0.3 o/v	0.5 o/v	N/a
GENERAL							
Total Weight (Including Packaging) kg	60.5	60.5	66.5	66.5	76.5	76.5	147
Min mounting weight without front panel kg	50	50	56	56	65	65	123
Dimension mm (WxHxD)	500x750x500	500x750x500	500x750x500	500x750x500	500x750x500	500x750x500	600x1045x602
NO_x (Dry, 0% O_2) NCV - EN15502 (Class 6) Mg/kWh	33	33	36	36	29	33	36
Noise levels dB(A) at 1 metre	38.3	45.1	46.7	46.7	51.6	51.1	59.5
Eco Design Sound Power Levels LWA indoors dB	46	53	55	55	60	59	68
Standby heat loss kW	0.101	0.101	0.110	0.110	0.123	0.123	0.191
ELECTRICAL							
Nominal power supply	230v x 1ph x 50hz	230v x 1ph x 50hz	230v x 1ph x 50hz	230v x 1ph x 50hz	230v x 1ph x 50hz	230v x 1ph x 50hz	230v x 1ph x 50hz
Power consumption w	19-40	20-75	38-100	26-89	26-114	32-182	47-275
Modulating input v dc	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Fuse rating amps	2.5	2.5	2.5	2.5	2.5	2.5	6.3
Controls voltage	24 (max 4va)	24 (max 4va)	24 (max 4va)	24 (max 4va)	24 (max 4va)	24 (max 4va)	24 (max 4va)
Electrical protection index VAC	X4D	X4D	X4D	X4D	X4D	X4D	X1B

*Gas consumption based on lower heating value under standard heating conditions: T=288.15K, p=1013.25mbar. Gag 30.33, G25 29.25, G31 88.00 MJ/m³.
**Open vented option maximum operating temperature 75°C.

SUGGESTED ENGINEERING SPECIFICATION

QUINTA ACE

CONSTRUCTION

The boiler will be a wall-hung type condensing boiler which may also be installed free-standing on a suitable frame. The single piece, cast aluminium heat exchanger and other major components are contained within a sealed air box. The boiler casing will be complete with a removable front section for maintenance purposes. Electrical and electronic controls will be contained within the instrument panel mounted in the drop-down lower front panel and also the electrical housing mounted on the inside right hand panel.

HYDRAULIC, GAS AND FLUE CONNECTIONS

The combined flue gas outlet and combustion air inlet will be mounted on the top of the boiler, with the flow, return, gas and condensate connections located at the bottom. The boiler will be suitable for room-sealed or open-flue applications. The boiler will be designed for central heating and indirect hot water production up to four bar. The boiler will be suitable for use on sealed systems and open-vented installations.

OPERATION

The boiler will be 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 will be complete with a pre-mix burner (NG or LPG) with the gas/air ratio control system controlled internally. An intelligent, advanced boiler control will continuously monitor the boiler conditions, varying the heat output to suit the system load. The control will be able to react to external negative influences in the rest of the system (flow rates and air/gas supply problems), maintaining boiler output for as long as possible without resorting to a lockout condition. Should a negative effect happen in the system, the boiler will reduce its output and/or shut down (shut-off mode), awaiting the negative conditions to return to normal before re-starting. The control cannot override the standard flame safety controls. Standard frost protection will activate below 7°C with stage one activating system/shunt pump. Stage two will activate below 3°C with boiler switching on to 10°C flow.

CONTROLS

The boiler will include an “E-Smart Inside” control platform offering improved connectivity using the integral MK3 controller. The controls package will allow 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 will come as standard with the following inputs/outputs:

- 0-10V input (flow temperature or output percentage control)
- DHW temperature input
- high limit lock out
- safety/shutdown/release input (blocking)
- low water protection
- outside sensor (optional)
- external shunt pump control
- service report output
- external system pump control
- fault alarm output
- DHW 3-port valve control or pump
- OpenTherm, R-Bus & Volt Free Enable connection.

FEATURES

- Ultra-low NO_x ≤36mg/kWh
- Fully modulating
- Quiet operation <52dB(A)
- LED illuminated interior (integral battery)
- Data file for storing fault/run info
- Automatic maintenance warning
- PC connection
- ErP compliant
- Relay kit (optional)
- Premix burner
- In build passive flue gas non-return valve.

The Quinta Ace 30/45/55/65/90/115 boilers conform with the following EC-directives:

GAR (EU) 2016/426 to EN 15502-1:2012 +A1:2015 and EN 15502-2-1:2012 +A1:2016

BED 92/42/EEC to EN 15502-1:2012 +A1:2015 and EN 15502-2-1:2012 +A1: 2016

EMC 2014/30/EU to EN 55014-1:2017, EN 61000-3-2:2014 and EN 61000-3-3:2013

LVD 2014/35/EU to EN60335-2-102:2016, EN60335-1:2012

ErP 2009/125/EC

CE Certification Remeha Quinta Ace 30/45/55/65/90/115
PIN: 0063CS3928

QUINTA ACE 160

CONSTRUCTION

The boiler will be a wall-hung type condensing boiler which may also be installed free-standing on a suitable frame. The single piece, cast aluminium heat exchanger and other major components are contained within a sealed air box. The boiler casing shall be complete with a removable front section for maintenance purposes. Electrical and electronic controls will be contained within the instrument panel mounted in the drop-down lower front panel. This control panel will be able to be removed and wall-mounted if required.

HYDRAULIC, GAS AND FLUE CONNECTIONS

The combined flue gas outlet and combustion air inlet will be mounted on the top of the boiler, with the flow, return, gas and condensate connections located at the bottom. The boiler will be suitable for room-sealed or open-flue applications. The boiler will be designed for central heating and indirect hot water production up to four bar. The boiler will only be suitable for use on sealed hydraulic systems.

OPERATION

The boiler will be 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 will be complete with a pre-mix burner with the gas/air ratio control system controlled internally. An intelligent, advanced boiler control will continuously monitor the boiler conditions, varying the heat output to suit the system load. The control will be able to react to external negative influences in the rest of the system (flow rates and air/gas supply problems), maintaining boiler output for as long as possible without resorting to a lockout condition. Should a negative effect happen in the system the boiler shall reduce its output and/or shut down (shut-off mode), awaiting the negative conditions to return to normal before re-starting. The control cannot override the standard flame safety controls. Standard frost protection will activate below 7°C with stage one activating system/shunt pump. Stage two will activate below 3°C with boiler switching on to 10°C flow.

CONTROLS

The boiler will include 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 will come as standard with the following inputs/outputs:

- 0-10V input (flow temperature or output percentage control)
- DHW temperature input
- high limit lock out
- safety/shutdown/release input (blocking)
- low water protection
- outside sensor (optional)
- external shunt pump control
- service report output
- external system pump control
- fault alarm output
- DHW 3-port valve control or pump
- OpenTherm connection.

FEATURES

- Ultra-low NO_x 36mg/kWh.
- Fully modulating.
- Quiet operation <60dB(A).
- LED illuminated interior (integral battery).
- Data file for storing fault/run info.
- Automatic maintenance warning.
- PC connection.
- ErP compliant.
- Relay kit (optional).
- Premix burner.
- In build passive flue gas non-return valve.

The Quinta Ace 160 boiler is in conformity with the following EC-directives:

GAR (EU) 2016/426 to EN 15502-1:2012 + A1:2015 and EN 15502-2-1:2012

BED 92/42/EEC to EN 15502-1:2012 + A1:2015 and EN 15502-2-1:2012

EMC 2014/30/EU to EN 55014-1:2007 + A1:2009 + A2:2011, EN 55014-2: 2015, EN 61000-3-2:2014 and EN 61000-3-3:2013

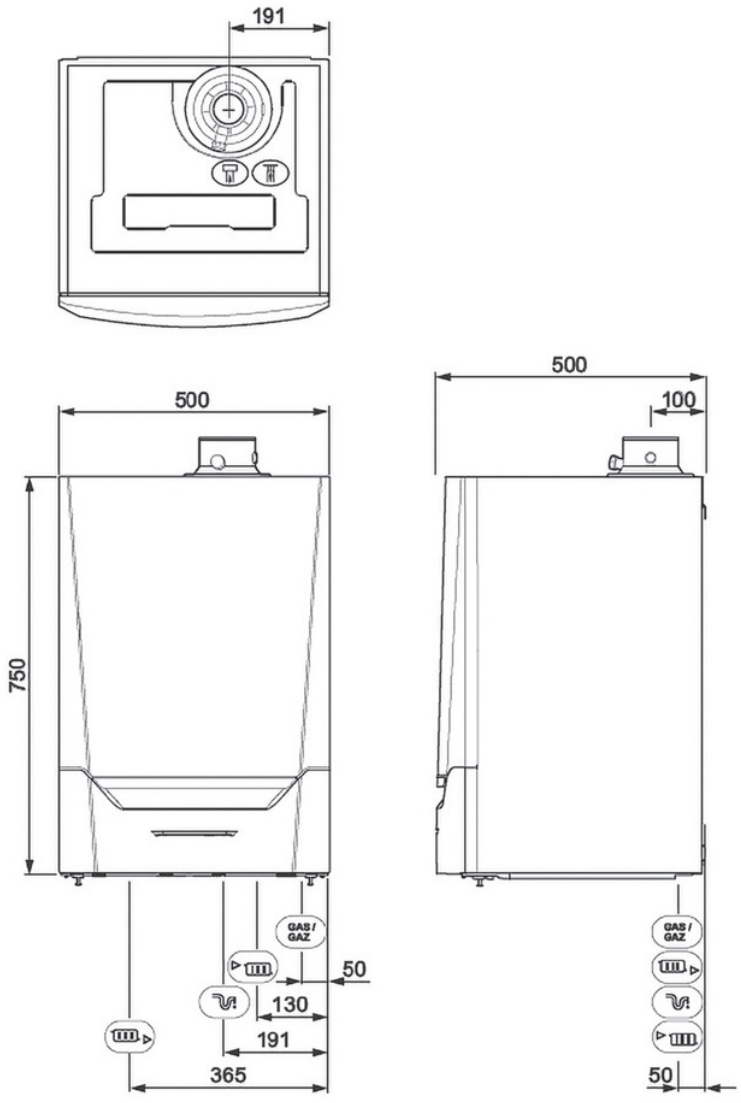
LVD 2014/35/EU to EN 60335-2-102:2016

ErP 2009/125/EC

CE Certification Remeha Quinta Ace 160 PIN: 0063CQ3781

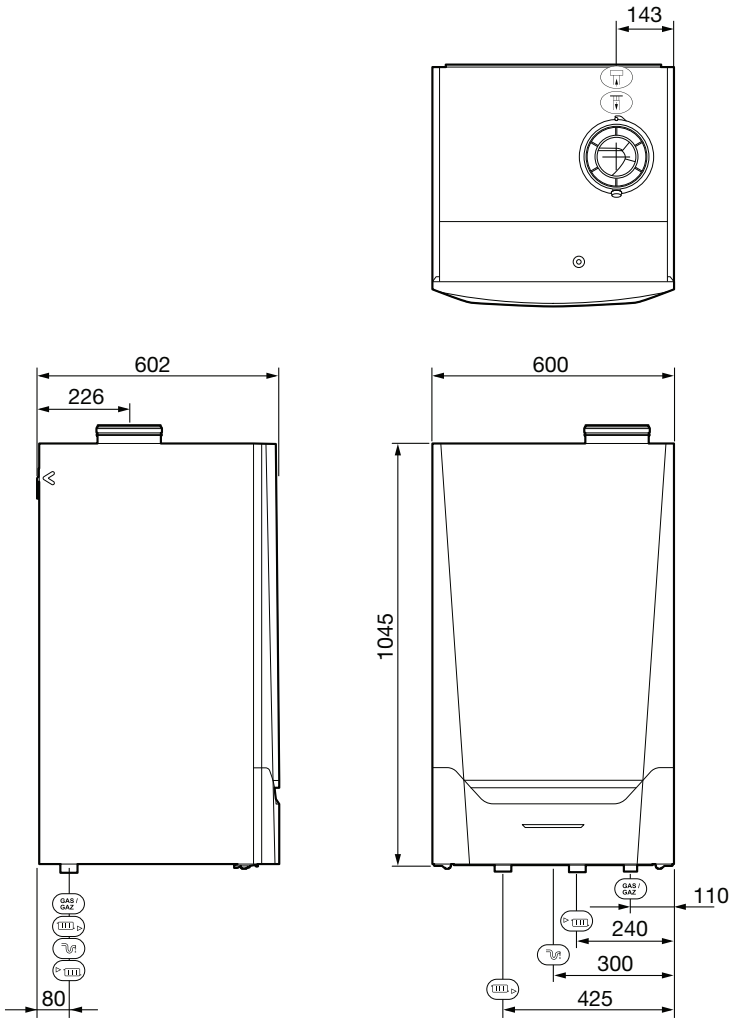
QUINTA ACE
DIMENSIONS AND CONNECTIONS

The complete range of Quinta Ace 30, 45, 55, 65, 90 and 115 boilers have a compact design of h750 x w500 x d500mm.



KEY	
	Connection of the combustion gas exhaust pipe; • Ø 80mm (≤ 45kW) • Ø 100mm (≥ 55kW)
	Connection of the air intake pipe; • Ø 125mm (≤ 45kW) • Ø 150mm (≤ 55kW)
	Siphon connection bush
	Heating circuit return; 1¼" Male thread (32mm)
GAS / GAZ	Gas connection; ¾" Male thread (22mm)
	Heating circuit flow; 1¼" Male thread (32mm)

QUINTA ACE 160
DIMENSIONS AND CONNECTIONS

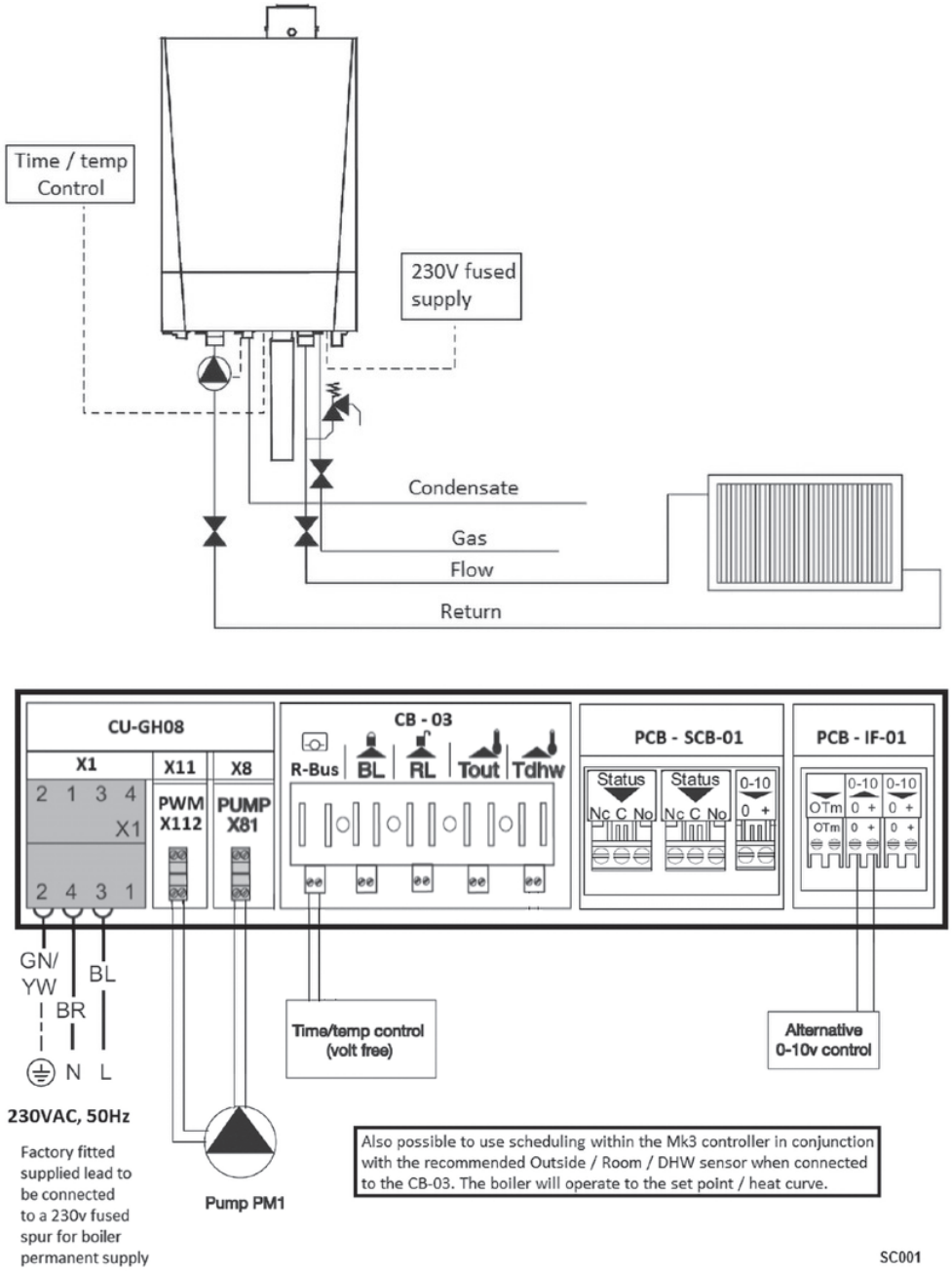


KEY	
	Flue gas outlet connection; Ø 100mm
	Air supply connection; Ø 150mm
	Siphon connection 32mm
	Flow connection; 1¼" Male thread (32mm)
	Return connection; 1¼" Male thread (32mm)
GAS / GAZ	Gas connection; 1" Male thread (28mm)

The schematics presented within this document are generic and therefore is not representative of a design for a specific site application. It is the responsibility of the specifier and the installer to ensure that all system components are appropriately sized for the specific application.

QUINTA ACE TYPICAL INSTALLATION

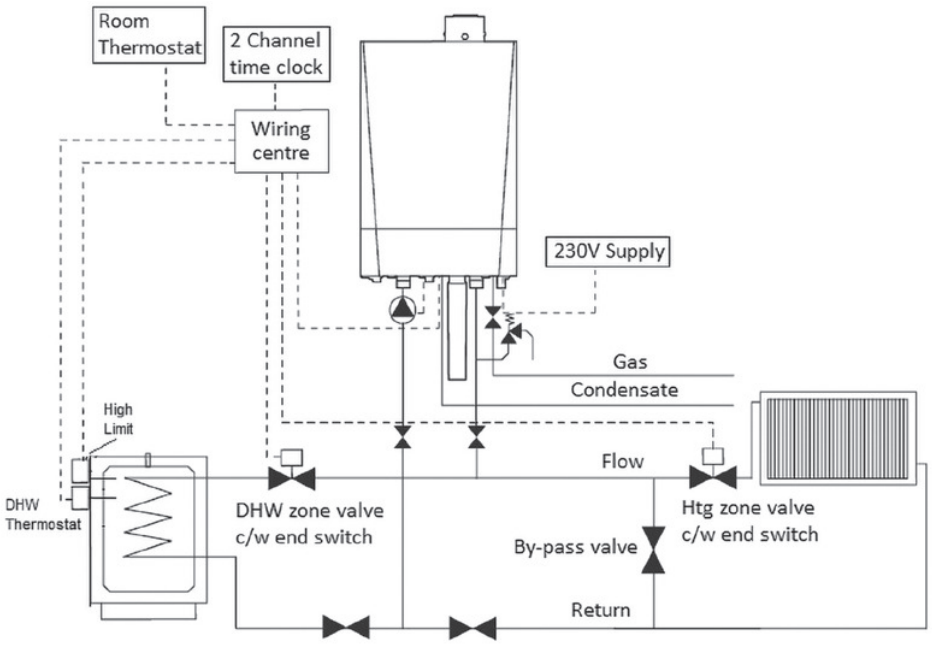
Single Quinta Ace 30, 45, 55, 65, 90 and 115 boilers, heating only.

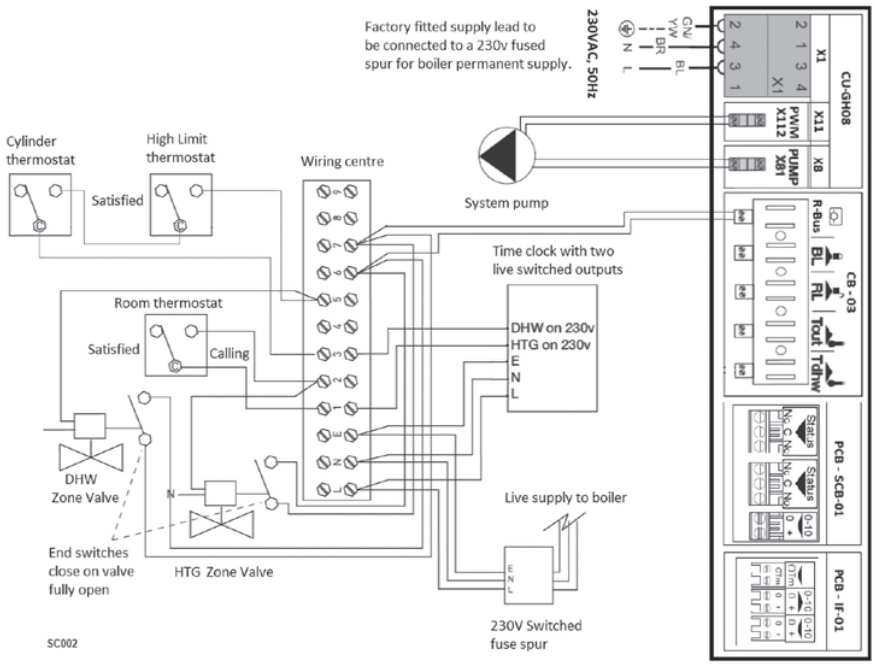


Note: Control PCBs are shown diagrammatically. Earths are omitted for clarity.

QUINTA ACE TYPICAL INSTALLATION

Single Quinta Ace 30, 45, 55, 65, 90 and 115 boilers, heating and domestic hot water, using a simple 'S' plan.

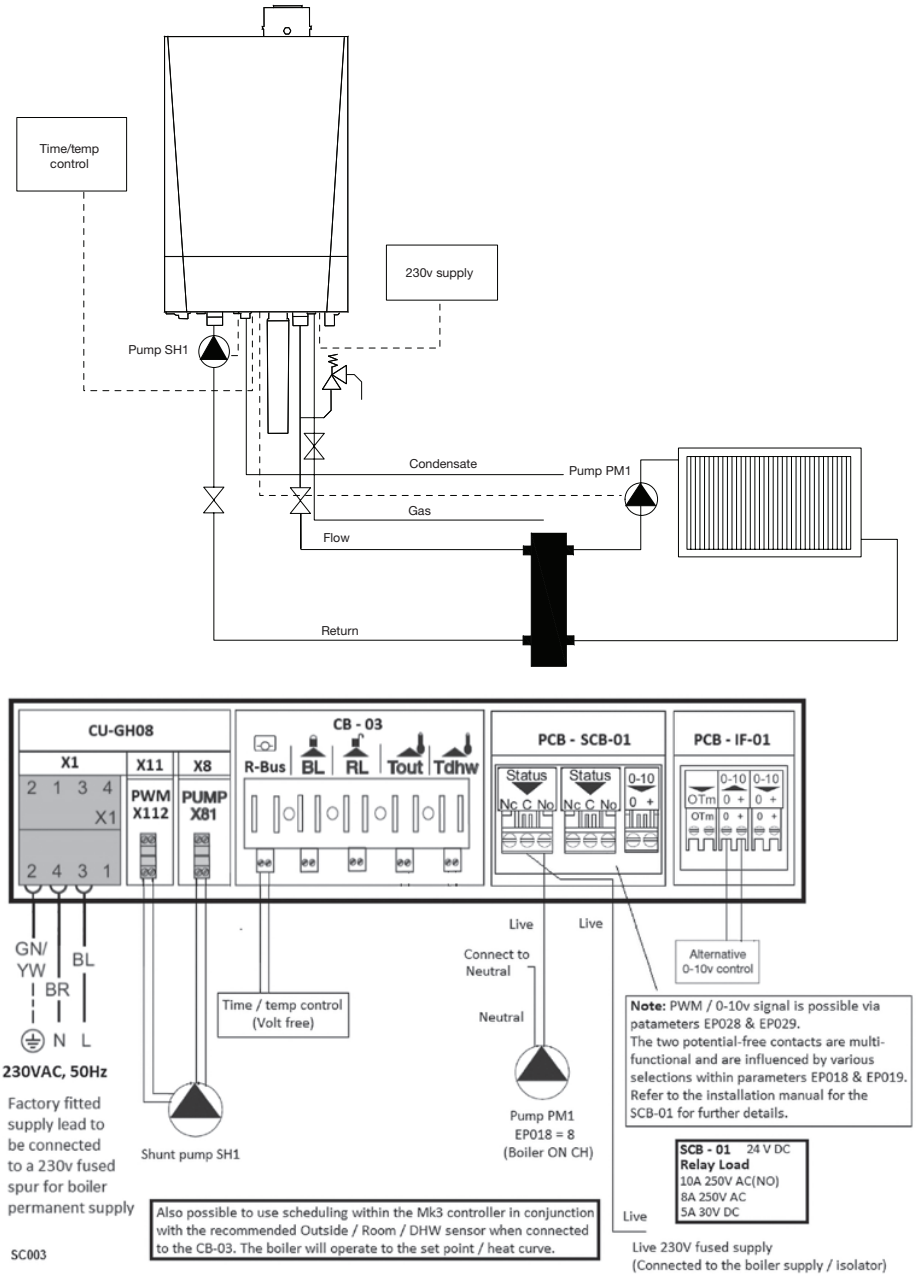




Note: Control PCBs are shown diagrammatically. Some earths and neutrals are omitted for clarity.

QUINTA ACE
TYPICAL INSTALLATION

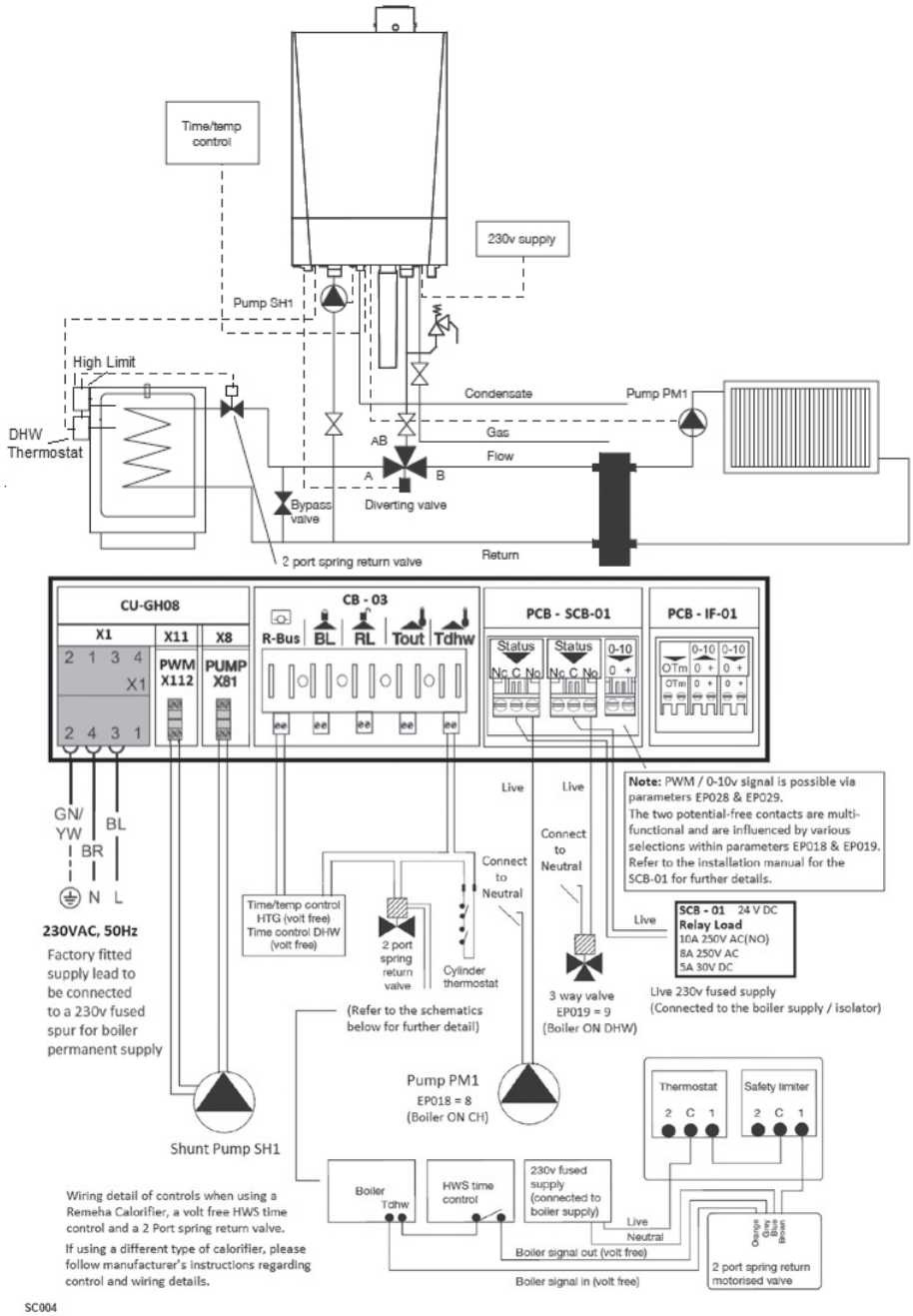
Single Quinta Ace 30, 45, 55, 65, 90 and 115 boilers, heating only with low loss header.



Note: Control PCBs are shown diagrammatically. Earths are omitted for clarity.

QUINTA ACE TYPICAL INSTALLATION

Single Quinta Ace boiler, heating with priority hot water using a low loss header. 3-way valve DHW priority Quinta Ace 30/45/55/65 only.

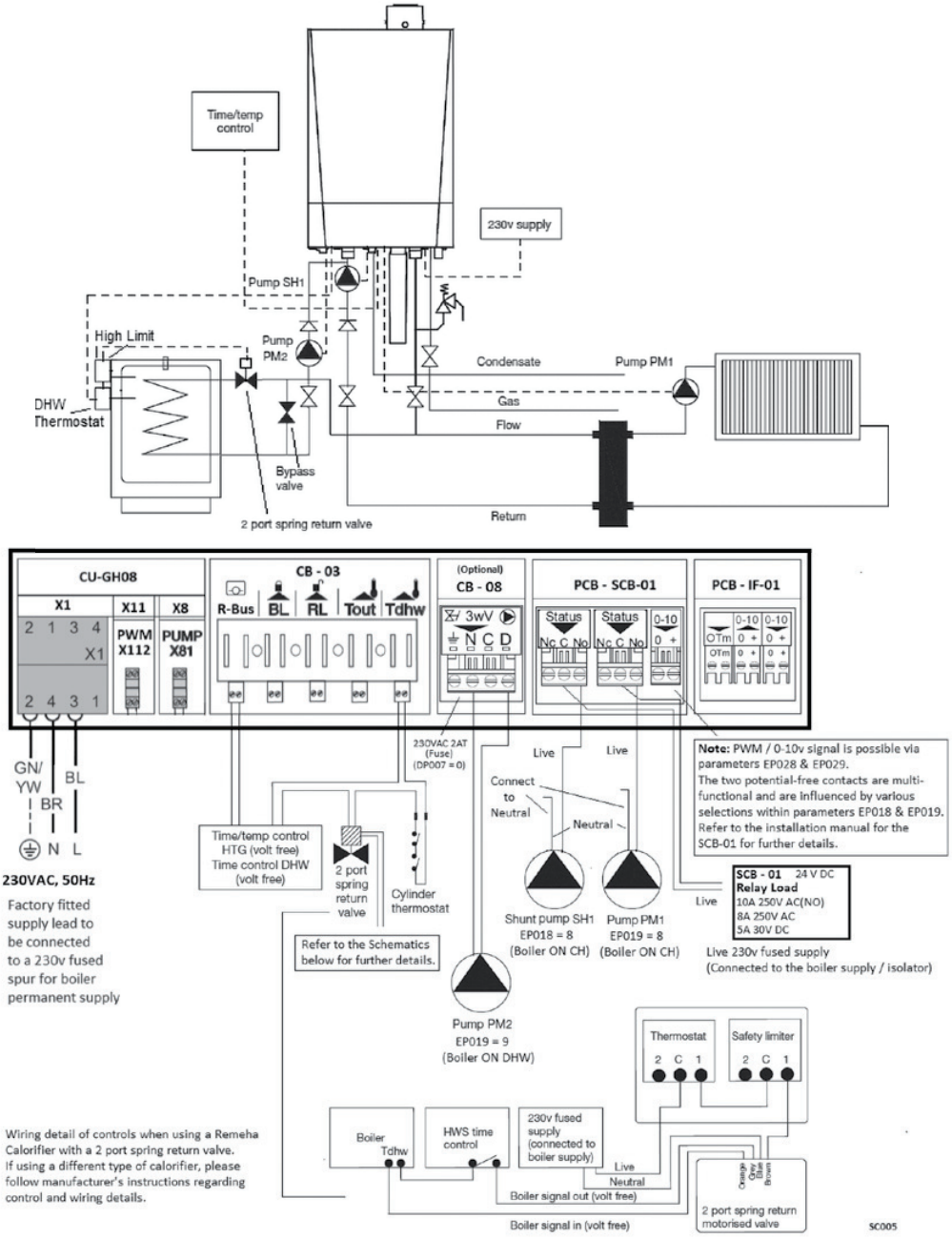


SC004

Note: When using the Remeha supplied low loss header and pump kit and the DHW diverting valve or primary pump kit, the calorifier must be sited within 3M of the boiler. In both cases, the DHW cylinder must be a high recovery unit capable of accepting the full or adjusted DHW output of the boiler used. Control PCBs are shown diagrammatically. Earths are omitted for clarity.

QUINTA ACE
TYPICAL INSTALLATION

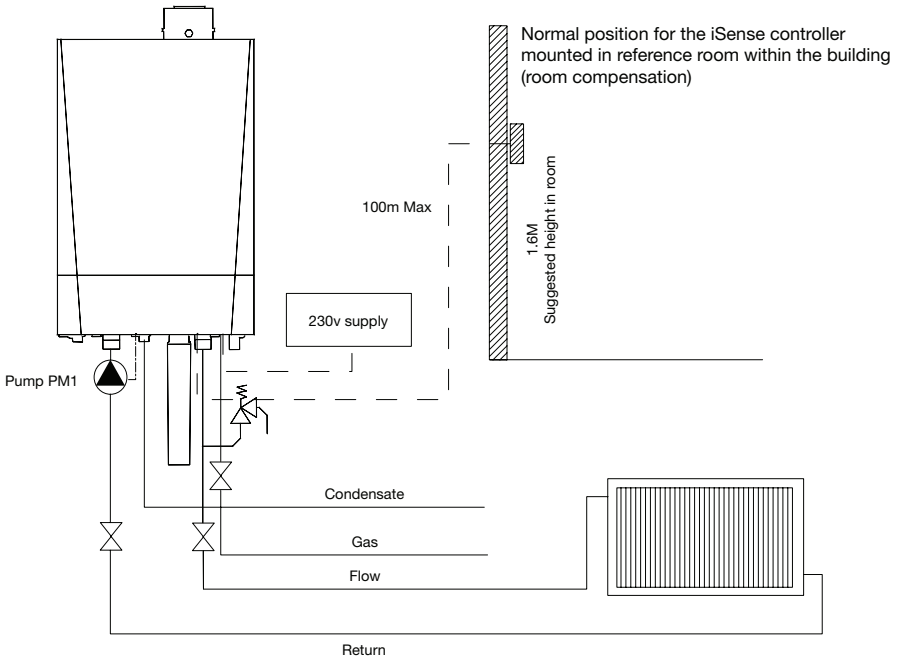
Single Quinta Ace boiler, heating with priority hot water using a low loss header. Pumped option, DHW priority can be used on all Quinta Ace 30, 45, 55, 65, 90 and 115 (see page 21).

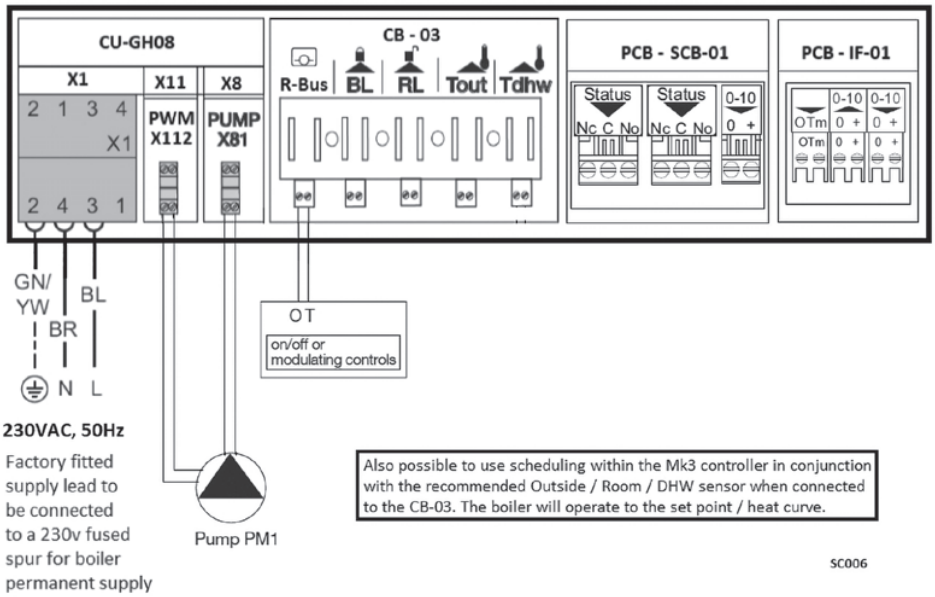


Note: When using the Remeha supplied low loss header and pump kit and the DHW diverting valve or primary pump kit, the calorifier must be sited within 3M of the boiler. In both cases, the DHW cylinder must be a high recovery unit capable of accepting the full or adjusted DHW output of the boiler used. Control PCBs are shown diagrammatically. Earths are omitted for clarity.

QUINTA ACE TYPICAL INSTALLATION

Single Quinta Ace 30, 45, 55, 65, 90 and 115 boilers, heating only, room compensation using iSense controls.

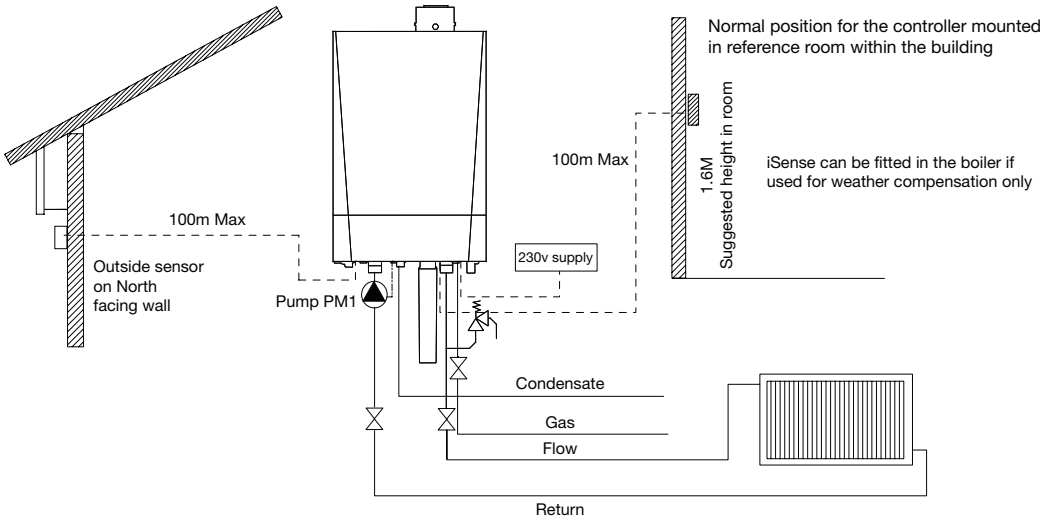


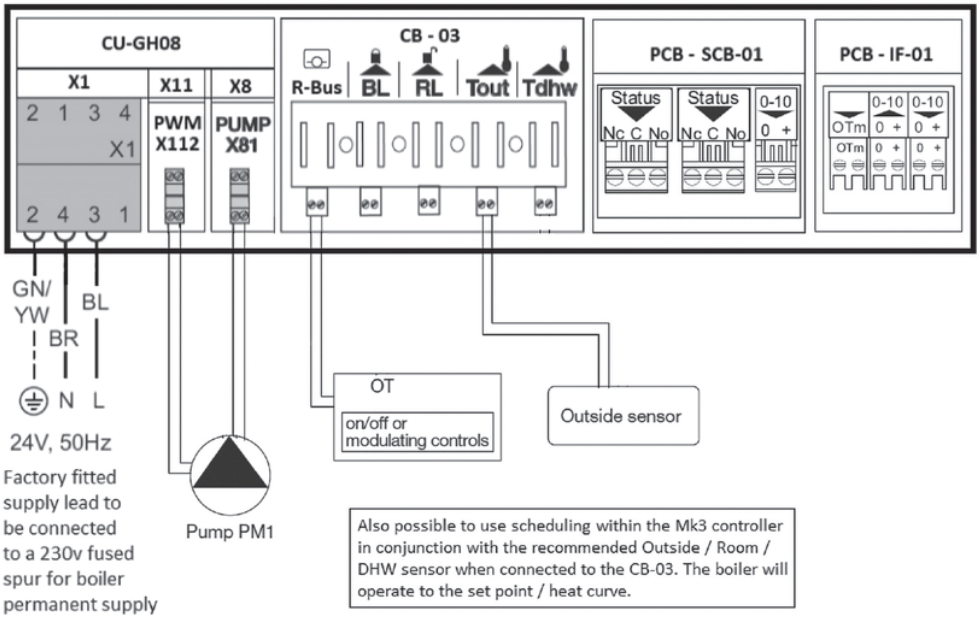


Note: Control PCBs are shown diagrammatically. Earths are omitted for clarity.

QUINTA ACE
TYPICAL INSTALLATION

Single Quinta Ace 30, 45, 55, 65, 90 and 115 boilers, heating only, weather compensation using the iSense controls.

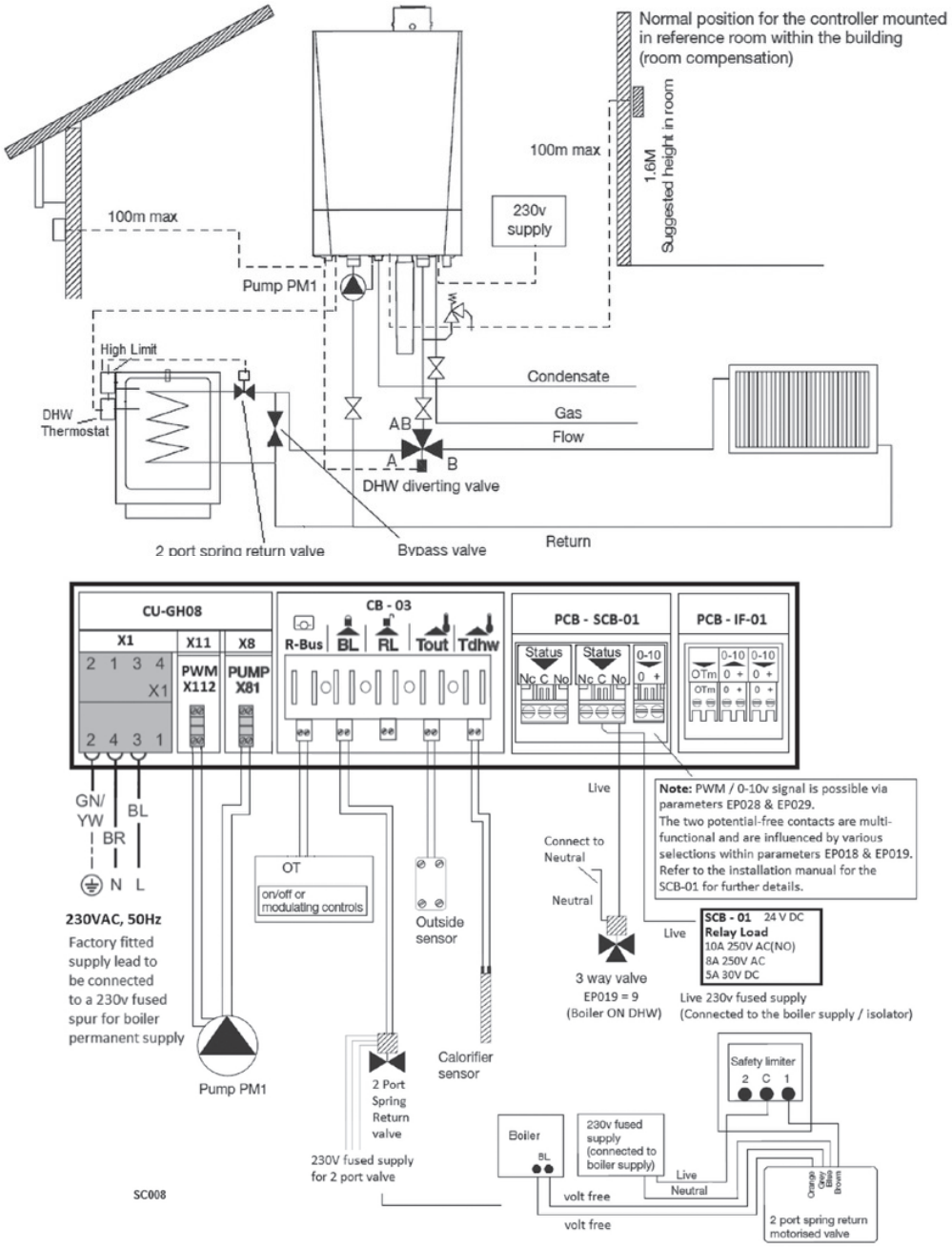




Note: Control PCBs are shown diagrammatically. Earths are omitted for clarity.

QUINTA ACE TYPICAL INSTALLATION

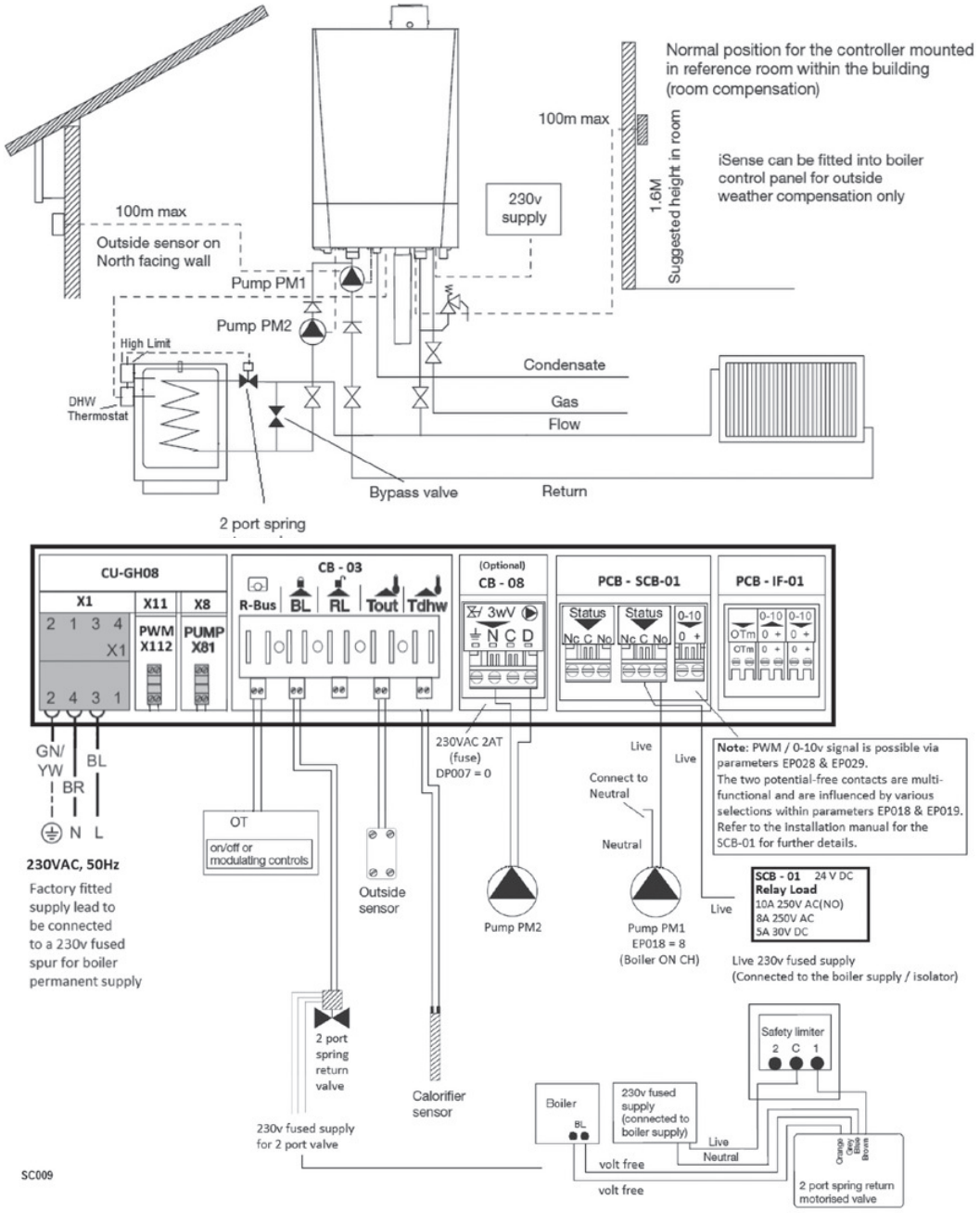
Single Quinta Ace boiler, heating and hot water priority. Heating room or outside weather compensated with iSense controls. 3-way value hot water priority Quinta Ace 30/45/55/65 only.



Note: When using the Remeha supplied low loss header and pump kit and the DHW diverting valve or primary pump kit, the calorifier must be sited within 3M of the boiler. In both cases, the DHW cylinder must be a high recovery unit capable of accepting the full or adjusted DHW output of the boiler used. Control PCBs are shown diagrammatically. Earths are omitted for clarity.

QUINTA ACE
TYPICAL INSTALLATION

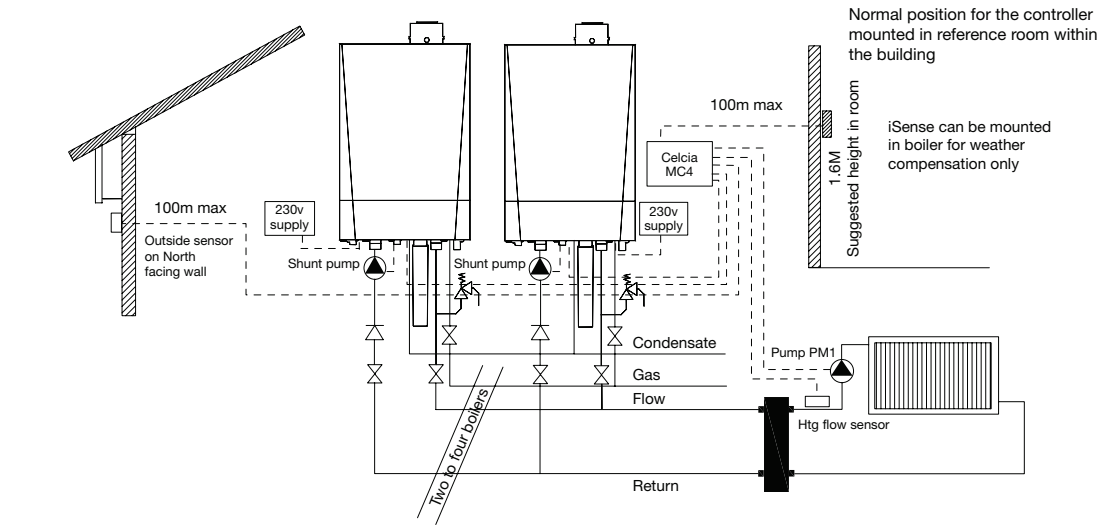
Single Quinta Ace boiler, heating and hot water priority. Heating room or outside weather compensation with iSense controls. Pump option hot water priority can be used on all Quinta Ace 30, 45, 55, 65, 90 and 115.

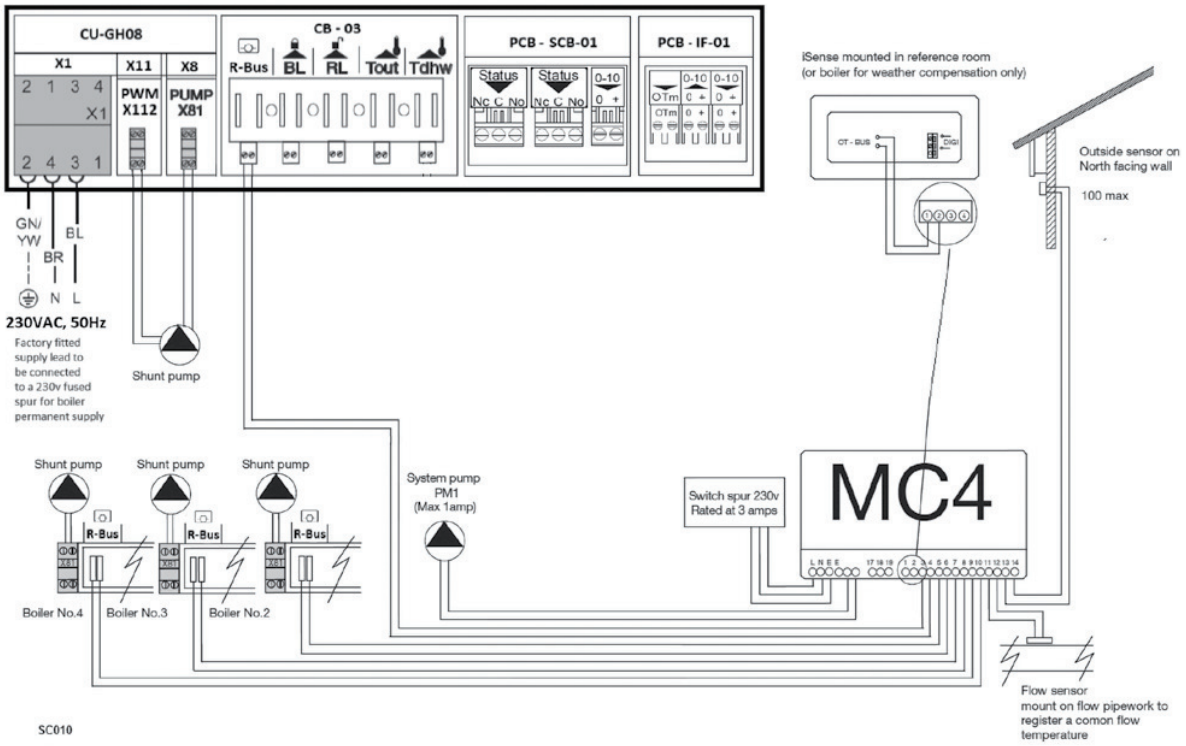


Note: When using the Remeha supplied low loss header and pump kit and the DHW diverting valve or primary pump kit, the calorifier must be sited within 3M of the boiler. In both cases, the DHW cylinder must be a high recovery unit capable of accepting the full or adjusted DHW output of the boiler used. Control PCBs are shown diagrammatically. Earths are omitted for clarity.

QUINTA ACE TYPICAL INSTALLATION

Multiple Quinta Ace 30, 45, 55, 65, 90 or 115, heating only, outside weather or room compensation with the Celcia MC4 and iSense controls with a low loss header (optimising/weather compensated).

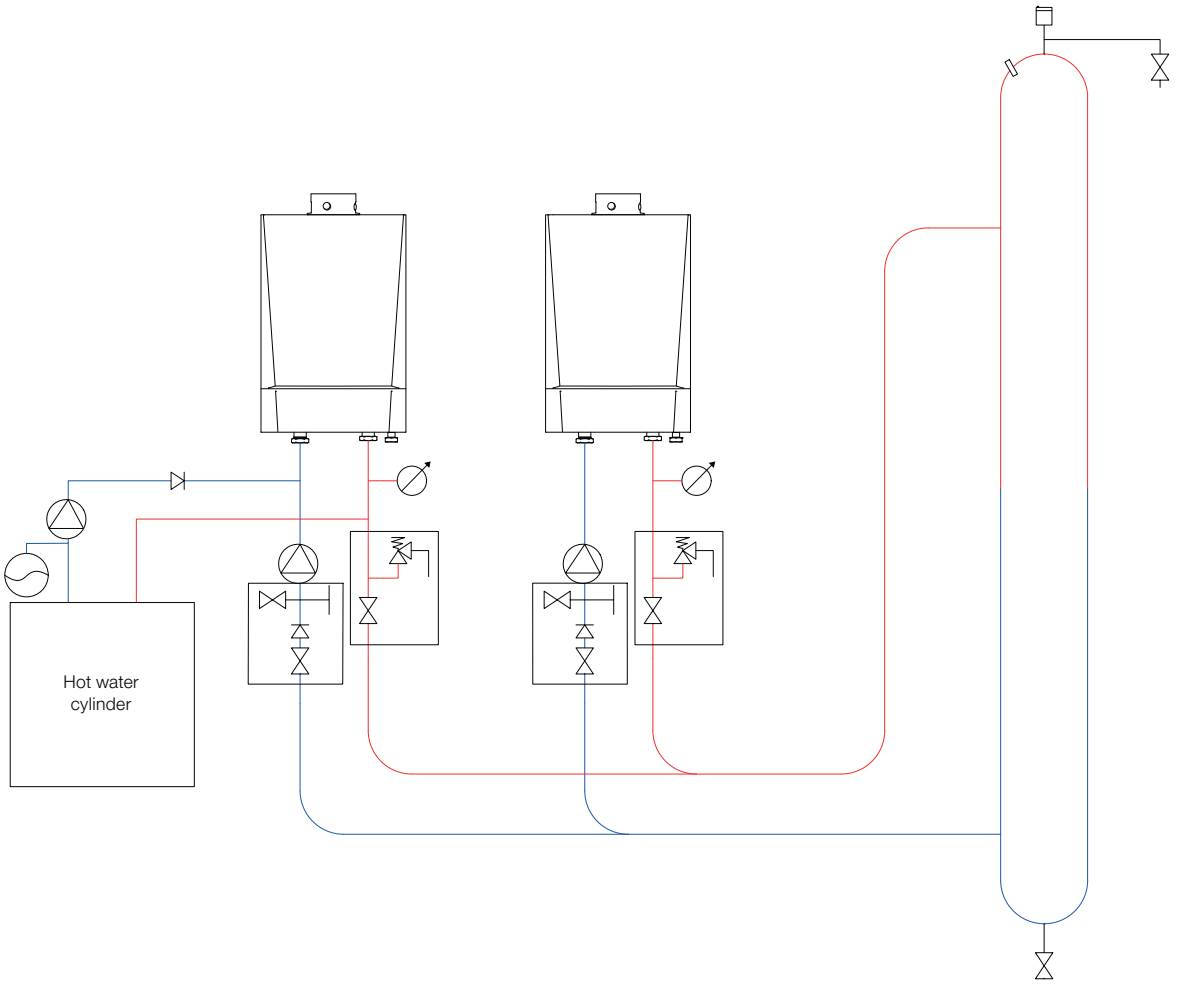




Note: Control PCBs are shown diagrammatically. Earths are omitted for clarity.

QUINTA ACE 160
TYPICAL INSTALLATION

Suggested hydraulic circuit diagram.



Note: This information is indicative.

ELECTRICAL INSTALLATION AND CONTROLS
QUINTA ACE 30, 45, 55, 65, 90 AND 115

GENERAL

The Quinta Ace 30, 45, 55, 65, 90 and 115 is supplied as standard with electronic control and flame ionisation safety controls, with a specially designed microprocessor at the heart of the control system.

SPECIFICATIONS

ELECTRICAL SUPPLY

The Quinta Ace 30, 45, 55, 65, 90 and 115 must have a permanent 230V/50Hz single phase supply rated at 2.5 amps. The control unit is not phase/neutral sensitive.

CONTROL BOX

- Manufacture: SIT
- Model: CU-GH08
- Supply voltage: 230V/50Hz
- Pump run on (HTG): 1-99 minutes

FUSE SPECIFICATION

The boiler is protected by fuses:

- Main Fuse F1 (230 VAC) 2.5 amps
- Fan 230V.

BOILER TEMPERATURE CONTROL

The Quinta Ace range has electronic temperature control with flow and return temperature sensors. The flow temperature can be adjusted between 20 and 90°C.

HIGH LIMIT TEMPERATURE PROTECTION

The high limit, temperature protection device switches off and locks out the boiler when the flow temperature exceeds the high limit set point (set by boiler type). When the fault is corrected the boiler can be restarted by using the reset key on the control panel.

LOW WATER PROTECTION (FLOW AND CONTENT)

The Quinta Ace range is supplied with a low water protection on the basis of a low water pressure switch and also by temperature measurement. By modulating down at the moment that the water flow threatens to fall too low, the boiler is kept operating for as long as possible.

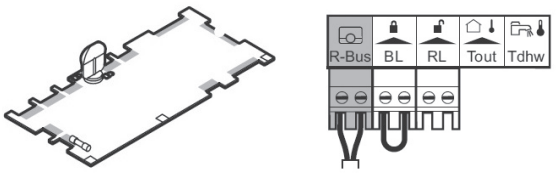
EXTERNAL CONNECTIONS

All external connections are made to any one of the standard supplied PCBs depending on the type of control and external components fitted.

CONNECTING A THIRD PARTY CONTROL UNIT TO A STANDARD BOARD

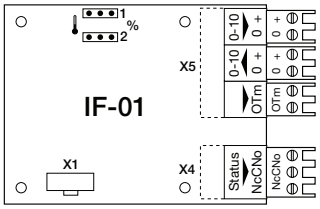
PCB (CU-GH08)

Main PCB control is included as standard.



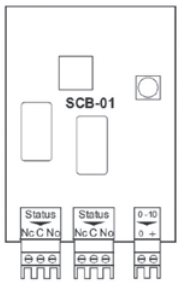
PCB (IF-01)

0-10V control.



PCB (SCB 01)

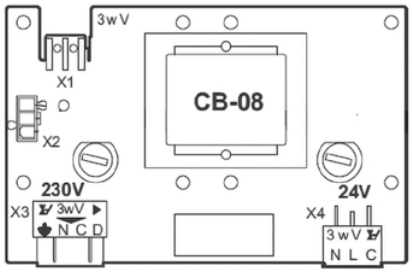
This has two potential-free contacts, Status/ Function, can be configured as required. Depending on the setting, a particular status / function can be transmitted by the boiler, alarm, run, Boiler on CH, Boiler on DHW, etc.



SCB-01
24V DC
Relay Load
10A 250V AC (NO)
8A 250V AC
5A 30V DC

PCB (CB 08) OPTIONAL

For control of external DHW 3 way valve or DHW pump.



BOILER CONTROLS

The Quinta Ace Range can be controlled using a number of methods – other examples are given below. Scheduling using the integral Mk3 controller in conjunction with the recommended Outside / Room / DHW sensor when connected to the CB-03 control board. Other examples are given below. Please contact our sales or technical departments for further options.

MODULATING (TWO WIRE CONTROL)

When using the optional Remeha compensating controllers the heat output modulates between the minimum and maximum value on the basis of the boiler flow temperature sensor. This applies to both single and multiple boiler installations, under the dictates of a room and/or outside temperature sensor.

iSense Pro – multi-boiler multi zone optimising/compensating controller can control up to ten boilers, two heating zones either VT or CT and one domestic hot water circuit. Information on the iSense Pro controller can be obtained from the installation manual and the suggested wiring and controls schematics for the controller.

iSense controller – single-boiler (option for multiple boiler) single zone optimising/compensating controller.

Remeha MC4 – in conjunction with the iSense controller can provide step control for multi-boiler installation of up to four boilers.

Analogue control (0-10V d.c.).

The heat output modulates between the minimum and the maximum values on the basis of the voltage supplied by an external analogue (0-10V) input.

ON/OFF VOLT FREE CONTROL FROM A THIRD PARTY INSTALLER

Connect a two wire cable to terminal R-Bus which must be a volt free connection from the third party controller.

ANALOGUE TEMPERATURE-BASED CONTROL

The 0-10V signal controls the boiler flow temperature between 0°C and 100°C. This control modulates on the basis of the flow temperature, whereby the heat output varies between the minimum and maximum values on the basis of the flow temperature set point calculated by the controller sent by the BMS e.g: 6.4V = 64ºC.

A jumper 2 (see table opposite) on the interface is used to select either temperature control or heat output control (%).

ANALOGUE HEAT OUTPUT-BASED CONTROL (%)

The 0-10V signal controls the boiler output between 0% and 100% of its total capacity (kW).

The minimum and maximum values are limited. The minimum output is linked to the boiler's modulation depth. The output varies between the minimum and maximum value on the basis of the value determined by the controller.

JUMPER 2	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

JUMPER 2	INPUT SIGNAL (V)	HEAT OUTPUT (%)	DESCRIPTION
%	0-2.0 (1)	0-20	Boiler off
	2.0-2.2 (1)	20-22	Hysteresis
	2.0-10 (1)	20-100	Heat output requested

(1) Dependent on the minimum modulation depth (set speeds, standard 20%.

PRIORITY DHW CONTROL

TEMPERATURE CONTROL

With a Remeha temperature sensor or with a standard (volt free) DHW thermostat.

Note: It will only provide a setting and read out facility when the sensor option is used.

Primary flow control:

- with a three-way diverting valve (not Q90/115)
- with a DHW pump
- untimed (available 24 hours a day).

SYSTEM/SHUNT PUMP

A shunt pump can be connected to the boiler (maximum input 200w). If the pump requires more than this, terminals can only be used to switch a pump relay. The pump should be fitted on the heating return connection and be as close to the boiler as possible. A system pump can also be connected to the boiler via SCB - 01 (Refer to page 24, SCB-01 Relay Load data for maximum load).

SYSTEM WATER

Before operation, the system should be cleaned and flushed (according to BS 7593 (2006), and filled with mains cold water. Suitable chemicals and their use should be discussed with specialist water treatment companies in respect to aluminium heat exchangers. For further information “Remeha Water Quality Regulations” is available from **remeha.co.uk**
The recommendations in the document must be followed.

FROST PROTECTION

Install the boiler in a frost-free room. The built-in frost protection system is activated as follows: below 7°C – system pump is switched on if connected to the boiler. Below 3°C – boiler is switched on, when the flow temp reaches 10°C the boiler and pump switch off.

Note: This control is designed to protect the boiler – for full system protection use a frost thermostat or a weather compensator.

REMOTE ALARM AND BOILER RUN INDICATION

As standard the boiler is supplied with the integral smart control board SCB-01. This has two potential-free contacts, Status / Function, can be configured as required. Depending on the setting, a common alarm and boiler run signal can be transmitted by the boiler.

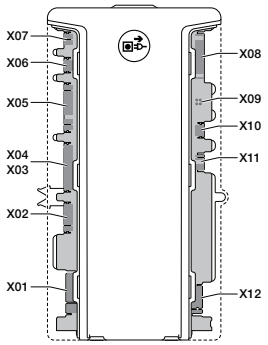
SAFETY INTERLOCKS

As standard the boiler is supplied with shutdown (BL) and release (RL) inputs via the main standard connections board CB 03.

QUINTA
ACE 160

SPECIFICATIONS

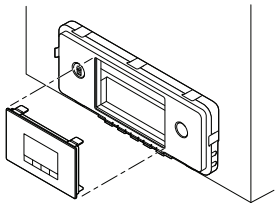
The boiler has a three-wire mains lead (lead length 1.5m) and is suitable for a 230VAC/50Hz power supply with a phase/neutral/ earth system. The boiler is not phase sensitive and the boiler is completely pre-wired.



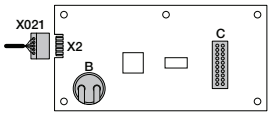
Connectors from the control unit CU GH06 (Front view)

ASSEMBLY OF THE CONTROL PANEL

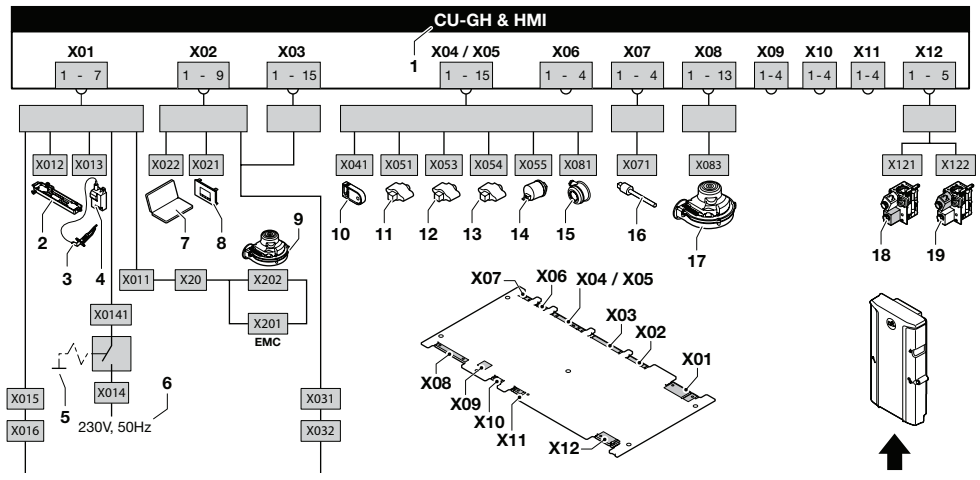
The Human Machine Interface (HMI) and the connection box need to be fitted. The connection box contains standard control PCB CB-01 and expansion board SCB-01 for external connections. The optional PCBs are also placed in the connection box. For further information, please refer to the Installation and Service Manual for the boiler and the control panel.



Control panel



HMI PCB



KEY					
1	Boiler control unit	8	Control fascia panel	15	Air pressure differential switch
2	Lighting	9	Fan supply	16	Flue gas sensor
3	Ignition probe	10	Programmable storage unit	17	Fan control (PWM)
4	Ignition transformer	11	Flow sensor	18	Gas valve 1
5	Power supply	12	Heat exchanger sensor	19	Gas valve 2
6	N/a	13	Return sensor		
7	Service connector/computer connection	14	Hydraulic pressure sensor		

FLUE OPTIONS

The Quinta Ace Range of condensing boilers has fan assisted flues. They are supplied as standard with a concentric flue outlet/air inlet connection which is used for room-sealed operation or for open-flue (room ventilated) applications. An optional twin pipe fitting is available for the room-sealed CLV system.

The concentric system can be supplied for individual boilers for horizontal or vertical installation. Because of the excess fan capacity of the boiler, most flue lengths can be accommodated (depending on the boiler model and actual route taken), which enables the installer to position the boiler almost anywhere in the building.

Open-flue, or room ventilated systems can be installed as individual or combined flues and should discharge vertically with the flue terminating in an optional tapered cone complete with bird guard.

Care should be taken when siting the actual discharge point as a vapour plume will be visible when the boiler is operating (maximum flue gas exit temperature will be less than 75°C) and it is possible for water to drip to the ground from the terminal on horizontal installations, which could turn to ice in freezing conditions.

☐ GUIDELINES

Refer to latest relevant British Standards.

- Ref BS 5440 – 2: Specification for installation and maintenance of ventilation for gas appliances not exceeding 70kW (1st, 2nd and 3rd family gases).
- Ref BS 5440 – 1: Specification for installation of gas appliances to chimneys and for maintenance of chimneys not exceeding 70kW (1st, 2nd and 3rd family gases).
- Ref BS 6644: Specification for installation of gas-red hot water boilers of rated inputs between 70kW to 1.8MW (net) (2nd and 3rd family gases).
- Ref IGE/UP/10: Installation of flued gas appliances in industrial and commercial premises.

It is the responsibility of the installer to install the flues and fluecades to comply with the current regulations and standards.

Note: The flue system for the Quinta Ace 160 is currently under review.

IMPORTANT NOTE

All flue terminals and CLV kits can be supplied with a condensate drain/siphon, this must be connected within one metre of the boiler flue connection. Any condensate which is able to flow back into the boiler from flue lengths greater than one metre must be discharged via a condensate collector and drain system fitted within one metre of the boiler flue connection. Make sure that any flue gas outlet pipe towards the boiler has a sufficient gradient (at least 50mm per metre) and that there is a sufficient condensate collector. Where boilers have been installed on a common open-flue system, condensate collectors and drain systems must be fitted on each individual boiler directly above the boiler flue connection. Condensate siphons must be deep seal water type with discharge taken to a suitable drain point.

Further information regarding flue with dissimilar metals can be found in BS6644 – 2011 Section 6.10.4.

Concentric room-sealed flue components should not be mixed with single wall flue components.

Flue components are constructed from a white painted metal outer and plastic inner.

Flue terminals are painted as detailed in the terminal diagrams.

Plume kit external components are aluminium or plastic and are painted black.

All flue components are CE approved.

QUINTA ACE RANGE FLUE OUTLET/AIR INLET DETAILS

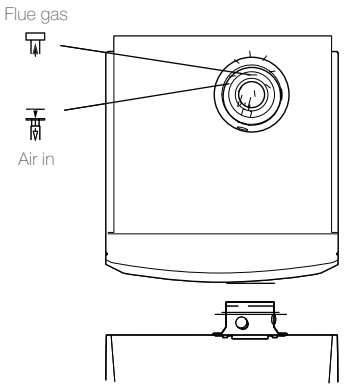
The Quinta Ace Range of boilers are supplied as standard with a concentric flue outlet/air inlet connection which can be used for:

1. Room-sealed operation using the concentric flue system (flue within air duct).

2. Conventional/open-flue operation using single skin flue system connected to the inner concentric connection with the air supply taken from the boiler house via the outer concentric connection.

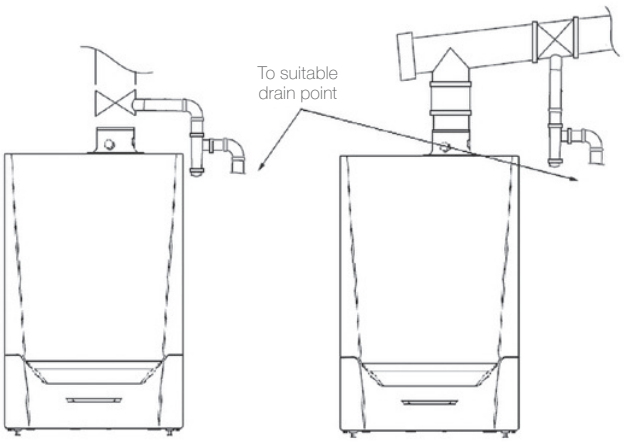
DETAILS OF INLET CONNECTION

This shows the concentric flue connection used for room-sealed operation and an option using single skin is available.



DETAILS OF CONDENSATE DRAIN

In order to prevent the spilling of combustion products a condensate trap (not supplied) must be fitted on the plastic drain connection on the condensate drain, which is available as an option with horizontal and vertical flue terminals.



Note: The condensate trap should be as close as practical to the condensate outlet and the trap and pipework should be adequately supported.

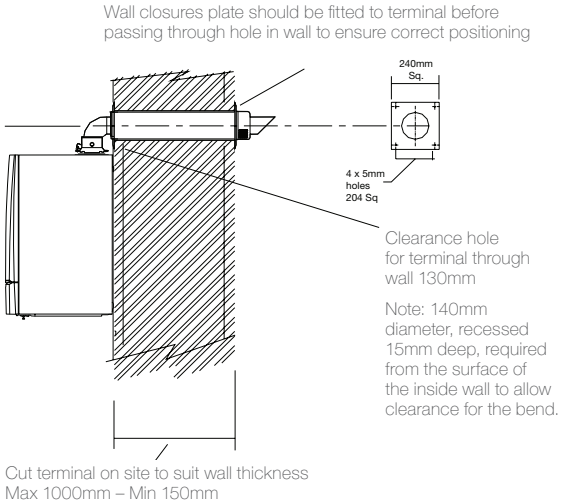
QUINTA ACE 30 AND 45
ROOM-SEALED, 80/125MM HORIZONTAL CONCENTRIC FLUE KIT OPTION QP01

For use when the boiler/s are mounted on and flued through a rear outside wall, and for a typical single-boiler installation. It can also be used for multiple boilers but each must have its own flue system and terminals positioned at a minimum of 530mm centres and never installed immediately above another. For two boilers only, it is also possible to install the external terminal wall plates touching each other.

Kit parts – MG410082982
(max wall thickness 500mm)

- 1 x horizontal terminal
- Note: Boiler bend and wall plate are included

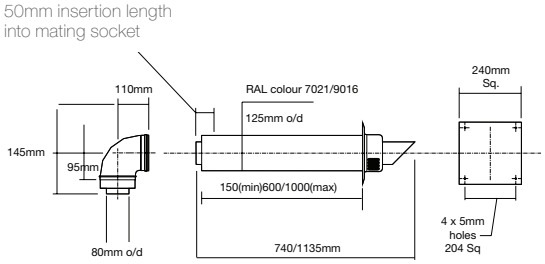
HORIZONTAL FLUE KIT 80/125MM



Kit parts – MG410081940
(extended version max wall thickness 1000mm)

- 1 x horizontal terminal
- Note: Boiler bend and wall plate are included

EXTENDED HORIZONTAL FLUE KIT 80/125MM



HRS room-sealed terminal (80/125mm)
MG410082982 and MG410081940

Note: Fall to boiler ≥ 50mm /Mtr.

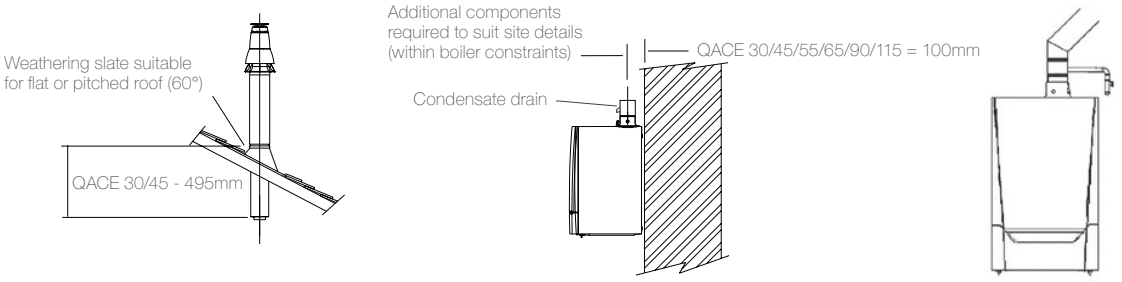
QUINTA ACE 30 AND 45
ROOM-SEALED, 80/125MM VERTICAL CONCENTRIC FLUE KIT OPTION QP03

For use when the flue is discharged vertically through the roof, and for a typical single-boiler installation. It can also be used for multiple boilers, but each must have its own flue system and terminals separated by a minimum of 300mm if it's at the same height. Refer to the relevant British Standard if this is not the case.

Kit parts – KT1215
(max wall thickness 500mm)

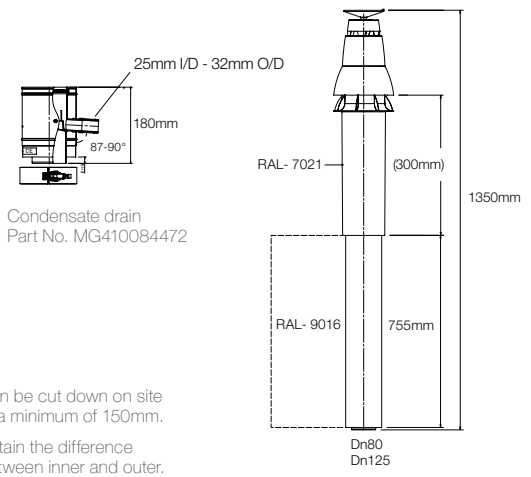
- 1 x vertical terminal – MG410086864
- 1 x universal roof seal pack – VE001

CONCENTRIC VERTICAL FLUE KIT 80/125MM



Detail of the vertical 80/125mm concentric flue kit option QP03 (KT1215).

CONCENTRIC VERTICAL FLUE KIT 80/125MM

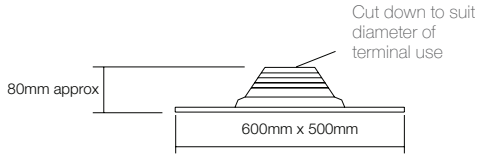


Condensate drain
Part No. MG410084472

Can be cut down on site to a minimum of 150mm.

Retain the difference between inner and outer.

VERTICAL FLASHING DETAIL



Detail of standard weathering plate for 100mm to 150mm flue (Part No. VE001) flat or pitched roofs up to 60°.

QUINTA ACE 30 AND 45
80/125MM ROOM-SEALED CALCULATED DATA TO DETERMINE MAXIMUM FLUE RUNS

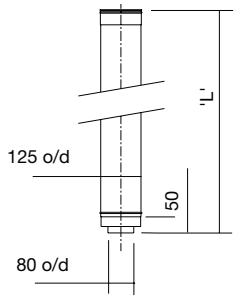
Calculation data based on flue products supplied by Remeha.

ROOM-SEALED CALCULATION DATA		QUINTA ACE 30 – 80/125MM	QUINTA ACE 45 – 80/125MM
Maximum overall flue run	Metres	20	20
Reduction length for each 45° bend	Metres	1	1
Reduction length for each 90° bend	Metres	2	2
Maximum horizontal flue run	Metres	6	6

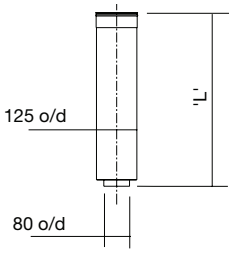
Note: Minimum fall back is 2° or 50mm per metre.

80/125MM CONCENTRIC FLUE SYSTEM COMPONENTS FOR ROOM-SEALED OPERATION

Note 2: The components listed below are not for external use.

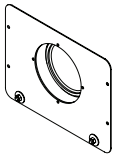


Standard length (cannot be cut)
'L' = 1000mm Part No. MG410084486
'L' = 500mm Part No. MG410084485

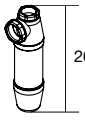


Standard length (cuttable length)
'L' = 1000mm Part No. MG410082314
'L' = 500mm Part No. MG410082313

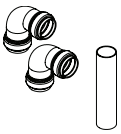
Internal seal (80mm)
Part No. MG410027355



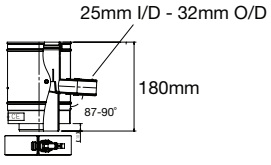
Internal wall plate
Part No. MG410081302



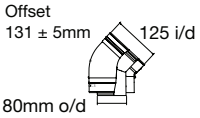
Siphon
Part No. MG410081165



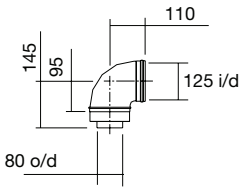
Siphon adaptor kit
Part No. MG410087491



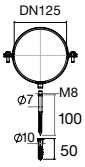
Condensate drain Part No. MG410084472



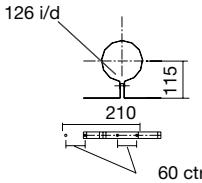
45° Bend
Part No. MG410084461



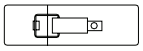
90° Boiler short bend Part No. MG410084810
90° Bend Part No. MG410084460



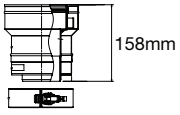
Extended wall bracket
Part No. MG410084481



Wall bracket
Part No. MG410087863



Clamp band
Part No. MG410087654
(one supplied with
each component
except MG410084810)



80/125mm - 100/150mm
Concentric adaptor
Part No. MG410084475

Note 3: All dimensions are in mm.

QUINTA ACE 30 AND 45
ROOM-SEALED, 100MM TWO ZONE CLV FLUE KIT OPTION QP04

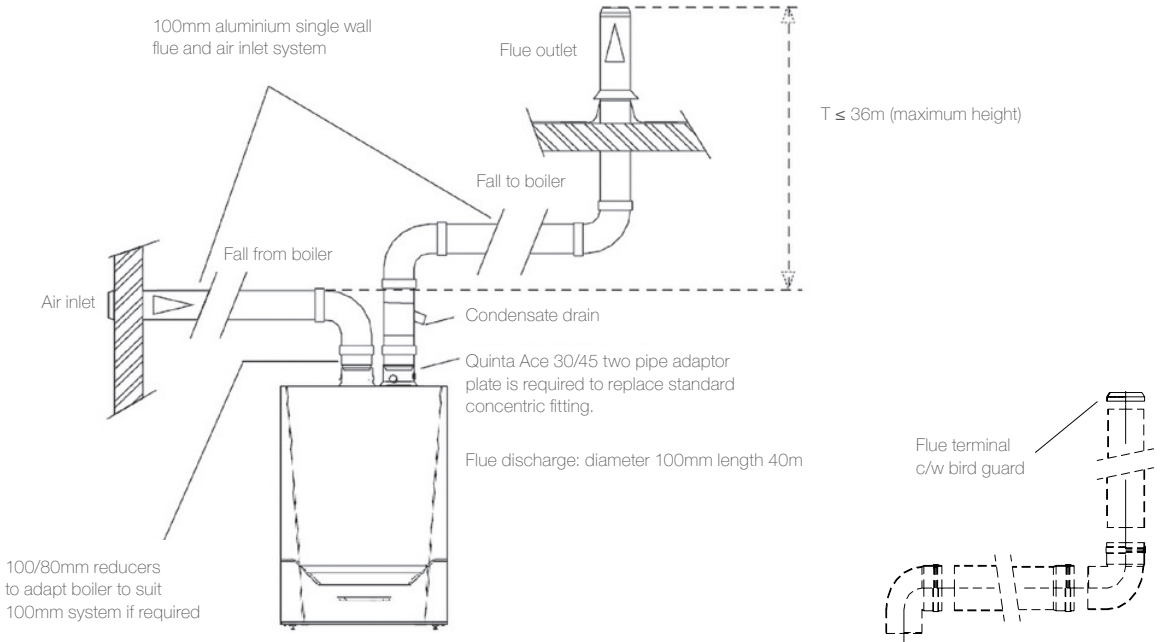
Connection in areas of different pressure (C53).

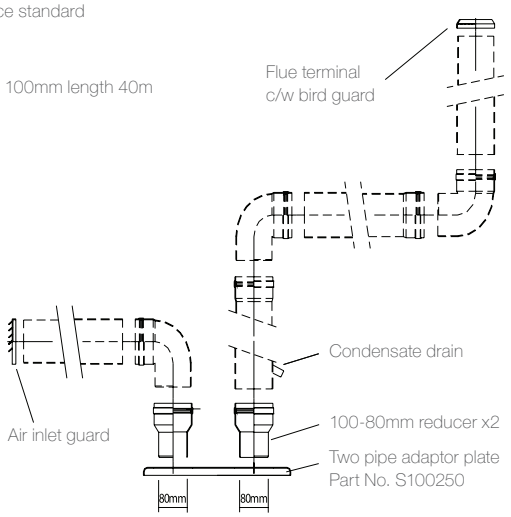
Combustion air supply and combustion gas discharge are possible in various pressure zones, semi-CLV system, with the exception of coastal areas. The maximum permissible difference in height between the combustion air supply and the combustion gas discharge is 36m.

Kit parts – KT032

- 1 x flue connection – S100250
- 2 x flue adaptor 80/100 – MG87127
- 1 x flue terminal – PU001
- 1 x air inlet – PU002
- 1 x condensate drain – MG410085130
- 1 x siphon – MG410081165
- 1 x condense adaptor kit – MG410087491

CLV
FLUE KIT
80/125MM





Detail of the 100mm two zone CLV Flue Kit Option QP04 (Part No. KT032)

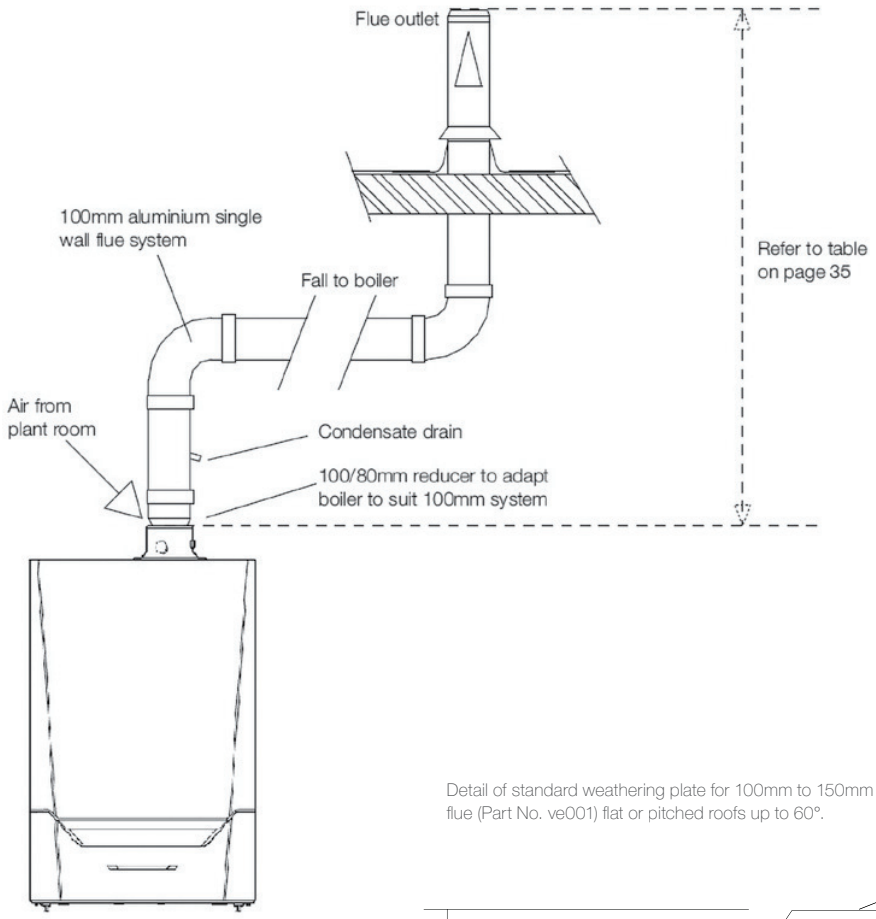
Only parts named are in the kit additional 100mm single wall pipe and bends, shown dotted will be needed to suit site requirements (overall length to be within boiler constraints).

Different CLV flue configurations may be available.
Please contact our technical department for advice.

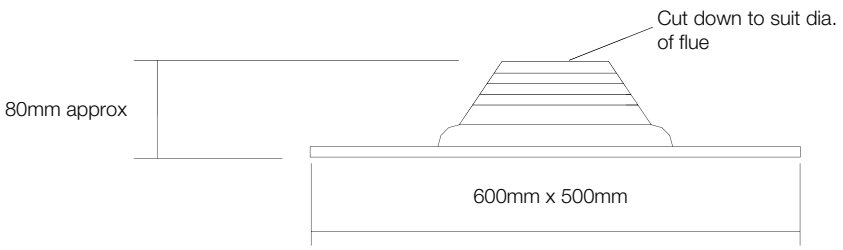
Note: Maximum combined length of air intake and flue is 40m.
Note 2: Fall to boiler ≥ 50mm /Mtr.

CONVENTIONAL FLUE
QUINTA ACE 30 AND 45 100MM CONVENTIONAL OR OPEN-FLUE SYSTEMS

Typical single-boiler installation. Ensure that the overall route does not exceed the maximum values in the table on page 40.



Detail of standard weathering plate for 100mm to 150mm flue (Part No. ve001) flat or pitched roofs up to 60°.



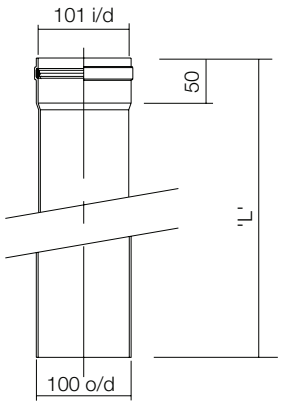
Note: Fall to boiler ≥ 50mm /Mtr.

QUINTA ACE 30 AND 45 – 100MM
CONVENTIONAL OR OPEN-FLUE SYSTEMS

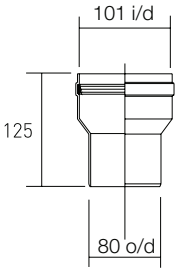
The components listed below are only suitable for internal use as illustrated on pages 33 and 34. As the boiler is fan assisted it makes no difference if the run is horizontal or vertical but the flue should terminate vertically.

OPEN-FLUE DATA		QUINTA ACE 30 100MM	QUINTA ACE 45 100MM
Maximum overall flue run	Metres	40	40
Reduction length for each 45° bend	Metres	1.4	1.4
Reduction length for each 90° bend	Metres	4.9	4.9

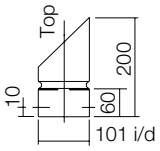
Calculation data based on flue products supplied by Remeha. Other distances available at 110mm (see manual) are achievable with increased flue sizes.



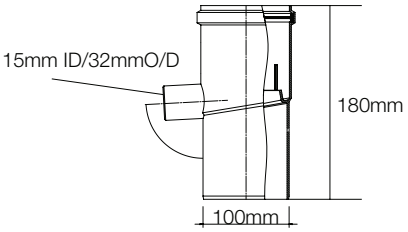
Standard length
'L' = 1000mm Part No. MG87062
'L' = 500mm Part No. MG87061
'L' = 250mm Part No. MG87060



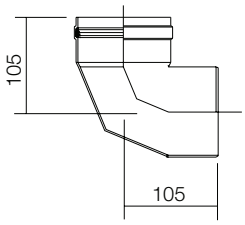
Reducer 80mm spigot to 100mm
Part No. MG87127
Must be used on the QACE 30/45 flue socket connection to adapt to 100mm system



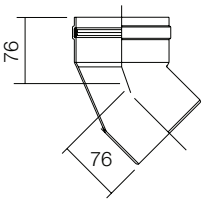
Air Inlet guard
Part No. PU002



Condensate drain
Part No. MG410085130

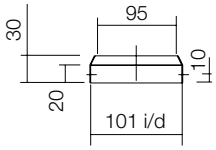


90° Bend
Part No. MG87113



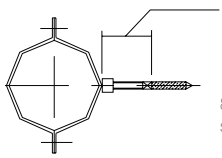
45° Bend
Part No. MG87103

Note:
2 x 45° bends will offset to 71mm centres



Flue terminal c/w bird guard
Part No. PU001

Twin pipe adaptor plate
Part No. S100250



Mounting bracket
Part No. MG87193

8mm x 45mm screw thread

Silicon seal ring
Part No. MG87183

Note: All dimensions are in mm.
Note 2: Fall to boiler ≥ 50mm /Mtr.

QUINTA ACE 30 AND 45 PLUME KITS
80/125MM FLUE KIT OPTION QP05

Plume kit termination positions must not be used to circumvent current standards and regulations, the point of exit determines the flue outlet position. The 80mm plastic discharge components can then be utilised to position the flue gases/plume to a suitable discharge point in line with current regulations.

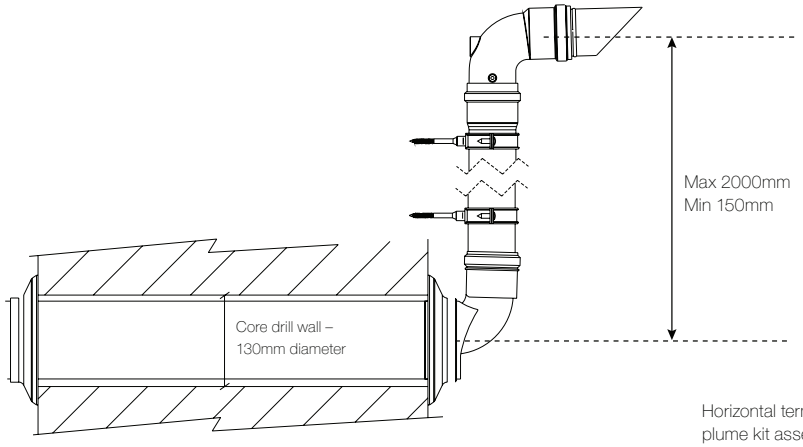
Kit parts – PMK-horizontal terminal kit KT00335

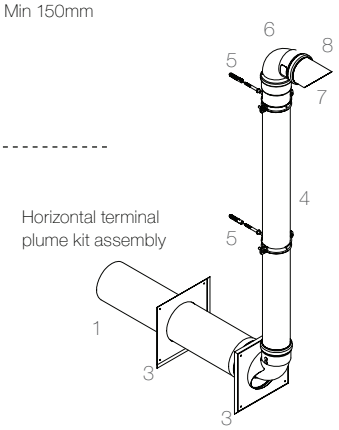
1. PMK wall terminal
2. Boiler bend – not illustrated
3. Wall plates
4. Plume extension
5. Support bracket (80mm)
6. 90° bend (80mm)
7. Flue outlet (80mm)
8. Bird guard

1 x siphon – MG410081165 (not illustrated)

1 x condensate adaptor kit – MG410087491 (not illustrated)

HORIZONTAL
FLUE KIT
80/125MM





Note: Both the concentric flue terminal and plume flue outlet positions of the Plume Management Kit (PMK) must comply with the current regulations and British Standards with regards to the minimum distances from openings, walls, etc.

Flue can be taken directly through rear outside wall or discharged through a side wall left or right. Both must be within the constraints in the table below.

80/125mm Plume Management details. Calculations based on products supplied by Remeha.

Note 2: Fall to boiler ≥ 50mm /Mtr.

ROOM-SEALED (PMK) DATA		QUINTA ACE 30 – 80/125MM	QUINTA ACE 45 – 80/125MM
Maximum horizontal run	Metres	6	6
Reduction length for each 45° bend	Metres	1.0	1.0
Reduction length for each 90° bend	Metres	2.0	2.0

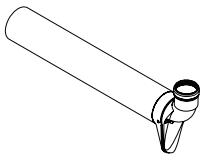
Note: The table shows the maximum lengths allowed. Both the boiler bend (90° @ 80/25mm concentric) at the spigot and the PMK terminal bend (90° @ 80mm single skin) are included. Any further fittings must be subtracted from the maximum overall flue run by applying the respective reduction in lengths. **The maximum horizontal flue run is six metres.** The external components for this PMK are constructed of black aluminium.

Note 2: The combination of internal concentric and external PMK must not exceed the overall concentric maximum.

80/125MM PLUME MANAGEMENT
COMPONENTS PART DETAIL

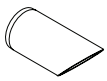
Note: The components listed below must only be used as part of the Plume Management Kit.

PMK-horizontal
Terminal – not supplied as a separate component

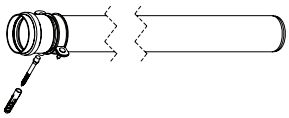


MG410082343
PMK – 90° bend (80mm)

MG410082344
PMK – horizontal outlet (80mm)

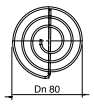


MG410082341
PMK – 1000mm flue extension piece c/w wall bracket (80mm)

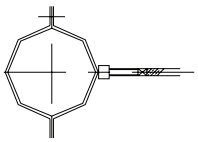


MG410082342
PMK – 45° bend (80mm)

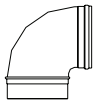
MG410082345
Bird mesh (80mm)



MG410087191
PMK – wall bracket (80mm)



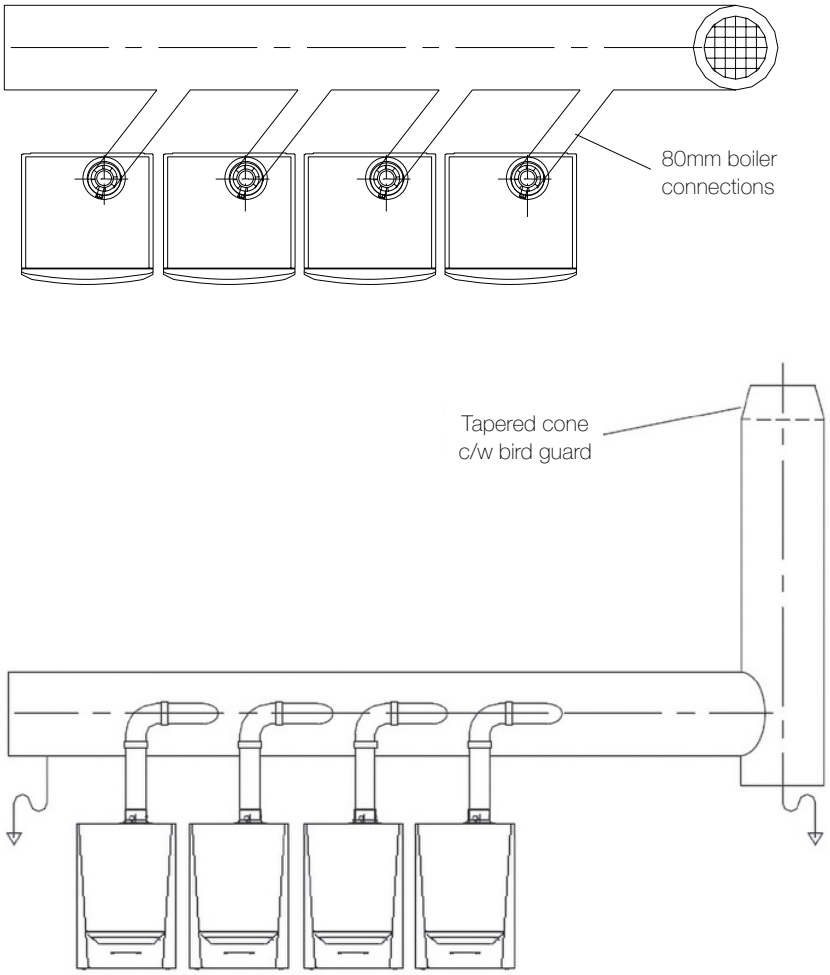
MG410084810
Boiler bend (80mm)



QUINTA ACE 30 AND 45 – MULTI-BOILER
INSTALLATION ON A COMBINED HEADER

It is recommended you consult a flue specialist for the design, manufacture and installation of the flue system.
For conventional or open-flue systems, on a typical multi-boiler installation with the flue combined into a single header and riser.

INSTALLATION ON A COMBINED HEADER



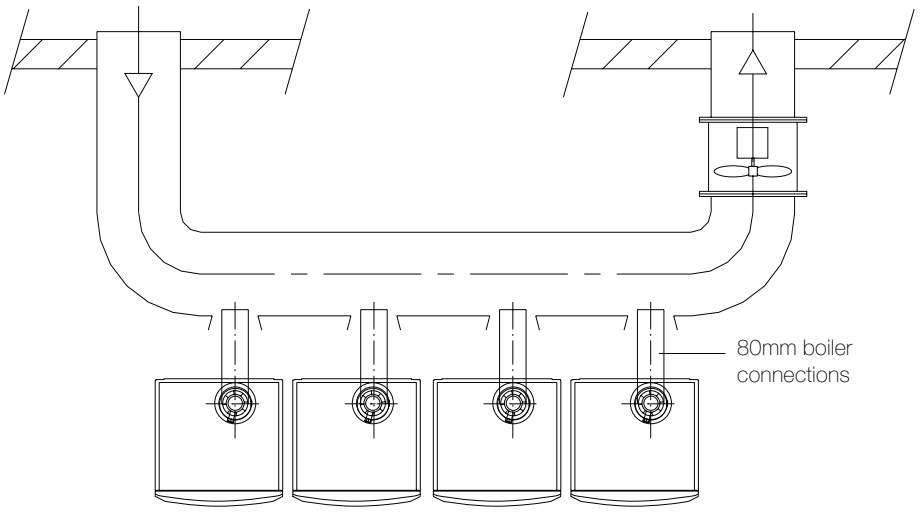
For illustration purposes only (we recommend installation of condensate collectors with drainage system and water sealed siphon to the spigot of each boiler).

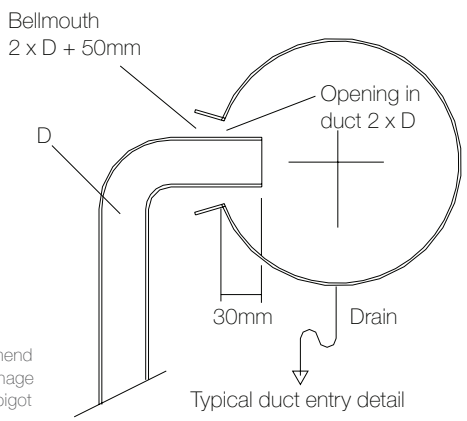
QUINTA ACE 30 AND 45 – MULTI OR SINGLE-BOILER INSTALLATION ON A FLUE DILUTION SYSTEM

Remeha is unable to offer a flue dilution system and recommends the installer contacts a flue specialist to design and manufacture the system in accordance with the requirements of the British Standards.

A typical installation for a flue dilution system showing the flue break necessary for all pre-mix boilers to prevent the dilution fan affecting the gas/air ratio control system in the boiler.

INSTALLATION ON A FLUE DILUTION SYSTEM





Typical duct entry detail

For illustration purposes only (we recommend installation of condensate collectors, drainage system and water sealed siphon to the spigot of each boiler).

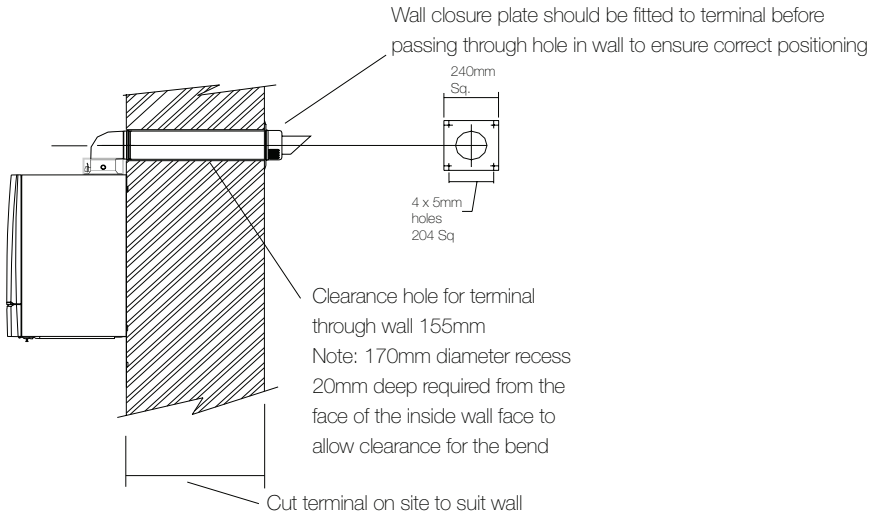
QUINTA ACE 55, 65, 90, 115 AND 160 – ROOM-SEALED, 100/150MM HORIZONTAL CONCENTRIC FLUE KIT

For use when the boiler/s are mounted on and flued through the outside wall and on a typical single-boiler installation – can also be used for multiple boilers but each must have its own flue system. At a minimum of 530mm centres and never immediately above another. When installing two boilers only, it is also possible to install the external terminal wall plates touching each other.

Kit parts – MG410082981
(max wall thickness 500mm)

- 1 x horizontal terminal
- Note: boiler bend and wall plate are included

HORIZONTAL FLUE KIT 100/150MM

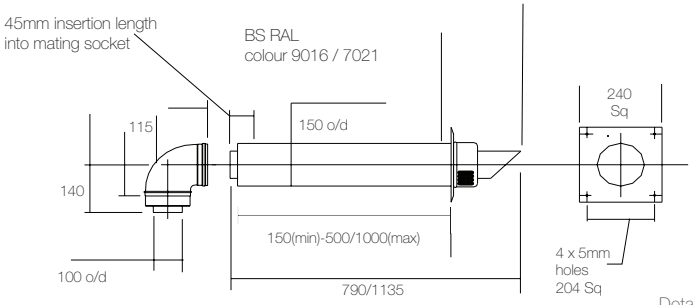


Note: Fall to boiler ≥ 50mm /Mtr.

Kit parts – MG410081941
(extended version max wall thickness 1000mm)

- 1 x horizontal terminal
- Note: boiler bend and wall plate are included

EXTENDED HORIZONTAL FLUE KIT 100/150MM



Note: All dimensions are in mm.

HRS room sealed terminal 100/150
MG410082981 & MG410081941

Detail of the 100/150mm horizontal concentric flue kit option QP06 (condensate drain not shown).

QUINTA ACE 55, 65, 90, 115 AND 160 – ROOM-SEALED, 100/150MM VERTICAL CONCENTRIC FLUE KIT

For use when the flue is discharged vertically through the roof and on a typical single-boiler installation. It can also be used for multiple boilers but each must have its own flue system and be separated by a minimum of 300mm if at the same height. Refer to the relevant British Standard if this is not the case.

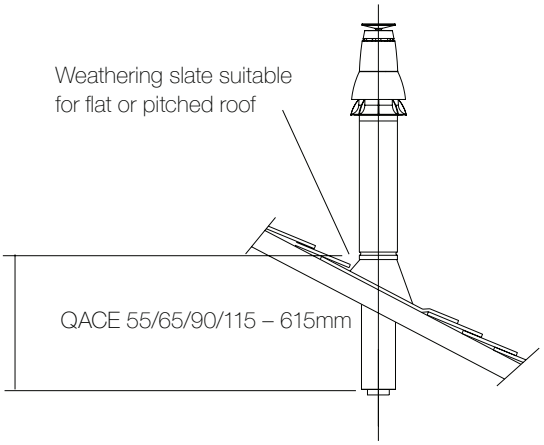
Kit parts – KT1216

- 1 x vertical terminal – MG410084862
- 1 x universal roof seal pack – VE001

Kit parts – KT00310

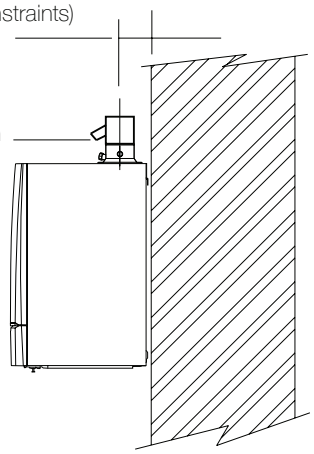
- Contains optional condensate drain

VERTICAL FLUE KIT 100/150MM



Additional components required to suit site details (within boiler constraints)

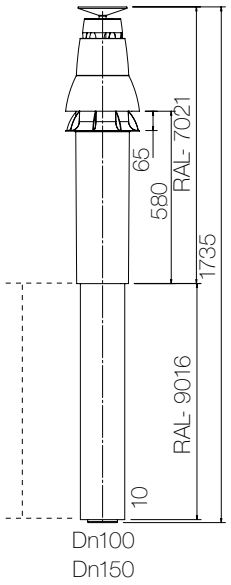
QACE 55/65/90/115 = 100mm



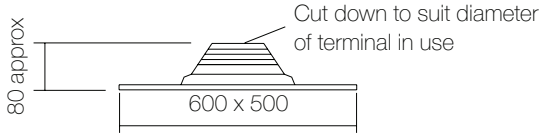
Detail of the vertical 100/150mm Concentric Flue Kit (KT1216)

Can be cut on site to a minimum of 150mm

Internal flue to extend beyond the outer by a minimum of 10mm



VRS room-sealed terminal 100/150mm



Note: It is recommended a condensate drain is used for vertical flue lengths above 1.5m.

QUINTA ACE 55, 65, 90, 115 AND 160 - 100/150MM
ROOM-SEALED CALCULATION DATA TO DETERMINE MAX FLUE RUNS

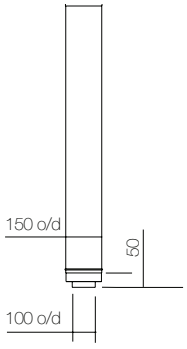
Calculation data based on flue products supplied by Remeha.

ROOM-SEALED FLUE DATA		QUINTA ACE 55 100/150MM	QUINTA ACE 65 100/150MM	QUINTA ACE 90 100/150MM	QUINTA ACE 115 100/150MM	QUINTA ACE 160 100/150MM
Maximum overall flue run	Metres	20	18	17	13	6
Reduction length for each 45° bend	Metres	1.0	1.0	1.0	1.0	1.0
Reduction length for each 90° bend	Metres	2.0	2.0	2.0	2.0	2.0

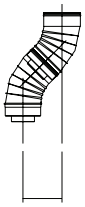
Note: Maximum horizontal flue run is six metres. Minimum fall back is 2° or 50mm per metre.

100/150MM CONCENTRIC FLUE SYSTEM COMPONENTS FOR ROOM-SEALED OPERATION

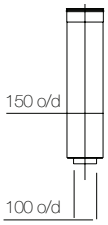
Note 2: The components listed below are not for external use.



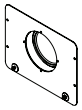
Standard length
1000mm Part No. MG410084336
500mm Part No. MG410084335



150mm Offset

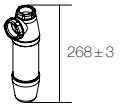


Cuttable length
1000mm – Part No. MG410082318
500mm – Part No. MG410082317

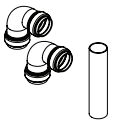


Internal wall plate
Part No. MG410081303

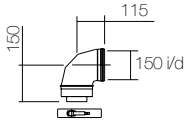
Silicon seal ring (flue side)
Part No. MG410027356



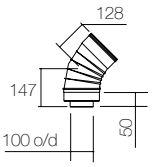
Siphon
Part No MG410081165



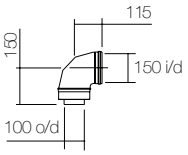
Siphon adaptor kit
Part No MG410087491



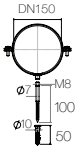
90° bend
Part No. MG410084310



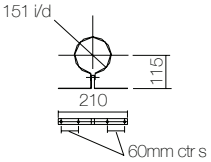
45° bend
Part No. MG410084313



90° boiler short bend
Part No. MG410084360
(clamp not required)

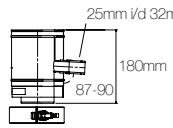


Extended wall bracket
Part No. MG410084331



Wall bracket
Part No. MG410087915

Clamp band
Part No. MG410087656
(one supplied with each component except MG410084360)



Condensate drain
Part No. MG410084322

Note 3: All dimensions are in mm.

QUINTA ACE 55, 65, 90, 115 AND 160 - ROOM-SEALED TWO ZONE CLV FLUE KIT

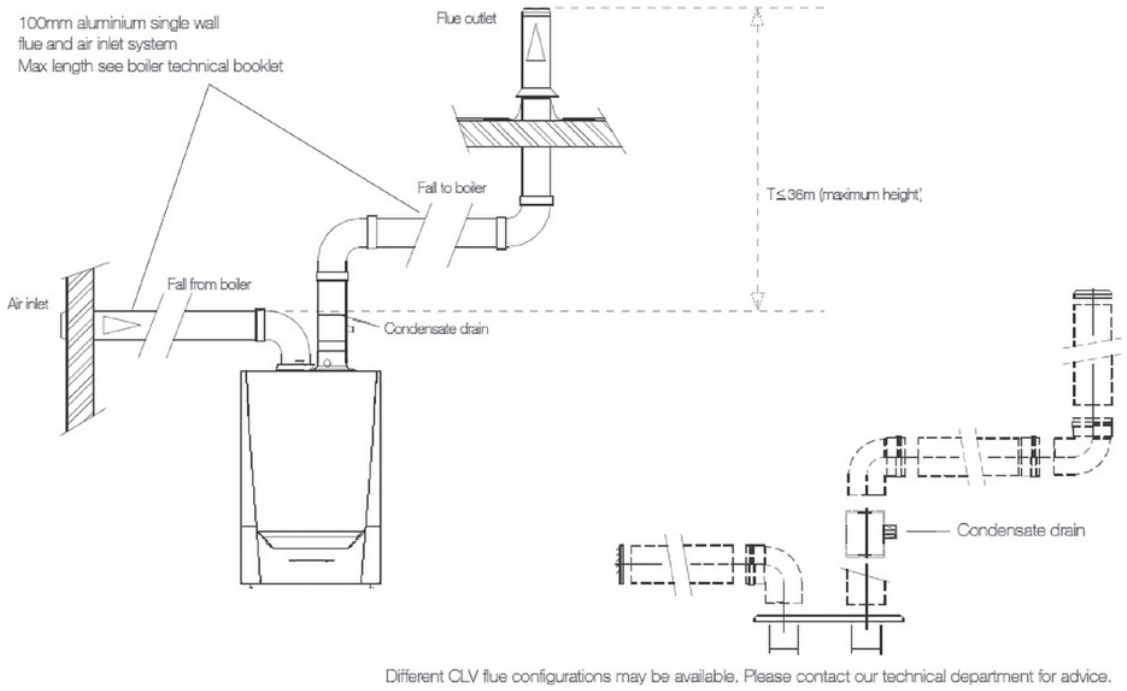
The Quinta Ace 160 boiler can be installed in areas with different pressure zones if connected to a C53 flue system. An integral non return valve is fitted as standard.

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.

Kit parts – KT030

- 1 x flue connection – S101626
- 1 x flue terminal – PU001
- 1 x air inlet – PU002
- 1 x condensate drain – MG410085130 x siphon – MG410081165 x condense adaptor kit – MG41008749

TWO ZONE FLUE KIT 100/150MM



Different CLV flue configurations may be available. Please contact our technical department for advice.

Note: Fall to boiler ≥ 50mm /Mtr.

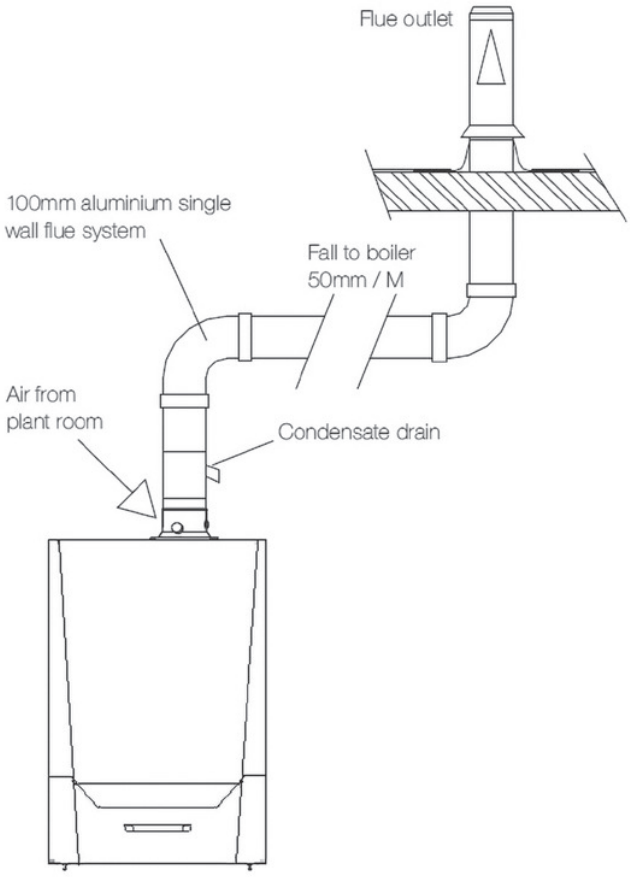
ROOM-SEALED FLUE DATA	QUINTA ACE 55 100MM Ø	QUINTA ACE 65 100MM Ø	QUINTA ACE 90 100MM Ø	QUINTA ACE 115 100MM Ø	QUINTA ACE 160 150MM Ø
Maximum length (M)	27	16	17	14	40
Equivalent length of 45° elbow (M)	1.4	1.4	1.4	1.4	1.2
Equivalent length of 90° elbow (M)	4.9	4.9	4.9	4.9	2.1

Note 2: Maximum permitted height difference between combustion air supply and flue gas outlet is 36 Mtr.

QUINTA ACE 55, 65, 90, 115 AND 160 – CONVENTIONAL OR OPEN-FLUE SYSTEMS

Typical single-boiler installation. It can also be used for multiple boilers with each boiler having its own flue system.

CONVENTIONAL
OR OPEN
FLUE SYSTEMS

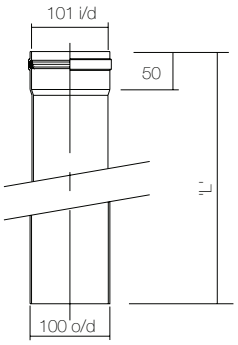


OPEN FLUE DATA (100MM)	QUINTA ACE 55 100MM Ø	QUINTA ACE 65 100MM Ø	QUINTA ACE 90 100MM Ø	QUINTA ACE 115 100MM Ø	QUINTA ACE 160 100MM Ø	QUINTA ACE 160 150MM* Ø
Maximum overall flue run (M)	39	26	24	19	8	40
Reduction length for each 45° bend (M)	1.4	1.4	1.4	1.4	1.4	1.2
Reduction length for each 90° bend (M)	4.9	4.9	4.9	4.9	4.9	2.1

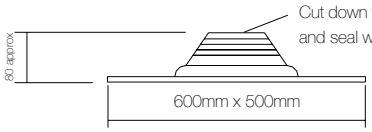
Note: Table shows max length of flue. Greater distances can be achieved by using larger diameter flue.
Please refer to Remeha technical department for further details. *Not supplied by Remeha.

100MM SINGLE WALL
ALUMINIUM FLUE COMPONENTS

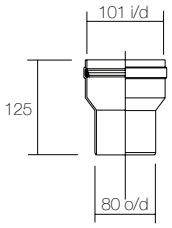
ALUMINIUM FLUE COMPONENTS



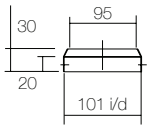
Standard length
'L'= 1000mm Part No. MG87062
'L'= 500mm Part No. MG87061
'L'= 250mm Part No. MG87060



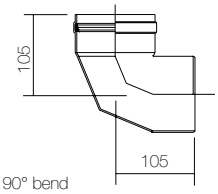
Detail of standard weathering plate for
100mm to 150mm flue (Part No. VE001)



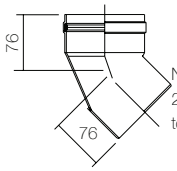
Reducer 80 spigot to 100 socket
Part No. MG87127
Must be used on the QP 30/45 flue
connection to adapt to 100mm system



Flue terminal c/w bird guard
Part No. PU001

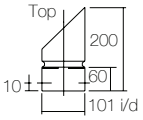


90° bend
Part No. MG87113

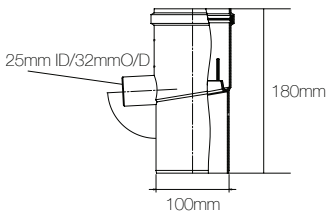


Note:
2 x 45° bends will offset
to 71mm centres

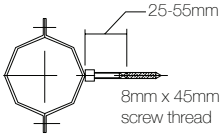
45° bend
Part No. MG87103



Air inlet guard
Part No. PU002

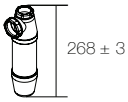


Condensate drain
Part No. MG410085130



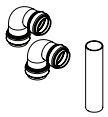
Mounting bracket
Part No. MG87193

Silicon seal ring
Part No. MG87183



Siphon
Part No. MG410081165

Eccentric flue connector
80/80 – Part No. S100250
100/100 – Part No. S101626



Siphon adaptor kit
Part No. MG410087491

Note: All dimensions are in mm.
Note 2: The only parts that are suitable for external use are VE001, PU001 and PU002.

QUINTA ACE 55, 65, 90, 115 AND 160 – 100/150MM FLUE KIT OPTION QP11

Plume kit termination positions must not be used to circumvent current standards and regulations. The point of exit determines the flue outlet position. The 100mm aluminium discharge components can then be used to position the flue gases/plumes to a suitable discharge point, again in line with current regulations.

100/150mm Plume Management Kits
QP11 Kit part – KT00336

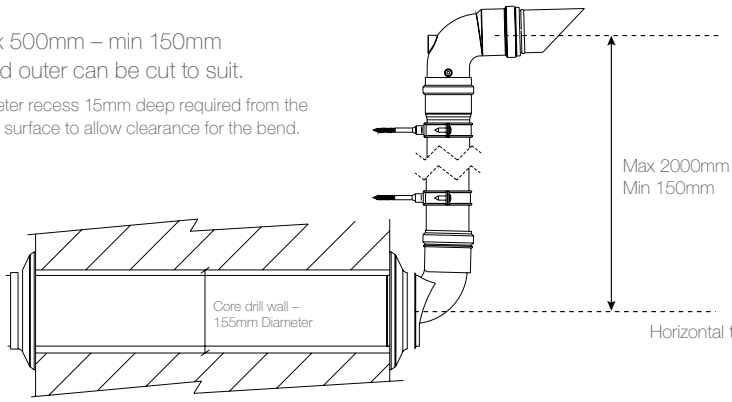
PMK-horizontal terminal kit
1. PMK wall terminal
2. Boiler bend – not illustrated
3. Wall plates
5. Support bracket (100mm)
6. 90° bend (100mm)
7. Flue outlet (100mm)
8. Bird guard

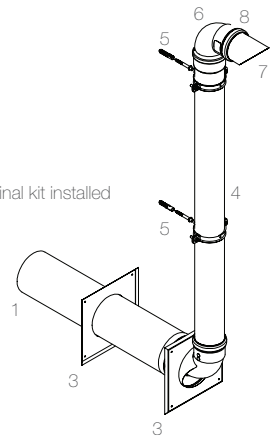
1 x siphon – MG410081165 – not illustrated
1 x condense adaptor kit – MG410087491 – not illustrated

FLUE
KIT OPTION

Wall depth – max 500mm – min 150mm
Terminal inner and outer can be cut to suit.

Note 1: 170mm diameter recess 15mm deep required from the face of the inside wall surface to allow clearance for the bend.





Note 2: Both the concentric flue terminal and plume flue outlet positions of the PMK must comply with the current regulations and British Standards with regards to the minimum distances from openings, walls, etc.

Flue can be taken directly through rear outside wall or discharged through a side wall, left or right. Both must be within the constraints listed in the table below.

Note 3: Fall to boiler ≥ 50mm /Mtr.

100/150MM PLUME MANAGEMENT DETAILS (CALCULATION BASED ON PRODUCTS SUPPLIED BY REMEHA)

ROOM-SEALED (PMK) FLUE DATA	QUINTA ACE 55 100/150MM	QUINTA ACE 65 100/150MM	QUINTA ACE 90 100/150MM	QUINTA ACE 115 100/150MM	QUINTA ACE 160 100/150MM
Maximum horizontal run (M)	6	6	6	6	6
Reduction length for each 45° bend (M)	1.2	1.2	1.2	1.2	1.2
Reduction length for each 90° bend (M)	2.8	2.8	2.8	2.8	2.8

Note: The table shows the maximum lengths allowed. Both the boiler bend (90° @ 100/150mm concentric) at the spigot and the PMK terminal bend (90° @ 100mm single skin) are included. Any further fittings must be subtracted from the maximum overall flue run by applying the respective reduction in lengths. **The maximum horizontal flue run is six metres.** The external components for this PMK are constructed of black aluminium. If the flue is greater than 1m, then provision of a condense drain is required.

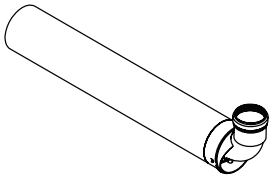
Note 2: The combination of internal concentric and external PMK must not exceed the overall concentric maximum.

100/150MM PLUME MANAGEMENT
COMPONENTS PART DETAIL

COMPONENTS
PART DETAIL

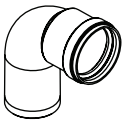
PMK – horizontal terminal

Not supplied as a separate component



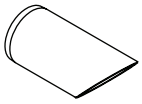
MG410081753

PMK – 90° bend (100mm)



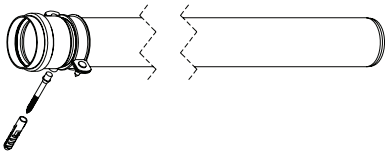
MG410081754

PMK – horizontal outlet (100mm)



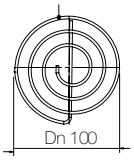
MG410081751

PMK – 1000mm glue extension piece c/w wall bracket (100mm)



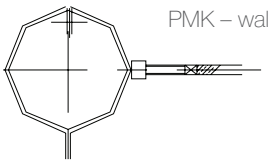
MG410081752

PMK – 45° bend (100mm)



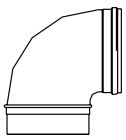
MG410081755

Bird mesh 100mm



MG410087193

PMK – wall bracket (100mm)



MG410084360

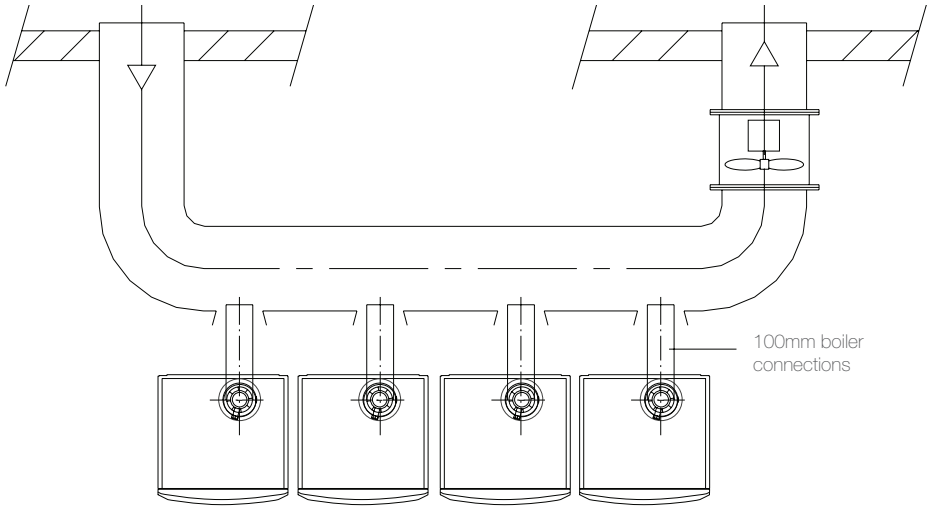
Boiler bend

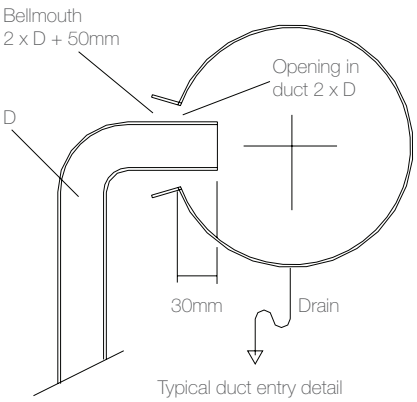
Note: The components listed below must only be used as part of the Plume Management Kit.

QUINTA ACE 55, 65, 90, 115 AND 160 – MULTI OR SINGLE-BOILER INSTALLATION ON A FLUE DILUTION SYSTEM

Remeha is unable to offer a flue dilution system and recommends that the installer contacts a flue specialist to design and manufacture the system in accordance with the requirements of the British Standards. Typical multi-boiler installation for a flue dilution system showing the flue break necessary for all pre-mix boilers to prevent the dilution fan affecting the gas/air ratio control system in the boiler.

FLUE DILUTION SYSTEM



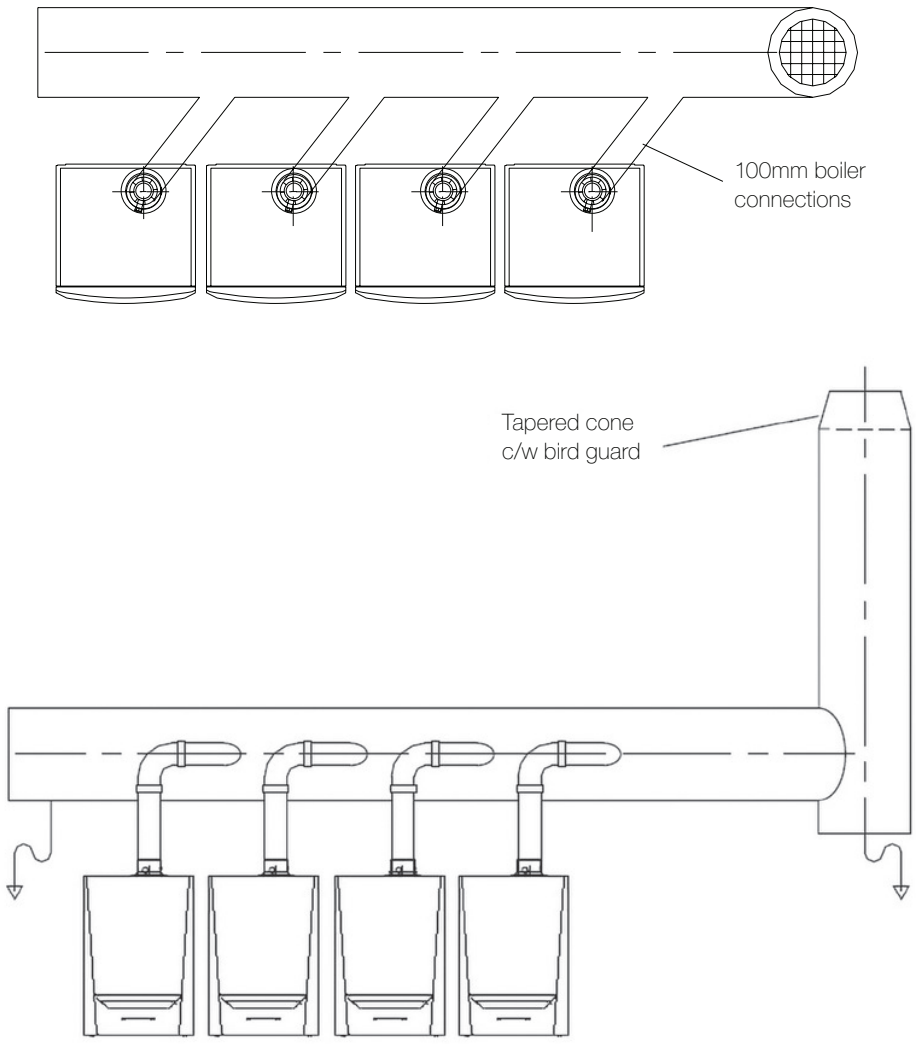


Typical duct entry detail

For illustration purposes only (we recommend installation of condensate collectors with drainage system and water sealed siphon to the spigot of each boiler).

QUINTA ACE 55, 65, 90 AND 115 – MULTI-BOILER INSTALLATION ON A COMBINED HEADER

It is recommended you consult a flue specialist for the design, manufacture and installation of the flue system.
For conventional or open-flue systems in a typical multi-boiler installation with the flue combined into a single header and riser.



For illustration purposes only (we recommend installation of condensate collectors with drainage system and water sealed siphon to the spigot of each boiler).
Note: Using 90° boiler connections into the header may result in larger headers and risers being required.

FLUECADE
SYSTEM

The Fluecade system can only be used on the Quinta Ace 30, 45, 55, 65, 90 and 115 boilers from two boilers up to a maximum of six in-line and back-to-back.

The flue is designed for internal use in a plant room and not for external use. The system comes complete with all associated components. Optional adaptors are available which can be connected to the last boiler connection. Refer to table on page 58.

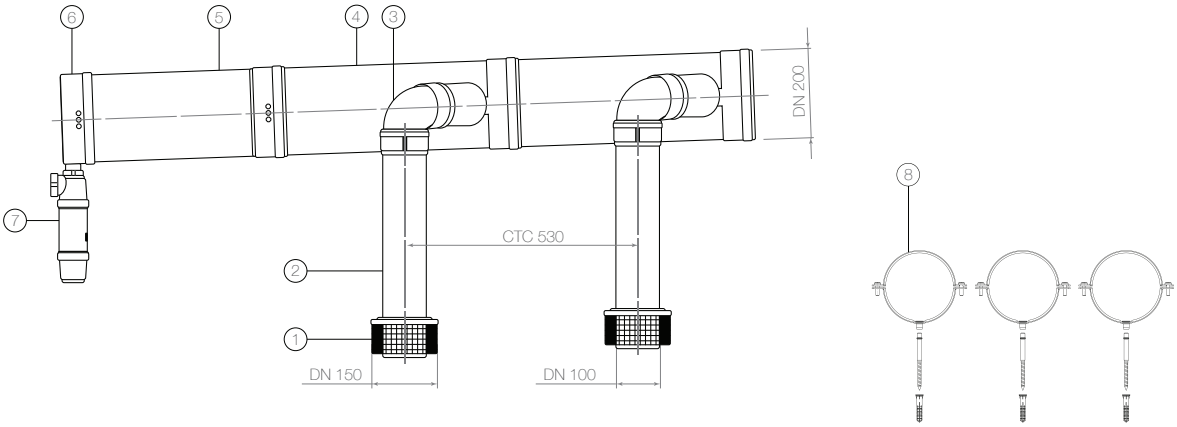
The flue can then continue to the external exit point and termination using suitable flue products/components. The flue header is supplied in 200mm only, and is CE approved. Only the components and accessories listed on pages 55 to 57 can be fitted as within the fluecade system.

THIS BASIC PP 200MM FLUECADE HEADER KIT IS SUITABLE FOR THE CONNECTION OF TWO QUINTA ACE BOILERS – IN AN IN-LINE CONFIGURATION

Please refer to table on page 58 to determine the maximum length and diameter of the fluecade system for the Quinta Ace range of boilers.

Kit parts – MG410121372

IN-LINE CONFIGURATION



KEY

1	Air inlet grill 100-150 Part No. MG410075435 x 2	4	Collector PP 200 1 x 100 45° L = 585 Part No. MG410076748 x 1	7	Syphon PP h = 150, Part No. MG410081165 x 1
2	Extension PP 100 L = 500 Part No. MG410085481 x 2	5	Extension PP 200 L = 500 Part No. MG410 0704 01 x 1	8	Wall bracket 150 Part No. MG410087198 x 3
3	Elbow short PP 100-90° Part No. MG410085141 x 2	6	Cover PP 200 and Condensate Part No. MG410071526 x 1		

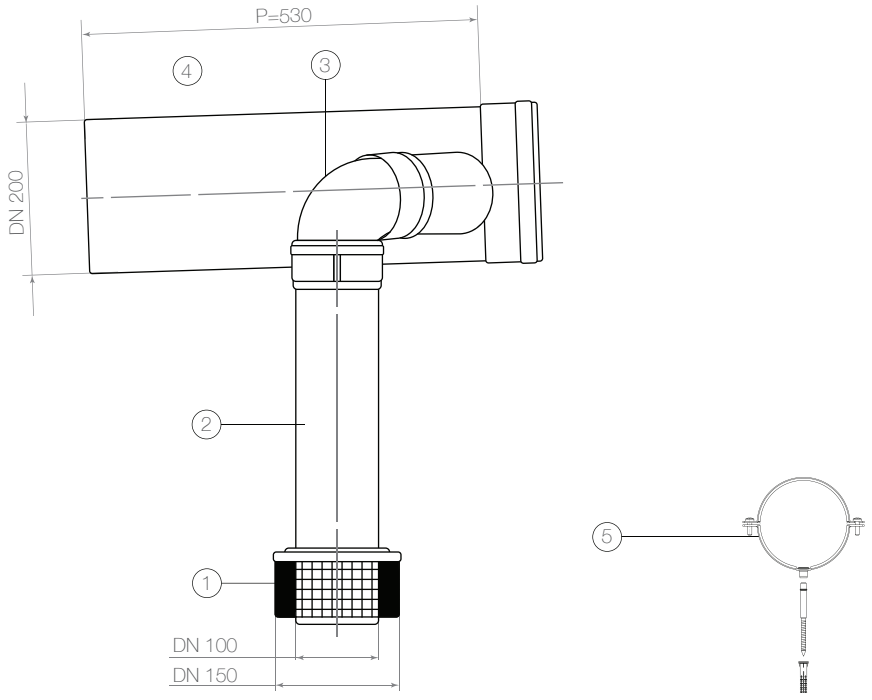
Note: The Quinta Ace 30 and Quinta Ace 45 boilers also require the 80/125 boiler connection kit MG410076724.
Note 2: Fall ≥ 50mm /Mtr.

THIS BASIC PP 200MM FLUECADE EXTENSION KIT IS SUITABLE FOR THE CONNECTION OF AN EXTRA QUINTA ACE BOILER – IN AN IN-LINE CONFIGURATION

Please refer to table on page 58 to determine the maximum length and diameter of the fluecade system for the Quinta Ace range of boilers.

Kit parts – MG410121373

IN-LINE CONFIGURATION



KEY					
1	Air inlet grill 100-150 Part No. MG410075435 x 1	3	Elbow short PP 100-90° Part No. MG410085141 x 1	5	Wall bracket 200 Part No. MG410087198 x1
2	Extension PP 100 L = 500 Part No. MG410085481 x 1	4	Collector PP 200 1 x 100 45° L = 570 Part No. MG41076748 x 1		

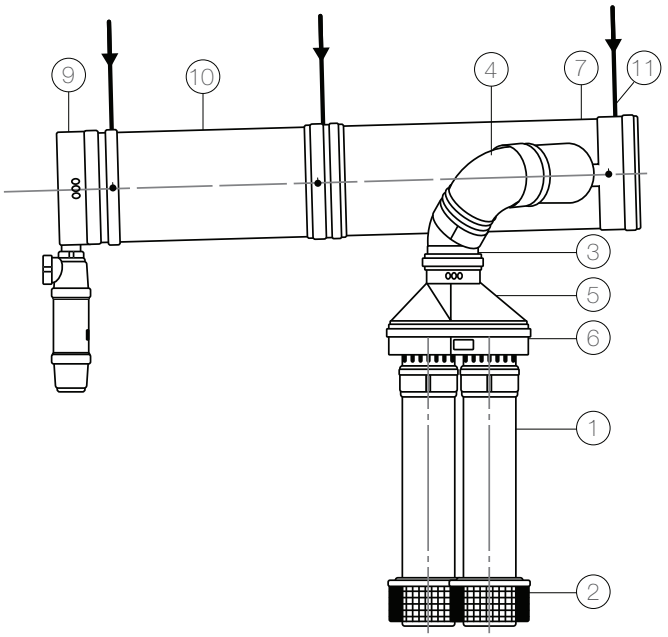
Note: The Quinta Ace 30 and Quinta Ace 45 boilers also requires the 80/125 boiler connection kit MG410076724.
Note 2: Fall ≥ 50mm /Mtr.

THIS BASIC PP 200MM FLUECADE HEADER KIT IS SUITABLE FOR TWO QUINTA ACE BOILERS – IN A BACK-TO-BACK CONFIGURATION

Please refer to table on page 58 to determine the maximum length and diameter of the fluecade system for the Quinta Ace range of boilers.

Kit parts – MG410076746

BACK-TO-BACK CONFIGURATION



KEY					
1	Extension PP 100 L = 500 Part No. MG410085481 x 2	5	Reducer PP 150-100 Part No. MG410071518 x 2	9	Cover PP 200 and Condensate Part No. MG410071526 x 1
2	Air inlet grill 100-150 Part No. MG410075435 x 2	6	Expander PP 100-150 Part No. MG410085635 x 2	10	Extension PP 200 L = 500 Part No. MG410070401 x 1
3	Elbow short PP 100-45° Part No. MG410085142 x 2	7	Collector PP 200, 2 x 100 45° L = 585 Part No. MG410081949 x 1	11	Wall bracket 200 Part No. MG410087198 x 3
4	Elbow short PP 100-90° Part No. MG410085141 x 2	8	Syphon PP h = 150 Part No. MG410081165 x 1		

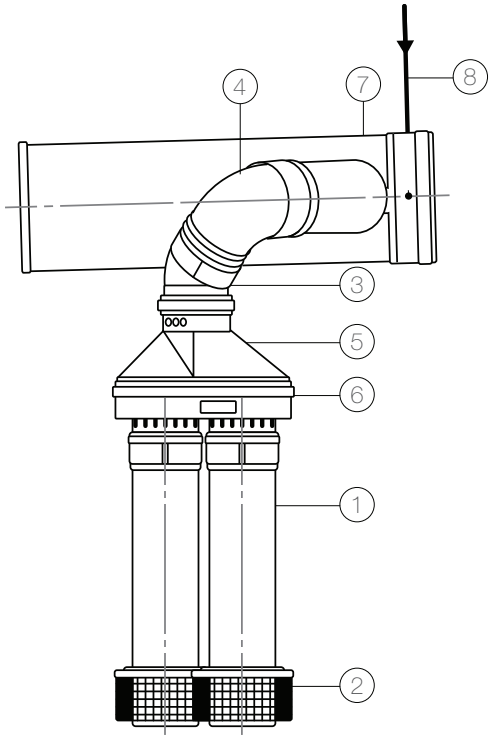
Note: Quinta Ace 30 and Quinta Ace 45 boilers also require 80/125 boiler connection kit (1 x MG410076724 per boiler).
Note 2: Fall ≥ 50mm /Mtr.

THIS BASIC PP 200MM FLUECADE EXTENSION KIT IS SUITABLE FOR TWO QUINTA ACE BOILERS – IN A BACK-TO-BACK CONFIGURATION

Please refer to table on page 58 to determine the maximum length and diameter of the fluecade system for the Quinta Ace range of boilers.

Kit parts – MG410076747

BACK-TO-BACK CONFIGURATION



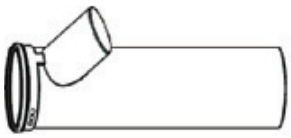
KEY

1	Extension PP 100 L = 500 Part No. MG410085481 x 2	4	Elbow short PP 100-90° Part No. MG410085141 x 2	7	Collector PP 200, 2 x 100 45° L = 585 Part No. MG410081949 x 1
2	Air inlet grill 100-150 Part No. MG410075435 x 2	5	Reducer PP 150-100 Part No. MG410071518 x 2	8	Wall bracket 200 Part No. MG410087196 x1
3	Elbow short PP 100-45° Part No. MG410085142 x 2	6	Expander PP 100-150 Part No. MG410085635 x 2		

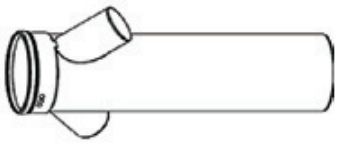
Note: Quinta Ace 30 and Quinta Ace 45 boilers also require 80/125 boiler connection kit (1 x MG410076724 per boiler).
Note 2: Fall ≥ 50mm /Mtr.

FLUECADE
COMPONENTS

Flue header 200mm Part No. MG410076748



Flue header 200mm Part No. MG410081949



Quinta Pro 30/45 80mm x 125mm
boiler connection Part No. MG410076724

Air intake grill (parallel) 80mm Part No. MG410076039
Air intake grill (parallel) 100mm Part No. MG410079314

Air intake grill (concentric) 80/125mm Part No. MG410075434
Air intake grill (concentric) 100/150mm Part No. MG410075435

Straight flue 200mm x 500mm Part No. MG410070401

Straight flue 200mm x 770mm Part No. MG410070420

200mm 90° elbow Part No. MG410070411

200mm 45° Elbow Part No. MG410070412

Note All PP Fluecade components are designed for internal use only.

FLUECADE
COMPONENTS

Wall bracket 200mm Part No. MG410087198

100mm 45° elbow Part No. MG410085142

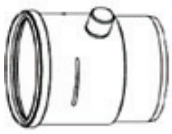
90° elbow 100mm
Part No. MG410085141

Seal HR – EPDM 200mm Part No. MG410027360
Seal HR – EPDM 150mm Part No. MG410027358
Seal HR – EPDM 100mm Part No. MG410027356

Straight flue 100mm x 500mm
Part No. MG410085481

Condense adaptor
Kit parts – MG410087491

Condensate trap with drain point 200mm
Part No. MG410071526



Siphon Part No. MG410087490

Note All PP Fluecade components are designed for internal use only.

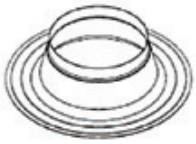
FLUECADE

200mm PP roof terminal Part No. MG410070439

Straight flue 200mm x 2000mm Part No. MG410070404

Ventilation grate 250mm x 300mm (175cm²)
Part No. MG410087433

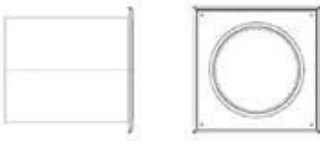
200mm flat roof flashing Part No. MG410079612



200mm chimney cap Part No. MG410087398

Straight flue 200mm x 1000mm Part No. MG410070402

Cover plate 300mm x 300mm with sleeve
250mm x 300mm Part No. MG410081362



Note All PP Fluecade components are designed for internal use only.

DATA TO DETERMINE THE MAXIMUM LENGTH AND DIAMETER OF THE FLUECADE SYSTEM FOR THE QUINTA ACE RANGE OF BOILERS

BOILER	UNIT	QACE30	QACE45	QACE55	QACE65	QACE90	QACE115
Heat input net kW	kW	30.0	41.2	56.5	62	86	107.9
Max back pressure at full load	Pa	70	150	120	100	160	220
Max back pressure at ignition	Pa	50	50	50	50	50	50

HEAT INPUT kW	CONFIGURATION	H=5M	H=9M	H=13M	H=17M
59.6/81.6	2 x QACE 30/45	150	150	150	150
89.4/122.4	3 x QACE 30/45	150	150	150	150
119.2/163.2	4 x QACE 30/45	150	150	150	150
149/204	5 x QACE 30/45	150	150	150	150
178.8/244.8	6 x QACE 30/45	150	150	150	150
110.6	2 x QACE 55	150	150	150	150
165.9	3 x QACE 55	150	150	150	150
221.2	4 x QACE 55	150	150	150	150
276.5	5 x QACE 55	150	150	150	150
331.8	6 x QACE 55	150/200	150/200	150/200	150/200
123	2 x QACE 65	150	150	150	150
184.5	3 x QACE 65	150	150	150	150
246	4 x QACE 65	150/200	150/200	150/200	150/200
307.5	5 x QACE 65	150/200	150/200	150/200	150/200
369	6 x QACE 65	150/200	150/200	150/200	150/200
168.4	2 x QACE 90	150	150	150	150
252.6	3 x QACE 90	150	150	150	150
336.8	4 x QACE 90	150	150	150	150/200
421	5 x QACE 90	150/200	150/200	150/200	150/200
505.2	6 x QACE 90	200	200	200	200
207.8	2 x QACE 115	150	150	150	150
311.7	3 x QACE 115	150	150/200	150/200	150/200
415.6	4 x QACE 115	150/200	150/200	150/200	150/200
519.5	5 x QACE 115	150/200	150/200	150/200	150/200
623.4	6 x QACE 115	200	200	200	200
304.2	2 x QACE 160	200	200	200	200
456.3	3 x QACE 160	N/a	N/a	N/a	N/a
608.4	4 x QACE 160	N/a	N/a	N/a	N/a
760.5	5 x QACE 160	N/a	N/a	N/a	N/a
912.6	6 x QACE 160	N/a	N/a	N/a	N/a

ELBOW TYPE	150MM	200MM	250MM
45°	1.1m	1.5m	2m
90°	2.5m	3.3m	4.9m

Note 1: Length between shaft and last boiler = 1 metre.

Note 2: For calculating other horizontal/vertical lengths between the last boiler and the vertical riser the height must be reduced by the number of lengths added to the horizontal over one metre and for any added bends the details in the table adjacent must be used.

Note 3: The optional flue adaptors can be connected to the PP connection on the last boiler before the horizontal/vertical to increase the flue size as shown in table 10, ensure all joints are air and water tight.

Note 4: 150/200mm means; horizontal = 150mm, vertical = 200mm.

CASCADE OPTIONS

Spreading the total required heat output over several boilers in cascade configuration offers several advantages:

- greater reliability
- higher efficiency
- improved design flexibility
- quick and easy installation.

In order to make it as simple as possible to create a cascade configuration, we have offered complete cascade systems for years. The compact design of the boilers, combined with the smart gas and water connection technology of the cascade system, makes it possible to install a high heat output in a small area.

When installing two to eight boilers, our product range includes systems that are very comprehensive and easy to install. The hydraulic and gas system can be put together entirely without welding, using screw connections, compression connections and flanges. The individual components of the cascade systems are available for independent cascade installation.

Please contact our technical or sales departments for different configurations. We also provide in-depth advice on the choice of flue gas discharge material and control engineering.

STRUCTURE OF QUINTA ACE 30, 45, 55, 65, 90, 115 AND 160 CASCADE SYSTEMS

The flow, return and gas connections of the individual boilers are connected using the fittings supplied by means of horizontal connections to main pipes for flow, return and gas. These pipes are welded onto a frame that rests on the floor and is fixed to the wall or to a free-standing frame. The low loss header supplied has flange connections, which can be fitted to the left or right of the cascade main pipe as required. The blind flanges supplied are then fitted on the other side. The gas main pipe has a flange to which the optional gas filter can also be connected on the left or right as required. The blind flange supplied is then fitted on the other side. When a gas filter is used, a pressure loss of three mbar over the gas filter must be taken into account. The minimum inlet working gas pressure after the gas filter is 17mbar. A common PVC condensed water discharge pipe (not supplied) can be installed in the frame. For this purpose, holes have been made in the frame into which this pipe can be fitted (to the left or right as required) sloping downwards.

Quinta Ace 30, 45, 55, 65, 90 and 115 boilers are particularly suitable for use in cascade systems due to their small footprint and width of only 50cm which allows an exceptionally compact cascade configuration. For example, when using six Quinta Ace 115 boilers in line (including low loss header), approximately only 3.8m wall width is required for 642kW (80/60°C).

The cascade systems can be divided into three main groups:

- two to eight Quinta Ace boilers in a linear configuration, wall-mounted
- two to eight Quinta Ace boilers in a linear configuration, mounted on a free-standing frame
- two to ten Quinta Ace boilers in a back-to-back configuration, mounted on a free-standing frame.

The boiler side of the cascade systems is sized to 20ºC.
The low loss header is based on 20/11ºC.

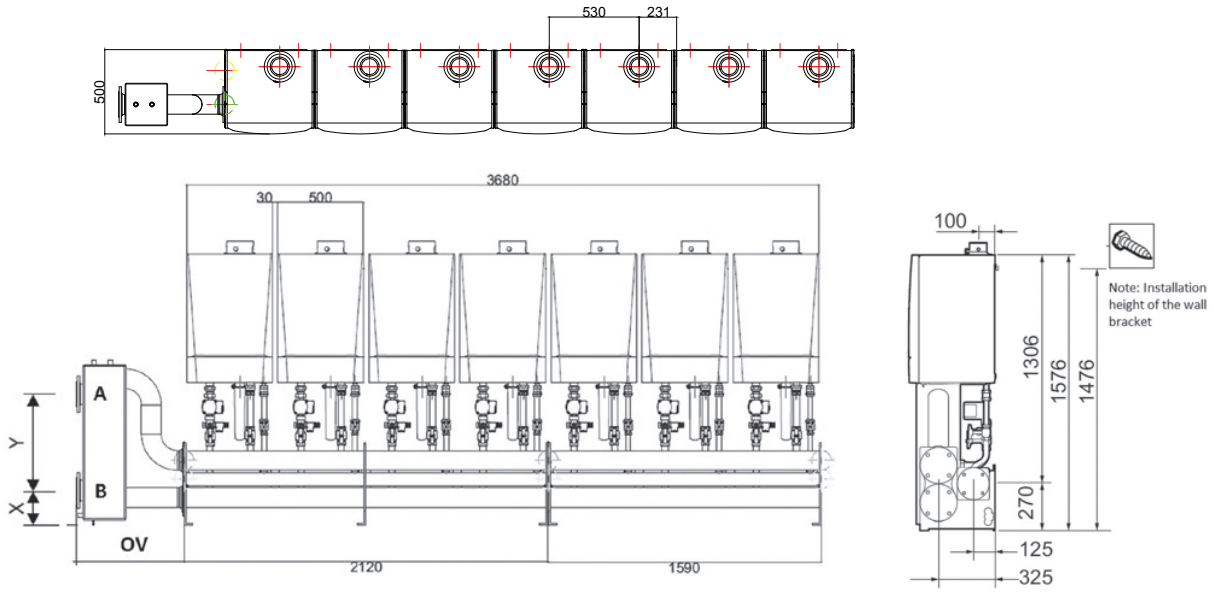
QUINTA ACE INSTALLATION DRAWINGS
FOR WALL-MOUNTED CASCADE SYSTEMS

The cascade systems can be divided into three main groups:
- two to eight boilers in a linear configuration, wall-mounted
- two to eight boilers in a linear configuration, mounted on a free-standing frame
- three to ten boilers in a back-to-back configuration, mounted on a free-standing frame.

The boiler side of the cascade systems is sized to 20ºC. The low loss header is based on 20/11ºC.

Wall-mounted configuration.

QUINTA ACE



KEY

A	System flow; connection DN 100 or 125/DIN 2631 (8 holes)	OV	Low loss header (DN 65 = 633mm; DN 100 = 643mm)	Gas supply connection DN 50 or 65/DIN 2633 (4 holes)
B	System return; connection DN 100 or 125/DIN 2631 (8 holes)	X	Distance to system return connection = 200mm	Air inlet/flue gas discharge concentric connection
		Y	Distance to system flow connection = 560mm	Quinta Ace 30/45 = 80/125mm, Quinta Ace 55/65/90/115 = 100/150mm

DIMENSIONS (MM) - BOILERS ONLY

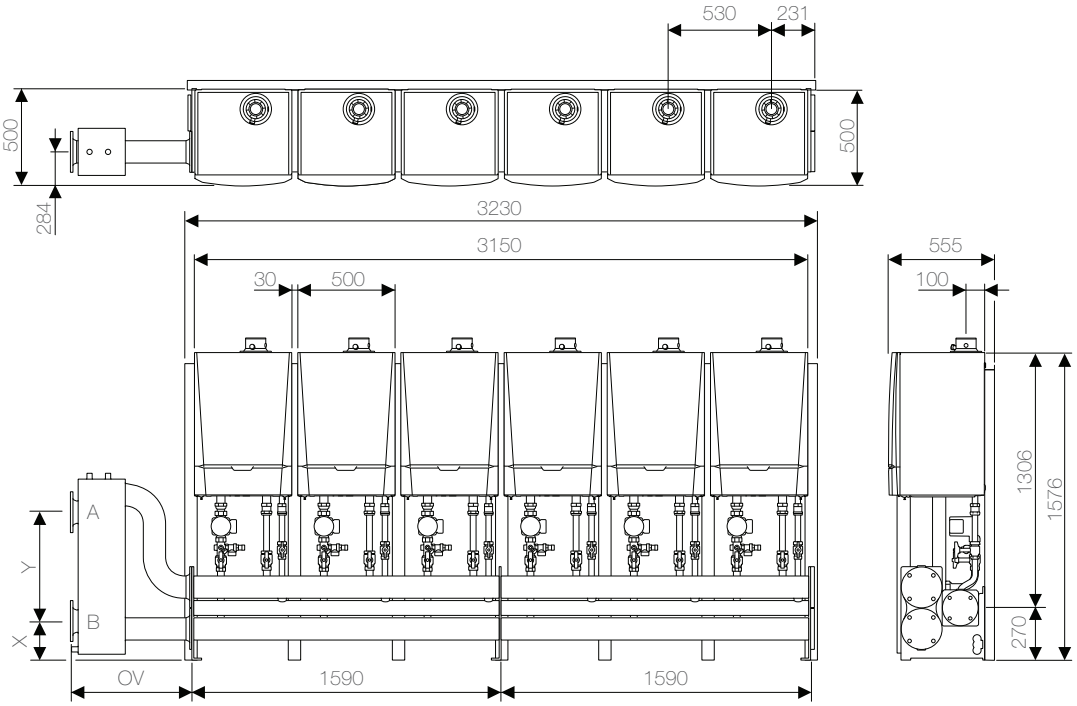
NO. OF BOILERS	2	3	4	5	6	7	8
Width mm	1030	1560	2090	2620	3150	3680	4210

Note This information is provided as a guide only. Please refer to the Quinta Pro Cascade Installation and Service Manual for specific details.

QUINTA ACE LINEAR CONFIGURATION, MOUNTED ON A FREE-STANDING FRAME – TWO TO EIGHT BOILERS

QUINTA
ACE

Free-standing frame configuration.



T003419-A

KEY				
A	System flow; connection DN 100 or 125/DIN 2631 (8 holes)	OV	Low loss header DN 65 = 633mm DN 100 = 643mm	Gas supply connection DN 50 or 65/DIN 2633 (4 holes)
B	System return; connection DN 100 or 125/DIN 2631 (8 holes)	X	Distance to system return connection = 200mm	Air inlet/flue gas discharge concentric connection Quinta Ace 30/45 = 80/125mm Quinta Ace 55/65/90/115 = 100/150mm
		Y	Distance to system flow connection = 560mm	

DIMENSIONS (MM) - BOILERS & FRAME ONLY

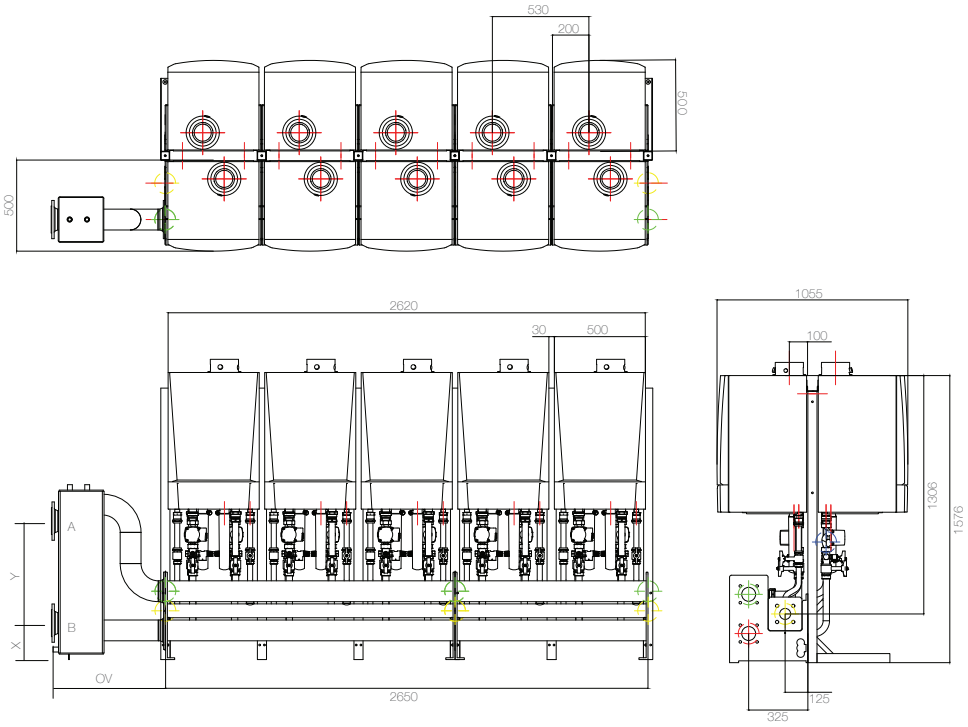
NO. OF BOILERS	2	3	4	5	6	7	8
Width mm	1110	1640	2170	2700	3230	3760	4290

Note This information is provided as a guide only. Please refer to the Quinta Pro Cascade Installation and Service Manual for specific details.

QUINTA ACE BACK-TO-BACK MOUNTED OR FREE-STANDING FRAME CONFIGURATION (RG) – THREE TO TEN BOILERS

Back-to-back mounted on a free-standing frame configuration.

QUINTA ACE



KEY				
A	System flow; connection DN 100 or 125/DIN 2631 (8 holes)	X	Distance to system return connection = 200mm	Gas supply connection DN 50 or 65/DIN 2633 (4 holes)
B	System return; connection DN 100 or 125/DIN 2631 (8 holes)	Y	Distance to system flow connection = 560mm	Air inlet/flue gas discharge concentric connection
		OV	Low loss header (DN 65 = 633mm; DN 100 = 643mm)	Quinta Ace 30/45 = 80/125mm, Quinta Ace 55/65/90/115 = 100/150mm

DIMENSIONS (MM) - BOILERS & FRAME ONLY

NO. OF BOILERS	2	3	4	5	6	7	8	9	10
Width mm	N/a	1110	1110	1640	1640	2170	2170	2700	2700

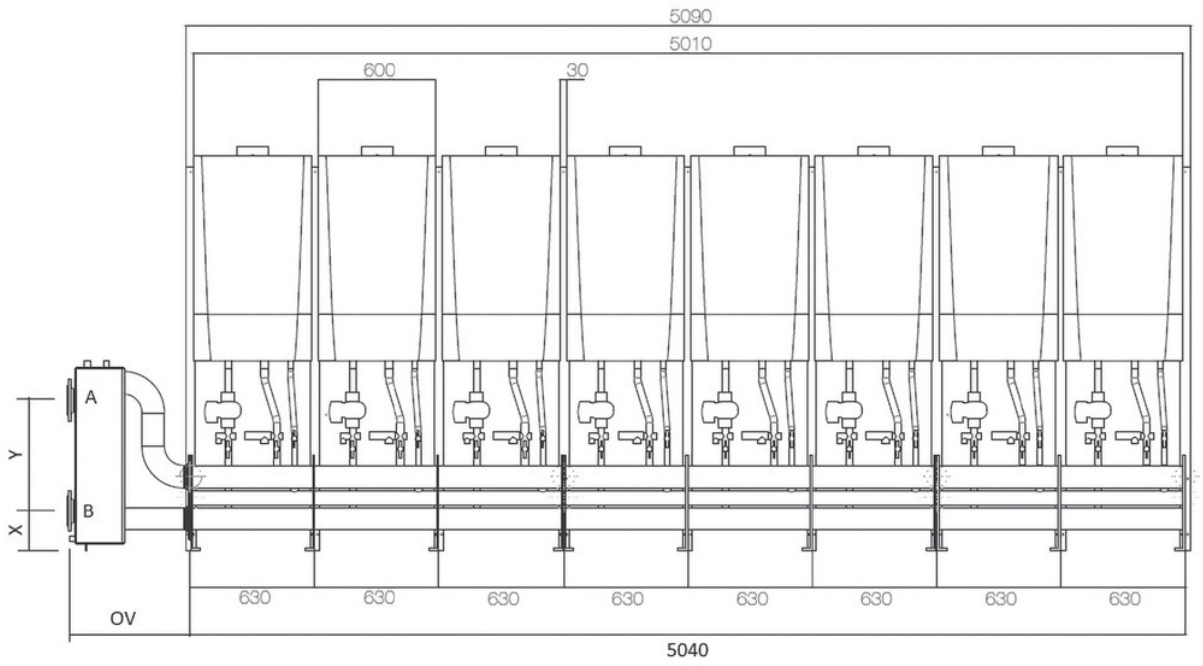
Note This information is provided as a guide only. Please refer to the Quinta Pro Cascade Installation and Service Manual for specific details.

STRUCTURE OF QUINTA ACE 160
CASCADE SYSTEMS

Complete cascade options are available for the Quinta Ace 160 with both insulated and non-insulated versions.

QUINTA
ACE 160

Two to eight Quinta Ace 160 boilers in a linear configuration, mounted on a free-standing frame.



KEY

A	System Flow; Connection DN 125 / DIN 2633 (8 holes)	X	Distance to system return connection = 200mm	Gas supply connection DN65 / DIN 2633 (4 holes)
B	System Return; Connection DN 125 / DIN 2633 (8 holes)	Y	Distance to system flow connection = 560mm	Air inlet/flue gas discharge concentric connection – 100 / 150mm
		OV	Low loss header DN 100 = 633mm	

FREE-STANDING DIMENSIONS (MM) - BOILERS & FRAME ONLY

NO. OF BOILERS	2	3	4	5	6	7	8
Width mm	1310	1940	2570	3200	3830	4460	5090

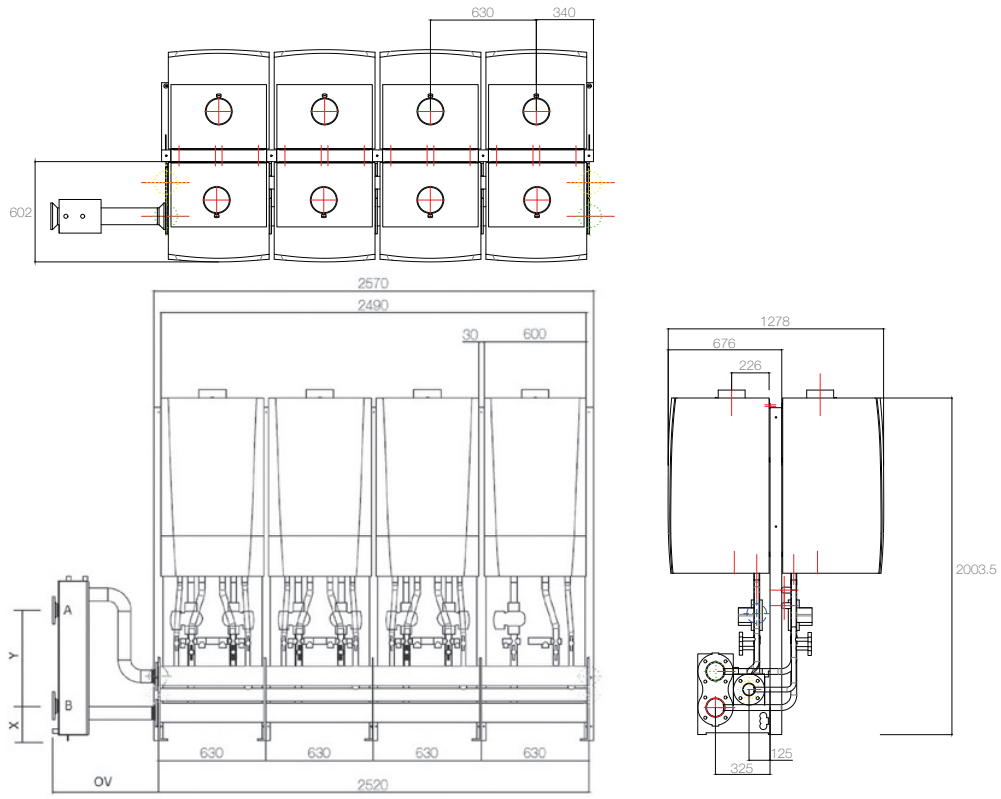
Note This information is provided as a guide only. Please refer to the Quinta Pro Cascade Installation and Service Manual for specific details.

STRUCTURE OF QUINTA ACE 160
CASCADE SYSTEMS

Complete cascade options are available for the Quinta Ace 160 with both insulated and non-insulated versions.

QUINTA ACE 160

Three to eight Quinta Ace 160 boilers in a back-to-back configuration, mounted on a free-standing frame.



KEY

A	System Flow; Connection DN 125 / DIN 2633 (8 holes)	X	Distance to system return connection = 200mm	Gas supply connection DN65 / DIN 2633 (4 holes)
B	System Return; Connection DN 125 / DIN 2633 (8 holes)	Y	Distance to system flow connection = 560mm	Air inlet/flue gas discharge concentric connection – 100 / 150mm
		OV	Low loss header DN 100 = 633mm	

DIMENSIONS (MM) - BOILERS & FRAME ONLY

NO. OF BOILERS	2	3	4	5	6	7	8
Width mm	N/a	1310	1310	1940	1940	2570	2570

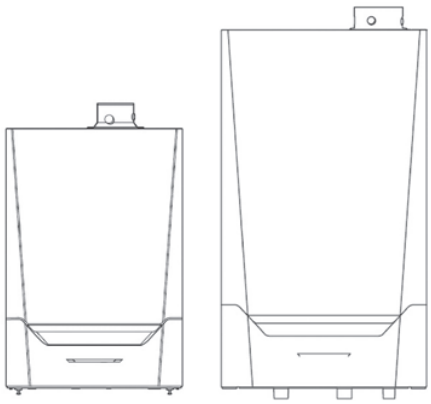
Note This information is provided as a guide only. Please refer to the Quinta Pro Cascade Installation and Service Manual for specific details.

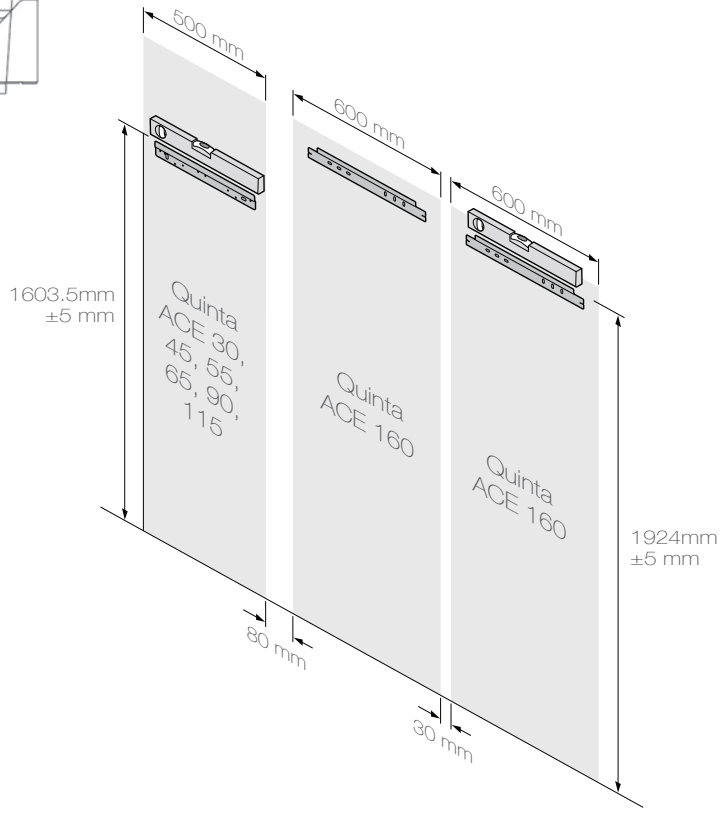
MULTIPLE OUTPUT
QUINTA BOILER CASCADES

Remeha also offers options for multiple output configurations combining Quinta Ace 30 to 115 with Quinta Ace 160 boilers.

Please contact your local sales manager for further information.
Contact details are available via the website **remeha.co.uk**

QUINTA
BOILER
CASCADES





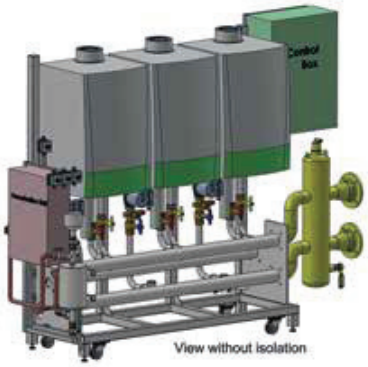
Note: Please take into account boiler and component weights.

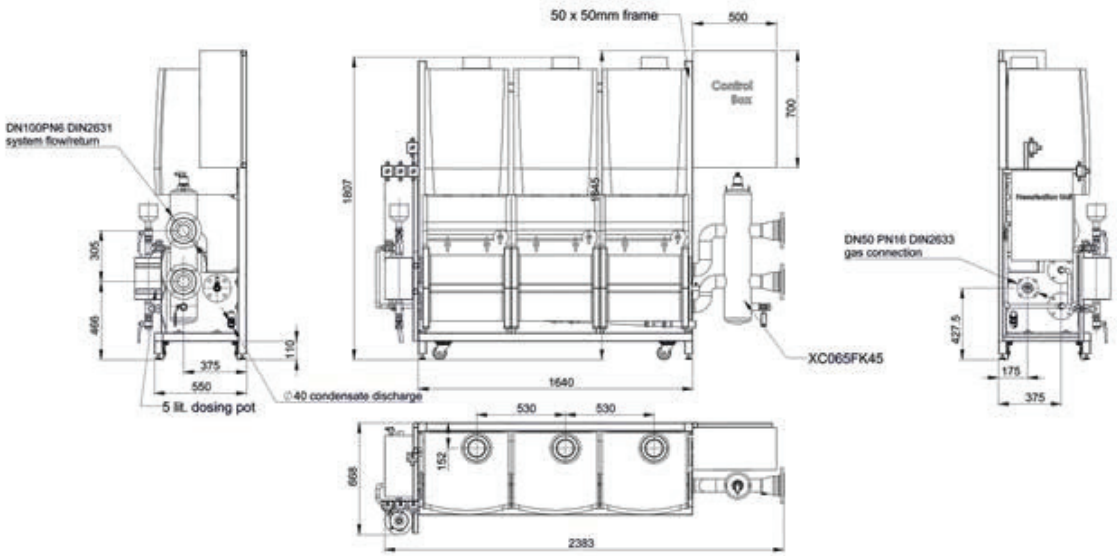
BESPOKE
RIG SYSTEMS

We provide bespoke rig system service to support consultants in overcoming plant room limitations and tight deadlines. These rigs are designed and manufactured to meet the exact requirements of each individual project so that they can be installed in a fraction of the time. This solution is particularly beneficial for organisations restricted to a small window of time in which to carry out installation.

For more information, please contact our sales team. You can find your local Area Sales Manager on our website: **remeha.co.uk**

BESPOKE
RIG SYSTEMS





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 **0118 978 3434**. 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 (after sales).

DECLARATION OF COMPLIANCE

The boiler meets the requirements of the EC regulations and directives:

- Gas Appliances Regulations (EU) 2016/426
- Boiler Efficiency Directive 92/42/EEC
- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- ErP 2009/125/EC
- CE Certification
- Remeha Quinta Ace 30, 45, 55, 65, 90 and 115 – PIN: 0063CS3928
- Remeha Quinta Ace 160 – PIN: 0063CQ3781

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Quinta Ace Specification Guide June 2019

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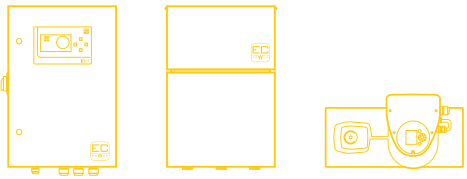
- **REMEHA** – ENGINEERING EFFICIENCY SINCE 1935
  Reliably engineering high-performance and high-efficiency heating solutions.
- **ANDREWS WATER HEATERS** – BUILT TO PERFORM
  UK's No. 1 commercial water heaters of choice for quality and reliability.
- **POTTERTON COMMERCIAL** – TOTALLY DEPENDABLE
  Heating solutions that customers can rely on and services they can trust.
- **PACKAGED PLANT SOLUTIONS** – INGENUITY BOXED
  Leading specialists in prefabricated plant rooms from concept to completion.



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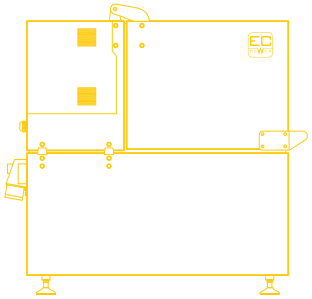

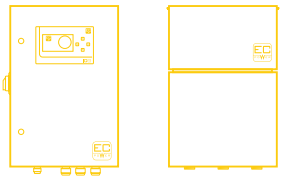

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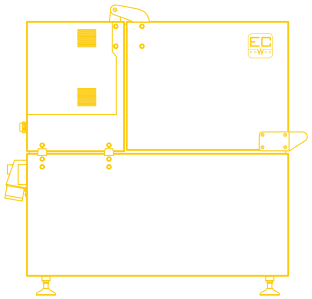


XRGI® 9

TECHNICAL DATA

TECHNICAL DATA FOR THE XRGI® 9

Product data sheet in accordance with Regulation (EU) No. 811/2013, Dated 26.09.2015

A++

The XRGI® is a combined heat and power plant (CHP) that works on the principle of cogeneration.
An XRGI® system consists of three main components – the Power Unit, Q-Heat Distributor and the iQ-Control Panel. In a package with a Flow Master (temperature controll, class II = 2 %) the XRGI® is rated as seasonal space heating energy efficiency class A+++.

In addition, you can also extend your XRGI® system with a storage tank with a capacity of 500, 800 or 1,000 litres for optimum operation.

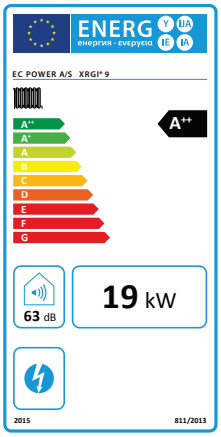
ORDERING DATA

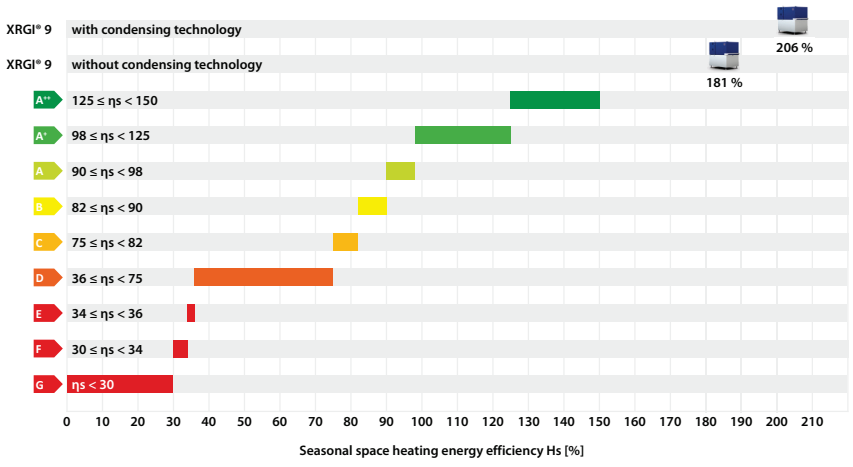
Supplier's name or trademark	EC POWER	
Supplier's model identifier	**XRGI® 9 without condensing technology[1]**	**XRGI® 9 with condensing technology[1]**
Article number	X090001	X090001+01KIT2616
Modules	Power Unit, iQ10-Control Panel, Q20-Heat Distributor	Power Unit, iQ10-Control Panel, Q20-Heat Distributor + Condensing and exhaust gas heat exchanger kit

ErP-LABEL DATA[2]

Seasonal space heating energy efficiency class		A++	A++
Rated heat output	P_{rated}	19 kW	21 kW
Seasonal space heating energy efficiency; Hs	η_s	**181 %**	**206 %**
Sound power level, indoors	L_{WA}	63 dB	63 dB
Electrical efficiency; in accordance with heating value Hi	$\eta_{el\ CHP100+SUP\ 0}$	30 %	31 %
All special precautions to be taken during assembly, installation or service		Refer to Commissioning and Service Manual	Refer to Commissioning and Service Manual

[1] Return temperatures as per EN 50465 2015 7.6.1: Without condensing technology 47 °C, with condensing technology 30 °C.
[2] The values were rounded in accordance with the requirements governing product data sheets by Regulation (EU) No. 811/2013.





OUTPUT

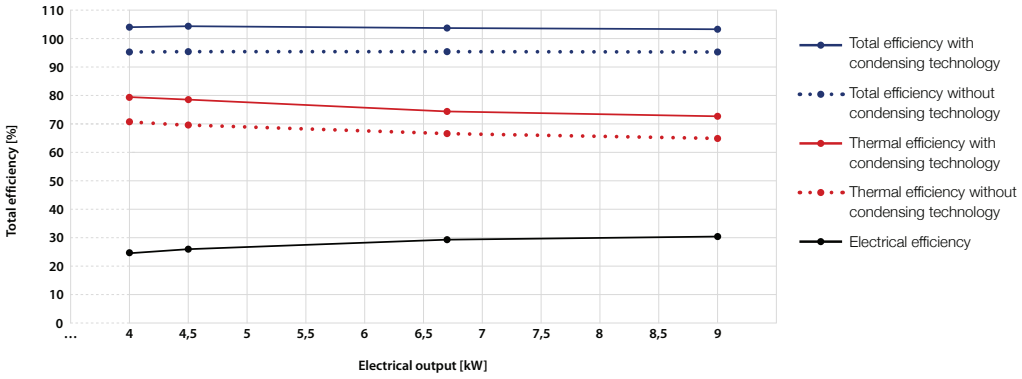
XRGI® system			XRGI® 9 without condensing technology[1]			XRGI® 9 with condensing technology[1]		
Power modulation*			50 %	75 %	100 %	50 %	75 %	100 %
Electrical output, modulating*		kW	4.5	6.8	9.0	4.5	6.8	9.0
Thermal output, modulating*		kW	12.0	15.4	19.2	13.5	17.2	21.3
Power consumption, gas	in accordance with Hi	kW	17.3	23.2	29.5	17.2	23.1	29.3
Electrical own demand, production		kW	0.101	0.100	0.099	0.102	0.101	0.100
Electrical own demand, stand-by		kW	0.024			0.024		

EFFICIENCIES & OPERATING PARAMETERS

Power modulation*			50 %	75 %	100 %	50 %	75 %	100 %
Electrical efficiency	in accordance with Hi	%	25.9	29.3	30.4	25.9	29.4	30.6
Thermal efficiency	in accordance with Hi	%	69.6	66.1	64.9	78.5	74.4	72.7
Total efficiency	in accordance with Hi	%	95.4	95.4	95.3	104.3	103.7	103.3
Seasonal space heating energy efficiency in operating mode [2,3]	η_{son}	%	186			211		

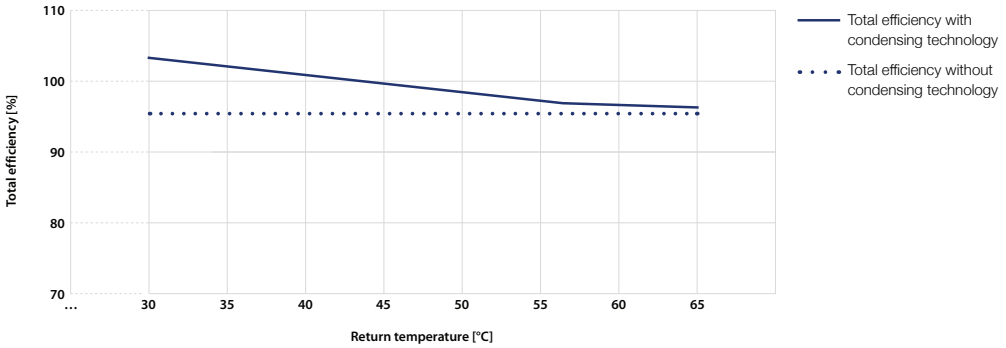
POWER MODULATION

Continuous modulation of 4 – 9 kW in power-controlled mode



TOTAL EFFICIENCY AT FULL LOAD

XRGI® 9 total efficiency / return temperature



* Continuous modulation in power-controlled mode

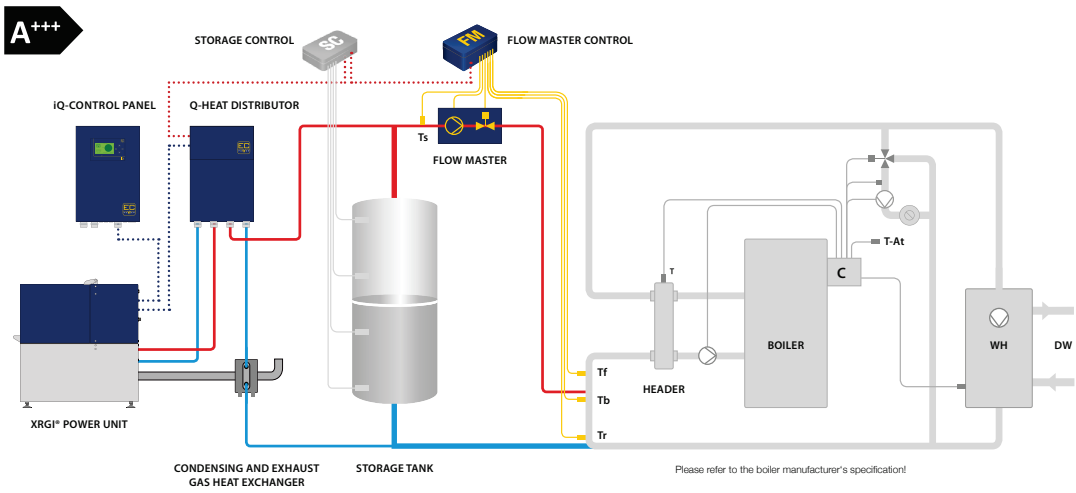
[1] Return temperatures as per EN 50465 2015 7.6.1: Without condensing technology 47 °C, with condensing technology 30 °C.

[2] Based on the values measured by the Danish Gas technology Center and accredited independent third-party organisations.

[3] Efficiency at rated heat output as per the delegated Commission Regulation (EU) No. 811/2013

HYDRAULIC INTEGRATION

Principle circuit diagram: Series circuit with injection – boiler with header



More principle circuit diagrams and information can be found in the EC POWER „Hydraulic Solutions“.

NOTE:
If products from other companies are used in the system in addition to EC Power products, EC POWER assumes no liability for the accuracy of the energy efficiency class calculation for the entire system.

XRGI® system		XRGI® 9 without condensing technology[1]	XRGI® 9 with condensing technology[1]
Flow temperature, constant	°C	~ 80	~ 80
Return temperature, variable	°C	5-70	5-70

FUELS

Natural gas (all qualities), propane, butane	yes	yes

EXHAUST GAS

Power modulation			50 %	75 %	100 %	50 %	75 %	100 %
Max. exhaust gas temperature		°C	-	-	100	-	-	90
Condensate		kg/h	-	-	-	1.9	2.3	2.6
Emissions (test data)	CO < 70	mg/Nm³	-	-	52	-	-	55
	NOx < 100	mg/Nm³	-	-	52	-	-	54

SOUND

Sound pressure level at a distance of up to 1 m (based on surroundings)	dB(A)	49

POWER CONNECTION

Voltage, 3 phases + N + Earth	V	400
Frequency	Hz	50

SERVICE

Service interval (operating hours)	Hours	10,000

DIMENSIONS AND WEIGHT

		XRGI® 9 Power Unit	Q20-Heat Distributor	iQ10-Control Panel
Dimensions, W x H x D	mm	640 x 960 x 920	400 x 600 x 195	400 x 600 x 210
Footprint	m²	0.59	wall mounted	wall mounted
Weight	kg	440	25	30

All values are net and have been certified by an independent inspection body. Tolerance ±5 %.
Specifications subject to change without notice.

TECHNICAL DATA FOR THE XRGI® 9 WITH FLOW MASTER

(Temperature control, Class II = 2 %)

Product data sheet in accordance with Regulation (EU) No. 811/2013, Dated 26.09.2015

Q20 iQ10 FM

Figure shows FM type 350

A+++

The Flow Master including Flow Master Control regulates the supply of heat from the XRGI® and from the storage tank to the consumer network. This technology enables a significantly higher heat output to be temporarily made available to the consumer side. This allows peaks of heat demand to be handled by the XRGI®, thereby extending its service life and increasing electricity production.

The 4 models can deliver a heat output of 50, 150, 250 or 350 at a ΔT of 20 K.

ORDERING DATA

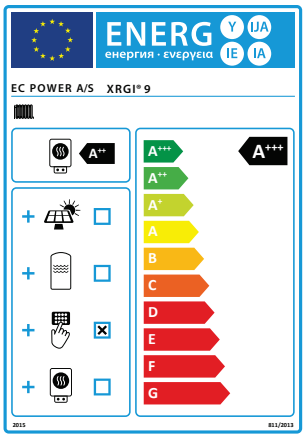
Supplier's name or trademark	EC POWER			
Supplier's model identifier	**XRGI® 9 without condensing technology[1]**		**XRGI® 9 with condensing technology[1]**	
Article number	X090001		X090001+01KIT2616	
Modules	Power Unit, iQ10-Control Panel, Q20-Heat Distributor		Power Unit, iQ10-Control Panel, Q20-Heat Distributor + Condensing and exhaust gas heat exchanger kit	
Supplier's model identifier	**Flow Master including Flow Master Control**			
FM-type (Temperature control, Class II = 2 %) 2	**FM 50**	**FM 150**	**FM 250**	**FM 350**
Article number	17D1130	17D1131	17D1132	17D1133

ErP-LABEL DATA[2]

Seasonal space heating energy efficiency class of package	A+++	A+++
Seasonal space heating energy efficiency of package	**183 %** 5	**208 %**

[1] Return temperatures as per EN 50465 2015 7.6.1: Without condensing technology 47 °C, with condensing technology 30 °C.

[2] The values were rounded in accordance with the requirements governing product data sheets by Regulation (EU) No. 811/2013.



The energy efficiency of the package of products provided for in this fiche may not correspond to its actual energy efficiency once installed in a building, as this efficiency is influenced by further factors such as heat loss in the distribution system and the dimensioning of the products in relation to building size and characteristics.

Seasonal space heating energy efficiency of the space heater with cogeneration — 1 — **181** %

Temperature control — From fiche of temperature control — Class I = 1 %, Class II = 2 % , Class III = 1,5 %, Class IV = 2 %, Class V = 3 % , Class VI = 4 %, Class VII = 3,5 %, Class VIII = 5 % , — 2 — + **2** %

Supplementary boiler — From fiche of boiler — Seasonal space heating energy efficiency in %

( ) -'I') x 'II' = — 3 — −) %

Solar contribution (From fiche of solar device)

Collector size (in m²)	Tank volume (in m³)	Kollektorwirkungsgrad (in %)	Tank rating A⁺ = 0,95, A = 0,91, B = 0,86, C = 0,83, D-G = 0,83

('III' x) + 'IV' x) x 0,7 x (/ 100) x = — 4 — +) %

Seasonal space heating energy efficiency of package — 5 — **183** %

Seasonal space heating energy efficiency class of package

G	F	E	D	C	B	A	A+	A++	A+++
< 30 %	≥ 30 %	≥ 34 %	≥ 36 %	≥ 75 %	≥ 82 %	≥ 90 %	≥ 98 %	≥ 125 %	≥ 150 %

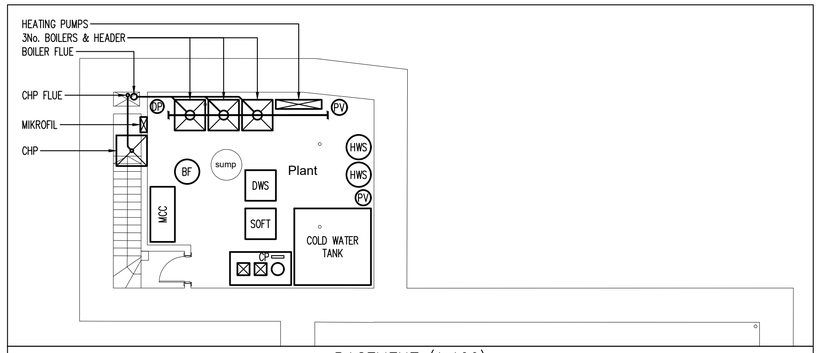
We reserve the right to make technical modifications!

WWW.ECPOWER.EU

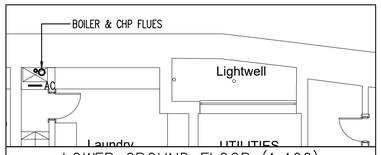
XRGI® 9

TECHNICAL DATA

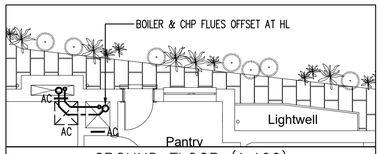
A6 Flue Location Plans



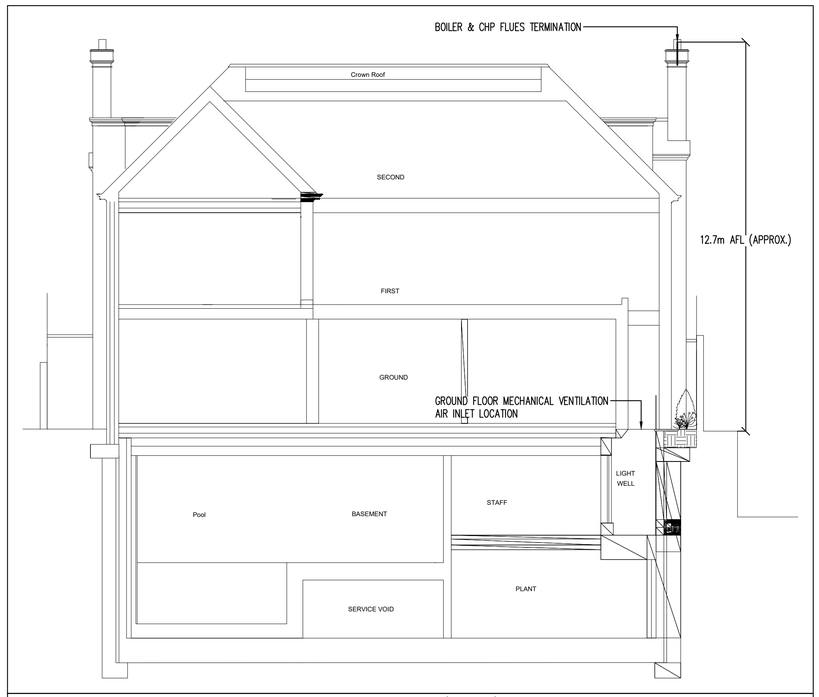
BASEMENT (1:100)



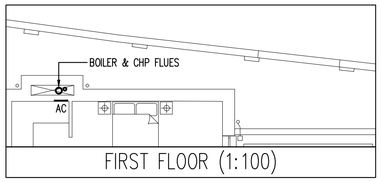
LOWER GROUND FLOOR (1:100)



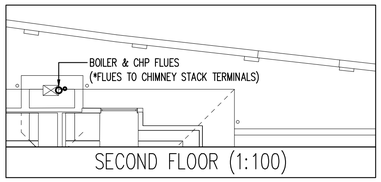
GROUND FLOOR (1:100)



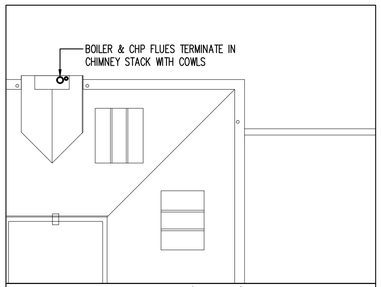
SECTION A–A (1:100)



FIRST FLOOR (1:100)



SECOND FLOOR (1:100)



ROOF (1:100)

Flue Arrangement

Note

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE SETTING OUT OR MAKING ANY SHOP DRAWINGS. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE CONSULTANT ENGINEER'S SPECIFICATION.

Orientation

Rev./Date	REVISIONS
P 11.02.20	PLANNING ISSUE

ME7

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Web: www.me7.ltd
Tel: +44(0)1277 353225
M&E Consultants Energy Consultants

ace consultancy engineering business environment
www.acenet.co.uk

Description

BOILER & CHP
FLUE ARRANGEMENT

Project

16 AVENUE ROAD
ST JOHN'S WOOD, NW8 6BP

Architect

xref

Scale	Drawn
A1 @ 1:100 A3 @ 1:200	JB / CA
Date: February 2020	Checked: JB

Issue: PRELIMINARY

Project No.	Services	Dwg No.	Rev.
682	ME	1	P