

Technical guide



H<sub>2</sub> READY · 20%

**VITODENS 100-W** Type B1HF, B1KF

Wall mounted gas condensing boiler  
3.2 to 32.0 kW  
For natural gas and LPG

**VITODENS 111-W** Type B1LF

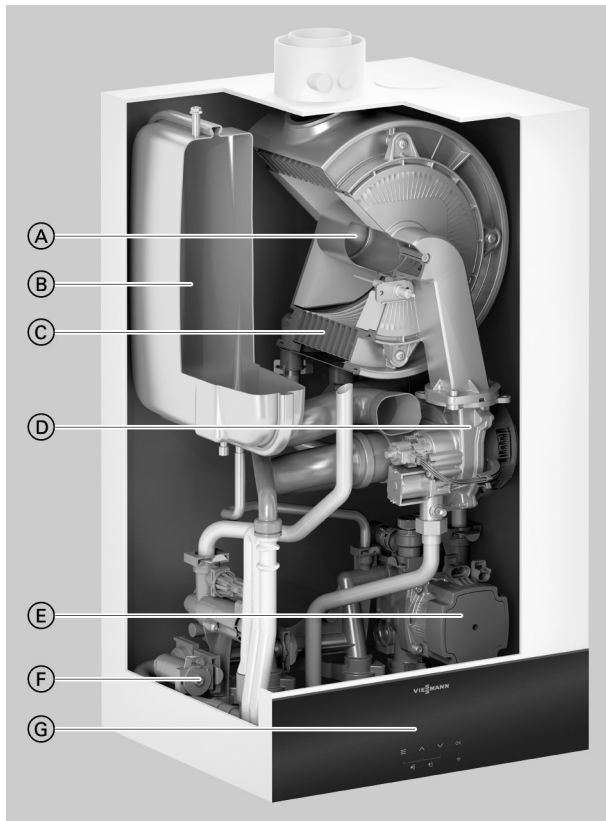
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Index

<b>1. Vitodens 100-W</b>	1.1 Product description .....	4
	1.2 Specification .....	6
	■ Gas condensing system boiler .....	6
	■ Gas condensing combi boiler .....	8
	■ Permissible CO <sub>2</sub> or O <sub>2</sub> content .....	11
	■ Variable speed heating circuit pump in the Vitodens 100-W .....	13
	■ Standby instantaneous water heater (gas condensing combi boiler) .....	14
<b>2. Vitodens 111-W</b>	2.1 Product description .....	16
	2.2 Specification .....	18
	■ Variable speed heating circuit pump in the Vitodens 111-W .....	21
<b>3. Separate DHW cylinders for Vitodens 100-W</b>	3.1 Vitocell 100-W below the boiler .....	23
	■ Delivered condition .....	26
	3.2 Vitocell 100-W adjacent to the boiler .....	27
	■ Delivered condition .....	30
	3.3 Vitocell 100-W adjacent to the boiler for dual mode DHW heating .....	31
	■ Delivered condition .....	34
<b>4. Installation accessories</b>	4.1 Vitodens 100-W installation accessories .....	35
	■ Pre-plumbing jigs .....	35
	■ Valves/fittings .....	35
	■ Mounting frame .....	37
	■ Further accessories .....	39
	■ Connections between the Vitodens and the DHW cylinder .....	42
	4.2 Installation accessories for Vitodens 111-W .....	43
	■ Pre-plumbing jigs .....	43
	■ Mounting frame .....	43
	■ Valves/fittings .....	44
	■ Further accessories .....	44
	■ Flue gas cascade (positive pressure) for multi boiler systems with Vitodens 100-W and 111-W .....	45
	4.3 Divicon heating circuit distributor and low loss headers .....	47
	■ Divicon heating circuit distributor .....	47
	■ Low loss headers .....	54
<b>5. Design information</b>	5.1 Siting, installation .....	55
	■ Siting conditions for open flue operation (appliance type B) .....	55
	■ Siting conditions for room sealed operation (appliance type C) .....	56
	■ Operation of the Vitodens in wet rooms .....	57
	■ Electrical connection .....	58
	■ Gas connection .....	58
	■ Minimum clearances .....	58
	■ Installation of the Vitodens 100-W .....	58
	■ Replacing third party boilers with the Vitodens 100-W .....	64
	■ Pre-installation of the Vitodens 111-W .....	68
	5.2 Decision making aids for DHW heating .....	71
	■ Vitodens 100-W .....	72
	■ Vitodens 111-W .....	72
	■ Notes on water quality .....	72
	■ Separate DHW cylinders .....	72
	■ Sizing the DHW cylinder .....	73
	■ DHW cylinder selection tables .....	73
	5.3 Connections on the water side .....	74
	■ Connection on the DHW side .....	74
	5.4 Condensate connection .....	76
	■ Condensate drain pipe and neutralisation .....	76
	5.5 Hydraulic connection .....	78
	■ General .....	78
	■ Expansion vessels .....	80
	■ Low loss header .....	80
	5.6 Intended use .....	81
<b>6. Control unit</b>	6.1 Layout and functions .....	81
	■ Modular design .....	81
	■ Functions .....	82
	■ Notes on PlusBus subscribers .....	83
	■ Frost protection function .....	83
	■ Heating curve setting (slope and level) .....	83

	■ Heating systems with a low loss header or heating water buffer cylinder .....	83
	■ Flow temperature sensor .....	84
	■ Cylinder temperature sensor .....	84
	■ Outside temperature sensor .....	84
6.2	Specification – control unit .....	85
6.3	Accessories for control unit .....	85
	■ Vitotrol 100, type UTA .....	85
	■ Vitotrol 100, type UTDB .....	86
	■ Vitotrol 100, type UTDB-RF .....	86
	■ Vitotrol 200-E .....	87
	■ Outside temperature sensor .....	88
	■ Room temperature sensor .....	88
	■ Immersion temperature sensor .....	88
	■ Cylinder temperature sensor .....	89
	■ Contact thermostat .....	89
	■ Contact thermostat .....	89
	■ Immersion thermostat .....	89
	■ Notes on PlusBus subscribers .....	90
	■ EM-MX mixer extension kit with integral mixer motor .....	90
	■ EM-M1 mixer extension kit for separate mixer motor .....	90
	■ EM-MX mixer extension kit for Divicon heating circuit distribution .....	91
	■ EM-P1 extension .....	92
	■ Solar control units .....	92
	■ EM-EA1 extension .....	94
<b>7.</b>	<b>Appendix</b>	
	7.1 Regulations / Directives .....	95
	■ Regulations and directives .....	95
	■ Manufacturer declarations .....	96
<b>8.</b>	<b>Keyword index</b> .....	97

## 1.1 Product description



- Ⓐ Modulating MatriX-Plus gas burner with intelligent Lambda Pro combustion controller for extremely clean combustion and quiet operation
- Ⓑ Integral diaphragm expansion vessel
- Ⓒ Inox-Radial heat exchanger made from stainless steel – for high operational reliability, a long service life and high heating output on a very small footprint
- Ⓓ Variable speed combustion air fan for quiet and economical operation
- Ⓔ Integral, variable speed high efficiency circulation pump
- Ⓕ Hydraulics
- Ⓖ Digital boiler control unit with 7-segment display

The top model among the wall mounted gas condensing boilers is the Vitodens 100-W. The MatriX-Plus gas burner and Inox-Radial heat exchanger made of stainless steel are a combination that guarantees high efficiency and a high level of heating convenience over the long term.

All sizes of the Vitodens 100-W are equipped with the automatic Lambda Pro combustion controller. Modulation range down to 1:10 (32 kW).

The integral, variable speed high efficiency circulation pump reduces power consumption by up to 70 %.

### Recommended applications

- Modernisation and new build
- Replacement of old appliances in apartment buildings or prefabricated houses

### Benefits at a glance

- Seasonal central heating energy efficiency  $\eta_s$  up to 94 % (label A).
- Low cycle frequency, even with low heat demand, through optimised pauses and wide modulation range down to 1:10 (32 kW)
- Durable and efficient thanks to Inox-Radial stainless steel heat exchanger
- MatriX-Plus gas burner with Lambda Pro combustion controller for permanently high efficiency and clean combustion.
- Power saving, high efficiency circulation pump
- Easy operation using control unit with touchscreen
- Web-enabled through integral WiFi interface for operation and service via Viessmann apps

### Delivered condition

Wall mounted gas condensing boiler with Inox-Radial heat exchanger, modulating MatriX-Plus gas burner for natural gas and LPG to DVGW Code of Practice G260 [Germany], hydraulics and variable speed high efficiency circulation pump. Weather-compensated or constant temperature control unit with integral WiFi interface.

Fully plumbed and wired. Colour of the epoxy-coated casing: Vito-pearlwhite.

Integral diaphragm expansion vessel (8 litre capacity).

Preset for operation with natural gas. Conversion within gas groups E/LL is not required. The conversion to LPG is made at the control unit (a conversion kit is not required).

The gas condensing boiler is suitable for operation with a hydrogen admixture of up to 20 % by volume.

### Note on multiple connection

*If multiple appliances are to be connected to a common flue system, the **multiple connection** version of the appliance will be required.*

*Using appliances for individual connection, or operating a mix of appliances for individual and multiple connection, on a common flue system is **not permitted**.*

*The multiple connection version is already fitted with an internal back draught safety device. When installing with multiple connections, it is **essential** to order an additional back draught safety device for the boiler flue connection to each appliance. The multiple connection version cannot be operated with LPG.*

### Accessories required (order separately)

#### Vitodens installation directly on a wall

Pre-plumbing jig for surface mounting:

- With fixings
- With valves/fittings
- With boiler drain & fill valve
- With gas shut-off valve with thermally activated safety shut-off valve



## Vitodens 100-W (cont.)

Valves/fittings for surface mounting:

- With valves/fittings
- With boiler drain & fill valve
- With gas shut-off valve with thermally activated safety shut-off valve

Valves/fittings for flush mounting:

- With valves/fittings
- With boiler drain & fill valve
- With gas shut-off valve with thermally activated safety shut-off valve

Mounting frame for surface mounting (installed depth 90 mm):

- With fixings
- With valves/fittings
- With boiler drain & fill valve
- With angle gas valve with thermally activated safety shut-off valve


### Vitodens installation in front of a wall

Plumbing wall mounting frame (installed depth 110 mm):

- With fixings

A pre-plumbing jig or valves/fittings for surface mounting/flush mounting must be ordered separately for the plumbing wall mounting frame.

### Tested quality

 CE designation according to current EU Directives

Meets the requirements for the "Blue Angel" ecolabel to RAL UZ 61.

## 1.2 Specification

### Gas condensing system boiler

Gas boiler, type B and C, category II <sub>2N3P</sub>		B1HF			
Type					
<b>Rated heating output range (details to EN 15502)</b>					
T <sub>F</sub> /T <sub>R</sub> = 50/30 °C					
Natural gas	kW	3.2 (5.7 <sup>*1</sup> ) to 11.0	3.2 (5.7 <sup>*1</sup> ) to 19.0	3.2 (5.7 <sup>*1</sup> ) to 25.0	3.2 (5.7 <sup>*1</sup> ) to 32.0
LPG	kW	3.2 to 11.0	3.2 to 19.0	3.2 to 25.0	3.2 to 32.0
T <sub>F</sub> /T <sub>R</sub> = 80/60 °C					
Natural gas	kW	2.9 (5.2 <sup>*1</sup> ) to 10.1	2.9 (5.2 <sup>*1</sup> ) to 17.5	2.9 (5.2 <sup>*1</sup> ) to 23.0	2.9 (5.2 <sup>*1</sup> ) to 29.3
LPG	kW	2.9 to 10.1	2.9 to 17.5	2.9 to 23.0	2.9 to 29.3
<b>Rated heating output for DHW heating</b>					
Natural gas	kW	2.9 (5.2 <sup>*1</sup> ) to 17.5	2.9 (5.2 <sup>*1</sup> ) to 17.5	2.9 (5.2 <sup>*1</sup> ) to 23.0	2.9 (5.2 <sup>*1</sup> ) to 29.3
LPG	kW	2.9 to 17.5	2.9 to 17.5	2.9 to 23.0	2.9 to 29.3
<b>Rated heat input (Q<sub>n</sub>)</b>					
Natural gas	kW	3.0 (5.3 <sup>*1</sup> ) to 10.3	3.0 (5.3 <sup>*1</sup> ) to 17.8	3.0 (5.3 <sup>*1</sup> ) to 23.4	3.0 (5.3 <sup>*1</sup> ) to 29.9
LPG	kW	3.0 to 10.3	3.0 to 17.8	3.0 to 23.4	3.0 to 29.9
<b>Rated heat input for DHW heating (Q<sub>nw</sub>)</b>					
Natural gas	kW	3.0 (5.3 <sup>*1</sup> ) to 17.8	3.0 (5.3 <sup>*1</sup> ) to 17.8	3.0 (5.3 <sup>*1</sup> ) to 23.4	3.0 (5.3 <sup>*1</sup> ) to 29.9
LPG	kW	3.0 to 17.8	3.0 to 17.8	3.0 to 23.4	3.0 to 29.9
<b>Product ID</b>		CE-0085DL0217			
<b>IP rating to EN 60529</b>		IP X4 to EN 60529			
NO <sub>x</sub>		6	6	6	6
<b>Gas supply pressure</b>					
Natural gas	mbar	20	20	20	20
	kPa	2	2	2	2
LPG	mbar	50	50	50	50
	kPa	5	5	5	5
<b>Max. permiss. gas supply pressure<sup>*2</sup></b>					
Natural gas	mbar	13 to 25.0	13 to 25.0	13 to 25.0	13 to 25.0
	kPa	1.3 to 2.5	1.3 to 2.5	1.3 to 2.5	1.3 to 2.5
LPG	mbar	25 to 57.5	25 to 57.5	25 to 57.5	25 to 57.5
	kPa	2.5 to 5.75	2.5 to 5.75	2.5 to 5.75	2.5 to 5.75
<b>Sound power level</b> (to EN ISO 15036-1)					
– At partial load	dB(A)	31.9	31.9	31.9	31.9
– At rated heating output (DHW heating)	dB(A)	42.3	42.3	46.1	48.4
<b>Power consumption</b> (in the delivered condition)		38	45	64	110
<b>Rated voltage</b>		230			
Rated frequency		50			
Appliance fuse protection		4.0			
Backup fuse (power supply)		16			
<b>Communication module</b> (integral)					
WiFi frequency band	MHz	2400 to 2483.5			
Max. transmission power	dBm	20			
Low power radio frequency band	MHz	2400 to 2483.5			
Max. transmission power	dBm	10			
Supply voltage	V ≍	24			
Power consumption	W	4			
<b>Electronic temperature limiter setting (TN)</b>		91			
<b>Electronic temperature cut-out setting</b>		110			
<b>Electronic flue gas temperature limiter setting</b>		110			
<b>Permissible ambient temperature</b>					
– During operation		Frost-free, dry and heated rooms			
– During storage and transport	°C	-5 to +60			
<b>Weight</b>					
– Excl. heating water and packaging	kg	32	32	32	32
– Incl. heating water	kg	37.6	37.6	37.6	37.6

\*1 Appliances for multiple connection of type B1HF-[kW]-M and B1KF-[kW]-M

\*2 If the gas supply pressure is higher than the maximum permissible value, install a separate gas pressure governor upstream of the system.



## Vitodens 100-W (cont.)

Gas boiler, type B and C, category II <sub>2N3P</sub>		B1HF			
Type					
<b>Rated heating output range (details to EN 15502)</b>					
T <sub>F</sub> /T <sub>R</sub> = 50/30 °C					
Natural gas	kW	3.2 (5.7 <sup>*1</sup> ) to 11.0	3.2 (5.7 <sup>*1</sup> ) to 19.0	3.2 (5.7 <sup>*1</sup> ) to 25.0	3.2 (5.7 <sup>*1</sup> ) to 32.0
LPG	kW	3.2 to 11.0	3.2 to 19.0	3.2 to 25.0	3.2 to 32.0
T <sub>F</sub> /T <sub>R</sub> = 80/60 °C					
Natural gas	kW	2.9 (5.2 <sup>*1</sup> ) to 10.1	2.9 (5.2 <sup>*1</sup> ) to 17.5	2.9 (5.2 <sup>*1</sup> ) to 23.0	2.9 (5.2 <sup>*1</sup> ) to 29.3
LPG	kW	2.9 to 10.1	2.9 to 17.5	2.9 to 23.0	2.9 to 29.3
Water capacity (excl. diaphragm expansion vessel)	l	3.0	3.0	3.0	3.0
Max. flow temperature	°C	82	82	82	82
Max. flow rate (Limit for the use of hydraulic separation)	l/h	See residual head graph			
Nominal circulating water volume At T <sub>F</sub> /T <sub>R</sub> = 80/60 °C	l/h	434	752	988	1259
<b>Diaphragm expansion vessel</b>					
Capacity	l	8	8	8	8
Pre-charge pressure	bar	0.75	0.75	0.75	0.75
	kPa	75	75	75	75
Permiss. operating pressure	bar	3	3	3	3
	MPa	0.3	0.3	0.3	0.3
<b>Connections (with connection accessories)</b>					
Boiler flow and return	R	¾	¾	¾	¾
Cold water and DHW	G	½	½	½	½
<b>Dimensions</b>					
Length	mm	360	360	360	360
Width	mm	400	400	400	400
Height	mm	700	700	700	700
Gas connection	R	¾	¾	¾	¾
<b>Supply values</b>					
Relative to the max. load and 1013 mbar/15 °C					
With gas					
Natural gas E	m <sup>3</sup> /h	1.88	1.88	2.48	3.16
Natural gas LL	m <sup>3</sup> /h	2.19	2.19	2.88	3.68
LPG	kg/h	1.38	1.38	1.82	2.32
<b>Flue gas parameters</b>					
<b>Temperature (at a return temperature of 30 °C)</b>					
– At rated heating output	°C	39	41	46	59
– At partial load	°C	38	38	38	38
<b>Temperature (at a return temperature of 60 °C, for DHW heating)</b>					
Flue gas superheating temperature	°C	120	120	120	120
<b>Mass flow rate (for DHW heating)</b>					
Natural gas					
– At maximum heating output	kg/h	31.7	31.7	41.6	54.9
– At partial load	kg/h	5.6 (9.8)	5.6 (9.8)	5.6 (9.8)	5.6 (9.8)
LPG					
– At maximum heating output	kg/h	30.1	30.1	41.0	53.9
– At partial load	kg/h	5.1	5.1	5.1	5.1
Available draught	Pa	116	116	168	323
	mbar	1.16	1.16	1.68	3.23
Available draught	Pa	25	25	25	25
For type C <sub>(10)</sub> (at interface to collector pipe system)					
Maximum permissible pressure differential between flue gas outlet and air inlet with C <sub>(10)</sub> <sup>*3</sup>	Pa	-200	-200	-200	-200
Available draught	Pa	232	527	698	635
For type B <sub>23P</sub>					
Max. amount of condensate To DWA-A 251	l/h	2.5	2.5	3.3	4.2

\*1 Appliances for multiple connection of type B1HF-[kW]-M and B1KF-[kW]-M

\*3 Appliances for multiple connection, type B1HF-M (for multiple connection)

## Vitodens 100-W (cont.)

Gas boiler, type B and C, category II <sub>2N3P</sub>		B1HF			
Type					
<b>Rated heating output range (details to EN 15502)</b> T <sub>F</sub> /T <sub>R</sub> = 50/30 °C					
Natural gas	kW	3.2 (5.7 <sup>*1</sup> ) to 11.0	3.2 (5.7 <sup>*1</sup> ) to 19.0	3.2 (5.7 <sup>*1</sup> ) to 25.0	3.2 (5.7 <sup>*1</sup> ) to 32.0
LPG	kW	3.2 to 11.0	3.2 to 19.0	3.2 to 25.0	3.2 to 32.0
<b>Rated heating output range (details to EN 15502)</b> T <sub>F</sub> /T <sub>R</sub> = 80/60 °C					
Natural gas	kW	2.9 (5.2 <sup>*1</sup> ) to 10.1	2.9 (5.2 <sup>*1</sup> ) to 17.5	2.9 (5.2 <sup>*1</sup> ) to 23.0	2.9 (5.2 <sup>*1</sup> ) to 29.3
LPG	kW	2.9 to 10.1	2.9 to 17.5	2.9 to 23.0	2.9 to 29.3
Condensate connection (hose nozzle)	Ø mm	20 to 24	20 to 24	20 to 24	20 to 24
Flue gas connection	Ø mm	60	60	60	60
Ventilation air connection	Ø mm	100	100	100	100
<b>Standard seasonal efficiency [to DIN] at T<sub>F</sub>/T<sub>R</sub> = 40/30 °C</b>		Up to 98 (H <sub>s</sub> ) [gross cv]			
<b>Energy efficiency class</b>		A	A	A	A

### Note

The supply values are only for reference (e.g. in the gas contract application) or for a supplementary, rough estimate to check the volumetric settings. Due to factory settings, the gas pressure must not be altered from these values. Reference: 15 °C, 1013 mbar (101.3 kPa).

## Gas condensing combi boiler

Gas boiler, type B and C, category II <sub>2N3P</sub>		B1KF-26	B1KF-30	B1KF-35
Type				
<b>Rated heating output range (details to EN 15502)</b> T <sub>F</sub> /T <sub>R</sub> = 50/30 °C				
Natural gas	kW	3.2 (5.7 <sup>*4</sup> ) to 25.0	3.2 (5.7 <sup>*4</sup> ) to 25.0	3.2 (5.7 <sup>*4</sup> ) to 32.0
LPG	kW	3.2 to 25.0	3.2 to 25.0	3.2 to 32.0
<b>Rated heating output range (details to EN 15502)</b> T <sub>F</sub> /T <sub>R</sub> = 80/60 °C				
Natural gas	kW	2.9 (5.2 <sup>*4</sup> ) to 23.0	2.9 (5.2 <sup>*4</sup> ) to 23.0	2.9 (5.2 <sup>*4</sup> ) to 29.3
LPG	kW	2.9 to 23.0	2.9 to 23.0	2.9 to 29.3
<b>Rated heating output for DHW heating</b>				
Natural gas	kW	2.9 (5.2 <sup>*4</sup> ) to 26	2.9 (5.2 <sup>*4</sup> ) to 30	2.9 (5.2 <sup>*4</sup> ) to 35
LPG	kW	2.9 to 26	2.9 to 30	2.9 to 35
<b>Rated heat input (Q<sub>n</sub>)</b>				
Natural gas	kW	3.0 (5.3 <sup>*4</sup> ) to 23.4	3.0 (5.3 <sup>*4</sup> ) to 23.4	3.0 (5.3 <sup>*4</sup> ) to 29.9
LPG	kW	3.0 to 23.4	3.0 to 23.4	3.0 to 29.9
<b>Rated heat input for DHW heating (Q<sub>nw</sub>)</b>				
Natural gas	kW	3.0 (5.3 <sup>*4</sup> ) to 26.5	3.0 (5.3 <sup>*4</sup> ) to 30.6	3.0 (5.3 <sup>*4</sup> ) to 35.3
LPG	kW	3.0 to 26.5	3.0 to 30.6	3.0 to 35.3
<b>Product ID</b>		CE-0085DL0217		
<b>IP rating to EN 60529</b>		IP X4 to EN 60529		
<b>Gas supply pressure</b>				
Natural gas	mbar	20	20	20
	kPa	2	2	2
LPG	mbar	50	50	50
	kPa	5	5	5
<b>Max. permiss. gas supply pressure<sup>*5</sup></b>				
Natural gas	mbar	25.0	25.0	25.0
	kPa	2.5	2.5	2.5
LPG	mbar	57.5	57.5	57.5
	kPa	5.75	5.75	5.75
<b>Sound power level</b> (to EN ISO 15036-1)				
– At partial load	dB(A)	31.9	31.9	31.9
– At rated heating output (DHW heating)	dB(A)	49.1	50	50.4

\*1 Appliances for multiple connection of type B1HF-[kW]-M and B1KF-[kW]-M

\*4 Appliances for multiple connection of type B1HF-[kW]-M and B1KF-[kW]-M

\*5 If the gas supply pressure is higher than the maximum permissible value, install a separate gas pressure governor upstream of the system.

## Vitodens 100-W (cont.)

Gas boiler, type B and C, category II <sub>2N3P</sub>		B1KF-26	B1KF-30	B1KF-35
<b>Type</b>				
<b>Rated heating output range (details to EN 15502)</b>				
T <sub>F</sub> /T <sub>R</sub> = 50/30 °C				
Natural gas	kW	3.2 (5.7 <sup>*4</sup> ) to 25.0	3.2 (5.7 <sup>*4</sup> ) to 25.0	3.2 (5.7 <sup>*4</sup> ) to 32.0
LPG	kW	3.2 to 25.0	3.2 to 25.0	3.2 to 32.0
T <sub>F</sub> /T <sub>R</sub> = 80/60 °C				
Natural gas	kW	2.9 (5.2 <sup>*4</sup> ) to 23.0	2.9 (5.2 <sup>*4</sup> ) to 23.0	2.9 (5.2 <sup>*4</sup> ) to 29.3
LPG	kW	2.9 to 23.0	2.9 to 23.0	2.9 to 29.3
<b>Power consumption</b> (in the delivered condition)	W	45	64	110
<b>Rated voltage</b>	V	230		
Rated frequency	Hz	50		
Appliance fuse protection	A	4		
Backup fuse (power supply)	A	16		
<b>Communication module</b> (integral)				
WiFi frequency band	MHz	2400 to 2483.5		
Max. transmission power	dBm	20		
Low power radio frequency band	MHz	2400 to 2483.5		
Max. transmission power	dBm	10		
Supply voltage	V ~	24		
Power consumption	W	4		
<b>Electronic temperature limiter setting (TN)</b>	°C	91		
<b>Electronic temperature cut-out setting</b>	°C	110		
<b>Electronic flue gas temperature limiter setting</b>	°C	110		
<b>Permissible ambient temperature</b>				
– During operation		Frost-free, dry and heated rooms		
– During storage and transport	°C	-5 to +60		
<b>Weight</b>				
– Excl. heating water and packaging	kg	35	35	35
– Incl. heating water	kg	41	41	41
<b>Water capacity</b> (excl. diaphragm expansion vessel)	l	3.0	3.0	3.0
<b>Max. flow temperature</b>	°C	82	82	82
<b>Max. flow rate</b> (Limit for the use of hydraulic separation)	l/h	See residual head graphs		
<b>Nominal circulating water volume</b> At T <sub>F</sub> /T <sub>R</sub> = 80/60 °C	l/h	752	988	1259
<b>Diaphragm expansion vessel</b>				
Capacity	l	8	8	8
Pre-charge pressure	bar	0.75	0.75	0.75
	kPa	75	75	75
<b>Permiss. operating pressure</b>	bar	3	3	3
	MPa	0.3	0.3	0.3
Connections (with connection accessories)				
Boiler flow and return	R	¾	¾	¾
Cold water and DHW	G	½	½	½
<b>Dimensions</b>				
Length	mm	360	360	360
Width	mm	400	400	400
Height	mm	700	700	700
<b>Gas connection</b>	R	¾	¾	¾
<b>Standby instantaneous water heater</b>				
DHW and cold water connections	G	½	½	½
Permiss. operating pressure (DHW side)	bar	10	10	10
	MPa	1	1	1
Minimum pressure, cold water connection	bar	1.0	1.0	1.0
	MPa	0.1	0.1	0.1
Outlet temperature, adjustable	°C	30 to 60	30 to 60	30 to 60
Continuous DHW output	kW	26.3	30.0	34.4
Spec. water flow rate (D)	l/min	13.26	15.59	17.04
At ΔT = 30 K (to EN 13203-1)				

## Vitodens 100-W (cont.)

Gas boiler, type B and C, category II <sub>2N3P</sub>				
Type		B1KF-26	B1KF-30	B1KF-35
<b>Rated heating output range (details to EN 15502)</b>				
T <sub>F</sub> /T <sub>R</sub> = 50/30 °C				
Natural gas	kW	3.2 (5.7 <sup>*4</sup> ) to 25.0	3.2 (5.7 <sup>*4</sup> ) to 25.0	3.2 (5.7 <sup>*4</sup> ) to 32.0
LPG	kW	3.2 to 25.0	3.2 to 25.0	3.2 to 32.0
T <sub>F</sub> /T <sub>R</sub> = 80/60 °C				
Natural gas	kW	2.9 (5.2 <sup>*4</sup> ) to 23.0	2.9 (5.2 <sup>*4</sup> ) to 23.0	2.9 (5.2 <sup>*4</sup> ) to 29.3
LPG	kW	2.9 to 23.0	2.9 to 23.0	2.9 to 29.3
<b>Supply values</b>				
Relative to the max. load and 1013 mbar/15 °C				
Natural gas E	m <sup>3</sup> /h	2.89	3.35	3.69
Natural gas LL	m <sup>3</sup> /h	3.36	3.90	4.29
LPG	kg/h	2.12	2.46	2.71
<b>Flue gas parameters</b>				
<b>Temperature</b> (at a return temperature of 30 °C)				
– At rated heating output	°C	41	46	59
– At partial load	°C	38	38	38
<b>Temperature</b> (at a return temperature of 60 °C, for DHW heating)				
	°C	65	67	72
Flue gas superheating temperature	°C	120	120	120
<b>Mass flow rate</b> (for DHW heating)				
Natural gas				
– At maximum heating output	kg/h	49.3	57.3	62.1
– At partial load	kg/h	5.6 (9.8 <sup>*4</sup> )	5.6 (9.8 <sup>*4</sup> )	5.6 (9.8 <sup>*4</sup> )
LPG				
– At maximum heating output	kg/h	30.1	41	53.9
– At partial load	kg/h	3.9	3.9	3.9
<b>Available draught</b>				
	Pa	334	340	474
	mbar	3.34	3.40	4.74
<b>Available draught</b>				
	Pa	25	25	25
For type C <sub>(10)</sub> (at interface to collector pipe system)				
Maximum permissible pressure differential between flue gas outlet and air inlet with C <sub>(10)</sub> <sup>*6</sup>	Pa	-200	-200	-200
<b>Available draught</b>				
	Pa	527	698	635
For type B <sub>23P</sub>				
<b>Max. amount of condensate</b>				
	l/h	3.7	4.3	4.9
To DWA-A 251				
<b>Condensate connection (hose nozzle)</b>	Ø mm	20 to 24	20 to 24	20 to 24
<b>Flue gas connection</b>	Ø mm	60	60	60
<b>Ventilation air connection</b>	Ø mm	100	100	100
<b>Standard seasonal efficiency [to DIN] at</b>				
T <sub>F</sub> /T <sub>R</sub> = 40/30 °C	%	Up to 98 (H <sub>s</sub> ) [gross cv]		
<b>Energy efficiency class</b>				
		A	A	A

### Note

The supply values are only for reference (e.g. in the gas contract application) or for a supplementary, rough estimate to check the volumetric settings. Due to factory settings, the gas pressure must not be altered from these values. Reference: 15 °C, 1013 mbar (101.3 kPa).

\*4 Appliances for multiple connection of type B1HF-[kW]-M and B1KF-[kW]-M

\*6 Appliances for multiple connection, type B1HF-M (for multiple connection)

## Vitodens 100-W (cont.)

### Permissible CO<sub>2</sub> or O<sub>2</sub> content

#### Operation with natural gas

Rated heating output (kW)	CO <sub>2</sub> content (%)		O <sub>2</sub> content (%)	
	Upper heating output	Lower heating output	Upper heating output	Lower heating output
11	7.3 to 10.5	7.3 to 10.5	2.1 to 7.9	2.1 to 7.9
19	7.5 to 10.5	7.5 to 10.5	2.1 to 7.6	2.1 to 7.6
25	7.5 to 10.5	7.5 to 10.5	2.1 to 7.6	2.1 to 7.6
32	7.5 to 10.5	7.5 to 10.5	2.1 to 7.6	2.1 to 7.6

#### Operation with LPG

- CO<sub>2</sub> content: 8.4 to 11.8 %
- O<sub>2</sub> content: 3.1 to 8.1 %



1

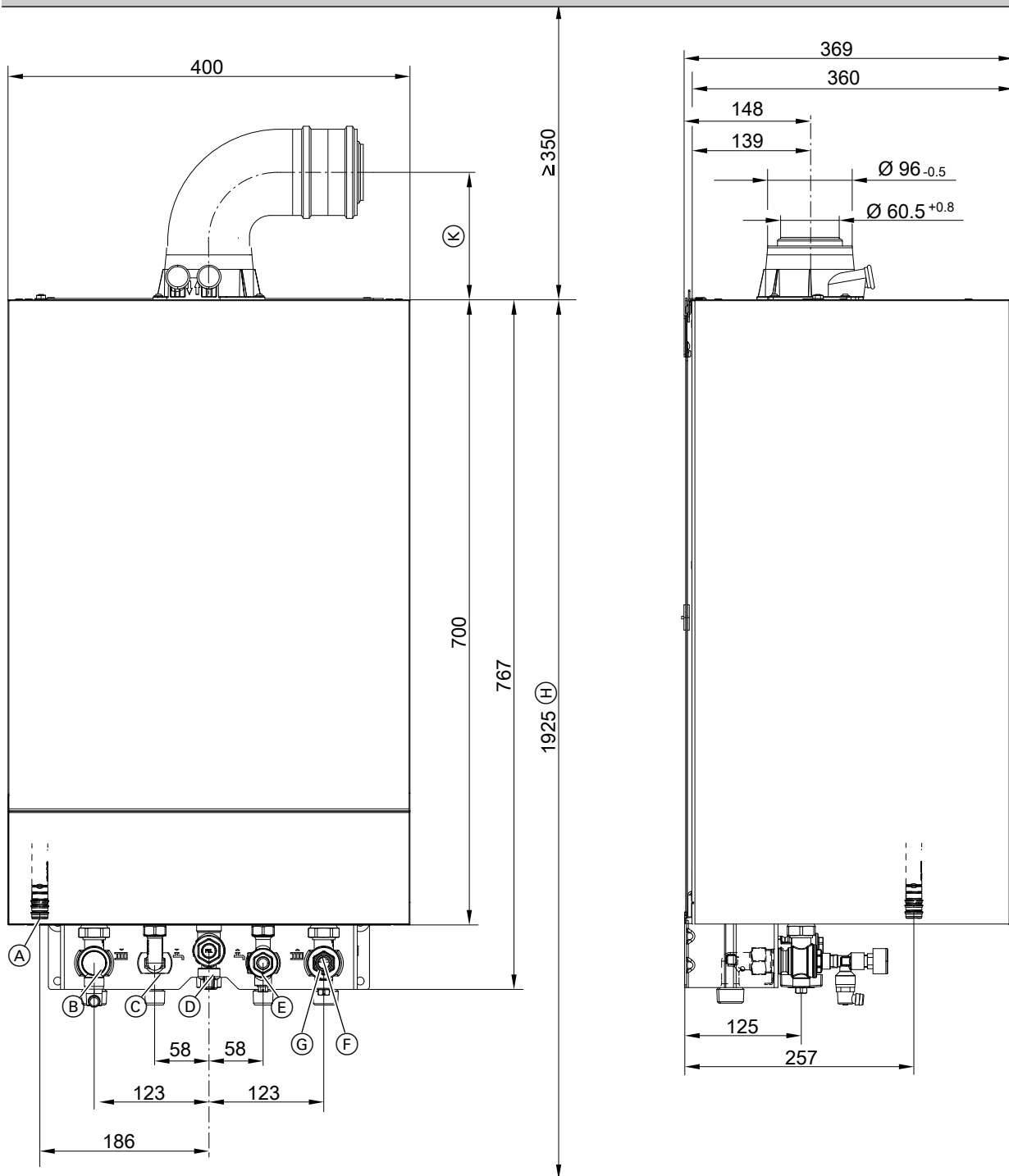


Illustration shows a gas condensing combi boiler

- (A) Condensate drain
- (B) Heating flow
- (C) DHW (gas condensing combi boiler)  
Cylinder flow (gas condensing system boiler)
- (D) Gas connection
- (E) Cold water (gas condensing combi boiler)  
Cylinder return (gas condensing system boiler)
- (F) Heating return
- (G) Filling/draining



## Vitodens 100-W (cont.)

- Ⓜ Dimension for siting with DHW cylinder below the boiler
- Ⓚ Dimension: 161 mm – for external wall connection, Order nos. 7441467, 7411961  
Dimension: 131 mm – for external wall connection, Order no. 7946886 (with reduced flue bend)

### Note

This boiler (IP rating: IP X4) is approved for installation in wet rooms inside safety zone 1. Exposure to jets of water must be prevented. For open flue operation, the boiler may only be operated with a splash cover.

### Variable speed heating circuit pump in the Vitodens 100-W

The integral circulation pump is a highly efficient pump with substantially lower power consumption than conventional pumps. The pump speed and consequently the pump rate are controlled subject to the outside temperature and the switching times for heating mode or reduced mode. The control unit transmits the currently specified speeds to the circulation pump via a PWM signal. The min. and max. speeds and the speed for reduced mode can be matched to the existing heating system via parameters at the control unit.

Setting (%) in group heating circuit 1:

- Min. speed: Parameter 1102.0
- Max. speed: Parameter 1102.1

- In the delivered condition, the minimum pump rate and the maximum pump rate are set to the following values:

Rated heating output in kW	Speed settings in the delivered condition in %	
	Min. pump rate	Max. pump rate
11	40	60
19	40	65
25	40	75
32	40	100

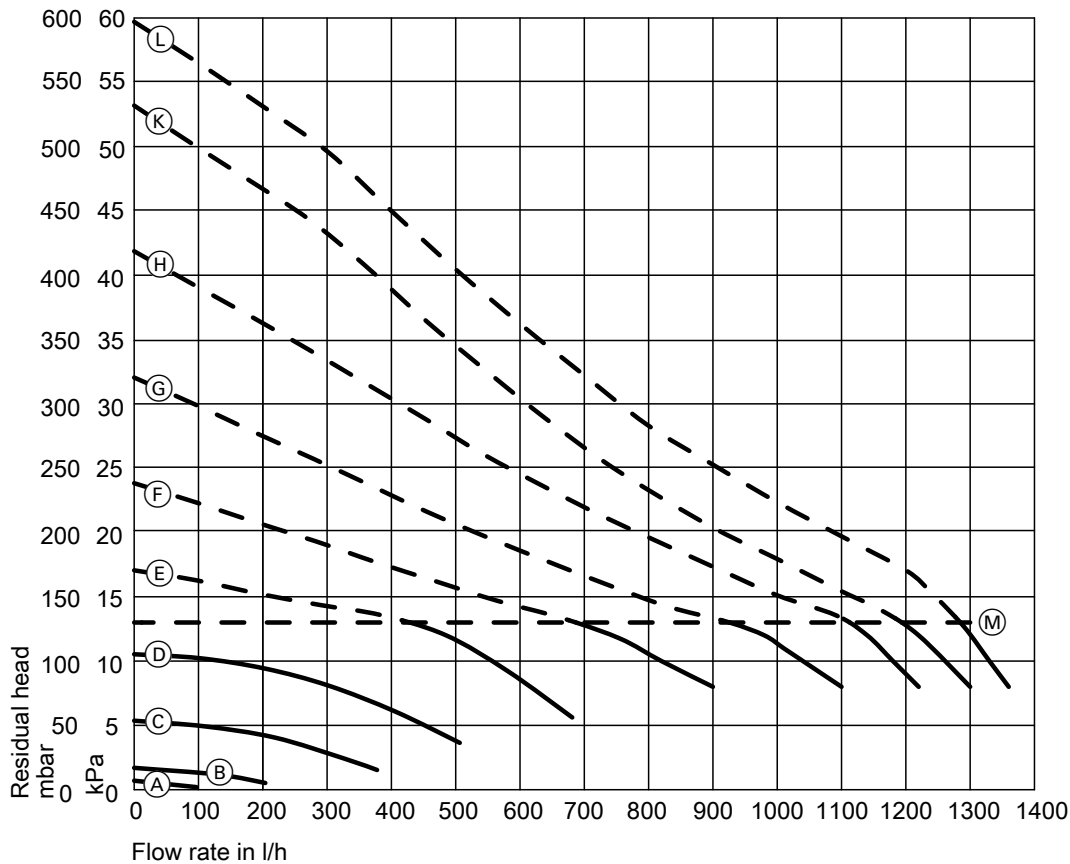
- In conjunction with a low loss header, heating water buffer cylinder and heating circuits with mixer, the internal circulation pump runs at a constant speed.

### Specification – circulation pump

Rated heating output	kW	11	19	25	32
Type		B1HF	B1HF B1KF	B1HF B1KF	B1HF B1KF
Circulation pump	Type	UPM3 15-75	UPM3 15-75	UPM3 15-75	UPM3 15-75
Rated voltage	V~	230	230	230	230
Power consumption					
– Max.	W	60	60	60	60
– Min.	W	2	2	2	2
– Delivered condition	W	14.6	21.9	34.3	60.0
Energy efficiency class		A	A	A	A
Energy efficiency index (EEI)		≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.20

## Vitodens 100-W (cont.)

### Residual head of integral circulation pump



(M) Upper operational limit (integral bypass opens)

Curve	Pump rate of circulation pump
(A)	10 %
(B)	20 %
(C)	30 %
(D)	40 %
(E)	50 %
(F)	60 %
(G)	70 %
(H)	80 %
(K)	90 %
(L)	100 %

### Standby instantaneous water heater (gas condensing combi boiler)

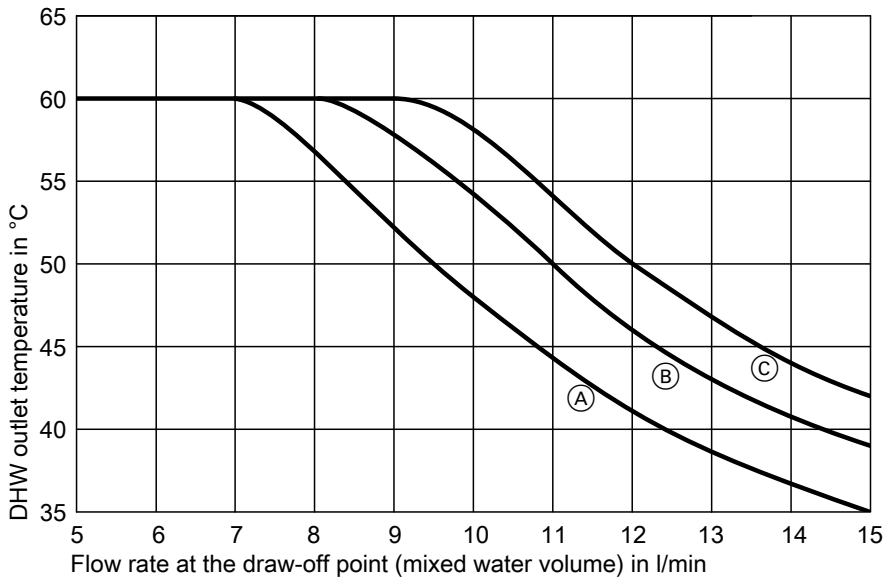
A standby instantaneous water heater is integrated into the Vitodens 100-W, type B1KF.

#### Output levels

Rated heating output, gas condensing combi boiler	kW	19.0	25.0	32.0
Continuous DHW output	kW	27.1	31.1	34.4
For DHW heating from 10 to 45 °C	l/h	666	764	845
Draw-off rate	l/min	3 to 12	3 to 14	3 to 16
Outlet temperature, adjustable	°C	30 to 60	30 to 60	30 to 60

## Vitodens 100-W (cont.)

### DHW temperature subject to flow rate



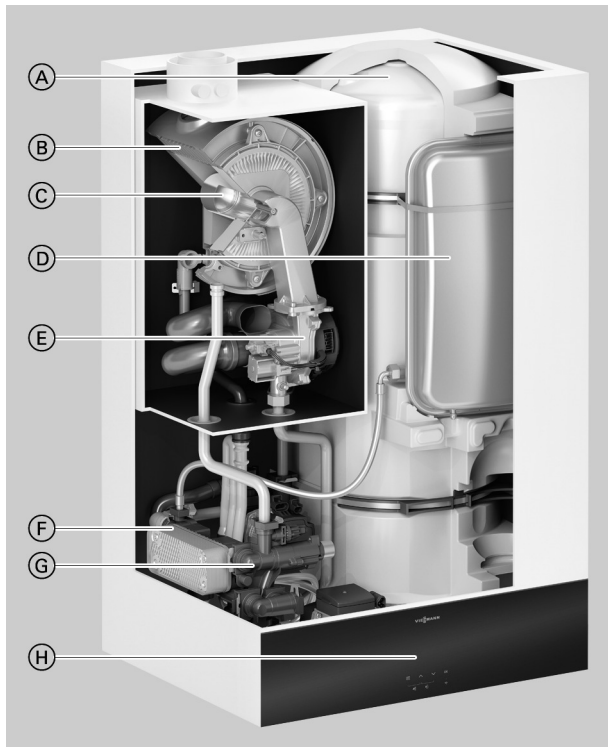
- (A) Vitodens 100-W, 19 kW
- (B) Vitodens 100-W, 25 kW
- (C) Vitodens 100-W, 32 kW

The graph illustrates the changes in the outlet temperature, subject to the flow rate at the draw-off point.

If a greater volume of water is required, cold water needs to be admixed, which reduces the outlet temperature.

The illustrated outlet temperature characteristics are based on a cold water inlet temperature of 10 °C.

## 2.1 Product description



- (A) Loading cylinder made from stainless steel
- (B) Inox-Radial heat exchanger made from stainless steel – for high operational reliability, a long service life and high heating output on a very small footprint
- (C) Modulating Matrix-Plus gas burner with intelligent Lambda Pro combustion controller for extremely clean combustion and quiet operation
- (D) Integral diaphragm expansion vessel
- (E) Variable speed combustion air fan for quiet and economical operation
- (F) Plate heat exchanger
- (G) Hydraulics with integral, variable speed high efficiency circulation pump
- (H) Digital boiler control unit with black/white screen

The Vitodens 111-W is a particularly space saving, wall mounted gas condensing storage combi boiler for situations where high DHW convenience is required. The heat cell comprises the proven stainless steel Inox-Radial heat exchanger, the modulating Matrix-Plus gas burner and the Lambda Pro Control automatic combustion controller. The integral 46 l stainless steel loading cylinder offers the same DHW convenience as a separate 150 l DHW cylinder with internal indirect coil. DHW is available immediately and constantly at the required temperature, even simultaneously at different draw-off points. In addition to the loading cylinder, all the most important system components, such as the heating water expansion vessel, pumps and safety valves, are integrated and fully fitted. All this – with a total weight of max. 68 kg and in a casing that fits into a standard 600 mm wide kitchen unit space.

### Recommended applications

- Installation in detached and terraced houses
- New build (e.g. prefabricated houses and developer projects):  
Installation in utility rooms and attics
- Modernisation: Replacement of gas system boilers, floorstanding atmospheric gas boilers and oil/gas boilers with DHW cylinders installed below.
- Replacement of boilers in various types of systems, including those with several heating circuits and underfloor heating

### Benefits at a glance

- Seasonal central heating energy efficiency  $\eta_s$  up to 94 % (label A).
- Low cycle frequency, even with low heat demand, due to optimised pauses and a wide modulation range down to 1:10
- Durable and efficient thanks to Inox-Radial stainless steel heat exchanger
- Matrix-Plus gas burner with Lambda Pro combustion controller for permanently high efficiency and clean combustion.
- Power saving, high efficiency circulation pump
- Black/white display with 7-segment display, commissioning assistant and option to operate from a mobile device
- Web-enabled through integral WiFi interface for operation and service via Viessmann app

### Delivered condition

Gas condensing boiler with Inox-Radial heat exchanger, modulating Matrix-Plus gas burner for natural gas and LPG to DVGW Code of Practice G260 [Germany], expansion vessel, variable speed high efficiency circulation pump and integral stainless steel DHW loading cylinder. Fully plumbed and wired. Weather-compensated or constant temperature control unit with integral WiFi interface. Colour of the epoxy-coated casing: Vitopearlwhite. Integral diaphragm expansion vessel (10 l capacity). Preset for operation with natural gas. Conversion within gas groups E/LL is not required. The conversion to LPG is made at the control unit (a conversion kit is not required). The gas condensing boiler is suitable for operation with a hydrogen admixture of up to 20 % by volume.

### Note on multiple connection

*If multiple appliances are to be connected to a common flue system, the **multiple connection** version of the appliance will be required. Using appliances for individual connection, or operating a mix of appliances for individual and multiple connection, on a common flue system is **not permitted**. The multiple connection version is already fitted with an internal back draught safety device. When installing with multiple connections, it is **essential** to order an additional back draught safety device for the boiler flue connection to each appliance. The multiple connection version cannot be operated with LPG.*

### Accessories required (order separately)


Pre-plumbing jig with:

- Fixings
- Valves/fittings
- DHW safety valve
- Boiler drain & fill valve
- Gas shut-off valve with thermally activated safety shut-off valve

For either surface or flush mounting

## Vitodens 111-W (cont.)

### Tested quality

 CE designation according to current EU Directives

Meets the requirements for the "Blue Angel" ecolabel to RAL UZ 61.

## 2.2 Specification

Gas boiler, type B and C, category II <sub>2N3P</sub>		B1LF		
Type		B1LF		
<b>Rated heating output range (details to EN 15502)</b>				
T <sub>F</sub> /T <sub>R</sub> = 50/30 °C (P(50/30))				
Natural gas	kW	3.2 (5.7 <sup>*7</sup> ) to 19.0	3.2 (5.7 <sup>*7</sup> ) to 25.0	3.2 (5.7 <sup>*7</sup> ) to 32.0
LPG	kW	3.2 to 19.0	3.2 to 25.0	3.2 to 32.0
T <sub>F</sub> /T <sub>R</sub> = 80/60 °C (Pn(80/60))				
Natural gas	kW	2.9 (5.2 <sup>*7</sup> ) to 17.5	2.9 (5.2 <sup>*7</sup> ) to 23	2.9 (5.2 <sup>*7</sup> ) to 29.3
LPG	kW	2.9 to 17.5	2.9 to 23	2.9 to 29.3
<b>Rated heating output for DHW heating</b>				
Natural gas	kW	2.9 (5.2 <sup>*7</sup> ) to 26.8	2.9 (5.2 <sup>*7</sup> ) to 31.1	2.9 (5.2 <sup>*7</sup> ) to 34.6
LPG	kW	2.9 to 26.8	2.9 to 31.1	2.9 to 34.6
<b>Rated heat input (Q<sub>n</sub>)</b>				
Natural gas	kW	3.0 (5.3 <sup>*7</sup> ) to 17.8	3.0 (5.3 <sup>*7</sup> ) to 23.4	3.0 (5.3 <sup>*7</sup> ) to 29.9
LPG	kW	3.0 (5.3 <sup>*7</sup> ) to 17.8	3.0 (5.3 <sup>*7</sup> ) to 23.4	3.0 (5.3 <sup>*7</sup> ) to 29.9
<b>Rated heat input for DHW heating (Q<sub>nw</sub>)</b>		27.3	31.7	34.9
Natural gas	kW	3.0 (5.3 <sup>*7</sup> ) to 27.3	3.0 (5.3 <sup>*7</sup> ) to 31.7	3.0 (5.3 <sup>*7</sup> ) to 34.9
LPG	kW	3.0 to 27.3	3.0 to 31.7	3.0 to 34.9
<b>Product ID</b>		CE-0085DL0217		
<b>IP rating</b>		IP X1 to EN 60529		
<b>NO<sub>x</sub></b>	Class	6	6	6
<b>Gas supply pressure</b>				
Natural gas	mbar	20	20	20
	kPa	2	2	2
LPG	mbar	50	50	50
	kPa	5	5	5
<b>Max. perm. gas supply pressure<sup>*8</sup></b>				
Natural gas	mbar	13 to 25.0	13 to 25.0	13 to 25.0
	kPa	1.3 to 2.5	1.3 to 2.5	1.3 to 2.5
LPG	mbar	25 to 57.5	25 to 57.5	25 to 57.5
	kPa	2.5 to 5.75	2.5 to 5.75	2.5 to 5.75
<b>Rated voltage</b>		V		
Rated frequency		Hz		
Appliance fuse protection		A		
Backup fuse (power supply)		A		
<b>Communication module (integral)</b>				
WiFi frequency band	MHz	2400 to 2483.5		
Max. transmission power	dBm	20		
Low power radio frequency band	MHz	2400 to 2483.5		
Max. transmission power	dBm	10		
Supply voltage	V $\equiv$	24		
Power consumption	W	4		
<b>Sound power level (to EN ISO 15036-1)</b>				
– At partial load	dB(A)	35	35	35
– At rated heating output (DHW heating)	dB(A)	49.7	51.1	52.9
<b>Power consumption (delivered condition)</b>		W	71	110
<b>Permissible ambient temperature</b>				
– During operation		Frost-free, dry and heated room		
– During storage and transport		°C		
<b>Electronic temperature limiter setting (TN)</b>		°C		
<b>Electronic temperature cut-out setting</b>		°C		
<b>Electronic flue gas temperature limiter setting</b>		°C		
<b>Weight</b>				
– Excl. heating water and DHW	kg	67.8	67.8	67.8
– Incl. heating water and DHW	kg	120.0	120.0	120.0
<b>Water capacity (excl. diaphragm expansion vessel)</b>		l	3.0	3.0
<b>Max. flow temperature</b>		°C	82	82

<sup>\*7</sup> Appliances for multiple connection of type B1LF-[kW]-M

<sup>\*8</sup> If the gas supply pressure is higher than the maximum permissible value, install a separate gas pressure governor upstream of the system.





## Vitodens 111-W (cont.)

Gas boiler, type B and C, category II <sub>2N3P</sub>		B1LF		
Type				
<b>Rated heating output range (details to EN 15502)</b>				
T <sub>F</sub> /T <sub>R</sub> = 50/30 °C (P(50/30))				
Natural gas	kW	3.2 (5.7 <sup>*7</sup> ) to 19.0	3.2 (5.7 <sup>*7</sup> ) to 25.0	3.2 (5.7 <sup>*7</sup> ) to 32.0
LPG	kW	3.2 to 19.0	3.2 to 25.0	3.2 to 32.0
T <sub>F</sub> /T <sub>R</sub> = 80/60 °C (Pn(80/60))				
Natural gas	kW	2.9 (5.2 <sup>*7</sup> ) to 17.5	2.9 (5.2 <sup>*7</sup> ) to 23	2.9 (5.2 <sup>*7</sup> ) to 29.3
LPG	kW	2.9 to 17.5	2.9 to 23	2.9 to 29.3
Max. flow rate	l/h	See residual head graphs		
(Limit for the use of hydraulic separation)				
<b>Nominal circulating water volume</b>		752	988	1259
At T <sub>F</sub> /T <sub>R</sub> = 80/60 °C				
<b>Expansion vessel</b>				
Capacity	l	10	10	10
Pre-charge pressure	bar	0.75	0.75	0.75
	kPa	75	75	75
<b>Permiss. operating pressure</b>	bar	3	3	3
	MPa	0.3	0.3	0.3
<b>Connections (with connection accessories)</b>				
Boiler flow and return	R	¾	¾	¾
Cold water and DHW	G	½	½	½
<b>Dimensions</b>				
Length	mm	500	500	500
Width	mm	600	600	600
Height	mm	950	950	950
<b>Gas connection (with connection accessories)</b>	R	¾	¾	¾
<b>DHW loading cylinder</b>				
Capacity	l	46	46	46
Permiss. operating pressure (DHW side)	bar	10	10	10
	MPa	1	1	1
Continuous DHW output	kW	26.6	30.3	33.9
For DHW heating from 10 to 45 °C	l/h	643.2	726.6	813.6
Performance factor N <sub>L</sub> <sup>*9</sup>		1.2	1.5	1.7
<b>Initial DHW output</b>	l/10 min	154.2	170.3	180.8
For DHW heating from 10 to 45 °C				
<b>Supply values</b>				
Relative to the max. load and 1013 mbar/15 °C				
Natural gas E	m <sup>3</sup> /h	2.89	3.35	3.69
Natural gas LL	m <sup>3</sup> /h	3.36	3.90	4.29
LPG	kg/h	2.12	2.46	2.71
<b>Flue gas parameters</b>				
Temperature (at a return temperature of 30 °C)				
– At rated heating output	°C	41	46	59
– At partial load	°C	38	38	38
Temperature (at a return temperature of 60 °C)				
Flue gas superheating temperature	°C	70	74	77
Mass flow rate (for DHW heating)		120	120	120
Natural gas				
– At maximum heating output	kg/h	49.3	57.3	62.1
– At partial load	kg/h	5.6 (9.8)	5.6 (9.8)	5.6 (9.8)
LPG				
– At maximum heating output	kg/h	49.2	57.1	61.1
– At partial load	kg/h	3.9	3.9	3.9
Available draught	Pa			
	mbar			

\*7 Appliances for multiple connection of type B1LF-[kW]-M

\*9 At 70 °C average boiler water temperature and cylinder storage temperature T<sub>cyl</sub> = 60 °C.

DHW performance factor N<sub>L</sub> depends on cylinder storage temperature T<sub>cyl</sub>.

Standard values: T<sub>cyl</sub> = 60 °C → 1.0 × N<sub>L</sub> T<sub>cyl</sub> = 55 °C → 0.75 × N<sub>L</sub> T<sub>cyl</sub> = 50 °C → 0.55 × N<sub>L</sub> T<sub>cyl</sub> = 45 °C → 0.3 × N<sub>L</sub>.

## Vitodens 111-W (cont.)

Gas boiler, type B and C, category II<sub>2N3P</sub>

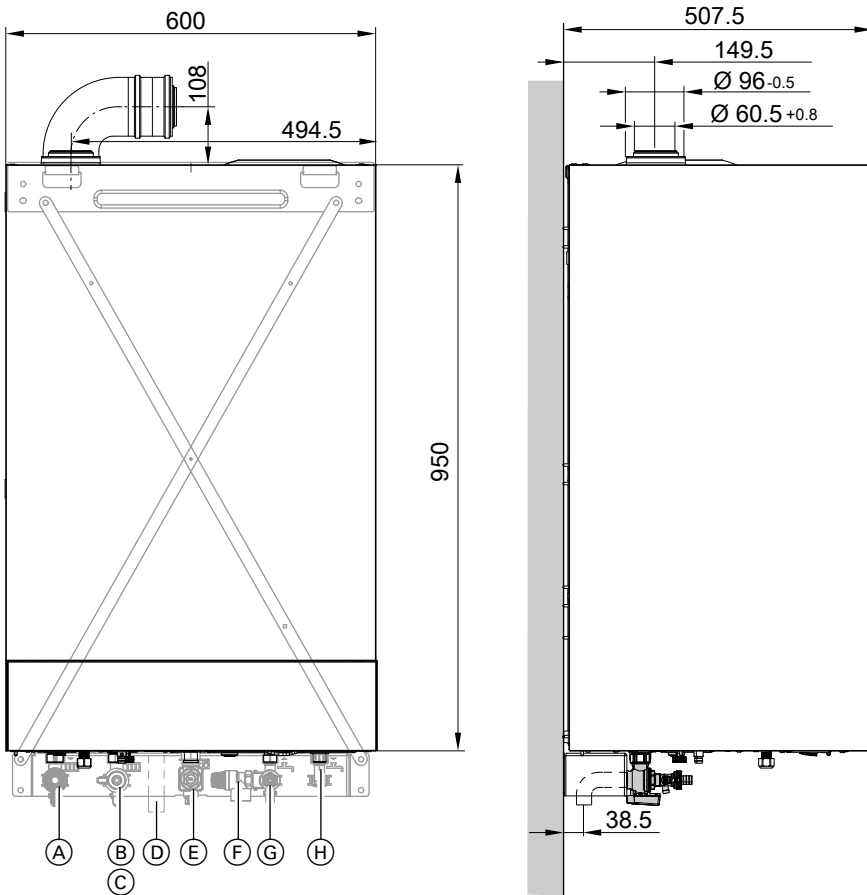
Type		B1LF		
<b>Rated heating output range (details to EN 15502)</b>				
$T_F/T_R = 50/30 \text{ °C (P(50/30))}$				
Natural gas	kW	3.2 (5.7 <sup>*7</sup> ) to 19.0	3.2 (5.7 <sup>*7</sup> ) to 25.0	3.2 (5.7 <sup>*7</sup> ) to 32.0
LPG	kW	3.2 to 19.0	3.2 to 25.0	3.2 to 32.0
$T_F/T_R = 80/60 \text{ °C (Pn(80/60))}$				
Natural gas	kW	2.9 (5.2 <sup>*7</sup> ) to 17.5	2.9 (5.2 <sup>*7</sup> ) to 23	2.9 (5.2 <sup>*7</sup> ) to 29.3
LPG	kW	2.9 to 17.5	2.9 to 23	2.9 to 29.3
<b>Available draught</b>	Pa	25	25	25
For type C <sub>(10)</sub> (at interface to collector pipe system)				
Maximum permissible pressure differential between flue gas outlet and air inlet with C <sub>(10)</sub> <sup>*10</sup>	Pa	-200	-200	-200
<b>Available draught</b>	Pa	527	698	635
For type B <sub>23P</sub>				
<b>Max. amount of condensate</b>	l/h	3.2	4.1	4.9
To DWA-A 251				
<b>Condensate connection</b> (hose nozzle)	Ø mm	20 to 24	20 to 24	20 to 24
<b>Flue gas connection</b>	Ø mm	60	60	60
<b>Ventilation air connection</b>	Ø mm	100	100	100
<b>Standard seasonal efficiency [to DIN] at</b>		Up to 98 (H <sub>s</sub> ) [gross cv]		
$T_F/T_R = 40/30 \text{ °C}$	%			
<b>Energy efficiency class</b>				
- Heating		A	A	A
- DHW heating, draw-off profile XL		A	A	A

### Note

The supply values are only for reference (e.g. in the gas contract application) or for a supplementary, rough estimate to check the volumetric settings. Due to factory settings, the gas pressure must not be altered from these values. Reference: 15 °C, 1013 mbar (101.3 kPa).

\*7 Appliances for multiple connection of type B1LF-[kW]-M

\*10 Appliances for multiple connection, type B1LF-M (for multiple connection)



- (A) Heating flow
- (B) Heating return
- (C) Filling/draining
- (D) Condensate drain
- (E) Gas connection
- (F) Safety valve
- (G) Cold water
- (H) DHW

**Note**

This boiler (IP rating: IP X1) is approved for installation in wet rooms inside safety zone 3. Exposure to water jets and spray must be prevented.

For open flue operation, the boiler may only be operated with a splash cover.

Observe the requirements of DIN VDE 0100.

**Variable speed heating circuit pump in the Vitodens 111-W**

The integral circulation pump is a highly efficient pump with substantially lower power consumption than conventional pumps.

The pump speed and consequently the pump rate are controlled subject to the outside temperature and the switching times for heating mode or reduced mode. The control unit transmits the currently specified speeds to the circulation pump via a PWM signal.

The min. and max. speeds and the speed for reduced mode can be matched to the existing heating system via parameters at the control unit.

Setting (%) in group heating circuit 1:

- Min. speed: Parameter 1102.0
- Max. speed: Parameter 1102.1

- In the delivered condition, the minimum pump rate and the maximum pump rate are set to the following values:

Rated heating output in kW	Speed settings in the delivered condition in %	
	Min. pump rate	Max. pump rate
19	40	70
25	40	80
32	40	100

- In conjunction with a low loss header, heating water buffer cylinder and heating circuits with mixer, the internal circulation pump runs at a constant speed.

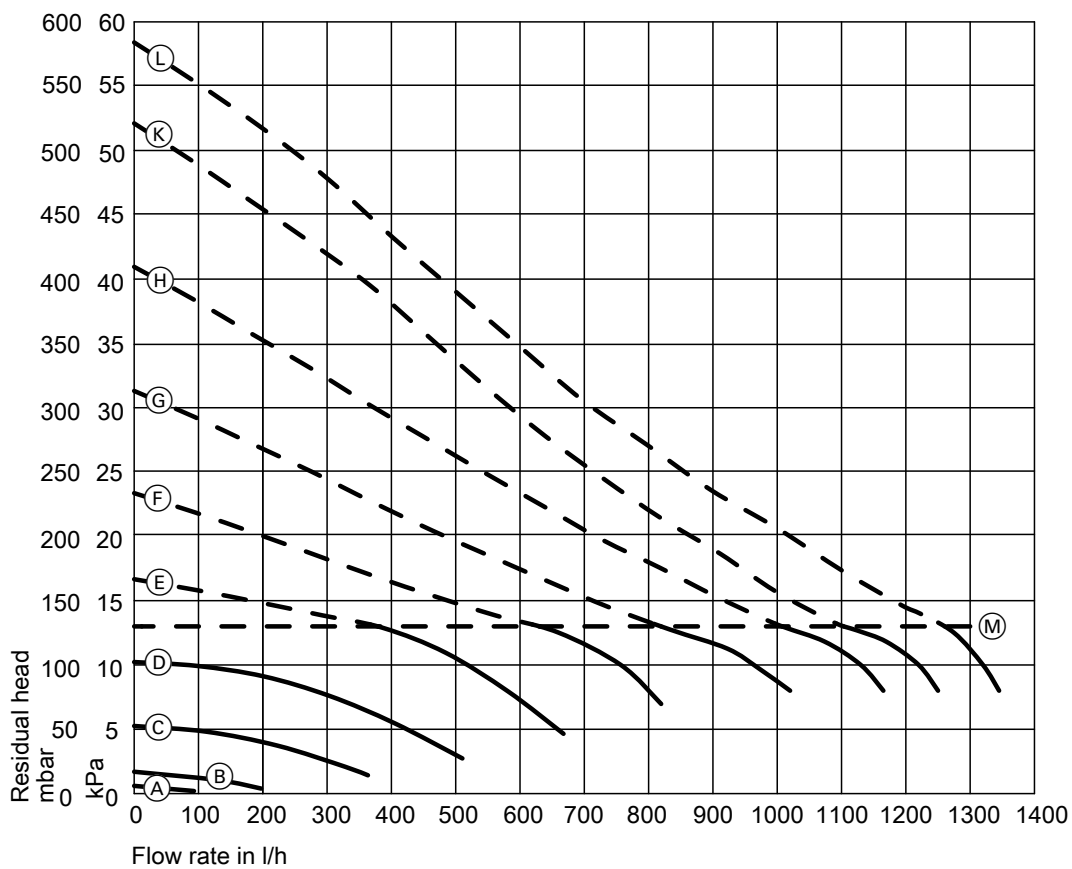
## Vitodens 111-W (cont.)

### Specification – circulation pump

Rated heating output	kW	19	25	32
Circulation pump	Type	UPM3 15-75	UPM3 15-75	UPM3 15-75
Rated voltage	V~	230	230	230
Power consumption				
– Max.	W	60	60	60
– Min.	W	2	2	2
– Delivered condition	W	21.9	34.3	60
Energy efficiency class		A	A	A
Energy efficiency index (EEI)		≤ 0.20	≤ 0.20	≤ 0.20

2

### Residual head of integral circulation pump



(M) Upper operational limit (integral bypass opens)

Curve	Pump rate of circulation pump
(A)	10 %
(B)	20 %
(C)	30 %
(D)	40 %
(E)	50 %
(F)	60 %
(G)	70 %
(H)	80 %
(K)	90 %
(L)	100 %

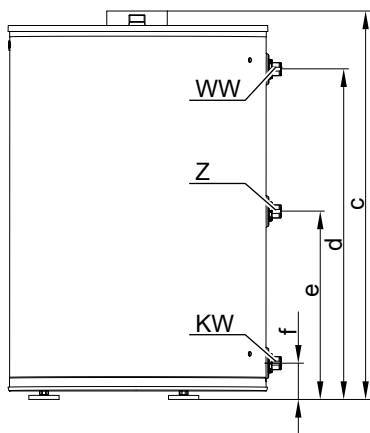
## Separate DHW cylinders for Vitodens 100-W

### 3.1 Vitocell 100-W below the boiler

#### Specification

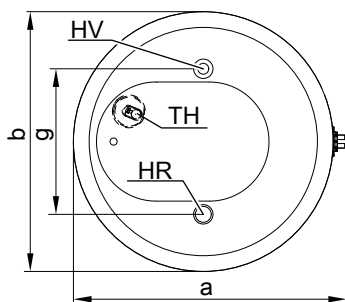
Type		CUGA	CUGB	CUGB-A	CUGB	CUGB-A
<b>Cylinder capacity</b>	l	100	120		150	
<b>Heating water capacity</b>	l	6	6.5		6.5	
<b>Gross volume</b>	l	106	126.5		156.5	
<b>DIN registration no.</b>		Applied for				
<b>Connections (male thread)</b>						
Heating water flow and return	R	1	1	1	1	1
DHW and cold water	R	¾	¾	¾	¾	¾
DHW circulation	R	¾	¾	¾	¾	¾
<b>Permissible temperatures</b>						
– Heating water side	°C	160	160	160	160	160
– DHW side	°C	95	95	95	95	95
<b>Permissible operating pressure</b>						
Heating water and DHW sides	bar	10	10	10	10	10
	MPa	1	1	1	1	1
<b>Standby heat loss</b>	kWh/24 h	1.239	1.015	0.866	1.041	0.853
<b>Dimensions</b>						
Length a	mm	577	582	634	634	634
Width b	mm	∅ 549	∅ 582	∅ 634	∅ 634	∅ 634
Height c	mm	815	929	929	958	958
<b>Weight</b>	kg	48	55	58	61	61
Heating area	m <sup>2</sup>	0.9	1.0	1.0	1.0	1.0
<b>Energy efficiency class</b>		C	B	A	B	A
<b>Colour</b>		Vitopearlwhite				

#### Dimensions of type CUGA, 100 l



#### Dimensions of type CUGA

Dim.		
a	mm	577
b	mm	549
c	mm	815
d	mm	700
e	mm	398
f	mm	77
g	mm	308

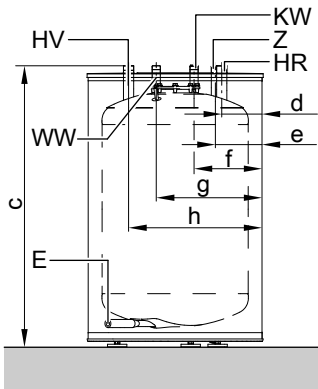


- HR Heating return
- HV Heating flow
- KW Cold water (drain)
- WW DHW
- TH Sensor well for cylinder temperature sensor (int. dia. 7 mm)
- Z DHW circulation

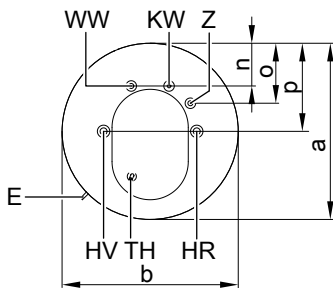
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## Separate DHW cylinders for Vitodens 100-W (cont.)

### Dimensions of type CUGB, CUGB-A, 120 and 150 l



HV Heating flow  
 KW Cold water  
 WW DHW  
 TH Sensor well for cylinder temperature sensor (int. dia. 7 mm)  
 Z DHW circulation



E Drain  
 HR Heating return

### Dimensions of type CUGB, CUGB-A

Type	CUGB	CUGB-A	CUGB	CUGB-A
Capacity	120 l		150 l	
a mm	582	634	634	634
b mm	582	634	634	634
c mm	929	929	958	958
d mm	137	163	163	163
e mm	158	184	184	184
f mm	229	255	255	255
g mm	353	379	379	379
h mm	445	471	471	471
n mm	141	167	167	167
o mm	198	224	224	224
p mm	291	317	317	317

### DHW performance data at rated heating output

#### Type CUGA

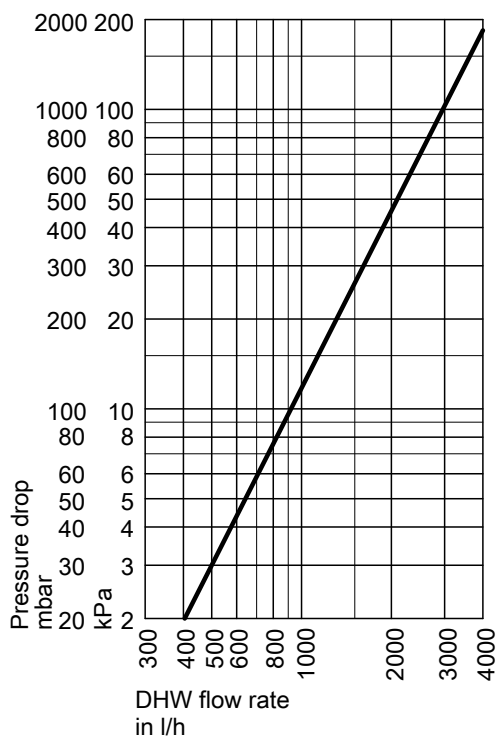
Rated heating output of the wall mounted appliance for DHW heating	kW	16	18	19	22	24	25	32
Continuous DHW output	kW	16	18	19	22	22	22	22
For DHW heating from 10 to 45 °C and an average boiler water temperature of 78 °C	l/h	390	440	465	540	540	540	540
Performance factor $N_L$ to DIN 4708								
Cylinder capacity: 100 l		1.0	1.0	1.0	1.0	1.0	1.0	1.0
Peak output over 10 min								
Cylinder capacity: 100 l	l/10 min	143	143	143	143	143	143	143

## Separate DHW cylinders for Vitodens 100-W (cont.)

### Type CUGB, CUGB-A

Rated heating output of the wall mounted appliance for DHW heating	kW	16	18	19	22	24	25	32
<b>Continuous DHW output</b> For DHW heating from 10 to 45 °C and an average boiler water temperature of 78 °C	kW l/h	16 390	18 440	19 465	22 540	24 590	24 590	24 590
<b>Performance factor <math>N_L</math> to DIN 4708</b>								
Cylinder capacity								
120 l		1.2	1.2	1.2	1.2	1.2	1.2	1.2
150 l		1.6	1.6	1.6	1.6	1.6	1.6	1.6
<b>Peak output over 10 min</b>								
Cylinder capacity								
120 l	l/10 min	153	153	153	153	153	153	153
150 l	l/10 min	173	173	173	173	173	173	173

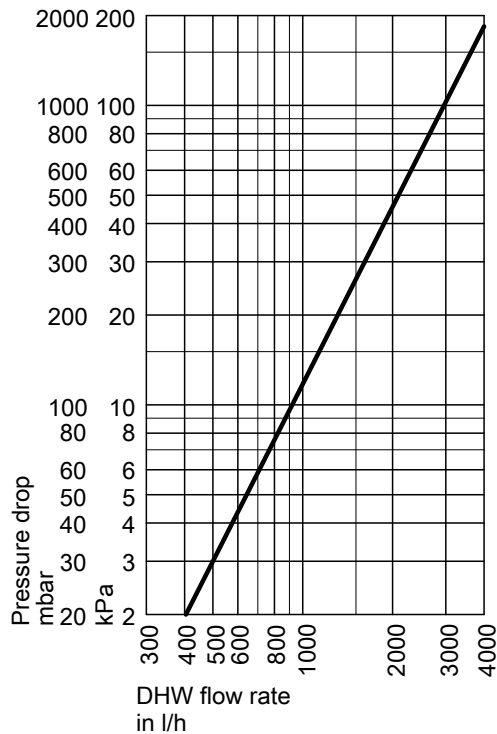
### Pressure drop on the DHW side





## Separate DHW cylinders for Vitodens 100-W (cont.)

### Pressure drop on the DHW side



### DHW output data at rated heating output

<b>Rated heating output for DHW heating</b>	<b>kW</b>	<b>17.5</b>	<b>23.0</b>	<b>29.3</b>
<b>Continuous DHW output</b>	<b>kW</b>	17.5	23.0	24
For DHW heating from 10 to 45 °C and an average boiler water temperature of 78 °C	<b>l/h</b>	425	555	590
<b>Performance factor <math>N_L</math></b> to DIN 4708				
Cylinder capacity 120 l		1.2	1.2	1.2
Cylinder capacity 150 l		1.6	1.6	1.6
<b>Peak output</b> over 10 minutes				
Cylinder capacity 120 l	<b>l/10 min</b>	153	153	153
Cylinder capacity 150 l	<b>l/10 min</b>	173	173	173

### Delivered condition

#### Delivered condition

#### Type CUGB, CUGB-A

DHW cylinder with **120 and 150 l** capacity:

- Fitted thermal insulation
- Sheet steel casing, epoxy-coated: Vitoppearlwhite
- Adjustable feet
- Cylinder and internal indirect coil made from steel, corrosion protection through Ceraprotect enamel coating
- Additional cathodic protection with protective magnesium anode
- Welded sensor well for cylinder temperature sensor

#### Vitocell 100-W, type CUGA, CUGB and CUGB-A 100, 120 and 150 l

DHW cylinder made from steel with Ceraprotect enamel coating

- Welded sensor well for cylinder temperature sensor
- Threaded adjustable feet
- Protective magnesium anode
- Fitted thermal insulation

Colour of the epoxy-coated sheet steel casing: Vitoppearlwhite

## Separate DHW cylinders for Vitodens 100-W (cont.)

### 3.2 Vitocell 100-W adjacent to the boiler

For further specifications: See the separate datasheet for the Vitocell 100-V/100-W.

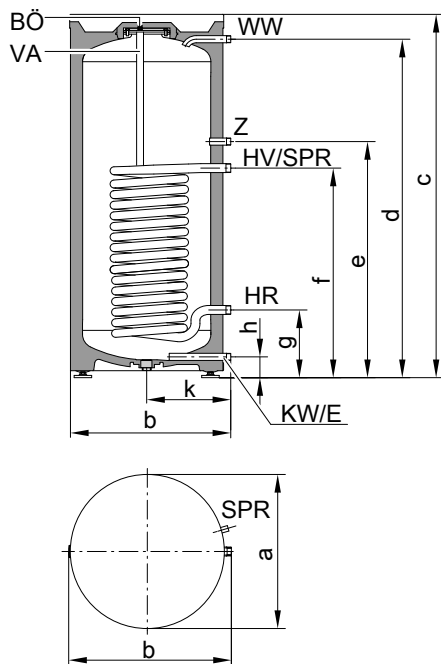
#### Sizing entry points

The actual dimensions of the DHW cylinder may vary slightly due to manufacturing tolerances.

#### Specification

Type		CVAA/CVAB-A	CVAA/CVAB-A	CVAB
<b>Cylinder capacity</b> (AT: Actual water capacity)	l	<b>160</b>	<b>200</b>	<b>300</b>
<b>Heating water capacity</b>	l	5.5	5.5	10.0
<b>Gross volume</b>	l	165.5	205.5	310.0
<b>DIN registration no.</b>		Applied for		
<b>Connections (male thread)</b>				
Heating water flow and return	R	1	1	1
DHW and cold water	R	¾	¾	1
DHW circulation	R	¾	¾	1
<b>Permissible temperatures</b>				
– Heating water side	°C	160	160	160
– DHW side	°C	95	95	95
<b>Permissible operating pressure</b>				
– Heating water side	bar	25	25	25
	MPa	2.5	2.5	2.5
– DHW side	bar	10	10	10
	MPa	1	1	1
<b>Standby heat loss</b>	kWh/24 h	0.97/1.35	1.04/1.46	1.65
<b>Dimensions</b>				
Length a (∅)	mm	582/634	582/634	668
Width b	mm	607/637	607/637	706
Height c	mm	1128/1129	1348/1349	1687
<b>Weight</b>	kg	62/65	70/73	115
<b>Energy efficiency class</b>		B / A	B / A	B
<b>Colour</b>		Vitosilver Vitopearlwhite		
– Vitocell 100-V				
– Vitocell 100-W				

#### Dimensions of type CVAA, CVAB-A, 160 and 200 l capacity



- HR Heating water return
- HV Heating water flow
- KW Cold water
- SPR Clamping device for securing immersion temperature sensors to the cylinder jacket, with fixing points for 3 immersion temperature sensors
- VA Protective magnesium anode
- WW DHW
- Z DHW circulation

#### Dimensions of type CVAA, CVAB-A

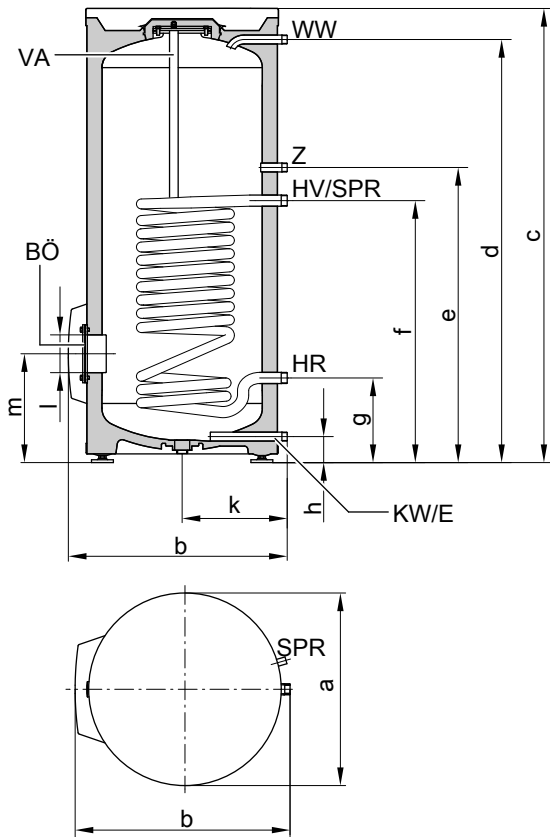
Type		CVAA		CVAB-A		
Cylinder capacity	l	160	200	160	200	
Length (∅)	a	mm	582	582	634	634
Width	b	mm	607	607	637	637
Height	c	mm	1128	1348	1129	1349
	d	mm	1055	1275	1055	1275
	e	mm	889	889	889	889
	f	mm	639	639	639	639
	g	mm	254	254	254	254
	h	mm	77	77	77	77
	k	mm	317	317	347	347

- BÖ Inspection and cleaning aperture
- E Drain

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## Separate DHW cylinders for Vitodens 100-W (cont.)

### Dimensions of type CVAB, 300 l capacity



- HR Heating water return
- HV Heating water flow
- KW Cold water
- SPR Cylinder temperature sensor of the cylinder temperature controller or thermostat
- VA Protective magnesium anode
- WW DHW
- Z DHW circulation

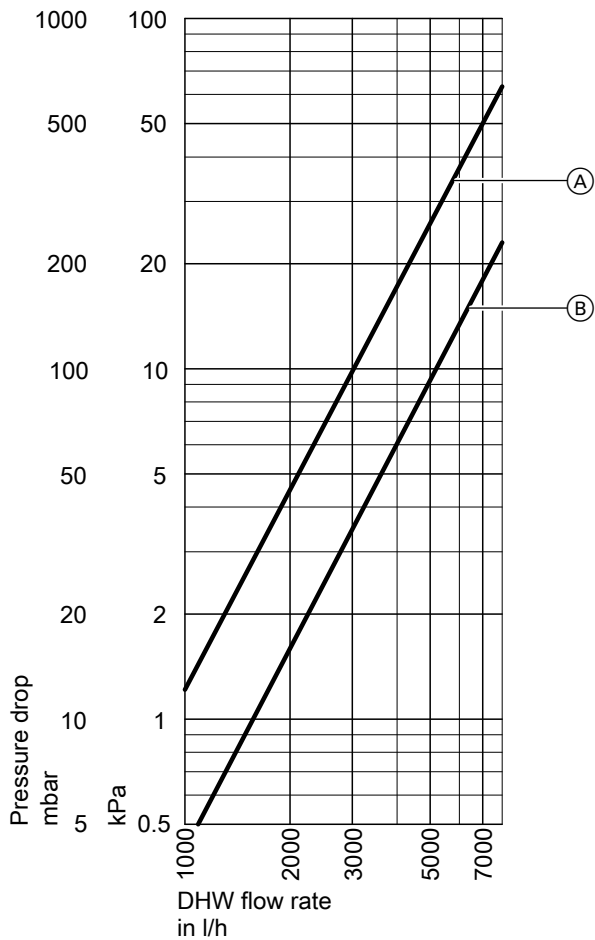
### Dimensions of type CVAB

Cylinder capacity		l		300
Length (∅)	a	mm		668
Width	b	mm		706
Height	c	mm		1687
	d	mm		1607
	e	mm		1122
	f	mm		882
	g	mm		267
	h	mm		83
	k	mm		362
	l	mm		∅ 100
	m	mm		340

- BÖ Inspection and cleaning aperture
- E Drain

## Separate DHW cylinders for Vitodens 100-W (cont.)

### Pressure drop on the DHW side



- (A) 160 and 200 l  
 (B) 300 l

### DHW output data at rated heating output

Rated heating output for DHW heating	kW	17.5	23.0	29.3
<b>Continuous DHW output</b>				
For DHW heating from 10 to 45 °C and an average boiler water temperature of 78 °C				
Cylinder capacity 160 and 200 l	kW	17.5	23.0	26
	l/h	425	555	638
Cylinder capacity 300 l	kW	17.5	23.0	29.3
	l/h	425	555	715
<b>Performance factor N<sub>L</sub></b>				
to DIN 4708				
Cylinder capacity 160 l		2.1	2.2	2.2
Cylinder capacity 200 l		3.1	3.2	3.2
Cylinder capacity 300 l		7.5	8.0	8.0
<b>Peak output</b>				
over 10 minutes				
Cylinder capacity 160 l	l/10 min	192	199	199
Cylinder capacity 200 l	l/10 min	233	236	236
Cylinder capacity 300 l	l/10 min	360	368	368

## Separate DHW cylinders for Vitodens 100-W (cont.)

### Delivered condition

#### Delivered condition

##### Type CVAA, CVAB-A

DHW cylinder with **160 and 200 l** capacity:

- Fitted thermal insulation
- Sheet steel casing, epoxy-coated: Vitoppearlwhite or Vitosilver
- Adjustable feet
- Cylinder and internal indirect coil made from steel, corrosion protection through Ceraprotect enamel coating
- Additional cathodic protection with protective magnesium anode
- Clamping device for securing immersion temperature sensors to the cylinder jacket, with fixing points for 3 immersion temperature sensors

##### Type CVAB

DHW cylinder with **300 l** capacity:

- Fitted thermal insulation
- Sheet steel casing, epoxy-coated: Vitoppearlwhite or Vitosilver
- Adjustable feet
- Cylinder and internal indirect coil made from steel, corrosion protection through Ceraprotect enamel coating
- Additional cathodic protection with protective magnesium anode
- Clamping device for securing immersion temperature sensors to the cylinder jacket, with fixing points for 3 immersion temperature sensors

## Separate DHW cylinders for Vitodens 100-W (cont.)

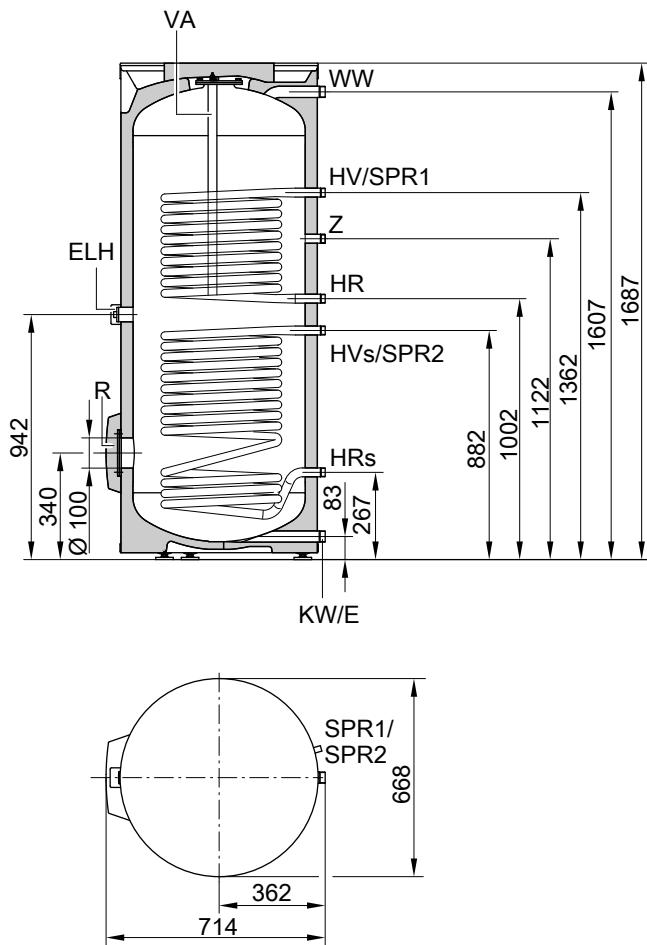
### 3.3 Vitocell 100-W adjacent to the boiler for dual mode DHW heating

For further specifications, see the separate datasheet for the Vitocell 100-B/100-W.

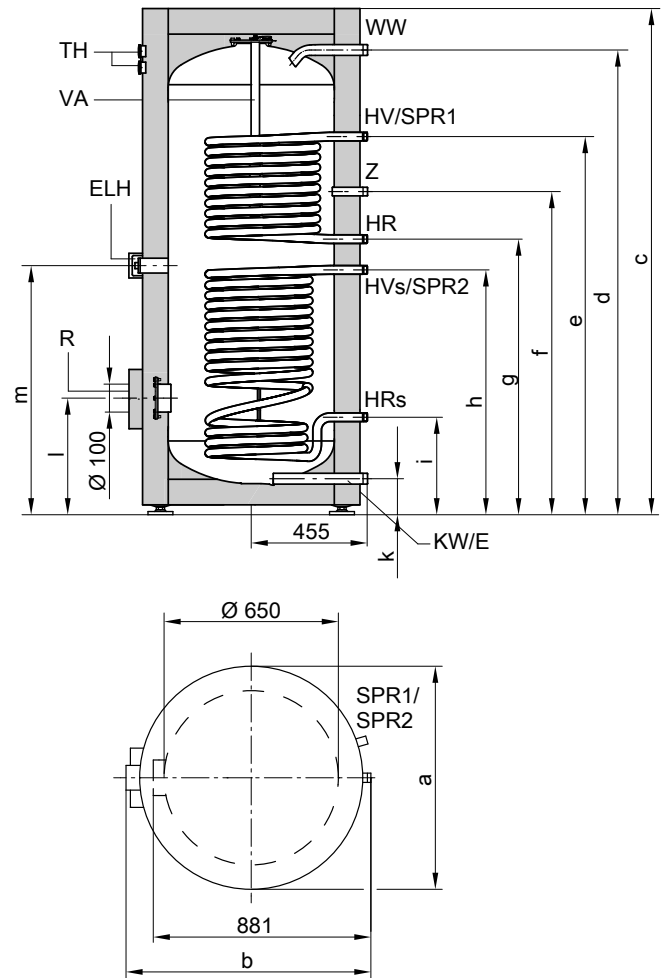
Type		CVBC	CVB
<b>Cylinder capacity</b> (AT: Actual water capacity)	l	300	400
<b>Heating water capacity</b>	l	16	17
<b>Gross volume</b>	l	316	417
<b>DIN registration no.</b>		Applied for	9W242/11-13 MC/E
<b>Connections (male thread)</b>			
Heating water flow and return	R	1	1
DHW and cold water	R	1	1¼
DHW circulation	R	1	1
<b>Permissible temperatures</b>			
– Heating water side	°C	160	160
– DHW side	°C	95	95
– Solar side	°C	160	160
<b>Permissible operating pressure</b> on the heating water, solar and DHW sides	bar MPa	10 1	10 1
<b>Standby heat loss</b>	kWh/24 h	1.65	1.80
<b>Dimensions</b>			
Length a (∅)	mm	667	859
Width b	mm	714	923
Height d	mm	1687	1624
<b>Weight</b>	kg	126	167
<b>Energy efficiency class</b>		B	B
<b>Colour</b>			
– Vitocell 100-B		Vitosilver	Vitopearlwhite
– Vitocell 100-W		Vitopearlwhite	—

## Separate DHW cylinders for Vitodens 100-W (cont.)

Dimensions of type CVB, 300 l capacity



Dimensions of type CVB, 400 l capacity



- E Drain
- ELH Immersion heater
- HR Heating water return
- HR<sub>s</sub> Heating water return, solar thermal system
- HV Heating water flow
- HV<sub>s</sub> Heating water flow, solar thermal system
- KW Cold water
- R Inspection and cleaning aperture with flange cover (also suitable for installation of an immersion heater)
- SPR1 Clamping device for securing immersion temperature sensors to the cylinder jacket, with fixing points for 3 immersion temperature sensors
- SPR2 Clamping device for securing immersion temperature sensors to the cylinder jacket, with fixing points for 3 immersion temperature sensors
- TH Thermometer (accessories)
- VA Protective magnesium anode
- WW DHW
- Z DHW circulation

- E Drain
- ELH Connector for immersion heater
- HR Heating water return
- HR<sub>s</sub> Heating water return, solar
- HV Heating water flow
- HV<sub>s</sub> Heating water flow, solar
- KW Cold water
- R Inspection and cleaning aperture with flange cover (also suitable for installation of an immersion heater)
- SPR1 Cylinder temperature sensor for cylinder temperature controller (internal diameter 16 mm)
- SPR2 Temperature sensors/thermometers (internal diameter 16 mm)
- TH Thermometer (accessories)
- VA Protective magnesium anode
- WW DHW
- Z DHW circulation

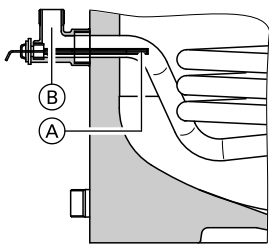


## Separate DHW cylinders for Vitodens 100-W (cont.)

### Dimensions of type CVB

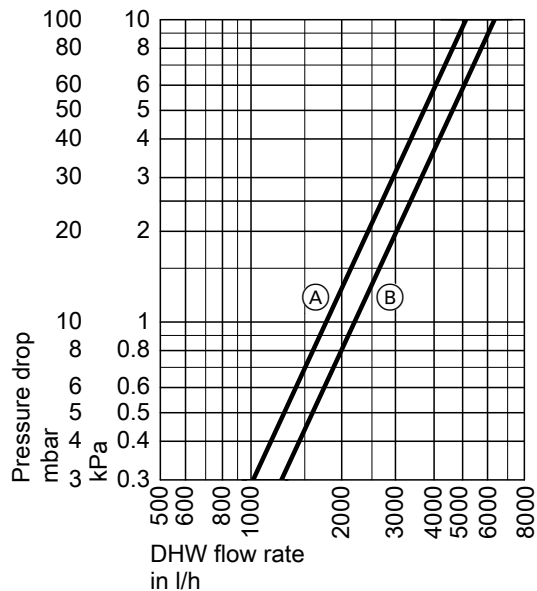
Cylinder capacity	l	400
a	mm	∅ 859
b	mm	923
c	mm	1624
d	mm	1458
e	mm	1204
f	mm	1044
g	mm	924
h	mm	804
i	mm	349
k	mm	107
l	mm	422
m	mm	864

### Recommended positioning of the cylinder temperature sensor for solar operation



- (A) Cylinder temperature sensor (solar control unit)
- (B) Threaded elbow with sensor well (standard delivery)

### Pressure drop on the DHW side



- (A) 300 l capacity
- (B) 400 l capacity

## Separate DHW cylinders for Vitodens 100-W (cont.)

### DHW output data at rated heating output

Rated heating output for DHW heating	kW	17.5	23.0	29.3
<b>Continuous DHW output</b>				
For DHW heating from 10 to 45 °C and an average boiler water temperature of 78 °C	kW	17.5	23.0	26
	l/h	425	555	638
<b>Performance factor <math>N_L^{*11}</math></b>		1.4	1.4	1.4
to DIN 4708				
<b>Peak output over 10 minutes</b>	l/10 min	164	164	164

### Delivered condition

#### Delivered condition

##### Type CVBC

DHW cylinder with **300 l** capacity:

- Fitted thermal insulation
- Sheet steel casing, epoxy-coated: Vitoppearlwhite or Vitosilver
- Adjustable feet
- Cylinder and internal indirect coil made from steel, corrosion protection through Ceraprotect enamel coating
- Additional cathodic protection with protective magnesium anode
- 2 clamping devices for securing immersion temperature sensors to the cylinder jacket, each with fixing points for 3 immersion temperature sensors

- Threaded elbow with sensor well: Internal diameter 6.5 mm
- Connection for installing an immersion heater: R 1 1/2

##### Type CVB

DHW cylinder with **400 l** capacity:

- Removable thermal insulation
- Polystyrene casing: Vitoppearlwhite
- Adjustable feet
- Cylinder and internal indirect coil made from steel, corrosion protection through Ceraprotect enamel coating
- Additional cathodic protection with protective magnesium anode
- 2 integral welded sensor wells for cylinder temperature sensors or temperature controller with internal diameter 16 mm
- Threaded elbow with sensor well: Internal diameter 6.5 mm
- Connection for installing an immersion heater: R 1 1/2

\*11 Values for the upper indirect coil.

## Installation accessories

### 4.1 Vitodens 100-W installation accessories

#### Pre-plumbing jigs

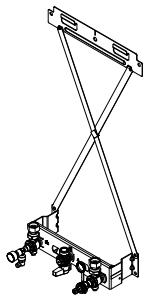
**Pre-plumbing jig for surface mounting**  
For gas condensing system boiler

**Part no. ZK04307**  
**Part no. ZK04918**

Comprising:

- Fixings
- Valves/fittings, heating flow/heating return
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve

Connections (male thread)		
Gas shut-off valve	R	¾
	G	
Heating flow/heating return	R	¾
	G	

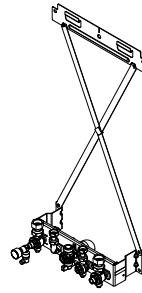


**Part no. ZK04920**

Comprising:

- Fixings
- Valves/fittings, heating flow/heating return
- Valves/fittings, cold water/DHW
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve

Connections (male thread)		
Gas shut-off valve	R	¾
	G	
Heating flow/heating return	R	¾
	G	
Cold water/DHW	R	½
	G	



**Pre-plumbing jig for surface mounting**  
For gas condensing combi boiler

**Part no. ZK04919**

#### Valves/fittings

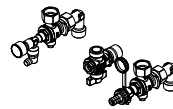
**Valves/fittings for surface mounting**  
For gas condensing system boiler

**Part no. ZK04669**  
**Part no. ZK04924**  
**Part no. ZK05676**

Comprising:

- Valves/fittings, heating flow/heating return
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve

Connections (male thread)		
Gas shut-off valve	R	¾
	G	DN 15 with G ¾ locking ring fitting
Heating flow/heating return	R	¾
	G	



**Valves/fittings for surface mounting**  
For gas condensing combi boiler

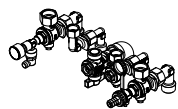
**Part no. ZK04925**  
**Part no. ZK04927**  
**Part no. ZK05675**

Comprising:

- Valves/fittings, heating flow/heating return
- Valves/fittings, cold water/DHW
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve

## Installation accessories (cont.)

Connections (male thread)		
Gas shut-off valve	R	$\frac{3}{4}$
	G	DN 15 with G $\frac{3}{4}$ locking ring fitting
Heating flow/heating return	R	$\frac{3}{4}$
Cold water/DHW	R	$\frac{1}{2}$



### Valves/fittings for flush mounting

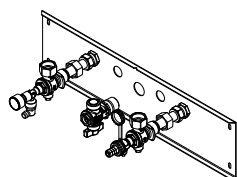
#### Part no. ZK04670

For gas condensing system boiler

Comprising:

- Valves/fittings, heating flow/heating return
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve
- Mounting plate, flush mounting

Connections (male thread)		
Gas shut-off valve	R	$\frac{3}{4}$
Heating flow/heating return	R	$\frac{3}{4}$



### Valves/fittings for flush mounting

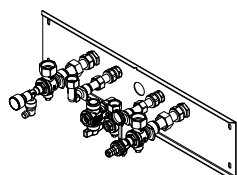
For gas condensing combi boiler

#### Part no. ZK04926

Comprising:

- Valves/fittings, heating flow/heating return
- Valves/fittings, cold water/DHW
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve
- Mounting plate, flush mounting

Connections (male thread)		
Gas shut-off valve	R	$\frac{3}{4}$
Heating flow/heating return	R	$\frac{3}{4}$
Cold water/DHW	R	$\frac{1}{2}$



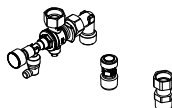
### Valves/fittings for surface mounting "light version"

For gas system boiler

#### Part no. ZK05673

Comprising:

- Gas connection piece
- Connection pieces and angle valves



### Valves/fittings for surface mounting "light version"

For gas system boiler

#### Part no. ZK05672

Comprising:

- Gas connection piece
- Connection pieces and angle valves

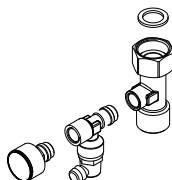
### Pressure gauge supplementary set

For retrofitting an analogue pressure gauge on the heating flow

#### Part no. ZK05681

Comprising:

- Connecting tee
- Air vent valve



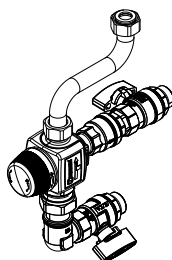
### Solar kit for gas condensing combi boiler

Assembly for solar DHW heating for installation below the appliance

#### Part no. ZK05434

Comprising:

- Thermostatic mixing valve
- Shut-off valves for solar and cold water
- Connection pipes



## Installation accessories (cont.)

### Mounting frame

#### Mounting frame

For gas condensing system boiler

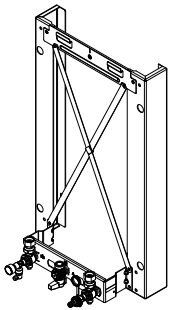
#### Part no. ZK04308

Comprising:

- Fixings
- Valves/fittings, heating flow/heating return
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve

Wall clearance 90 mm

Connections (male thread)		
Gas shut-off valve	R	¾
Heating flow/heating return	R	¾



#### Mounting frame

For gas condensing system boiler

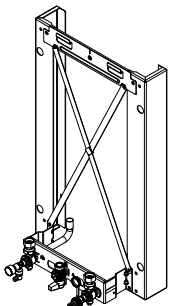
#### Part no. ZK04921

Comprising:

- Fixings
- Valves/fittings, heating flow/heating return with pipe bend
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve

Wall clearance 90 mm

Connections		
Gas shut-off valve (male thread)	G	¾
Heating flow/heating return (external diameter)	Ø mm	20



#### Mounting frame

For gas condensing combi boiler

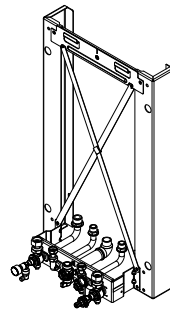
#### Part no. ZK04922

Comprising:

- Fixings
- Valves/fittings, heating flow/heating return
- Valves/fittings, cold water/DHW
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve

Wall clearance 90 mm

Connections (male thread)		
Gas shut-off valve	R	¾
Heating flow/heating return	R	¾
Cold water/DHW	R	½



#### Mounting frame

For gas condensing combi boiler

#### Part no. ZK04923

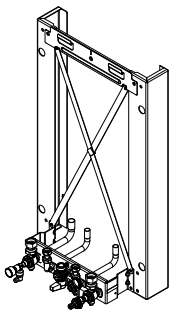
Comprising:

- Fixings
- Valves/fittings, heating flow/heating return with pipe bend
- Valves/fittings, cold water/DHW with pipe bend
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve

Wall clearance 90 mm

Connections		
Gas shut-off valve (male thread)	G	¾
Heating flow/heating return (external diameter)	Ø mm	20
Cold water/DHW (external diameter)	Ø mm	16

## Installation accessories (cont.)



### Mounting frame

For replacing third party appliances with Viessmann gas condensing combi boilers.

Replacing Saunier Duval

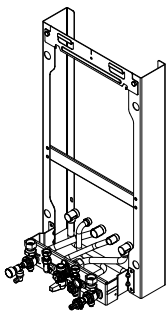
#### Part no. ZK05678

Comprising:

- Fixings
- Connection accessories
- Adaptor
- Valves/fittings
- Power cable
- Drained water collector
- Gas shut-off valve
- Valve/fittings cover

#### Connections

Gas shut-off valve (male thread)	G	¾
Heating flow/heating return (external diameter)	Ø mm	20
Cold water/DHW (external diameter)	Ø mm	16



### Mounting frame

For replacing third party appliances with Viessmann gas condensing combi boilers.

Replacing Chaffoteaux and Maury

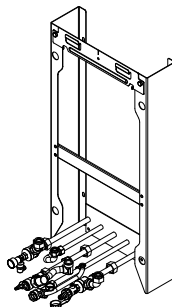
#### Part no. ZK05679

Comprising:

- Fixings
- Connection accessories
- Adaptor
- Valves/fittings
- Power cable
- Drained water collector
- Gas shut-off valve
- Valve/fittings cover

#### Connections

Gas shut-off valve (male thread)	G	¾
Heating flow/heating return (external diameter)	Ø mm	20
Cold water/DHW (external diameter)	Ø mm	16



### Mounting frame

For replacing third party appliances with Viessmann gas condensing combi boilers.

Replacing e.l.m. Leblanc

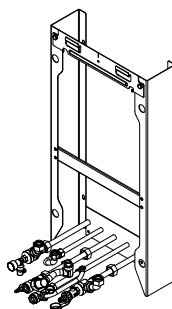
#### Part no. ZK05680

Comprising:

- Fixings
- Connection accessories
- Adaptor
- Valves/fittings
- Power cable
- Drained water collector
- Gas shut-off valve
- Valve/fittings cover

#### Connections

Gas shut-off valve (male thread)	G	¾
Heating flow/heating return (external diameter)	Ø mm	20
Cold water/DHW (external diameter)	Ø mm	16



### Wall spacer frame

For gas combi and system boilers

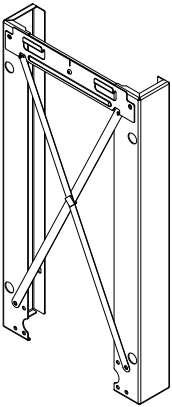
#### Part no. ZK05677

Comprising:

- Fixings

Wall clearance: 90 mm

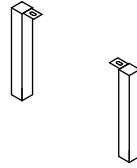
## Installation accessories (cont.)



### Ceiling extension for plumbing wall mounting frame

Part no. ZK02546

For installation "anywhere" in the room

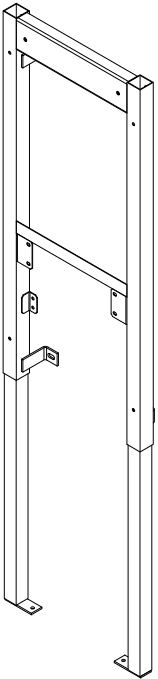


### Plumbing wall mounting frame

Part no. ZK04309

Suitable for wall mounting, plumbing wall installation anywhere in the room or in front of lightweight walls.

A pre-plumbing jig (part no. ZK04307) or valves/fittings (part no. ZK04669 or ZK04670) must be ordered separately in addition to the plumbing wall mounting frame.



## Further accessories

### Hydraulic adaptor

Part no. ZK02587

For connection to on-site pipework with surface mounting

For replacing the following older appliances with the Vitodens 100-W:

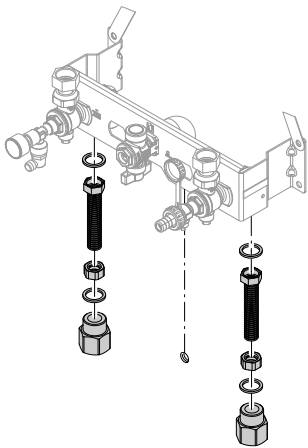
- Pendola
- Vitopend (from 2004 onwards)
- Thermoblock-VC and VC 110 E/112 E
- Thermoblock-VCW
- Cerastar-ZR or Ceramini
- Cerastar-ZWR

Connection to on-site heating flow/heating return:

Connection pipes with union nuts and connection pieces Rp  $\frac{3}{4}$  (female thread)

The pre-plumbing jig for surface mounting must be ordered separately.

## Installation accessories (cont.)



### Hydraulic adaptor

**Part no. ZK02588**

For connection to on-site pipework with flush mounting

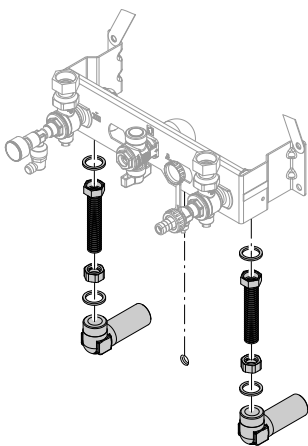
For replacing the following older appliances with the Vitodens 100-W:

- Pendola
- Vitopend (from 2004 onwards)
- Thermoblock-VC and VC 110 E/112 E
- Thermoblock-VCW
- Cerastar-ZR or Ceramini
- Cerastar-ZWR

Connection to on-site heating flow/heating return

Connection pipes with union nuts and connection elbows G 3/4 (male thread)

The pre-plumbing jig for surface mounting must be ordered separately.



### Straight-through gas valve R 1/2

**Part no. ZK01989**

For surface mounting

With integral, thermally activated safety shut-off valve.

### Angle gas valve R 1/2

**Part no. ZK01990**

For flush mounting

With integral, thermally activated safety shut-off valve.

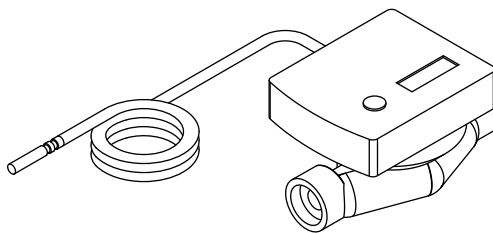
### Heat meter

For installation in the connection line

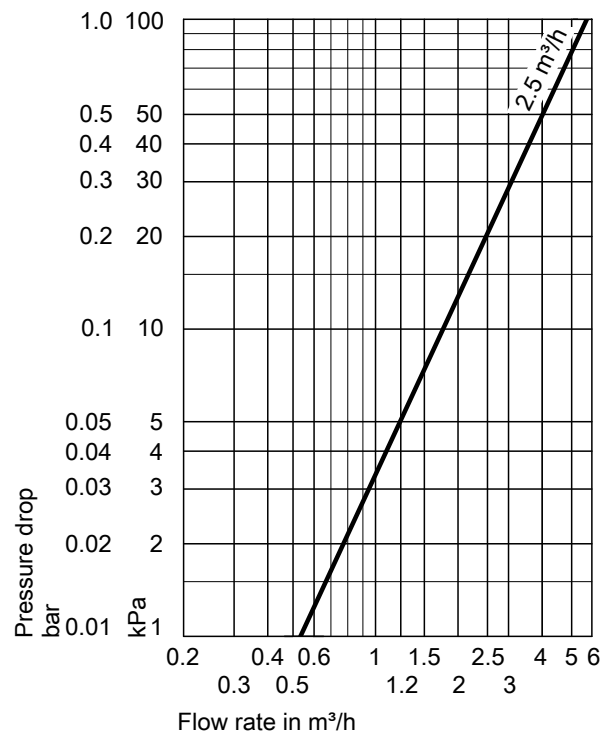
Part no.	Suitable for DHW cylinders:
7172847	– Vitocell 100: Up to 500 l capacity – Vitocell 300: Up to 200 l capacity With connection accessories for G 1
7172848	– Vitocell 300: 300 to 500 l capacity With connection accessories for G 1 1/4

Components:

- Measuring unit with threaded connector for capturing the flow rate.
- Temperature sensor Pt1000, connected to the heat meter, sensor lead 1.5 m long.
- G 1 or G 1 1/4 connection accessories including ball valves.



### Pressure drop



### Specification

Nominal flow rate	2.5 m³/h
Lead length	1.5 m
IP rating	IP 54 to EN 60529; ensure through design/installation
Permissible ambient temperature	
– During operation	5 to 55 °C
– During storage and transport	–20 to +70 °C
Sensor type	Pt1000
Max. operating pressure	10 bar (1 MPa)



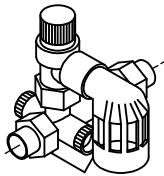
## Installation accessories (cont.)

Nominal diameter	DN 20
Installed length	130 mm
Max. flow rate	5000 l/h
Minimum flow rate	
– Horizontal installation	50 l/h
– Vertical installation	50 l/h
Start-up value (for horizontal installation)	7 l/h
Battery life	Approx. 10 years

### Safety assembly to DIN 1988

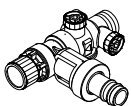
Comprising:

- Shut-off valve
- Non-return valve and test connector
- Pressure gauge connector
- Diaphragm safety valve
  - 10 bar (1 MPa)
    - DN 15, up to 200 l cylinder capacity  
**Part no. 7219722**
    - DN 20, for 300 l cylinder capacity  
**Part no. 7180662**
  - (A) 6 bar (0.6 MPa)
    - DN 15, up to 200 l cylinder capacity  
**Part no. 7265023**
    - DN 20, for 300 l cylinder capacity  
**Part no. 7179666**



For Vitocell 100-W below the boiler

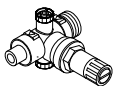
- 10 bar (1 MPa), DN 15, right angle version  
**Part no. 7180097**
- (A) 6 bar (0.6 MPa), DN 15, right angle version  
**Part no. 7179457**



### Pressure reducer (DN 15)

**Part no. 7180148**

To match right angle version of the safety assembly

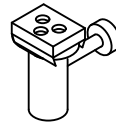


### Drain outlet set

**Part no. 7459591**

Drain outlet with trap and rose. For connecting the drain lines of the safety valves and the condensate drain.

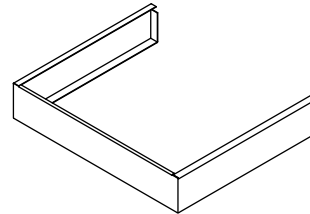
Drain connection G 1



### Valve/fittings cover

**Part no. ZK05674**

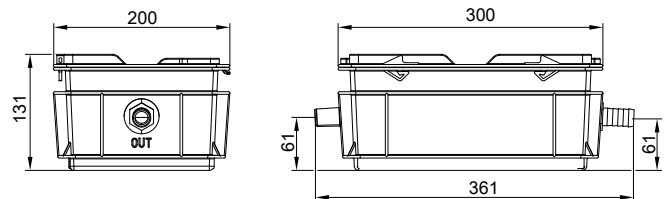
Cannot be used in conjunction with a DHW cylinder below the boiler



### Neutralising system with wall mounting bracket

**Part no. ZK03652**

With neutralising granulate



### Neutralising granulate

**Part no. ZK03654**

2.5 kg

To match the neutralising system, part no. ZK03652

### Condensate lifting system

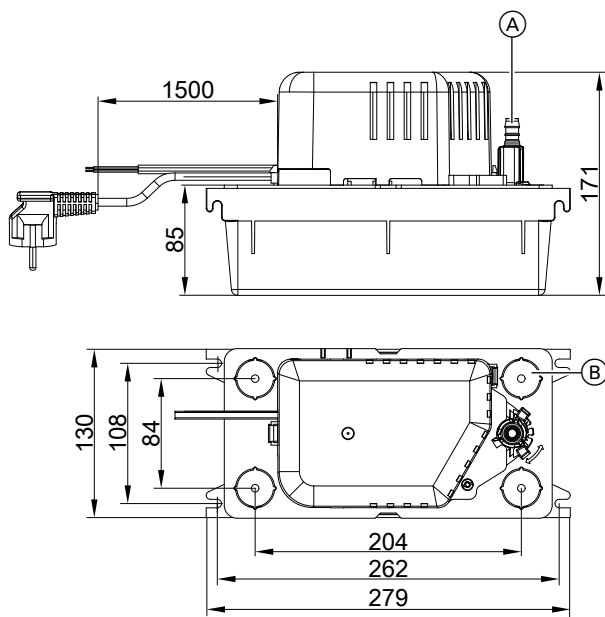
**Part no. ZK02486**

Automatic condensate removal pump for condensate with a pH value of  $\geq 2.8$  from gas condensing boilers

Components:

- Condensate container 2.0 l
- Centrifugal pump
- Non-return valve
- Connecting cable (1.5 m long) for fault messages
- Power cable (1.5 m long) with plug
- 4 connection apertures  $\varnothing$  30 mm for condensate drain with connector  $\varnothing$  max. 40 mm
- Drain hose  $\varnothing$  10 mm (5 m long)

## Installation accessories (cont.)



- (A) Condensate drain
- (B) 4 x condensate inlet (closed in delivered condition)

### Specification

Rated voltage	230 V~
Rated frequency	50 Hz

Power consumption	70 W
IP rating	IP 20
Permissible medium temperature	+65 °C
Max. head	50 kPa
Max. pump rate	500 l/h
Alarm contact	Changeover contact (floating), breaking capacity 250 V/4 A

### Ventilation air cover

#### Part no. ZK04940

For parallel connection of flue pipe and ventilation air pipe  
 $\varnothing$  60/60 mm without parallel adaptor.

### Water spray protection

#### Part no. 7590109

To ensure adherence to the required protection class. Must be ordered separately for open flue operation.

### Small softening system for heating water

For filling heating circuits  
 See Vitoset pricelist

### Tool kit

#### Part no.: ZK04569

For maintenance and service  
 Case with all tools required for maintenance and service: Screwdriver, extension and inserts

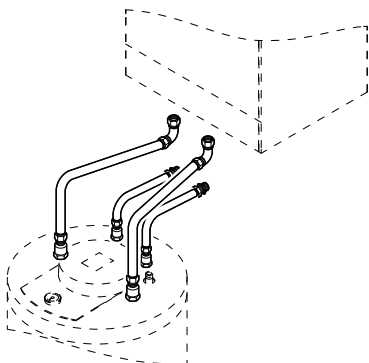
## Connections between the Vitodens and the DHW cylinder

Connection set for Vitocell 100-W DHW cylinder, type CUGA and CUGA-A below the boiler, with connection pipes  
**Part no. ZK04709**

Comprising:

- Cylinder temperature sensor
- Connection pipes on the heating water side
- Connection pipes on the DHW side

### Surface or flush mounting



Connection set for Vitocell 100-W DHW cylinder adjacent to the boiler

Comprising:

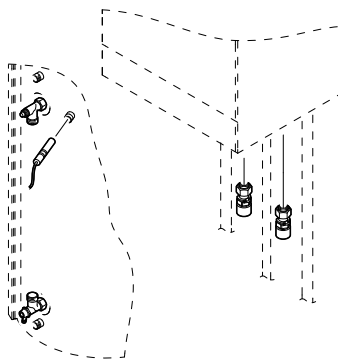
- Cylinder temperature sensor
  - Connection fittings
- DHW cylinder to the **left or right** of the Vitodens

- Threaded fitting version

#### Part no. ZK04710

- Solder version

#### Part no. ZK04711



## 4.2 Installation accessories for Vitodens 111-W

### Pre-plumbing jigs

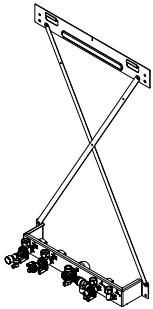
#### Pre-plumbing jig for surface mounting

Part no. ZK04929

Comprising:

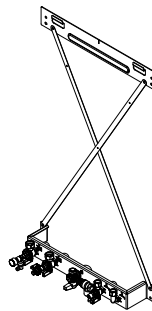
- Fixings
- Valves/fittings, heating flow/heating return
- Diaphragm safety valve 10 bar (1 MPa)
- Valves/fittings, cold water/DHW
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve

Connections (male thread)		
Gas shut-off valve	R	¾
Heating flow/heating return	R	¾
Cold water/DHW	R	½



- Diaphragm safety valve 10 bar (1 MPa)
- Valves/fittings, cold water/DHW
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve

Connections (male thread)		
Gas shut-off valve	G	¾
Heating flow/heating return (external diameter)	Ø mm	20
Cold water/DHW (external diameter)	Ø mm	16



#### Pre-plumbing jig for surface mounting

Part no. ZK04930

Comprising:

- Fixings
- Valves/fittings, heating flow/heating return

### Mounting frame

#### Mounting frame for surface mounting

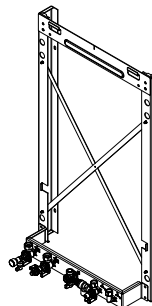
Part no. ZK04931

Comprising:

- Fixings
- Valves/fittings, heating flow/heating return
- Diaphragm safety valve 10 bar (1 MPa)
- Valves/fittings, cold water/DHW
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve

Wall clearance 90 mm

Connections (male thread)		
Gas shut-off valve	R	¾
Heating flow/heating return	R	¾
Cold water/DHW	R	½



#### Mounting frame for surface mounting

Part no. ZK04932

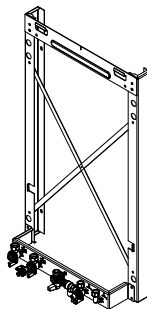
Comprising:

- Fixings
- Valves/fittings, heating flow/heating return
- Diaphragm safety valve 10 bar (1 MPa)
- Valves/fittings, cold water/DHW

## Installation accessories (cont.)

- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve

Connections (male thread)		
Gas shut-off valve	G	$\frac{3}{4}$
Heating flow/heating return (external diameter)	Ø mm	20
Cold water/DHW (external diameter)	Ø mm	16



## Valves/fittings

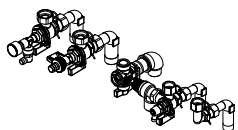
### Valves/fittings for surface mounting

#### Part no. ZK04933

Comprising:

- Valves/fittings, heating flow/heating return
- Diaphragm safety valve 10 bar (1 MPa)
- Valves/fittings, cold water/DHW
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve

Connections (male thread)		
Gas shut-off valve	R	$\frac{3}{4}$
Heating flow/heating return	R	$\frac{3}{4}$
Cold water/DHW	R	$\frac{1}{2}$



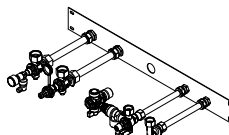
### Valves/fittings for flush mounting

#### Part no. ZK04934

Comprising:

- Valves/fittings, heating flow/heating return
- Diaphragm safety valve 10 bar (1 MPa)
- Valves/fittings, cold water/DHW
- Boiler drain & fill valve
- Air vent valve
- Pressure gauge
- Gas shut-off valve with thermally activated safety shut-off valve
- Mounting plate, flush mounting

Connections (male thread)		
Gas shut-off valve	R	$\frac{3}{4}$
Heating flow/heating return	R	$\frac{3}{4}$
Cold water/DHW	R	$\frac{1}{2}$



## Further accessories

### Safety valve

#### Part no. ZK04936

6 bar (0.6 MPa)

For attachment to connection accessories

Only for AT

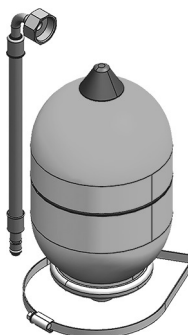
### DHW expansion vessel

#### Part no. ZK04937

2 l capacity

Permiss. operating pressure 10 bar (1.0 MPa)

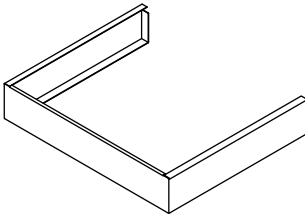
For installation in the Vitodens 111-W



## Installation accessories (cont.)

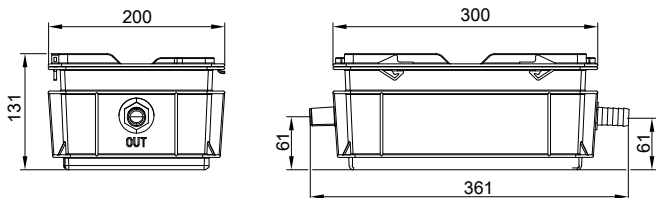
### Valve/fittings cover

Part no. ZK04938



### Neutralising system with wall mounting bracket

Part no. ZK03652  
With neutralising granulate



### Neutralising granulate

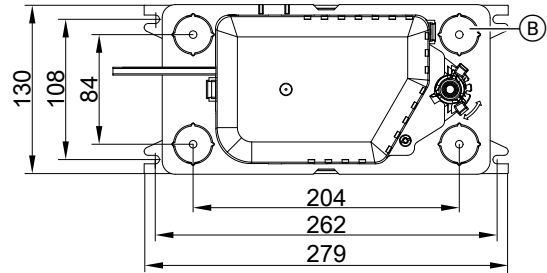
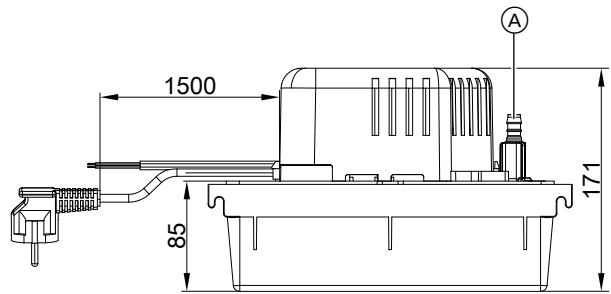
Part no. ZK03654  
2.5 kg  
To match the neutralising system, part no. ZK03652

### Condensate lifting system

Part no. ZK02486  
Automatic condensate removal pump for condensate with a pH value of  $\geq 2.8$  from gas condensing boilers

Components:

- Condensate container 2.0 l
- Centrifugal pump
- Non-return valve
- Connecting cable (1.5 m long) for fault messages
- Power cable (1.5 m long) with plug
- 4 connection apertures  $\varnothing$  30 mm for condensate drain with connector  $\varnothing$  max. 40 mm)
- Drain hose  $\varnothing$  10 mm (5 m long)



- (A) Condensate drain
- (B) 4 x condensate inlet (closed in delivered condition)

### Specification

Rated voltage	230 V~
Rated frequency	50 Hz
Power consumption	70 W
IP rating	IP 20
Permissible medium temperature	+65 °C
Max. head	50 kPa
Max. pump rate	500 l/h
Alarm contact	Changeover contact (floating), breaking capacity 250 V/4 A

### Ventilation air cover

Part no. ZK04940  
For parallel connection of flue pipe and ventilation air pipe  
 $\varnothing$  60/60 mm without parallel adaptor.

### Water spray protection

Part no. 7590109  
To ensure adherence to the required protection class. Must be ordered separately for open flue operation.

### Plate heat exchanger flushing system

Part no. 7373005

### Small softening system for heating water

For filling heating circuits  
See Vitoset pricelist

### Tool kit

Part no.: ZK04569

For maintenance and service  
Case with all tools required for maintenance and service: Screwdriver, extension and inserts

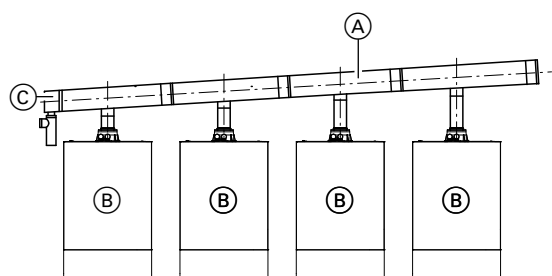
## Flue gas cascade (positive pressure) for multi boiler systems with Vitodens 100-W and 111-W

Comprising:

6173204

## Installation accessories (cont.)

- Back draught safety device for each boiler
- Flue gas collector
- End piece with condensate drain and trap



- (A) Flue gas collector
- (B) Back draught safety device (for installation in the Vitodens)
- (C) End piece with trap

- **Two-boiler system**
  - System size 110, **part no. ZK01944**
  - System size 160, **part no. Z008385**
- **3-boiler system**
  - System size 110, **part no. ZK01945**
  - System size 160, **part no. Z008386**
- **4-boiler system**
  - System size 110, **part no. ZK01946**
  - System size 160, **part no. Z008387**

### Note

See "Flue system" technical guide

### 4.3 Divicon heating circuit distributor and low loss headers

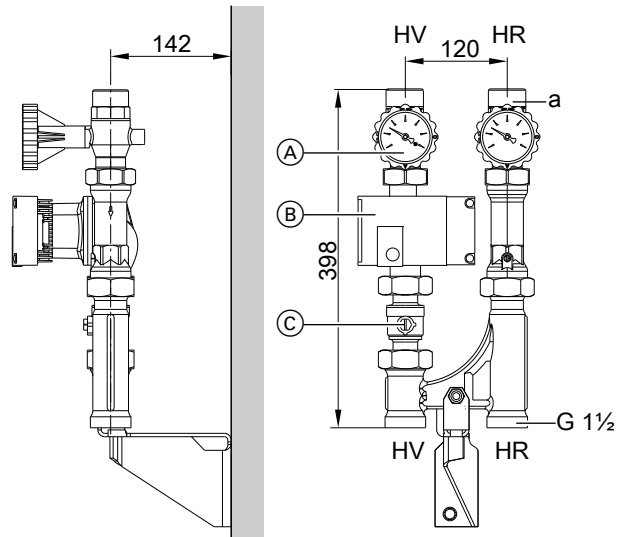
#### Divicon heating circuit distributor

##### Layout and function

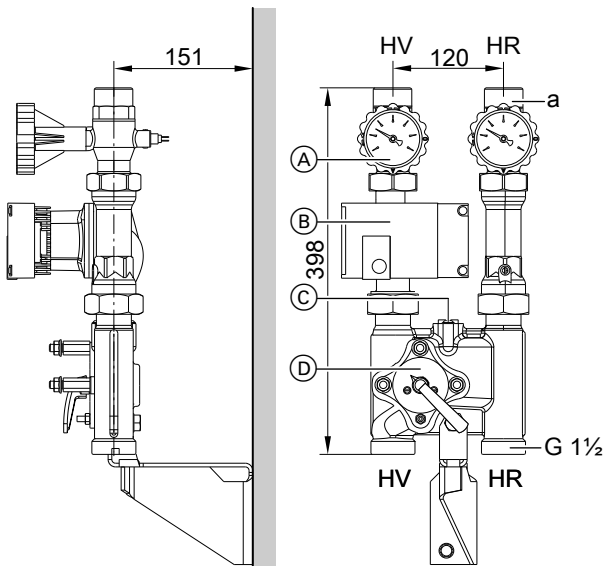
- Available with R ¾, R 1 and R 1¼ connections.
- With heating circuit pump, check valve, ball valves with integral thermometers and 3-way mixer or without mixer.
- Quick and simple installation due to pre-assembled unit and compact design.
- All-round thermal insulation shells for low radiation losses.
- High efficiency pumps and optimised mixer curve ensure low electricity costs and precise control characteristics.
- The bypass valve for hydraulic balancing of the heating system is available as an accessory and is provided as a threaded component for inserting into the prepared hole in the cast body.
- Individually wall mounted or with a double or triple manifold.
- Also available as a kit. For further details see the Viessmann pricelist.

For part numbers in conjunction with the different circulation pumps, see the Viessmann pricelist.

The dimensions of the heating circuit distributor are the same, with or without mixer.



Divicon without mixer (wall mounting, shown without thermal insulation)



Divicon with mixer (wall mounting, shown without thermal insulation or mixer drive extension kit)

- HR Heating return
- HV Heating flow
- (A) Ball valves with thermometer (as operating element)
- (B) Circulation pump
- (C) Bypass valve (accessories)
- (D) Mixer-3

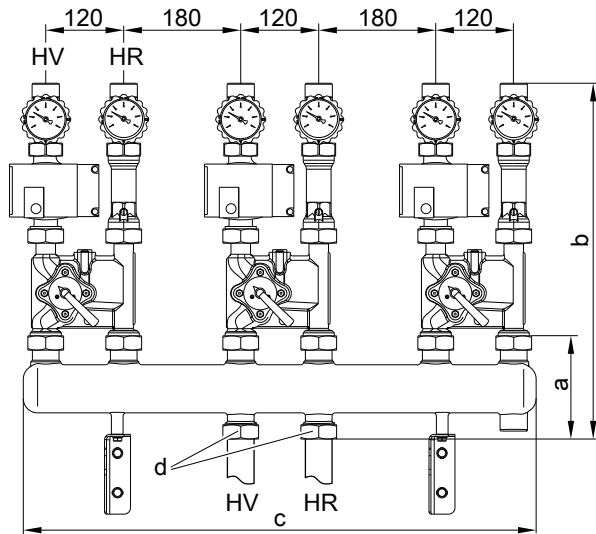
- HR Heating return
- HV Heating flow
- (A) Ball valves with thermometer (as operating element)
- (B) Circulation pump
- (C) Ball valve

Heating circuit connection	R	¾	1	1¼
Flow rate (max.)	m <sup>3</sup> /h	1.0	1.5	2.5
a (female)	Rp	¾	1	1¼
a (male)	G	1¼	1¼	2

Heating circuit connection	R	¾	1	1¼
Flow rate (max.)	m <sup>3</sup> /h	1.0	1.5	2.5
a (female)	Rp	¾	1	1¼
a (male)	G	1¼	1¼	2

## Installation accessories (cont.)

### Installation example: Divicon with triple manifold

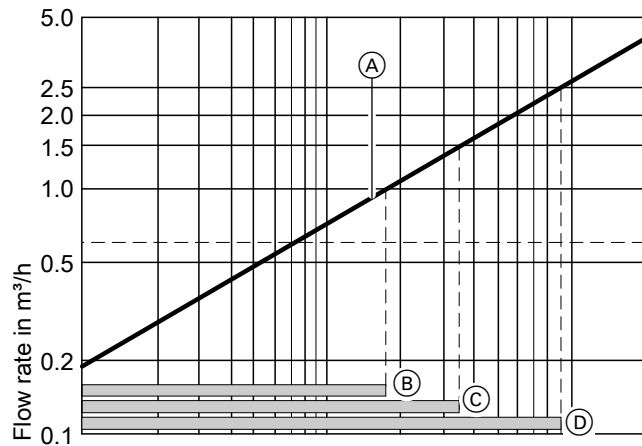


(shown without thermal insulation)

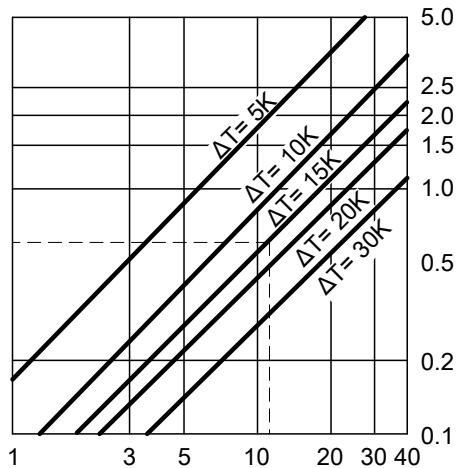
HR Heating return  
HV Heating flow

Dim.	Manifold with heating circuit connection	
	R ¾ and R 1	R 1¼
a	135	183
b	535	583
c	784	784
d	G 1¼	G 2

### Determining the required nominal diameter



Mixer control characteristics



Heating circuit output in kW

- Ⓐ Divicon with mixer-3  
The operating ranges marked Ⓑ to Ⓓ provide optimum control characteristics with the Divicon mixer:
- Ⓑ Divicon with mixer-3 (R ¾)  
Application range: 0 to 1.0 m<sup>3</sup>/h
- Ⓒ Divicon with mixer-3 (R 1)  
Application range: 0 to 1.5 m<sup>3</sup>/h
- Ⓓ Divicon with mixer-3 (R 1¼)  
Application range: 0 to 2.5 m<sup>3</sup>/h

#### Example:

Heating circuit for radiators with a heating output of  $\dot{Q} = 11.6$  kW  
Heating system temperature 75/60 °C ( $\Delta T = 15$  K)

c Specific thermal capacity  
 $\dot{m}$  Mass flow rate



## Installation accessories (cont.)

$\dot{Q}$  Heating output  
 $\dot{V}$  Flow rate

$$\dot{Q} = \dot{m} \cdot c \cdot \Delta T \quad c = 1.163 \frac{\text{Wh}}{\text{kg} \cdot \text{K}} \quad \dot{m} \hat{=} \dot{V} \quad (1 \text{ kg} \approx 1 \text{ dm}^3)$$

$$\dot{V} = \frac{\dot{Q}}{c \cdot \Delta T} = \frac{11600 \text{ W} \cdot \text{kg} \cdot \text{K}}{1.163 \text{ Wh} \cdot (75-60) \text{ K}} = 665 \frac{\text{kg}}{\text{h}} \hat{=} 0.665 \frac{\text{m}^3}{\text{h}}$$

Select the smallest possible mixer within the application limit with the value  $\dot{V}$ .

### Circulation pump curves and pressure drop on the heating water side

The residual pump head results from the differential between the selected pump curve and the pressure drop curve of the respective heating circuit distributor or further components (pipe assembly, distributor, etc.).

The following pump graphs show the pressure drop curves of the different Divicon heating circuit distributors.

**Maximum flow rate** for Divicon:

- With R ¾ = 1.0 m³/h
- With R 1 = 1.5 m³/h
- With R 1¼ = 2.5 m³/h

#### Example:

Flow rate  $\dot{V} = 0.665 \text{ m}^3/\text{h}$

Selected:

- Divicon with mixer R ¾
- Wilo Yonos PARA 25/6 circulation pump, variable differential pressure operating mode and set to maximum delivery head
- Pump rate 0.7 m³/h

Head of the relevant pump

curve: 48 kPa  
 Divicon pressure drop: 3.5 kPa  
 Residual head: 48 kPa – 3.5 kPa = 44.5 kPa.

#### Note

For further components (pipe assembly, distributor, etc.) determine the pressure drop and deduct it from the residual head.

### Differential pressure-dependent heating circuit pumps

According to the [German] Energy Saving Ordinance (EnEV), circulation pumps in central heating systems must be sized in accordance with current technical rules.

As of 1 January 2013, the Ecodesign Directive 2009/125/EC requires high efficiency circulation pumps to be used throughout Europe if the pumps are not installed in the heat generator.

#### Design information

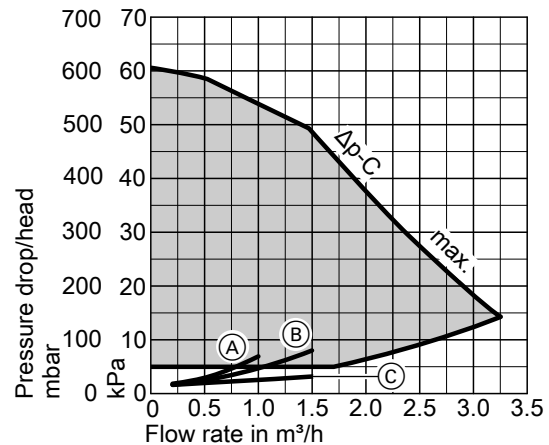
The use of differential pressure-dependent heating circuit pumps requires heating circuits with variable pump rates. These include e.g. single and twin line heating systems with thermostatic valves and underfloor heating systems with thermostatic or zone valves.

Result of this example: Divicon with mixer-3 (R ¾)

### Wilo Yonos PARA 25/6

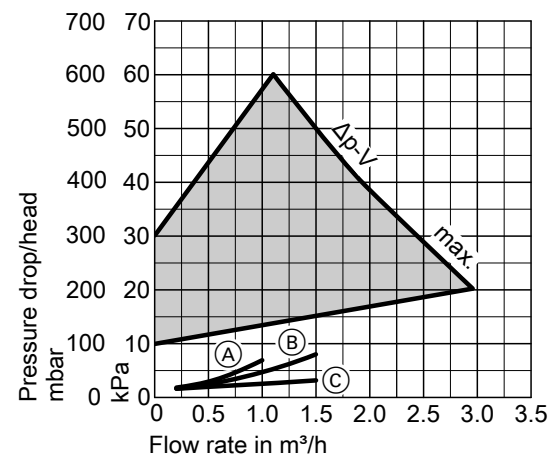
- Particularly power saving, high efficiency circulation pump
- Energy efficiency index EEI ≤ 0.20

#### Operating mode: Constant differential pressure



- (A) Divicon R ¾ with mixer
- (B) Divicon R 1 with mixer
- (C) Divicon R ¾ and R 1 without mixer

#### Operating mode: Variable differential pressure



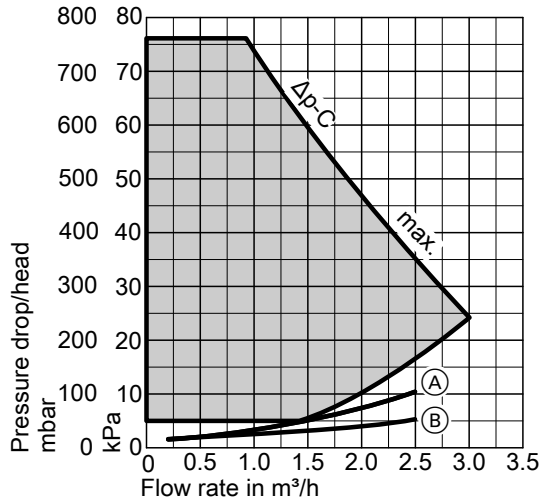
- (A) Divicon R ¾ with mixer
- (B) Divicon R 1 with mixer
- (C) Divicon R ¾ and R 1 without mixer

## Installation accessories (cont.)

### Wilo Yonos PARA Opt. 25/7.5

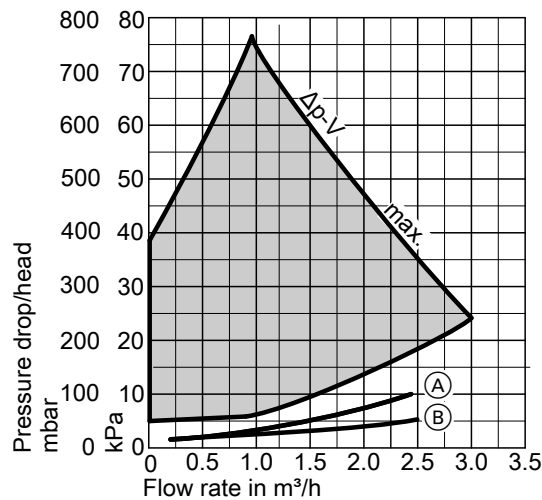
#### Operating mode: Constant differential pressure

- Energy efficiency index EEI ≤ 0.21



- (A) Divicon R 1¼ with mixer
- (B) Divicon R 1¼ without mixer

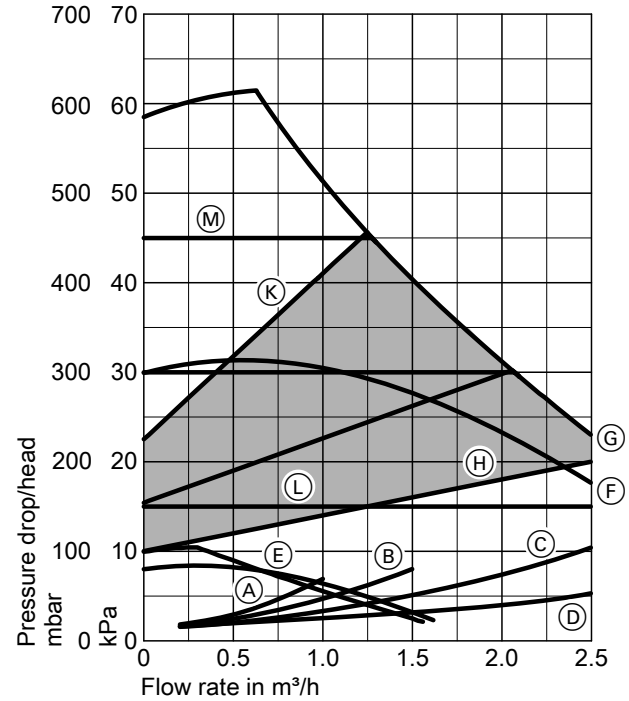
#### Operating mode: Variable differential pressure



- (A) Divicon R 1¼ with mixer
- (B) Divicon R 1¼ without mixer

### Grundfos Alpha 2.1 25-60

- With power consumption display
- With Autoadapt function (automatic matching to the pipework)
- With night setback function
- Energy efficiency index EEI ≤ 0.20



- (A) Divicon R ¾ with mixer
- (B) Divicon R 1 with mixer
- (C) Divicon R 1¼ with mixer
- (D) Divicon R ¾, R 1 and R 1¼ without mixer
- (E) Stage 1
- (F) Stage 2
- (G) Stage 3
- (H) Min. proportional pressure
- (K) Max. proportional pressure
- (L) Min. constant pressure
- (M) Max. constant pressure

#### Bypass valve

##### Part no. 7464889

For hydronic balancing of the heating circuit with mixer. To be inserted into the Divicon.

## Installation accessories (cont.)

### Manifold

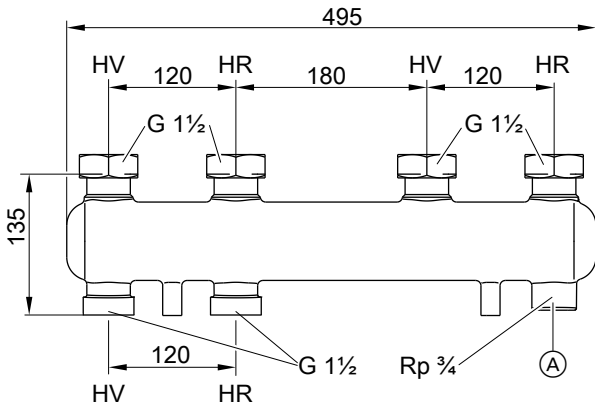
Incl. thermal insulation.

For wall mounting with separately ordered wall mounting bracket.

The connection between boiler and manifold must be made on site.

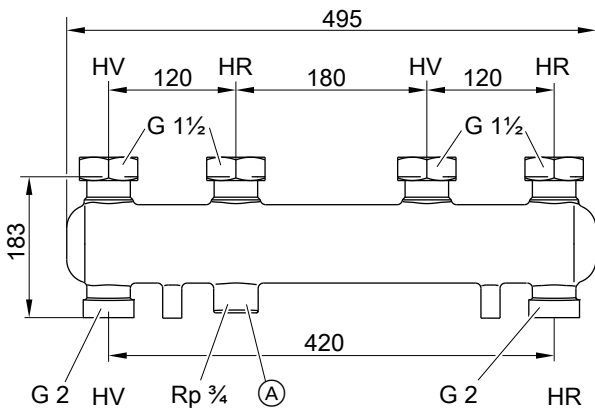
### For 2 Divicon

Part no. 7460638 for Divicon R  $\frac{3}{4}$  and R 1



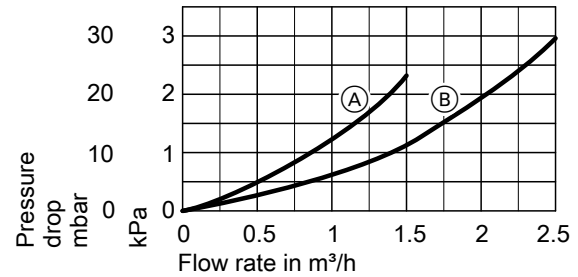
- Ⓐ Connection option for expansion vessel
- HV Heating water flow
- HR Heating water return

Part no. 7466337 for Divicon R  $1\frac{1}{4}$



- Ⓐ Connection option for expansion vessel
- HV Heating water flow
- HR Heating water return

### Pressure drop

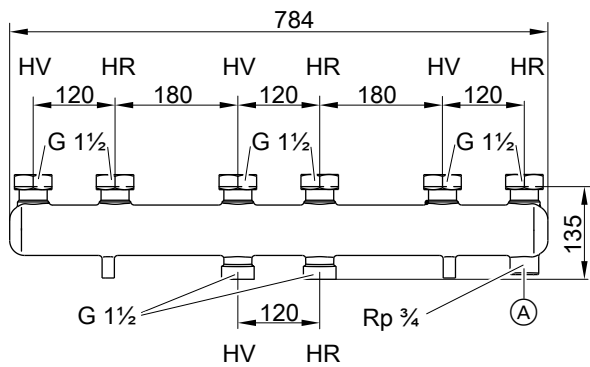


- Ⓐ Manifold for Divicon R  $\frac{3}{4}$  and R 1
- Ⓑ Manifold for Divicon R  $1\frac{1}{4}$

## Installation accessories (cont.)

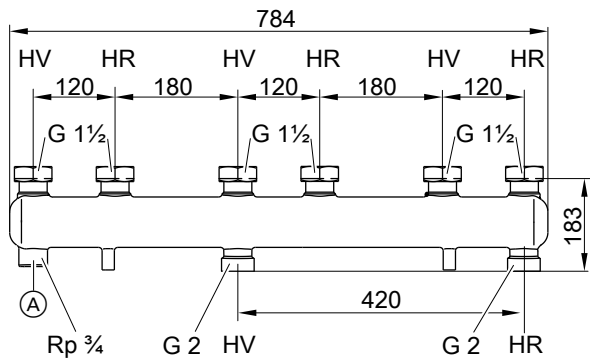
For 3 Divicon

Part no. 7460643 for Divicon R ¾ and R 1



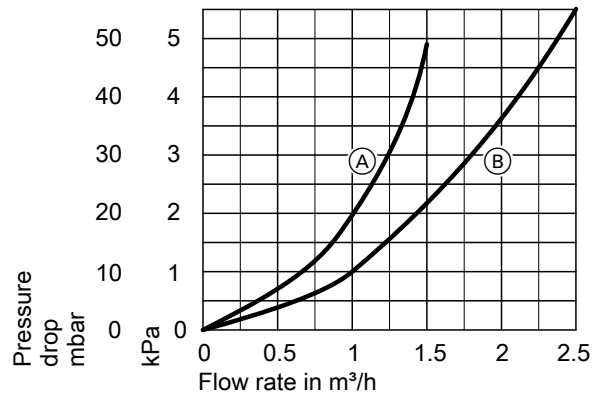
- (A) Connection option for expansion vessel
- HV Heating water flow
- HR Heating water return

Part no. 7466340 for Divicon R 1¼



- (A) Connection option for expansion vessel
- HV Heating water flow
- HR Heating water return

Pressure drop

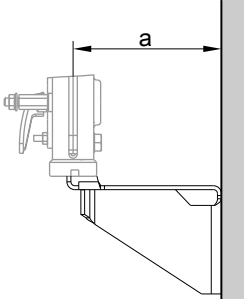


- (A) Manifold for Divicon R ¾ and R 1
- (B) Manifold for Divicon R 1¼

## Installation accessories (cont.)

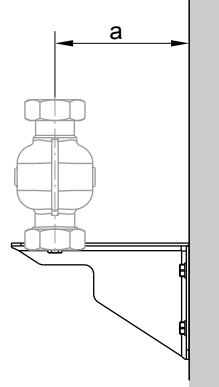
### Wall mounting bracket

**Part no. 7465894**  
For individual Divicon.  
With screws and rawl plugs.



For Divicon	With mixer	Without mixer
a mm	151	142

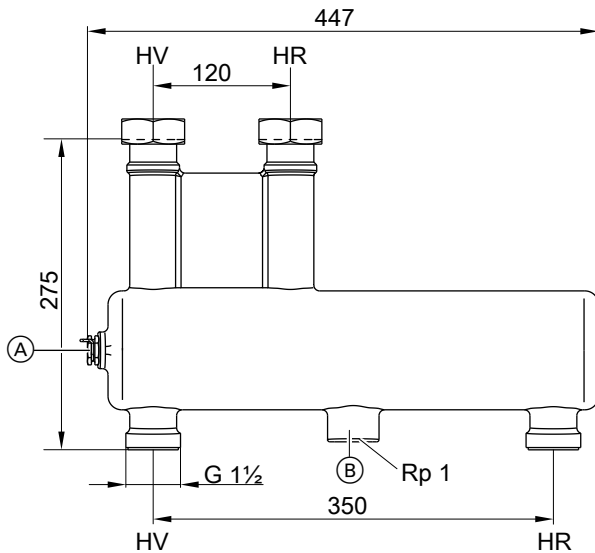
**Part no. 7465439**  
For manifold.  
With screws and rawl plugs.



For Divicon	R ¾ and R 1	R 1¼
a mm	142	167

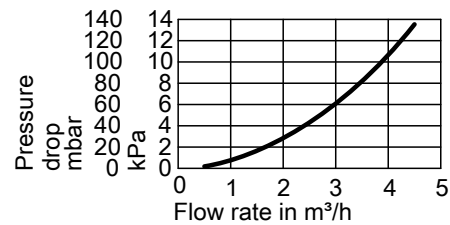
### Low loss header

**Part no. 7460649**  
Max. flow rate 4.5 m<sup>3</sup>/h.  
With thermal insulation and integral sensor well.  
The connection between boiler and low loss header must be made on site.



- Ⓐ Sensor well
- Ⓑ Optional blow-down
- HV Heating water flow
- HR Heating water return

### Pressure drop



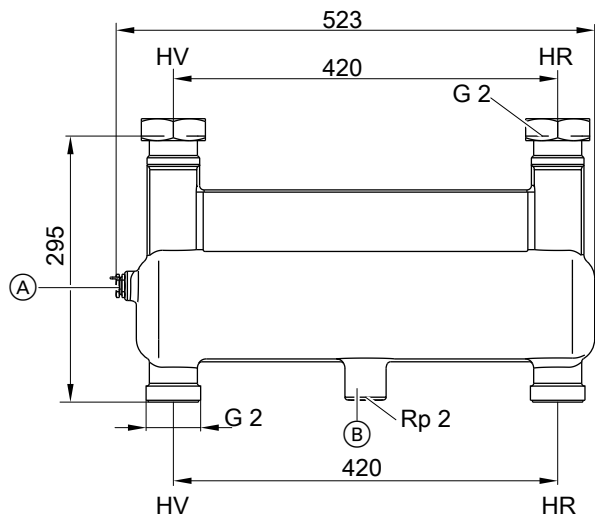
## Installation accessories (cont.)

### Part no. 7460648

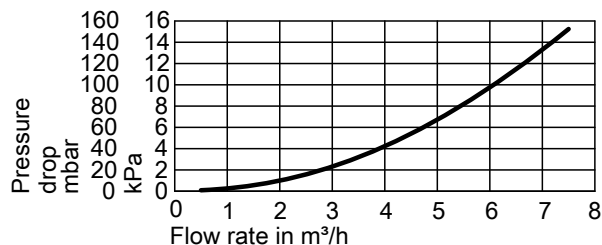
Max. flow rate 7.5 m<sup>3</sup>/h.

With thermal insulation and integral sensor well.

The connection between boiler and low loss header must be made on site.



### Pressure drop



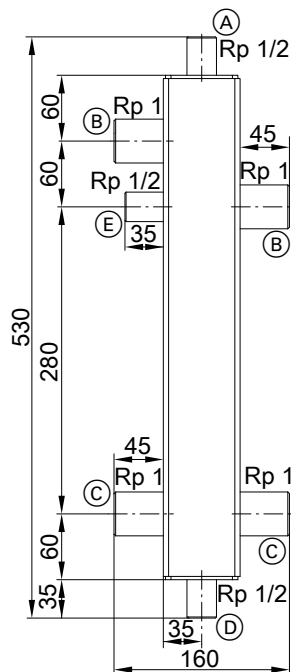
## 4

### Low loss headers

#### Low loss header, type Q70

##### Part no. ZK03679

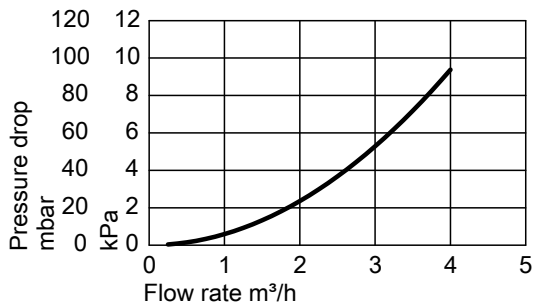
- Flow rate up to 3 m<sup>3</sup>/h
  - R 1 female connector
  - 3 female connections Rp ½ for air vent valve, drain outlet and sensor well
  - With air vent valve and sensor well for temperature sensor
  - With EPP thermal insulation to EnEV
- The connection to the heat generator is made on site.



- (A) Ventilation Rp ½
- (B) Heating water flow R 1 female thread
- (C) Heating water return R 1 female thread
- (D) Drain Rp ½
- (E) Sensor well Rp ½

## Installation accessories (cont.)

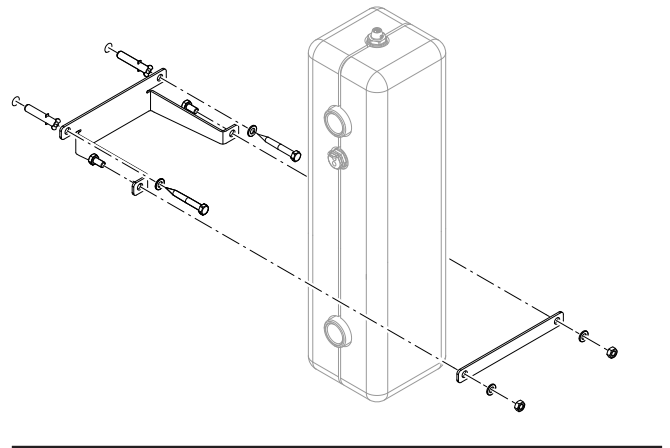
### Pressure drop



### Wall mounting bracket for low loss header, type Q70

Part no. ZK03682

With fixing materials



5

## Design information

### 5.1 Siting, installation

#### Siting conditions for open flue operation (appliance type B)

Type B<sub>23</sub> and B<sub>33</sub>

In rooms where **air contamination from halogenated hydrocarbons or organosilicon compounds (e.g. siloxanes)** may occur, such as hairdressing salons, printing shops, dry cleaners, laboratories, etc., the Vitodens may only be operated as a room sealed system.

If in doubt, please consult us.

Never install the Vitodens in areas subject to very dusty conditions. The installation room must be kept frost-free, dry, heated and well ventilated.

Provide a condensate drain and a discharge pipe for the safety valve in the installation room.

If these instructions are not observed, any consequential appliance damage directly related to any of these causes is excluded from our warranty.

When installing in Austria, observe all current safety regulations as defined by ÖVGW-TR Gas (G1), ÖNORM, ÖVGW, ÖVE and locally applicable standards.

#### Multi boiler systems with flue systems under negative pressure

Systems with several Vitodens with separate hydraulic connections require a flue gas cascade suitable for negative pressure or individual flue gas routing for each boiler.

#### Installation room

##### Permissible:

- Siting gas equipment on the same floor
- Living space with interconnected room air supply
- Ancillary rooms with interconnected room air supply (larders, basements, utility rooms, etc.)
- Ancillary rooms with vents to the outside: Ventilation air/extract air 150 cm<sup>2</sup> or 2 × 75 cm<sup>2</sup> each at the top and bottom of the same wall, up to 35 kW
- Attic rooms, but only with adequate minimum chimney height to DIN 18160 – 4 m above inlet (negative pressure operation).

##### Not permissible:

- Stairwells and communal hallways. Exception: In detached and two-family houses of low height, top edge of floor in the top storey < 7 m above ground level.
- Bathrooms and toilets without outside windows with shaft ventilation
- Rooms where explosive or flammable materials are stored
- Rooms that are ventilated mechanically or via individual duct systems to DIN 18117-1

### Observe all local fire regulations.

#### Connection on the flue gas side

The connection piece to the chimney should be as short as possible. Therefore position the Vitodens as close to the chimney as possible. The flue should be designed to be as straight as possible. If bends are unavoidable, do not arrange these directly one after another. The entire flue gas path must be able to be checked and cleaned as required.

No special protective measures or clearances towards combustible objects, such as furniture, packaging or similar, need to be taken/observed. The surface temperatures of the Vitodens and the flue system do not exceed 85 °C at any point.

For further details, see the technical guide on flue systems for the Vitodens.

### Siting conditions for room sealed operation (appliance type C)

Type C<sub>10(3)x</sub>, C<sub>11(3)x</sub>, C<sub>13(3)x</sub> or C<sub>14(3)x</sub> to TRGI 2018

The Vitodens can be installed for **room sealed operation independent** of the size and ventilation of the installation room.

#### Installation room

Suitable siting locations include:

- Recreational rooms and other living spaces
- Unventilated ancillary rooms
- Cabinets (open at the top)
- Recesses without compulsory clearance towards combustible materials
- Attic rooms (pitched attics and long panes) where the balanced flue pipe can be routed directly through the roof

The installation room must be kept frost-free, dry and well ventilated. Provide a condensate drain and a discharge pipe for the safety valve in the installation room.

Electrical interlocks for extractors (extractor hoods, etc.) are not required with room sealed operation.

#### Connection on the flue gas side

The flue should be designed as short and straight as possible. If bends are unavoidable, do not install them directly one after another. It must be possible to test and clean the entire flue gas path as required.

Since the flue pipe connection for room sealed operation is surrounded by combustion air (coaxial pipe), maintaining clearances towards combustible components is not required.

Ventilation air ducts with which oil or solid fuel boilers were previously used must not contain any sulphur or soot deposits on the inner surfaces.

Sulphur and soot deposits cause operating faults.

If thorough cleaning is not possible, a balanced flue pipe must be laid through the shaft. Alternatively, lay separate ventilation air and flue gas pipes.

Viessmann accepts no liability for damages resulting from failure to observe these instructions.

Close off and seal any other connection apertures with appropriate materials.

This does not apply to any cleaning or inspection apertures that are provided with chimney cleaning covers and that are identified with an appropriate test mark.

For further details, see the technical guide on flue systems for the Vitodens.

#### Balanced flue system for multiple connection C<sub>10(3)x</sub>, C<sub>11(3)x</sub>,

C<sub>13(3)x</sub>, C<sub>14(3)x</sub>)

For connecting multiple flues to a single balanced flue chimney (balanced flue system, positive pressure)

#### Extractors

Operating appliances that extract air to the outside (extractor hoods, extractors, air conditioning units, etc.) can create negative pressure. If the boiler is operated at the same time, this can lead to a reverse flow of **flue gas**, which can cause life threatening poisoning.

To prevent the reverse flow of flue gas, fit an **interlock circuit** or take suitable steps to ensure an adequate supply of combustion air.

#### Safety equipment for the installation room

Viessmann heat generators are tested and approved in accordance with all safety regulations and are therefore fail-safe. Unpredictable external factors may, in the rarest of cases, lead to the potentially harmful escape of carbon monoxide (CO). For this case, we recommend using a CO limiter.

#### Note

*When connecting multiple flues to a single balanced flue chimney, the multiple connection version of the appliance, "B1xF-[kW]-M", must be ordered. Using appliances for individual connection, or operating a mix of appliances for individual and multiple connection, on a common flue system is **not permitted**.*

With a positive pressure C<sub>14(3)x</sub> multiple connection, the boilers may only be operated with natural gas. A back draught safety device must be installed in the flue gas connection and in the mixing shaft of the burner for each boiler.

For further details, see the technical guide on flue systems for the Vitodens.

#### Use of third party flue systems of type C<sub>63</sub>/C<sub>63x</sub>

Any approved flue system can be used for type C<sub>63</sub>/C<sub>63x</sub>. A system test of these flue systems with Viessmann heat generators has not been carried out, so there is no system certification in accordance with Gas Appliances Regulation (EU) 2016/426.

When implementing type C<sub>63</sub>/C<sub>63x</sub> with Viessmann heat generators, the following specifications must be observed and complied with:

- Viessmann design specifications for types C<sub>13x</sub>, C<sub>14(3)x</sub>, C<sub>33x</sub>, C<sub>53x</sub>, C<sub>83x</sub> and C<sub>93x</sub>
- Appliance-specific details of Viessmann heat generators, e.g. max. draughts, flue gas temperatures, mass flow rates, boiler flue connection tolerances
- Reverse flow of flue gas at the terminal of the flue system, even when it is windy: ≤ 10 %
- Wind protection devices for the supply of combustion air and the discharge of flue gas must not be installed on opposite walls of the building.

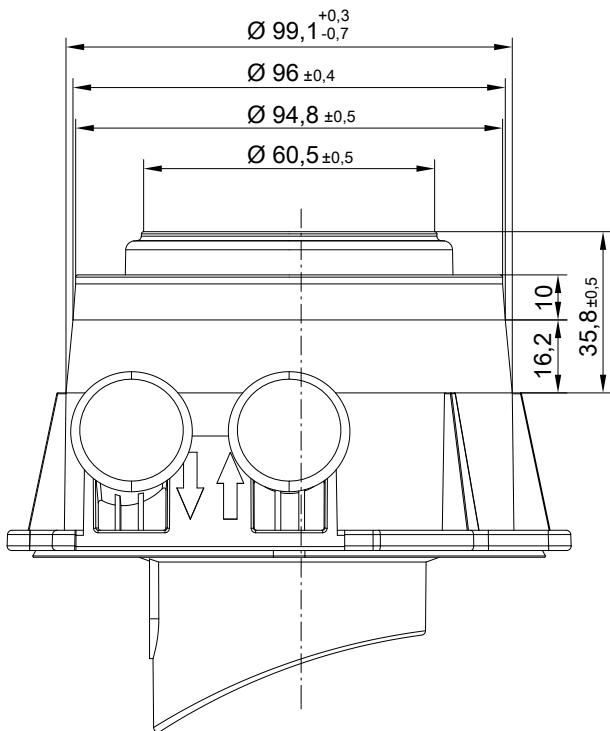
#### Flue pipes

- Flues made from plastic (PPS):  
Measures inside the equipment ensure that the flue gas temperature of 120 °C will never be exceeded. Flues made from plastic (PPS) with an approval for flue gas temperatures up to a maximum of 120 °C (type B) can therefore be used.
- Flues made from aluminium:  
Aluminium residues in the condensate can impair the function of the heat generator. A condensate trap must therefore be additionally installed above the boiler flue connection. The condensate trap must allow the condensate returned from the flue system to completely bypass the heat generator.



## Design information (cont.)

### Dimensions of boiler flue gas connection



### Safety equipment for the installation room

Viessmann heat generators are tested and approved in accordance with all safety regulations and are therefore fail-safe. Unpredictable external factors may, in the rarest of cases, lead to the potentially harmful escape of carbon monoxide (CO). For this case, we recommend using a CO limiter.

### Operation of the Vitodens in wet rooms

#### Room sealed operation

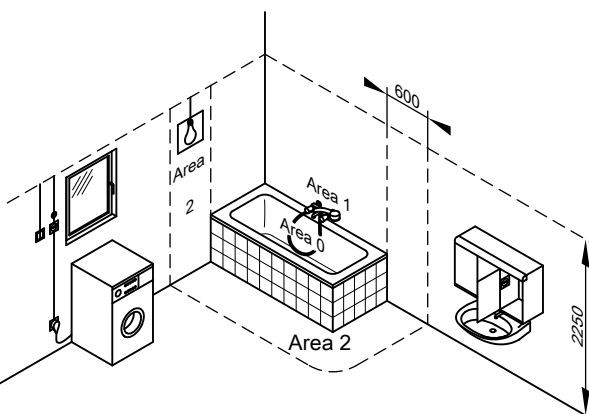
- The Vitodens is approved for installation in wet rooms
- Vitodens 100-W: Protection rating IP X4 splashproof  
The boiler may be installed in safety zone 1 if hosed water (e.g. from massage showers) is prevented.
- Vitodens 111-W: Protection rating IP X1  
The boiler must not be installed in safety zone 1 or 2.

#### Open flue operation

- The Vitodens 100-W may only be installed in safety zone 1 or 2 if additional splash protection (part no. 7590109) is fitted.
- These systems must not be installed in safety zones 1 or 2.

When installing the Vitodens in wet rooms, observe the safety zones and minimum wall clearances according to VDE 0100 [or local regulations] (see also "Electrical safety zone").

### Electrical safety zone



6173204

## Design information (cont.)

### Electrical connection

The power supply must comply with the requirements of the local power supply utility and current VDE [or local] regulations!  
The power supply must comply with the requirements of the local power supply utility and current ÖVE [or local] regulations!  
Protect the power cable with a fuse with a max. rating of 16 A.  
We recommend installing an AC/DC-sensitive RCD (RCD class B) for DC (fault) currents that can occur with energy efficient equipment.  
Make the power supply (230 V~, 50 Hz) via a permanent connection.  
Flexible connecting cable included in standard delivery:

Vitodens 100-W and 111-W: Approx. 2 m long  
It can be connected via an on-site junction box outside the appliance.  
The power supply for the accessories is connected at the terminals in the appliance. The cables are inserted into the boiler through the underside (Vitodens 100-W and 111-W).  
The outside temperature sensor, cylinder temperature sensor (Vitodens 100-W) and PlusBus to the accessories are connected to an external plug:  
Vitodens 100-W and 111-W: Plug on the underside

### Recommended cables

Flexible connecting cable max. 3 x 1.5 mm <sup>2</sup>	Flexible 2-core connecting cable min. 0.75 mm <sup>2</sup>
<ul style="list-style-type: none"><li>– Power cables (accessories)</li><li>– DHW circulation pump</li></ul>	<ul style="list-style-type: none"><li>– EM-EA1, EM-P1, EM-S1 (PlusBus) extension</li><li>– Outside temperature sensor</li><li>– Extension kit for heating circuit with mixer (PlusBus)</li><li>– Vitotrol 200-E (PlusBus)</li></ul>

### Interlock switch

Install an interlock for open flue operation if an extractor (e.g. cooker hood) is fitted in the room providing the combustion air supply.  
The EM-EA1 extension (accessories) can be used for this. This switches any extractors off when the burner is started.

However, the high safety standard derived from the use of an external safety solenoid valve has proved to be valuable. We therefore recommend the continued installation of an external safety solenoid valve when installing the Vitodens in rooms below ground level. The EM-EA1 extension (accessory) is required for this.

### Additional requirements when siting boilers operated with LPG in rooms below ground level

According to TRF 2012, an external safety solenoid valve is no longer required when installing the Vitodens below ground level.

### Gas connection

Gas installations must only be carried out by a registered gas fitter authorised by the relevant gas supply utility.  
Connect and size the mains gas according to TRGI 2018 or TRF 2012 [or local regulations].  
Connect the mains gas according to ÖVGW-TR Gas (G1) and the regionally applicable building regulations.  
Max. test pressure 150 mbar (15 kPa).  
We recommend installing a gas filter to DIN 3386 in the gas line.

The gas shut-off valves supplied with the Vitodens are equipped with integral, thermally activated safety shut-off valves.

### Gas supply pipe

Calculate the size of the on-site gas supply pipe using the gas supply values (specification).

### Thermally activated safety shut-off valve

According to paragraph 4, section 5 of the FeuVo 2008 [check local fire regulations], thermally activated shut-off equipment must be installed in combustion equipment or in gas supply lines immediately upstream of the combustion equipment. This equipment must shut off the gas supply if the external temperature exceeds 100 °C. The valves must isolate the gas supply for at least 30 min up to a temperature of 650 °C. This is intended to prevent the formation of explosive gas mixtures in the event of a fire.

### Minimum clearances

Clearance for maintenance work and operating the ON/OFF switch:

- 700 mm in front of the boiler
- To the left or right of the boiler
  - Vitodens 100-W and 111-W: No clearance required

### Installation of the Vitodens 100-W

Accessories required in addition to installation with the pre-plumbing jig, valves/fittings or mounting frame:  
Installation without DHW cylinder: Caps for cylinder flow and return  
Installation with DHW cylinder: Connection set for DHW cylinder

## Design information (cont.)

### Pre-plumbing jig for surface mounting

With fixings, valves/fittings and gas shut-off valve R  $\frac{3}{4}$  with integral, thermally activated safety shut-off valve.

With fixings, valves/fittings and gas shut-off valve G  $\frac{3}{4}$  with integral, thermally activated safety shut-off valve.

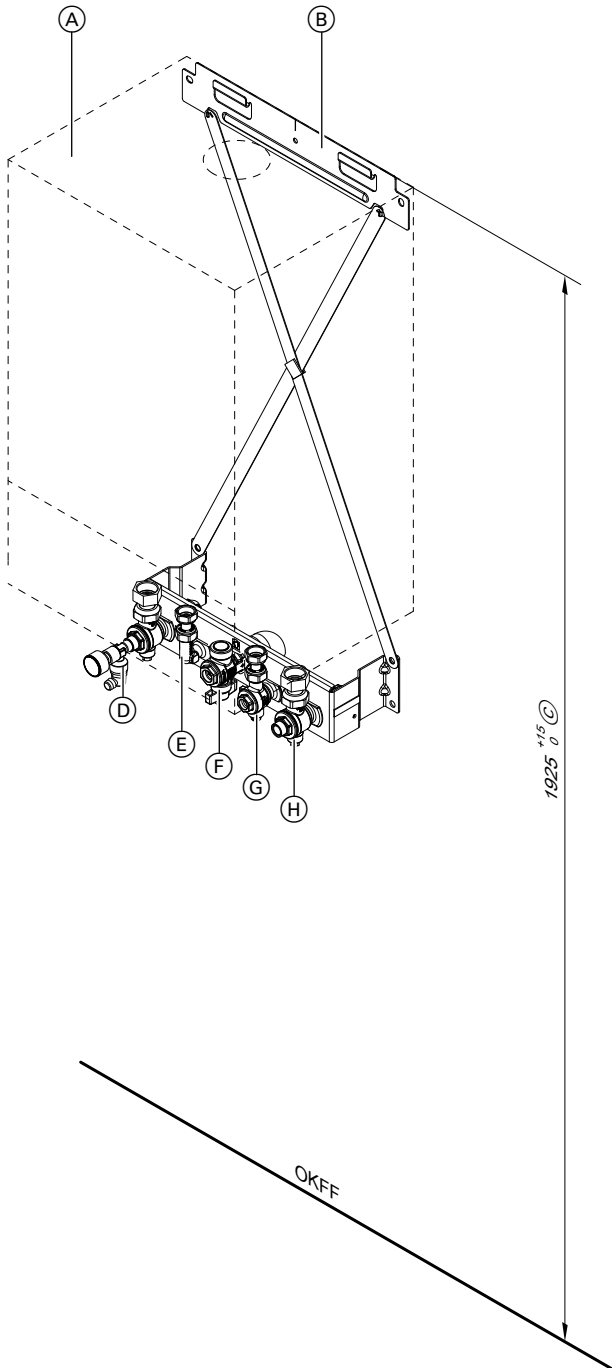


Illustration shows a gas condensing combi boiler

- |     |   |      |   |
|-----|---|------|---|
| (A) | Vitodens  | (E)  | Cold water R $\frac{1}{2}$                                    |
| (B) | Pre-plumbing jig  | (F)  | Gas connection R $\frac{3}{4}$                                |
| (C) | Compulsory in conjunction with DHW cylinders below the boiler; otherwise recommended. |      | Gas connection G $\frac{3}{4}$                                |
| (D) | Heating flow R $\frac{3}{4}$ with pressure gauge and air vent valve                   | (G)  | DHW R $\frac{1}{2}$   |
|     |   | (H)  | Heating return R $\frac{3}{4}$ with boiler drain & fill valve |
|     |   | OKFF | Top edge, finished floor                                      |

## Design information (cont.)

### Valves/fittings for surface mounting

With valves/fittings and gas shut-off valve R ¾ with integral, thermally activated safety shut-off valve.

With valves/fittings and gas shut-off valve G ¾ with integral, thermally activated safety shut-off valve.

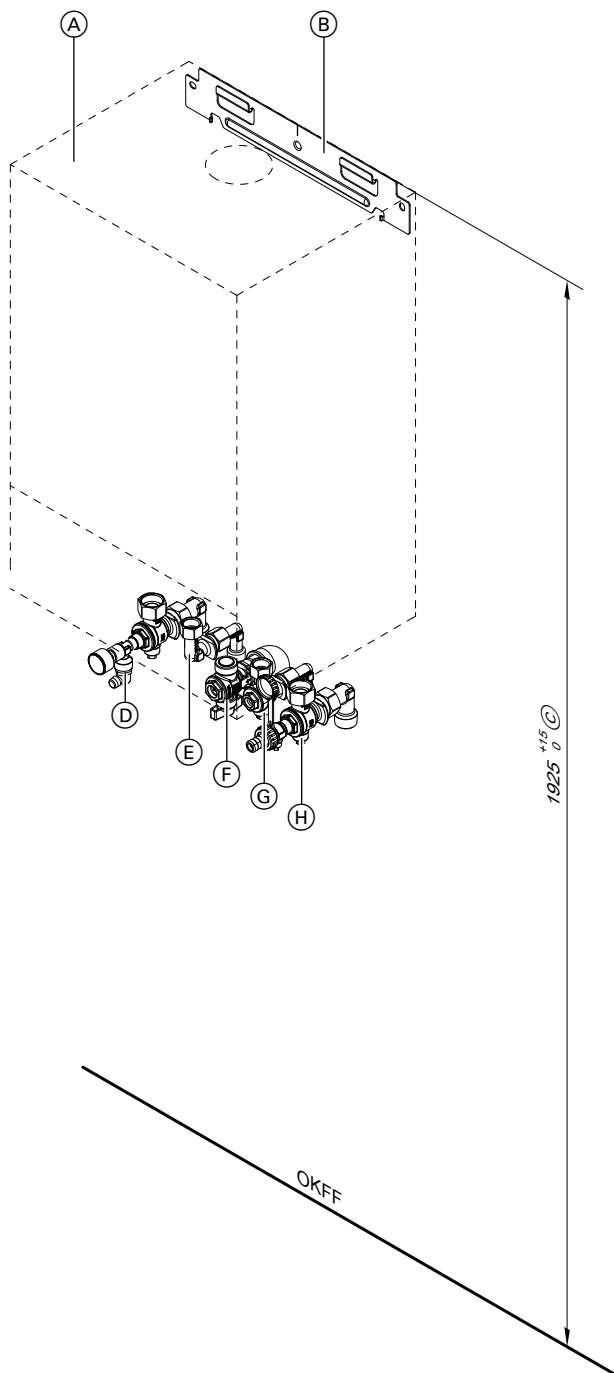


Illustration shows a gas condensing combi boiler

- |     |   |      |   |
|-----|---|------|---|
| (A) | Vitodens  | (E)  | Cold water R ½                                    |
| (B) | Pre-plumbing jig  | (F)  | Gas connection R ¾<br>Gas connection G ¾          |
| (C) | Compulsory in conjunction with DHW cylinders below the boiler; otherwise recommended. | (G)  | DHW R ½   |
| (D) | Heating flow R ¾ with pressure gauge and air vent valve                               | (H)  | Heating return R ¾ with boiler drain & fill valve |
|     |   | OKFF | Top edge, finished floor                          |

## Design information (cont.)

### Valves/fittings for flush mounting

With valves/fittings and gas shut-off valve R  $\frac{3}{4}$  with integral, thermally activated safety shut-off valve and mounting plate.

With valves/fittings and gas shut-off valve G  $\frac{3}{4}$  with integral, thermally activated safety shut-off valve and mounting plate.

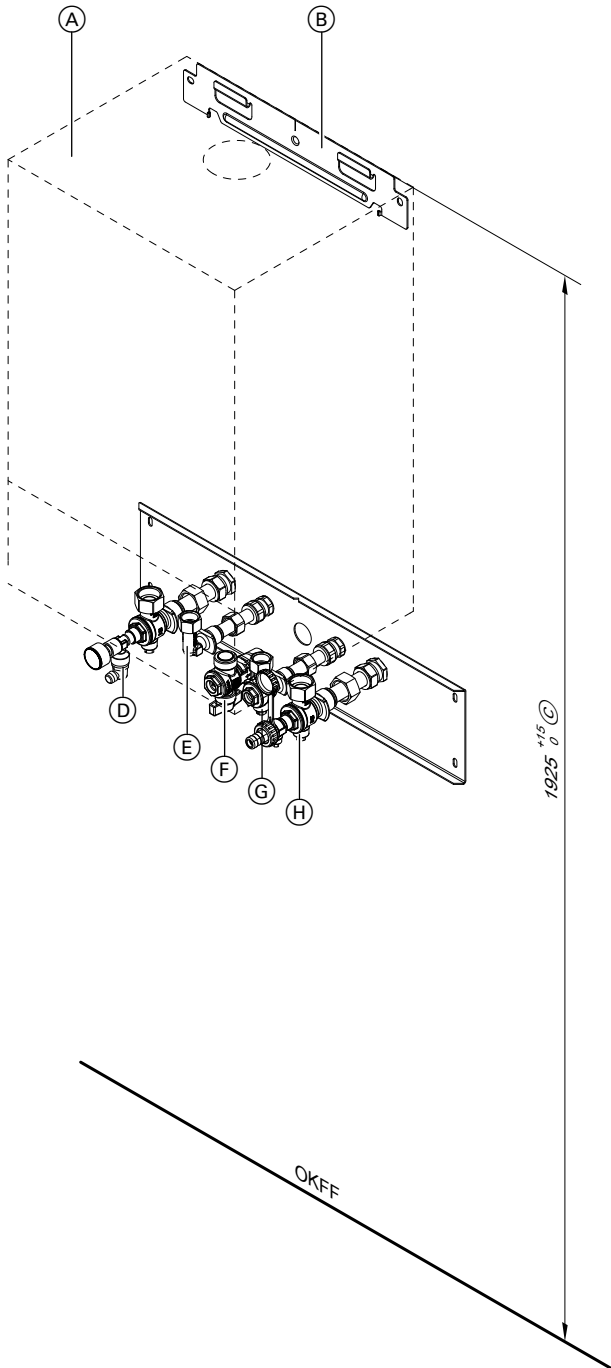


Illustration shows a gas condensing combi boiler

- (A) Vitodens
- (B) Pre-plumbing jig
- (C) Compulsory in conjunction with DHW cylinders below the boiler; otherwise recommended.
- (D) Heating flow R  $\frac{3}{4}$  with pressure gauge and air vent valve

- (E) Cold water R  $\frac{1}{2}$
- (F) Gas connection R  $\frac{3}{4}$   
Gas connection G  $\frac{3}{4}$
- (G) DHW R  $\frac{1}{2}$
- (H) Heating return R  $\frac{3}{4}$  with boiler drain & fill valve
- OKFF Top edge, finished floor

## Design information (cont.)

### Mounting frame for surface mounting

With fixings, valves/fittings and gas shut-off valve R  $\frac{3}{4}$  with integral, thermally activated safety shut-off valve.

With fixings, valves/fittings and gas shut-off valve R  $\frac{3}{4}$  with integral, thermally activated safety shut-off valve.

With fixings, valves/fittings and gas shut-off valve G  $\frac{3}{4}$  with integral, thermally activated safety shut-off valve.

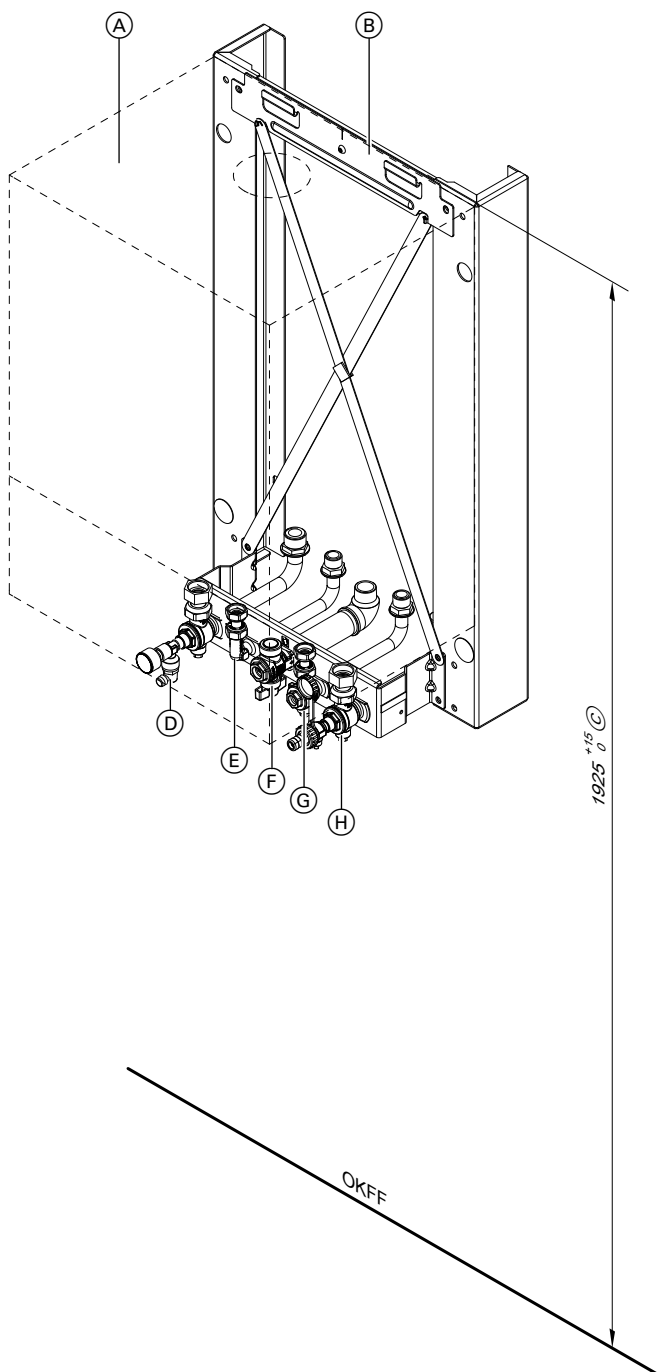


Illustration shows a gas condensing combi boiler

- |     |   |     |                                |
|-----|---|-----|--------------------------------|
| (A) | Vitodens  | (E) | Cold water R $\frac{1}{2}$     |
| (B) | Mounting frame  | (F) | Gas connection R $\frac{3}{4}$ |
| (C) | Compulsory in conjunction with DHW cylinders below the boiler; otherwise recommended. | (G) | Gas connection G $\frac{3}{4}$ |
| (D) | Heating flow R $\frac{3}{4}$ with pressure gauge and air vent valve                   | (H) | DHW R $\frac{1}{2}$            |



## Design information (cont.)

- Ⓜ Heating return R ¾ with boiler drain & fill valve
- OKFF Top edge, finished floor

**Plumbing wall installation with a plumbing wall mounting frame**  
Suitable for wall mounting, plumbing wall installation anywhere in the room or in front of lightweight walls.

A pre-plumbing jig (part no. ZK04307) must be ordered separately in addition to the plumbing wall mounting frame.

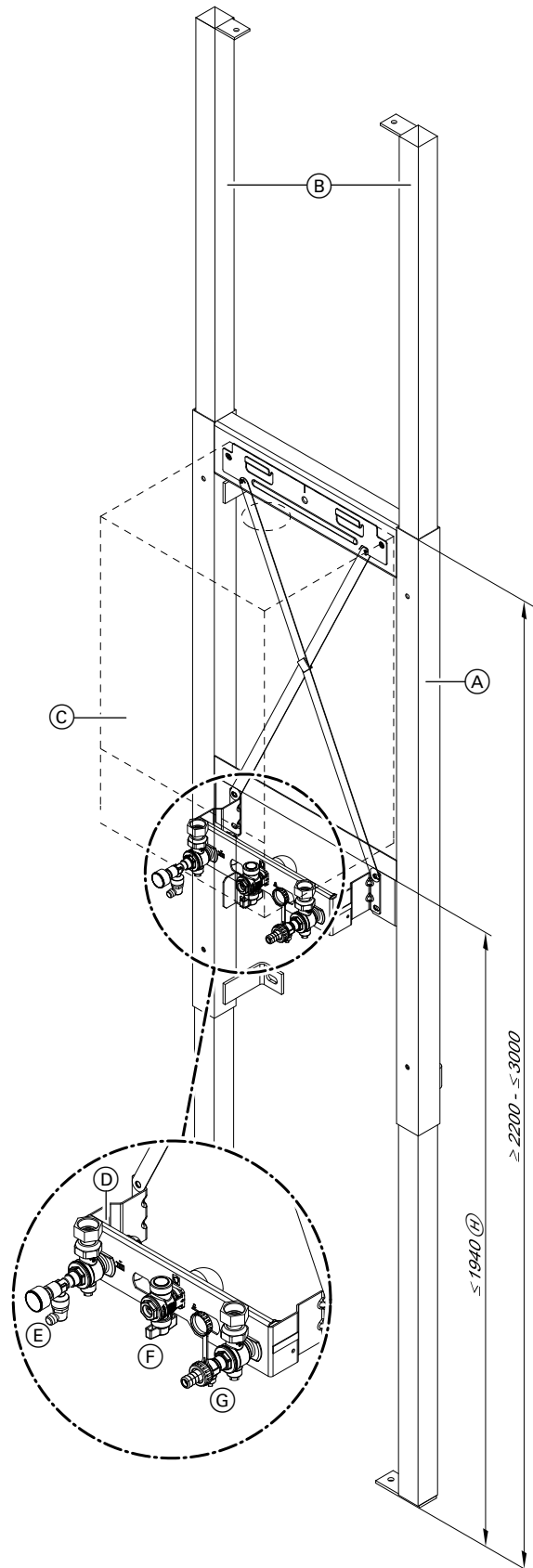


Illustration shows a gas condensing system boiler

## Design information (cont.)

- (A) Plumbing wall mounting frame
- (B) Extension for ceiling installation
- (C) Vitodens
- (D) Pre-plumbing jig
- (E) Heating flow R ¾ with pressure gauge and air vent valve
- (F) Gas connection R ¾
- Gas connection G ¾
- (G) Heating return R ¾ with boiler drain & fill valve
- (H) In conjunction with DHW cylinder below the boiler, min. 1933 mm

### Replacing third party boilers with the Vitodens 100-W

Using an adaptor, the Vitodens hydraulic connections are compatible with Ceramini-Z-SR, Cerastar-ZR/-ZWR and Thermoblock-VC110E-/VC112E/-VC/-VCW boilers.

For modernisation projects, adaptors are available as accessories (see pricelist). These comprise connection components for the heating water and DHW sides and fixings for replacing the third party appliances listed below with a Vitodens. A pre-plumbing jig for surface mounting or valves/fittings for surface mounting must be ordered separately in addition to the Vitodens 100-W.

The installation work involved is no greater than replacement with a same-brand appliance.

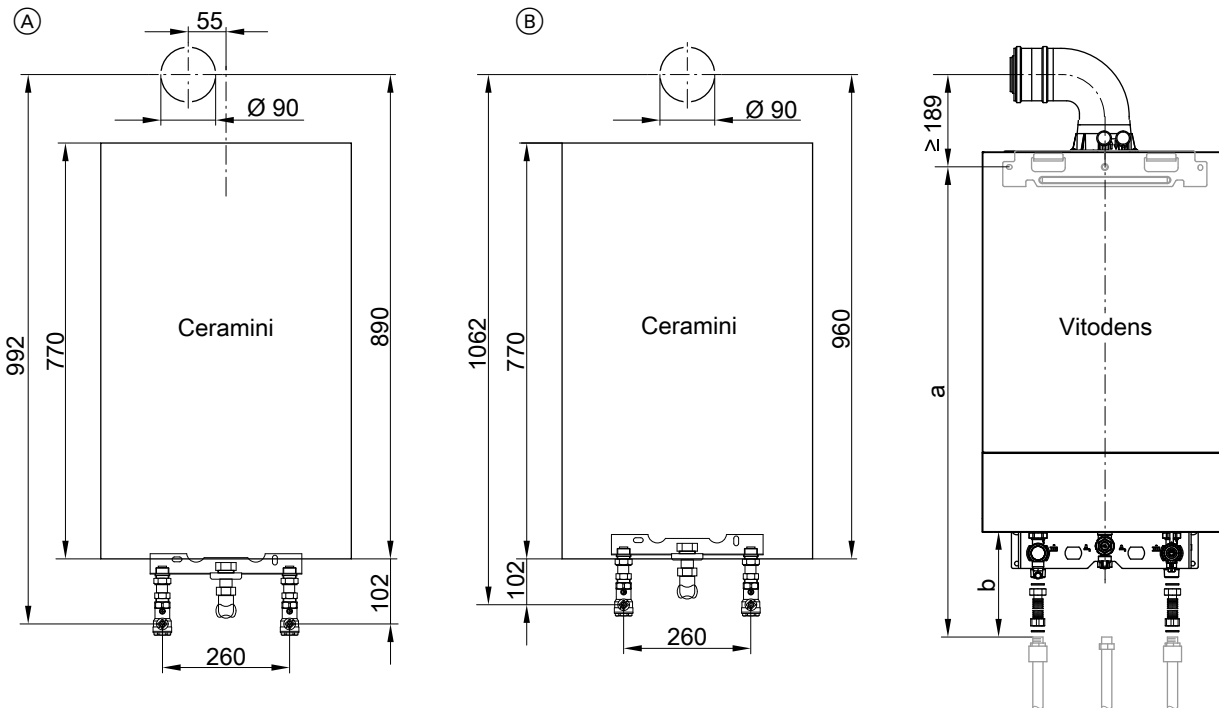
Where a wall mounted gas boiler is replaced by a Vitodens 100-W gas condensing system boiler, the flue must also be replaced with a system that is suitable for "condensing operation" (see pricelist "Flue systems for the Vitodens").

Adapt the flue connections on site.

#### Note

For modernisation projects, the State Building Regulations [Germany] require the on-site installation of a gas shut-off valve with thermally activated shut-off facility.

### Replacing a Ceramini-Z-SR with a Vitodens 100-W, 11 kW and 19 kW



- (A) Open flue operation
- (B) Room sealed operation

Dim.	Flush mounting	Surface mounting
a mm	790 <sup>+25/-0</sup>	802 <sup>+50/-0</sup>

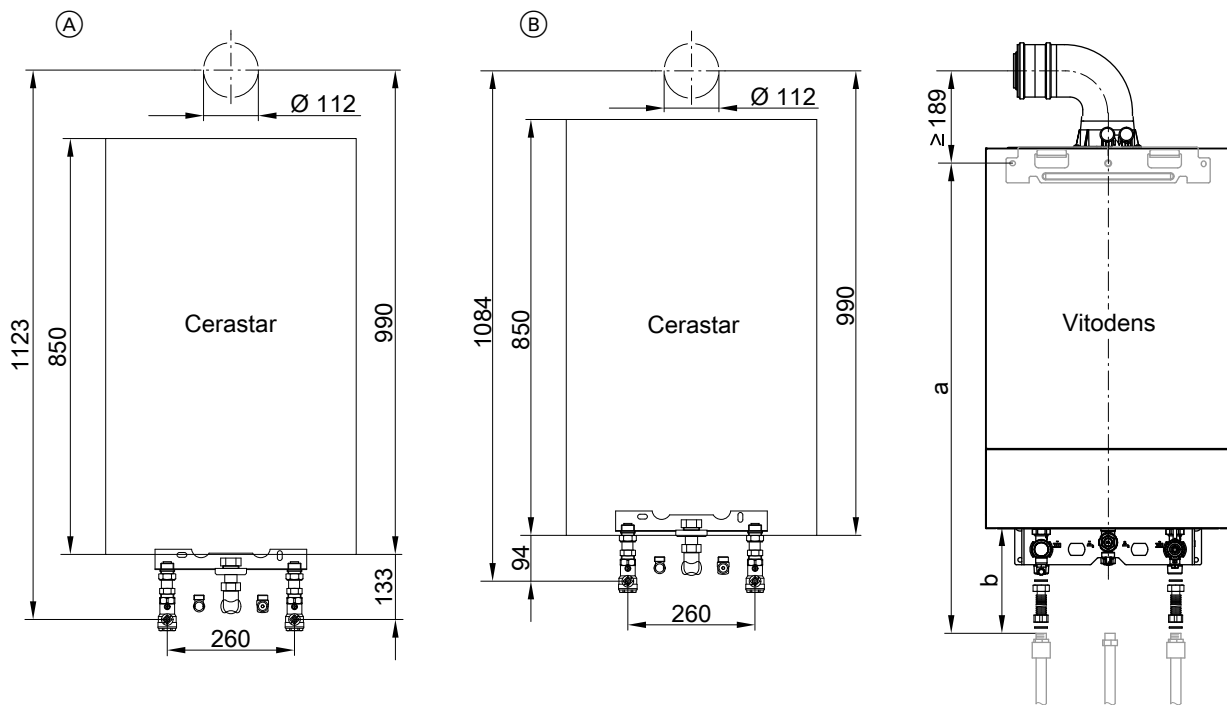
#### Note

Height of flue gas connection in combination with balanced flue bend 60/100. If using a balanced flue inspection bend 60/100, the height is reduced by 10 mm.



## Design information (cont.)

Replacing a Cerastar-ZR/-ZWR with a Vitodens 100-W, 25 and 32 kW



- (A) Open flue operation
- (B) Room sealed operation

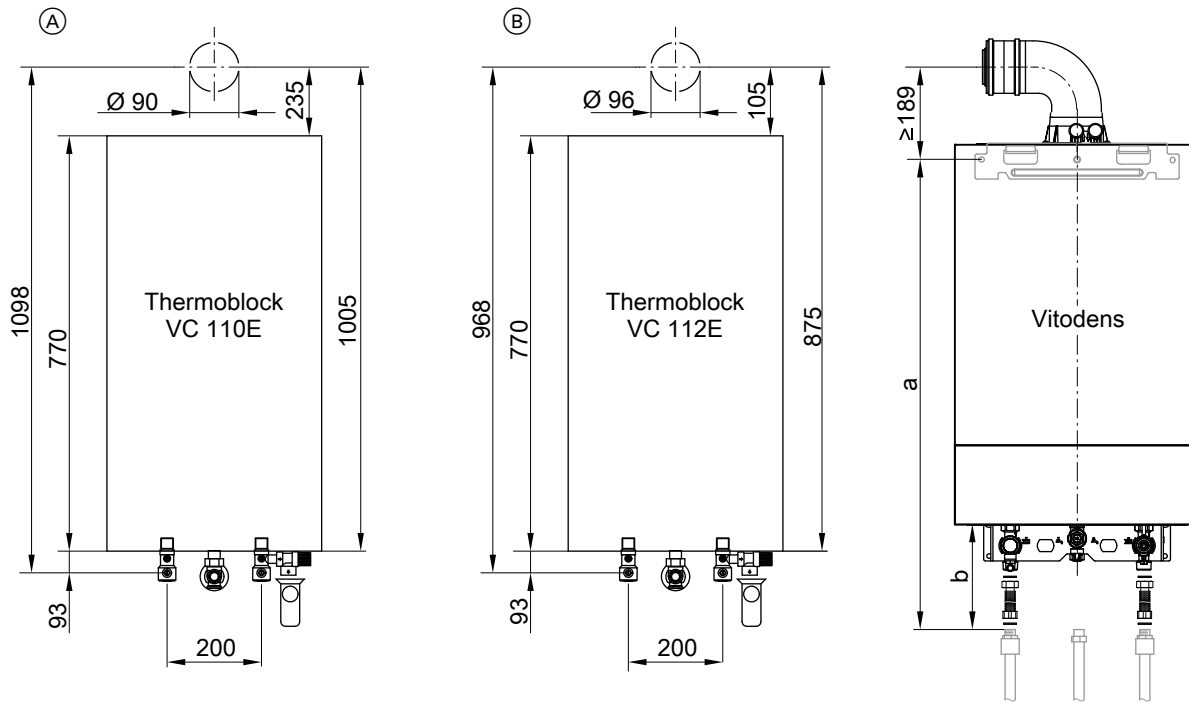
Dim.	Flush mounting	Surface mounting
a mm	790 <sup>+25/-0</sup>	802 <sup>+50/-0</sup>

### Note

Height of flue gas connection in combination with balanced flue bend 60/100. If using a balanced flue inspection bend 60/100, the height is reduced by 10 mm.

## Design information (cont.)

Replacing a Thermoblock-VC110E/-VC112E with a Vitodens 100-W, 11 and 19 kW



- (A) Open flue operation
- (B) Room sealed operation

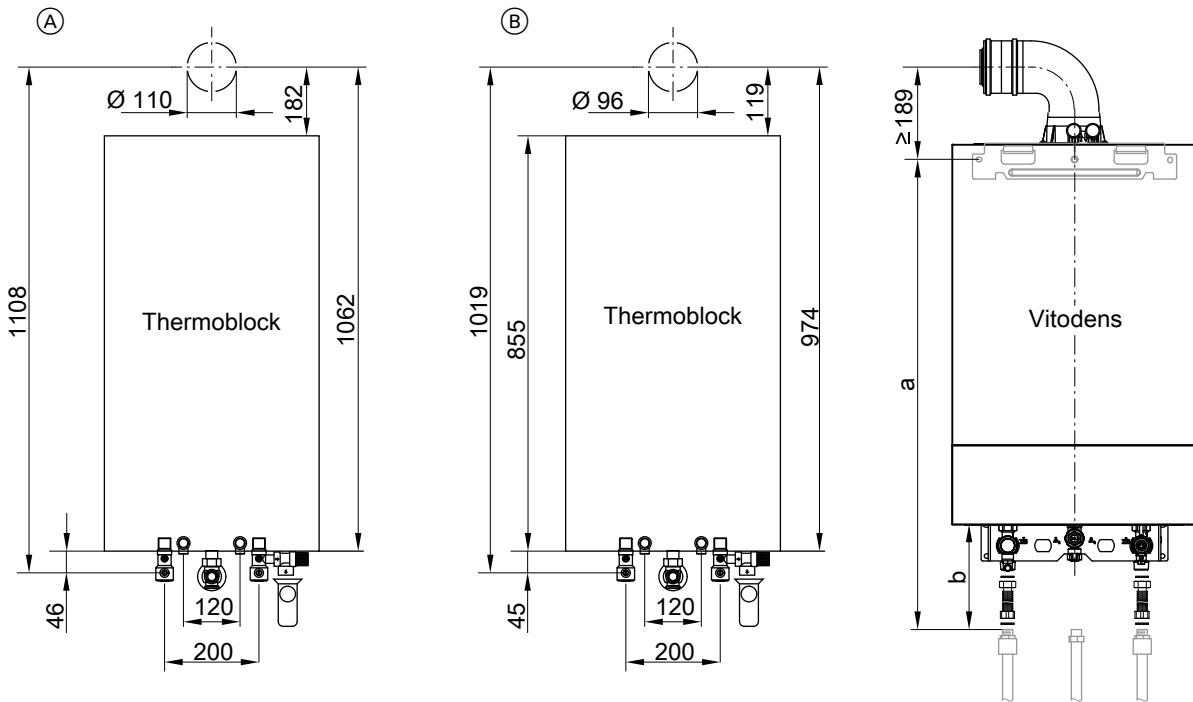
Dim.	Flush mounting	Surface mounting
a mm	786 <sup>+25/-0</sup>	802 <sup>+50/-0</sup>

### Note

Height of flue gas connection in combination with balanced flue bend 60/100. If using a balanced flue inspection bend 60/100, the height is reduced by 10 mm.

## Design information (cont.)

Replacing a Thermoblock-VC/-VCW with a Vitodens 100-W, 25 and 32 kW



- (A) Open flue operation
- (B) Room sealed operation

Dim.	Flush mounting	Surface mounting
a mm	786 <sup>+25/-0</sup>	802 <sup>+50/-0</sup>

**Note**

Height of flue gas connection in combination with balanced flue bend 60/100. If using a balanced flue inspection bend 60/100, the height is reduced by 10 mm.

## Design information (cont.)

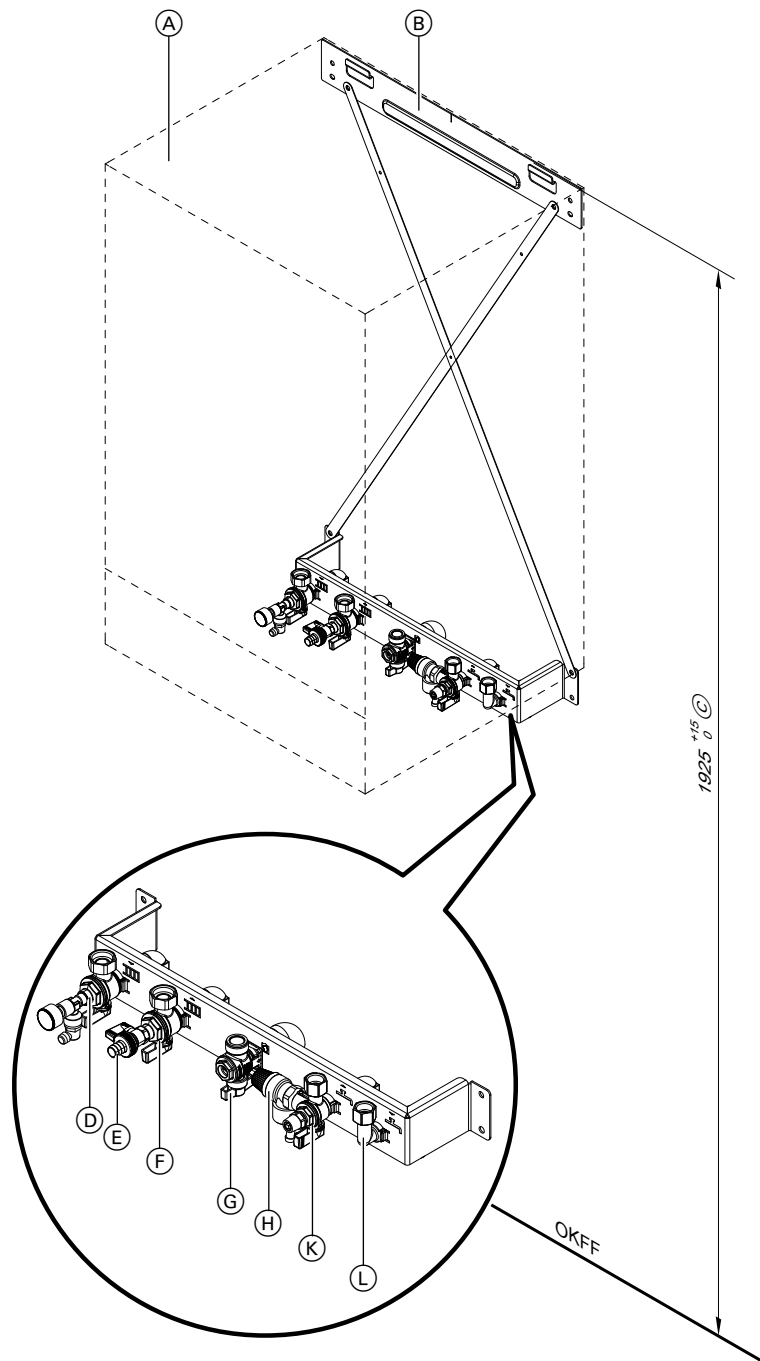
### Pre-installation of the Vitodens 111-W

#### Pre-plumbing jig for surface mounting

Pre-plumbing jig, comprising:

- Fixings
- Valves/fittings

- Gas shut-off valve
- Safety valve on the DHW side



- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>(A) Vitodens</li> <li>(B) Pre-plumbing jig</li> <li>(C) Recommended installation height</li> <li>(D) Heating flow R <math>\frac{3}{4}</math></li> <li>(E) Filling/drainage</li> </ul> | <ul style="list-style-type: none"> <li>(F) Heating return R <math>\frac{3}{4}</math></li> <li>(G) Gas connection R <math>\frac{3}{4}</math><br/>Gas connection G <math>\frac{3}{4}</math></li> <li>(H) Safety valve on the DHW side</li> <li>(K) Cold water R <math>\frac{1}{2}</math></li> <li>(L) DHW R <math>\frac{1}{2}</math></li> </ul> |
|--|---|

## Design information (cont.)

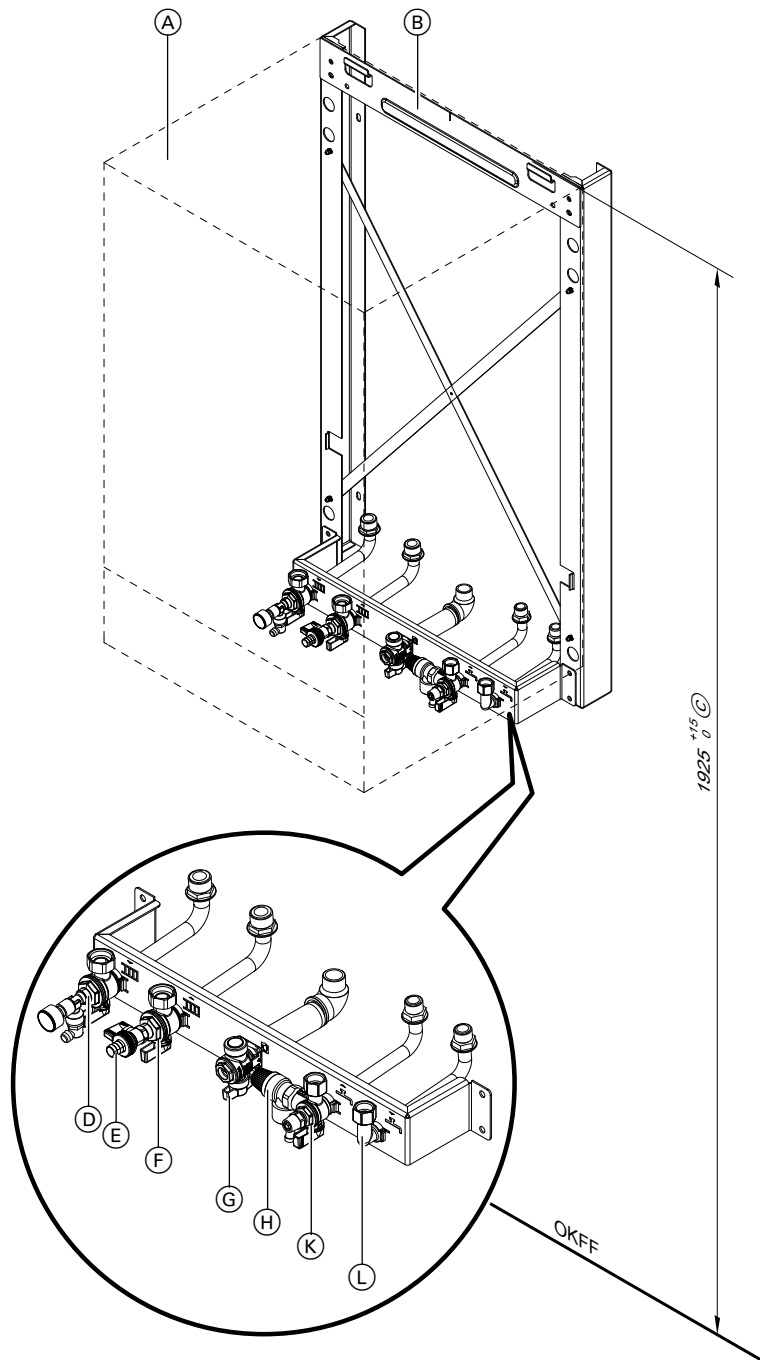
### Mounting frame for surface mounting

Mounting frame, comprising:

- Fixings
- Valves/fittings

- Gas shut-off valve
- Safety valve on the DHW side

Wall clearance 90 mm



- (A) Vitodens
- (B) Mounting frame
- (C) Recommended installation height
- (D) Heating flow R  $\frac{3}{4}$
- (E) Filling/draining

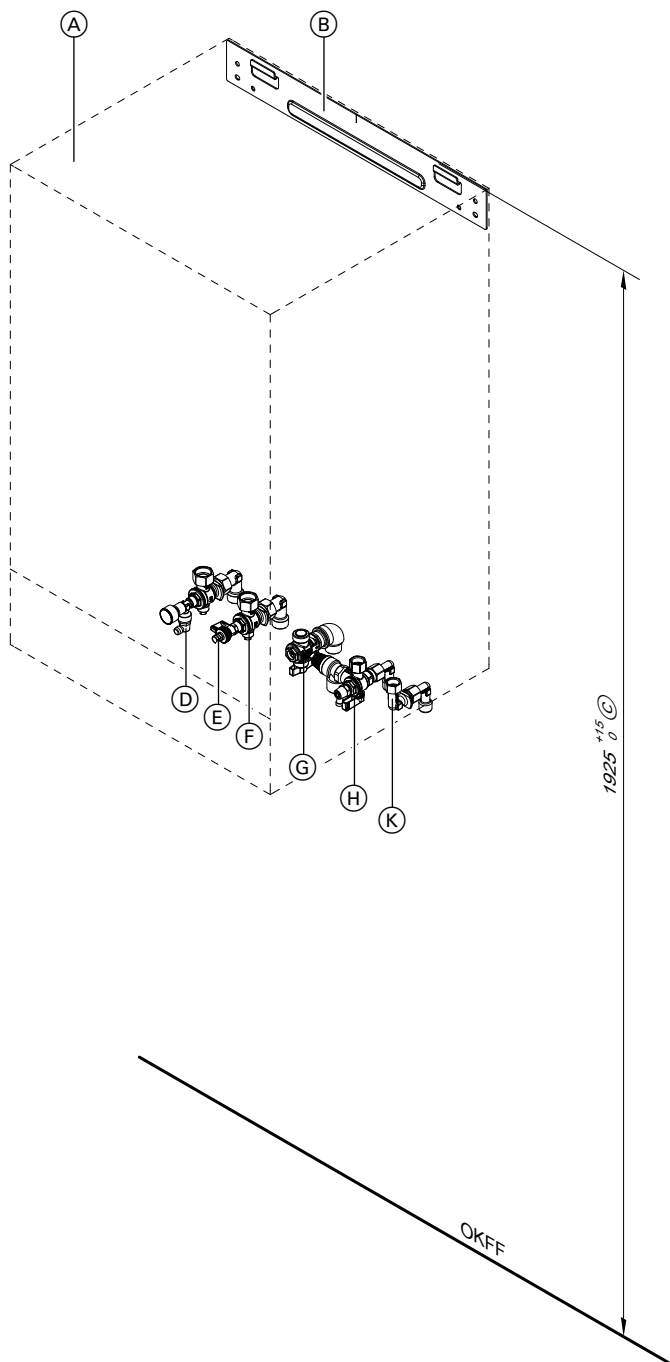
- (F) Heating return R  $\frac{3}{4}$
- (G) Gas connection R  $\frac{3}{4}$   
Gas connection G  $\frac{3}{4}$
- (H) Safety valve on the DHW side
- (K) Cold water R  $\frac{1}{2}$
- (L) DHW R  $\frac{1}{2}$

## Design information (cont.)

### Valves/fittings for surface mounting

With valves/fittings and gas shut-off valve R  $\frac{3}{4}$  with integral, thermally activated safety shut-off valve.

With valves/fittings and gas shut-off valve G  $\frac{3}{4}$  with integral, thermally activated safety shut-off valve.



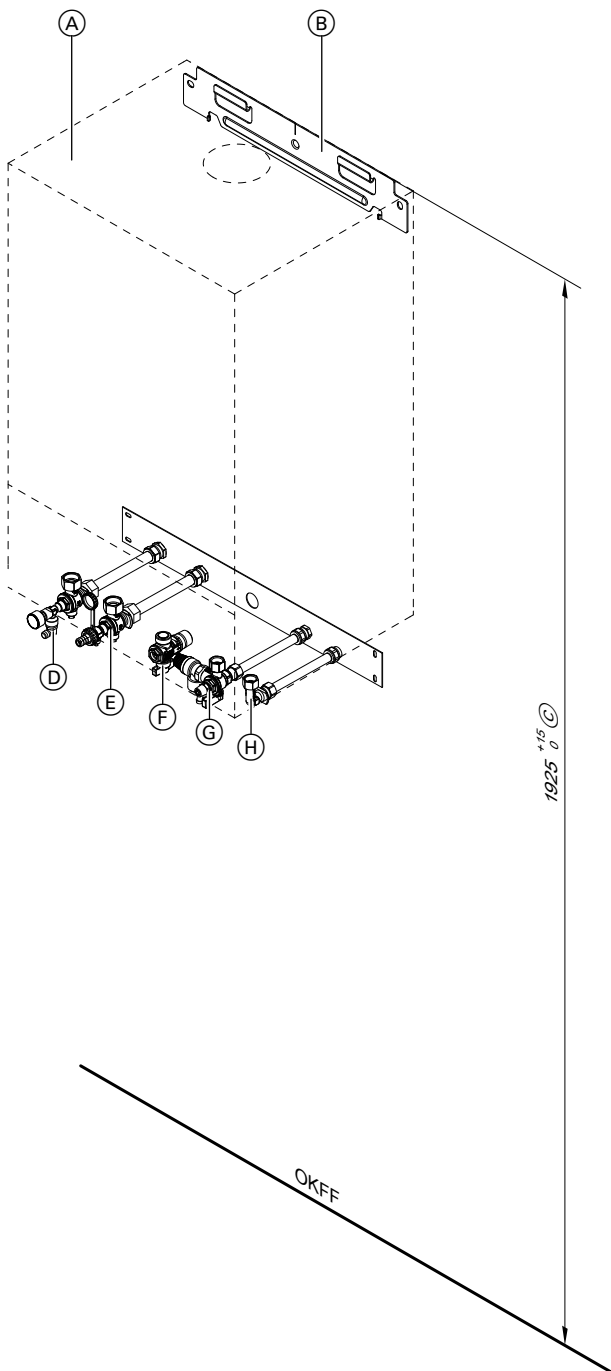
- (A) Vitodens
- (B) Wall mounting bracket (Vitodens standard delivery)
- (C) Recommended installation height
- (D) Heating flow R  $\frac{3}{4}$
- (E) Filling/draining
- (F) Heating return R  $\frac{3}{4}$

- (G) Gas connection R  $\frac{3}{4}$   
Gas connection G  $\frac{3}{4}$
- (H) Safety valve on the DHW side
- (K) Cold water R  $\frac{1}{2}$
- (L) DHW R  $\frac{1}{2}$
- OKFF Top edge, finished floor

## Design information (cont.)

### Valves/fittings for flush mounting

With valves/fittings, gas shut-off valve R  $\frac{3}{4}$  with integral, thermally activated safety shut-off valve and mounting plate.



- |     |  |      |                                |
|-----|--|------|--------------------------------|
| (A) | Vitodens   | (F)  | Heating return R $\frac{3}{4}$ |
| (B) | Wall mounting bracket (Vitodens standard delivery) | (G)  | Gas connection R $\frac{3}{4}$ |
| (C) | Recommended installation height                    | (H)  | Safety valve on the DHW side   |
| (D) | Heating flow R $\frac{3}{4}$                       | (K)  | Cold water R $\frac{1}{2}$     |
| (E) | Filling/draining                                   | (L)  | DHW R $\frac{1}{2}$            |
|     |  | OKFF | Top edge, finished floor       |

## 5.2 Decision making aids for DHW heating

To provide the perfect solution for every situation, the Vitodens is available in the following versions:

6173204

## Design information (cont.)

### Vitodens 100-W

- As a gas system boiler in combination with a separate DHW cylinder
- As a gas condensing combi boiler with integral, direct DHW heating

### Vitodens 111-W

With integral DHW loading cylinder

Various factors should be taken into consideration when designing heating systems and deciding between a gas system boiler with a separate DHW cylinder or a gas system boiler with an integral DHW loading cylinder:

- DHW demand, convenience
- Use of the various connected draw-off points

- Distance of the draw-off points from the boiler
- System modernisation
- Space requirement
- Water quality

### Notes on water quality

During DHW heating, settling of lime on the surfaces of the plate heat exchanger cannot be completely prevented. The tendency towards limescale build-up depends on various conditions, predominantly on the substances contained in the water, the amount of water that is heated (DHW consumption) and the DHW temperature. Although scale deposits inside the plate heat exchanger are generally minor enough not to cause any reduction in DHW output, such impairment cannot be excluded with increased water hardness. From a water hardness of 20 °dH (3.5 mol/m<sup>3</sup>) and higher, we therefore recommend the use of DHW cylinders with internal indirect coils or a water treatment system in the cold water supply when heating DHW.

Please note that regional water supply utilities frequently specify an average water hardness. Higher levels of water hardness may therefore occur from time to time. This may make the use of a water treatment facility advisable even from 17 °dH (> 3.0 mol/m<sup>3</sup>) upwards.

### Selection table

		Vitodens 100-W gas condensing system boiler with separate DHW cylinder	Vitodens 111-W with integral DHW loading cylinder
DHW demand, convenience	DHW demand for an apartment	+	+
	DHW demand for a detached house	+	+
	Centralised DHW demand for an apartment building	+	–
	Decentralised DHW demand for an apartment building	+	0
Use of the various connected draw-off points	One draw-off point	0	0
	Several draw-off points, not used simultaneously	+	+
	Several draw-off points, used simultaneously	+	+
Distance of draw-off point from boiler	Up to 7 m (without DHW circulation pipe)	+	+
	With DHW circulation pipe	+	–
Modernisation	DHW cylinder installed	+	–
	Replacement of an existing combi boiler	–	0
Space requirement	Minimal space available (siting in a recess)	0	0
	Sufficient space available (installation room)	+	+
Solar DHW heating can be connected	Connection to dual mode DHW cylinder	+	–
	Connection to integral DHW cylinder	–	–

+ = recommended

0 = recommended under certain conditions

– = not recommended

### Separate DHW cylinders

For greater DHW convenience, separate DHW cylinders are also available in white in the following versions:

- Below the boiler (120 or 150 l)
- Adjacent to the boiler (160, 200, 300 or 400 l)

Further DHW cylinders with up to 1000 l capacity are available in Vitosilver and may also be used in accordance with the available heating output.

The Vitodens 100-W is equipped at factory with a separate DHW cylinder for DHW heating. A diverter valve is integrated for this purpose.

For the connection of a separate DHW cylinder, a DHW cylinder connection set (incl. cylinder temperature sensor) must always be ordered separately.

For DHW cylinder specifications, see chapter "DHW cylinders".



## Design information (cont.)

### Sizing the DHW cylinder

Determine the DHW cylinder size in accordance with the specific DHW demand.

Various combinations of taps/draw-off points can be applied.

If identical taps/draw-off points are combined, only take into account the individual draw-off point, not the combination.

The following summary enables an **approximate** sizing of the DHW cylinder:

Small households (1 to 2 occupants)	
Average households (3 to 4 occupants)	

#### Cylinder capacity in litres

	Bath 1600 to DIN 4471	Bath 1700 to DIN 4471	Small bath and sit bath	Large bath (1800 × 750 mm)	Shower cubicle with mixer tap and standard shower head	Shower cubicle with 1 shower head and 2 side nozzles	Washbasin	Bidet
Draw-off rate in W/h	5820	6510	4890	8720	1630	4070	700	810
Draw-off volume per use or useful capacity in l	140	160	120	200	40	100	17	20
Bath 1600 to DIN 4471	120				120	120	120	120
	120				120	150/160	120	120
Bath 1700 to DIN 4471		120			120	120	120	120
		120			120	120	120	120
Small bath and sit bath			120		120	120	120	120
			120		120	120	120	120
Large bath (1800 × 750 mm)				120	120	120	120	120
				200	150/160	200	150/160	150/160
Shower cubicle with mixer tap and standard shower head	120	120	120	120	120	120	120	120
	120	120	120	150/160	120	120	120	120
Shower cubicle with 1 shower head and 2 side nozzles	120	120	120		120	120	120	120
	150/160		150/160	200	120	120	120	120
Washbasin	120	120	120	120	120	120	120	120
	120	120	120	150/160	120	120	120	120
Bidet	120	120	120	120	120	120	120	120
	120	120	120	150/160	120	120	120	120

#### Example:

- Average household with 3 occupants
- Use of a bath 1600 with 140 l drawn
- Simultaneous operation of a shower with mixer tap and standard head with 40 l drawn

The table shows that in accordance with DIN 4708, the correct DHW cylinder would have a capacity of 120 l.

### DHW cylinder selection tables

DHW cylinders with "-W" in the product name are supplied with a white finish. Appliances with "-B" or "-V" in the product name are supplied in Vitosilver (marked in grey in the table).

#### Vitodens 100-W gas system boilers, cylinder allocation

Rated heating output range [kW]	Practical cylinder allocation (cylinder capacity in litres)		
	up to 19.0	25.0	32.0
Vitocell 100-W (type CUGA, CUGA-A) below the boiler	120 150	120 150	120 150
Vitocell 100-W (type CVA, CVAA, CVAA-A) adjacent to the boiler	160 200 300	160 200 300	160 200 300
Vitocell 100-V (type CVA) adjacent to the boiler	—	—	500
Vitocell 100-W (type CVB, CVBB) adjacent to the boiler, dual mode	300 400	300 400	300 400
Vitocell 100-W (type CVUB) adjacent to the boiler, dual mode	300	300	300
Vitocell 100-W (type CVUC-A) adjacent to the boiler, dual mode (for Vitodens 100-W only)	300	300	300
Vitocell 100-B (type CVB) adjacent to the boiler, dual mode	—	500	500

## Design information (cont.)

Rated heating output range [kW]	Practical cylinder allocation (cylinder capacity in litres)		
	up to 19.0	25.0	32.0
Vitocell 300-B (type EVBA-A) adjacent to the boiler, dual mode	300	300 500	300 500
Vitocell 340-M (type SVKC) heating water buffer cylinder with DHW heating	708/30	708/30	708/30
Vitocell 360-M (type SVSB) heating water buffer cylinder with DHW heating	708/30	708/30	708/30

## 5.3 Connections on the water side

### Connection on the DHW side

#### Vitodens 100-W gas condensing combi boiler

For the DHW connection, connection sets for surface or flush mounting are available as accessories. The instantaneous water heater provides direct DHW heating.

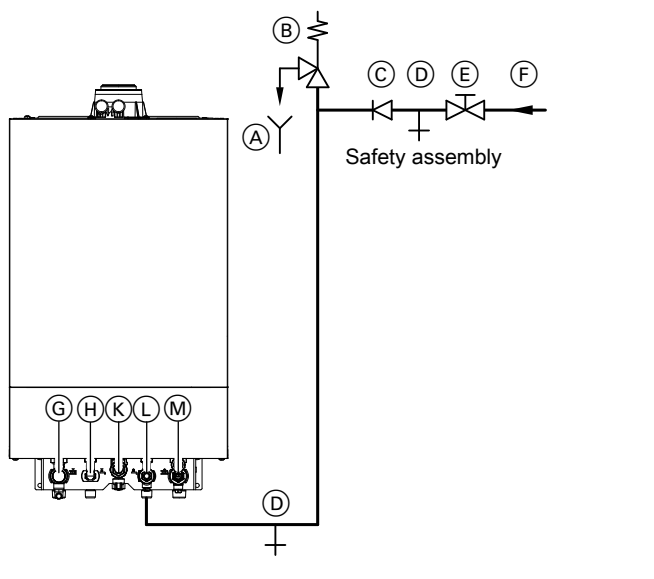
If used in conjunction with galvanised pipes, note that the instantaneous water heater is designed as a stainless steel plate heat exchanger with copper solder joints (observe the flow rule).

In existing installations (modernisation projects), the risk of electrolytic corrosion is low, since a protective layer will have formed on the inside of the pipes.

If DHW is to be drawn simultaneously from several points, we recommend the installation of a separate DHW cylinder in conjunction with the gas system boiler (see "Decision making aids regarding DHW heating").

With water hardness of 20 °dH and higher, we recommend the use of a water treatment system in the cold water line when heating DHW.

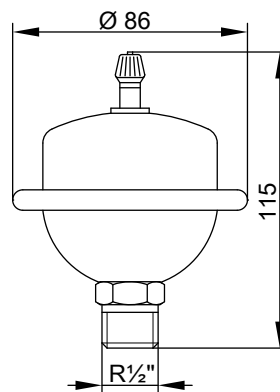
#### Cold water installation of Vitodens 100-W gas condensing combi boiler



Install a safety valve if the cold water supply is equipped with a non-return valve. In addition remove the toggle from the cold water shut-off valve.

Non-return valves are commonly found in pressure reducers and combined shut-off and non-return valves.

#### Shock arrestor



If the pipework to which the Vitodens is connected also supplies draw-off points at which water hammers may occur (e.g. pressure washers, washing machines or dishwashers): Install shock arrestors near the source of the water hammer (recommended).

Flexofit S made by Flamco-Flexcon

or

Reflex made by Winkelmann + Pannhoff GmbH (available from your local dealer).

- (A) Visible drain pipe outlet point
- (B) Safety valve
- (C) Non-return valve
- (D) Drain
- (E) Shut-off valve
- (F) Cold water
- (G) Heating flow
- (H) DHW
- (K) Gas connection
- (L) Cold water
- (M) Heating return

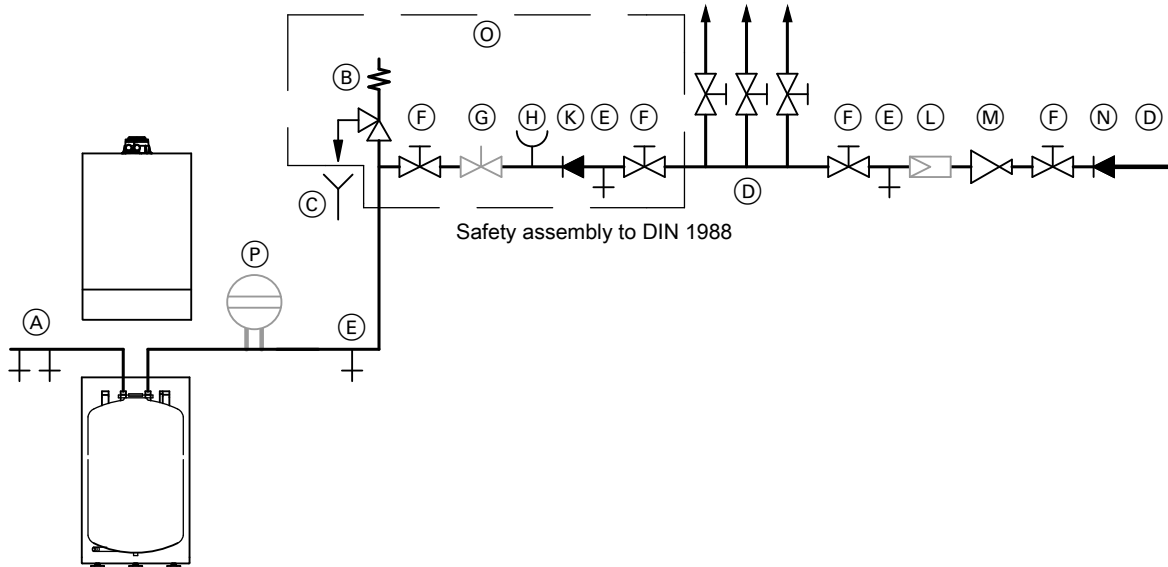
A safety valve to DIN 1988 is only required if the mains water supply pressure exceeds 10 bar (1 MPa) and no DHW pressure reducing valve is installed (to DIN 4753).

## Design information (cont.)

### Vitodens 100-W connection on the DHW side with separate DHW cylinder and Vitodens 111-W with integral loading cylinder

#### Example:

DHW cylinder below the boiler (120 or 150 l) with safety assembly to DIN 1988



- |  |   |
|--|---|
| (A) DHW  | (H) Pressure gauge connector  |
| (B) Safety valve<br>Included in the standard delivery of the pre-plumbing jig for<br><b>Vitodens 111-W</b> | (K) Non-return valve  |
| (C) Visible discharge pipe outlet point  | (L) Drinking water filter   |
| (D) Cold water   | (M) Pressure reducer to DIN 1988-2, Dec. 1988 version   |
| (E) Drain  | (N) Non-return valve/pipe separator   |
| (F) Shut-off valve   | (O) Standard delivery of the safety assembly available as an acces-<br>sory (for separate DHW cylinders only) |
| (G) Flow regulating valve (installation recommended)   | (P) Diaphragm expansion vessel, suitable for potable water  |

#### Safety valve

The safety valve **must** be installed.

We recommend you install the safety valve higher than the top edge of the cylinder. This protects the valve against contamination, scaling and high temperatures. It also means that the DHW cylinder does not need to be drained when working on the safety valve.

#### Drinking water filter

Install a drinking water filter in accordance with DIN 1988-200.

#### DHW circulation

Only in conjunction with the Vitodens 100-W. Cannot be used with the Vitodens 111-W because of the integral loading cylinder. DHW circulation pipes increase DHW convenience and reduce water consumption. These benefits result from the immediate availability of DHW at the tap/draw-off point.

However, poor thermal insulation of the DHW circulation pipe can lead to substantial heat losses.

From a **pipe length of 7 m** upwards, we recommend the installation of a DHW circulation pipe with appropriate thermal insulation in accordance with the Energy Saving Ordinance [Germany]. The Energy Saving Ordinance specifies that the DHW circulation pipe should include a circulation pump, check valve and time switch for stopping DHW circulation during the night.

#### Power supply for DHW circulation pump

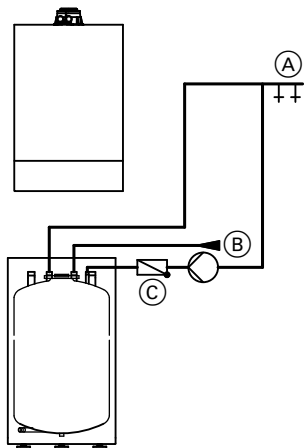
DHW circulation pumps equipped with their own internal control unit must be connected via a separate power supply. Connecting the power supply via the heat generator control unit or its accessories is **not** permissible.

#### Using a non-return valve

If using a DHW cylinder adjacent to the boiler, we recommend installing a non-return valve in the heating water connection line to prevent the DHW cylinder cooling due to any recirculation that may occur.

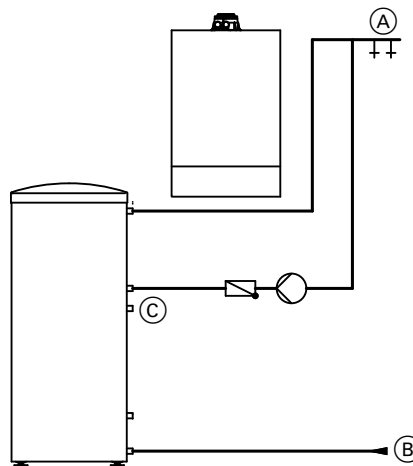
## Design information (cont.)

### Vitodens 100-W



DHW cylinder below the boiler

- (A) DHW
- (B) Cold water
- (C) DHW circulation



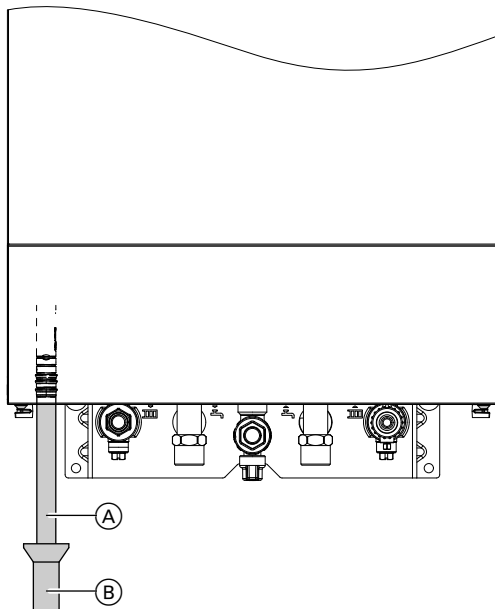
DHW cylinder adjacent to the boiler

- (A) DHW
- (B) Cold water
- (C) DHW circulation

## 5.4 Condensate connection

Route the condensate pipe with a constant fall. Route the condensate from the flue system together with the boiler condensate directly or via a neutralising system (if installed – accessories) to the public waste water system.

### Vitodens 100-W

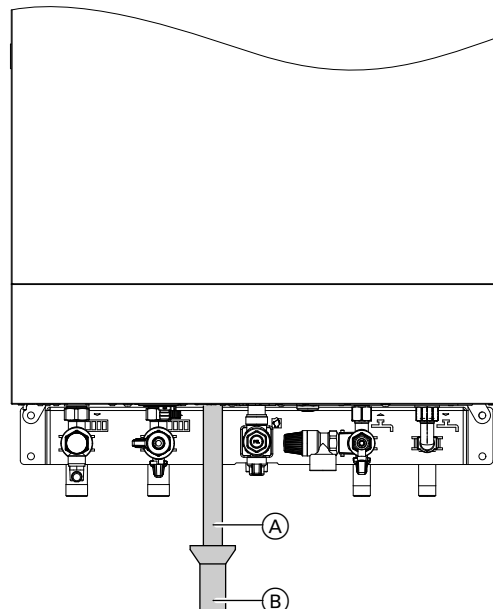


- (A) Drain hose (Vitodens standard delivery)
- (B) Drain outlet kit (accessories)

### Note

A pipe vent **must** be installed between the trap and the neutralising system.

### Vitodens 111-W



- (A) Drain hose (Vitodens standard delivery)
- (B) Drain outlet kit (accessories)

## Condensate drain pipe and neutralisation

During heating operation, condensate with pH values between 4 and 5 is formed in the condensing boiler and in the flue.

The condensate should be drained in accordance with appropriate regulations.

## Design information (cont.)

Code of Practice DWA-A 251 on "Condensate from condensing boilers", which is generally based on the local waste water regulations [in Germany], determines conditions for draining condensate from condensing boilers into the public sewer system.

The composition of condensate drained from Vitodens condensing boilers meets the requirements specified in Code of Practice DWA-A 251.

The condensate drain pipe to the sewer connection must be freely accessible for inspection.

It must be installed with a continuous fall and must contain a stench trap.

Also provide a suitable facility for sampling. Condensate drain pipes must only be made from corrosion-resistant materials (e.g. reinforced hoses).

**Never use any zinc-plated materials or those containing copper for pipes, connection pieces, etc.**

A trap is installed in the condensate drain to prevent flue gases escaping.

Local water regulations and/or specific technical circumstances may prescribe designs that vary from those described in the above Codes of Practice.

Contact your local authority responsible for waste water management in good time prior to installation, to find out about local regulations.

### Condensate from gas combustion equipment up to 200 kW combustion output

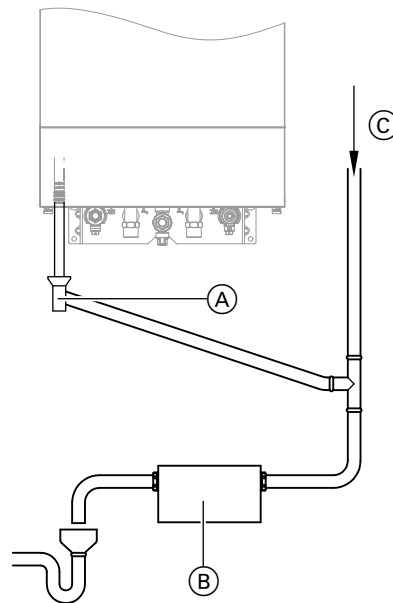
Up to a rated heating output of 200 kW, the condensate from a gas condensing boiler can generally be introduced into the public waste water system without prior neutralisation.

Domestic drainage systems must be made from materials that are resistant to acidic condensate.

According to the Code of Practice DWA-A 251, these materials include:

- Vitrified clay pipes
- Hard PVC pipes
- PVC pipes
- PE HD pipes
- PE pipes
- ABS/ASA pipes
- Stainless steel pipes
- Borosilicate pipes

### Neutralising system



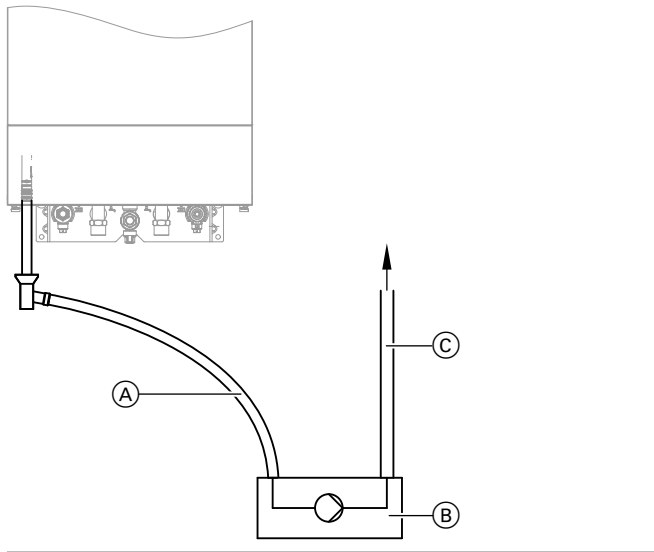
- Ⓐ Condensate drain
- Ⓑ Neutralising system
- Ⓒ Ventilation via the roof

The Vitodens can (if required) be supplied with a separate neutralising system (accessories). Any condensate is piped to and processed in the neutralising system. Since the consumption of neutralising granulate depends on the system's operating mode, carry out regular checks during the first year of operation to determine the required top-up volumes. One fill can last longer than one year.

The condensate drain pipe to the sewer connection must be accessible for inspection. Install it with a fall and a stench trap on the sewer side, and provide a suitable facility for extracting samples.

Install a condensate lifting pump if the Vitodens has been installed below the waste water anti-flooding level. Condensate lifting pumps are available as accessories.

### Condensate removal pump (accessories)



- (A) Condensate inlet
- (B) Condensate removal pump
- (C) Condensate drain

## 5.5 Hydraulic connection

### General

#### System design

Viessmann condensing boilers can generally be installed in any fully pumped hot water heating system (sealed unvented system).

The circulation pump is an integral part of the appliance.

Minimum system pressure 1.0 bar (0.1 MPa).

The boiler water temperature is limited to 82 °C.

To minimise distribution losses, we recommend sizing the heat distribution system to a max. flow temperature of 70 °C.

Due to the immediate capture of the room influence factors, we recommend using the Vitodens in conjunction with the Vitotrol 200-E for apartments with less than 80 m<sup>2</sup> living space or for low energy houses with a low heat demand.

The heat generator must be correctly sized and selected.

#### Chemical anti-corrosion agents

According to VDI guideline 2035, the design of heating systems must ensure they are sealed against corrosion. Additives in the heating water (additives, chemicals) as corrosion protection measures are normally not necessary.

Exception: In systems without system separation, for example, additives can be considered.

#### Heating circuits

For heating systems with plastic pipes, we recommend the use of impermeable pipes to prevent the diffusion of oxygen through the pipe walls.

Provide system separation in heating systems with plastic pipes that are permeable to oxygen (DIN 4726). A separate heat exchanger for this purpose is available.

Install a dirt separator in underfloor heating systems. See Viessmann Vitoset pricelist.

Underfloor heating systems and heating circuits with very large water content (>15 l/kW) should be connected to the condensing boiler via a 3-way mixer. See technical guide "Control of underfloor heating systems" or the relevant sample applications.

Install a temperature limiter in the flow of the underfloor heating circuit to restrict the maximum temperature. Observe the requirements of DIN 18560-2 [or local regulations].

#### Plastic pipework for radiators

We also recommend the use of a temperature limiter to restrict the maximum temperature for plastic pipework in heating circuits with radiators.

#### Attic heating centre

The installation of a low water indicator, compulsory according to the DVGW [Germany], is not required when installing boilers in an attic heating centre.

The boilers are protected against water shortage in accordance with EN 12828.

#### Safety valve

A safety valve in accordance with TRD 721 is integrated in the Vitodens (opening pressure 3 bar (0.3 MPa)).

Route the discharge pipe in accordance with EN 12828 into a drain outlet (drain outlet kit available as an accessory). The drain outlet incorporates a siphon as a stench trap.

#### Low water indicator

According to EN 12828, a low water indicator can be omitted for boilers up to 300 kW, as long as heating can be reliably prevented when there is a water shortage.

Viessmann condensing boilers are equipped with a low water indicator (boil-dry protection). Tests have verified that the burner will be automatically switched off in the event of water shortage due to a leak in the heating system and simultaneous burner operation, before the boiler or the flue system reaches unacceptably high temperatures.

## Design information (cont.)

### Water quality/frost protection

#### Fill and top-up water

The quality of the fill and top-up water is one of the key factors for preventing damage caused by deposits or corrosion in the heating system.

In order to prevent system damage, the European standards and national guidelines for fill and top-up water must be observed right from the design stage, e.g. VDI 2035.

- Regular checks of the appearance, water hardness, conductivity and pH value of the heating water during operation lead to higher operational reliability and system efficiency. These properties must also be observed for the top-up water. According to VDI 2035, the quantity and properties of the top-up water must always be documented in the system log or maintenance reports.
- The basis for filling the heating system is tap water of potable water quality in line with Directive 98/83/EC. For use as heating water, it is normally sufficient to soften the tap water. VDI 2035 specifies the maximum recommended concentrations of alkaline earths (hardeners), depending on the heating output and the specific system volume (ratio of the heating output of the heat generators to the heating water volume of the system): See the table below.

- We recommend always softening the fill and top-up water, as the water hardness can vary due to the mixture of different sources of supply, and the information provided by water supply utilities only gives average values. The information provided by water supply utilities is not sufficient for designing the system. In addition, it must be taken into account that the quantity of top-up water that will be added to the system during its service life cannot be predicted precisely at the design stage (especially in the case of existing heating circuits).
- If no aluminium or aluminium alloy components are installed, the heating water in systems with Viessmann heat generators does not need to be fully desalinated.
- The use of glycol as antifreeze without adequate inhibition and buffering is not permitted. The suitability of an antifreeze or other chemical additive should be certified by the manufacturer. Chemical additives in the heating water require more extensive monitoring and maintenance. Observe the manufacturer's instructions. Viessmann accepts no liability for damage or operational failure arising due to the use of unsuitable additives, incorrect dosing or poor maintenance.
- Chemical water treatments may only be planned and carried out by appropriately qualified specialist companies.

#### Total permissible hardness of the fill and top-up water according to VDI 2035

Total heating output of heat generator	Specific water capacity of heat generator <sup>*12</sup>	Specific system volume <sup>*13</sup>		
		≤ 20 l/kW	> 20 to ≤ 40 l/kW	> 40 l/kW
≤ 50 kW	≥ 0.3 l/kW	None	≤ 3.0 mol/m <sup>3</sup> (16.8 °dH)	≤ 0.05 mol/m <sup>3</sup> (0.3 °dH)
	< 0.3 l/kW	≤ 3.0 mol/m <sup>3</sup> (16.8 °dH)	≤ 1.5 mol/m <sup>3</sup> (8.4 °dH)	≤ 0.05 mol/m <sup>3</sup> (0.3 °dH)
> 50 to ≤ 200 kW	—	≤ 2.0 mol/m <sup>3</sup> (11.2 °dH)	≤ 1.0 mol/m <sup>3</sup> (5.6 °dH)	≤ 0.05 mol/m <sup>3</sup> (0.3 °dH)
> 200 to ≤ 600 kW	—	≤ 1.5 mol/m <sup>3</sup> (8.4 °dH)	≤ 0.05 mol/m <sup>3</sup> (0.3 °dH)	≤ 0.05 mol/m <sup>3</sup> (0.3 °dH)
> 600 kW	—	≤ 0.05 mol/m <sup>3</sup> (0.3 °dH)	≤ 0.05 mol/m <sup>3</sup> (0.3 °dH)	≤ 0.05 mol/m <sup>3</sup> (0.3 °dH)

#### Further requirements for the fill and top-up water independent of the heating output according to VDI 2035

##### Appearance

Clear, free of sedimented substances

##### Electrical conductivity

If the conductivity of the heating water is above **1500 µS/cm** due to a high salt content (e.g. in supply areas near the coast), desalination is necessary.

##### pH value

Materials in the system	pH value
Without aluminium alloys	8.2 to 10.0
With aluminium alloys	8.2 to 9.0

##### Information about system design

- For softening the heating water, use softening systems with water flow meters: See Vitoset pricelist.
- During installation, ensure that individual pipework sections can be drained separately. This avoids the need to drain all the heating water in the case of maintenance and repair work.
- As the formation of sludge and magnetite in the heating water cannot generally be completely prevented during operation, we recommend the installation of suitable magnetic dirt separators: See Vitoset pricelist.

##### Notes on commissioning and operating the system

- In order to prevent corrosion by remaining flushing water, fill the system completely immediately after flushing.
- Even treated fill water contains oxygen and small amounts of foreign matter. In order to prevent local concentrations of corrosion products and other deposits on the heating surfaces of the heat generator, commission the system in stages with a high heating water flow rate. Start with the heat generator at its lowest output. For the same reason, in the case of multi boiler systems and cascades, commission all heat generators at the same time.
- If extending the system or conducting maintenance or repair work, only drain the pipework sections where absolutely necessary.
- Check and clean filters, dirt traps and other blow-down or separating facilities in the heating water circuit after filling and commissioning.
- Special regional regulations regarding fill and top-up water must be observed. When disposing of heating water containing additives, check whether additional treatment may be required before it is discharged into the public waste water system.  
CH: Observe SWKI guideline BT 102-01.

##### Installation examples

For installation examples, see "[www.viessmann-schemes.com](http://www.viessmann-schemes.com)".  
Never install the Vitodens 111-W in dual mode systems with solid fuel boilers.

<sup>\*12</sup> In the case of systems with several heat generators that have several different specific water capacities, the smallest specific water capacity is definitive.

<sup>\*13</sup> To calculate the specific system volume, the smallest individual heating output should be used for systems with several heat generators.



## Design information (cont.)

### Expansion vessels

In accordance with EN 12828, water heating systems must be equipped with an expansion vessel.

#### An expansion vessel is integrated in the boilers:

Vitodens 100-W: Capacity 8 l

111-W: Capacity 10 l

Pre-charge pressure in the delivered condition: 0.75 bar (0.075 MPa)

Determine the size of the expansion vessel to be installed in accordance with EN 12828.

If the integral expansion vessel is insufficient, install a suitably sized expansion vessel on site.

#### Note

When hydraulically connecting the diaphragm expansion vessel, ensure that there is always a connection between the diaphragm expansion vessel and the heat generator.

For example, when the thermostat valves are closed and if the 3-way diverter valve is set to "DHW". The 3-way diverter valve is installed in the heating water flow.

### Low loss header

#### Application

Design rules for system hydraulics:

- When balancing the low loss header, adjust the flow rate on the equipment side to approx. 10 to 30 % below the flow rate on the system side (reducing the return temperature).
- The low loss header should be sized for the max. flow rate which may occur in the overall system.

The low loss header separates the heat generator circuit (boiler circuit) from the downstream heating circuits.

A low loss header must be used if the max. flow rate of an individual design is greater than the possible flow rate as shown on the relevant "Residual head" graph.

For installation schemes in conjunction with low loss headers, see "www.viessmann-schemes.com".

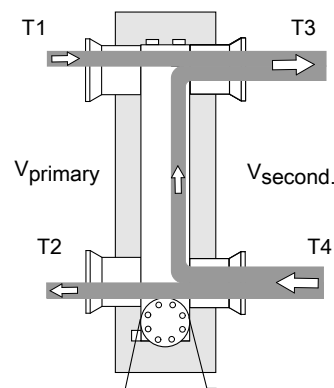
#### Heat generator circuit

The circulation pump in the Vitodens must be able to deliver the required water volume against the (mostly low) pressure drop of the heat generator circuit; the pressure drop of the low loss header is negligible. The pump graphs are used to find the relevant residual head for determining the internal pipe diameters, subject to the water volume circulating in the heat generator circuit.

#### Heating circuit

The heating circuit pumps to be installed on site must be able to deliver the water volume in the heating circuits against their pressure drop. They must be sized accordingly.

#### Principle of operation



$V_{\text{primary}}$  Heating water volume in the heat generator circuit (approx. 10 to 30 % less than  $V_{\text{secondary}}$ )

$V_{\text{secondary}}$  Heating water volume, heating circuit

$T_1$  Flow temperature, heat generator circuit

$T_2$  Return temperature, heat generator circuit

$T_3$  Flow temperature, heating circuit

$T_4$  Return temperature, heating circuit  
 $Q_{\text{primary}}$  Amount of heat supplied by the heat generator  
 $Q_{\text{secondary}}$  Amount of heat transferred by the heating circuit

$V_{\text{primary}} < V_{\text{secondary}}$   
 $T_1 > T_3$   
 $T_2 \approx T_4$   
 $Q_{\text{primary}} = Q_{\text{secondary}}$

#### Note

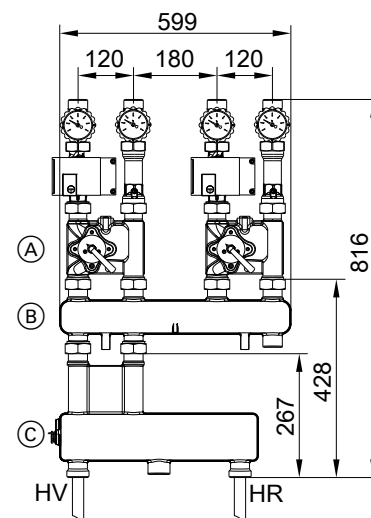
Thermometers in the flow and return to the low loss header make adjustments easier.

#### Low loss header (separate accessories)

See Vitodens installation accessories, page 54

#### Low loss header in conjunction with Divicon

	Max. flow rate in m <sup>3</sup> /h
Low loss header	
– R ¾	4.5
– R 1	4.5
– R 1¼	7.5
Divicon heating circuit distributor	
– R ¾	1.0
– R 1	1.5
– R 1¼	2.5



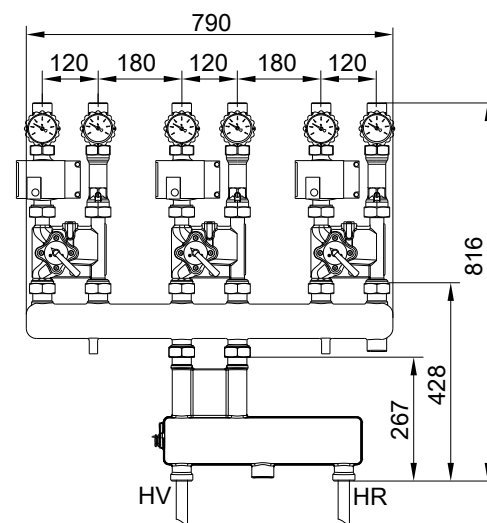
HR Heating return

HF Heating flow



## Design information (cont.)

- Ⓐ Divicon heating circuit distributor
- Ⓑ Manifold
- Ⓒ Low loss header



HR Heating return  
HF Heating flow

## 5.6 Intended use

The appliance is intended solely for installation and operation in sealed unvented heating systems that comply with EN 12828, with due attention paid to the associated installation, service and operating instructions. It is only designed for heating up heating water that is of potable water quality.

Intended use presupposes that a fixed installation in conjunction with permissible, system-specific components has been carried out.

The appliance is intended exclusively for domestic or semi-domestic use; even users who have not had any instruction are able to operate the appliance safely.

Commercial or industrial usage for a purpose other than heating the building or DHW shall be deemed inappropriate.

Any usage beyond this must be approved by the manufacturer in each individual case.

Incorrect usage or operation of the appliance (e.g. the appliance being opened by the system user) is prohibited and will result in an exclusion of liability. Incorrect usage also occurs if the components in the heating system are modified from their intended use (e.g. if the flue gas and ventilation air paths are sealed).

## Control unit

### 6.1 Layout and functions

#### Modular design

The control unit is integrated into the Vitodens.

The control unit comprises electronics modules and a programming unit:

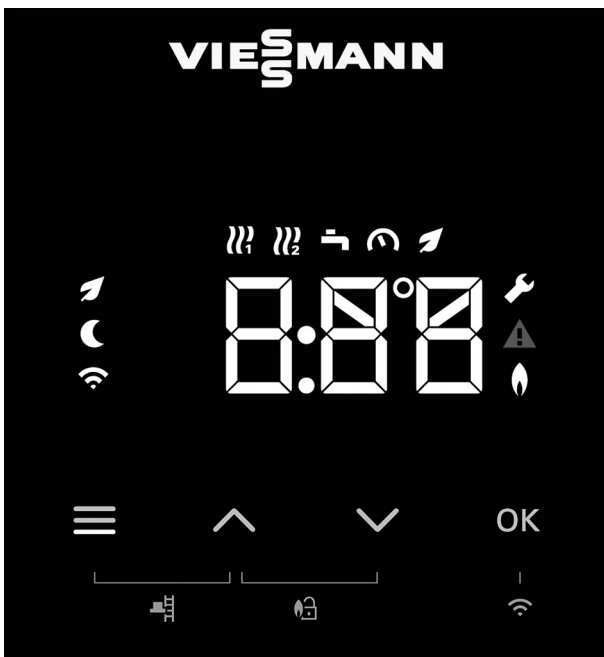
- HMI programming unit with 7-segment black/white display and integral TCU communication module
- HBMU heat management unit:
  - For connecting actuators and sensors
  - For connecting accessories via PlusBus
- HBMU with electric combustion control
- Status indicator (Lightguide) for operating and fault display

The control unit can be set to the following operating modes:

- Weather-compensated operation
  - An outside temperature sensor (accessories) must be connected.
- Optional Constant operation with room thermostat (accessory)
  - Operation with constant flow temperature:
    - 1 heating circuit without mixer and 1 heating circuit with mixer possible. The room thermostat controls heating circuit 1; heating circuit 2 with mixer is constantly supplied with heat regardless of room thermostat.
- Constant operation with time program:
  - 3 set flow temperatures possible, depending on level (reduced, standard and comfort)
- Operation with an OpenTherm controller is possible as an alternative to weather-compensated operation.

#### Note

The OpenTherm controller cannot be operated simultaneously with PlusBus.



### Programming unit

- Connectivity via:
  - Integral WiFi interface
  - Access point mode
  - Low power radio
- With digital time switch
- Touch buttons for:
  - Navigation
  - Settings
  - Confirmation
  - Menu
- Adjustment of:
  - Set room temperature
    - Reduced
    - Standard
    - Comfort
  - Set flow temperature (in constant operation)
  - Set DHW temperature
  - Operating programs for central heating and DHW heating
  - Time programs for central heating and DHW heating
  - Heating curves
  - Parameters
  - Test mode
    - Other settings, e.g. Actuator test, can be made using the software tool
- Display of:
  - Outside temperature
  - Heat generator flow temperature
  - Flow temperature in heating circuits with mixer
  - Set flow temperature
  - DHW temperature
  - Operating data
  - Diagnostic data
  - Fault messages

### Functions

- Control of the flow temperature (selectable):
  - Weather-compensated
  - Constant with time program
  - Constant, optionally with room thermostat
  - OpenTherm
- Control of 1 heating circuit without mixer
- Control of max. 1 heating circuits with mixer (accessories)
- Electronic maximum and minimum temperature limit
- Demand-dependent heating circuit pump and burner shutdown control
- Setting a variable heating limit (only possible on 19, 25 and 32 kW output sizes)



## Control unit (cont.)

- Automatic winter/summertime changeover
- Individually programmable switching times for central heating and DHW heating.  
Max. 2 time phases for each per day
- Heating system frost protection monitoring
- Integral diagnostic system
- Commissioning via commissioning assistant
- Cylinder temperature controller with priority control
- Hygiene function for DHW heating (short term heating to a higher temperature)
- Simultaneous screed drying program for all heating circuits (choice of 6 stored programs)
- Connection option for extension modules

- External heating circuit hook-up (weather-compensated control of flow temperature for up to 2 heating circuits in conjunction with room thermostat).
- In conjunction with the EM-S1 extension module
  - Control of solar DHW heating
 See also: [www.viessmann-schemes.com](http://www.viessmann-schemes.com)

To reduce the heat-up output, the reduced room temperature can be raised when outside temperatures are low. To shorten the heat-up time after a setback phase the flow temperature is raised for a limited time.

According to the [German] Energy Saving Ordinance, the temperature in each room must be individually controlled, e.g. by means of thermostatic valves.

## Notes on PlusBus subscribers

As a maximum, the following PlusBus subscribers can be connected to the control unit:

- 1 EM-M1 or EM-MX extensions (ADIO electronics module)
- 1 Vitotrol 200-E
- 1 EM-EA1 extensions (DIO electronics module)

- 1 EM-S1 extension (ADIO or SDIO/SM1A electronics module)
- 1 EM-P1 extension (ADIO electronics module)

The max. total length of the PlusBus lead is 50 m.  
With an unscreened lead, 2-core, 0.34 mm<sup>2</sup>.

## Frost protection function

- The frost protection function will start when the outside temperature falls below approx. +1 °C.  
With active frost protection, the heating circuit pump is switched on and set to reduced flow temperature.
- If the actual temperature in the DHW cylinder is < 5 °C, the DHW cylinder is heated to 20 °C. If weather-compensated operation is configured with external heating circuit hook-up, then the heating circuit frost protection function is not active (if the contact is not assigned). Frost protection for the heating circuit must be provided on site.
- The frost protection function will stop when the outside temperature exceeds approx. +3 °C.

## Heating curve setting (slope and level)

The flow temperature of the heating circuit without mixer **and** the flow temperature of the heating circuits with mixer (in conjunction with the extension kit for one heating circuit with mixer) are controlled in weather-compensated mode. The flow temperature of the heat generator is therefore automatically regulated to between 0 and 40 K above the currently required set flow temperature (delivered condition 8 K).

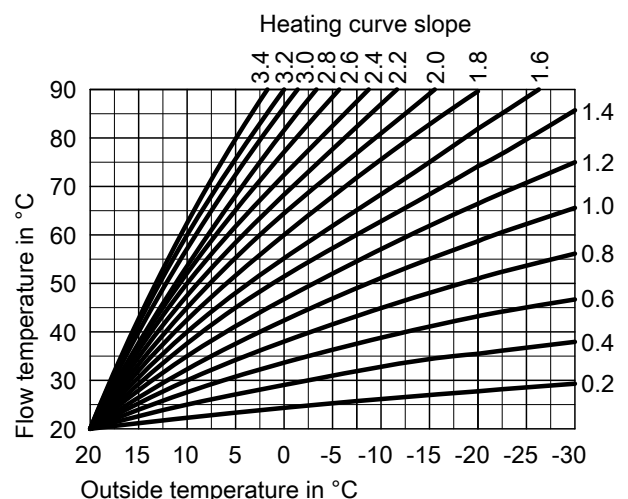
The flow temperature required to reach a specific room temperature depends on the heating system and the thermal insulation of the building to be heated.

Adjusting the heating curves matches the boiler water temperature and the flow temperature to these conditions.

Heating curves:

The flow temperature is restricted at the upper end of the scale by the temperature limiter and the maximum temperature set at the electronic maximum temperature limiter.

The flow temperature of the heating circuits cannot exceed the flow temperature of the heat generator.



## Heating systems with a low loss header or heating water buffer cylinder

When using hydraulic separation (low loss header) or a heating water buffer cylinder, a temperature sensor must be installed in the low loss header or heating water buffer cylinder.

On heating circuits with mixers, the temperature sensor is connected to mixer extension kit EM-M1 or EM-MX.

If only one heating circuit without mixer is available downstream of the low loss header or heating water buffer cylinder, the temperature sensor and the heating circuit pump of the heating circuit without mixer is connected to the EM-P1 extension.

## Control unit (cont.)

### Flow temperature sensor

The flow temperature sensor is connected to the HBMU heat management unit and installed in the appliance.

#### Specification

Sensor type	Viessmann NTC 10 k $\Omega$ at 25 °C
Permissible ambient temperature	
– Operation	0 to +130 °C
– Storage and transport	–20 to +70 °C

### Cylinder temperature sensor

Standard delivery for:

#### Vitodens 100-W:

- Part of the standard delivery of the connection set for DHW cylinders below the boiler (120 or 150 l) (order separately)
- Part of the standard delivery of the connection set for DHW cylinders adjacent to the boiler (160 to 400 l) or alternative DHW cylinders (order separately)
- Cylinder temperature sensor (part no. ZK04671)  
Required with on-site DHW cylinder

#### Vitodens 111-W

- The cylinder temperature sensor is connected in the control unit and installed in the DHW cylinder
- The outlet temperature sensor is connected to the HBMU heat management unit and installed in the boiler

#### Specification

Lead length	3.75 m, fully wired
IP rating	IP 32
Sensor type	Viessmann NTC 10 k $\Omega$ at 25 °C
Permissible ambient temperature	
– Operation	0 to +90 °C
– Storage and transport	–20 to +70 °C

### Outside temperature sensor

#### Installation location

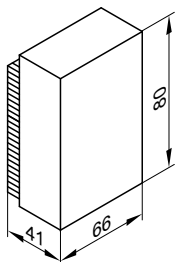
- North or north-west facing wall of the building
- 2 to 2.5 m above the ground; for multi storey buildings in the upper half of the second floor

#### Connection

- 2-core lead, length up to 35 m with a cross-section of 1.5 mm<sup>2</sup> (copper)
- Never route this cable immediately next to 230/400 V cables.

#### Specification

IP rating	IP 43 to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 k $\Omega$ at 25 °C
Permissible ambient temperature during operation, storage and transport	–40 to +70 °C



## 6.2 Specification – control unit

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	4 A
Protection class	I
Permissible ambient temperature	
– Operation	Frost-free, dry and heated room
– Storage and transport	–20 to +65 °C
Electronic temperature limiter setting (heating mode)	91 °C (cannot be altered)
Setting range for DHW temperature	10 to 60 °C
Setting range for heating curve	
Slope	0.2 to 3.5
Level	–13 to 40 K
<b>TCU communication module (integral)</b>	
WiFi frequency band	2400 - 2483.5 MHz
Max. transmitting power	+ 17 dBm
Zigbee frequency band	2400 - 2483.5 MHz
Max. transmitting power	+ 10 dBm
Supply voltage	24 V $\equiv$
Power consumption	4 W

## 6.3 Accessories for control unit

### Vitotrol 100, type UTA

Part no. 7170149

Room thermostat

- With switching output (2-point output)
- With analogue time switch
- With adjustable individual day program
- Standard switching times are factory-set (individually programmable)
- Shortest switching interval 15 minutes

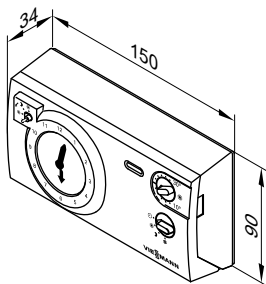
The Vitotrol 100 is installed in the main living room on an internal wall opposite radiators, although never inside shelving units, in recesses, or immediately by a door or heat source (e.g. direct sunlight, fireplace, TV set, etc.).

Control unit connection:

3-core cable with a cross-section of 1.5 mm<sup>2</sup> (no green/yellow wire) for 230 V~.

#### Specification

Rated voltage	230 V/50 Hz
Rated breaking capacity of the contact	6(1) A 250 V~
IP rating	IP 20 to EN 60529 Ensure through design/installation
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	–20 to +60 °C
Set value setting range for standard mode and reduced mode	10 to 30 °C
Set room temperature in standby mode	6 °C



## Control unit (cont.)

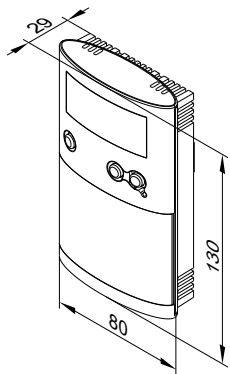
### Vitotrol 100, type UTDB

Part no. Z007691

Room temperature controller

- With switching output (2-point output)
- With digital time switch
- With individual day and seven-day program
- Operation with user prompts:
  - 3 preselected time programs, individually adjustable
  - Constant manual mode with adjustable set room temperature
  - Frost protection mode
  - Holiday program
- With selector keys for party and economy mode

Installation in the main living room on an internal wall opposite radiators. Never install inside shelving units, in recesses, or immediately by a door or heat source (e.g. direct sunlight, fireplace, TV set, etc.). Operation independent of mains power supply (2 x 1.5 V Mignon alkaline batteries, type LR6/AA, battery life approx. 1.5 years). Control unit connection: 2-core cable with a cross-section of 0.75 mm<sup>2</sup> for 230 V~.



#### Specification

Rated voltage	3 V– Battery LR6/AA
Rated breaking capacity of the floating contact	
– max.	6(1) A, 230 V~
– min.	1 mA, 5 V–
IP rating	IP 20 to EN 60529 Ensure through design/installation
Function type	RS type 1B to EN 60730-1
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	–25 to +65 °C
Setting range	
– Comfort temperature	10 to 40 °C
– Setback temperature	10 to 40 °C
– Frost protection temperature	5 °C
Power reserve during battery change	3 min

### Vitotrol 100, type UTDB-RF

Part no. Z007692

Room temperature controller with integral wireless transmitter and receiver

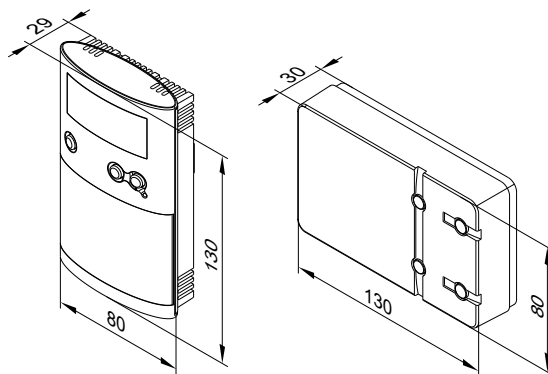
- With digital time switch
- With individual day and seven-day program
- Operation with user prompts:
  - 3 preselected time programs, individually adjustable
  - Constant manual mode with adjustable set room temperature
  - Frost protection mode
  - Holiday program
- With selector keys for party and economy mode

Installation in the main living room on an internal wall opposite radiators. Never install inside shelving units, in recesses, or immediately by a door or heat source (e.g. direct sunlight, fireplace, TV set, etc.). Room temperature controller operation independent of mains power supply (2 x 1.5 V Mignon alkaline batteries, type LR6/AA, battery life approx. 1.5 years).

Receiver with relay state indication.

Connection of the receiver to the control unit (subject to control unit type):

- 4-core cable with a cross-section of 1.5 mm<sup>2</sup> for 230 V~ or
- 3-core cable without green/yellow wire for 230 V~ or
- 2-core lead with a cross-section of 0.75 mm<sup>2</sup> for LV for the connection to the control unit, plus an additional 2-core cable for the 230 V~ power supply



## Control unit (cont.)

### Specification, room temperature controller

Rated voltage	3 V–
Transmission frequency	868 MHz
Transmission	< 10 mW
Range	approx. 25 to 30 m inside buildings, subject to construction
IP rating	IP 20 to EN 60529 Ensure through design/installation
Function type	RS type 1B to EN 60730-1
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	–25 to +65 °C
Setting range	
– Comfort temperature	10 to 40 °C
– Setback temperature	10 to 40 °C
– Frost protection temperature	5 °C
Power reserve during battery change	3 min

### Specification, receiver

Operating voltage	230 V~ ± 10 % 50 Hz
Rated breaking capacity of the floating contact	
– max.	6(1) A, 230 V~
– min.	1 mA, 5 V–
IP rating	IP 20 to EN 60529 Ensure through design/installation
Safety category	II to EN 60730-1 subject to correct installation
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	–25 to +65 °C

## Vitotrol 200-E

### Part no. Z017415

- PlusBus subscriber
- Max. 2 Vitotrol 200-E can be connected to a heat generator control as a PlusBus subscriber.
- Up to 4 heating circuits can be controlled with a Vitotrol 200-E. Alternatively, a Vitotrol 200-E can be assigned to a heating circuit. A heating circuit cannot be controlled by more than one remote control.
- With integral room temperature sensor for room temperature hook-up (only for one heating circuit with mixer)

### Displays

- Room temperature
- Outside temperature
- Operating condition

### Settings

- Set room temperature for standard room temperature, comfort room temperature and reduced room temperature.
- Set DHW temperature
- Switching times for heating circuits and DHW heating, plus further settings via plain text menu on the display
- Integral room temperature sensor for room temperature hook-up (only for one heating circuit with mixer)

### Quick select function for:

- Comfort mode
- One-off cylinder heat-up
- Holiday program
- "Holiday at home"

### Installation location

- Weather-compensated operation:  
Installation anywhere in the building
- Room temperature hook-up:  
The integral room temperature sensor captures the room temperature and effects any necessary correction of the flow temperature.

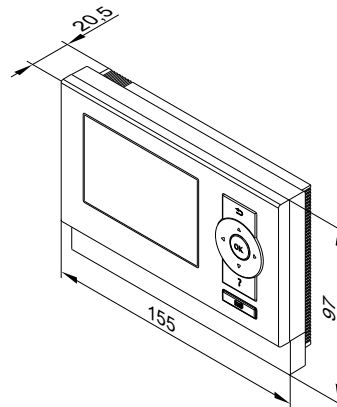
The captured room temperature depends on the installation site:

- Installation only in enclosed buildings
- Not next to windows or doors
- Not between shelves, in recesses, etc.
- Not near heat sources (direct insolation, fireplace, TV set, etc.)

### Connection

- 2-core lead, length max. 50 m (even if connecting several remote control units)
- Never route this cable immediately next to 230/400 V cables.
- Extra low voltage (ELV) plug included in standard delivery

### Specification



### Vitotrol 200-E

Power supply	Via PlusBus
Voltage	V 28
Current	mA 25
Protection class	III
Permissible ambient temperature	
– Operation	°C 0 to +40
– Storage and transport	°C –20 to +65 °C

## Control unit (cont.)

### Outside temperature sensor

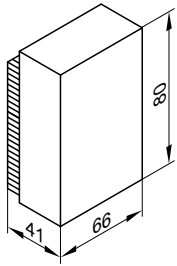
#### Part no. ZK04306

Installation location:

- North or north-west facing wall of the building
- 2 to 2.5 m above the ground; for multi storey buildings in the upper half of the second floor

Connection:

- 2-core lead, length up to 35 m with a cross-section of 1.5 mm<sup>2</sup> (copper)
- Never route this cable immediately next to 230/400 V cables.



#### Specification

IP rating	IP 43 to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature during operation, storage and transport	-40 to +70 °C

### Room temperature sensor

#### Part no. 7438537

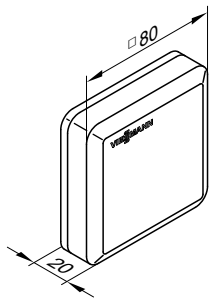
Separate room temperature sensor as supplement to the Vitotrol 200-E; to be used if the Vitotrol 200-E cannot be installed inside the main living room or in a suitable position for temperature capture and adjustment.

Installation in the main living room on an internal wall opposite radiators. Never install inside shelving units, in recesses, or immediately by a door or heat source, e.g. direct sunlight, fireplace or TV set.

Connect the room temperature sensor to the Vitotrol 200-E.

Connection:

- 2-core lead with a cross-section of 1.5 mm<sup>2</sup> (copper)
- Max. lead length from the remote control: 30 m
- Never route this cable immediately next to 230/400 V cables.



#### Specification

Protection class	III
IP rating	IP 30 to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	-20 to +65 °C

### Immersion temperature sensor

#### Part no. ZK04032

To capture the low loss header temperature

#### Specification

Lead length	3.75 m, fully wired
IP rating	IP 32 to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +90 °C
– Storage and transport	-20 to +70 °C



## Control unit (cont.)

### Cylinder temperature sensor

**Part no. ZK04671**

For capturing the DHW temperature in the on-site DHW cylinder

**Specification**

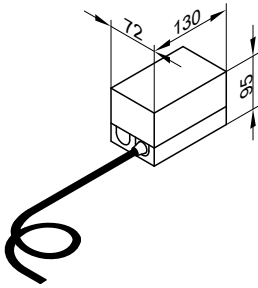
Lead length	3.75 m, fully wired
IP rating	IP 32
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +90 °C
– Storage and transport	–20 to +70 °C

### Contact thermostat

**Part no. ZK04647**

Can be used as a maximum temperature limiter for underfloor heating systems (only in conjunction with metal pipes).

The temperature limiter is fitted to the heating flow. If the flow temperature is too high, the temperature limiter switches off the heat generator.

**Specification**

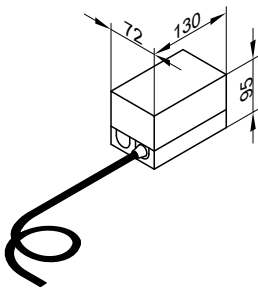
Lead length	1.5 m
Setting range	30 to 80 °C
Switching differential	6.5 K ±2.5 K
Breaking capacity	6(1.5) A, 250 V~
Setting scale	Inside the enclosure
Protection rating to EN 60529	IP 41

### Contact thermostat

**Part no. 7151729**

Can be used as a maximum temperature limiter for underfloor heating systems (only in conjunction with metal pipes).

In conjunction with heating circuits with separate heating circuit pump and mixer extension kit.

**Specification**

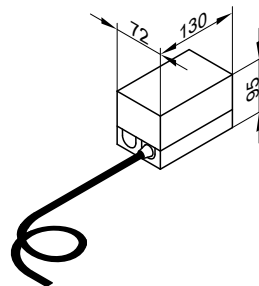
Lead length	4.2 m
Setting range	30 to 80 °C
Switching differential	6.5 K ±2.5 K
Breaking capacity	6(1.5) A, 250 V~
Setting scale	Inside the enclosure
Protection rating to EN 60529	IP 41

### Immersion thermostat

**Part no. 7151728**

Can be used as a maximum temperature limiter for underfloor heating systems (only in conjunction with metal pipes).

- With stainless steel sensor well R ½ x 200 mm
- In conjunction with heating circuits with separate heating circuit pump and mixer extension kit.



## Control unit (cont.)

### Specification

Lead length	4.2 m
Setting range	30 to 80 °C
Switching differential	6.5 K ±2.5 K
Breaking capacity	6(1.5) A, 250 V~
Setting scale	Inside the enclosure
Protection rating to EN 60529	IP 41

### Notes on PlusBus subscribers

As a maximum, the following PlusBus subscribers can be connected to the control unit:

- 1 EM-M1 or EM-MX extensions (ADIO electronics module)
- 1 Vitotrol 200-E
- 1 EM-EA1 extensions (DIO electronics module)

- 1 EM-S1 extension (ADIO or SDIO/SM1A electronics module)
- 1 EM-P1 extension (ADIO electronics module)

The max. total length of the PlusBus lead is 50 m.

With an unscreened lead, 2-core, 0.34 mm<sup>2</sup>.

### EM-MX mixer extension kit with integral mixer motor

#### Part no. Z017409

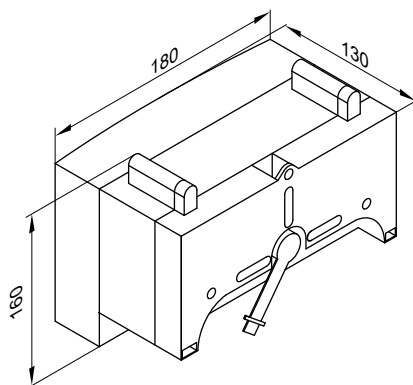
PlusBus subscriber

Components:

- Mixer PCB (ADIO electronics module) with mixer motor for Viessmann mixer DN 20 to DN 50 and R ½ to R 1¼
- Flow temperature sensor (contact temperature sensor) with connecting lead and plug
- Plug for connecting the heating circuit pump
- Power cable (3.0 m long) with plug
- PlusBus connecting lead (3.0 m long) with plug
- Option to connect immersion temperature sensor low loss header (separate accessory)

The mixer motor is mounted directly onto the Viessmann mixer DN 20 to DN 50 and R ½ to R 1¼.

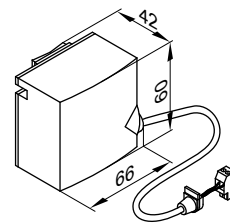
#### Mixer PCB with mixer motor



#### Specification - Mixer PCB with mixer motor

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	5.5 W
IP rating	IP 20D to EN 60529; ensure through design/installation.
Protection class	I
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	–20 to +65 °C
Rated relay output breaking capacity	
– Heating circuit pump [20]	1 A, 230 V~
– Mixer motor [52]	0.1 A, 230 V~
Torque	3 Nm
Required runtime of the mixer motor for 90° <	Approx. 120 s

#### Flow temperature sensor (contact temperature sensor)



Secured with a tie.

#### Flow temperature sensor specification

Lead length	2.0 m, fully wired
IP rating	IP 32D to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +120 °C
– Storage and transport	–20 to +70 °C

### EM-M1 mixer extension kit for separate mixer motor

#### Part no. Z017410

PlusBus subscriber

For connecting a separate mixer motor

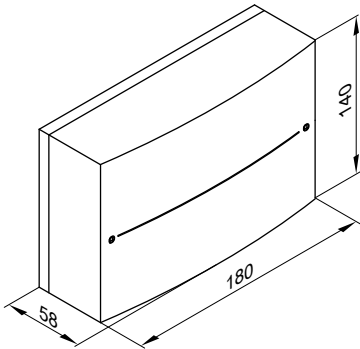
Components:

- Mixer PCB (ADIO electronics module) for connecting a separate mixer motor
- Flow temperature sensor (contact temperature sensor) with connecting lead and plug

## Control unit (cont.)

- Plug for connecting the heating circuit pump and the mixer motor
- Power cable (3.0 m long) with plug
- PlusBus connecting lead (3.0 m long) with plug
- Option to connect immersion temperature sensor low loss header (separate accessory)

### Mixer PCB



#### Mixer PCB specification

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	1.5 W
IP rating	IP 20D to EN 60529; ensure through design/installation.
Protection class	I

#### Permissible ambient temperature

– Operation	0 to +40 °C
– Storage and transport	–20 to +65 °C

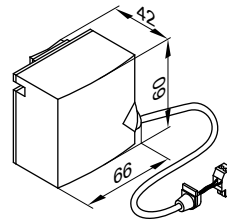
#### Rated relay output breaking capacity

– Heating circuit pump [20]	1 A, 230 V~
– Mixer motor [52]	0.1 A, 230 V~

#### Required runtime of the mixer motor for 90° <

Approx. 120 s

### Flow temperature sensor (contact temperature sensor)



Secured with a tie.

#### Flow temperature sensor specification

Lead length	5.8 m, fully wired
IP rating	IP 32D to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +120 °C
– Storage and transport	–20 to +70 °C

## EM-MX mixer extension kit for Divicon heating circuit distribution

### Part no. Z017414

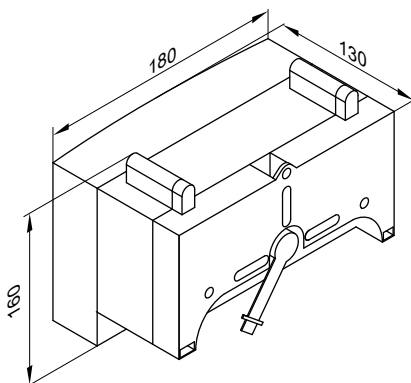
PlusBus subscriber

#### Components:

- Mixer PCB (ADIO electronics module) with mixer motor for Divicon heating circuit distribution
- Flow temperature sensor (contact temperature sensor) with connecting lead and plug
- Plug for connecting the heating circuit pump
- Power cable (3.0 m long) with plug
- PlusBus connecting lead (3.0 m long) with plug
- Option to connect immersion temperature sensor low loss header (separate accessory)

The mixer motor is mounted directly onto the Viessmann mixer of the Divicon heating circuit distributor.

### Mixer PCB with mixer motor



#### Specification - Mixer PCB with mixer motor

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	5.5 W
IP rating	IP 20D to EN 60529; ensure through design/installation.
Protection class	I

#### Permissible ambient temperature

– Operation	0 to +40 °C
– Storage and transport	–20 to +65 °C

#### Rated relay output breaking capacity

– Heating circuit pump [20]	1 A, 230 V~
– Mixer motor [52]	0.1 A, 230 V~

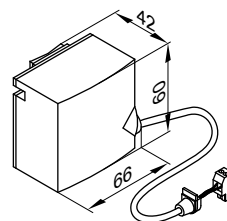
#### Torque

3 Nm

#### Required runtime of the mixer motor for 90° <

Approx. 120 s

### Flow temperature sensor (contact temperature sensor)



Secured with a tie.

6173204

## Control unit (cont.)

### Flow temperature sensor specification

Lead length	2.0 m, fully wired
IP rating	IP 32D to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +120 °C
– Storage and transport	–20 to +70 °C

### EM-P1 extension

#### Part no. Z017411

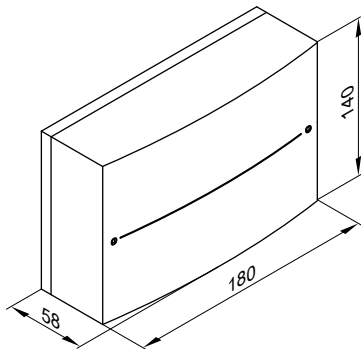
Function extension to control a heating circuit pump and/or DHW circulation pump depending on the hydraulics of the heating system

- Controlling a heating circuit pump for a heating circuit without mixer (heating circuit 1)
- Controlling a DHW circulation pump

In an enclosure for wall mounting  
PlusBus subscriber

Components:

- ADIO electronics module
- Plug for connecting the heating circuit pump
- Power cable (3.0 m long) with plug
- PlusBus connecting lead (3.0 m long) with plug
- Option to connect immersion temperature sensor low loss header (separate accessory)



#### Specification

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	1.5 W
Rated relay output breaking capacity	1 A, 230 V~
Protection class	I
IP rating	IP 20D to EN 60529; ensure through design/installation.
Permissible ambient temperature	
– Operation	0 to +40 °C Installation in living spaces or boiler rooms (standard ambient conditions)
– Storage and transport	–20 to +65 °C

### Solar control units

#### SDIO/SM1A electronics module

- Integrated in the DHW cylinder and Solar-Divicon.
- Compatible with Viessmann control units with PlusBus or KM-BUS communication
- Automatic differentiation between PlusBus and KM-BUS subscribers

#### Functions

- Control and display via the heat generator control unit
- Switching the solar circuit pump
- Solar circuit pump speed control via PWM signal  
Only use solar circuit pumps with PWM input.
- Suppression of DHW cylinder reheating by the heat generator subject to solar yield
- Collector safety shutdown
- Electronic temperature limitation in the DHW cylinder
- Switching of a transfer pump for the DHW cylinder
- Frost protection function
- Interval function
- General function overview: See chapter "Functions".

#### Design

- PCB
- Terminals:
  - 4 sensors
  - Solar circuit pump
  - KM-BUS/PlusBus
  - Power supply (on-site ON/OFF switch)
- PWM output for switching the solar circuit pump
- 1 relay for switching one pump or one valve

## Control unit (cont.)

### Collector temperature sensor

Delivered separately for connection inside the appliance.

On-site extension of the connecting lead:

- 2-core lead, length up to 60 m with a cross-section of 1.5 mm<sup>2</sup> (copper)
- Never route this lead immediately next to 230/400 V cables

### Specification – collector temperature sensor

Lead length	2.5 m
IP rating	IP 32 to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 20 kΩ at 25 °C
Permissible ambient temperature	
– Operation	–20 to +200 °C
– Storage and transport	–20 to +70 °C

### Cylinder temperature sensor

The sensor is connected inside the control unit.

### Specification – cylinder temperature sensor

IP rating	IP 32 to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +90 °C
– Storage and transport	–20 to +70 °C

### Specification – SDIO/SM1A electronics module

Rated voltage	230 V ~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	1.5 W
Protection class	I
IP rating	IP 20D to EN 60529; ensure through design/installation.
Permissible ambient temperature	
– Operation	0 to +35 °C, use in the living space or boiler room (standard ambient conditions)
– Storage and transport	–20 to +65 °C
Rated relay output breaking capacity	
– Semi-conductor relay 1	1 (1) A, 230 V~
– Relay 2	1 (1) A, 230 V~
– Total	Max. 2 A

### EM-S1 extension to control DHW heating and provide simple central heating backup

#### Part no. Z019336

- PlusBus subscriber
- Function extension inside enclosure for wall mounting
- Electronic temperature differential control for control of dual mode DHW heating and simple central heating backup using solar collectors

#### Note

See also: [www.viessmann-schemes.com](http://www.viessmann-schemes.com)

### Functions

- Control and display via the heat generator control unit
- Switching the solar circuit pump
- Solar circuit pump speed control via PWM signal
- Suppression of DHW cylinder reheating by the heat generator subject to solar yield

- Safety shutdown of the solar circuit pump
- Electronic temperature limitation in the DHW cylinder
- Switching of a transfer pump for the DHW cylinder
- Frost protection function
- Interval function

### Design

The EM-S1 extension comprises:

- ADIO electronics module
- Terminals for:
  - 3 sensors
  - Solar circuit pump
  - PlusBus
  - Power supply
  - Transfer pump
- PWM output for switching the solar circuit pump

### Collector temperature sensor

For connection to the EM-S1 extension

On-site extension of the connecting lead:

- 2-core lead, length up to 60 m with a cross-section of 1.5 mm<sup>2</sup> (copper)
- Do not route this lead immediately next to 230 V/400 V cables.

### Specification – collector temperature sensor

Lead length	2.5 m
IP rating	IP 32 to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 20 kΩ at 25 °C
Permissible ambient temperature	
– Operation	–20 to +200 °C
– Storage and transport	–20 to +70 °C

### Cylinder temperature sensor

For connection to the EM-S1 extension

On-site extension of the connecting lead:

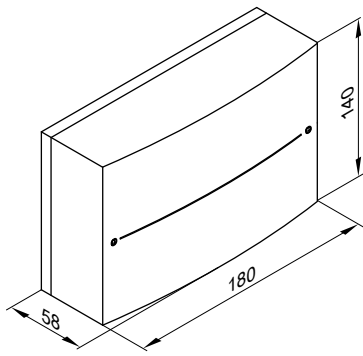
- 2-core lead, length up to 60 m with a cross-section of 1.5 mm<sup>2</sup> (copper)
- Never route this lead immediately next to 230/400 V cables.

### Specification – cylinder temperature sensor

Lead length	3.75 m
IP rating	IP 32 to EN 60529; ensure through design/installation.
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– Operation	0 to +90 °C
– Storage and transport	–20 to +70 °C

For systems with Viessmann DHW cylinders, the cylinder temperature sensor is installed in the threaded elbow in the heating water return (standard delivery or accessory for the respective DHW cylinder).

## Control unit (cont.)



### Specification – EM-S1 extension

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	1.5 W
Protection class	I
IP rating	IP 20 to EN 60529; ensure through design/installation.
Function type	Type 1B to EN 60730-1
Permissible ambient temperature	
– Operation	0 to +40 °C, for use in the living space or boiler room (standard ambient conditions)
– Storage and transport	–20 to +65 °C
Rated relay output breaking capacity	1 A, 230 V~

### Functions

#### Cylinder temperature limit

The solar circuit pump will be switched OFF if the set cylinder temperature is exceeded.

#### Collector emergency stop

In order to protect the system components, the solar circuit pump is switched off if the adjustable collector limit temperature is exceeded. In the Vitosol-FM and 300-TM switching collectors, the collector temperature limit can be set to 145 °C. To do so, please comply with the manufacturer system pressure specification. This enables solar circuit pump operation even when the system is shut down.

Ensure the following:

- The components in the solar circuit flow line must be designed for a temperature of 145 °C.
- The return line temperature must not exceed 120 °C.

### EM-EA1 extension

#### Part no. Z017412

- PlusBus subscriber
- Enclosure for wall mounting

### Functions

#### Note

Only one function can be connected to each EM-EA1 extension (DIO electronics module).

#### Minimum collector temperature limit

If the actual temperature falls below the minimum collector temperature, the solar circuit pump is shut down.

#### Frost protection function

Viessmann collectors are filled with Viessmann heat transfer medium. This function does not have to be activated.

Activate only when using water as the heat transfer medium.

With a collector temperature below +5 °C, the solar circuit pump will be started to avoid damage to the collectors. The pump is stopped when a temperature of +7 °C is reached.

#### Heat statement

When determining thermal yields, the difference between the collector and cylinder temperature, the set throughput, the type of heat transfer medium and the operating time of the solar circuit pump are taken into account.

#### Reheating suppression

DHW cylinder reheating by the boiler is suppressed in 2 stages.

During solar heating of the DHW cylinder, the set cylinder temperature is reduced. Suppression remains active for a certain time after the solar circuit pump is switched off.

If solar heating is uninterrupted (> 2 h), reheating by the boiler only occurs if the temperature falls below the 3rd set DHW temperature, as set at the boiler control unit (in parameter "1394.0") (setting range 10 to 95 °C). This value must be **below** the 1st set DHW temperature.

If the solar thermal system is unable to maintain this set value, the DHW cylinder is heated by the boiler (solar circuit pump running).

#### Auxiliary function for DHW heating

In solar thermal systems with DHW storage, we recommend heating the preheating cylinder and the preheating stage in dual mode DHW cylinders to ≥ 60 °C once a day (regardless of the cylinder volume). Enabling of the auxiliary function for DHW heating must be programmed at the boiler control unit. The solar preheat stage can be heated up at selectable times.

#### Relay kick

If the pumps and valves have been switched off for 24 hours, they are started for approx. 10 s to prevent them seizing up.

#### Reduction of stagnation time

If there is an excess of solar energy, the speed of the solar circuit pump is reduced before the maximum cylinder temperature is reached. This causes an increase in the differential between collector temperature and cylinder temperature. The heat transfer to the DHW cylinder is reduced, which delays stagnation.

#### ■ 230 V fault message input and fault message output (potential-free) without system blocking

Fault message input: If a voltage of 230 V is present at digital input contact 43-1, fault message is active. Fault message output 66 active.

#### ■ External LPG valve

Output 43-L is active if the burner control unit opens the external LPG valve.

#### ■ Extractor hood: External extractor interlock

An extractor can be switched off. Output 66 switches from NC to NO and thereby switches the extractor hood off when the burner control unit starts the burner.

## Control unit (cont.)

### ■ Operating mode changeover

Demand to all available heating circuits simultaneously, as long as contact remains closed. With the set room temperature of each individual heating circuit:

- DI1 Reduced room temperature
- DI2 Standard room temperature
- DI3 Comfort room temperature

### ■ Fault message input 24 V and system blocking, e.g. condensate removal pump

If contact DI1 is closed, the heat generator is blocked. Output 66 is switched over. Fault message F.104 appears. E.g. block burner if fault is present at condensate removal pump.

#### Note

If only the fault message output is to be used, set e.g. the "fault message input... and fault message output" functions.

### ■ Fault message input 230 V and system blocking

If a voltage of 230 V is present at digital input contact 43-1, the heat generator is blocked. Output 66 is switched over. Fault message F.104 appears.

### ■ External demand (digital)

If a voltage of 230 V is present at digital input contact 43-1, a demand is sent to the heat generator with an adjustable set flow temperature (parameter 528.0) and a set speed for the primary circuit pump (parameter 1100.2).

### ■ External blocking

If a voltage of 230 V is present at digital input contact 43-1, the heat generator is blocked. Message info I.57 is displayed.

### ■ 0-10 V analogue input

Connection of the external set flow temperature (observe polarity of the applied 0-10 V DC control voltage).

#### Note

No galvanic separation is required between the earth conductor and the negative pole of the on-site power source.

If a voltage of 230 V is present at digital input 43-1, the external 0-10 V default is enabled.

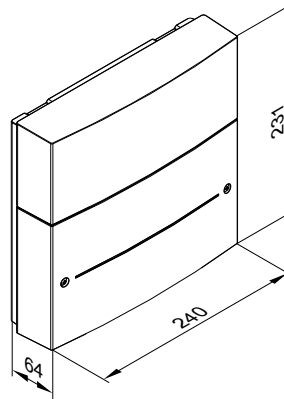
- External heating circuit hook-up with 2 or 3 heating circuits

Components:

- DIO electronics module
- Plug for connecting the functions

- Power cable (3.0 m long) with plug

- PlusBus connecting lead (3.0 m long) with plug



### Specification

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	2.8 W
Rated breaking capacity output 66 (potential-free)	1 A 230 V~
Output 43 rated breaking capacity	1 A 230 V~
Protection class	I
IP rating	IP 20D to EN 60529; ensure through design/installation.
Permissible ambient temperature	
– Operation	0 to +40 °C Installation in living spaces or boiler rooms (standard ambient conditions)
– Storage and transport	–20 to +60 °C

### Demand to digital inputs DI to DI3

External contacts must be potential-free. When connecting, observe the requirements of safety category II, i.e. 5.0 mm air and creep path and 2.0 mm insulation thickness to live parts.

## Appendix

### 7.1 Regulations / Directives

#### Regulations and directives

We, Viessmann Climate Solutions SE, declare that the Vitodens gas condensing boilers have been tested and approved in accordance with the currently applicable directives/regulations, standards and technical rules.

Observe all engineering standards of the building authorities and statutory requirements applicable to the installation and operation of this system.

Installation, gas and flue gas connections, commissioning, electrical connections and general service/maintenance may only be carried out by a registered contractor.

The installation of a condensing boiler must be reported to and approved by the relevant gas supply utility.

In some regions, permits may be required for the flue system and condensate connection to the public waste water system.

The local flue gas inspector and water authorities must be informed prior to commencing installation.

We recommend that maintenance and cleaning procedures are performed annually. As part of the maintenance procedure, check the correct function of the entire system. Any faults that occur must be rectified.

Condensing boilers must only be operated with specially designed, tested and approved flues.

Only an authorised contractor may convert this boiler for use in countries other than those stated on the type plate. That contractor must also arrange approval in accordance with the statutes of the relevant country.



### Manufacturer declarations

Manufacturer declarations for BAFA/KfW subsidy applications and product parameters are available from [www.viessmann.com](http://www.viessmann.com).



## Keyword index

### A

Accessories	
– For installation	35
Accessories for control unit	85
Anti-corrosion agents	78

### C

Cables	58
Carbon monoxide	56, 57
Cold water connection	21
CO limiter	56, 57
Comfort function	14
Condensate	77
Condensate connection	76
Conductivity	79
Connections	21
Contact thermostat	89
Control unit	81
Cylinder sizing	73
Cylinder temperature sensor	84

### D

Decision making aids for DHW heating	71
DHW circulation	75
DHW connection	21, 74
DHW cylinders	72
DHW cylinders adjacent to boiler	27
DHW cylinders below boiler	23
DHW heating	71
Dirt separator	79
Dirt trap	79
Drain outlet set	41
Draw-off rate	14
Dual mode DHW cylinder	31

### E

Electrical conductivity	79
Electrical connection	58
Electrical safety zone	57
EM-EA1 extension	94
EM-P1 extension	92
EnEV	83
Expansion vessel	80
Extension, solar	93
Extension EM-S1	93
Extension kit, mixer	
– Integrated mixer motor	91

### F

Fill water	79
Flow temperature sensor	84
Flushing water	79
Frost protection	79
Frost protection function	83

### G

Gas connection	21, 58
----------------	--------

### H

Hardness	79
Headers, low loss	80
Heating curves	83
Heating flow	21
Heating return	21
Hydraulic connection	78

### I

Immersion thermostat	89
Installation	58
Installation in unfinished buildings	58
Installation room	55
Instantaneous water heater	74
Interlock circuit	56
Interlock switch	58

### L

Level	83
Loading cylinder	71
Low loss header	80
Low water indicator	78

### M

Magnetite	79
Mixer extension	
– Integral mixer motor	90
– Integrated mixer motor	91
– Separate mixer motor	90
Mixer extension kit	
– Integral mixer motor	90
– Separate mixer motor	90
Mounting frame	37

### N

Neutralisation	76
Neutralising system	77

### O

Open flue operation	55
Outlet temperature sensor	84
Outside temperature sensor	84, 88

### P

pH value	79
Plumbing wall installation	63
Pre-installation	58
Programming unit	82
Protection	57

### R

Replacing third party boilers	64
Room sealed operation	56
Room temperature controller	86
Room temperature sensor	88
Room thermostat	85, 86

### S

Safety assembly to DIN 1988	75
Safety equipment	78
Safety valve	21, 74, 78
Safety zone, electrical	57
Separating facility	79
Shock arrestor	74
Siting conditions	55
Slope	83
Softening	79
Solar extension	
– Specification	94
Specification	
– Control unit	85
– Extension EM-S1	94
Specific system volume	79
Standby instantaneous water heater	14
SWKI guideline	79
System design	78

## Keyword index

### T

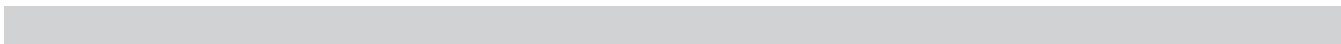
Temperature sensor	
– Room temperature sensor.....	88
Temperature sensors	
– Flow temperature sensor.....	84
– Outside temperature sensor.....	84, 88
Thermally activated safety shut-off valve.....	58
Thermostat	
– Contact temperature.....	89
– Immersion temperature.....	89
Top-up water.....	79

### V

VDI 2035.....	79
Vitocell 100.....	23
Vitocell 100-W.....	27, 31
Vitocell 100-W, adjacent	
– Pressure drop on the DHW side.....	33
Vitocell 100-W adjacent to the boiler	
– Pressure drop on DHW side.....	29
Vitocell 100-W below the boiler	
– Pressure drop on the DHW side.....	26
Vitotrol	
– 200-E.....	87
Vitotrol 100	
– UTA.....	85
– UTDB.....	86
– UTDB-RF.....	86

### W

Waste water system.....	79
Water hardness.....	79
Weather-compensated control	
– Frost protection function.....	83
Weather-compensated control unit	
– Functions.....	82
– Programming unit.....	82
Wet room.....	57





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