

Product information Cascade system

Quinta Ace S

Dear Customer,

Thank you very much for buying this appliance. Please read through the manual carefully before using the product, and keep it in a safe place for later reference. In order to ensure continued safe and efficient operation we recommend that the product is serviced regularly. Our service and customer service organisation can assist with this. We hope you enjoy years of problem-free operation with the product.

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1 About this manual

1.1 General

This manual is intended for the installer.



Important

Some illustrations in this manual show parts that may not be available in your market.

1.2 Additional documentation

The following documentation is available in addition to this manual:

- Installation manual

1.3 Symbols used in the manual

This manual contains special instructions, marked with specific symbols. Please pay extra attention when these symbols are used.



Danger of electric shock

Indicates: an imminently hazardous situation

Consequence if not avoided: Will result in death or serious injury.

- This is how to avoid the hazard.



Danger

Indicates: an imminently hazardous situation

Consequence if not avoided: Will result in death or serious injury.

- This is how to avoid the hazard.



Warning

Indicates: a potentially hazardous situation

Consequence if not avoided: Could result in death or serious injury.

- This is how to avoid the hazard.



Caution

Indicates: a potentially hazardous situation

Consequence if not avoided: Could result in minor or moderate injury.

- This is how to avoid the hazard.



Notice

Indicates: a potential risk of damage to the supported product

Consequence if not avoided: Could result in damage to the product or other property.

- This is how to avoid the hazard.



Important

Please note: important information.

The symbols mentioned below are of lower importance, but they can help you navigate or give useful information.



See

Reference to other manuals or pages in this manual.



Helpful information or extra guidance.



Direct menu navigation, confirmations will not be shown. Use if you are familiar with the system.

2 Description of the product

2.1 Modular cascade system



Important

The cascade systems are designed and supplied for specific use with BAXI boilers.

Cascade systems link multiple boilers together to provide a desired total heating output. The BAXI cascade system is modular and designed for expansion. A low loss header or plate heat exchanger balances the flow volumes between the cascade and the rest of the heating system.

2.2 Cascade types

Tab.1 Cascade types

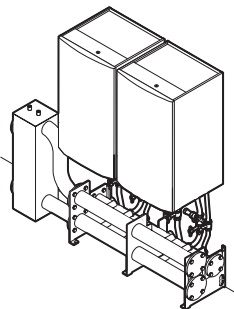
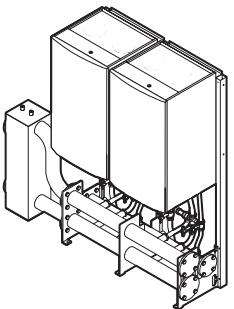
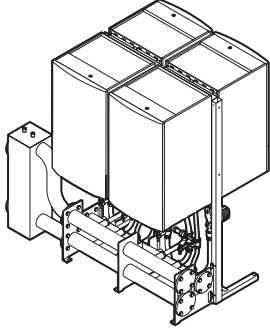
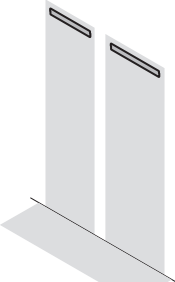
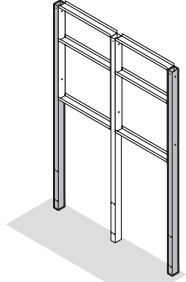
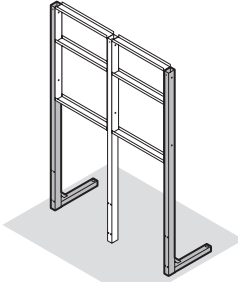
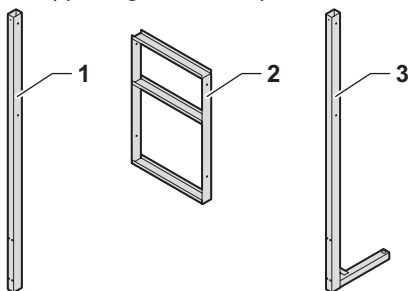
Cascade type	In-line wall mounted configuration	In-line standing configuration	Back-to-back configuration
Description	Boilers in line, mounted to the wall. The collector pipe assembly is mounted to the wall. The frame consists of wall brackets.	Boilers in line, mounted to the frame. The collector pipe assembly is mounted to the frame. The frame consists of I-poles.	Boilers back to back, mounted to the frame. The collector pipe assembly is mounted to the frame. The frame consists of I-poles and L-poles.
Example	 AD-3002462-01	 AD-3002463-01	 AD-3002464-01
Frame type	 AD-3002465-01	 AD-3002466-01	 AD-3002467-01

Fig.1 Supporting frame components

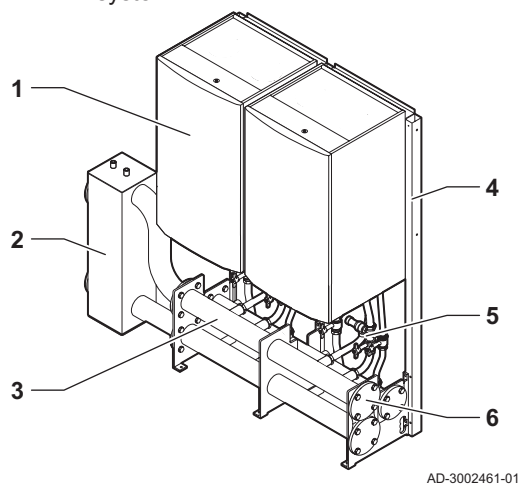


- 1 I-pole
- 2 Intermediate frame
- 3 L-pole

AD-3003375-01

2.3 Main components

Fig.2 Main components of a cascade system



Tab.2 Main components

Item	Description	Function
1	Appliance	The wall-hung boiler used in cascade.
2	Hydraulic separator	A hydraulic separator between the boiler side and system side of an installation maintains a correct water flow and a constant flow temperature. A hydraulic separator can be a plate heat exchanger or a low loss header.
3	Collector pipe	A collector pipe assembly combines the flow, return and gas pipes into a single frame. A 40 mm condensate collector pipe (not supplied) can be installed in the frame. Holes in the frame allow the pipe to be fitted to the left or right with a downwards slope.
4	Supporting frame	Floor standing supporting frames are needed when a wall is not available. Supporting frames consists of I-poles, L-poles and intermediate frames.
5	Boiler connection set	Boiler connection sets connect the boilers to the collector pipes.
6	Blanking flange	A blanking flange seals the end of the collector pipe assembly.

2.4 Cascade delivery options



The available cascade options may vary per country or per selected boiler setup.

Tab.3 Cascade system options

Description	Function	Options
Boiler connection set	Connections the boiler to the collector pipe assembly.	<ul style="list-style-type: none"> Boiler connection set straight (for boilers installed directly above the collector pipes) Boiler connection set back (for boilers installed on the rearmost row of the back-to-back configuration)
Blanking flange set	Seals the end of the collector pipe assembly.	<ul style="list-style-type: none"> Blanking flange for low loss header Blanking flange with expansion vessel connection (for cascades with a plate heat exchanger hydraulic separator and additional expansion vessel)

Description	Function	Options
Collector pipe assembly (DN65)	Collector pipe assembly with DN65 flow and return pipes, combined with DN50 for gas (for nominal configurations to 460 kW).	<ul style="list-style-type: none"> Collector pipe assembly for 2 in-line boilers (or 4 back-to-back) Collector pipe assembly for 3 in-line boilers (or 6 back-to-back) Collector pipe assembly for 4 in-line boilers (or 8 back-to-back)
Collector pipe assembly (DN100)	Collector pipe assembly with DN100 flow and return pipes, combined with DN65 for gas (for nominal configurations to 1200 kW).	<ul style="list-style-type: none"> Collector pipe assembly for 2 in-line boilers (or 4 back-to-back) Collector pipe assembly for 3 in-line boilers (or 6 back-to-back) Collector pipe assembly for 4 in-line boilers (or 8 back-to-back)
Expansion vessel	An expansion vessel connects to the boiler connection set in a cascade.	Expansion vessel
Low loss header	A hydraulic separator between the cascade and system to maintain a correct water flow and flow temperature.	<ul style="list-style-type: none"> DN65 without magnetic filter (for nominal heat output configurations to 460 kW) DN100 without magnetic filter (for nominal heat output configurations to 1200 kW) DN65 with magnetic filter (for nominal heat output configurations to 460 kW) DN100 with magnetic filter (for nominal heat output configurations to 1200 kW)
Plate heat exchanger	A hydraulic separator between the cascade and system to maintain a correct water flow and flow temperature.	The plate heat exchanger depends on the boiler type and number of boilers in a cascade.
Supporting frame	Levelling bracket for installing multiple boilers in-line on a wall.	<ul style="list-style-type: none"> I-pole L-pole Intermediate frame
Wall bracket	Levelling bracket for installing multiple boilers in-line on a wall.	<ul style="list-style-type: none"> Wall brackets for 2 boilers Wall brackets for 3 boilers Wall brackets for 4 boilers

**See also**

Choosing a heat exchanger type, page 16

2.5 Accessories



The available accessories may vary per country or per selected cascade configuration.



Contact a BAXI supplier for available flue gas pipe accessories.

Tab.4 Accessories

Accessory	Description	Available versions
Bend sets	Used for positioning the low loss headers at a 90° angle.	<ul style="list-style-type: none"> DN65 bend set DN100 bend set
Cascade managers	Used to control the appliances in the cascade system.	Several cascade managers are available, depending on the heating system.
DHW connection sets	Used for connecting one of the outermost boilers to a DHW cylinder.	Ø 35 mm connection to DHW (pipe shape is depending of the boiler).
Frame mounting plates	Used to mount cascade controllers or other electrical connection boxes.	<ul style="list-style-type: none"> Plate for top pole-mounting Plate for side pole-mounting
Gas filter expansion pipes	Used for mounting a gas filter next to a low loss header.	<ul style="list-style-type: none"> DN50 expansion pipe DN65 expansion pipe
Gas filter sets	Used to prevent clogging of the gas control valves.	<ul style="list-style-type: none"> DN50 filter DN65 filter

Accessory	Description	Available versions
Insulation sets	Used to reduce heat loss.	<ul style="list-style-type: none"> • Collector pipe assembly insulation • Low loss header insulation • Elbow set insulation
Levelling feet	Used to level the collector pipes frame(s) when installed on uneven ground.	Levelling feet with washers and nuts.
Low loss header adapter plate	Used to fit a DN65 low loss header to a DN100 collector pipe assembly.	DN65 to DN100
Welding flange sets	Used to weld connecting pipes to the low loss headers or gas filters.	<ul style="list-style-type: none"> • DN65 flange kit • DN100 flange kit

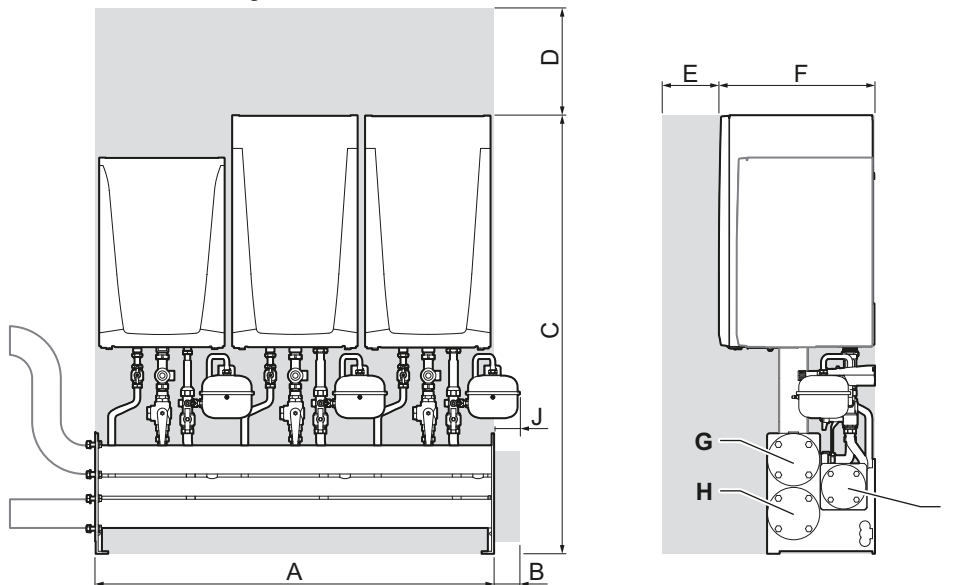
3 Technical specifications

3.1 Dimensions and connections

3.1.1 Dimensions and connections - Cascade setup

The images in this chapter show DN100 collector pipes.

Fig.3 In-line wall mounted configuration



AD-3003379-01

Tab.5 Dimensions in mm with DN65 collector pipes

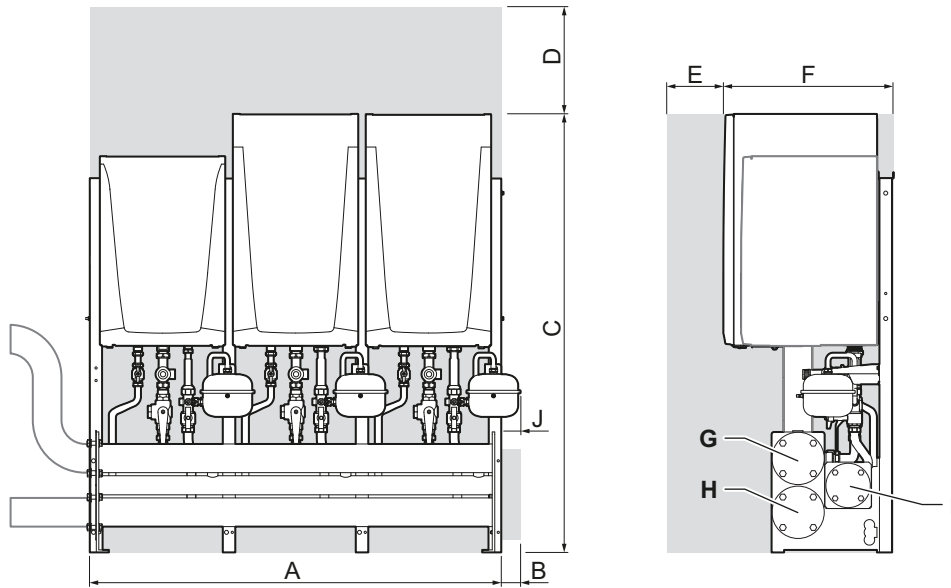
Description	2 boilers	3 boilers	4 boilers	5 boilers	6 boilers	7 boilers	8 boilers
A Total width	1060	1590	2120	2650	3180	3710	4240
B Free space required for mounting the blanking flanges ⁽¹⁾	50	50	50	50	50	50	50
C Total height	1579	1579	1579	1579	1579	1579	1579
D Free space above the boilers (recommended minimum) ⁽²⁾	700	700	700	700	700	700	700
E Free space in front of the boilers (recommended)	1000	1000	1000	1000	1000	1000	1000
F Total depth	560	560	560	560	560	560	560
G Flow connection	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6
H Return connection	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6

	Description	2 boilers	3 boilers	4 boilers	5 boilers	6 boilers	7 boilers	8 boilers
I	Gas connection	DN50 PN16	DN50 PN16	DN50 PN16	DN50 PN16	DN50 PN16	DN50 PN16	DN50 PN16
J	Free space required for expansion vessel	102	102	102	102	102	102	102
(1) When fitting a blanking flange with an expansion vessel connection, make sure there is enough space for fitting the vessel. (2) Make sure there is enough space for the flue gas system.								

Tab.6 Dimensions in mm with DN100 collector pipes

	Description	2 boilers	3 boilers	4 boilers	5 boilers	6 boilers	7 boilers	8 boilers
A	Total width	1060	1590	2120	2650	3180	3710	4240
B	Free space required for mounting the blanking flanges ⁽¹⁾	50	50	50	50	50	50	50
C	Total height For a cascade with Quinta Ace S ≤ 70 kW boiler models	1579	1579	1579	1579	1579	1579	1579
C	Total height For a cascade with Quinta Ace S ≥ 90 kW boiler models	1748	1748	1748	1748	1748	1748	1748
D	Free space above the boilers (recommended minimum) ⁽²⁾	700	700	700	700	700	700	700
E	Free space in front of the boilers (recommended)	1000	1000	1000	1000	1000	1000	1000
F	Total depth For a cascade with Quinta Ace S ≤ 70 kW boiler models	560	560	560	560	560	560	560
F	Total depth For a cascade with Quinta Ace S ≥ 90 kW boiler models	631	631	631	631	631	631	631
G	Flow connection	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6
H	Return connection	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6
I	Gas connection	DN65 PN16	DN65 PN16	DN65 PN16	DN65 PN16	DN65 PN16	DN65 PN16	DN65 PN16
J	Free space required for expansion vessel	102	102	102	102	102	102	102
(1) When fitting a blanking flange with an expansion vessel connection, make sure there is enough space for fitting the vessel. (2) Make sure there is enough space for the flue gas system.								

Fig.4 In-line frame mounted configuration



AD-3003380-01

Tab.7 Dimensions in mm with DN65 collector pipes

	Description	2 boilers	3 boilers	4 boilers	5 boilers	6 boilers	7 boilers	8 boilers
A	Total width	1110	1640	2170	2700	3230	3760	4290
B	Free space required for mounting the blanking flanges ⁽¹⁾	50	50	50	50	50	50	50
C	Total height	1687	1687	1687	1687	1687	1687	1687
D	Free space above the boilers (recommended minimum) ⁽²⁾	700	700	700	700	700	700	700
E	Free space in front of the boilers (recommended)	1000	1000	1000	1000	1000	1000	1000
F	Total depth	610	610	610	610	610	610	610
G	Flow connection	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6
H	Return connection	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6	DN65 PN6
I	Gas connection	DN50 PN16	DN50 PN16	DN50 PN16	DN50 PN16	DN50 PN16	DN50 PN16	DN50 PN16
J	Free space required for expansion vessel	76	76	76	76	76	76	76

(1) When fitting a blanking flange with an expansion vessel connection, make sure there is enough space for fitting the vessel.
 (2) Make sure there is enough space for the flue gas system.

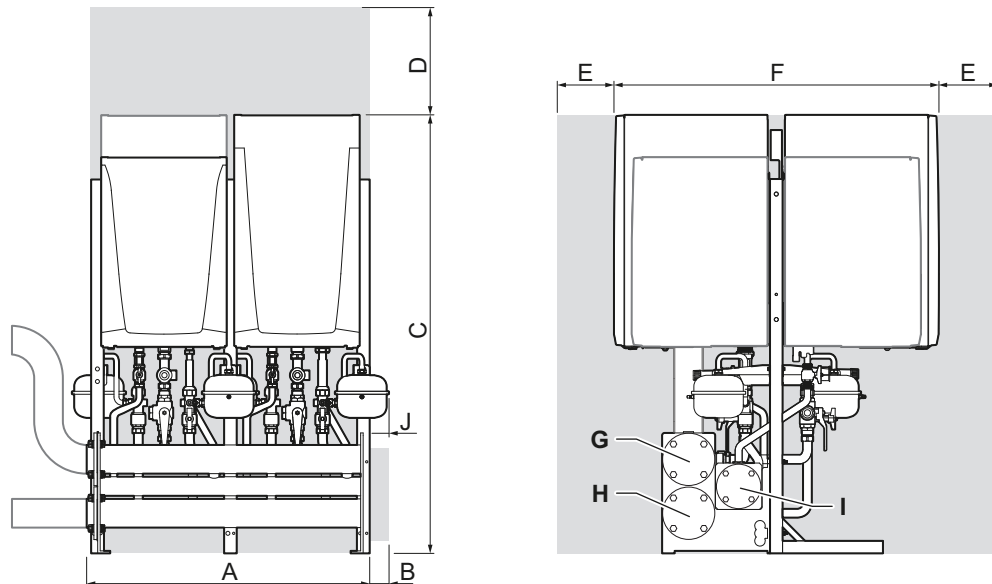
Tab.8 Dimensions in mm with DN100 collector pipes

	Description	2 boilers	3 boilers	4 boilers	5 boilers	6 boilers	7 boilers	8 boilers
A	Total width	1110	1640	2170	2700	3230	3760	4290
B	Free space required for mounting the blanking flanges ⁽¹⁾	50	50	50	50	50	50	50
C	Total height For a cascade with Quinta Ace S ≤ 70 kW boiler models	1687	1687	1687	1687	1687	1687	1687
C	Total height For a cascade with Quinta Ace S ≥ 90 kW boiler models	1748	1748	1748	1748	1748	1748	1748
D	Free space above the boilers (recommended minimum) ⁽²⁾	700	700	700	700	700	700	700
E	Free space in front of the boilers (recommended)	1000	1000	1000	1000	1000	1000	1000

	Description	2 boilers	3 boilers	4 boilers	5 boilers	6 boilers	7 boilers	8 boilers
F	Total depth For a cascade with Quinta Ace S ≤ 70 kW boiler models	610	610	610	610	610	610	610
F	Total depth For a cascade with Quinta Ace S ≥ 90 kW boiler models	681	681	681	681	681	681	681
G	Flow connection	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6
H	Return connection	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6	DN100 PN6
I	Gas connection	DN65 PN16	DN65 PN16	DN65 PN16	DN65 PN16	DN65 PN16	DN65 PN16	DN65 PN16
J	Free space required for expansion vessel	76	76	76	76	76	76	76

(1) When fitting a blanking flange with an expansion vessel connection, make sure there is enough space for fitting the vessel.
(2) Make sure there is enough space for the flue gas system.

Fig.5 Back-to-back configuration



AD-3003381-01

Tab.9 Dimensions in mm with DN65 collector pipes

	Description	3-4 boilers	5-6 boilers	7-8 boilers
A	Total width	1110	1640	2170
B	Free space required for mounting the blanking flanges ⁽¹⁾	50	50	50
C	Total height	1687	1687	1687
D	Free space above the boilers (recommended minimum) ⁽²⁾	700	700	700
E	Free space in front of the boilers (recommended)	1000	1000	1000
F	Total depth	1170	1170	1170
G	Flow connection	DN65 PN6	DN65 PN6	DN65 PN6
H	Return connection	DN65 PN6	DN65 PN6	DN65 PN6
I	Gas connection	DN50 PN16	DN50 PN16	DN50 PN16
J	Free space required for expansion vessel	76	76	76

(1) When fitting a blanking flange with an expansion vessel connection, make sure there is enough space for fitting the vessel.
(2) Make sure there is enough space for the flue gas system.

Tab.10 Dimensions in mm with DN100 collector pipes

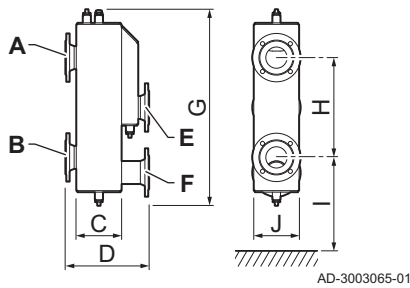
	Description	3 – 4 boilers	5 – 6 boilers	7 – 8 boilers
A	Total width	1110	1640	2170
B	Free space required for mounting the blanking flanges ⁽¹⁾	50	50	50
C	Total height For a cascade with Quinta Ace S ≤ 70 kW boiler models	1687	1687	1687
C	Total height For a cascade with Quinta Ace S ≥ 90 kW boiler models	1748	1748	1748
D	Free space above the boilers (recommended minimum) ⁽²⁾	700	700	700
E	Free space in front of the boilers (recommended)	1000	1000	1000
F	Total depth For a cascade with Quinta Ace S - ≤ 70 kW boiler models	1170	1170	1170
F	Total height For a cascade with Quinta Ace S ≥ 90 kW boiler models	1312	1312	1312
G	Flow connection	DN100 PN6	DN100 PN6	DN100 PN6
H	Return connection	DN100 PN6	DN100 PN6	DN100 PN6
I	Gas connection	DN65 PN16	DN65 PN16	DN65 PN16
J	Free space required for expansion vessel	76	76	76

(1) When fitting a blanking flange with an expansion vessel connection, make sure there is enough space for fitting the vessel.
 (2) Make sure there is enough space for the flue gas system.

3.1.2 Dimensions and connections - Low loss headers

The images in this chapter show DN65 low loss headers.

Fig.6 Low loss header dimensions - DN65 <350 kW



Tab.11 Low loss header dimensions - DN65 <350 kW

	Description	DN65 <350 kW	DN65 - DN100 ⁽¹⁾
A	flange size flow, system side	DN65 PN6	DN65 PN6
B	flange size return, system side	DN65 PN6	DN65 PN6
C	body depth	143	143
D	total depth	277	357
E	flange size flow, boiler side	DN65 PN6	DN100 PN6
F	flange size return, boiler side	DN65 PN6	DN100 PN6
G	total height	610	610
H	flange distance, system side	330	330
I	flange height, system side	200	200
J	total width	160	200

(1) Includes an adapter to connect the DN65 low loss header to an DN100 collector pipe set.

Fig.7 Low loss header dimensions - DN65 <350 kW - DN100

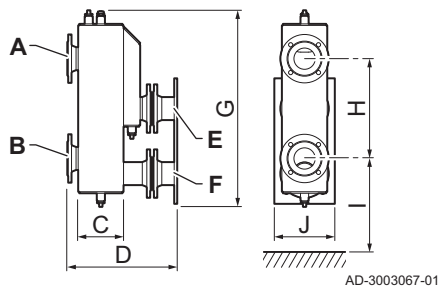
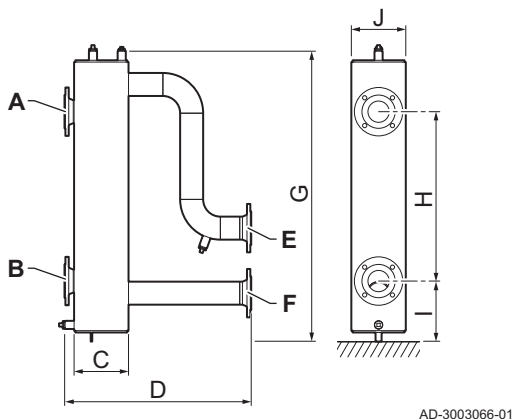


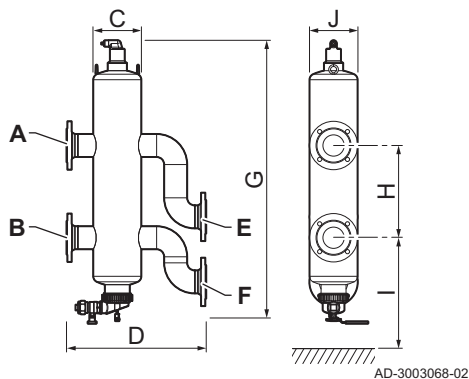
Fig.8 Low loss header dimensions



Tab.12 Low loss header dimensions

	Description	DN65	DN100
A	flange size flow, system side	DN65 PN6	DN100 PN6
B	flange size return, system side	DN65 PN6	DN100 PN6
C	body depth	180	250
D	total depth	617	631
E	flange size flow, boiler side	DN65 PN6	DN100 PN6
F	flange size return, boiler side	DN65 PN6	DN100 PN6
G	total height	960	960
H	flange distance, system side	560	560
I	flange height, system side	200	200
J	total width	180	250

Fig.9 Low loss header with dirt separator dimensions

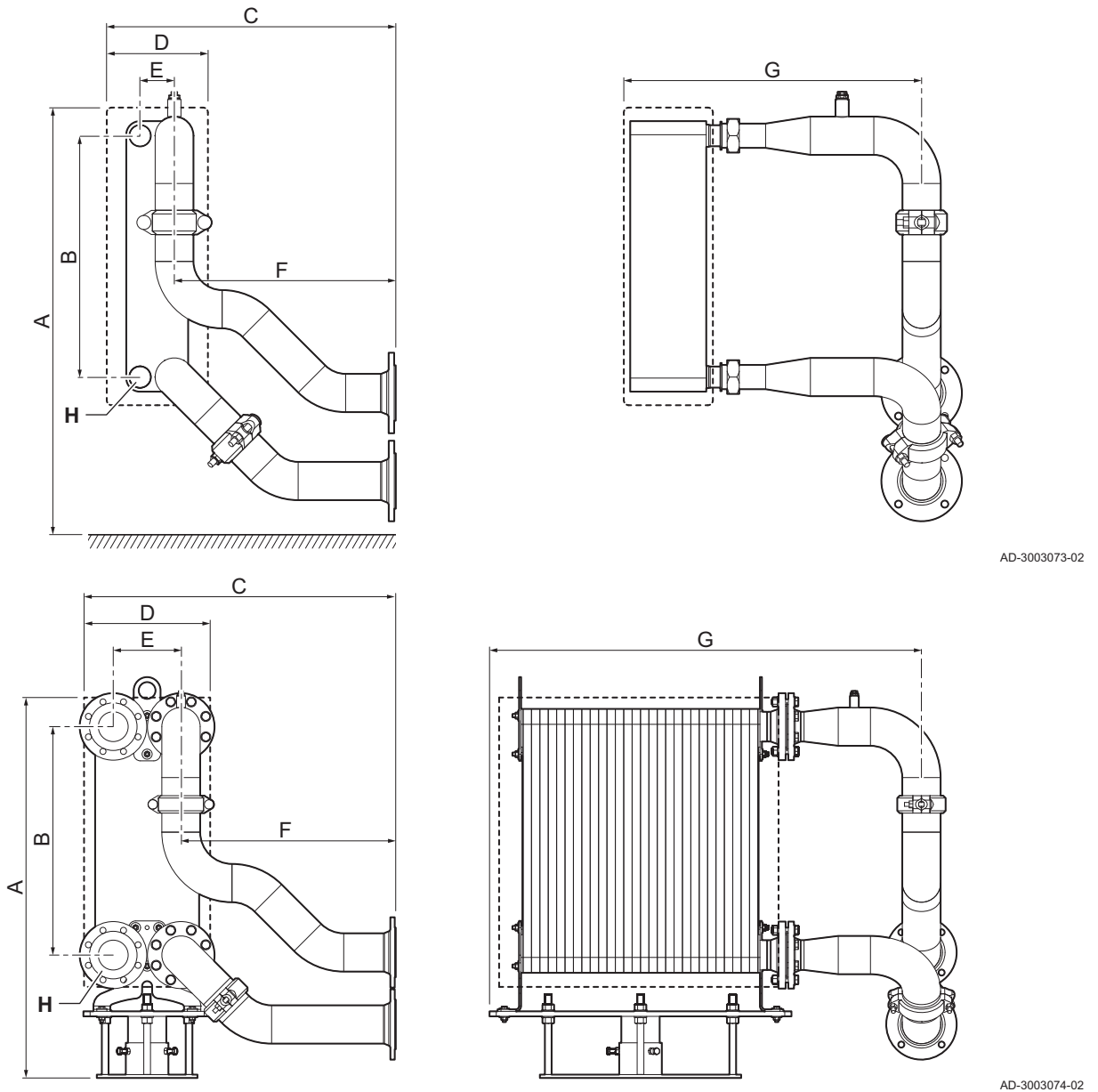


Tab.13 Low loss header with dirt separator dimensions

	Description	DN65	DN100
A	flange size flow, system side	DN65 PN6	DN100 PN6
B	flange size return, system side	DN65 PN6	DN100 PN6
C	body depth	ø159	ø219
D	total depth	462	744
E	flange size flow, boiler side	DN65 PN6	DN100 PN6
F	flange size return, boiler side	DN65 PN6	DN100 PN6
G	total height	905	1261
H	flange distance, system side	305	460
I	flange height, system side	306	414
J	total width	ø159	ø219

3.1.3 Dimensions and connections - Plate heat exchangers

Fig.10 Plate heat exchanger dimensions



Tab.14 Plate heat exchanger dimensions in mm

Dimension	A	B	C	D	E	F	G	H
Description	total height	flange distance	total depth	depth	flange distance	connection depth	total width	connection size
RHB-60-60	752	480	617	201	68	400	604	1 1/4" outer thread
RHB-60-80	752	480	617	248	68	400	651	1 1/4" outer thread
RHB-60-100	752	480	617	295	68	400	698	1 1/4" outer thread
RHB-60-120	752	480	617	342	68	400	745	1 1/4" outer thread
RHB-60-140	752	480	617	389	68	400	792	1 1/4" outer thread
RHB-110-80	964	520	684	308	91	400	703	2" outer thread
RHB-110-100	964	520	684	360	91	400	755	2" outer thread
RHB-110-120	964	520	684	412	91	400	807	2" outer thread
RHB-110-140	977	520	698	526	91	400	890	2" outer thread

Dimension	A	B	C	D	E	F	G	H
Description	total height	flange distance	total depth	depth	flange distance	connection depth	total width	connection size
RHB-110-160	964	520	684	516	91	400	911	2" outer thread
RHB-110-180	964	520	684	568	91	400	963	2" outer thread
RMB-235-80	1140	682	1016	333	204	400	757	DN80
RMB-235-100	1140	682	1016	383	204	400	807	DN80
RMB-235-120	1140	682	1016	433	204	400	857	DN80
RMB-235-140	1140	682	1016	483	204	400	907	DN80
RMB-235-160	1140	682	1016	533	204	400	957	DN80
RMB-235-180	1140	682	1016	583	204	400	1007	DN80
RMB-235-200	1140	682	1016	633	204	400	1057	DN80
RMB-235-220	1140	682	1016	683	204	400	1107	DN80
RMB-235-240	1140	682	1016	733	204	400	1157	DN80
RMB-235-260	1140	682	1016	783	204	400	1207	DN80
RMB-235-280	1140	682	1016	833	204	400	1257	DN80

4 Before installation

4.1 Installation regulations



Warning
Hazardous appliance
 Chance of injury.

- Installation of the appliance must only be carried out by a qualified installer in accordance with regulations and the information given in the manual.

4.2 Choice of the location

4.2.1 Boiler room

If the combined maximum load of the cascade system is higher than 130 kW, the boiler room must comply with specific regulations.



See

- The local regulations.
- BS6644: Specification for the installation and maintenance of gas-fired hot water boilers of rated inputs between 70 kW (net) and 1.8 MW (net)

4.3 Requirements for water connections

- Before installation, check that the connections meet the set requirements.
- Carry out any welding work required at a safe distance from the appliance.
- If using synthetic pipes, follow the manufacturer's instructions.

4.3.1 Requirements for the central heating connections

- We recommend installing a central heating filter in the return pipe to prevent clogging of boiler components.

4.3.2 Requirements for the condensate drain

- The drain pipe must be \varnothing 32 mm or larger, terminating in the drain.
- Use only plastic material for the discharge pipe due to the acidity (pH 2 to 5) of the condensate.
- Fit a trap in the drain pipe.
- The drain pipe must slope down at least 30 mm per metre, the maximum horizontal length is 5 metres.
- Do not make a fixed connection in order to prevent an overpressure in the trap.

4.4 Requirements for expansion vessels

An expansion vessel must be installed at each boiler.

When a plate heat exchanger is installed, an additional expansion vessel must be fitted on the boiler side of the heat exchanger. A blanking flange set with an expansion vessel connection is available separately for this purpose.

4.5 Choosing a heat exchanger type

A plate heat exchanger can be used as a hydraulic separator. Refer to the following table to determine the correct plate heat exchanger type.

All values in the table are valid for a ΔT of 20 °C.

Tab.15 Plate heat exchangers for Quinta Ace S - 35 kW

Number of boilers	Output ⁽¹⁾	Total flow	Heat exchanger type	Heat exchanger pressure drop
	kW			m ³ /h
2	67.6	2.91	RHB-60-60	7.13
3	101.4	4.36	RHB-60-60	15.19
4	135.2	5.81	RHB-60-80	16.53
5	169.0	7.27	RHB-60-100	18.54
6	202.8	8.72	RHB-60-120	22.02
7	236.6	10.17	RHB-110-80	15.43
8	270.4	11.63	RHB-110-100	13.43
9	304.2	13.08	RHB-110-100	16.85
10	338.0	14.53	RHB-110-120	16.11

(1) Nominal output P_{nc} 50/30 °C.

Tab.16 Plate heat exchangers for Quinta Ace S - 50 kW

Number of boilers	Output ⁽¹⁾	Total flow	Heat exchanger type	Heat exchanger pressure drop
	kW			m ³ /h
2	97.2	4.18	RHB-60-60	14.06
3	145.8	6.27	RHB-60-80	19.22
4	194.4	8.36	RHB-110-80	10.53
5	243.0	10.45	RHB-110-80	16.18
6	291.6	12.54	RHB-110-100	15.60
7	340.2	14.63	RHB-110-120	18.76
8	388.8	16.72	RHB-110-140	16.65
9	437.4	18.81	RHB-110-180	14.79
10	486.0	20.90	RMB-235-80	16.68

(1) Nominal output P_{nc} 50/30 °C.

Tab.17 Plate heat exchangers for Quinta Ace S - 60 kW

Number of boilers	Output ⁽¹⁾	Total flow	Heat exchanger type	Heat exchanger pressure drop
	kW			m ³ /h
2	118.8	5.11	RHB-60-80	12.97
3	178.2	7.66	RHB-60-100	20.50
4	237.6	10.22	RHB-110-80	15.55
5	297.0	12.77	RHB-110-100	16.11
6	356.4	15.33	RHB-110-120	17.80
7	415.8	17.88	RHB-110-140	18.94
8	475.2	20.43	RHB-110-160	20.24

Number of boilers	Output ⁽¹⁾	Total flow	Heat exchanger type	Heat exchanger pressure drop
	kW	m ³ /h		kPa
9	534.6	22.99	RMB-235-100	13.41
10	594.0	25.54	RMB-235-100	16.26

(1) Nominal output P_{nc} 50/30 °C.

Tab.18 Plate heat exchangers for Quinta Ace S - 70 kW

Number of boilers	Output ⁽¹⁾	Total flow	Heat exchanger type	Heat exchanger pressure drop
	kW	m ³ /h		kPa
2	140.4	6.04	RHB-60-80	17.73
3	210.6	9.06	RHB-110-80	12.36
4	280.8	12.06	RHB-110-100	14.49
5	351.0	15.09	RHB-110-120	17.32
6	421.2	18.11	RHB-110-140	19.38
7	491.4	21.13	RMB-235-80	17.08
8	561.6	24.15	RMB-235-100	14.63
9	631.8	27.17	RMB-235-100	18.30
10	702.0	30.19	RMB-235-120	17.12

(1) Nominal output P_{nc} 50/30 °C.

Tab.19 Plate heat exchangers for Quinta Ace S - 90 kW

Number of boilers	Output ⁽¹⁾	Total flow	Heat exchanger type	Heat exchanger pressure drop
	kW	m ³ /h		kPa
2	183.6	7.89	RHB-110-80	9.25
3	275.4	11.84	RHB-110-100	13.91
4	367.2	15.79	RHB-110-140	14.88
5	459.0	19.74	RMB-235-80	14.96
6	550.8	23.68	RMB-235-100	14.09
7	642.6	27.63	RMB-235-100	18.91
8	734.4	31.58	RMB-235-120	18.64
9	826.2	35.53	RMB-235-140	17.96
10	918.0	39.47	RMB-235-160	17.69

(1) Nominal output P_{nc} 50/30 °C.

Tab.20 Plate heat exchangers for Quinta Ace S - 110 kW

Number of boilers	Output ⁽¹⁾	Total flow	Heat exchanger type	Heat exchanger pressure drop
	kW	m ³ /h		kPa
2	220.4	9.48	RHB-110-160	4.59
3	330.6	14.22	RMB-235-80	7.72
4	440.8	18.95	RMB-235-120	7.05
5	551.0	23.69	RMB-235-160	6.65
6	661.2	28.43	RMB-235-200	6.72
7	771.4	33.17	RMB-235-260	6.44
8	881.6	37.91	RMB-235-280	7.72
9	991.8	42.65	RMB-235-280	9.70
10	1102.0	47.39	RMB-235-280	11.91

(1) Nominal output P_{nc} 50/30 °C.

Tab.21 Plate heat exchangers for Quinta Ace S - 130 kW

Number of boilers	Output ⁽¹⁾	Total flow	Heat exchanger type	Heat exchanger pressure drop
	kW	m ³ /h		kPa
2	261.2	11.23	RHB-110-100	12.58
3	391.8	16.85	RMB-235-80	11.08
4	522.4	22.46	RMB-235-100	12.71
5	653.0	28.08	RMB-235-120	14.91
6	783.6	33.70	RMB-235-140	16.25
7	914.2	39.31	RMB-235-180	14.62
8	1044.8	44.93	RMB-235-220	14.25

(1) Nominal output P_{nc} 50/30 °C.

Tab.22 Plate heat exchangers for Quinta Ace S - 150 kW

Number of boilers	Output ⁽¹⁾	Total flow	Heat exchanger type	Heat exchanger pressure drop
	kW	m ³ /h		kPa
2	301.8	12.98	RMB-235-80	6.74
3	452.7	19.47	RMB-235-140	5.69
4	603.6	25.96	RMB-235-200	5.64
5	754.5	32.44	RMB-235-280	5.74
6	905.4	38.93	RMB-235-280	8.12
7	1056.3	45.42	RMB-235-280	10.96
8	1207.2	51.91	RMB-235-280	14.22

(1) Nominal output P_{nc} 50/30 °C.

4.6 Requirements for the gas connection

- Carry out any welding work required at a safe distance from the boiler.
- Before installing, check that the gas meter has sufficient capacity. Take into account the consumption of all appliances. Notify the local energy company if the gas meter has insufficient capacity.
- An installed boiler gas cock must always be accessible.
- We recommend installing a gas filter to prevent clogging of the gas control valve.

4.7 Requirements for the flue gas discharge system

4.7.1 Material



Danger

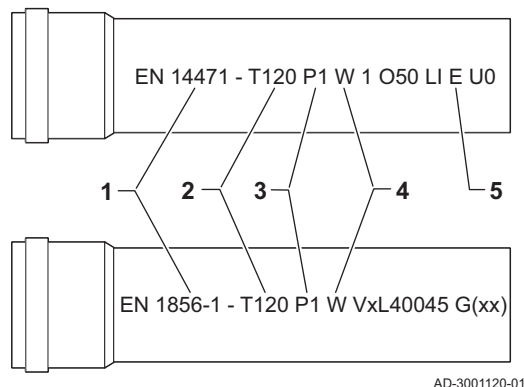
Flue gas leakage

Chance of CO poisoning.

- Do not combine pipes, coupling, roof terminals, and connection methods from different manufacturers. This also applies to common shared flue ducts.
- Follow the instructions provided by the manufacturer of the flue gas material.
- The materials used must comply with the prevailing regulations and standards.
- Please contact us when using flexible flue gas outlet material.

Use the string on the flue gas outlet material to check whether it is suitable for use on this appliance.

Fig.11 Sample string



- 1 **EN 14471 or EN 1856-1**: The material is UKCA and CE approved according to this standard. For plastic this is EN 14471, For aluminium and stainless steel this is EN 1856-1.
- 2 **T120**: The material has temperature class T120. A higher number is also allowed, but not lower.
- 3 **P1**: The material falls into pressure class P1. H1 is also allowed.
- 4 **W**: The material is suitable for draining condensation water (W='wet'). D is not allowed (D='dry').
- 5 **E**: The material falls into fire resistance class E. Class A to D are also allowed, F is not allowed. Only applicable to plastic.

Tab.23 Overview of material properties

Version	Flue gas outlet		Air supply	
	Material	Material properties	Material	Material properties
Single-wall, rigid	<ul style="list-style-type: none"> • Plastic⁽¹⁾ • Stainless steel⁽²⁾ • Thick-walled, aluminium⁽²⁾ 	<ul style="list-style-type: none"> • With UKCA and/or CE marking • Temperature class T120 or higher • Condensate class W (wet) • Pressure class P1 or H1 • Fire resistance class E or better⁽³⁾ 	<ul style="list-style-type: none"> • Plastic • Stainless steel • Aluminium 	<ul style="list-style-type: none"> • With UKCA and/or CE marking • Pressure class P1 or H1 • Fire resistance class E or better⁽³⁾
<p>(1) According to EN 14471. (2) According to EN 1856. (3) According to EN 13501-1.</p>				

4.7.2 Flue gas outlets/air inlets

- The positioning of air inlets and flue gas outlets must always meet the applicable national and local regulations.
- The terminals for the flue gas outlet and the air inlet must be in the same pressure range.
- The position of the terminals must allow free passage of air at all times.
- Avoid terminal positions of the flue gas outlet, where condensation plumes could cause nuisance.
- For installing the flue gas outlet and air inlet materials, refer to the instructions of the manufacturer of the relevant material.

4.7.3 Common flue gas outlet/air inlet

If there is sufficient height above the boilers, a common flue gas outlet/air inlet system can be used. In the design of the common system, a distinction is made between a series or parallel configuration.

In series configurations, individual boilers are connected directly to a horizontal collector pipe, which then continues on to the vertical section. An advantage of this configuration is that only one (room-ventilated operation) or two (room-sealed operation) collector pipes run immediately above the boilers.

In parallel configurations, all the flue outlet and air inlet pipes of the individual boilers run above the boilers to be connected to the vertical section. In this configuration there are multiple pipes running above the boilers.



Important

According to the IGEM/UP/10 Edition 4 standard, a maximum of 6 boilers may be connected to a common flue gas outlet/air inlet system.



Important

The terminals for the flue gas outlet and the air inlet must be in the same pressure range.

4.7.4 Individual flue gas outlet/air inlet

If there is insufficient height for a common shared flue system, individual roof terminals can be fitted.

For room sealed systems, the roof terminals must all be installed at the same height on flat or sloping roofs. This avoids flue gases from one boiler being taken in by another boiler. The roof terminals can also be placed within a single roof terminal construction.

i **Important**

Make sure no flue gas recirculation occurs in case discharge takes place into recesses or in the vicinity of rising walls.

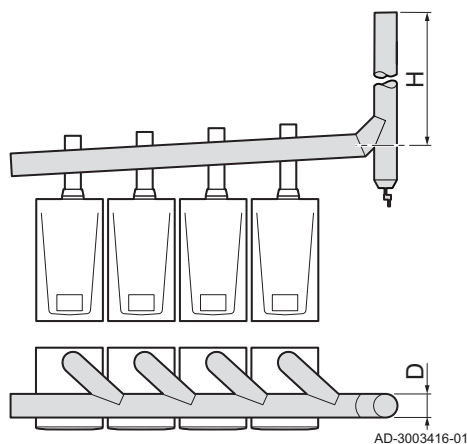
4.7.5 Dimensions flue gas outlet/air inlet pipes

Boilers in a cascade system can be fitted with individual flues, or connected to a common shared overpressure flue. Refer to the boiler documentation for the dimensions of individual flues.

In overpressure systems, the fan pressure of the boilers ensures a correct flue function. All boilers need to be fitted with a non-return valve to prevent flue gasses from entering boilers that are not in operation. In case a boiler is not fitted with a non-return valve, a non-return valve needs to be fitted at the connection to the common shared flue.

■ Room ventilated flue overpressure

Fig.12 Room ventilated



Use the following values to select the minimum diameter (**D**) from the tables:

- The system heat output in kW at 80/60 °C (**P**).
- The available vertical flue gas pipe height (**H**).

Tab.24 Flue gas outlet dimensions for Quinta Ace S (35 – 115 kW) boiler combinations.

Number of boilers	35 - 50 kW	60 - 70 kW	90 - 99 kW	110 - 115 kW	Minimum D (mm)				
					H = 0 – 2 m	H = 2 – 5 m	H = 5 – 9 m	H = 9 – 13 m	H = 13 – 17 m
Output range (P) kW (80/60 °C)									
67.6 – 90.0	2				95	95	95	100	105
88.8 – 110.0	1	1			100	100	110	115	115
110.0 – 130.0		2			105	110	115	120	125
135.8 – 157.8	1			1	110	110	130	130	130
157.0 – 177.8		1		1	120	125	130	140	150
187.0 – 205.2			1	1	120	125	130	140	150
204.0 – 225.6				2	125	130	135	140	150
212.0 – 242.8		2		1	145	145	150	160	170
220.8 – 250.2	1		1	1	150	155	170	175	180
237.8 – 270.6	1			2	155	165	170	175	180
259.0 – 290.0		1		2	160	165	170	175	180
289.0 – 317.4			1	2	160	165	170	175	180
306.0 – 338.4				3	165	170	175	180	185
314.0 – 355		2		2	180	180	190	195	200
339.8 – 383.4	1			3	190	195	200	205	210
361.0 – 403.4		1		3	175	180	185	190	200
391.0 – 430.8			1	3	190	195	200	205	210
408.0 – 451.2				4	200	200	205	210	215
416.0 – 468.4		2		3	205	210	215	220	225
424.0 – 485.0		4		2	210	215	220	225	225

Number of boilers	35 - 50 kW	60 - 70 kW	90 - 99 kW	110 - 115 kW	Minimum D (mm)				
					H = 0 – 2 m	H = 2 – 5 m	H = 5 – 9 m	H = 9 – 13 m	H = 13 – 17 m
Output range (P) kW (80/60 °C)									
446.0 – 495.8		1	1	3	210	220	225	230	230
441.8 – 496.2	1			4	215	220	225	230	235
463.0 – 516.2		1		4	215	220	225	230	235
493.0 – 543.6			1	4	215	225	230	230	235
510.0 – 564.0				5	220	225	230	235	240
518.0 – 581.2		2		4	230	235	240	245	250
548.0 – 608.6		1	1	4	240	240	245	250	255
543.8 – 609.0	1			5	240	245	250	255	260
565.0 – 629.0		1		5	240	245	250	255	260
595.0 – 656.4			1	5	240	245	250	255	260
612.0 – 676.8				6	245	250	255	260	265
620.0 – 694.0		2		5	250	255	265	270	275
650.0 – 721.4		1	1	5	255	265	270	275	275
645.8 – 721.8	1			6	260	265	270	275	280
667.0 – 741.5		1		6	260	265	270	275	280
697.0 – 769.2			1	6	260	265	270	275	280
714.0 – 789.6				7	265	270	275	280	285

Tab.25 Flue gas outlet dimensions for Quinta Ace S (130 – 160 kW) boiler combinations

Output range (P) kW (80/60 °C)	Number of 130 – 160 kW boilers	Minimum D (mm)				
		H = 0 – 2 m	H = 2 – 5 m	H = 5 – 9 m	H = 9 – 13 m	H = 13 – 17 m
243.0 – 280.6	2	140	145	150	155	160
364.5 – 420.9	3	180	185	190	195	200
486.0 – 561.2	4	215	220	225	230	235
607.5 – 701.5	5	245	250	255	260	265
729.0 – 841.8	6	270	275	280	285	285
850.5 – 982.1	7	295	300	305	305	310
972.0 – 112.4	8	315	320	325	325	330

4.7.6 Additional guidelines

■ Installation

- For installing the flue gas outlet and air supply materials, refer to the instructions of the manufacturer of the material.
- After installation, check at least all flue gas outlet and air supply parts for tightness.
- Install the flue gas outlet pipe towards the boiler with a sufficient gradient (at least 50 mm per metre).
- Install a sufficient condensate collector and discharge at least 1 m before the outlet of the boiler.
- The bends used must be larger than 90° to guarantee the gradient and a good seal on the lip rings.

■ Condensation

- Direct connection of the flue gas outlet to structural ducts is not permitted because of condensation.
- If condensate from a plastic or stainless steel pipe section can flow back to an aluminium part in the flue gas outlet, this condensate must be discharged via a trap before it reaches the aluminium.

- Newly installed aluminium flue gas pipes with longer lengths can produce relatively larger quantities of corrosion products. Also casting sand and processing metal chips from new boilers can fill the boiler trap on short term after installation. Check and clean the trap more often for these reasons.

4.8 Water quality and water treatment

For this appliance, the quality of the heating water must comply with all requirements as listed in **VDI 2035**. If water quality requirements for other components in the system are stated, the most stringent requirements apply.

If water quality is not met, consult a specialist.

Tab.26 Water quality requirements according to VDI 2035

Heat exchanger material	Unit	Stainless steel
Degree of acidity at 25 °C	pH	8.2 - 10.0
Electrical conductivity at 25 °C (for low saline water)	µS/cm	≤ 100
Electrical conductivity at 25 °C (for saline water)	µS/cm	100 - 1500
Oxygen (for low saline water)	mg/l	≤ 0.1
Oxygen (for saline water)	mg/l	≤ 0.02
Sum of alkaline earth metals	mmol/l	≤ 0.02

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