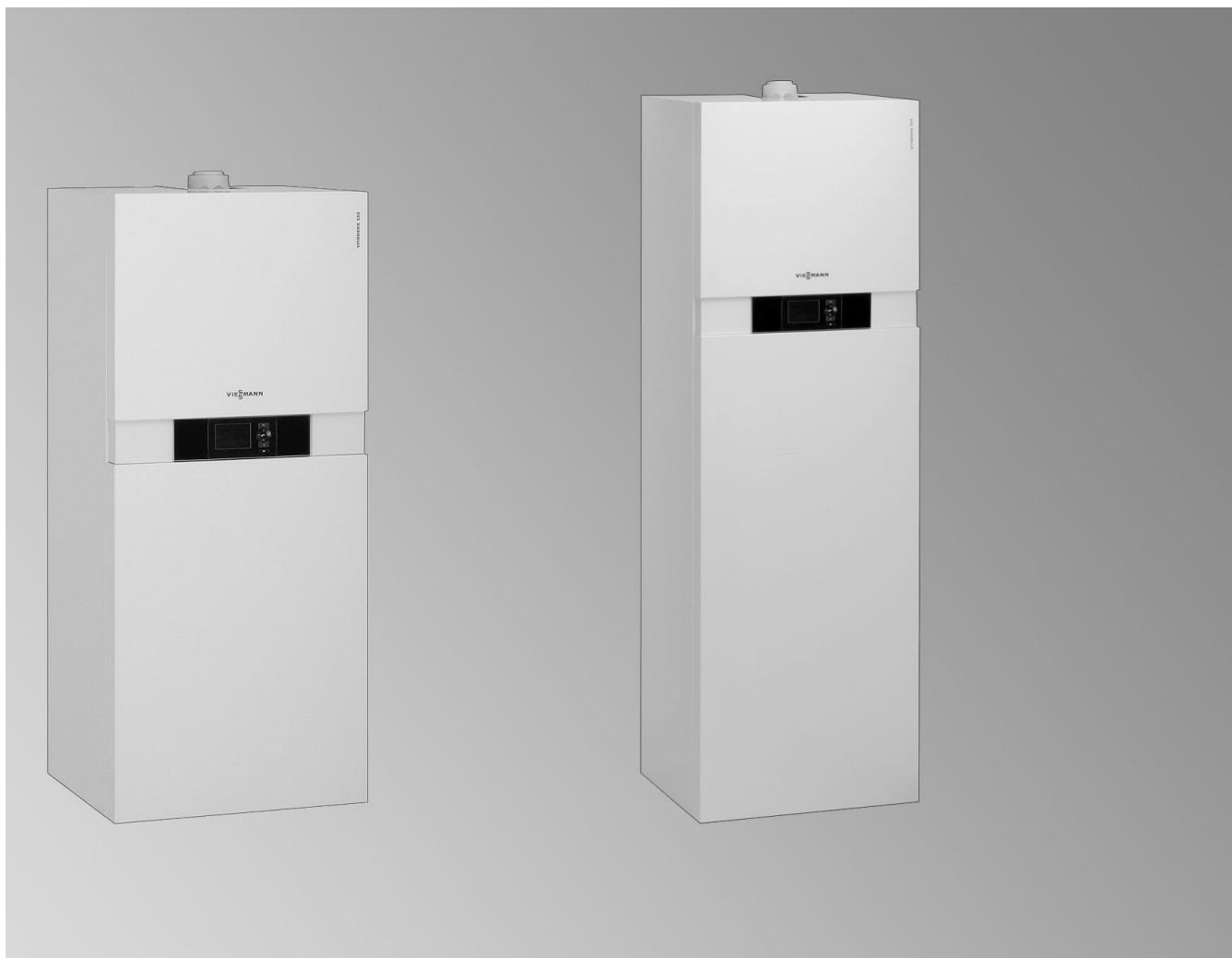


## Technical guide

**VITODENS 222-F** Type FS2B

Gas condensing storage combi boiler,  
4.8 to 35.0 kW,  
for natural gas and LPG

**VITODENS 242-F** Type FB2B

Compact Energy Tower for combined gas condensing/  
solar thermal systems,  
4.8 to 26.0 kW,  
for natural gas and LPG

**VITODENS 333-F** Type FS3B and FR3B

Gas condensing storage combi boiler,  
3.8 to 26.0 kW,  
for natural gas and LPG

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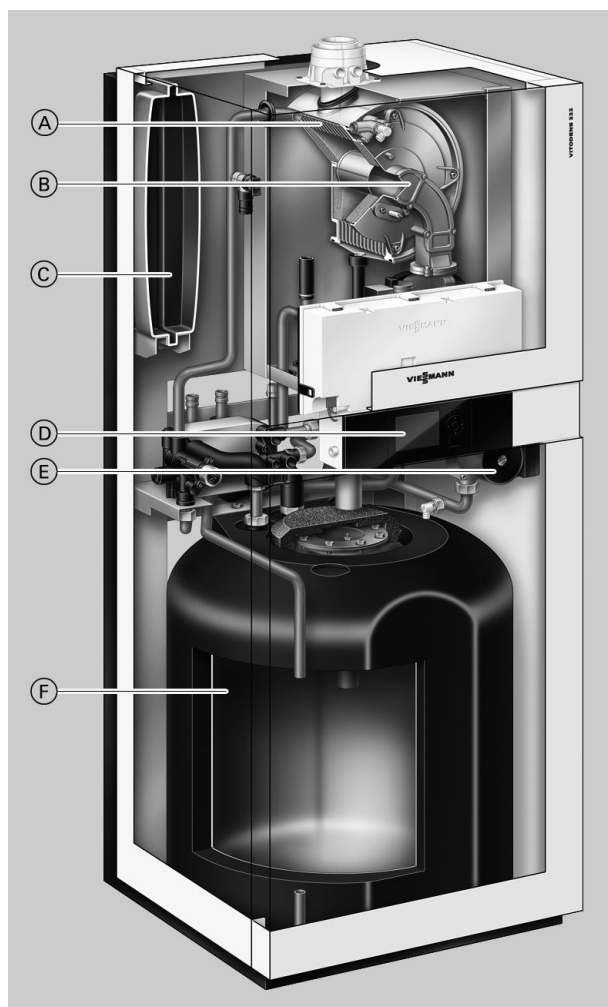
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## 1.1 Product description

1



- Ⓐ Stainless steel Inox-Radial heat exchanger for high operational reliability, a long service life and high output in the smallest space
- Ⓑ Modulating MatriX cylinder burner with intelligent Lambda Pro Control combustion controller for clean combustion and quiet operation
- Ⓒ Integral diaphragm expansion vessel
- Ⓓ Digital boiler control unit
- Ⓔ Integral two-stage circulation pump or variable speed high efficiency DC pump
- Ⓕ DHW primary store

The Vitodens 222-F gas condensing storage combi boiler is designed specifically for heating system modernisation projects and as a replacement for older gas boilers with cylinders installed below. With output ranging up to 35 kW, this heating centre is designed for high DHW convenience.

The integral primary store with 100 l capacity (up to 26 kW) or 130 l capacity (35 kW) offers the DHW convenience of a separate DHW cylinder with approximately twice that volume.

Like all Viessmann storage combi boilers, the Vitodens 222-F gas condensing storage combi boiler takes up little space: width and depth correspond to standard kitchen unit dimensions. The proven MatriX cylinder burner with Lambda Pro Control combustion controller automatically adjusts itself to varying gas qualities and ensures a constantly high seasonal efficiency [to DIN] of 98 % ( $H_s$ ).

### Recommended applications

- Installations in detached and terraced houses
- New build (e.g. pre-fabricated houses and housing association projects): installation in utility rooms and attics
- Modernisation: replacement of system boilers, floorstanding atmospheric gas boilers and oil/gas boilers with DHW cylinders below.

### Benefits at a glance

- Gas condensing storage combi boiler with integral enamelled primary store, 4.8 to 35.0 kW
- Standard seasonal efficiency [to DIN]: up to 98 % ( $H_s$ )/109 % ( $H_i$ )
- Enamelled primary store with 100 l capacity (35 kW): 130 l capacity
- Durable and efficient through the Inox-Radial heat exchanger

- Modulating MatriX cylinder burner with a long service life thanks to stainless steel MatriX mesh – resistant to high temperature loads
- New Vitotronic control unit that is easy to operate with plain text and graphic display
- The programming unit part of the control unit can also be fitted on a wall mounting base (accessory)
- Optionally with power-saving high efficiency DC pump (compliant with energy efficiency label A)
- Universal connection sets for individual installation flush with the wall
- No lateral service clearance required
- DHW expansion vessel and DHW circulation pump can be integrated inside the appliance

### Delivered condition

Gas condensing boiler with stainless steel Inox-Radial heat exchanger, modulating MatriX cylinder burner for natural gas and LPG to DVGW Code of Practice G260 [Germany], expansion vessel, two-speed or variable speed high efficiency DC pump and integral DHW primary store. Fully plumbed and wired.

Colour of the epoxy-coated casing: white.

Packed separately:

Vitotronic 100 for constant temperature mode or

Vitotronic 200 for weather-compensated operation.

Set up for operation with natural gas. A conversion within the gas group E/LL is not required. The conversion to LPG is made at the gas valve (a conversion kit is not required).

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## Vitodens 222-F, type FS2B (cont.)

### Accessories required (order separately)

Installation on finished walls

- Connection set (for upward connection) for installation on finished walls  
or
- Connection set (for upward connection) with premounting bracket for installation on finished walls  
or
- Connection set (for connection to the left or right) for installation on finished walls  
or
- Connection set (for connection to the left or right) with premounting bracket for installation on finished walls  
or

- Connection set (for downward connection) with premounting bracket for installation on finished walls  
or
- Assembly kit with mixer

Installation on unfinished walls

- Connection set for installation on unfinished walls  
or
- Assembly kit with mixer

### Approved quality

 CE designation according to current EC Directives

Meets the requirements for the "Blue Angel" certificate of environmental excellence to RAL UZ 61.

1

## 1.2 Specification

**1**

Gas boiler, types B and C, category II <sub>2N3P</sub>				
Rated output range (details to DIN EN 677)				
T <sub>V</sub> /T <sub>R</sub> = 50/30 °C	kW	4.8-19.0	6.5-26.0	8.8-35.0
T <sub>V</sub> /T <sub>R</sub> = 80/60 °C	kW	4.3-17.2	5.9-23.7	8.0-31.7
Rated output for DHW heating	kW	4.3-17.2	5.9-29.3	8.0-35.0
Rated heat input	kW	4.5-17.9	6.2-30.5	8.3-34.9
Product ID		CE-0085BU0051		
IP rating		IP X4D in accordance with DIN EN 60529		
Gas supply pressure				
Natural gas	mbar	20	20	20
LPG	mbar	50	50	50
Max. permissible gas supply pressure*1				
Natural gas	mbar	25.0	25.0	25.0
LPG	mbar	57.5	57.5	57.5
Power consumption (in the delivered condition)				
– with two-stage circulation pump	W	90	105	138
– with variable speed high efficiency DC pump	W	62	65	85
Weight	kg	129	132	141
Heat exchanger capacity	litres	1.8	2.4	2.8
Max. flow rate	l/h	1200	1400	1600
(limit for the use of hydraulic separation)				
Nominal circulation water volume	l/h	739	1018	1361
(at T <sub>V</sub> /T <sub>R</sub> = 80/60°C)				
Expansion vessel				
Capacity	litres	12	12	12
Pre-charge pressure	bar	0.75	0.75	0.75
Permiss. operating pressure (on the heating water side)	bar	3	3	3
Connections (with connection accessories)				
Boiler flow and return	R	¾	¾	¾
Hot and cold water	R	½	½	½
DHW circulation	R	½	½	½
Dimensions				
Length	mm	595	595	595
Width	mm	600	600	600
Height	mm	1425	1425	1625
Gas connection (with connection accessories)	R	½	½	½
DHW primary store				
Capacity	litres	100	100	130
Permiss. operating pressure (DHW side)	bar	10	10	10
Continuous DHW output	kW	17.2	29.3	35.0
for heating DHW from 10 to 45 °C	l/h	422	720	860
Performance factor N <sub>L</sub> *2		1.8	3.0	4.8
DHW outlet output	litres/10 min	182	230	273
for heating DHW from 10 to 45 °C				
Connection values				
in relation to the max. load				
with gas				
Natural gas E	m³/h	1.89	3.23	3.86
Natural gas LL	m³/h	2.20	3.75	4.48
LPG P	kg/h	1.40	2.39	2.85

<sup>\*1</sup> If the gas supply pressure is higher than the maximum permitted value, install a separate gas pressure governor upstream of the system.

<sup>\*2</sup> At 70 °C average boiler water temperature and cylinder storage temperature  $T_{cyl} = 60\text{ °C}$ .

The performance factor  $N_L$  changes with the cylinder storage temperature  $T_{cyl}$ .

Standard values:  $T_{cyl} = 60\text{ °C} \rightarrow 1.0 \times N_L$   $T_{cyl} = 55\text{ °C} \rightarrow 0.75 \times N_L$   $T_{cyl} = 50\text{ °C} \rightarrow 0.55 \times N_L$   $T_{cyl} = 45\text{ °C} \rightarrow 0.3 \times N_L$ .

## Vitodens 222-F, type FS2B (cont.)

<b>Gas boiler, types B and C, category II<sub>2N3P</sub></b>				
<b>Rated output range (details to DIN EN 677)</b>				
<b>T<sub>V</sub>/T<sub>R</sub> = 50/30 °C</b>	<b>kW</b>	<b>4.8-19.0</b>	<b>6.5-26.0</b>	<b>8.8-35.0</b>
<b>T<sub>V</sub>/T<sub>R</sub> = 80/60 °C</b>	<b>kW</b>	<b>4.3-17.2</b>	<b>5.9-23.7</b>	<b>8.0-31.7</b>
<b>Flue gas parameters<sup>*3</sup></b>				
Flue gas value group to G 635/G 636		G <sub>52</sub> /G <sub>51</sub>	G <sub>52</sub> /G <sub>51</sub>	G <sub>52</sub> /G <sub>51</sub>
Temperature (at 30 °C return temperature)				
– at rated output	°C	45	45	45
– at partial load	°C	35	35	35
Temperature (at 60 °C return temperature)				
– at rated output	°C	68	68	70
Mass flow rate				
– for natural gas				
– at rated output	kg/h	33.3	47.3	70.0
– at partial load	kg/h	8.4	11.8	15.7
– for LPG				
– at rated output	kg/h	32.5	46.4	68.2
– at partial load	kg/h	8.2	11.5	15.4
Available draught				
	Pa	250	250	250
	mbar	2.5	2.5	2.5
<b>Standard efficiency at</b>		up to 98 (H <sub>s</sub> )/109 (H <sub>i</sub> )		
<b>T<sub>V</sub>/T<sub>R</sub> = 40/30 °C</b>	<b>%</b>			
<b>Average condensate volume</b>				
for natural gas and				
T <sub>V</sub> /T <sub>R</sub> = 50/30 °C	litres/day	9-11	10-12	11-13
<b>Condensate connection (hose nozzle)</b>	Ø mm	20-24	20-24	20-24
<b>Flue gas connection</b>	Ø mm	60	60	60
<b>Ventilation air connection</b>	Ø mm	100	100	100

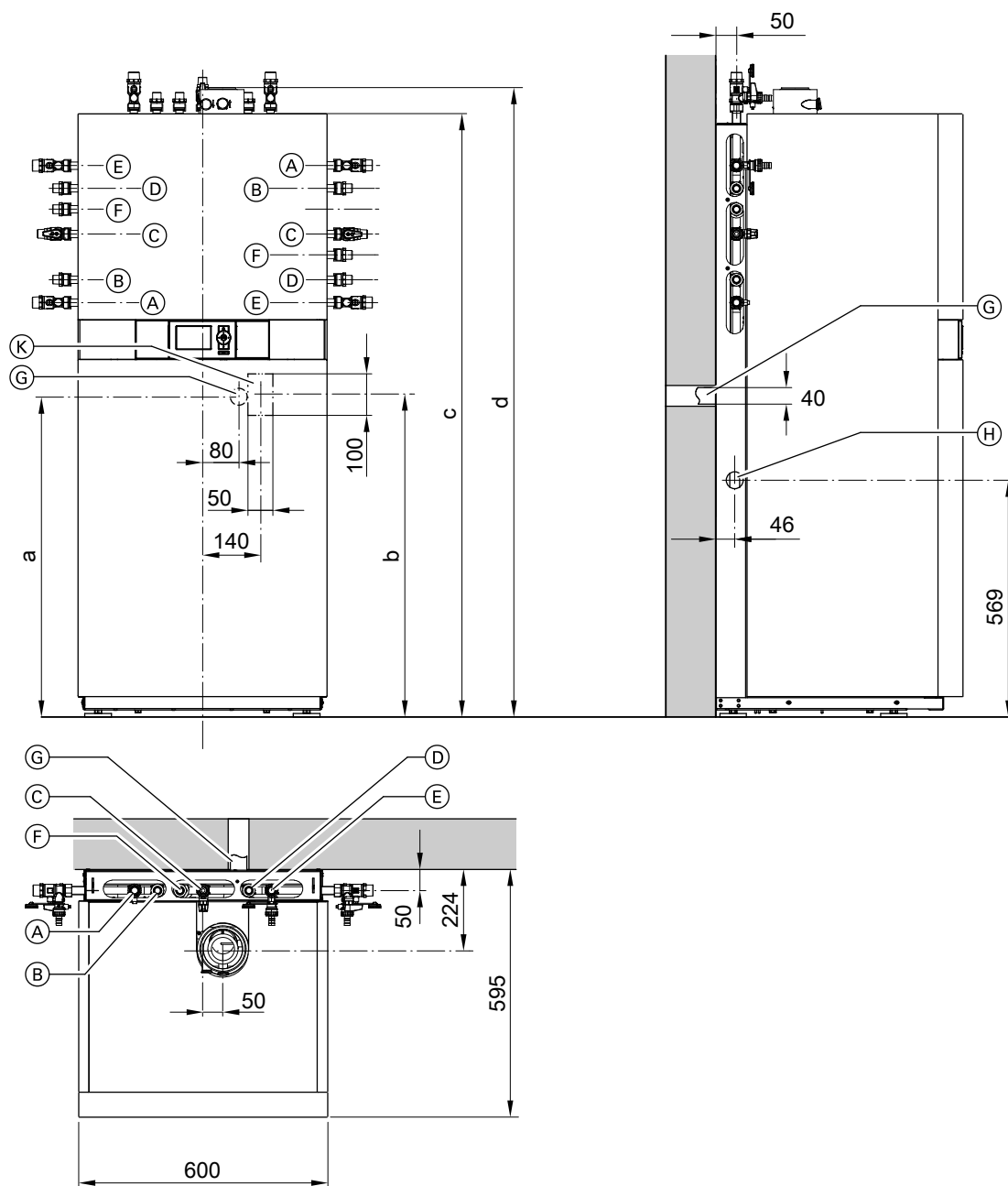
<sup>\*3</sup> Calculation values for sizing the flue system to DIN EN 13384.

Flue gas temperatures measured as gross values at 20 °C combustion air temperature.

The flue gas temperature at a return temperature of 30 °C is significant for the sizing of the flue system.

The flue gas temperature at a return temperature of 60 °C is used to determine the application range of flue pipes with maximum permissible operating temperatures.

1



- (A) Heating flow R  $\frac{3}{4}$
- (B) DHW R  $\frac{1}{2}$
- (C) Gas connection R  $\frac{1}{2}$
- (D) Cold water R  $\frac{1}{2}$
- (E) Heating return R  $\frac{3}{4}$

- (F) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (G) Condensate drain to the back into the wall
- (H) Side condensate drain
- (K) Cable entry area

Rated output range kW	a mm	b mm	c mm	d mm
4.8 to 19	745	750	1425	1465
6.5 to 26	745	750	1425	1465
8.8 to 35	945	950	1625	1665

**Note**

The dimensioned drawing shows example fittings for upward connection and connection to the left/right, for installation on finished walls. Order the connection sets separately as accessories. For the dimensions of the individual connection sets, see the technical guide.

If using the connection set (for downward connection) with a pre-mounting bracket for installation on finished walls, maintain a wall clearance of 70 mm.

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**Vitodens 222-F, type FS2B (cont.)**

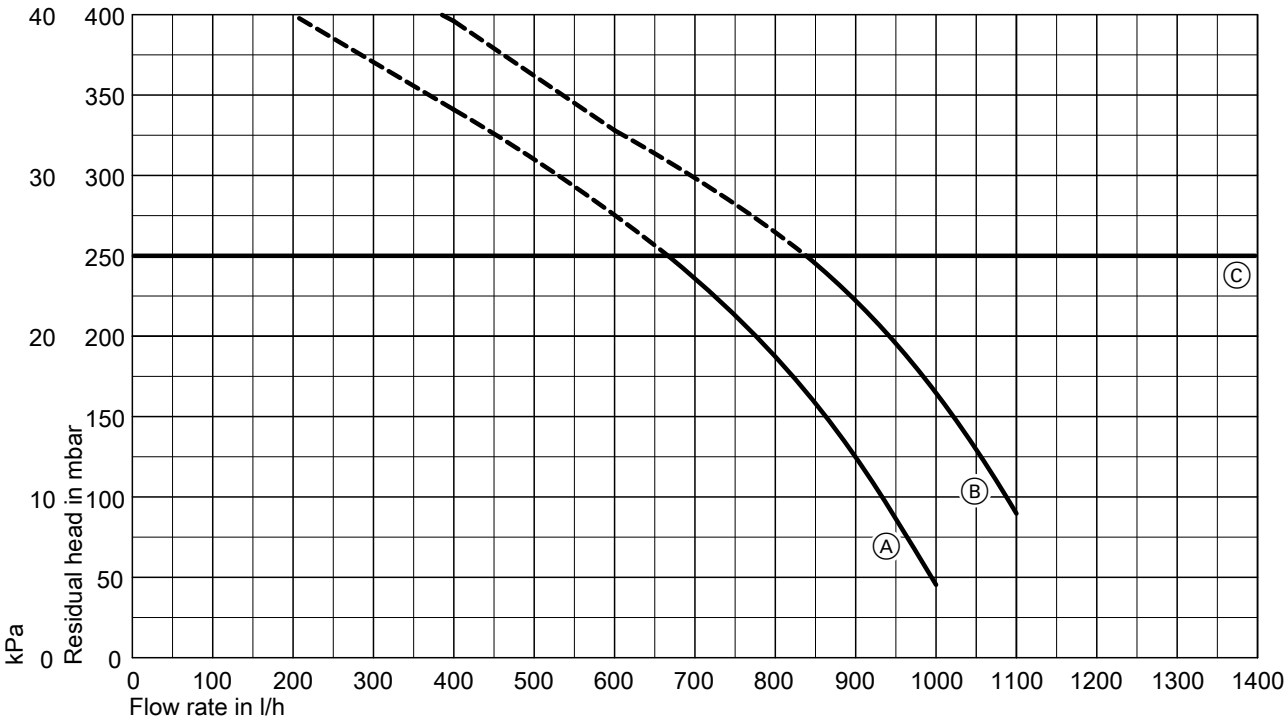
**Note**  
The adjustable feet give all height measurements a tolerance of +15 mm.

**Two-stage heating circuit pump in the Vitodens 222-F**

Rated boiler output		kW	4.8 - 26.0	8.8 - 35.0
Type			VI UPSO 15-60	VI UPSO 15-70
Rated voltage		V~	230	230
Power consumption	Stage 1	W	60	70
	Stage 2	W	70	90

**Residual head of the integral circulation pump**

**Vitodens 222-F, 4.8 - 26.0 kW**

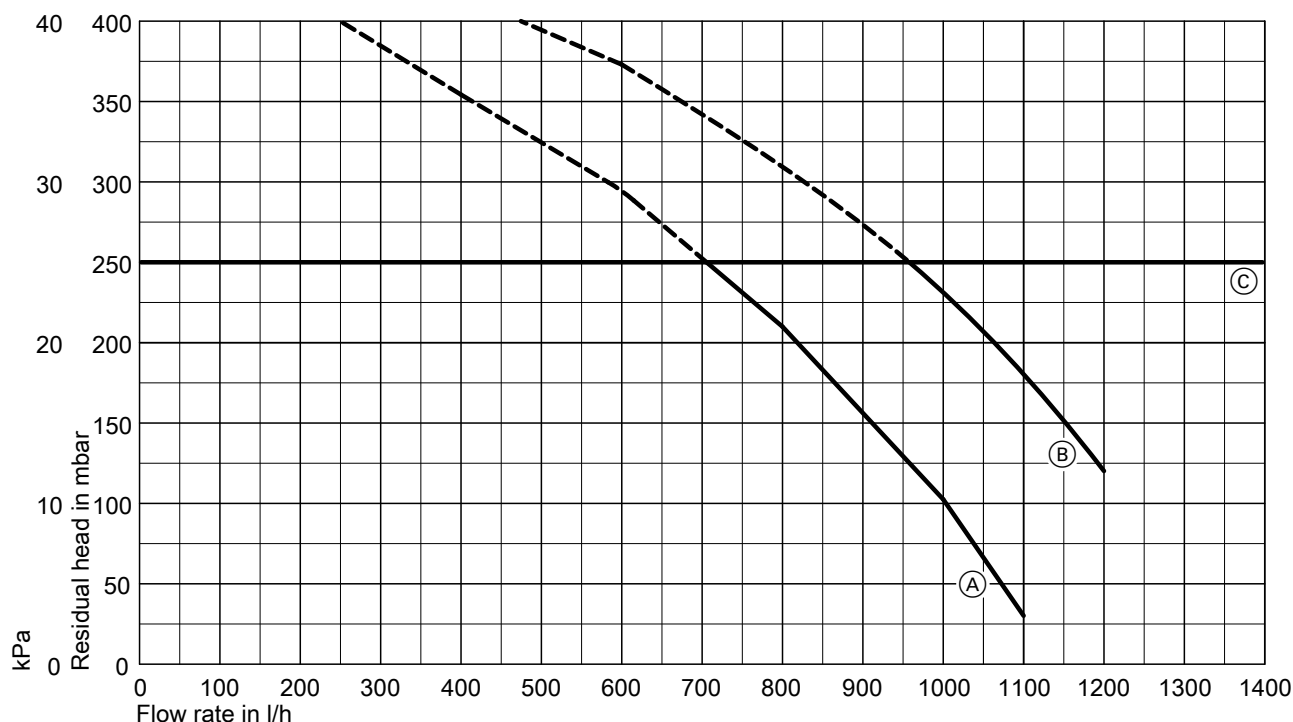


- Ⓐ Stage 1
- Ⓑ Stage 2
- Ⓒ Upper operational limit

## Vitodens 222-F, type FS2B (cont.)

Vitodens 222-F, 8.8 - 35.0 kW

1



- (A) Stage 1
- (B) Stage 2
- (C) Upper operational limit

### Variable speed heating circuit pump in the Vitodens 222-F

The integral circulation pump is a highly efficient DC pump with substantially lower power consumption than conventional pumps. The pump speed and consequently the pump rate is regulated subject to the outside temperature and the switching times for heating or reduced mode. The control unit transmits the current default speed via an internal data BUS to the circulation pump. Individually match the minimum and maximum speed plus the speed for reduced mode to the existing heating system using the control unit codes.

In the delivered condition, the minimum pump rate (coding address "E7") is set to 30 %. The maximum pump rate (coding address "E6") is set to the following values:

Rated output range in kW	Speed settings in the delivered condition in %
4.8-19	55
6.5-26	65
8.8-35	65

### Circulation pump VI UPM-15-70 KM

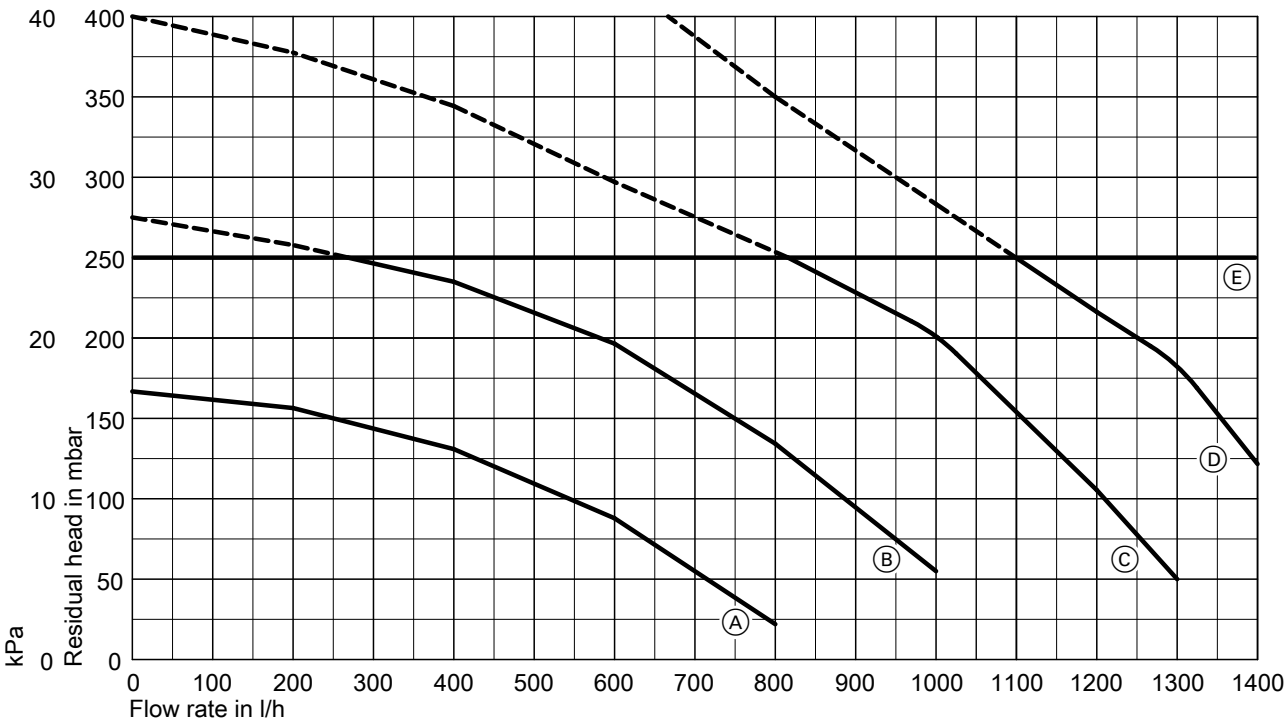
Rated voltage	V~	230
Power consumption	max.	W 70
	min.	W 6
Power consumption in the delivered condition		
- 4.8-19 kW	W	27
- 6.5-26 kW	W	37
- 8.8-35 kW	W	37

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Vitodens 222-F, type FS2B (cont.)

Residual head of the integral circulation pump

Vitodens 222-F, 4.8 - 26.0 kW

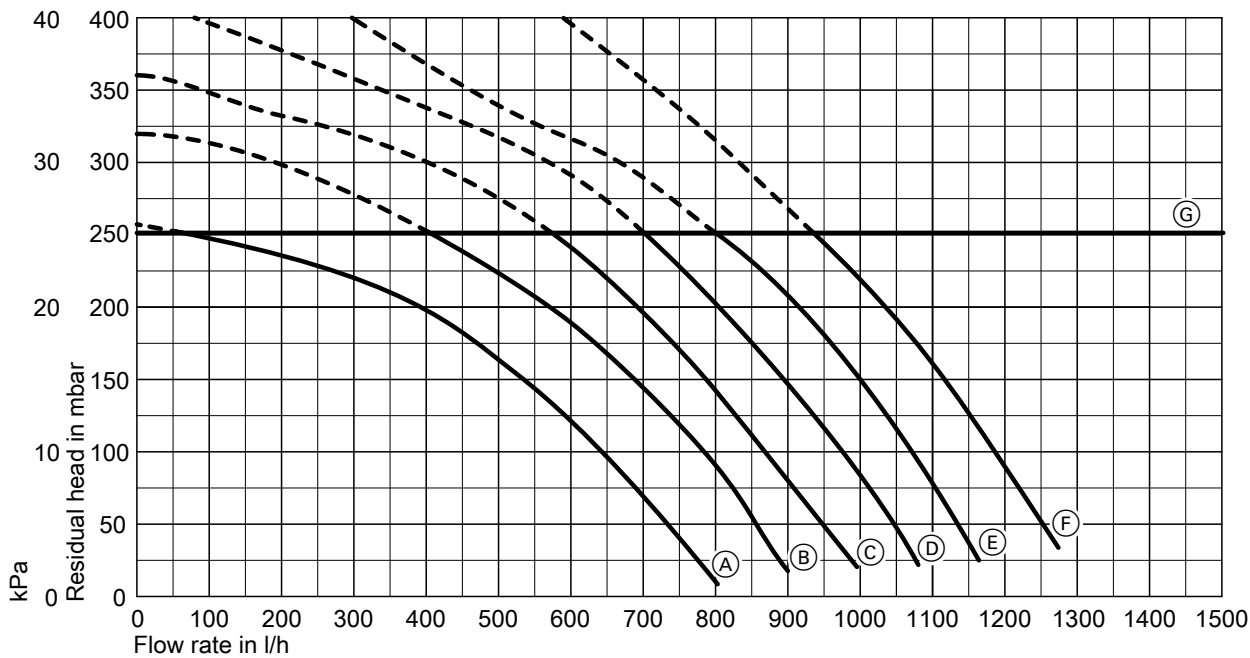


(E) Upper operational limit

Curve	Circulation pump rate	Setting code address "E6"
(A)	30 %	E6:030
(B)	50 %	E6:050
(C)	75 %	E6:075
(D)	100 %	E6:100

Vitodens 222-F, type FS2B (cont.)

Vitodens 222-F, 8.8 - 35.0 kW



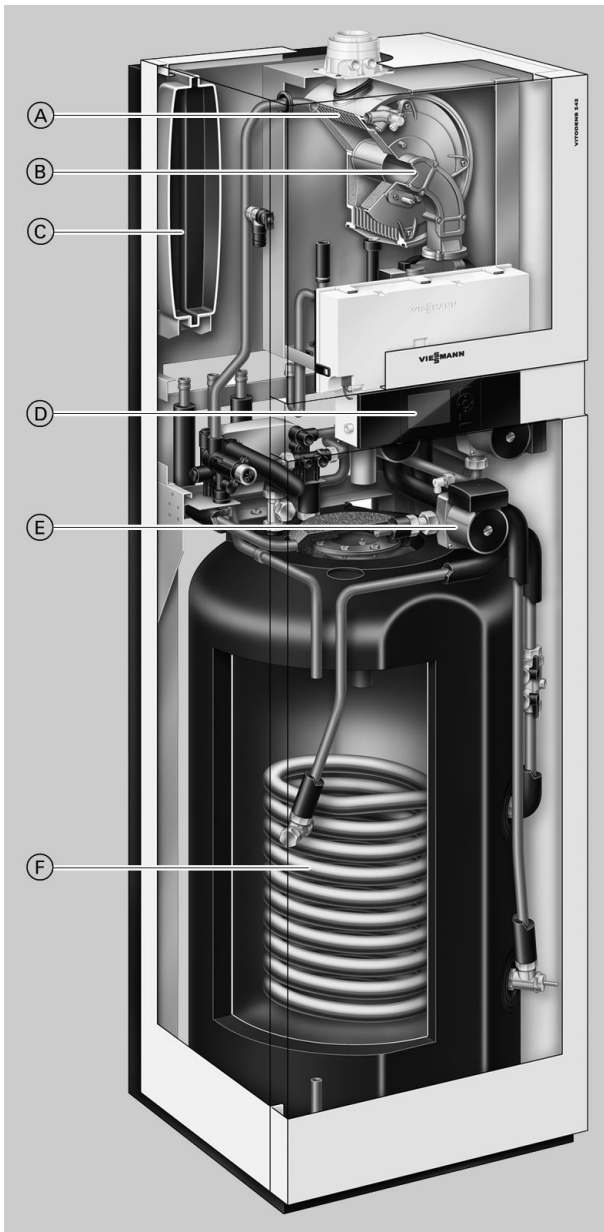
Ⓔ Upper operational limit

Curve	Circulation pump rate	Setting code address "E6"
Ⓐ	30 %	E6:030
Ⓑ	50 %	E6:050
Ⓒ	60 %	E6:060
Ⓓ	70 %	E6:070
Ⓔ	80 %	E6:080
Ⓕ	100 %	E6:100



## Vitodens 242-F, type FB2B

### 2.1 Product description



- Ⓐ Stainless steel Inox-Radial heat exchanger for high operational reliability, a long service life and high output in the smallest space
- Ⓑ Modulating MatriX gas burner for extremely clean combustion
- Ⓒ Integral diaphragm expansion vessel
- Ⓓ Digital boiler control unit
- Ⓔ Integral solar circuit pump
- Ⓕ Dual mode DHW cylinder

2

The Vitodens 242-F gas condensing storage combi boiler for installation tight against the wall is affordable, compact, efficient and solar-compatible. This compact appliance is factory-prepared for the direct connection of a solar thermal system. The solar control module is already integrated and is regulated via the Vitotronic control unit. A convenient DHW supply is ensured by the 170 l dual mode DHW cylinder. For ease of handling, the Vitodens 242-F can be transported in two parts.

#### Recommended applications

- Installations in detached and terraced houses
- New build (e.g. pre-fabricated houses and housing association projects): installation in utility rooms

#### Benefits at a glance

- Gas condensing storage combi boiler (4.8 to 26 kW) with integral solar cylinder
- Standard seasonal efficiency [to DIN]: up to 98 % ( $H_s$ )/109 % ( $H_i$ )
- Durable and efficient through stainless steel Inox-Radial heat exchanger

- MatriX cylinder burner with Lambda Pro Control combustion controller for permanently high efficiency and clean combustion
- Enamelled dual mode primary store with 170 l capacity
- New control unit that is easy to operate with plain text and graphic display plus integral solar control module.
- The programming unit part of the control unit can also be fitted on a wall mounting base (accessory)
- Connection sets for individual installation flush with the wall
- Solar coverage > 50 %
- Assembly kit with the dimensions and design of the appliance (accessory) for the connection of one regulated and one unregulated heating circuit

#### Delivered condition

Gas condensing boiler with Inox-Radial heat exchanger, MatriX cylinder burner for natural gas and LPG to DVGW Code of Practice G260 [Germany], expansion vessel, two-stage heating circuit pump, solar circuit pump, Vitotronic 200 for weather-compensated operation, solar control module and integral DHW solar cylinder. Fully plumbed and wired. Colour of the epoxy-coated casing: white.

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## Vitodens 242-F, type FB2B (cont.)

### Accessories required (order separately)

Installation on finished walls

- Connection set (for upward connection) for installation on finished walls  
or
- Connection set (for upward connection) with premounting bracket for installation on finished walls  
or
- Connection set (for connection to the left or right) for installation on finished walls  
or
- Connection set (for connection to the left or right) with premounting bracket for installation on finished walls  
or

- Connection set (for downward connection) with premounting bracket for installation on finished walls  
or
- Assembly kit with mixer

Installation on unfinished walls

- Connection set for installation on unfinished walls  
or
- Assembly kit with mixer

### Approved quality



CE designation according to current EC Directives

Meets the requirements for the "Blue Angel" certificate of environmental excellence to RAL UZ 61.

## Vitodens 242-F, type FB2B (cont.)

### 2.2 Specification

Gas boiler, types B and C, category II <sub>2N3P</sub>			
Rated output range (details to DIN EN 677)			
T <sub>V</sub> /T <sub>R</sub> = 50/30 °C	kW	4.8-19.0	6.5-26.0
T <sub>V</sub> /T <sub>R</sub> = 80/60 °C	kW	4.3-17.2	5.9-23.7
Rated output for DHW heating	kW	4.3-17.2	5.9-29.3
Rated heat input	kW	4.5-17.9	6.2-30.5
Product ID		CE-0085BU0051	
IP rating		IP X4D in accordance with DIN EN 60529	
Gas supply pressure			
Natural gas	mbar	20	20
LPG	mbar	50	50
Max. permissible gas supply pressure *4			
Natural gas	mbar	25.0	25.0
LPG	mbar	57.5	57.5
Power consumption (in the delivered condition)	W	90	105
Weight			
– Total (with casing)	kg	161	165
– Heat cell module	kg	42	46
– Cylinder module	kg	95	95
Heat exchanger capacity	litres	1.8	2.4
Max. flow rate	l/h	1200	1400
(limit for the use of hydraulic separation)			
Nominal circulation water volume	l/h	739	1018
(at T <sub>V</sub> /T <sub>R</sub> = 80/60°C)			
Expansion vessel			
Capacity	litres	12	12
Pre-charge pressure	bar	0.75	0.75
Permiss. operating pressure			
– Heating circuit	bar	3	3
– Solar circuit	bar	6	6
Connections (with connection accessories)			
Boiler flow and return	R	¾	¾
Solar flow and return	R/Ø mm	¾/22	¾/22
Hot and cold water	R	½	½
DHW circulation	R	½	½
Dimensions			
Length	mm	595	595
Width	mm	600	600
Height	mm	1875	1875
Height when tilted	mm	2000	2000
Gas connection (with connection accessories)	R	½	½
DHW cylinder			
Capacity	litres	170	170
Permiss. operating pressure (DHW side)	bar	10	10
Continuous DHW output	kW	17.2	29.3
for heating DHW from 10 to 45 °C	l/h	422	719
Performance factor N <sub>L</sub> *5		1.4	2.0
DHW outlet output	litres/10 min	164	190
for heating DHW from 10 to 45 °C			
Connection values			
in relation to the max. load			
with gas			
Natural gas E	m³/h	1.89	3.23
Natural gas LL	m³/h	2.20	3.75
LPG P	kg/h	1.40	2.39

<sup>\*4</sup> If the gas supply pressure is higher than the maximum permitted value, install a separate gas pressure governor upstream of the system.

<sup>\*5</sup> At 70 °C average boiler water temperature and cylinder storage temperature  $T_{cyl} = 60\text{ °C}$ .

The performance factor  $N_L$  changes with the cylinder storage temperature  $T_{cyl}$ .

Standard values:  $T_{cyl} = 60\text{ °C} \rightarrow 1.0 \times N_L$   $T_{cyl} = 55\text{ °C} \rightarrow 0.75 \times N_L$   $T_{cyl} = 50\text{ °C} \rightarrow 0.55 \times N_L$   $T_{cyl} = 45\text{ °C} \rightarrow 0.3 \times N_L$ .

## Vitodens 242-F, type FB2B (cont.)

<b>Gas boiler, types B and C, category II<sub>2N3P</sub></b>			
<b>Rated output range (details to DIN EN 677)</b>			
<b>T<sub>v</sub>/T<sub>R</sub> = 50/30 °C</b>	<b>kW</b>	<b>4.8-19.0</b>	<b>6.5-26.0</b>
<b>T<sub>v</sub>/T<sub>R</sub> = 80/60 °C</b>	<b>kW</b>	<b>4.3-17.2</b>	<b>5.9-23.7</b>
<b>Flue gas parameters<sup>*6</sup></b>			
Flue gas value group to G 635/G 636		G <sub>52</sub> /G <sub>51</sub>	G <sub>52</sub> /G <sub>51</sub>
Temperature (at 30 °C return temperature)			
– at rated output	°C	45	45
– at partial load	°C	35	35
Temperature (at 60 °C return temperature)		68	68
Mass flow rate			
– for natural gas			
– at rated output	kg/h	33.3	47.3
– at partial load	kg/h	8.4	11.8
– for LPG			
– at rated output	kg/h	32.5	46.4
– at partial load	kg/h	8.2	11.5
Available draught		250	250
		mbar	2.5
<b>Standard efficiency at</b>		up to 98 (H <sub>s</sub> )/109 (H <sub>i</sub> )	
T <sub>v</sub> /T <sub>R</sub> = 40/30 °C	%		
<b>Average condensate volume</b>			
for natural gas and			
T <sub>v</sub> /T <sub>R</sub> = 50/30 °C	litres/day	9-11	10-12
<b>Condensate connection</b> (hose nozzle)	Ø mm	20-24	20-24
<b>Flue gas connection</b>	Ø mm	60	60
<b>Ventilation air connection</b>	Ø mm	100	100

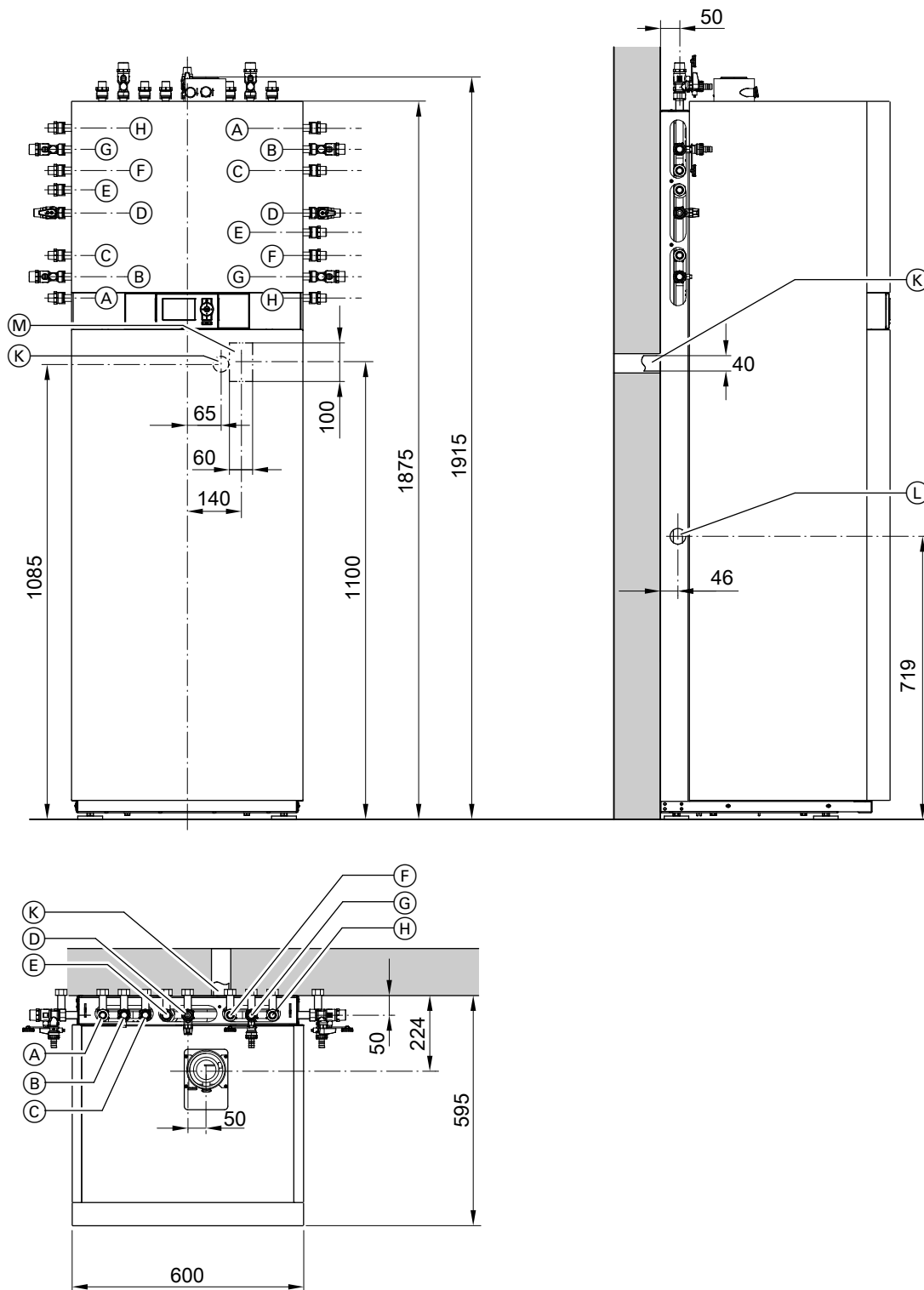
<sup>\*6</sup> Calculation values for sizing the flue system to DIN EN 13384.

Flue gas temperatures measured as gross values at 20 °C combustion air temperature.

The flue gas temperature at a return temperature of 30 °C is significant for the sizing of the flue system.

The flue gas temperature at a return temperature of 60 °C is used to determine the application range of flue pipes with maximum permissible operating temperatures.

## Vitodens 242-F, type FB2B (cont.)



- (A) Solar return  $R \frac{3}{4}/\text{Ø}22$  mm
- (B) Heating flow  $R \frac{3}{4}$
- (C) DHW  $R \frac{1}{2}$
- (D) Gas connection  $R \frac{1}{2}$
- (E) DHW circulation  $R \frac{1}{2}$  (separate accessory)
- (F) Cold water  $R \frac{1}{2}$

- (G) Heating return  $R \frac{3}{4}$
- (H) Solar flow  $R \frac{3}{4}/\text{Ø}22$  mm
- (K) Condensate drain to the back into the wall
- (L) Side condensate drain
- (M) Cable entry area

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Vitodens 242-F, type FB2B (cont.)

**Note**  
The dimensioned drawing shows example fittings for upward connection and connection to the left/right, for installation on finished walls. Order the connection sets separately as accessories.  
For the dimensions of the individual connection sets, see the technical guide.  
If using the connection set (for downward connection) with a pre-mounting bracket for installation on finished walls, maintain a wall clearance of 70 mm.

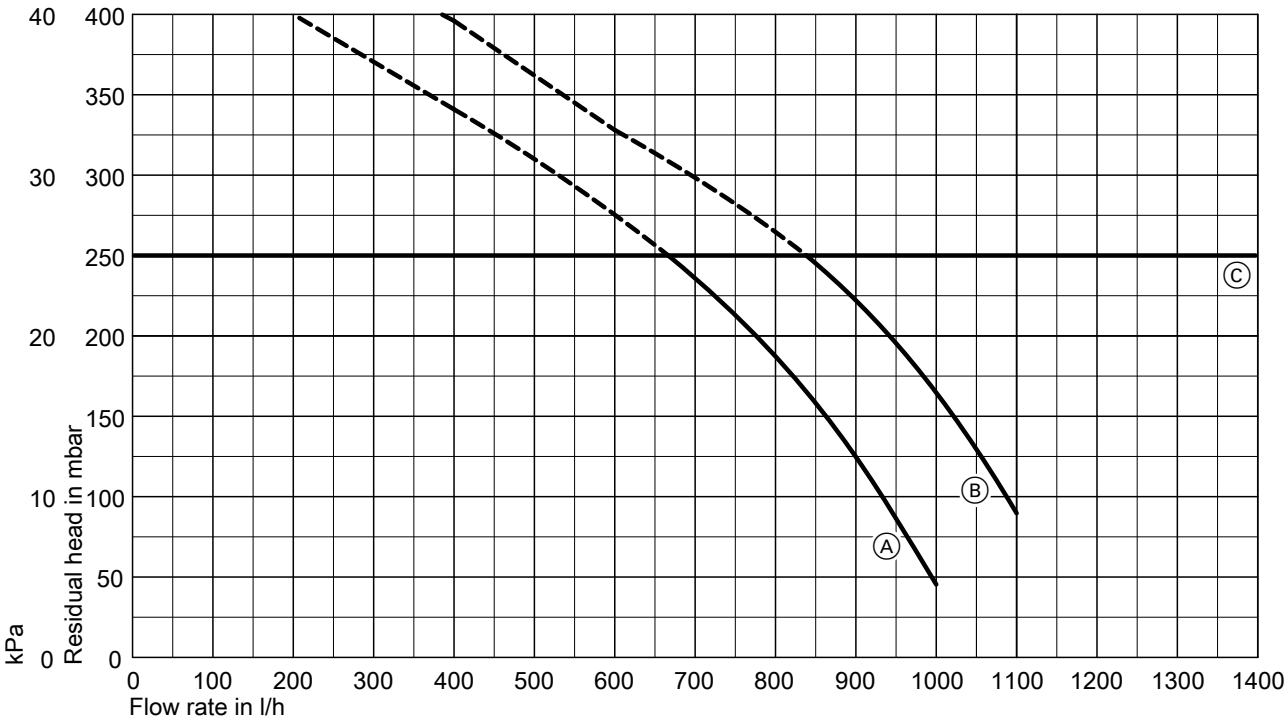
**Note**  
The adjustable feet give all height measurements a tolerance of +15 mm.

2

Two-stage heating circuit pump in the Vitodens 242-F

Rated boiler output		kW	4.8 - 26.0
Type			VI UPSO 15-60
Rated voltage		V~	230
Power consumption	Stage 1	W	60
	Stage 2	W	70

Residual head of the integral circulation pump



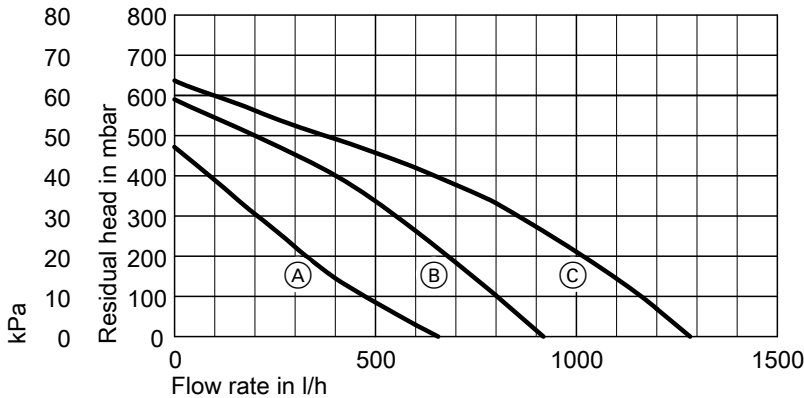
- (A) Stage 1
- (B) Stage 2
- (C) Upper operational limit

Three-stage solar circuit pump

Type			VI Solar 15-60
Rated voltage		V~	230
Power consumption	Stage 1	W	50
	Stage 2	W	65
	Stage 3	W	80

**Vitodens 242-F, type FB2B (cont.)**

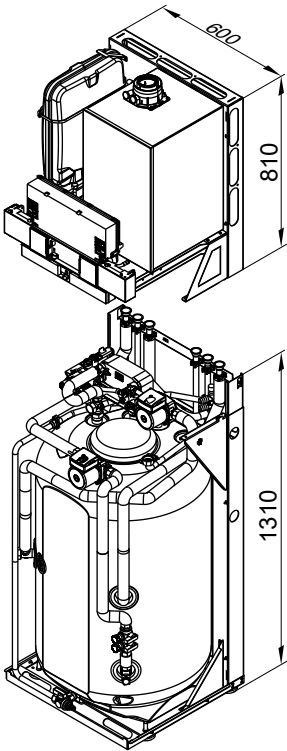
**Residual head of the integral solar circuit pump**



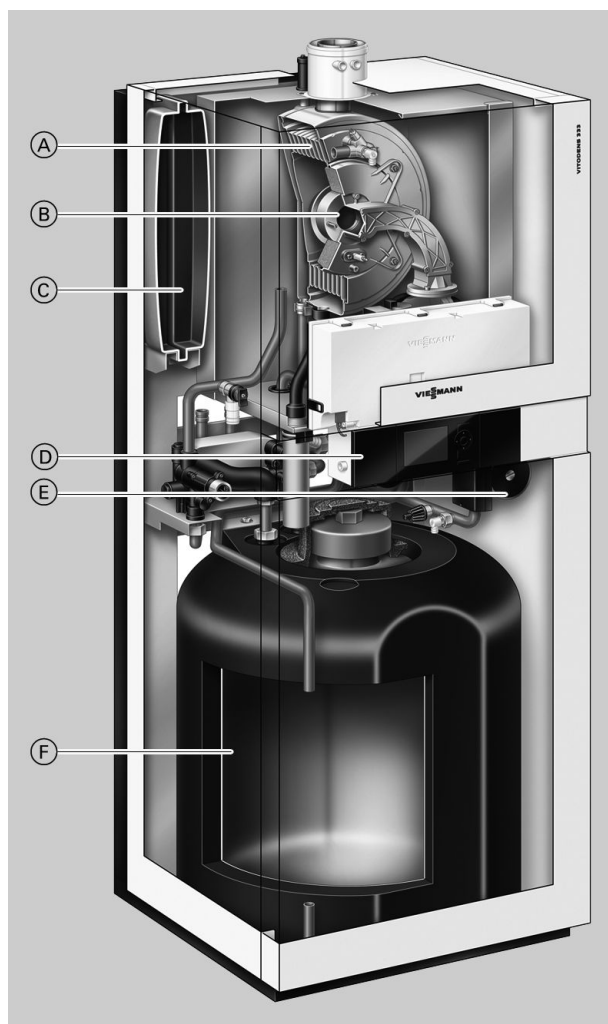
- (A) Stage 1
- (B) Stage 2
- (C) Stage 3

**Handling the Vitodens 242-F in tight spaces**

If required the heat cell and cylinder can be separated for easier handling at the installation location.  
For the weight of the individual parts, see the specification.



### 3.1 Product description



- (A) Stainless steel Inox-Radial heat exchanger for high operational reliability, a long service life and high output in the smallest space
- (B) Modulating MatriX gas burner for extremely clean combustion
- (C) Integral diaphragm expansion vessel
- (D) Digital boiler control unit
- (E) Integral, variable speed high efficiency DC pump
- (F) Stainless steel DHW primary store

The Vitodens 333-F storage combi boiler combines the benefits of the Vitodens 300-W with the high DHW convenience of a separate DHW cylinder.

With the MatriX gas burner and the stainless steel Inox-Radial heat exchanger, the Vitodens 333-F offers top technology for many years of energy efficiency and high heating and DHW convenience. The Lambda Pro Control and SMART modules, well-known from the Vitodens 300-W, plus the variable speed high efficiency DC pump, ensure permanently high efficiency, reliable operation and low power consumption.

The integral stainless steel 100 litre primary store offers the same DHW convenience as a separate DHW cylinder approximately twice the size.

#### Recommended applications

- Installations in detached and terraced houses
- New build (e.g. pre-fabricated houses and housing association projects): installation in utility rooms and attics
- Modernisation: replacement of system boilers, floorstanding atmospheric gas boilers and oil/gas boilers with DHW cylinders below.

#### Benefits at a glance

- Gas condensing storage combi boiler with integral stainless steel primary store, 3.8 to 26.0 kW
- Standard seasonal efficiency [to DIN]: up to 98 % ( $H_s$ )/109 % ( $H_i$ )
- Durable and efficient through the Inox-Radial heat exchanger
- MatriX gas burner with long service life thanks to stainless steel MatriX mesh – resistant to high temperature loads

- Stainless steel primary store with 100 l capacity ( $N_L$  value up to 2.4)
- Energy saving high efficiency DC pump (in accordance with Energy Label A)
- New Vitotronic control unit that is easy to operate with plain text and graphic display
- The programming unit part of the control unit can also be fitted on a wall mounting base (accessory)
- Lambda Pro Control combustion controller for all gas types – saving fees by extending the inspection intervals to up to five years [in Germany]
- Universal connection sets for individual installation flush with the wall
- DHW expansion vessel and DHW circulation pump can be integrated inside the appliance
- Assembly kit with the dimensions and design of the appliance (accessory) for the connection of one regulated and one unregulated heating circuit

#### Delivered condition

Gas condensing boiler with Inox-Radial heat exchanger, modulating MatriX gas burner for natural gas and LPG to DVGW Code of Practice G260 [Germany], expansion vessel, variable speed high efficiency DC pump and integral stainless steel DHW primary store. Fully plumbed and wired.

Colour of the epoxy-coated casing: white.

Packed separately:

Vitotronic 100 for constant temperature mode

or

Vitotronic 200 for weather-compensated operation.



## Vitodens 333-F, type FS3B (cont.)

Set up for operation with natural gas. A conversion within the gas group E/LL is not required. The conversion to LPG is made at the gas valve (a conversion kit is not required).

### Accessories required (order separately)

Installation on finished walls


- Connection set (for upward connection) for installation on finished walls  
or
- Connection set (for upward connection) with premounting bracket for installation on finished walls  
or
- Connection set (for connection to the left or right) for installation on finished walls  
or
- Connection set (for connection to the left or right) with premounting bracket for installation on finished walls  
or

- Connection set (for downward connection) with premounting bracket for installation on finished walls  
or
- Assembly kit with mixer

Installation on unfinished walls

- Connection set for installation on unfinished walls  
or
- Assembly kit with mixer

### Approved quality

 CE designation according to current EC Directives

Meets the requirements for the "Blue Angel" certificate of environmental excellence to RAL UZ 61.

### 3.2 Specification

Gas boiler, types B and C, category II <sub>2N3P</sub>				
Rated output range (details to DIN EN 677)				
T <sub>V</sub> /T <sub>R</sub> = 50/30 °C	kW	3.8-13.0	3.8-19.0	5.2-26.0
T <sub>V</sub> /T <sub>R</sub> = 80/60 °C	kW	3.5-11.8	3.5-17.2	4.7-23.7
Rated output for DHW heating	kW	3.5-16.0	3.5-17.2	4.7-23.7
Rated heat input	kW	3.6-16.7	3.6-17.9	4.9-24.7
Product ID		CE-0085BU0052		
IP rating		IP X4D in accordance with DIN EN 60529		
Gas supply pressure				
Natural gas	mbar	20	20	20
LPG	mbar	50	50	50
Max. permissible gas supply pressure <sup>*7</sup>				
Natural gas	mbar	25.0	25.0	25.0
LPG	mbar	57.5	57.5	57.5
Power consumption in the delivered condition (incl. circulation pump)	W	57	61	68
Weight	kg	110	110	113
Heat exchanger capacity	litres	3.8	3.8	5.0
Max. flow rate (limit for the use of hydraulic separation)	l/h	1000	1200	1400
Nominal circulation water volume (at T <sub>V</sub> /T <sub>R</sub> = 80/60°C)	l/h	507	740	1019
Expansion vessel				
Capacity	litres	12	12	12
Pre-charge pressure	bar	0.75	0.75	0.75
Permiss. operating pressure	bar	3	3	3
Connections (with connection accessories)				
Boiler flow and return	R	¾	¾	¾
Hot and cold water	R	½	½	½
DHW circulation	R	½	½	½
Dimensions				
Length	mm	595	595	595
Width	mm	600	600	600
Height	mm	1425	1425	1425
Gas connection (with connection accessories)	R	½	½	½
DHW primary store				
Capacity	litres	100	100	100
Permiss. operating pressure (DHW side)	bar	10	10	10
Continuous DHW output	kW	16.0	17.2	23.7
for heating DHW from 10 to 45 °C	l/h	393	423	582
Performance factor N <sub>L</sub> <sup>*8</sup>		1.7	1.9	2.4
DHW outlet output	litres/10 min	177	186	207
for heating DHW from 10 to 45 °C				
Connection values in relation to the max. load with gas				
Natural gas E	m³/h	1.77	1.89	2.61
Natural gas LL	m³/h	2.05	2.20	3.04
LPG P	kg/h	1.31	1.40	1.93

<sup>\*7</sup> If the gas supply pressure is higher than the maximum permitted value, install a separate gas pressure governor upstream of the system.

<sup>\*8</sup> At 70 °C average boiler water temperature and cylinder storage temperature  $T_{cyl} = 60\text{ °C}$ .

The performance factor  $N_L$  changes with the cylinder storage temperature  $T_{cyl}$ .

Standard values:  $T_{cyl} = 60\text{ °C} \rightarrow 1.0 \times N_L$   $T_{cyl} = 55\text{ °C} \rightarrow 0.75 \times N_L$   $T_{cyl} = 50\text{ °C} \rightarrow 0.55 \times N_L$   $T_{cyl} = 45\text{ °C} \rightarrow 0.3 \times N_L$ .

## Vitodens 333-F, type FS3B (cont.)

<b>Gas boiler, types B and C, category II<sub>2N3P</sub></b>				
<b>Rated output range (details to DIN EN 677)</b>				
<b>T<sub>V</sub>/T<sub>R</sub> = 50/30 °C</b>	<b>kW</b>	<b>3.8-13.0</b>	<b>3.8-19.0</b>	<b>5.2-26.0</b>
<b>T<sub>V</sub>/T<sub>R</sub> = 80/60 °C</b>	<b>kW</b>	<b>3.5-11.8</b>	<b>3.5-17.2</b>	<b>4.7-23.7</b>
<b>Flue gas parameters<sup>*9</sup></b>				
Flue gas value group to G 635/G 636		G <sub>52</sub> /G <sub>51</sub>	G <sub>52</sub> /G <sub>51</sub>	G <sub>52</sub> /G <sub>51</sub>
Temperature (at 30 °C return temperature)				
– at rated output	°C	45	45	45
– at partial load	°C	35	35	35
Temperature (at 60 °C return temperature)				
	°C	68	68	70
Mass flow rate				
– for natural gas				
– at rated output	kg/h	29.7	31.8	43.9
– at partial load	kg/h	6.4	6.4	8.7
– for LPG				
– at rated output	kg/h	28.6	30.6	42.3
– at partial load	kg/h	6.2	6.2	8.4
Available draught				
	Pa	100	100	100
	mbar	1.0	1.0	1.0
<b>Standard efficiency at</b>		up to 98 (H <sub>s</sub> )/109 (H <sub>i</sub> )		
<b>T<sub>V</sub>/T<sub>R</sub> = 40/30 °C</b>	<b>%</b>			
<b>Average condensate volume</b>				
for natural gas and				
T <sub>V</sub> /T <sub>R</sub> = 50/30 °C	litres/day	9-11	10-12	11-13
<b>Condensate connection (hose nozzle)</b>	Ø mm	20-24	20-24	20-24
<b>Flue gas connection</b>	Ø mm	60	60	60
<b>Ventilation air connection</b>	Ø mm	100	100	100

3

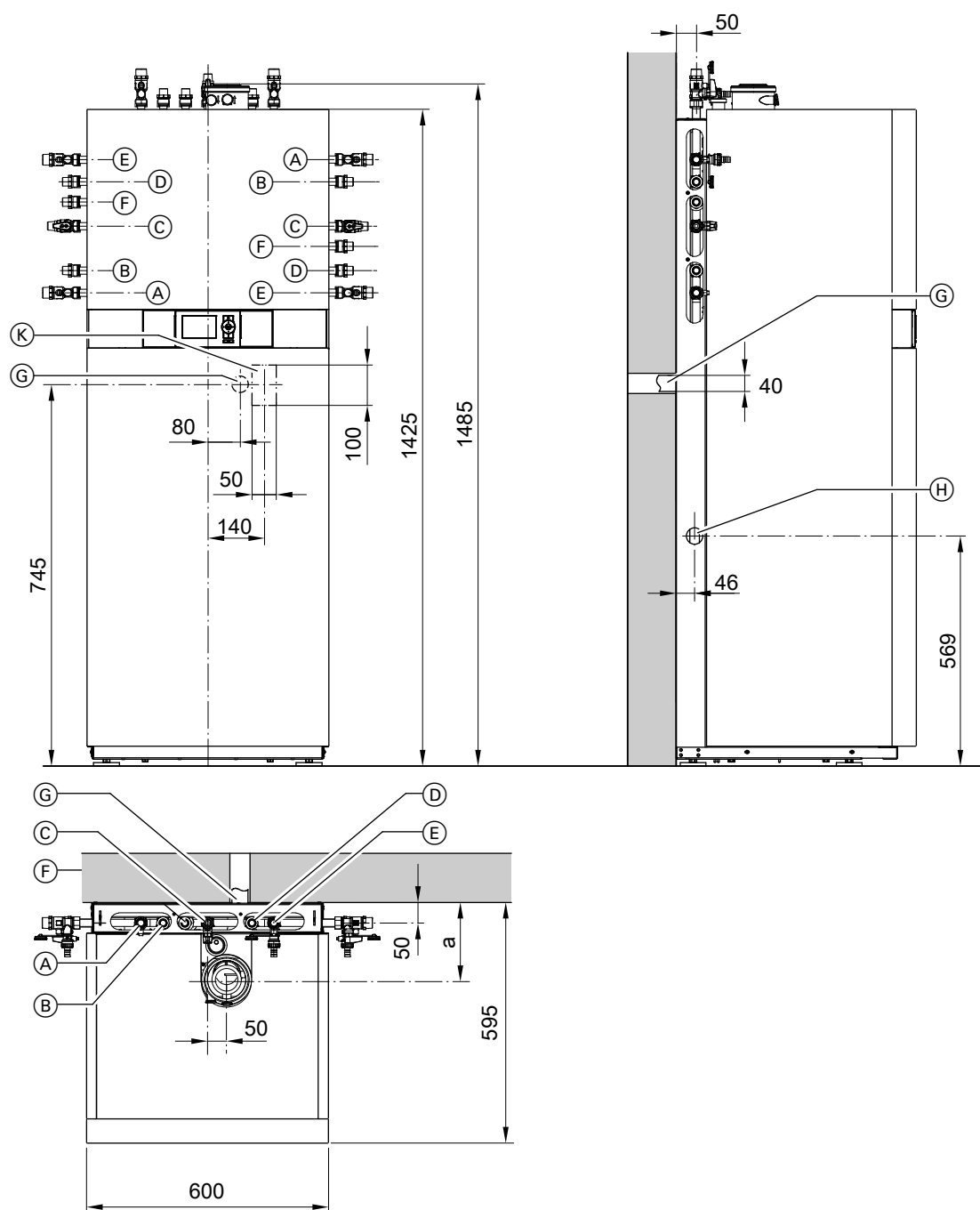
<sup>\*9</sup> Calculation values for sizing the flue system to DIN EN 13384.

Flue gas temperatures measured as gross values at 20 °C combustion air temperature.

The flue gas temperature at a return temperature of 30 °C is significant for the sizing of the flue system.

The flue gas temperature at a return temperature of 60 °C is used to determine the application range of flue pipes with maximum permissible operating temperatures.

# Vitodens 333-F, type FS3B (cont.)



- (A) Heating flow R  $\frac{3}{4}$
- (B) DHW R  $\frac{1}{2}$
- (C) Gas connection R  $\frac{1}{2}$
- (D) Cold water R  $\frac{1}{2}$
- (E) Heating return R  $\frac{3}{4}$
- (F) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (G) Condensate drain to the back into the wall
- (H) Side condensate drain
- (K) Cable entry area

Rated output range kW	a mm
3.8 to 13	201
3.8 to 19	201
5.2 to 26	235

## Note

The dimensioned drawing shows example fittings for upward connection and connection to the left/right, for installation on finished walls. Order the connection sets separately as accessories.

For the dimensions of the individual connection sets, see the technical guide.

If using the connection set (for downward connection) with a pre-mounting bracket for installation on finished walls, maintain a wall clearance of 70 mm.

## Note

The adjustable feet give all height measurements a tolerance of +15 mm.

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## Vitodens 333-F, type FS3B (cont.)

### Variable speed heating circuit pump in the Vitodens 333-F

The integral circulation pump is a highly efficient DC pump with substantially lower power consumption than conventional pumps. The pump speed and consequently the pump rate is regulated subject to the outside temperature and the switching times for heating or reduced mode. The control unit transmits the current default speed via an internal data BUS to the circulation pump. Individually match the minimum and maximum speed plus the speed for reduced mode to the existing heating system using the control unit codes.

In the delivered condition, the minimum pump rate (coding address "E7") is set to 30 %. The maximum pump rate (coding address "E6") is set to the following values:

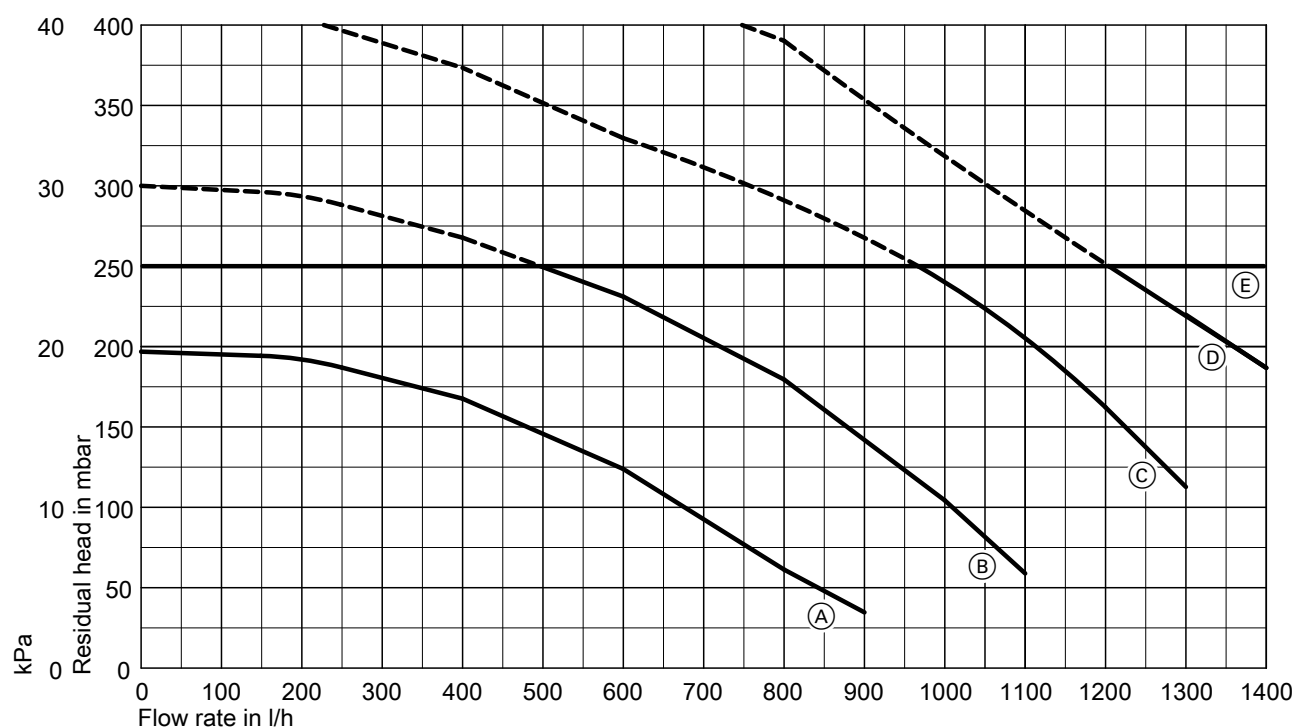
Rated output range in kW	Speed settings in the delivered condition in %
3.8-13	50
3.8-19	55
5.2-26	65

### Circulation pump VI UPM-15-70 KM

Rated voltage	V~	230
Power consumption	max.	W 70
	min.	W 6
Power consumption in the delivered condition		
– 13 kW	W	24
– 19 kW	W	27
– 26 kW	W	37

### Residual head of the integral circulation pump

#### Vitodens 333-F, 3.8-19 kW

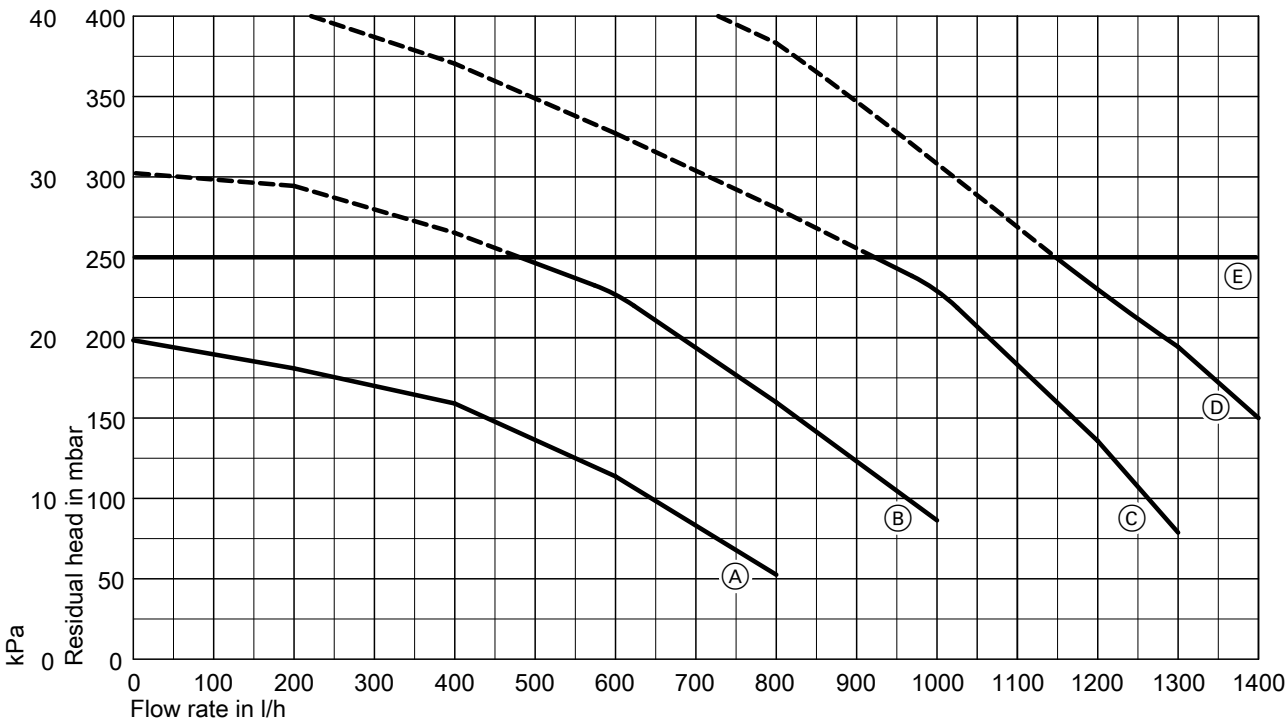


(E) Upper operational limit

Curve	Circulation pump rate	Setting code address "E6"
(A)	30 %	E6:030
(B)	50 %	E6:050
(C)	75 %	E6:075
(D)	100 %	E6:100

Vitodens 333-F, type FS3B (cont.)

Vitodens 333-F, 5.2-26 kW

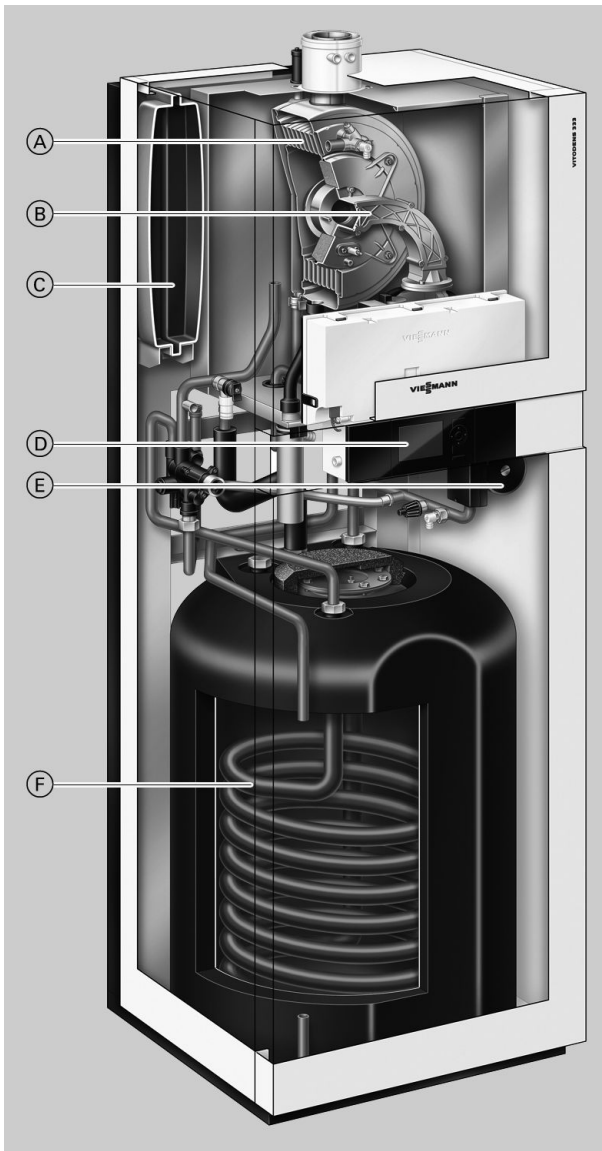


(K) Upper operational limit

Curve	Circulation pump rate	Setting code address "E6"
(A)	30 %	E6:030
(B)	50 %	E6:050
(C)	75 %	E6:075
(D)	100 %	E6:100

## Vitodens 333-F, type FR3B

### 4.1 Product description



- Ⓐ Stainless steel Inox-Radial heat exchanger for high operational reliability, a long service life and high output in the smallest space
- Ⓑ Modulating MatriX gas burner for extremely clean combustion
- Ⓒ Integral diaphragm expansion vessel
- Ⓓ Digital boiler control unit
- Ⓔ Integral, variable speed high efficiency DC pump
- Ⓕ DHW cylinder with internal indirect coil

4

The Vitodens 333-F storage combi boiler combines the benefits of the Vitodens 300-W with the high DHW convenience of a separate DHW cylinder.

With the MatriX gas burner and the stainless steel Inox-Radial heat exchanger, the Vitodens 333-F offers top technology for many years of energy efficiency and high heating and DHW convenience. The Lambda Pro Control and SMART modules, well-known from the Vitodens 300-W, plus the variable speed high efficiency DC pump, ensure permanently high efficiency, reliable operation and low power consumption.

The Vitodens 333-F, type FR3B, with its integral 130 litre cylinder with internal indirect coil, is particularly suitable for hard water areas.

The internal indirect coil with its smooth surface is not prone to attracting limescale deposits.

#### Recommended applications

- Installations in detached and terraced houses
- New build (e.g. pre-fabricated houses and housing association projects): installation in utility rooms and attics
- Modernisation: replacement of system boilers, floorstanding atmospheric gas boilers and oil/gas boilers with DHW cylinders below
- Use in areas with a water hardness of  $>20^\circ \text{dH}$  ( $3.58 \text{ mol/m}^3$ )

#### Benefits at a glance

- Gas condensing storage combi boiler with integral DHW cylinder with internal indirect coil, 3.8 to 26.0 kW
- Standard seasonal efficiency [to DIN]: up to 98 % ( $H_s$ )/109 % ( $H_i$ )
- Durable and efficient through the Inox-Radial heat exchanger
- MatriX gas burner with long service life thanks to stainless steel MatriX mesh – resistant to high temperature loads
- Enamelled DHW cylinder with internal indirect coil and 130 l capacity ( $N_L$  value up to 1.8)
- Energy saving high efficiency DC pump (in accordance with Energy Label A)
- New Vitotronic control unit that is easy to operate with plain text and graphic display
- The programming unit part of the control unit can also be fitted on a wall mounting base (accessory)
- Lambda Pro Control combustion controller for all gas types – saving fees by extending the inspection intervals to up to five years [in Germany]
- Universal connection sets for individual installation flush with the wall

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## Vitodens 333-F, type FR3B (cont.)

- DHW expansion vessel and DHW circulation pump can be integrated inside the appliance
- Assembly kit with the dimensions and design of the appliance (accessory) for the connection of one regulated and one unregulated heating circuit

### Delivered condition

Gas condensing boiler with Inox-Radial heat exchanger, modulating MatriX gas burner for natural gas and LPG to DVGW Code of Practice G260 [Germany], expansion vessel, variable speed high efficiency DC pump and integral DHW cylinder. Fully plumbed and wired.

Colour of the epoxy-coated casing: white.

Packed separately:

Vitotronic 100 for constant temperature mode

or

Vitotronic 200 for weather-compensated operation.

Set up for operation with natural gas. A conversion within the gas group E/LL is not required. The conversion to LPG is made at the gas valve (a conversion kit is not required).

### Accessories required (order separately)

Installation on finished walls

- Connection set (for upward connection) for installation on finished walls
- or
- Connection set (for upward connection) with premounting bracket for installation on finished walls
- or

- Connection set (for connection to the left or right) for installation on finished walls
- or
- Connection set (for connection to the left or right) with premounting bracket for installation on finished walls
- or
- Connection set (for downward connection) with premounting bracket for installation on finished walls
- or
- Assembly kit with mixer

Installation on unfinished walls

- Connection set for installation on unfinished walls
- or
- Assembly kit with mixer

### Approved quality



CE designation according to current EC Directives

Meets the requirements for the "Blue Angel" certificate of environmental excellence to RAL UZ 61.



## Vitodens 333-F, type FR3B (cont.)

### 4.2 Specification

<b>Gas boiler, types B and C, category II<sub>2N3P</sub></b>			
<b>Rated output range (details to DIN EN 677)</b>			
$T_V/T_R = 50/30\text{ °C}$	<b>kW</b>	<b>3.8-19.0</b>	<b>5.2-26.0</b>
$T_V/T_R = 80/60\text{ °C}$	<b>kW</b>	<b>3.5-17.2</b>	<b>4.7-23.7</b>
<b>Rated output for DHW heating</b>	<b>kW</b>	3.5-17.2	4.7-23.7
<b>Rated heat input</b>	<b>kW</b>	3.6-17.9	4.9-24.7
<b>Product ID</b>		CE-0085BU0052	
<b>IP rating</b>		IP X4D in accordance with DIN EN 60529	
<b>Gas supply pressure</b>			
Natural gas	mbar	20	20
LPG	mbar	50	50
<b>Max. permissible gas supply pressure<sup>*10</sup></b>			
Natural gas	mbar	25.0	25.0
LPG	mbar	57.5	57.5
<b>Power consumption</b> in the delivered condition (incl. circulation pump)		W	
		61	68
<b>Weight</b>	kg	142	145
<b>Heat exchanger capacity</b>	litres	3.8	5.0
<b>Max. flow rate</b> (limit for the use of hydraulic separation)	l/h	1200	1400
<b>Nominal circulation water volume</b> (at $T_V/T_R = 80/60\text{ °C}$ )	l/h	740	1019
<b>Expansion vessel</b>			
Capacity	litres	12	12
Pre-charge pressure	bar	0.75	0.75
<b>Permiss. operating pressure</b>	bar	3	3
<b>Connections</b> (with connection accessories)			
Boiler flow and return	R	¾	¾
Hot and cold water	R	½	½
DHW circulation	R	½	½
<b>Dimensions</b>			
Length	mm	595	595
Width	mm	600	600
Height	mm	1625	1625
<b>Gas connection</b> (with connection accessories)	R	½	½
<b>DHW cylinder</b>			
Capacity	litres	130	130
Permiss. operating pressure (DHW side)	bar	10	10
Continuous DHW output	kW	17.2	23.7
for heating DHW from 10 to 45 °C	l/h	423	582
Performance factor $N_L^{*11}$		1.3	1.8
DHW outlet output	litres/10 min	159	182
for heating DHW from 10 to 45 °C			
<b>Connection values</b> in relation to the max. load			
with gas			
Natural gas E	m³/h	1.89	2.61
Natural gas LL	m³/h	2.20	3.04
LPG P	kg/h	1.40	1.93

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<sup>\*10</sup> If the gas supply pressure is higher than the maximum permitted value, install a separate gas pressure governor upstream of the system.

<sup>\*11</sup> At 70 °C average boiler water temperature and cylinder storage temperature  $T_{cyl} = 60\text{ °C}$ .

The performance factor  $N_L$  changes with the cylinder storage temperature  $T_{cyl}$ .

Standard values:  $T_{cyl} = 60\text{ °C} \rightarrow 1.0 \times N_L$   $T_{cyl} = 55\text{ °C} \rightarrow 0.75 \times N_L$   $T_{cyl} = 50\text{ °C} \rightarrow 0.55 \times N_L$   $T_{cyl} = 45\text{ °C} \rightarrow 0.3 \times N_L$ .

## Vitodens 333-F, type FR3B (cont.)

<b>Gas boiler, types B and C, category II<sub>2N3P</sub></b>			
<b>Rated output range (details to DIN EN 677)</b>			
<b>T<sub>v</sub>/T<sub>R</sub> = 50/30 °C</b>	<b>kW</b>	<b>3.8-19.0</b>	<b>5.2-26.0</b>
<b>T<sub>v</sub>/T<sub>R</sub> = 80/60 °C</b>	<b>kW</b>	<b>3.5-17.2</b>	<b>4.7-23.7</b>
<b>Flue gas parameters<sup>*12</sup></b>			
Flue gas value group to G 635/G 636		G <sub>52</sub> /G <sub>51</sub>	G <sub>52</sub> /G <sub>51</sub>
Temperature (at 30 °C return temperature)			
– at rated output	°C	45	45
– at partial load	°C	35	35
Temperature (at 60 °C return temperature)			
– at rated output	°C	68	70
Mass flow rate			
– for natural gas			
– at rated output	kg/h	31.8	43.9
– at partial load	kg/h	6.4	8.7
– for LPG			
– at rated output	kg/h	30.6	42.3
– at partial load	kg/h	6.2	8.4
Available draught			
	Pa	100	100
	mbar	1.0	1.0
<b>Standard efficiency at</b>			
T <sub>v</sub> /T <sub>R</sub> = 40/30 °C	%	up to 98 (H <sub>s</sub> )/109 (H <sub>i</sub> )	
<b>Average condensate volume</b>			
for natural gas and			
T <sub>v</sub> /T <sub>R</sub> = 50/30 °C	litres/day	10-12	11-13
<b>Condensate connection</b> (hose nozzle)	Ø mm	20-24	20-24
<b>Flue gas connection</b>	Ø mm	60	60
<b>Ventilation air connection</b>	Ø mm	100	100

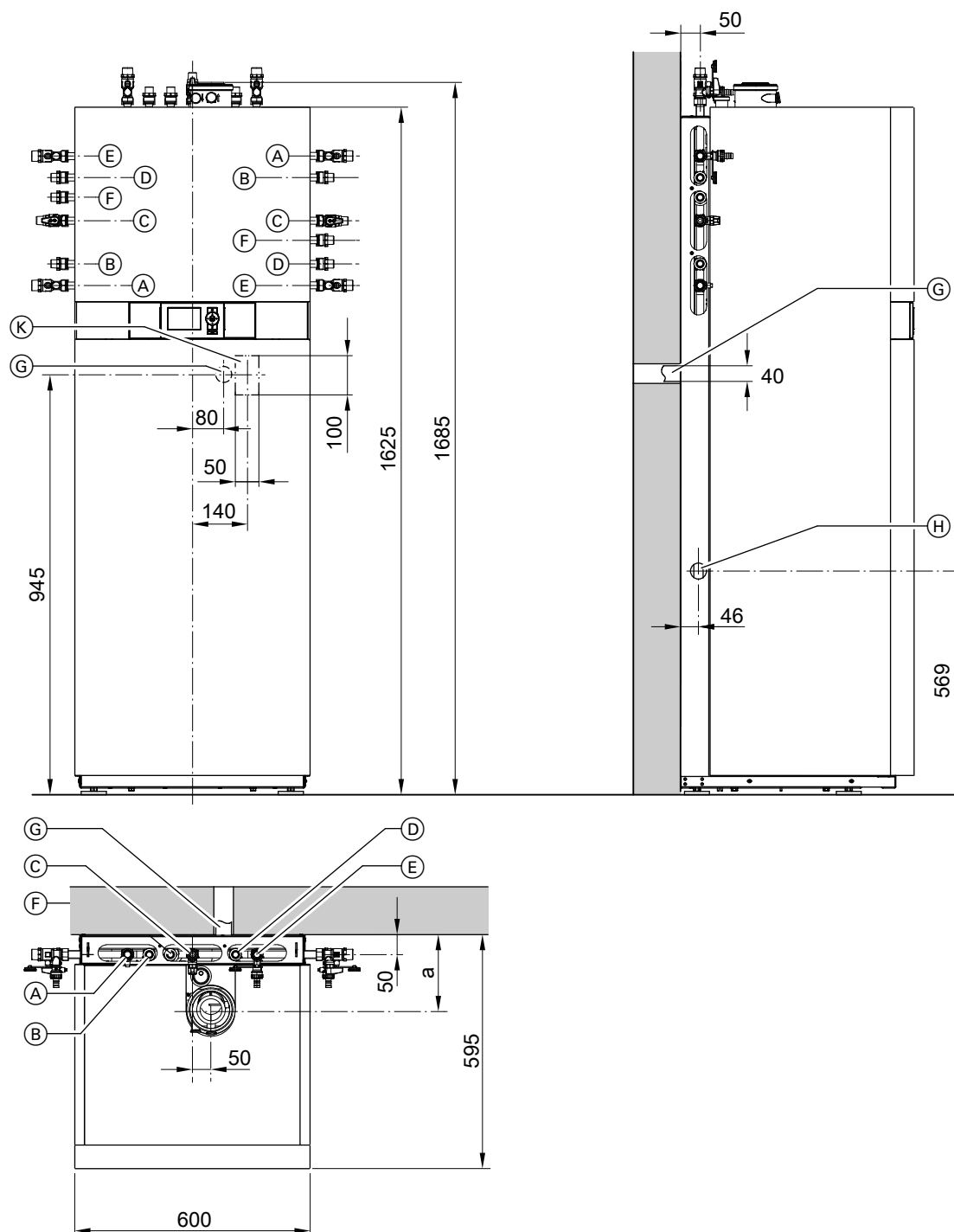
<sup>\*12</sup> Calculation values for sizing the flue system to DIN EN 13384.

Flue gas temperatures measured as gross values at 20 °C combustion air temperature.

The flue gas temperature at a return temperature of 30 °C is significant for the sizing of the flue system.

The flue gas temperature at a return temperature of 60 °C is used to determine the application range of flue pipes with maximum permissible operating temperatures.

# Vitodens 333-F, type FR3B (cont.)



- (A) Heating flow R  $\frac{3}{4}$
- (B) DHW R  $\frac{1}{2}$
- (C) Gas connection R  $\frac{1}{2}$
- (D) Cold water R  $\frac{1}{2}$
- (E) Heating return R  $\frac{3}{4}$
- (F) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (G) Condensate drain to the back into the wall
- (H) Side condensate drain
- (K) Cable entry area

## Note

The dimensioned drawing shows example fittings for upward connection and connection to the left/right, for installation on finished walls. Order the connection sets separately as accessories. For the dimensions of the individual connection sets, see the technical guide. If using the connection set (for downward connection) with a pre-mounting bracket for installation on finished walls, maintain a wall clearance of 70 mm.

## Note

The adjustable feet give all height measurements a tolerance of +15 mm.

5822 431 GB	Rated output range	a
	kW	mm
	3.8 to 19	201
	5.2 to 26	235

Vitodens 333-F, type FR3B (cont.)

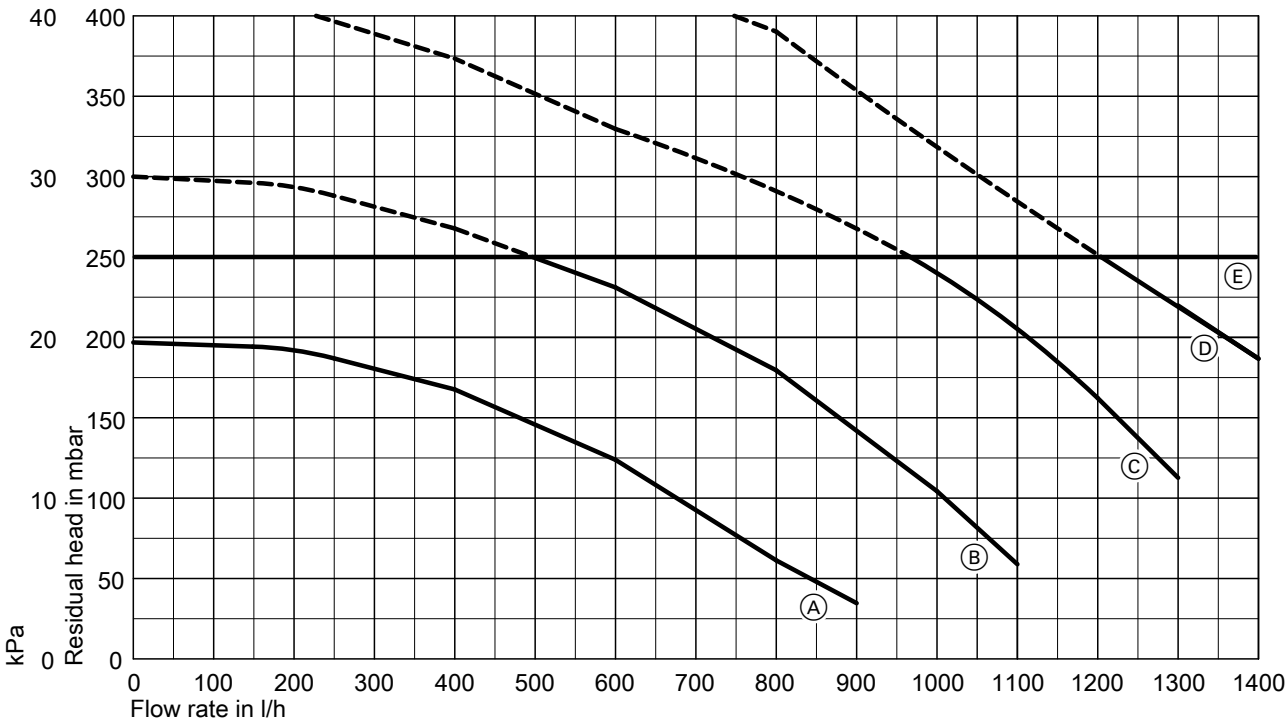
Variable speed heating circuit pump in the Vitodens 333-F

The integral circulation pump is a highly efficient DC pump with substantially lower power consumption than conventional pumps. The pump speed and consequently the pump rate is regulated subject to the outside temperature and the switching times for heating or reduced mode. The control unit transmits the current default speed via an internal data BUS to the circulation pump. Individually match the minimum and maximum speed plus the speed for reduced mode to the existing heating system using the control unit codes. In the delivered condition, the minimum pump rate (coding address "E7") is set to 30 %. The maximum pump rate (coding address "E6") is set to the following values:

Rated output range in kW	Speed settings in the delivered condition in %
3.8-19	55
5.2-26	65

Residual head of the integral circulation pump

Vitodens 333-F, 3.8-19 kW



(E) Upper operational limit

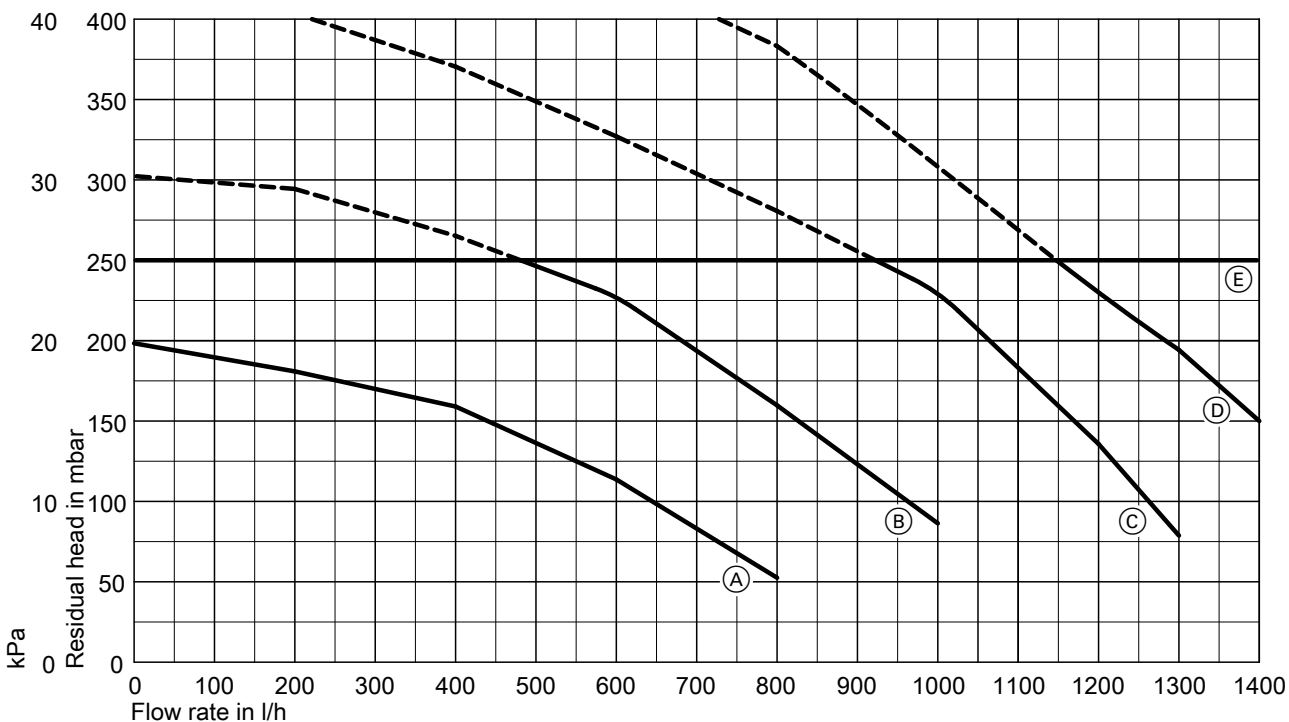
Curve	Circulation pump rate	Setting code address "E6"
(A)	30 %	E6:030
(B)	50 %	E6:050
(C)	75 %	E6:075
(D)	100 %	E6:100

Circulation pump VI UPM-15-70 KM

Rated voltage	V~	230
Power consumption	max.	W 70
	min.	W 6
Power consumption in the delivered condition		
– 19 kW	W	27
– 26 kW	W	37

**Vitodens 333-F, type FR3B (cont.)**

Vitodens 333-F, 5.2-26 kW



(K) Upper operational limit

Curve	Circulation pump rate	Setting code address "E6"
(A)	30 %	E6:030
(B)	50 %	E6:050
(C)	75 %	E6:075
(D)	100 %	E6:100

## Installation accessories

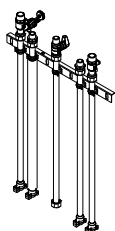
### 5.1 Installation accessories Vitodens 222-F and Vitodens 333-F

**Connection set (for upward connection) for installation on finished walls**

**Part no. 7348 566**

Comprising:

- Connecting pipes
- Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW (R ½)
- Gas shut-off valve (R ½) with thermally activated safety shut-off valve

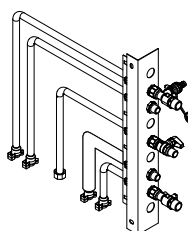


**Connection set (for connection to the left or right) with premounting bracket for installation on finished walls**

**Part no. 7354 403**

Comprising:

- Connection panel
- Connecting pipes
- Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW (R ½)
- Gas shut-off valve (R ½) with thermally activated safety shut-off valve

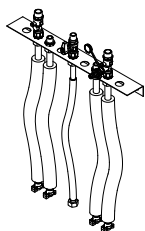


**Connection set (for upward connection) with premounting bracket for installation on finished walls**

**Part no. 7355 317**

Comprising:

- Connection panel
- Connecting pipes
- Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW (R ½)
- Gas shut-off valve (R ½) with thermally activated safety shut-off valve

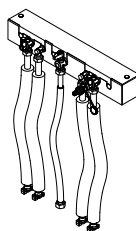


**Connection set (for downward connection) with premounting bracket for installation on finished walls**

**Part no. 7355 315**

Comprising:

- Connection panel
- Connecting pipes
- Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve and air vent valve
- 2 connectors for DHW (R ½)
- Gas angle valve (R ½) with thermally activated safety shut-off valve

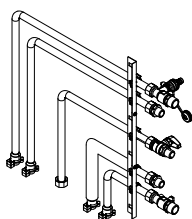


**Connection set (for connection to the left or right) for installation on finished walls**

**Part no. 7350 854**

Comprising:

- Connecting pipes
- Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW (R ½)
- Gas shut-off valve (R ½) with thermally activated safety shut-off valve



**Note**

*With this type of installation, a wall clearance of 70 mm is required behind the Vitodens.*

**Connection set for installation on unfinished walls**

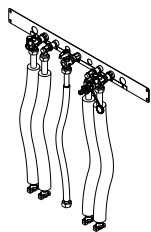
**Part no. 7351 625**

Comprising:

- Mounting bracket
- Connecting pipes
- Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW (R ½)
- Gas angle valve (R ½) with thermally activated safety shut-off valve

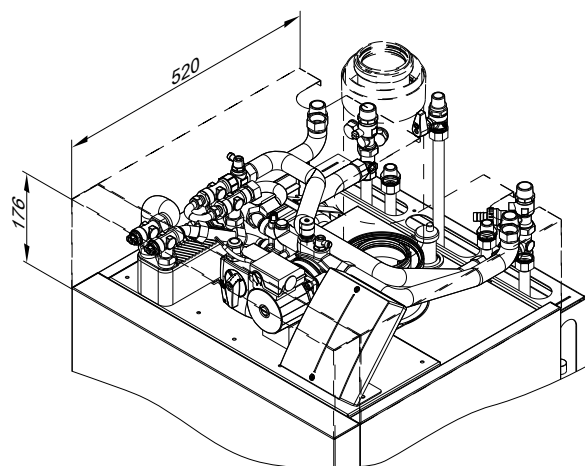


## Installation accessories (cont.)

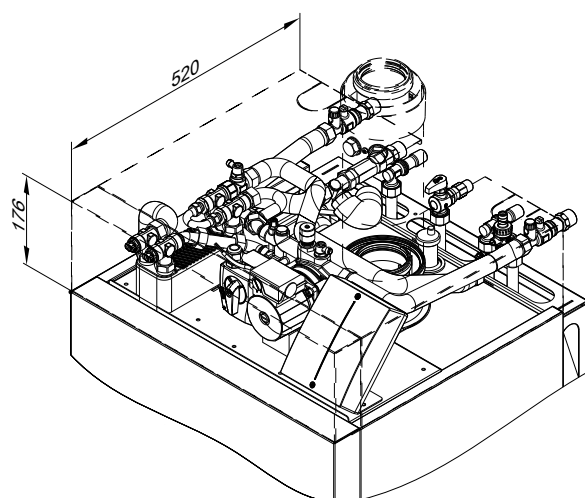


### Assembly kit with mixer

- For installation on finished walls
  - with three-stage circulation pump:  
**Part no. Z007 471**
  - With variable speed high efficiency DC pump:  
**Part no. Z008 378**



- For installation on unfinished walls
  - With variable speed high efficiency DC pump:  
**Part no. Z008 379**



### Assembly kit accessories

#### Line regulating valve

**Part no. 7194 894**

For hydraulically balancing the heating circuits.

#### Contact temperature limiter

**Part no. 7425 493**

Maximum temperature limiter for underfloor heating circuits.  
Contact temperature limiter with 1.5 m long connecting cable.

### Specification, assembly kit with mixer

Assembly for heat distribution via one heating circuit with mixer and one heating circuit without mixer with the same design as the appliance. For installation on the boiler.

Comprising:

- Plate heat exchanger for system separation of the heating circuit with mixer
- Circulation pump for the heating circuit with mixer
- Three-way mixer with mixer motor
- Mixer PCB, capable of communicating with the Vitotronic 200 via KM BUS
- Adjustable bypass
- Connection set for installation on finished or unfinished walls, with:
  - Connecting pipes
  - Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
  - 2 connectors for DHW (R ½)
  - Gas shut-off valve (R ½) with thermally activated safety shut-off valve
- Flow temperature sensor
- Cover with the same design as the appliance
- Balanced flue extension, boiler flue connection

The heating circuit without mixer is supplied by the integral circulation pump of the Vitodens. For an installation scheme for operation with the assembly kit, see "System examples".

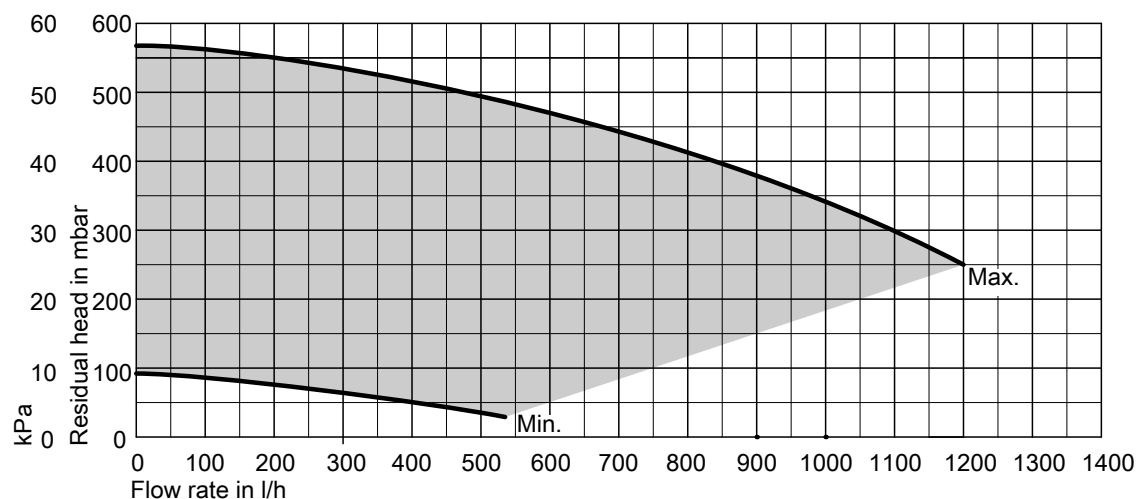
The assembly kit can only be used in conjunction with the Vitotronic 200.

Max. transferable output of the heating circuit with mixer ( $\Delta T$ 10 K)	kW	14
Max. flow rate of the heating circuit with mixer ( $\Delta T$ 10 K)	l/h	1200
Permiss. operating pressure	bar	3
Max. power consumption		
– with 3-stage circulation pump	W	89
– With variable speed high efficiency DC pump	W	48
Weight (incl. packaging)	kg	20

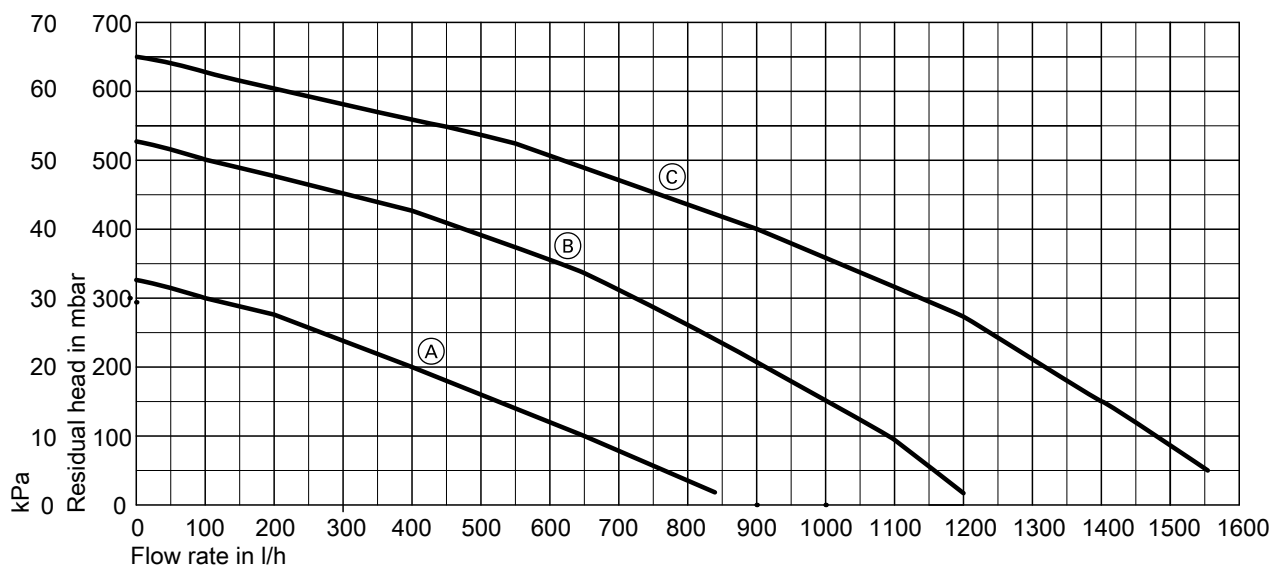
## Installation accessories (cont.)

### Residual head of the integral circulation pump for the heating circuit with mixer

With variable speed high efficiency DC pump



### With three-stage circulation pump



- (A) Stage 1
- (B) Stage 2
- (C) Stage 3

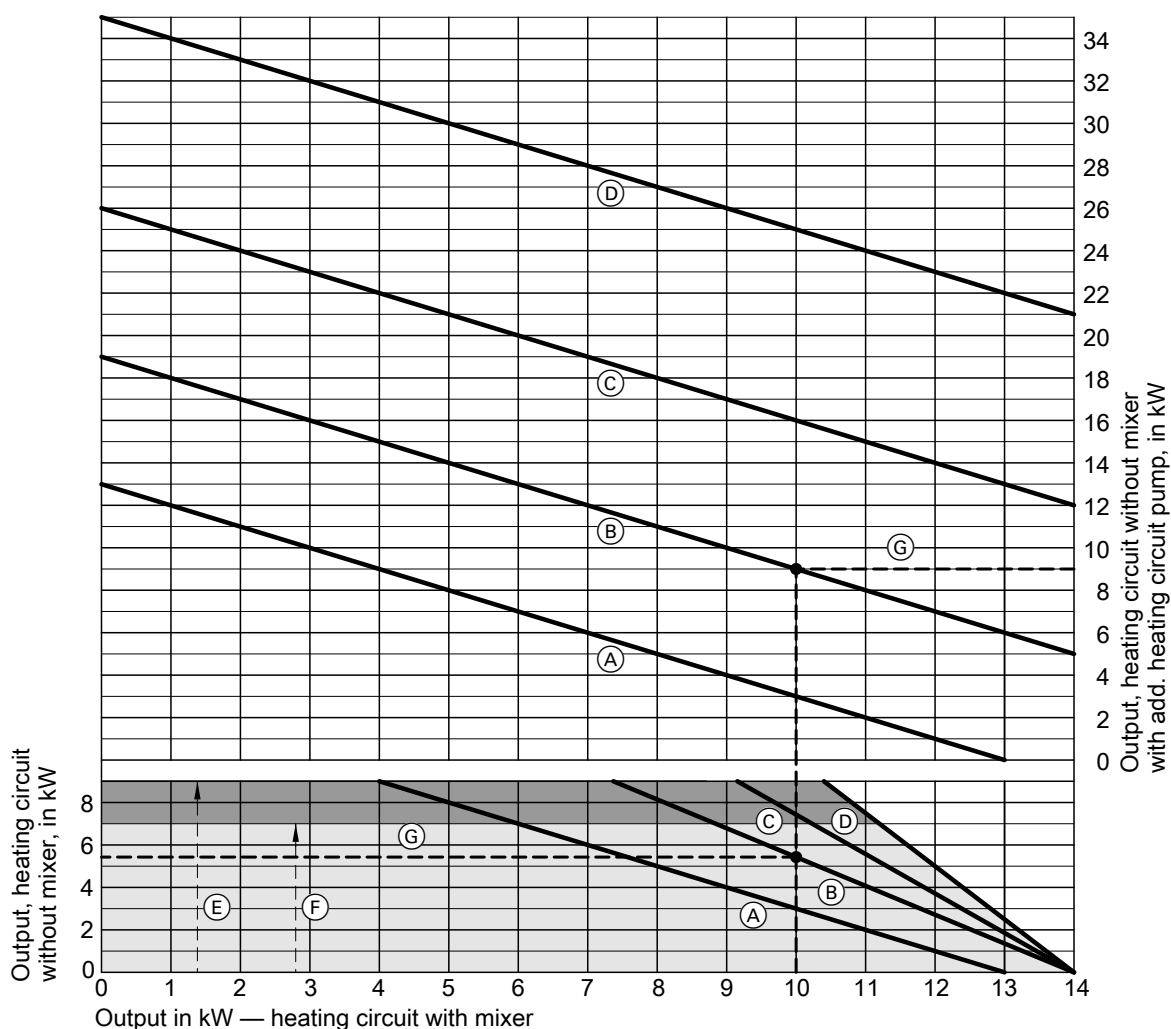
#### Assembly kit scope

The following diagram shows the relationship between the transferable outputs of the heating circuit with mixer and the heating circuit without mixer.

The diagram is based on the following system conditions:

- Pressure drop in the heating circuit without mixer: 100 mbar
- $\Delta T$  heating circuit without mixer: 20 K
- $\Delta T$  heating circuit with mixer: 10 K





- (A) Vitodens, 13 kW
- (B) Vitodens, 19 kW
- (C) Vitodens, 26 kW
- (D) Vitodens, 35 kW
- (E) Output range of the heating circuit without mixer **without** line regulating valve

- (F) Output range of the heating circuit without mixer **with** line regulating valve
- (G) Example

#### Calculating the transferable output (examples)

- Vitodens 333-F, 3.8 to 19 kW. Supplying the heating circuit without mixer through the internal circulation pump in the Vitodens.
  - 1.1. Apply the output of the heating circuit with mixer to the horizontal axis (example: 10 kW).
  - 1.2. Extend the line vertically down to **lower** curve (B).
  - 1.3. Transfer the intersection horizontally to the l.h. vertical axis, and read off the transferable output of the heating circuit without mixer.

The example results in approx. 5.4 kW.

- Vitodens 333-F, 3.8 to 19 kW. Supplying the heating circuit without mixer through an additional external circulation pump in the heating circuit.

#### Note

*This diagram applies only if the additional circulation pump has been correctly sized.*

- 1.1. Apply the output of the heating circuit with mixer to the horizontal axis (example: 10 kW).
  - 1.2. Extend the line vertically up to **upper** curve (B).
  - 1.3. Transfer the intersection horizontally to the r.h. vertical axis, and read off the transferred output of the heating circuit without mixer.
- The example results in approx. 9 kW.

#### Connection set, DHW circulation pump Part no. 7351 819

For installation in the Vitodens.

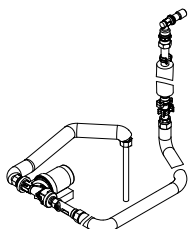
Comprising:

- High efficiency DC pump
- Flow regulating valve
- Pipe assembly including thermal insulation

## Installation accessories (cont.)

### Note

Vitodens with primary store or solar cylinder also requires an AM1 or EA1 extension for connection to the Vitotronic.



### Connection set DHW expansion vessel

**Part no. 7351 854**

For installation in the Vitodens.

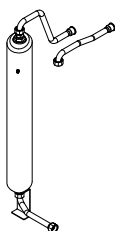
Max. operating pressure in the cold water supply line: 3 bar

DHW expansion vessel pre-charge pressure: 3 bar.

Capacity: 4 litres

Comprising:

- Direct flow diaphragm expansion vessel, suitable for drinking water
- Connecting cables



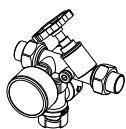
### Safety assembly to DIN 1988

DN 15

Comprising:

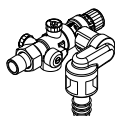
- Shut-off valve
- Non-return valve and test connector
- Pressure gauge (part no. 7219 722 and 7265 023)  
or  
Pressure gauge connector (part no. 7351 842 and 7351 840)
- Diaphragm safety valve

### For on-site installation on finished walls



- 10 bar  
**Part no. 7219 722**
- (A) 6 bar  
**Part no. 7265 023**

### For installation on unfinished walls in conjunction with the connection set



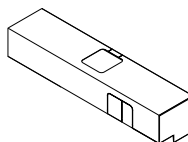
- 10 bar  
**Part no. 7351 842**
- (A) 6 bar  
**Part no. 7351 840**

### Valve/fitting cover

**Part no. 7352 257**

For connection set for installation on unfinished walls.

Not for use in conjunction with filling facility.

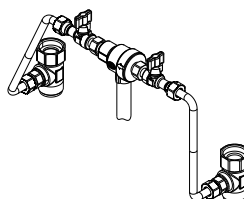


### Filling facility with pipe separator

For fitting to the connection sets.

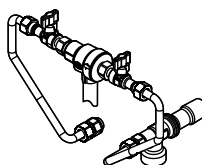
- For installation on finished walls (not for downward connection on finished walls)

**Part no. 7356 492**



- For downward connection on unfinished and finished walls

**Part no. 7356 902**



### Connection set for external heating water expansion vessel

**Part no. 7301 709**

Expansion vessel connection: R 1/2

Only possible with the Vitodens 333-F



### Connection bend for condensate drain

**Part no. 7301 709**

Connection of the line from the Vitodens: DN 20

Waste water connection: DN 40

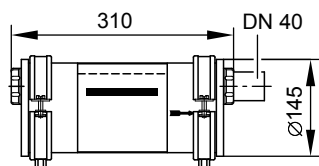


### Neutralising system

**Part no. 7252 666**

With neutralising granulate

## Installation accessories (cont.)



### Neutralising granulate

Part no. 9524 670

(2 × 1.3 kg)

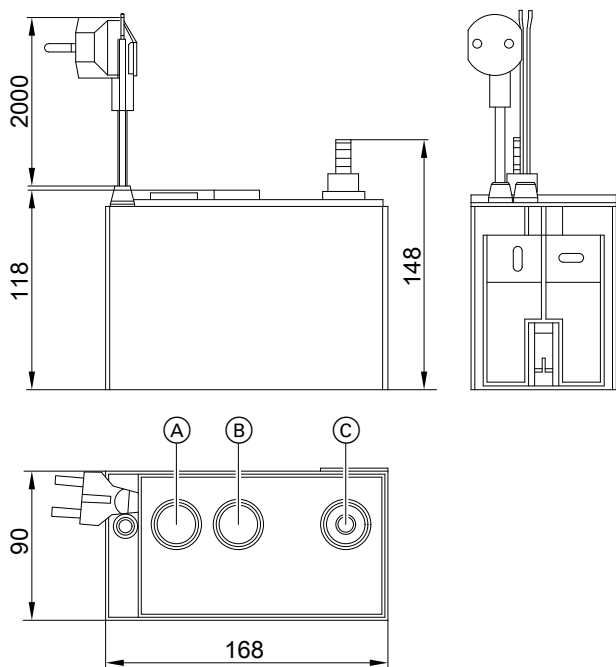
### Condensate lifting system

Part no. 7374 796

Automatic condensate lifting system for condensate with a pH value  $\geq 2.7$  from oil and gas condensing boilers.

Components:

- Condensate container 0.5 l
  - Shaftless permanent magnet ball motor pump
  - Control unit for pump operation, display of operating conditions and fault messages
  - 2 m long power cable with plug
  - Two  $\varnothing 24$  mm connection apertures for condensate inlet
- The standard delivery comprises:
- 6 m long drain hose  $\varnothing 14 \times 2$  mm
  - Non-return valve



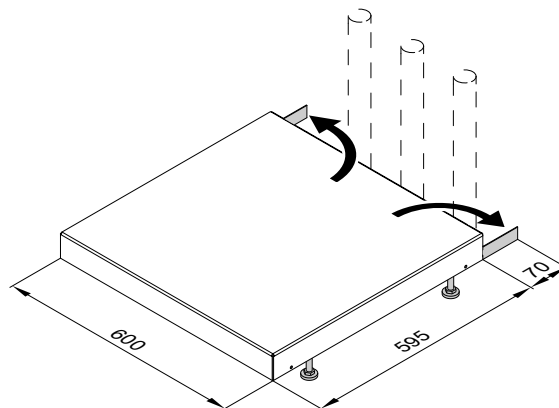
- (A) Condensate inlet
- (B) Condensate inlet with drain plug
- (C) Condensate drain

### Specification

Rated voltage	230 V~
Rated frequency	50 Hz
Power consumption	20 W
IP rating	IP 44
Protection class	F
Permissible medium temperature	+60 °C
Max. head	45 kPa
Max. capacity	450 l/h
Zero volt contact	N/C, breaking capacity 230 VA

### Boiler plinth

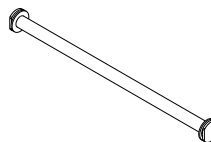
Part no. 7352 259



- For the installation of the Vitodens on unfinished floors
- Adjustable height, for screed floors from 10 to 18 cm

### Transport aid

Part no. 7425 341



To make transportation of the boiler easier.

### Small softening system for heating water

For filling heating circuits.

See Vitoset pricelist.

### Plate heat exchanger flushing system

Part no. 7373 005

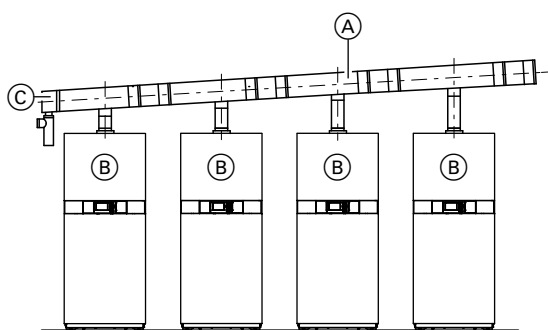
For cleaning the plate heat exchanger on Vitodens with primary store.

### Flue gas cascade (positive pressure) for multi-boiler systems with Vitodens 222-F

Comprising:

- Flue gas non-return device for each boiler
- Flue gas header
- Terminal with condensate drain and siphon

## Installation accessories (cont.)



- **Two-boiler system**
  - 19 and 26 kW: **Part no. Z008 384**
  - 35 kW: **Part no. Z008 385**
- **Three-boiler system**
  - 19 to 35 kW: **Part no. Z008 386**
- **Four-boiler system**
  - 19 to 35 kW: **Part no. Z008 387**

- (A) Flue gas header
- (B) Flue gas non-return device (for installation in the Vitodens 222-F)
- (C) Terminal with siphon

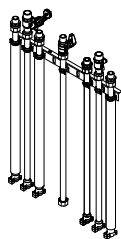
## 5.2 Installation accessories Vitodens 242-F

**Connection set (for upward connection) for installation on finished walls**

**Part no. 7348 552**

Comprising:

- Connecting pipes
- Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW (R ½)
- 2 connectors (R ¾) and 2 connectors (Ø22 mm smooth tube) for solar flow and return
- Gas shut-off valve (R ½) with thermally activated safety shut-off valve

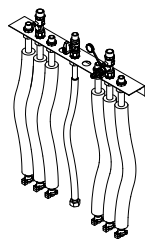


**Connection set (for upward connection) with premounting bracket for installation on finished walls**

**Part no. 7351 778**

Comprising:

- Connection panel
- Connecting pipes
- Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW (R ½)
- 2 connectors (R ¾) and 2 connectors (Ø22 mm smooth tube) for solar flow and return
- Gas shut-off valve (R ½) with thermally activated safety shut-off valve

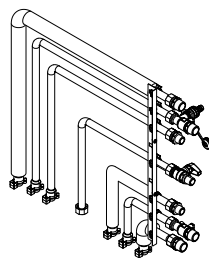


**Connection set (for connection to the left or right) for installation on finished walls**

**Part no. 7347 985**

Comprising:

- Connecting pipes
- Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW (R ½)
- 2 connectors (R ¾) and 2 connectors (Ø22 mm smooth tube) for solar flow and return
- Gas shut-off valve (R ½) with thermally activated safety shut-off valve

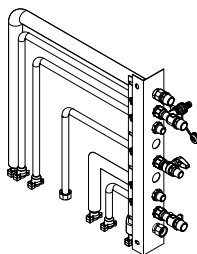


**Connection set (for connection to the left or right) with premounting bracket for installation on finished walls**

**Part no. 7354 386**

Comprising:

- Connection panel
- Connecting pipes
- Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW (R ½)
- 2 connectors (R ¾) and 2 connectors (Ø22 mm smooth tube) for solar flow and return
- Gas shut-off valve (R ½) with thermally activated safety shut-off valve

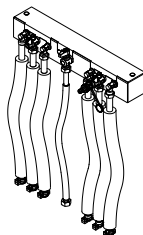


**Connection set (for downward connection) with premounting bracket for installation on finished walls**

**Part no. 7354 669**

Comprising:

- Connection panel
- Connecting pipes
- Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW (R ½)
- 2 connectors for solar flow and return (R ¾)
- Gas angle valve (R ½) with thermally activated safety shut-off valve



### Note

With this type of installation, a wall clearance of 70 mm is required behind the Vitodens.

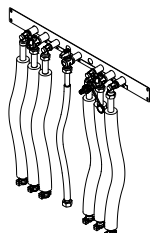
**Connection set for installation on unfinished walls**

**Part no. 7353 065**

Comprising:

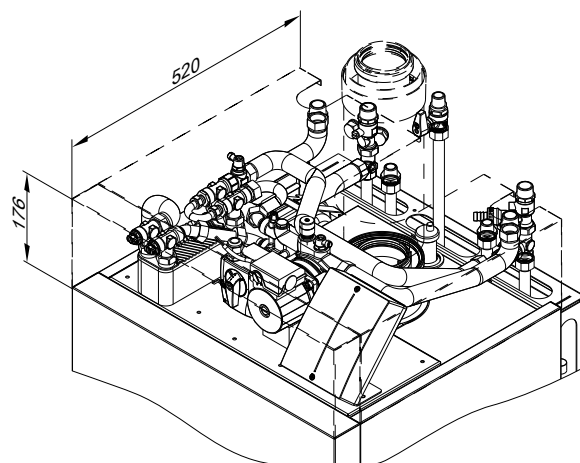
## Installation accessories (cont.)

- Mounting bracket
- Connecting pipes
- Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW (R ½)
- 2 connectors for solar flow and return (R ¾)
- Gas angle valve (R ½) with thermally activated safety shut-off valve

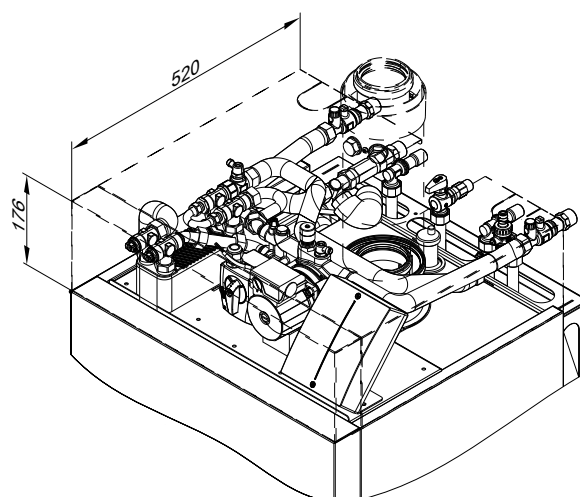


### Assembly kit with mixer

- For installation on finished walls
  - with three-stage circulation pump:  
**Part no. Z007 475**
  - With variable speed high efficiency DC pump:  
**Part no. Z008 380**



- For installation on unfinished walls
  - With variable speed high efficiency DC pump:  
**Part no. Z008 381**



### Assembly kit accessories

#### Line regulating valve

**Part no. 7194 894**

For hydraulically balancing the heating circuits.

#### Contact temperature limiter

**Part no. 7425 493**

Maximum temperature limiter for underfloor heating circuits.  
Contact temperature limiter with 1.5 m long connecting cable.

#### Specification, assembly kit with mixer

Assembly for heat distribution via one heating circuit with mixer and one heating circuit without mixer with the same design as the appliance. For installation on the boiler.

Installation accessories (cont.)

Comprising:

- Plate heat exchanger for system separation of the heating circuit with mixer
- Circulation pump for the heating circuit with mixer
- Three-way mixer with mixer motor
- Mixer PCB, capable of communicating with the Vitotronic 200 via KM BUS
- Adjustable bypass
- Connection set for installation on finished or unfinished walls, with:
  - Connecting pipes
  - Shut-off valves (R ¾) for heating water flow and return with boiler drain & fill valve
  - 2 connectors for DHW (R ½)
  - 2 connectors (R ¾) and 2 connectors (Ø22 mm smooth tube, only for installation on finished walls) for solar flow and return
  - Gas shut-off valve (R ½) with thermally activated safety shut-off valve

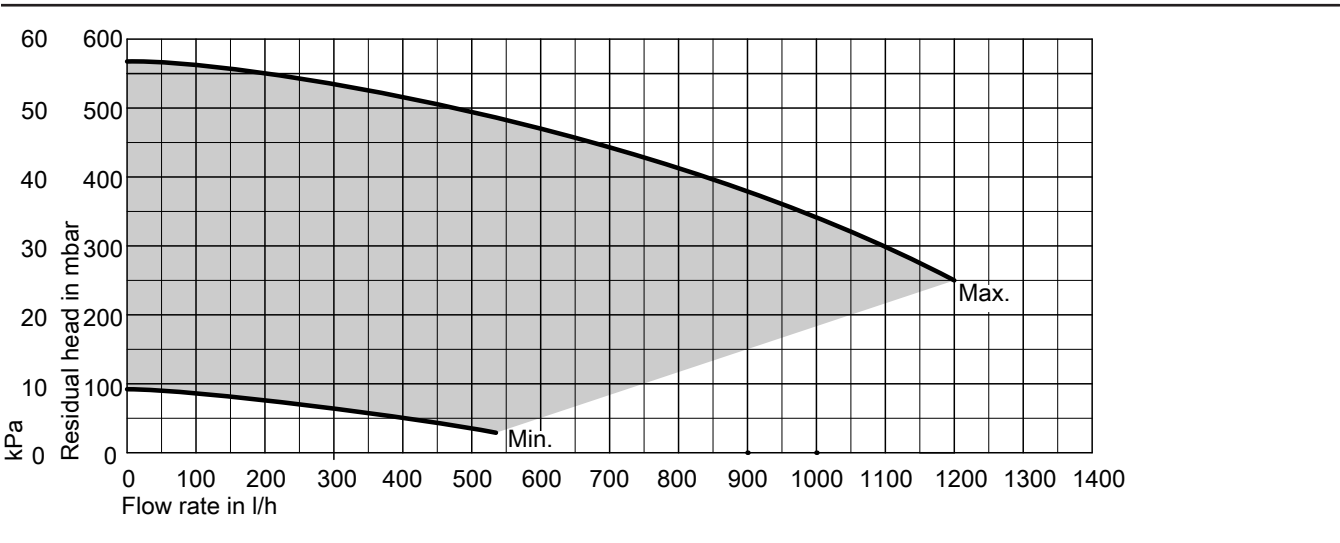
- Flow temperature sensor
- Cover with the same design as the appliance
- Balanced flue extension, boiler flue connection

The heating circuit without mixer is supplied by the integral circulation pump of the Vitodens. For an installation scheme for operation with the assembly kit, see "System examples".

Max. transferable output of the heating circuit with mixer ( $\Delta T$ 10 K)	kW	14
Max. flow rate of the heating circuit with mixer ( $\Delta T$ 10 K)	l/h	1200
Permiss. operating pressure	bar	3
Max. power consumption		
– with 3-stage circulation pump	W	89
– With variable speed high efficiency DC pump	W	48
Weight (incl. packaging)	kg	20

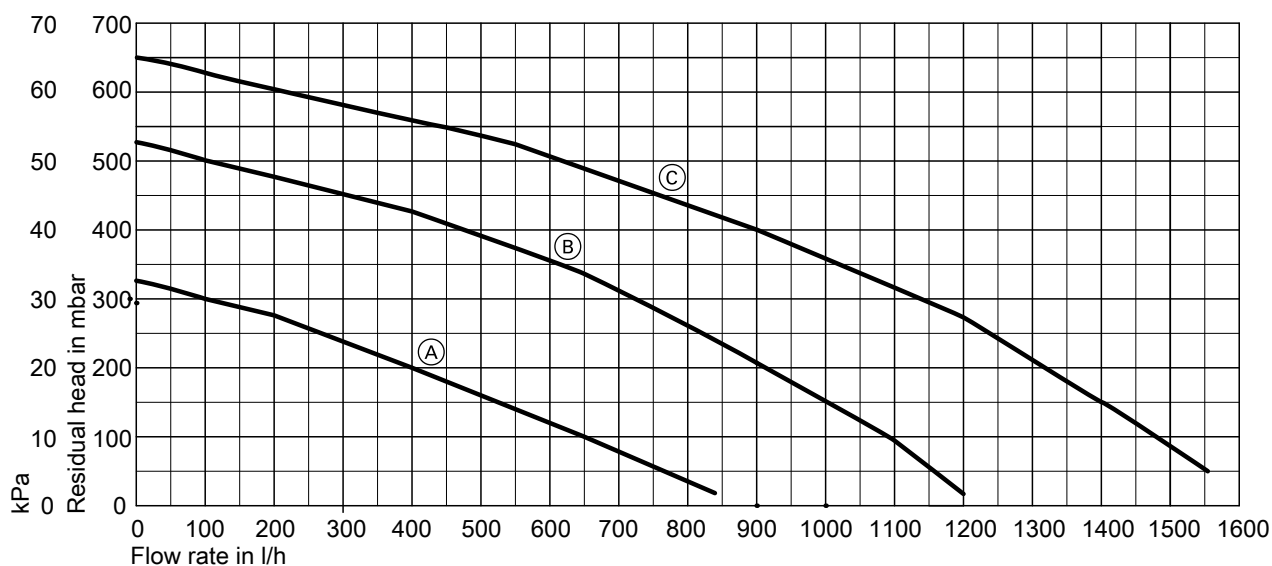
Residual head of the integral circulation pump for the heating circuit with mixer

With variable speed high efficiency DC pump



## Installation accessories (cont.)

### With three-stage circulation pump



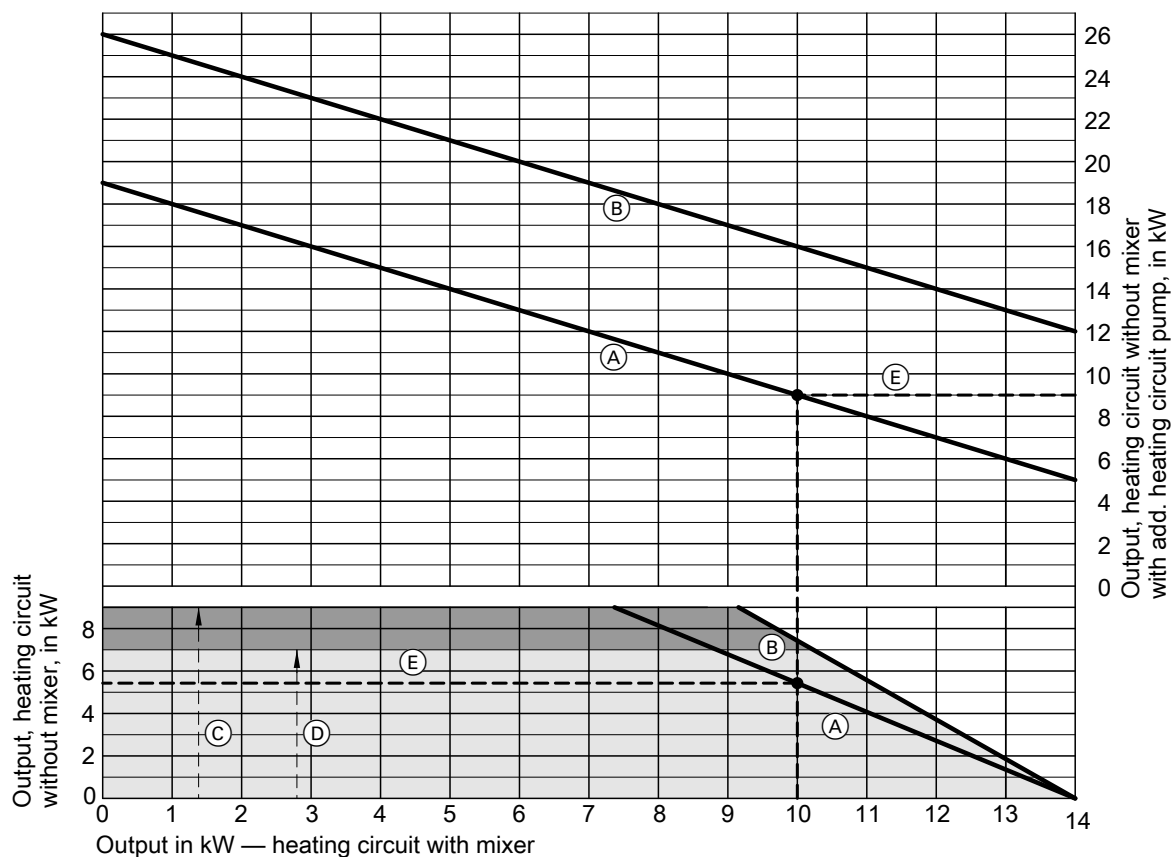
- (A) Stage 1
- (B) Stage 2
- (C) Stage 3

#### Assembly kit scope

The following diagram shows the relationship between the transferable outputs of the heating circuit with mixer and the heating circuit without mixer.

The diagram is based on the following system conditions:

- Pressure drop in the heating circuit without mixer: 100 mbar
- $\Delta T$  heating circuit without mixer: 20 K
- $\Delta T$  heating circuit with mixer: 10 K



- (A) Vitodens, 19 kW
- (B) Vitodens, 26 kW

- (C) Output range of the heating circuit without mixer **without** line regulating valve

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## Installation accessories (cont.)

- Ⓓ Output range of the heating circuit without mixer **with** line regulating valve
- Ⓔ Example

### Calculating the transferable output (examples)

- Vitodens, 19 kW. Supplying the heating circuit without mixer through the internal circulation pump in the Vitodens.
  - 1.1. Apply the output of the heating circuit with mixer to the horizontal axis (example: 10 kW).
  - 1.2. Extend the line vertically down to **lower** curve Ⓑ.
  - 1.3. Transfer the intersection horizontally to the l.h. vertical axis, and read off the transferable output of the heating circuit without mixer.

The example results in approx. 5.4 kW.
- Vitodens, 19 kW. Supplying the heating circuit without mixer through an additional external circulation pump in the heating circuit.

#### Note

*This diagram applies only if the additional circulation pump has been correctly sized.*

- 1.1. Apply the output of the heating circuit with mixer to the horizontal axis (example: 10 kW).
  - 1.2. Extend the line vertically up to **upper** curve Ⓑ.
  - 1.3. Transfer the intersection horizontally to the r.h. vertical axis, and read off the transferred output of the heating circuit without mixer.
- The example results in approx. 9 kW.

### Connection set, DHW circulation pump

**Part no. 7351 819**

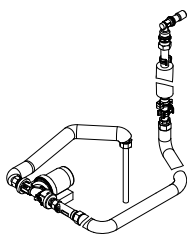
For installation in the Vitodens.

Comprising:

- High efficiency DC pump
- Flow regulating valve
- Pipe assembly including thermal insulation

#### Note

*An additional AM1 or EA1 extension is required for connection to the Vitotronic.*



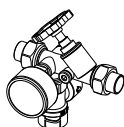
### Safety assembly to DIN 1988

DN 15

Comprising:

- Shut-off valve
- Non-return valve and test connector
- Pressure gauge (part no. 7219 722 and 7265 023) or Pressure gauge connector (part no. 7351 842 and 7351 840)
- Diaphragm safety valve

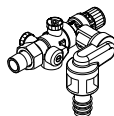
### For on-site installation on finished walls



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- 10 bar  
**Part no. 7219 722**
- Ⓐ 6 bar  
**Part no. 7265 023**

### For installation on unfinished walls in conjunction with the connection set

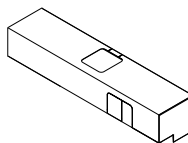


- 10 bar  
**Part no. 7351 842**
- Ⓐ 6 bar  
**Part no. 7351 840**

### Valve/fitting cover

**Part no. 7352 257**

For connection set for installation on unfinished walls.  
Not for use in conjunction with filling facility.

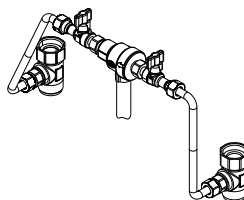


### Filling facility with pipe separator

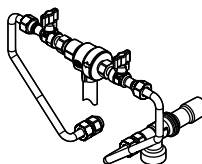
For fitting to the connection sets.

- For installation on finished walls (not for downward connection on finished walls)

**Part no. 7356 492**



- For downward connection on unfinished and finished walls  
**Part no. 7356 902**

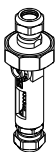


### Balancing valve solar

For integration in the Vitodens 242-F

**Part no. 7356 993**

## Installation accessories (cont.)



Connection: DN 18  
Setting range: 2 to 12 l/min

### Automatic thermostatic mixing valve

**Part no. 7265 058**

Connection: Ø 22 mm  
Setting range: 35 to 65°C

### Safety valve solar

For integration in the Vitodens 242-F

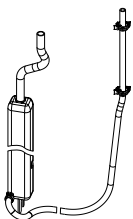
**Part no. 7460 323**

Response pressure: 6 bar  
Rp ½ - Rp ¾

### Collecting tank for solar transfer fluid

For integration in the Vitodens 242-F

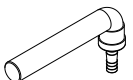
**Part no. 7465 998**



### Connection bend for condensate drain

**Part no. 7301 709**

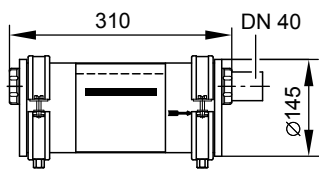
Connection of the line from the Vitodens: DN 20  
Waste water connection: DN 40



### Neutralising system

**Part no. 7252 666**

With neutralising granulate



### Neutralising granulate

**Part no. 9524 670**

(2 × 1.3 kg)

### Condensate lifting system

**Part no. 7374 796**

Automatic condensate lifting system for condensate with a pH value ≥ 2.7 from oil and gas condensing boilers.

Components:

- Condensate container 0.5 l
- Shaftless permanent magnet ball motor pump

- Control unit for pump operation, display of operating conditions and fault messages

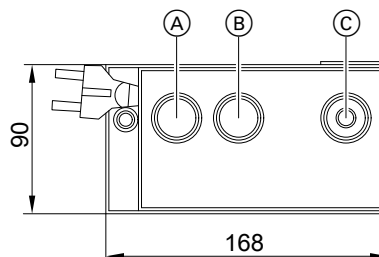
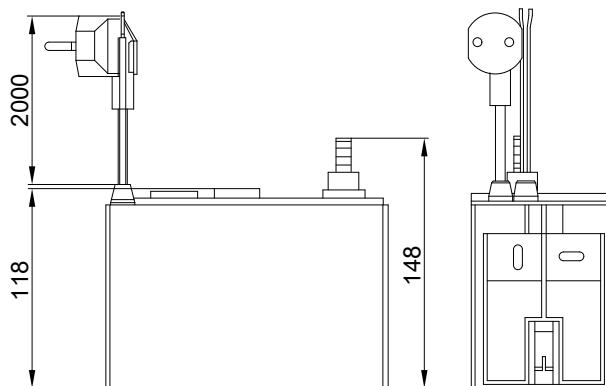
- 2 m long power cable with plug

- Two Ø 24 mm connection apertures for condensate inlet

The standard delivery comprises:

- 6 m long drain hose Ø 14 x 2 mm

- Non-return valve



(A) Condensate inlet

(B) Condensate inlet with drain plug

(C) Condensate drain

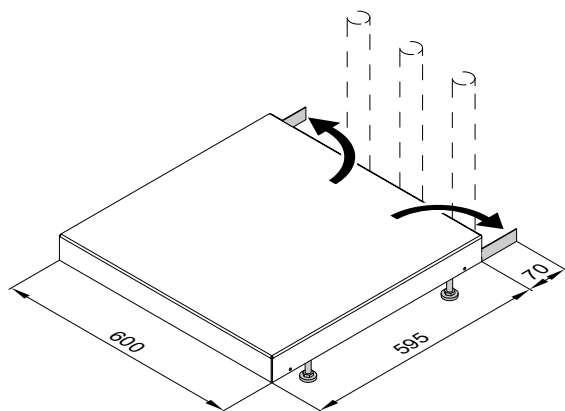
### Specification

Rated voltage	230 V~
Rated frequency	50 Hz
Power consumption	20 W
IP rating	IP 44
Protection class	F
Permissible medium temperature	+60 °C
Max. head	45 kPa
Max. capacity	450 l/h
Zero volt contact	N/C, breaking capacity 230 VA

### Boiler plinth

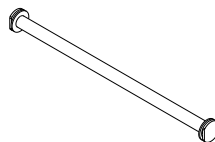
**Part no. 7352 259**

## Installation accessories (cont.)



- For the installation of the Vitodens on unfinished floors
- Adjustable height, for screed floors from 10 to 18 cm
- With spacer (for downward connection) for installation on finished walls

### Transport aid Part no. 7425 341



To make transportation of the boiler easier.

### Small softening system for heating water

For filling heating circuits.  
See Vitoset pricelist.

### Plate heat exchanger flushing system

**Part no. 7373 005**  
For cleaning the plate heat exchanger.

## Design information

### 6.1 Positioning, installation

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

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

In rooms where **air contamination through halogenated hydrocarbons** can occur, such as hairdressing salons, printing shops, chemical cleaners, laboratories, etc., install the Vitodens only as balanced flue system.

If in doubt, please contact us.

The Vitodens should not be installed in areas subject to very dusty conditions.

The installation location must be kept free from frost and must be adequately ventilated.

Provide a condensate drain and a blow-off line for the safety valve in the installation room.

The maximum ambient temperature of the system should not exceed 35 °C.

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

- (A) Bei der Montage in Österreich sind die einschlägigen Sicherheitsbestimmungen der ÖVGW-TR Gas (G1), ÖNORM, ÖVGW, ÖVE und der landesrechtlichen Bestimmungen einzuhalten.

#### Installation room

##### Permissible:

- Boiler installation on the same floor
- Living space with interconnected room ventilation
- Adjacent rooms with interconnected room ventilation (larders, basement, utility rooms, etc.)
- Adjacent rooms with apertures 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)
- Attic rooms, but only with adequate minimum chimney height to DIN 18160 – 4 m above inlet (negative pressure operation).

##### Not permissible:

- Stair wells and common hallways; exception: Detached and two-family homes of low height (top edge of floor in the top storey < 7 m above ground level)
- Bathrooms and toilets without outside windows with duct ventilation
- Rooms where explosive or flammable materials are stored
- Rooms ventilated mechanically or via individual duct systems to DIN 18117-1.

##### Observe all local fire regulations.

##### Connection on the flue gas side

(for further details, see the technical guide "Flue gas systems for the Vitodens")

The connecting piece to the chimney should be as short as possible. Therefore position the Vitodens as closely to the chimney as possible.

No special protective measures or clearances towards combustible objects, e.g. furniture, cartons or similar, need to be taken/observed. The surface temperatures of the Vitodens and the flue system never exceeds 85 °C anywhere.

##### Extractors

When installing devices with extraction to the outside (cooker hoods, extractors, etc.), ensure that air extraction will not create negative pressure inside the installation room. A return flow of flue gases could result, if the ventilation system and the Vitodens were to operate simultaneously. In such cases, install an **interlocking circuit** (see page 48).

#### Installation conditions for balanced flue operation (appliance type C)

The Vitodens can be installed as appliance type C<sub>13x</sub>, C<sub>33x</sub>, C<sub>43x</sub>, C<sub>53x</sub> or C<sub>63x</sub> to TRGI 2008, for **balanced** flue operation **independent** of the size and ventilation of the installation room.

## Design information (cont.)

It may, for example, be installed in recreation rooms, in other living space, in ancillary rooms without ventilation, in cupboards (open at the top) and recesses without maintaining minimum clearances to combustible parts as well as in attic rooms (pitched attics and ancillary rooms) where the balanced flue pipe can be directly routed through the roof. Since the flue pipe connecting piece for balanced flue operation is surrounded by combustion air (coaxial pipe), no clearances towards combustible parts need to be maintained (for further details, see the technical guide "Flue gas systems for the Vitodens"). The installation location must be safe from the risk of frost. Provide a condensate drain and a blow-off line for the safety valve in the installation room.

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

### Installation in a garage

Tests carried out by the Gaswärme-Institut e.V., Essen, have confirmed that the Vitodens is suitable for installation in garages. When installing this boiler in garages, maintain a clearance between the floor and the burner of at least 500 mm. Protect the boiler on site with a bracket or deflector against mechanical damage.

## Operation of the Vitodens in wet areas

The Vitodens is approved for installation in wet areas (e.g. bath or shower rooms) (protection IP X4 D, splash-proof). When installing the Vitodens in wet areas, observe the safety zones and minimum wall clearances according to VDE 0100 [or local regulations]. Electrical equipment in rooms containing a bathtub or a shower must be installed in such a way that users cannot be exposed to dangerous body currents.

The VDE 0100 specifies that cables to supply permanently installed consumers in zones 1 and 2 will only be run vertically and fed into the equipment from the back.

## Electrical connection

Ensure the power supply complies with the requirements of your local power supply utility and current VDE [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. Connect the supply cables and accessories at the terminals inside the boiler. For the cable entries, see dimensioned drawing in the specification section of the appropriate boiler.

### Recommended leads/cables

NYM 3 G 1.5 mm <sup>2</sup>	2-core min. 0.75 mm <sup>2</sup>	4-core 1.5 mm <sup>2</sup> or 3-core 1.5 mm <sup>2</sup> without green/ yellow core	NYM 3 X 1.5 mm <sup>2</sup>
– Power cables (also for accessories) – DHW circulation pump	– Extension AM1 or EA1 – Outside temperature sensor – Vitotronic 200-H (LON) – Extension kit for heating circuit with mixer (KM BUS) – Vitotrol 100, type UTDB (230 V) – Vitotrol 200A – Vitotrol 300A – Vitohome 300 – Radio clock receiver	– Vitotrol 100, type UTDB-RF (230 V)	– Vitotrol 100, type UTA

### 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. For this, the internal extension H2 (accessories) can be used. This switches the extractors OFF when the burner is started.

### Power supply of accessories

The power supply of accessories can be connected directly to the control unit. This connection is switched by the system ON/OFF switch. If the total system current exceeds 6 A, connect one or several extensions via a mains isolator directly to the mains supply. Where the boiler is installed in a wet area, the power supply connection of accessories must not be made at the control unit.

### Additional requirements when installing boilers with LPG operation in rooms below ground level

According to TRF 1996 Vol. 2 – valid as of 1 September 1997 – an external safety solenoid valve is no longer required when installing the Vitodens below ground level. However, the high safety standard derived from the use of an external safety solenoid valve has proved to be valuable. We therefore recommend the installation of an external safety solenoid valve when installing the boiler in rooms below ground level. This requires the internal extension H1 (part of the standard delivery).

## Gas connection

Gas installations must only be carried out by an approved gas fitter [CORGI] who has been authorised by the relevant gas supply utility. Connect and size the mains gas according to TRGI 2008 or TRF 1996 [or local regulations].

Ⓐ Connect the mains gas according to ÖVGW-TR Gas (G1) and the regionally applicable Building Regulations. Max. test pressure 150 mbar. We recommend the installation of a gas filter compliant with DIN 3386 into the gas supply line.

## Design information (cont.)

### Thermally activated safety shut-off valve

According to paragraph 4, sect. 5 of the FeuVo '96 [Germany], thermally activated shut-off equipment, that isolates the gas supply if external temperatures exceed 100 °C, must be installed in gas combustion equipment or in gas supply lines. These valves must isolate the gas supply for at least 30 minutes up to a temperature of 650 °C. This should prevent the formation of explosive gas mixtures in the event of a fire.

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

### Gas supply line

The following table is designed to assist in the approximate sizing of the on-site gas supply line.

90° bend results in a deduction from the max. possible pipe length of 1 m.

Checking your calculations against TRGI and TRF [or local regulations] is recommended.

Rated heat input	Gas type	Connected load		Internal diameter of the gas supply line		
kW		m³/h	kg/h	DN 15	DN 20	DN 25
				Max. possible pipe length in m		
16.7	Natural gas E	1.77		13	60	–
	Natural gas LL	2.05		8	40	127
	LPG		1.31	80	–	–
17.9	Natural gas E	1.89		8	40	127
	Natural gas LL	2.20		6	28	91
	LPG		1.40	62	–	–
24.7	Natural gas E	2.61		6	28	91
	Natural gas LL	3.04		4	21	68
	LPG		1.93	36	156	–
30.5	Natural gas E	3.23		4	21	68
	Natural gas LL	3.75		–	16	53
	LPG		2.38	23	100	–
33.3	Natural gas E	3.52		4	21	68
	Natural gas LL	4.10		–	16	53
	LPG		2.60	23	100	–
34.9	Natural gas E	3.86		4	21	68
	Natural gas LL	4.49		–	16	53
	LPG		2.85	23	100	–

### Sizing the gas flow limiter

Rated output - Vitodens kW	Gas flow limiter for natural gas
13 and 19	GS 4
26	GS 6
35	GS 10

### Minimum clearances

Area around the Vitodens for maintenance: min. 700 mm

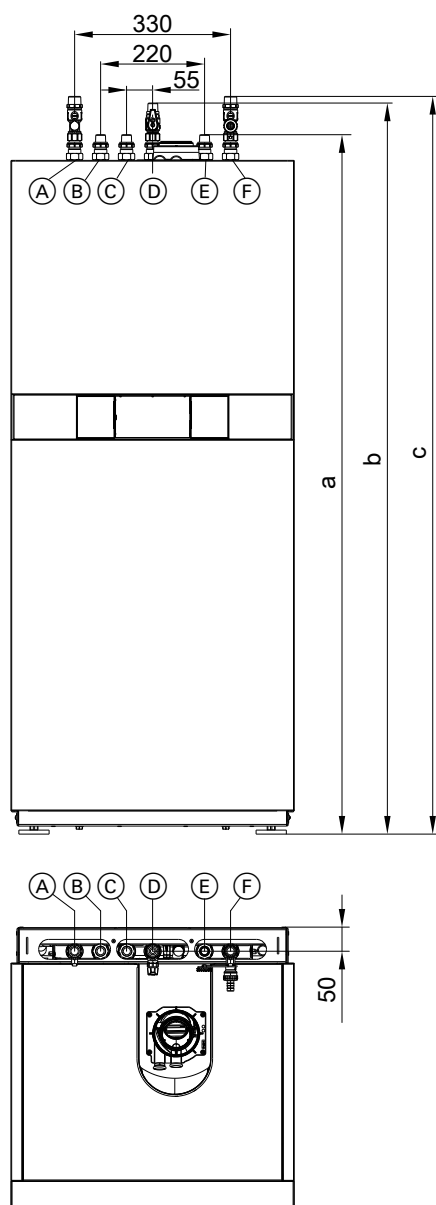
Maintenance clearances to the l.h. or r.h. side of the Vitodens are **not** required.

## Design information (cont.)

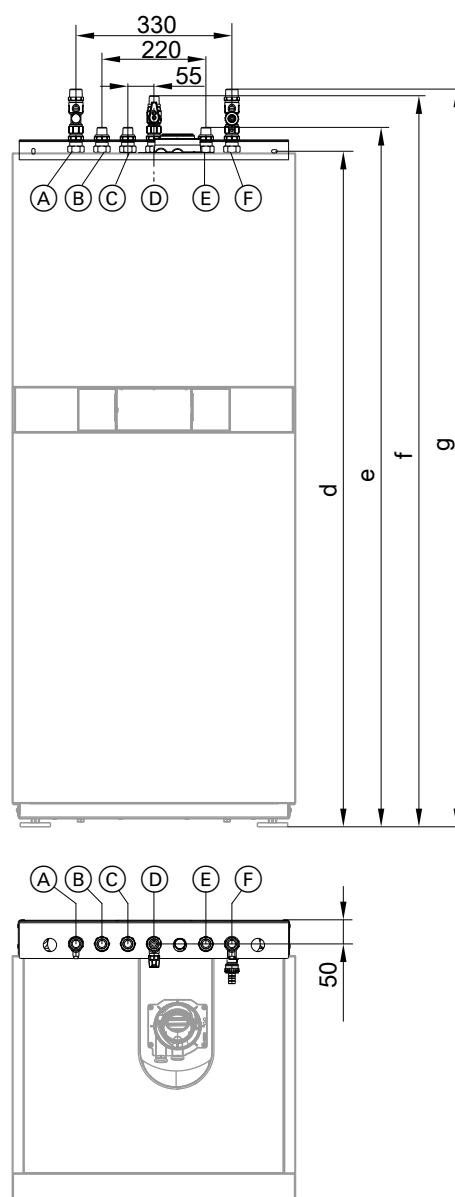
### Installation Vitodens 222-F and 333-F

Connection sets (for upward connection) for installation on finished walls

Connection set without premounting bracket, part no. 7348 566



Connection set with premounting bracket for pre-assembly in unfinished buildings, part no. 7355 317



- (A) Heating flow R  $\frac{1}{4}$
- (B) DHW R  $\frac{1}{2}$
- (C) DHW circulation R  $\frac{1}{2}$  (separate accessory)

- (D) Gas connection R  $\frac{1}{2}$
- (E) Cold water R  $\frac{1}{2}$
- (F) Heating return R  $\frac{1}{4}$

Type	a mm	b mm	c mm	d mm	e mm	f mm	g mm
Vitodens 222-F, FS2B							
- 19 and 26 kW	1477	1514	1526	1440	1480	1561	1573
- 35 kW	1677	1714	1726	1640	1680	1761	1773
Vitodens 333-F, FS3B	1477	1514	1526	1440	1480	1561	1573
Vitodens 333-F, FR3B	1677	1714	1726	1640	1680	1761	1773

#### Note

The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

For connecting on-site lines on the gas, heating water and DHW sides from above.

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## Design information (cont.)

Connection set comprising:

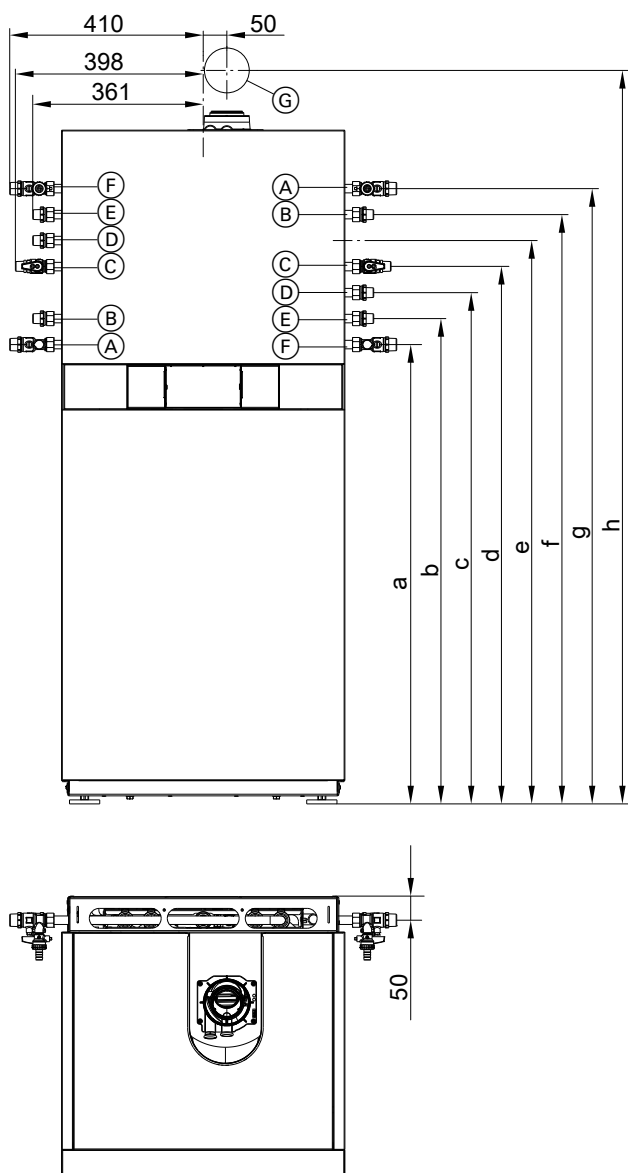
- Connection bracket (only for part no. 7355 317)
- Connecting pipes
- Shut-off valves for heating water flow and return with boiler drain & fill valve

■ 2 connectors for DHW

■ Gas shut-off valve with thermally activated safety shut-off valve

**Connection sets (for connection to the left or right) for installation on finished walls**

**Connection set without premounting bracket, part no. 7350 854**



(A) Heating flow R  $\frac{3}{4}$

(B) DHW R  $\frac{1}{2}$

(C) DHW circulation R  $\frac{1}{2}$  (separate accessory)

(D) Gas connection R  $\frac{1}{2}$

(E) Cold water R  $\frac{1}{2}$

(F) Heating return R  $\frac{3}{4}$

(G) Balanced flue connection (towards the back)

Type	a mm	b mm	c mm	d mm	e mm	f mm	g mm	h mm
Vitodens 222-F, FS2B								
- 19 and 26 kW	972	1027	1082	1137	1192	1247	1302	1552
- 35 kW	1172	1227	1282	1337	1392	1447	1502	1752
Vitodens 333-F, FS3B	972	1027	1082	1137	1192	1247	1302	1582
Vitodens 333-F, FR3B	1172	1227	1282	1337	1392	1447	1502	1782

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## Design information (cont.)

### Note

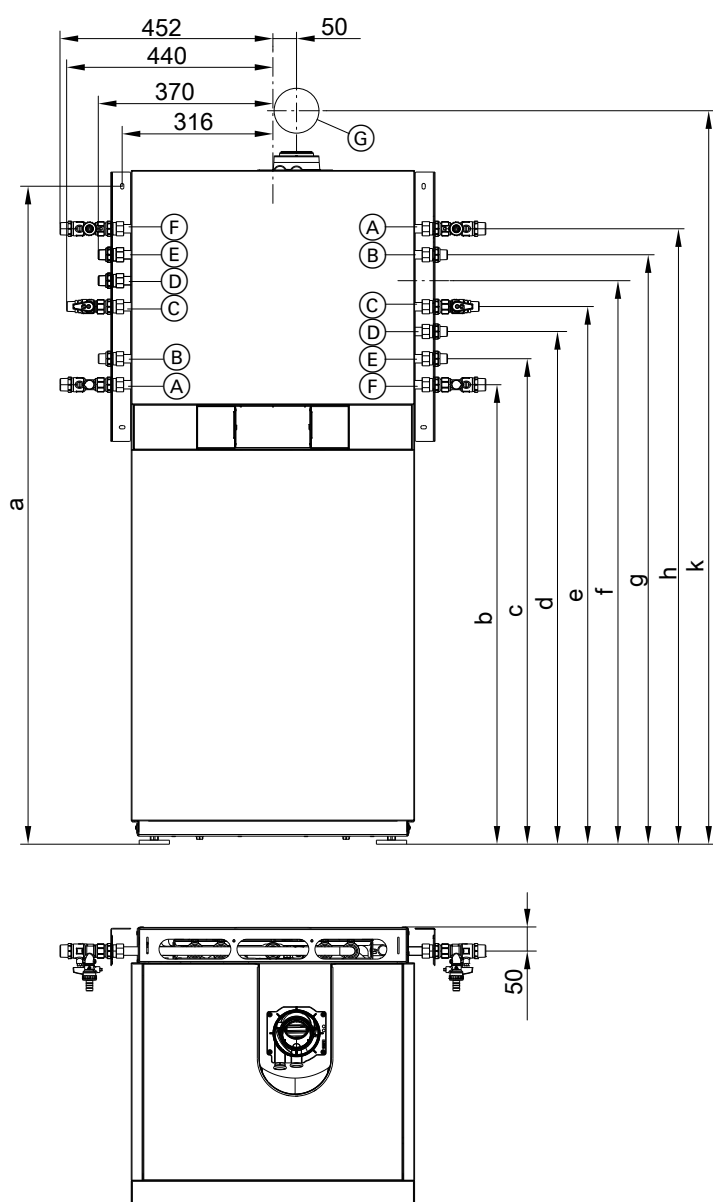
The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

For connecting on-site lines on the gas, heating water and DHW sides from the left or right.

Connection set comprising:

- Connecting pipes
- Shut-off valves for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW
- Gas shut-off valve with thermally activated safety shut-off valve

Connection set with premounting bracket for pre-assembly in unfinished buildings, part no. 7354 403



- (A) Heating flow R  $\frac{3}{4}$
- (B) DHW R  $\frac{1}{2}$
- (C) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (D) Gas connection R  $\frac{1}{2}$

- (E) Cold water R  $\frac{1}{2}$
- (F) Heating return R  $\frac{3}{4}$
- (G) Balanced flue connection (towards the back)

Type	a mm	b mm	c mm	d mm	e mm	f mm	g mm	h mm	k mm
Vitodens 222-F, FS2B									
- 19 and 26 kW	1402	972	1027	1082	1137	1192	1247	1302	1552
- 35 kW	1602	1172	1227	1282	1337	1392	1447	1502	1752
Vitodens 333-F, FS3B	1402	972	1027	1082	1137	1192	1247	1302	1582
Vitodens 333-F, FR3B	1602	1172	1227	1282	1337	1392	1447	1502	1782

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## Design information (cont.)

### Note

The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

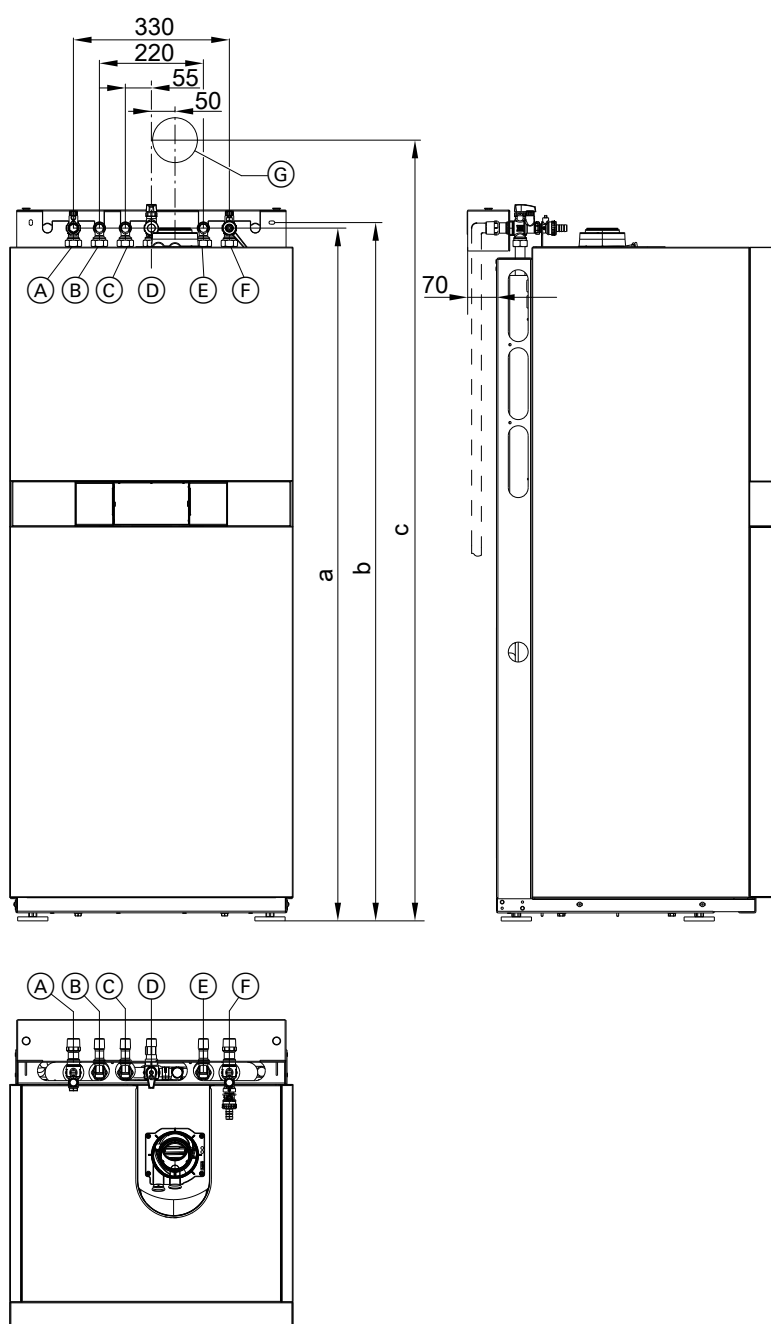
For connecting on-site lines on the gas, heating water and DHW sides from the left or right.

Connection set comprising:

- Connection panel
- Connecting pipes

- Shut-off valves for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW
- Gas shut-off valve with thermally activated safety shut-off valve

Connection set with pre-mounting bracket for pre-assembly on finished walls in unfinished buildings, part no. 7355 315



- (A) Heating flow R  $\frac{3}{4}$
- (B) DHW R  $\frac{1}{2}$
- (C) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (D) Gas connection R  $\frac{1}{2}$
- (E) Cold water R  $\frac{1}{2}$

- (F) Heating return R  $\frac{3}{4}$
- (G) Balanced flue connection towards the back

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## Design information (cont.)

Type	a mm	b mm	c mm
Vitodens 222-F, FS2B - 19 and 26 kW	1463	1475	1652
- 35 kW	1663	1675	1852
Vitodens 333-F, FS3B	1463	1475	1682
Vitodens 333-F, FR3B	1663	1675	1882

A wall clearance of 70 mm is required behind the Vitodens.

### Note

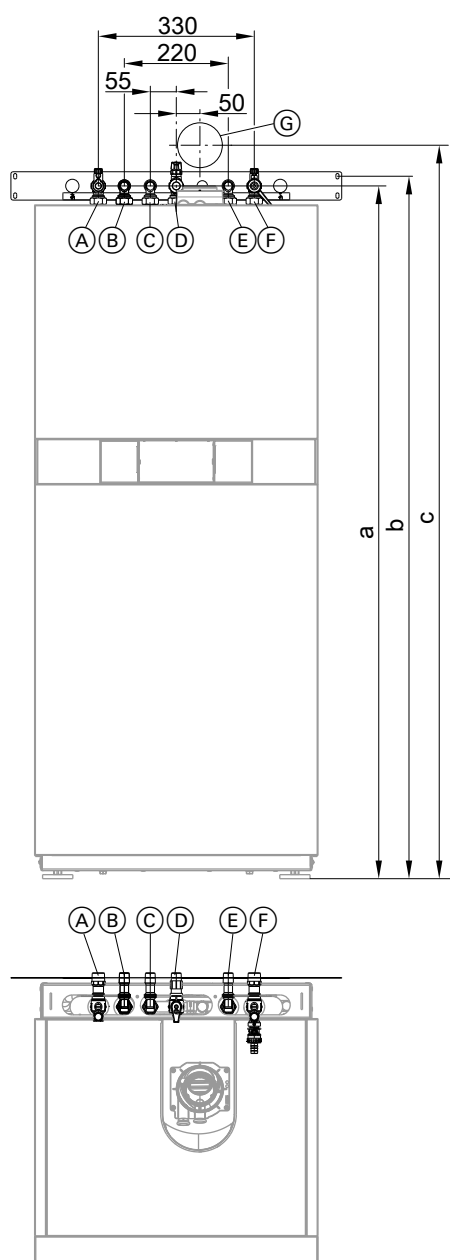
The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

For connecting on-site lines on the gas, heating water and DHW sides from below.

Connection set comprising:

- Connection panel
- Connecting pipes
- Shut-off valves for heating water flow and return with boiler drain & fill valve and air vent valve
- 2 connectors for DHW
- Gas angle valve with thermally activated safety shut-off valve

Connection set with mounting bracket for pre-assembly on unfinished walls in unfinished buildings, part no. 7351 625



- (A) Heating flow R  $\frac{1}{4}$
- (B) DHW R  $\frac{1}{2}$
- (C) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (D) Gas connection R  $\frac{1}{2}$
- (E) Cold water R  $\frac{1}{2}$

- (F) Heating return R  $\frac{1}{4}$
- (G) Balanced flue connection towards the back

Design information (cont.)

Type	a mm	b mm	c mm
Vitodens 222-F, FS2B - 19 and 26 kW	1475	1496	1752
- 35 kW	1675	1696	1952
Vitodens 333-F, FS3B	1475	1496	1782
Vitodens 333-F, FR3B	1675	1696	1982

**Note**

The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

For connecting on-site lines on the gas, heating water and DHW sides from within the wall.

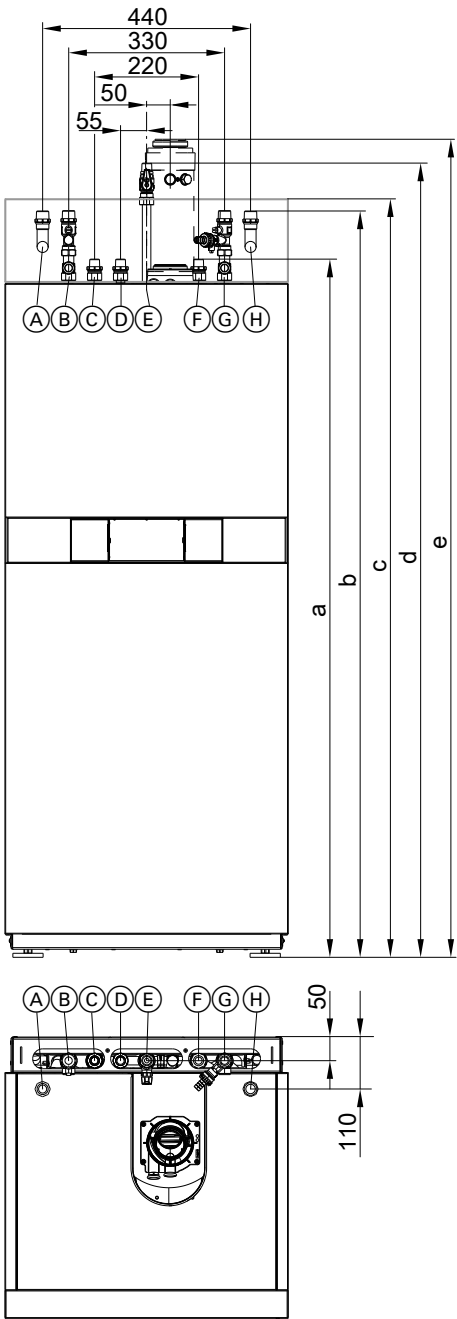
**Note**

In place of the connection bend for cold water, a safety assembly (separate accessory) can be fitted.

Connection set comprising:

- Mounting bracket
- Connecting pipes
- Shut-off valves for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW
- Gas angle valve with thermally activated safety shut-off valve

Assembly kit with mixer for finished walls, part no. Z007 473 and Z008 378



5822 431 GB

- (A) Heating flow, heating circuit with mixer R  $\frac{3}{4}$   
(B) Heating flow, heating circuit without mixer R  $\frac{3}{4}$

- (C) DHW R  $\frac{1}{2}$   
(D) DHW circulation R  $\frac{1}{2}$  (separate accessory)

## Design information (cont.)

- (E) Gas connection R ½  
 (F) Cold water R ½

- (G) Heating return, heating circuit without mixer R ¾  
 (H) Heating return, heating circuit with mixer R ¾

Type	a mm	b mm	c mm	d mm	e mm
Vitodens 222-F, FS2B					
- 19 and 26 kW	1477	1580	1602	1672	1725
- 35 kW	1677	1780	1802	1872	1925
Vitodens 333-F, FS3B	1477	1580	1602	1672	1725
Vitodens 333-F, FR3B	1677	1780	1802	1872	1925

### Note

The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

For connecting on-site lines on the gas, heating water and DHW sides from above.

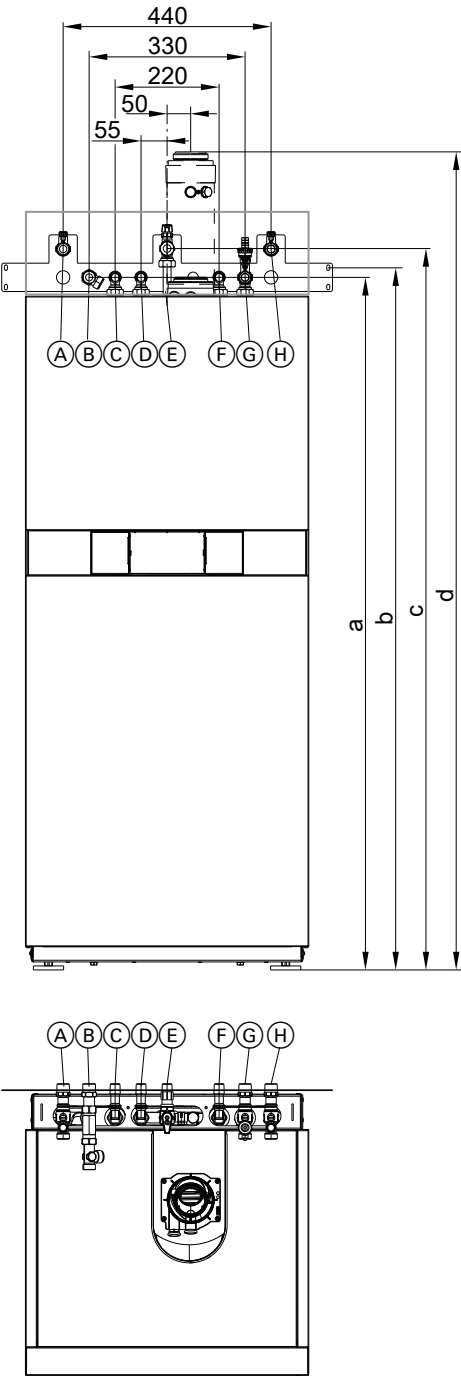
Assembly kit comprising:

- Plate heat exchanger for system separation of the heating circuit with mixer
- Circulation pump for the heating circuit with mixer
- Three-way mixer with mixer motor
- Mixer PCB, capable of communicating with the Vitotronic 200 via KM BUS

- Adjustable bypass
- Connection set for installation on finished or unfinished walls, with:
  - Connecting pipes
  - Shut-off valves for heating water flow and return with boiler drain & fill valve
  - 2 connectors for DHW
  - Gas shut-off valve (R ½) with thermally activated safety shut-off valve
- Flow temperature sensor
- Cover with the same design as the appliance
- Balanced flue extension, boiler flue connection

Design information (cont.)

Assembly kit with mixer – unfinished walls with mounting plate for pre-installation in unfinished buildings, part no. Z008 379



- (A) Heating flow, heating circuit with mixer R  $\frac{3}{4}$
- (B) Heating flow, heating circuit without mixer R  $\frac{3}{4}$
- (C) DHW R  $\frac{1}{2}$
- (D) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (E) Gas connection R  $\frac{1}{2}$
- (F) Cold water R  $\frac{1}{2}$
- (G) Heating return, heating circuit without mixer R  $\frac{3}{4}$
- (H) Heating return, heating circuit with mixer R  $\frac{3}{4}$

Type	a mm	b mm	c mm	d mm
Vitodens 222-F, FS2B				
- 19 and 26 kW	1475	1496	1535	1725
- 35 kW	1675	1696	1735	1925
Vitodens 333-F, FS3B	1475	1496	1535	1725
Vitodens 333-F, FR3B	1675	1696	1735	1925

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## Design information (cont.)

### Note

The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

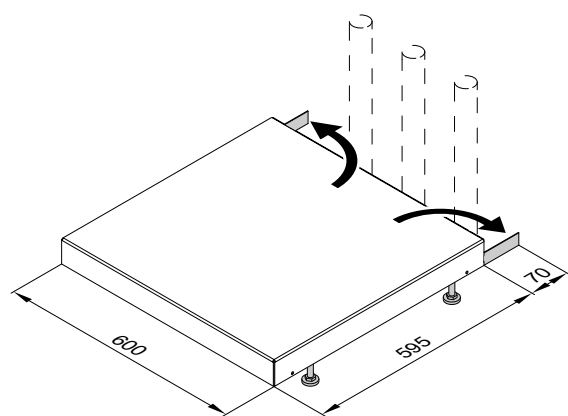
For connecting on-site lines on the gas, heating water and DHW sides from within the wall.

Assembly kit comprising:

- Plate heat exchanger for system separation of the heating circuit with mixer
- Circulation pump for the heating circuit with mixer
- Three-way mixer with mixer motor
- Mixer PCB, capable of communicating with the Vitotronic 200 via KM BUS

### Boiler plinth

Part no. 7352 259



- Adjustable bypass
- Connection set for installation on finished or unfinished walls, with:
  - Connecting pipes
  - Shut-off valves for heating water flow and return with boiler drain & fill valve
  - 2 connectors for DHW
  - Gas shut-off valve (R 1/2) with thermally activated safety shut-off valve
- Flow temperature sensor
- Cover with the same design as the appliance
- Balanced flue extension, boiler flue connection

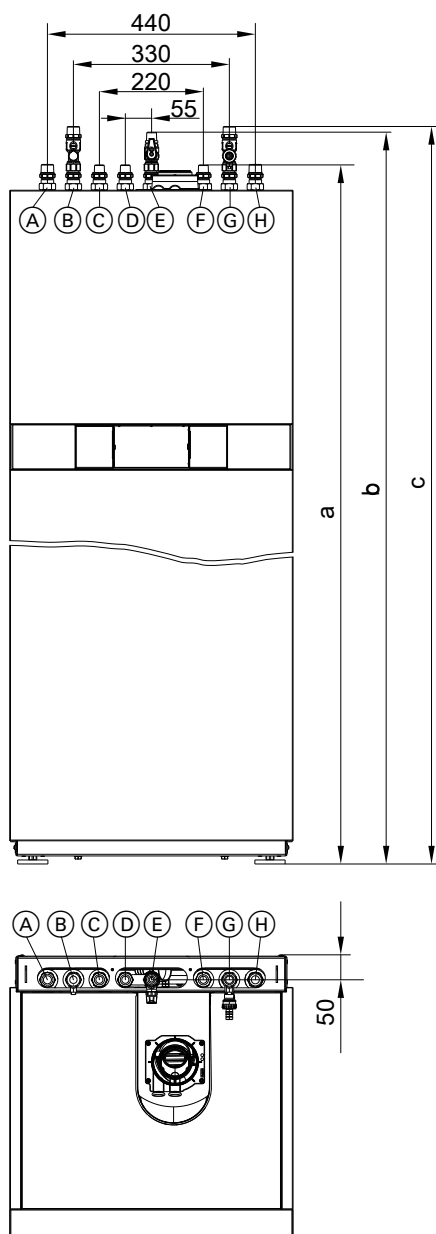
- For the installation of the Vitodens on unfinished floors
- Adjustable height, for screed floors from 10 to 18 cm
- With spacers (for downward connection) for installation on finished walls

## Design information (cont.)

### Installation Vitodens 242-F

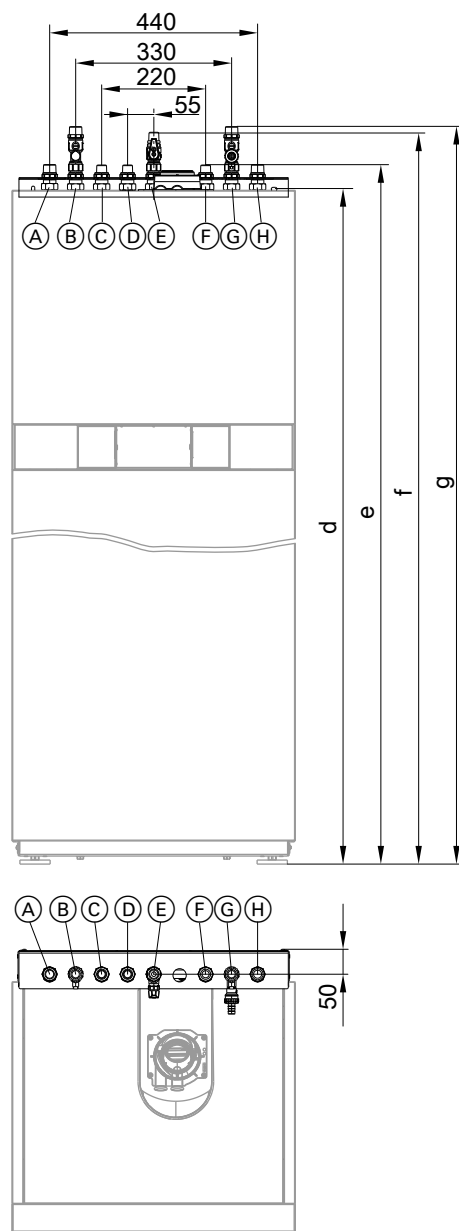
Connection sets (for upward connection) for installation on finished walls

Connection set without premounting bracket, part no. 7348 552



- (A) Solar return R  $\frac{3}{4}$ "/Ø22 mm
- (B) Heating flow R  $\frac{3}{4}$ "
- (C) DHW R  $\frac{1}{2}$ "
- (D) DHW circulation R  $\frac{1}{2}$ " (separate accessory)

Connection set with premounting bracket for pre-assembly in unfinished buildings, part no. 7351 778



- (E) Gas connection R  $\frac{1}{2}$ "
- (F) Cold water R  $\frac{1}{2}$ "
- (G) Heating return R  $\frac{3}{4}$ "
- (H) Solar flow R  $\frac{3}{4}$ "/Ø22 mm

Type	a mm	b mm	c mm	d mm	e mm	f mm	g mm
Vitodens 242-F, FB2B	1927	1964	1976	1890	1940	2011	2023

#### Note

The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

For connecting on-site lines on the gas, heating water and DHW sides from above.

Connection set comprising:

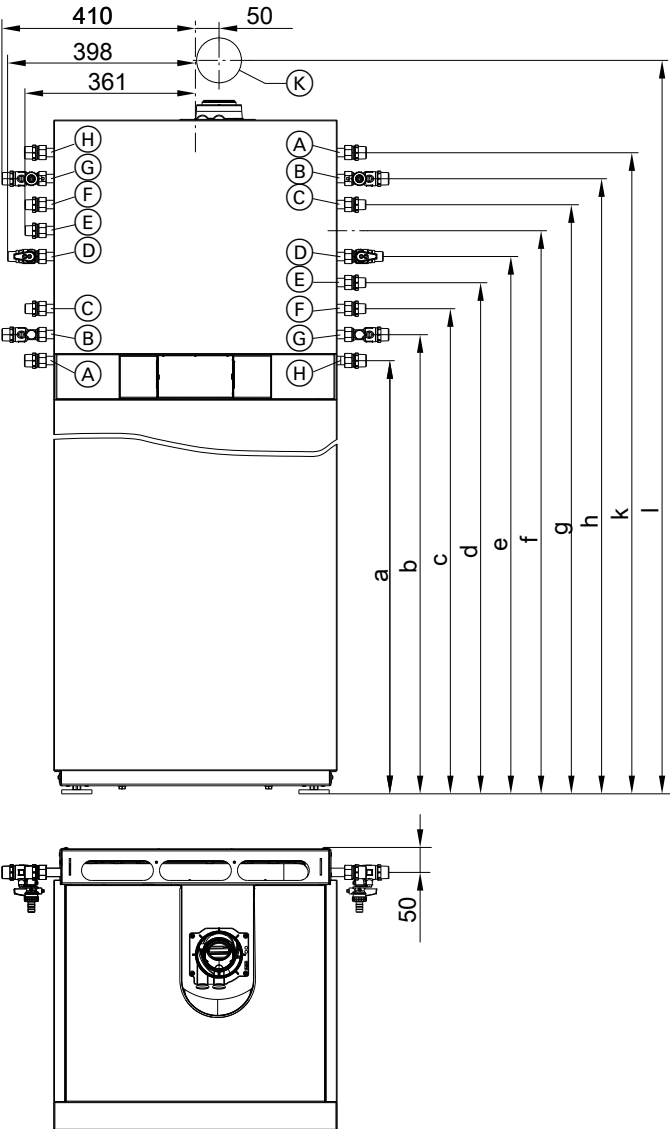
- Connection bracket (only for part no. 7351 778)
- Connecting pipes
- Shut-off valves for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW
- 2 connectors each for solar flow and return (R  $\frac{3}{4}$ "/Ø22 mm)
- Gas shut-off valve with thermally activated safety shut-off valve

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Design information (cont.)

Connection sets (for connection to the left or right) for installation on finished walls

Connection set without premounting bracket, part no. 7347 985



- (A) Solar return R ¾/Ø22 mm

(B) Heating flow R ¾

(C) DHW R ½

(D) Gas connection R ½

(E) DHW circulation R ½ (separate accessory)
- (F) Cold water R ½

(G) Heating return R ¾

(H) Solar flow R ¾/Ø22 mm

(K) Balanced flue connection towards the back

Type	a mm	b mm	c mm	d mm	e mm	f mm	g mm	h mm	k mm	l mm
Vitodens 242-F, FB2B	1367	1422	1477	1532	1587	1592	1696	1752	1807	2002

**Note**  
The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

For connecting on-site lines on the gas, heating water and DHW sides from the left or right.

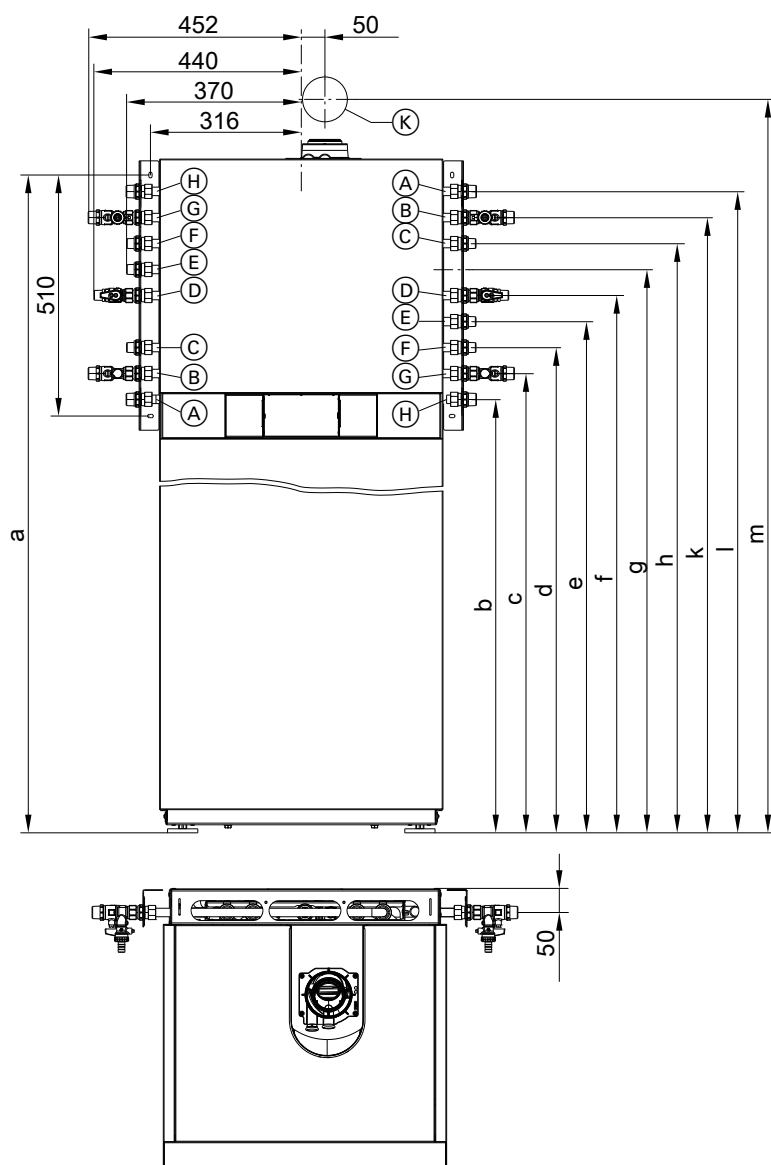
- Connection set comprising:
- Connecting pipes
  - Shut-off valves for heating water flow and return with boiler drain & fill valve

- 2 connectors for DHW
- 2 connectors each for solar flow and return (R¾/Ø22 mm)
- Gas shut-off valve with thermally activated safety shut-off valve



## Design information (cont.)

Connection set with premounting bracket for pre-assembly in unfinished buildings, part no. 7354 386



- (A) Solar return R  $\frac{3}{4}$ /Ø22 mm
- (B) Heating flow R  $\frac{3}{4}$
- (C) DHW R  $\frac{1}{2}$
- (D) Gas connection R  $\frac{1}{2}$
- (E) DHW circulation R  $\frac{1}{2}$  (separate accessory)

- (F) Cold water R  $\frac{1}{2}$
- (G) Heating return R  $\frac{3}{4}$
- (H) Solar flow R  $\frac{3}{4}$ /Ø22 mm
- (K) Balanced flue connection towards the back

Type	a mm	b mm	c mm	d mm	e mm	f mm	g mm	h mm	k mm	l mm	m mm
Vitodens 242-F, FB2B	1852	1367	1422	1477	1532	1587	1592	1696	1752	1807	2002

### Note

The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

For connecting on-site lines on the gas, heating water and DHW sides from the left or right.

Connection set comprising:

- Connection bracket (only for part no. 7354 386)
- Connecting pipes

- Shut-off valves for heating water flow and return with boiler drain & fill valve
- 2 connectors for DHW
- 2 connectors each for solar flow and return (R $\frac{3}{4}$ /Ø22 mm)
- Gas shut-off valve with thermally activated safety shut-off valve

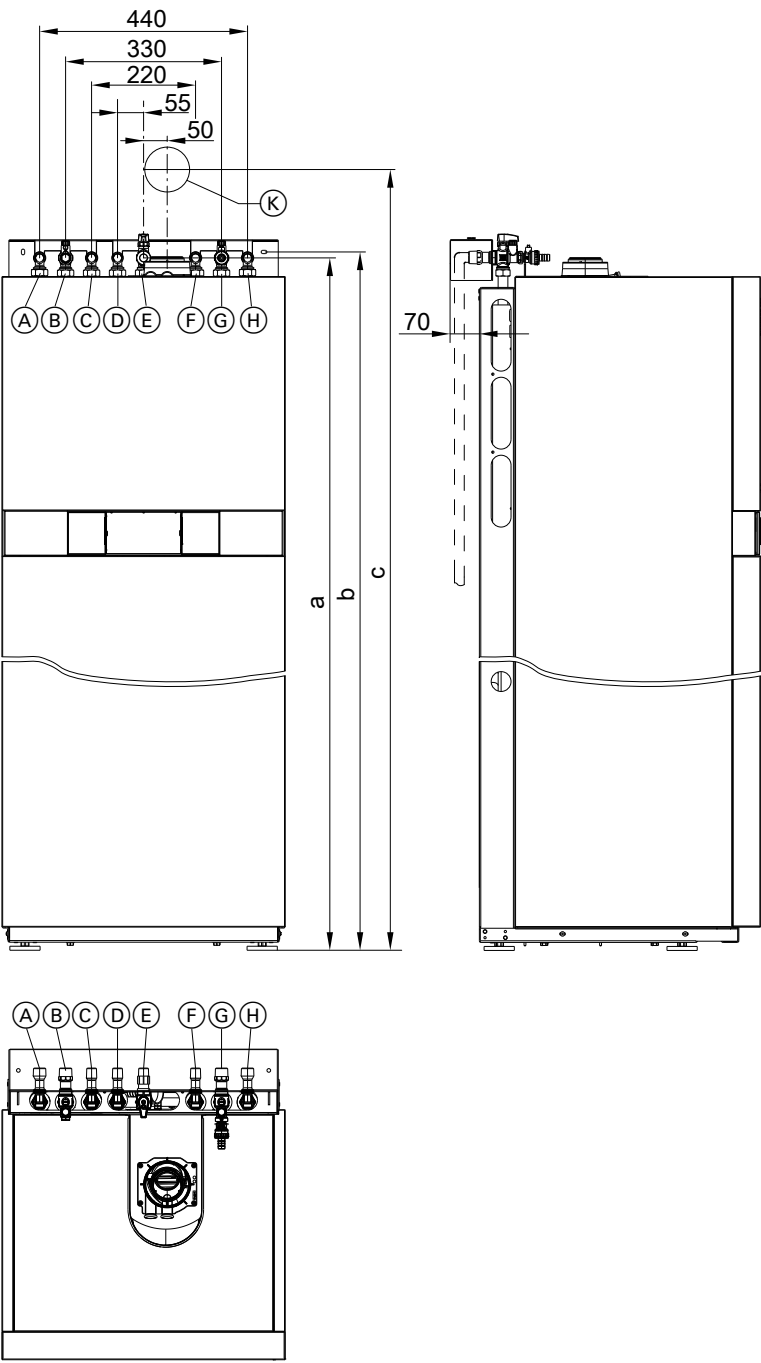
5822 431 GB

VITODENS

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Design information (cont.)

Connection set with pre-mounting bracket for pre-assembly on finished walls in unfinished buildings, part no. 7354 669



- (A) Solar return R  $\frac{3}{4}$
- (B) Heating flow R  $\frac{3}{4}$
- (C) DHW R  $\frac{1}{2}$
- (D) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (E) Gas connection R  $\frac{1}{2}$

Type	a mm	b mm	c mm
Vitodens 242-F, FB2B	1913	1925	2102

A wall clearance of 70 mm is required behind the Vitodens.

**Note**  
The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

- (F) Cold water R  $\frac{1}{2}$
- (G) Heating return R  $\frac{3}{4}$
- (H) Solar flow (R  $\frac{3}{4}$ )
- (K) Balanced flue connection towards the back

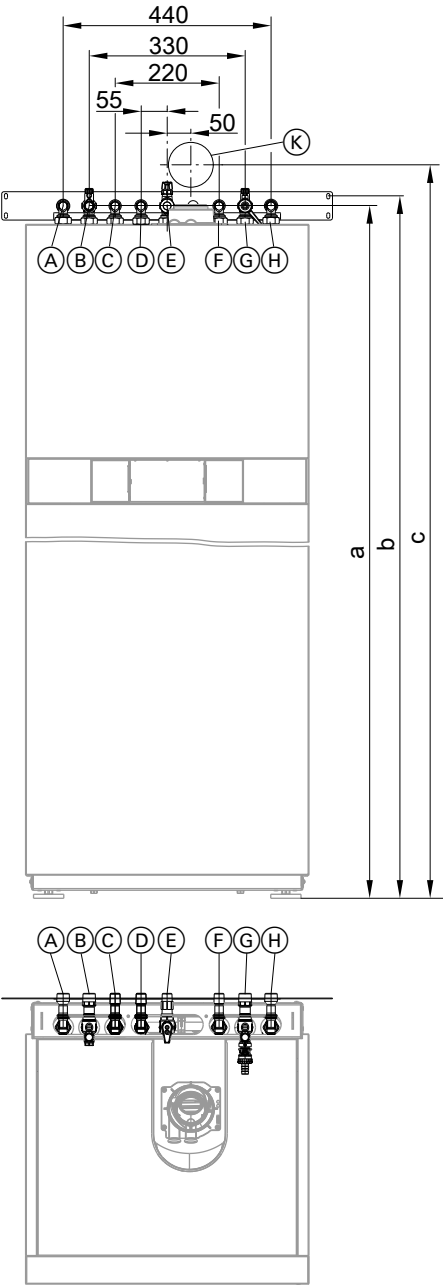
For connecting on-site lines on the gas, heating water and DHW sides from below.

- Connection set comprising:
- Connection panel
  - Connecting pipes
  - Shut-off valves for heating water flow and return with boiler drain & fill valve and air vent valve
  - 2 connectors for DHW
  - 2 connectors for solar flow and return
  - Gas angle valve with thermally activated safety shut-off valve

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Design information (cont.)

Connection set with mounting bracket for pre-assembly on unfinished walls in unfinished buildings, part no. 7353 065



- (A) Solar return R  $\frac{3}{4}$
- (B) Heating flow R  $\frac{3}{4}$
- (C) DHW R  $\frac{1}{2}$
- (D) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (E) Gas connection R  $\frac{1}{2}$
- (F) Cold water R  $\frac{1}{2}$
- (G) Heating return R  $\frac{3}{4}$
- (H) Solar flow (R  $\frac{3}{4}$ )
- (K) Balanced flue connection towards the back

Type	a mm	b mm	c mm
Vitodens 242-F, FB2B	1925	1946	2232

**Note**  
The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

For connecting on-site lines on the gas, heating water and DHW sides from within the wall.

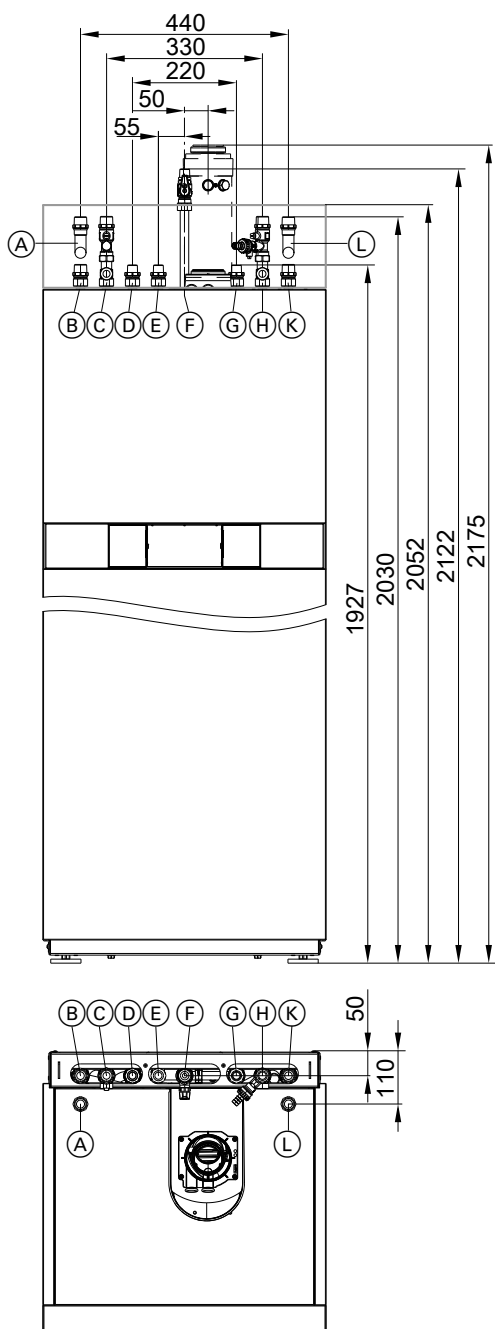
**Note**  
In place of the connection bend for cold water, a safety assembly (separate accessory) can be fitted.

- Connection set comprising:
- Mounting bracket
  - Connecting pipes
  - Shut-off valves for heating water flow and return with boiler drain & fill valve
  - 2 connectors for DHW
  - 2 connectors for solar flow and return
  - Gas angle valve with thermally activated safety shut-off valve

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## Design information (cont.)

Assembly kit with mixer for finished walls, part no. Z007 475 and Z008 380



- (A) Heating flow, heating circuit with mixer R  $\frac{3}{4}$
- (B) Solar return R  $\frac{3}{4}$ /Ø22 mm
- (C) Heating flow, heating circuit without mixer R  $\frac{3}{4}$
- (D) DHW R  $\frac{1}{2}$
- (E) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (F) Gas connection R  $\frac{1}{2}$
- (G) Cold water R  $\frac{1}{2}$
- (H) Heating return, heating circuit without mixer R  $\frac{3}{4}$
- (K) Solar flow R  $\frac{3}{4}$ /Ø22 mm
- (L) Heating return, heating circuit with mixer R  $\frac{3}{4}$

### Note

The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

For connecting on-site lines on the gas, heating water and DHW sides from above.

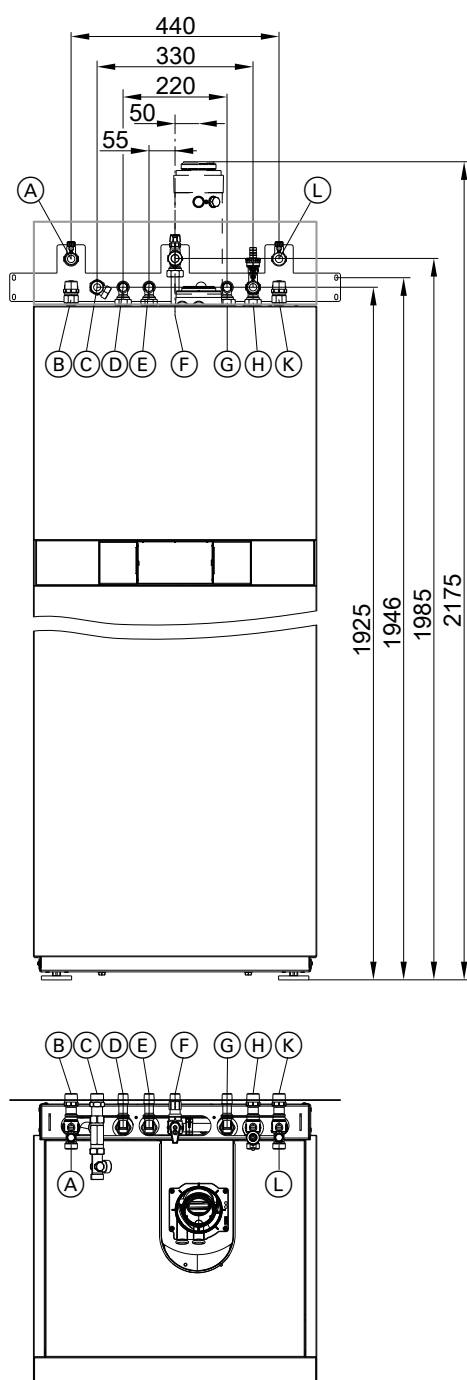
Assembly kit comprising:

- Plate heat exchanger for system separation of the heating circuit with mixer
- Circulation pump for the heating circuit with mixer
- Three-way mixer with mixer motor
- Mixer PCB, capable of communicating with the Vitotronic 200 via KM BUS
- Adjustable bypass
- Connection set for installation on finished or unfinished walls, with:
  - Connecting pipes
  - Shut-off valves for heating water flow and return with boiler drain & fill valve
  - 2 connectors for DHW
  - 2 connectors for solar flow and return
  - Gas shut-off valve with thermally activated safety shut-off valve
- Flow temperature sensor

## Design information (cont.)

- Cover with the same design as the appliance
- Balanced flue extension, boiler flue connection

**Assembly kit with mixer – unfinished walls with mounting plate for pre-installation in unfinished buildings, part no. Z008 381**



- (A) Heating flow, heating circuit with mixer R  $\frac{3}{4}$
- (B) Solar return R  $\frac{3}{4}$
- (C) Heating flow, heating circuit without mixer R  $\frac{3}{4}$
- (D) DHW R  $\frac{1}{2}$
- (E) DHW circulation R  $\frac{1}{2}$  (separate accessory)
- (F) Gas connection R  $\frac{1}{2}$
- (G) Cold water R  $\frac{1}{2}$
- (H) Heating return, heating circuit without mixer R  $\frac{3}{4}$
- (K) Solar flow (R  $\frac{3}{4}$ )
- (L) Heating return, heating circuit with mixer R  $\frac{3}{4}$

### Note

The adjustable feet give the height measurements of the connections a tolerance of + 15 mm.

For connecting on-site lines on the gas, heating water and DHW sides from within the wall.

Assembly kit comprising:

- Plate heat exchanger for system separation of the heating circuit with mixer
- Circulation pump for the heating circuit with mixer
- Three-way mixer with mixer motor

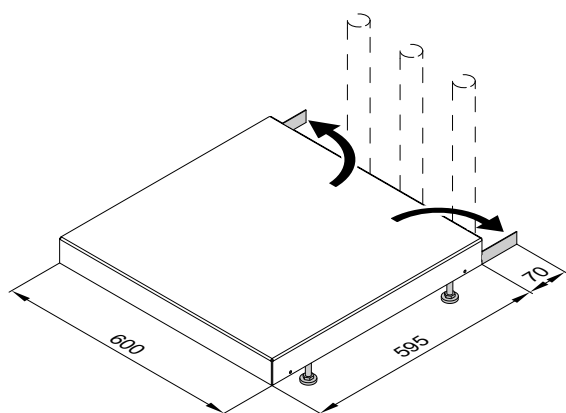
## Design information (cont.)

- Mixer PCB, capable of communicating with the Vitotronic 200 via KM BUS
- Adjustable bypass
- Connection set for installation on finished or unfinished walls, with:
  - Connecting pipes
  - Shut-off valves for heating water flow and return with boiler drain & fill valve
  - 2 connectors for DHW
  - 2 connectors for solar flow and return
  - Gas shut-off valve (R ½) with thermally activated safety shut-off valve

- Flow temperature sensor
- Cover with the same design as the appliance
- Balanced flue extension, boiler flue connection

### Boiler plinth

Part no. 7352 259



- For the installation of the Vitodens on unfinished floors
- Adjustable height, for screed floors from 10 to 18 cm
- With spacers (for downward connection) for installation on finished walls

## 6.2 Decision-making aids regarding DHW heating

To provide the perfect solution for every situation, the Vitodens may be supplied with an integral DHW primary store, an integral DHW cylinder with internal indirect coil or an integral solar cylinder (see product description).

Various factors must be considered when designing heating systems and deciding between gas boilers with integral DHW primary stores or integral DHW cylinders:

- DHW demand, convenience
- Utilisation of the various connected draw-off points
- Distance between the draw-off points and the boiler
- System modernisation
- Space requirement
- Water quality

## 6

### Information about water quality

#### Vitodens with primary store:

During DHW heating, settling of lime on the surfaces of the plate heat exchanger cannot be totally prevented. The tendency towards lime-scale 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 generally scale deposits inside the plate heat exchanger are minor enough not to cause any reduction in DHW output, such impairment cannot be excluded with increasing 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 observe that frequently, regional water supply utilities specify an average water hardness. In practical applications, therefore, higher levels of water hardness may from time to time occur. This may make the use of a water treatment facility advisable even from 17 °dH (> 3.0 mol/m<sup>3</sup>) upwards.

## Design information (cont.)

Selection table

		Vitodens 333-F, type FR3B with integral DHW cyl- inder with internal indirect coil	Vitodens 222-F, type FS2B and Vitodens 333-F, type FS3B with integral DHW pri- mary store	Vitodens 242-F and Vitodens 343-F with integral solar cylinder
DHW demand, con- venience	DHW demand for one apartment	+	+	+
	DHW demand for a detached house	+	+	+
	DHW demand for a centralised system in an apart- ment building	+	–	+
	DHW demand for a decentralised system in an apart- ment building	+	0	–
Utilisation of the var- ious connected draw-off points	One draw-off point	0	0	0
	Several draw-off points, no simultaneous utilisation	+	+	+
	Several draw-off points, simultaneous utilisation	+	+	+
Distance between draw-off point and boiler	Up to 7 m (without DHW circulation line)	–	–	–
	With DHW circulation line	+	+	+
Modernisation	Existing DHW cylinder	+	–	–
	Replacement of an existing combi boiler	–	0	–
Space requirement	Low space requirement (installation in a recess)	0	0	0
	Availability of sufficient space (installation room)	+	+	+
Solar DHW heating can be connected	Connection to a dual mode DHW cylinder	+	–	–
	Connection to the integral DHW cylinder	–	–	+

+ = recommended

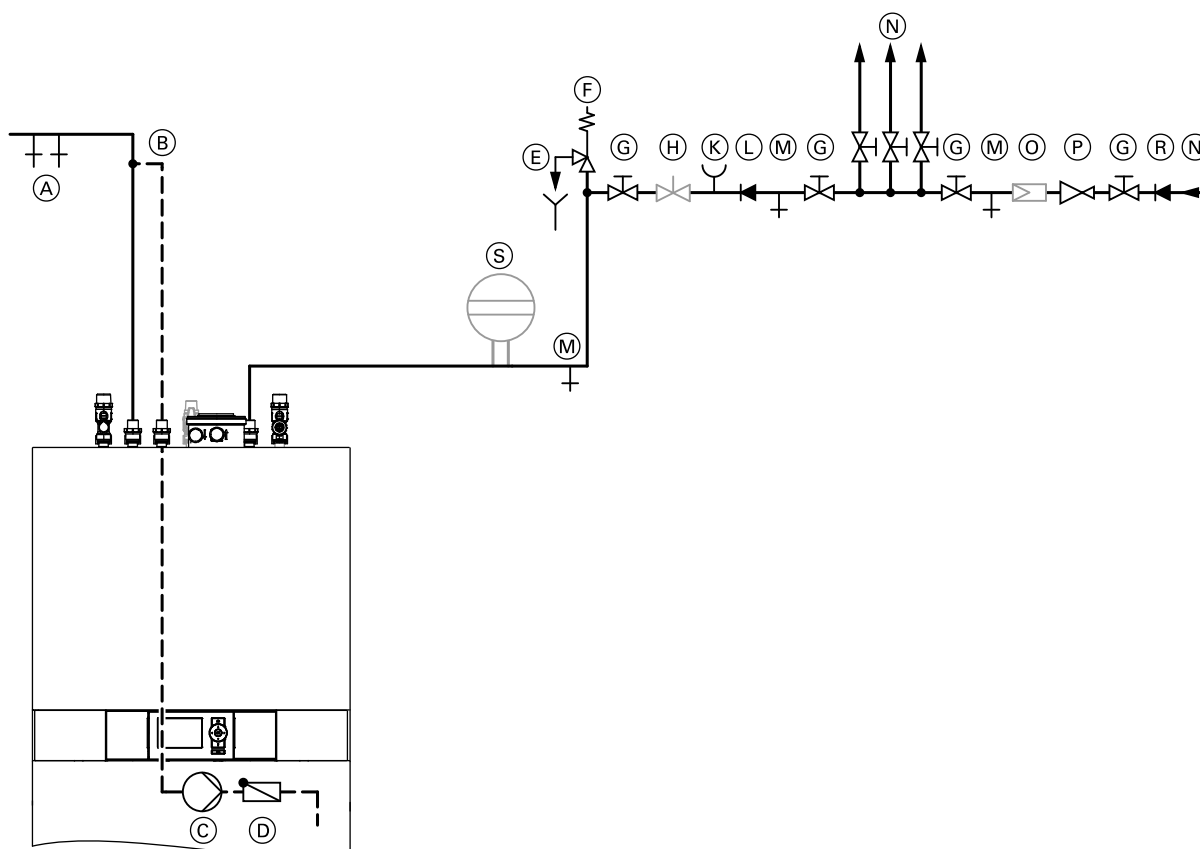
0 = recommended under certain conditions

– = not recommended

## 6.3 Connections on the water side

### Connections on the DHW side

#### Cold water installation



For the location of connections, see the relevant connection set

- |                                  |   |
|----------------------------------|---|
| (A) Domestic hot water           | (K) Pressure gauge connector                                |
| (B) DHW circulation line         | (L) Non-return valve  |
| (C) DHW circulation pump         | (M) Drain   |
| (D) Spring-loaded check valve    | (N) Cold water  |
| (E) Visible blow-off line outlet | (O) Drinking water filter                                   |
| (F) Safety valve                 | (P) Pressure reducer  |
| (G) Shut-off valve               | (R) Non-return valve/pipe separator                         |
| (H) Flow regulating valve        | (S) Diaphragm expansion vessel, suitable for drinking water |
- (Installation and adjustment of the maximum water flow rate in accordance with the peak draw-off rate of the DHW cylinder (see "Specification") is recommended)

#### Note

The DHW circulation pump (C) and check valve (D) are part of the DHW circulation pump connection set (accessory) and are fitted into the boiler.

#### Safety valve

The safety valve **must** be installed.

#### Drinking water filter

According to DIN 1988-2, a drinking water filter should be installed in systems with metal pipework. Viessmann also recommends the installation of a drinking water filter when using plastic pipes, as per DIN 1988, to prevent contaminants entering the DHW system.

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. The DHW cylinder does not then need to be drained when working on the safety valve.



## Design information (cont.)

### DHW circulation

DHW circulation pipes increase DHW convenience and reduce water consumption.

These advantages result from the immediate availability of hot water at the tap/draw-off point.

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

From a **line length of 7 m** and longer, we recommend the installation of a DHW circulation line with appropriate thermal insulation in accordance with the Energy Savings Order [Germany].

This specifies that the DHW circulation line should include a circulation pump, a check valve and a time switch for shutting down DHW circulation during the night.

Only use the DHW circulation pump connection set available as an accessory for fitting into the boiler. For this, the circulation pump is controlled by the boiler control unit.

The flow rate of the DHW circulation pump must not exceed **1.5 l/min**.

Installation scheme for DHW circulation, see page 68.

## 6.4 Condensate connection

Route the condensate drain with a constant slope.

Route the condensate from the flue gas system (if equipped with a drain), together with the boiler condensate directly or (if installed) via a neutralising system to the public sewer.

For routing the condensate connection, see the relevant chapter "Installation in unfinished buildings".

### Note

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

## Condensate drain and neutralisation

Drain the condensate created during the heating operation in the condensing boiler and in the flue pipe in accordance with appropriate regulations. During gas combustion, the condensate will have a pH between 4 and 5.

The Code of Practice ATV-DVWK-A 251 "Condensate from condensing boilers", that 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 consistency of condensate drained from Vitodens condensing boilers meets the requirements specified in the Code of Practice ATV-DVWK-A 251.

The condensate drain to the sewer connection must be able to be inspected.

It must be installed with a continuous gradient and must contain a stench trap. Also provide a suitable facility for extracting samples. Condensate drains must only be made from corrosion-resistant materials (e.g. reinforced hoses).

**Never use any galvanised materials or those containing copper for pipes, connectors, etc.**

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

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

It is advisable to contact your local authority responsible for waste water management prior to installation, to find out about local regulations.

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

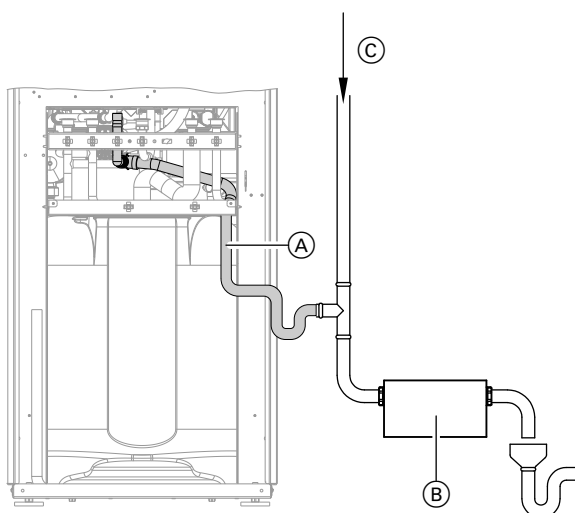
Up to a rated output of 200 kW, the condensate from a gas condensing boiler can generally be introduced into the public sewer system without prior neutralisation.

Also ensure that your domestic dewatering system is made from materials that are resistant to acidic condensate.

According to the Code of Practice ATV DVWK A 251, these materials include:

- Clay pipes
- Hard PVC pipes
- PVC pipes
- PE HD pipes
- PP pipes
- ABS/ASA pipes
- Stainless steel pipes
- Borosilicate pipes

### Neutralising system



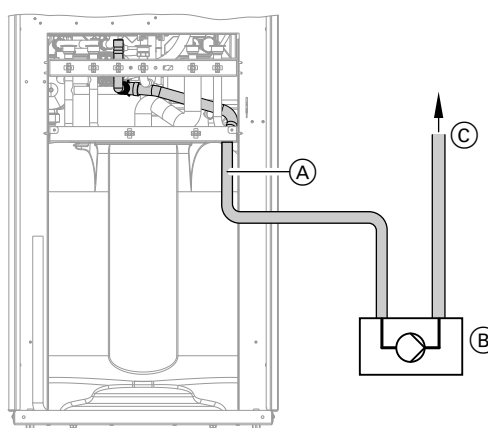
- (A) Condensate drain
- (B) Neutralising system
- (C) Venting via the roof

The Vitodens can (if required) be supplied with a separate neutralising system (accessories). Any condensate is piped to and treated in the neutralising system.

The condensate drain to the sewer connection must be able to be inspected. It must be installed with a slope and stench trap on the sewer side, and must provide a suitable facility for extracting samples.

Install a condensate lifting system (available as an accessory) if the Vitodens has been installed below the waste water antiflooding level. Since the consumption of neutralisation granulate depends on the operating mode of the system, determine the required top-up amount during the first year of operation by regular checks. It is feasible that one fill may last longer than 12 months.

### Condensate lifting system (accessory)



- (A) Condensate inlet
- (B) Condensate lifting system
- (C) Condensate drain

## 6.5 Hydraulic connection

### General

#### System design

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

The circulation pump is an integral part of the Vitodens.

Minimum system pressure 1.0 bar.

The boiler water temperature is limited to 82 °C.

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

For apartments with less than 80 m<sup>2</sup> living space or for low energy houses with low heat demand we recommend, due to the immediate capturing of the room-influencing factors, the utilisation of the Vitodens with a constant temperature control unit in conjunction with the Vitotrol 100.

#### Chemical anti-corrosion agents

Corrosion is generally avoided in correctly installed and operated sealed heating systems.

Never use chemical anti-corrosion agents.

Some manufacturers of plastic pipes recommend the use of chemical additives. In such cases, only use anti-corrosion agents offered by the heating trade that have been approved for boilers with DHW heating via single-walled heat exchangers (instantaneous water heater or DHW cylinder).

For this, observe the VDI guideline 2035 [or local regulations].

## Design information (cont.)

### 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 to DIN 4726 that are permeable to oxygen. We supply a separate heat exchanger for this.

Install a sludge separator in underfloor heating systems; see the Viessmann Vitoset pricelist.

Connect underfloor heating systems with very large water content (>15 l/kW), even with condensing boilers, to heating circuits via a 3-way mixer; see technical guide "Control of underfloor heating systems" or the relevant sample applications.

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

### Plastic pipework for radiators

We also recommend the installation of a temperature limiter to restrict the maximum temperature of plastic pipes in heating circuits with radiators.

### Attic heating centre

The installation of a low water indicator specified as compulsory by DVGW is not required when installing the Vitodens in an attic.

The Vitodens condensing boilers are protected against low water levels in accordance with EN 12828.

### Safety valve

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

### Low water indicator

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

Viessmann Vitodens 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 reach unacceptably high temperatures.

### Water quality/Frost protection

Unsuitable fill and top-up water increases the level of deposits and corrosion and may lead to boiler damage.

Regarding the quality and volume of heating water, incl. fill and top-up water, observe the VDI 2035.

- Thoroughly flush the entire heating system prior to filling it with water.
- Only use fill water of potable quality.
- Soften fill water with a hardness above 3.0 mol/m<sup>3</sup>, e.g. with the small softening system for heating water (see the Viessmann Vitoset pricelist).
- An antifreeze additive suitable for heating systems can be mixed with the fill water. The antifreeze manufacturer must verify its suitability, since otherwise damage to gaskets and diaphragms can occur as well as noise during heating operation. Viessmann accepts no liability for damage or consequential damage as a result.
- For commissioning or systems with a volume that is in excess of 20 litres/kW, observe VDI 2035.

### Installation examples

Installation examples, see separate document "System examples".

## Expansion vessels for the heating circuit

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

A diaphragm expansion vessel is integrated into the Vitodens.

Capacity: 12 l

Pre-charge pressure: 0.75 bar

The required size of the expansion vessel is subject to the heating system specification and should be checked in each case.

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

The following steps will enable you to make a rough check as to whether the integral expansion vessel is sufficient:

$$V_{DEV} = f \cdot ((V_A + V_K) \cdot A_f + 2.4)$$

$V_{DEV}$  = Volume of the expansion vessel  
 $f$  = Expansion factor (= 2 for expansion vessel)  
 $V_A$  = System volume  
 $V_K$  = Boiler water volume  
 $A_f$  = Heating water expansion factor

### Example:

System:

- Boiler water volume 5 l
- Rated output 26 kW
- Panel radiators
- System volume approx. 130 l
- Heating system 70/50 °C

Calculation:

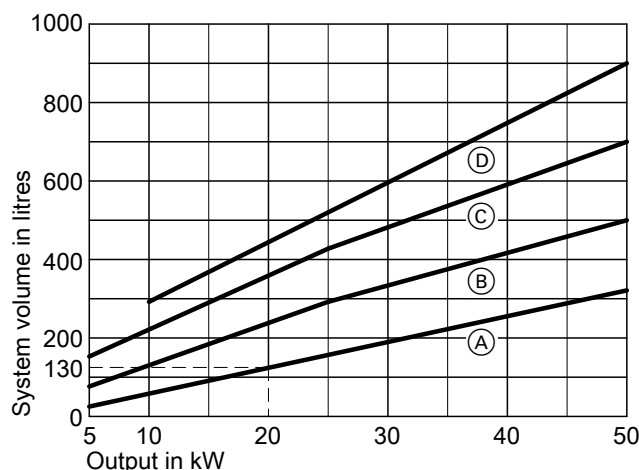
Heating system 70/50 °C: average water temperature approx. 60 °C  
 $A_f = 0.0171$

$$V_{DEV} = 2 \cdot ((130 + 5) \cdot 0.0171 + 2.4)$$

$$V_{DEV} = 9.41 \text{ litres}$$

**Result:** The integral expansion vessel (12 litre capacity) is sufficiently large for this system.

## Calculating the heating system volume (approximate values)



- (A) Convector heaters
- (B) Panel radiators
- (C) Radiators
- (D) Underfloor heating

## Calculating the expansion factor $A_f$

Average water temp. [°C]	Expansion factor $A_f$
50	0.0121
60	0.0171
70	0.0228

Expansion vessel and heat sink for the solar circuit

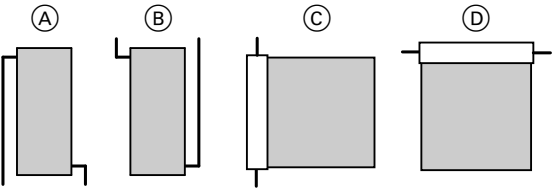
Stagnation in solar thermal systems

All safety equipment in a solar thermal system must be designed for stagnation. If, in case of active insolation onto the collector array, the system draws no further heat, the solar circuit pump will stop and the solar thermal system enters a stagnation phase. Longer system idle times, e.g. through faults or incorrect operation, can never be completely ruled out. This results in a rise in temperature up to the maximum collector temperature. Energy yield and loss are then the same. In the collectors, temperatures are reached that exceed the boiling point of the heat transfer medium. Solar thermal systems must therefore be inherently safe in design in accordance with the relevant regulations.

Inherent safety means the following:

- The solar thermal system must not be damaged by stagnation.
- The solar thermal system must not pose any risk during stagnation.
- Following stagnation, the solar thermal system must return to operation automatically.
- Collectors and pipework must be designed for the temperatures expected during stagnation.

A lower system pressure is beneficial where stagnation characteristics are concerned: **1 bar** positive pressure (during filling and at a heat transfer medium temperature of approx. 20 °C) at the collector is adequate. One crucial variable when engineering the pressure characteristics and safety equipment is the steam production capacity (DPL). This is the output of the collector array that, during stagnation, is transferred into the pipework in the form of steam. The maximum steam production capacity is influenced by the draining characteristics of the collectors and the array. Subject to collector type and hydraulic connection, different steam output levels can occur (see figure below).



- Ⓐ Flat-plate collector without liquid pocket  
Steam production capacity = 60 W/m<sup>2</sup>
- Ⓑ Flat-plate collector with liquid "bag"  
Steam production capacity = 100 W/m<sup>2</sup>

- Ⓒ Vacuum tube collector, header casing on the side  
Steam production capacity = 100 W/m<sup>2</sup>
- Ⓓ Vacuum tube collector, header casing on top  
Steam production capacity = 200 W/m<sup>2</sup>

The pipe run that holds steam during stagnation (steam range) is calculated from the balance between the steam production capacity of the collector array and the heat losses of the pipework. For the losses from a solar circuit pipe made from copper 100 % insulated with commercially available material, the following practical values are assumed:

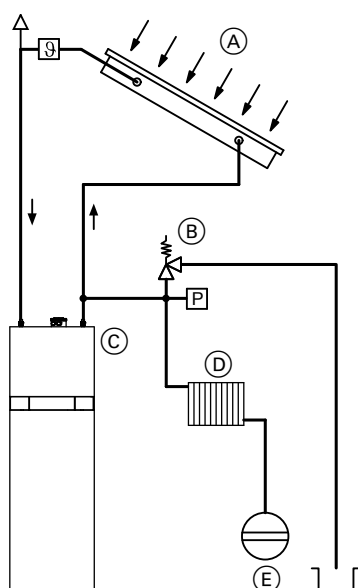
Dimensions	Heat loss in W/m
12 x 1/15 x 1/18 x 1	25
22 x 1/28 x 1.5	30

- Steam range **less** than the pipe run in the solar circuit (flow and return) between the collector and the expansion vessel:  
The steam cannot reach the expansion vessel in the event of stagnation. The displaced volume (collector array and pipework filled with steam) must be taken into account when sizing the expansion vessel.
- Steam range **greater** than the pipe run in the solar circuit (flow and return) between the collector and the expansion vessel:  
Planning a cooling line (heat sink) to protect the expansion vessel diaphragm against thermal overload (see figures below). Steam condenses again in this cooling line and reduces the liquefied heat transfer medium to a temperature below 70 °C.

## Design information (cont.)

### Expansion vessel and heat sink in the return

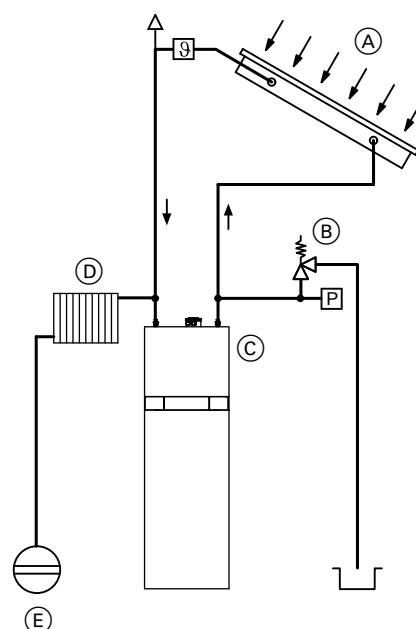
The steam can propagate in the flow and return.



- (A) Collector
- (B) Safety valve
- (C) Vitodens
- (D) Heat sink
- (E) Expansion vessel

### Expansion vessel and heat sink in the flow

The steam can propagate only in the flow.



The difference between the steam production capacity of the collector array and the heat loss of the pipework to the point where the diaphragm expansion vessel is connected to the heat sink results in the required residual cooling capacity.

#### Note

The SOLSEC program is available at [www.viessmann.com](http://www.viessmann.com) for calculating the residual cooling capacity and the sizing of the heat sink.

This program offers three suggestions for implementation:

- Sufficiently long, uninsulated pipework branching to the expansion vessel
- A sufficiently large pre-cooling vessel, in relation to the cooling capacity
- a correctly sized heat sink

Conventional radiators the capacity of which is determined as 115 K are assumed as the heat sink. To make things clearer, the heating output is given as 75/65 °C in the program.

#### Note

On account of the expected high surface temperatures, Viessmann stagnation heat sinks (see technical guide Vitosol) are equipped with a plate that receives no flow, as protection against accidental contact. Provide protection against accidental contact when using commercial radiators. In addition, the connections must be diffusion-proof.

### Specification, heat sinks

	Output at 75/65 °C in W	Cooling capacity during stagnation in W	Liquid content in l
Stagnation heat sink – Type 21	482	964	12
Pre-cooling vessel	—	450	

#### Expansion vessel

The expansion vessel can be calculated once the steam range has been determined and any heat sinks that may be used have been taken into consideration.

The required volume is determined by the following factors:

- Expansion of the heat transfer medium in its liquid state
- Liquid seal
- Expected steam volume, taking account of the static head of the system
- Pre-charge pressure

$$V_{\text{mag}} = (V_{\text{kol}} + V_{\text{drohr}} + V_e + V_{\text{lv}}) \cdot \beta$$

- $V_{\text{mag}}$  Rated volume of the expansion vessel in l
- $V_{\text{kol}}$  Liquid content of the collectors in l
- $V_{\text{drohr}}$  Content of the pipework subject to steam loads in l (calculated from the steam range and the pipework content per m pipe length)
- $V_e$  Increase in the volume of the heat transfer medium in its liquid state in l
- $V_e = V_a \cdot \beta$
- $V_a$  System volume (content of the collectors, the heat exchanger and the pipework)
- $\beta$  Expansion factor
- $\beta = 0.13$  for Viessmann heat transfer medium from -20 to 120 °C

## Design information (cont.)

- $V_{lv}$  Liquid seal in the expansion vessel in l  
(4 % of the system volume, min. 3 l)
- $D_f$  Pressure factor  
( $p_e + 1$ ) : ( $p_e - p_o$ )
- $p_e$  Max. system pressure at the safety valve in bar (90 % of the safety valve response pressure)
- $p_o$  System pre-charge pressure  
 $p_o = 1 \text{ bar} + 0.1 \text{ bar/m static head}$

To determine the steam volume in the pipework, the content per m of pipe must be taken into consideration.

Copper pipe	Dim.	12 × 1	15 × 1	18 × 1	22 × 1	28 × 1.5	35 × 1.5	42 × 1.5
		DN 10	DN 13	DN 16	DN 20	DN 25	DN 32	DN 40
Content	l/m pipe	0.079	0.133	0.201	0.314	0.491	0.804	1.195

Corrugated stainless steel pipe	Dim.	DN 16
Content	l/m pipe	0.25

Liquid content of the collectors, see technical guide Vitosol.

For further information, see the technical guide Vitosol.

### Quick selection of expansion vessel and heat sink

The details in the following table are standard values. They allow quick estimates at the design and calculation stage. We recommend a thorough calculation. The selection refers to a hydraulic system with a liquid "bag" and the use of a 6 bar safety valve.

### Note

Check the size of the expansion vessel on site.

### Vitosol 200-F/300-F, type SV

Absorber area in m <sup>2</sup>	Static height in m	System content in l	Recom. expansion vessel capacity in l	Recom. heat sink (see page 73)
2.3	5	22.3	18	—
	10	25.7	25	—
	15	29.2	—	—
4.6	5	24.7	25	2 m uninsulated pipe
	10	27.6	—	—
	15	31.0	—	—
6.9	5	28.5	40	Type 21
	10	29.6	—	0.6 m uninsulated pipe
	15	32.9	—	—

### Vitosol 200-F/300-F, type SH

Absorber area in m <sup>2</sup>	Static height in m	System content in l	Recom. expansion vessel capacity in l	Recom. heat sink (see page 73)
2.3	5	22.9	18	—
	10	26.4	25	—
	15	29.8	—	—
4.6	5	26.0	40	2 m uninsulated pipe
	10	28.9	—	—
	15	32.3	—	—
6.9	5	30.5	40	Type 21
	10	31.5	—	0.6 m uninsulated pipe
	15	34.8	50	—

### Vitosol 200-T

Absorber area in m <sup>2</sup>	Static height in m	System content in l	Recom. expansion vessel capacity in l	Recom. heat sink (see page 73)
2	5	25.1	25	1.5 m uninsulated pipe
	10	28.1	40	—
	15	31.6	—	—
3	5	29.2	40	Type 21
	10	30.1	50	—
	15	33.6	—	—
4	5	31.8	40	Type 21
	10	34.9	50	—
	15	35.8	80	—

## Design information (cont.)

### Vitosol 300-T

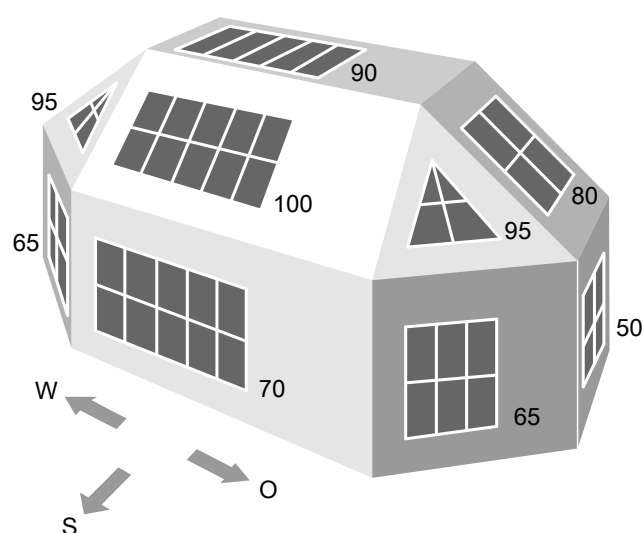
Absorber area in m <sup>2</sup>	Static height in m	System content in l	Recom. expansion vessel capacity in l	Recom. heat sink (see page 73)
2	5	21.7	18	—
	10	25.1		
	15	28.6	25	
3	5	22.3	18	
	10	25.7	25	
	15	29.2		
4	5	23.3	25	1.5 m uninsulated pipe
	10	23.6		—
	15	29.8	40	—

### Low loss header

See technical guide Vitodens 200-W and 300-W.

## 6.6 Sizing the solar thermal system

### Influence of alignment, inclination and shading



The yield varies subject to the method of installation of the collectors. The highest yields result from south-facing pitched roofs. Compared to this ideal, a roof with east-west orientation achieves only approx. 80 % of optimum yields.

Depending on application of the solar thermal system, we recommend the following optimum angles of inclination:

#### ■ Solar thermal system for DHW heating

30 to 45 °

This small angle of inclination takes the higher position of the sun in summer into account.

#### ■ Solar thermal system to back up central heating

45 to 60 °

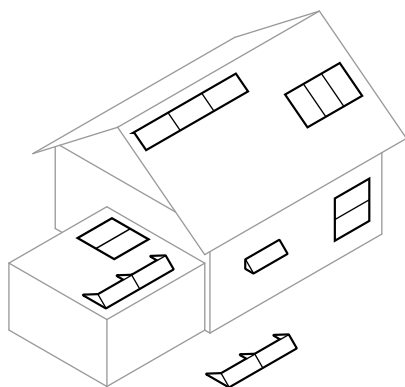
Taking the lower position of the sun in spring, autumn and winter into account.

The deliberately selected large angle of inclination in summer reduces periods of stagnation.

### Shade reduces the energy yield

Position and size the collector array so that the influence of structures, trees, etc. which create shadows, is minimised.

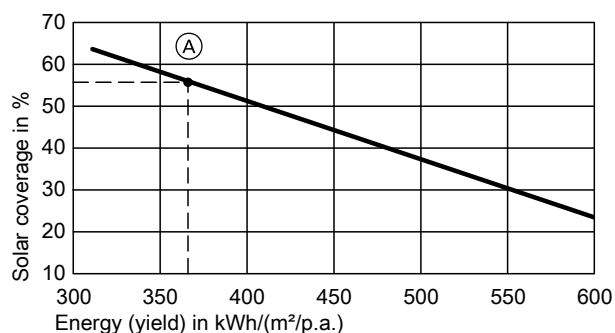
### Installation options



For installation on walls or for horizontal installation on flat roofs, we recommend sizing the collector area 20 to 30 % larger.

The Viessmann calculating program "ESOP" can be used to compare different yields.

## Solar coverage



(A) Conventional sizing for DHW systems in detached houses

The solar coverage indicates what percentage of the energy required annually for DHW or central heating can be covered by the solar thermal system.

Designing a solar thermal system always entails finding a good compromise between yield and solar coverage. The higher the selected solar coverage, the more conventional energy is saved.

However, this is linked to an excess of heat in summer. This means a lower average collector efficiency and consequently lower yields (energy in kWh) per m<sup>2</sup> absorber area.

## DHW demand of residential units

The following details are required for an estimation of the required collector area.

Hot water demand:

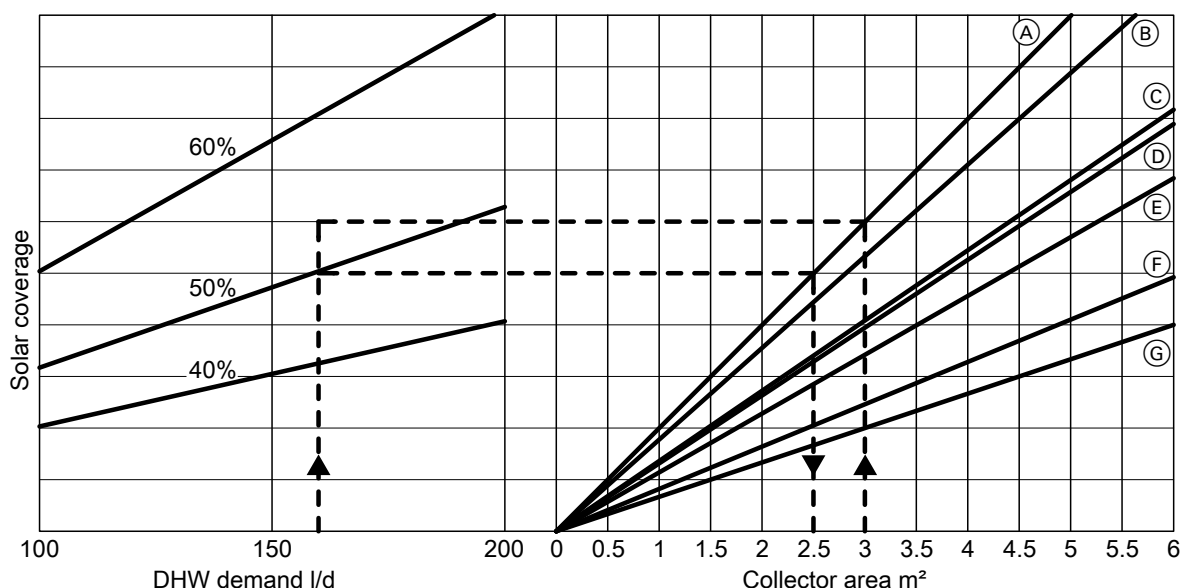
- Normal demands: 30 - 40 l/day and person
- Higher demands: 40 - 60 l/day and person

## Determining the required collector area

### Note

Select the collector area only within the **sizing limit** (H), since oversized collector areas can lead to stagnation.

Example for the following sizing aids: Detached house with 4 occupants, collector type Vitosol 300-T.



- (A) South 30°
- (B) Southwest 30° and southeast 30°
- (C) West 30° and east 30°
- (D) Southwest 90° and south 90°

- (E) Southeast 90°
- (F) West 90°
- (G) East 90°

1. Determining the DHW demand (see page 76).  
Assuming: 40 l/day and person  $\approx$  160 l/day.
2. Draw a vertical line to the required solar coverage (assumption: 50 %).
3. Draw a horizontal line to the existing roof orientation/inclination (assumption: south 30°).
4. Extend the intersection downwards and read off the required collector area.  
The example results in 2.5 m<sup>2</sup>.

5. Selection of the collector area that is physically possible:  
In the example 3.0 m<sup>2</sup>.
6. Draw a vertical line from the selected collector area (3.0 m<sup>2</sup>) to the intersection with the existing roof orientation.
7. Draw a horizontal line to the intersection with the line of the DHW demand and read off the achievable coverage.  
In the example approx. 53 %.

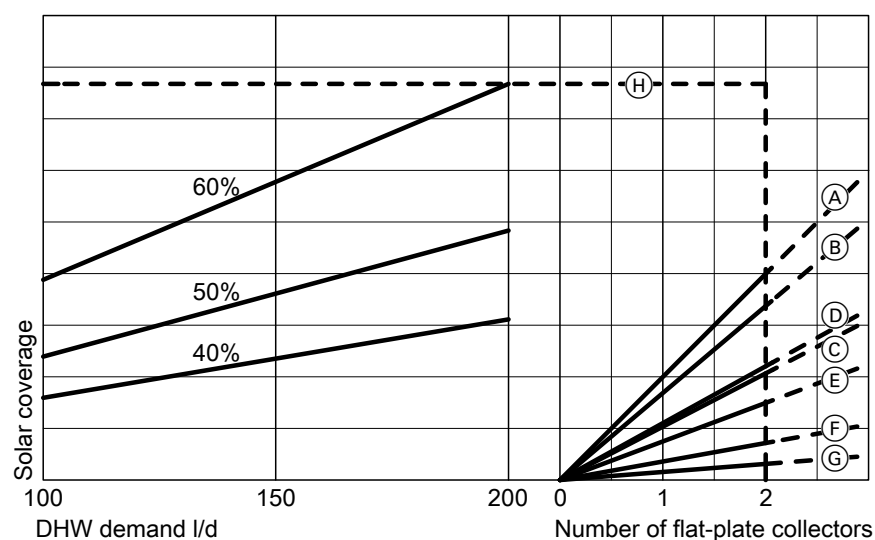


## Design information (cont.)

### Sizing aid for the Vitodens 242-F

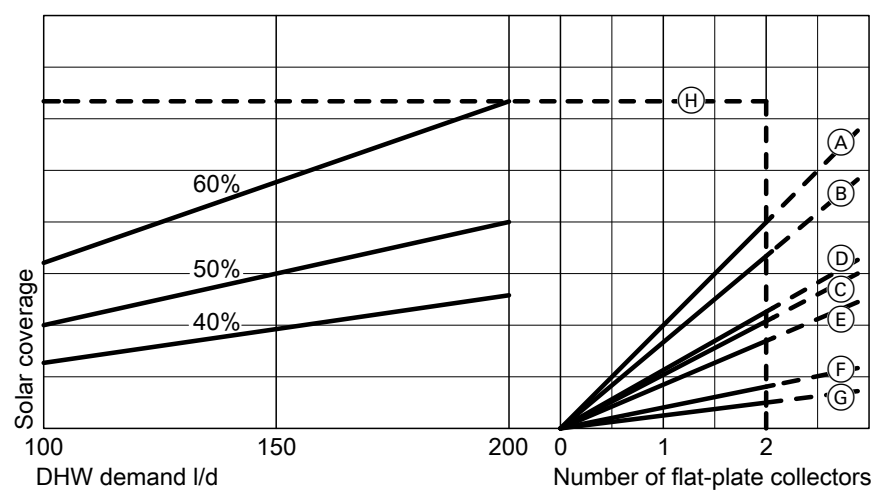
Sizing for the region Belgium, Poland, Lithuania, Latvia, Slovakia,  
Czech Republic and northern/central France  
Reference location Würzburg (DE)

Collector type Vitosol 100-F



- |                                     |                   |
|-------------------------------------|-------------------|
| (A) South 30°                       | (E) Southeast 90° |
| (B) Southwest 30° and southeast 30° | (F) West 90°      |
| (C) West 30° and east 30°           | (G) East 90°      |
| (D) Southwest 90° and south 90°     | (H) Sizing limit  |

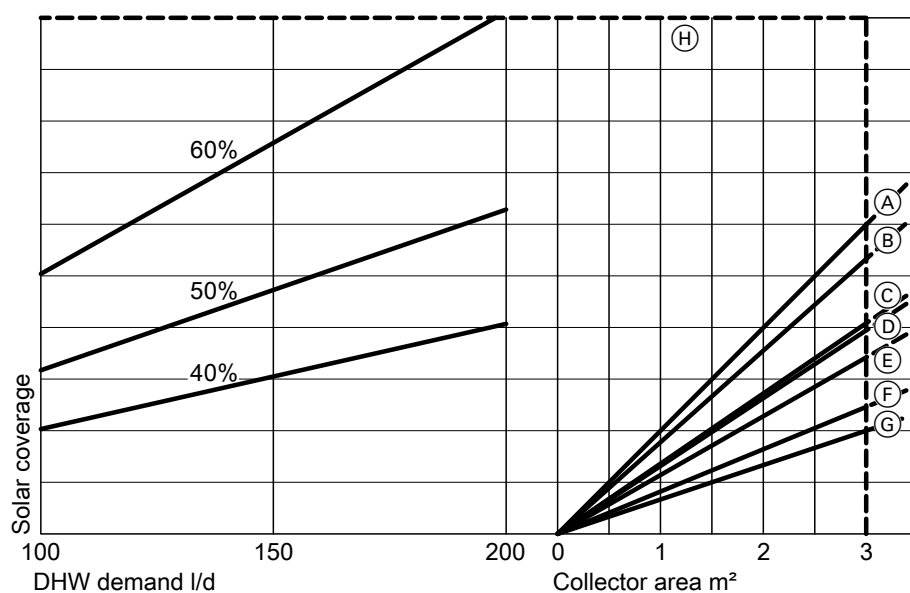
Collector type Vitosol 200-F and 300-F



- |                                     |                   |
|-------------------------------------|-------------------|
| (A) South 30°                       | (E) Southeast 90° |
| (B) Southwest 30° and southeast 30° | (F) West 90°      |
| (C) West 30° and east 30°           | (G) East 90°      |
| (D) Southwest 90° and south 90°     | (H) Sizing limit  |

## Design information (cont.)

### Collector type Vitosol 200-T and 300-T



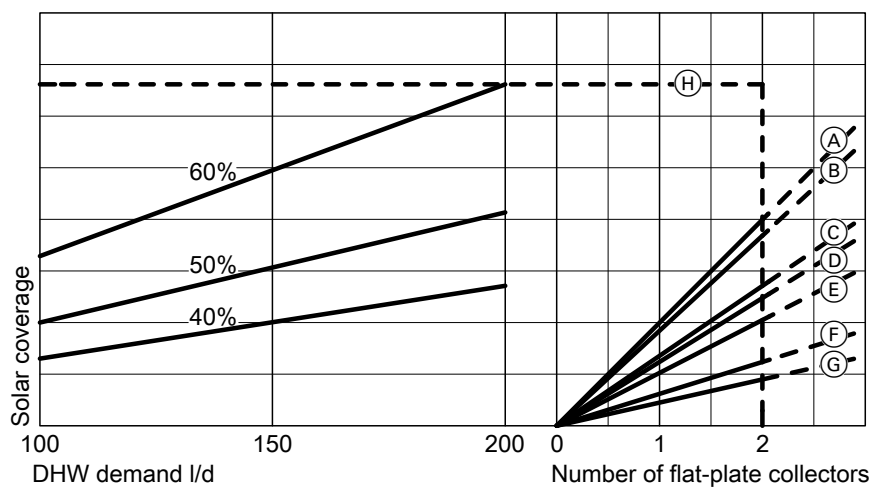
- (A) South 30°
- (B) Southwest 30° and southeast 30°
- (C) West 30° and east 30°
- (D) Southwest 90° and south 90°

- (E) Southeast 90°
- (F) West 90°
- (G) East 90°
- (H) Sizing limit

#### Sizing for the regions northern Italy, Hungary and Slovenia

Reference location Milan (IT)

### Collector type Vitosol 100-F

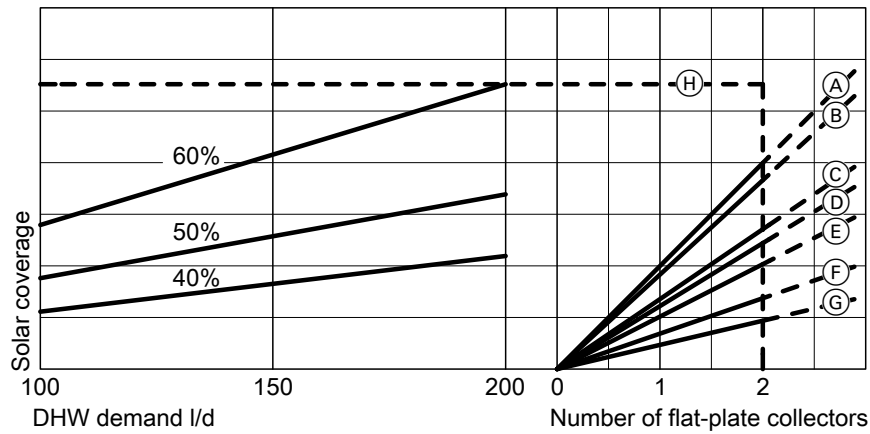


- (A) South 30°
- (B) Southwest 30° and southeast 30°
- (C) West 30° and east 30°
- (D) Southwest 90° and south 90°

- (E) Southeast 90°
- (F) West 90°
- (G) East 90°
- (H) Sizing limit

## Design information (cont.)

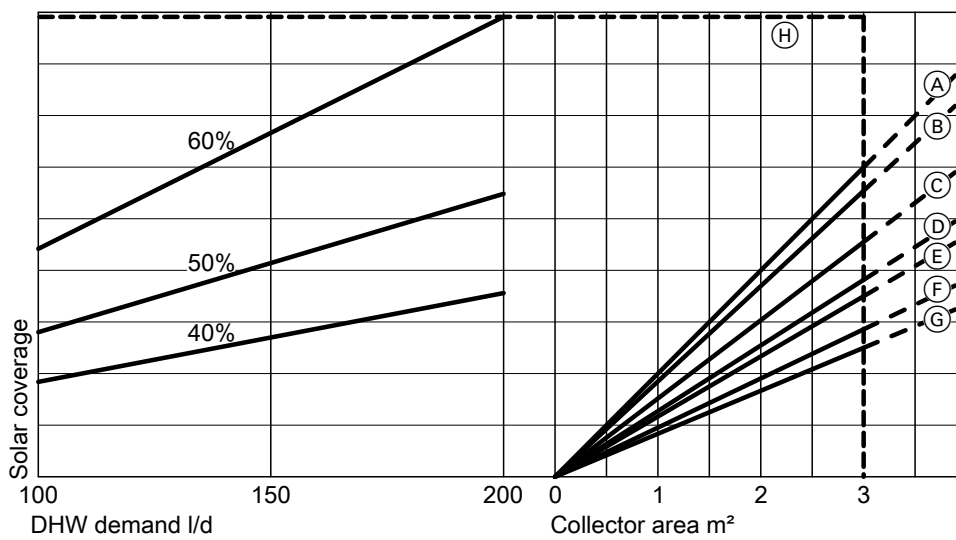
### Collector type Vitosol 200-F and 300-F



- (A) South 30°
- (B) Southwest 30° and southeast 30°
- (C) West 30° and east 30°
- (D) Southwest 90° and south 90°

- (E) Southeast 90°
- (F) West 90°
- (G) East 90°
- (H) Sizing limit

### Collector type Vitosol 200-T and 300-T



- (A) South 30°
- (B) Southwest 30° and southeast 30°
- (C) West 30° and east 30°
- (D) Southwest 90° and south 90°

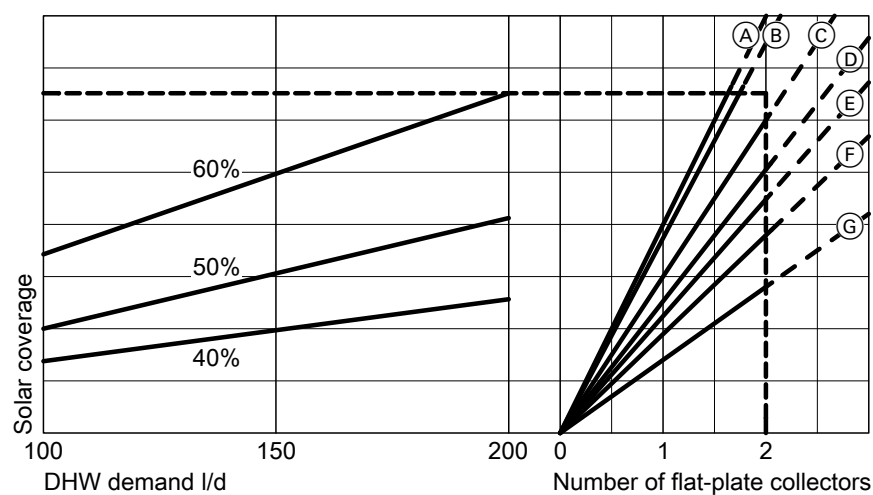
- (E) Southeast 90°
- (F) West 90°
- (G) East 90°
- (H) Sizing limit

### Sizing for the regions southern France, central/southern Italy and Turkey

Reference location Madrid (ES)

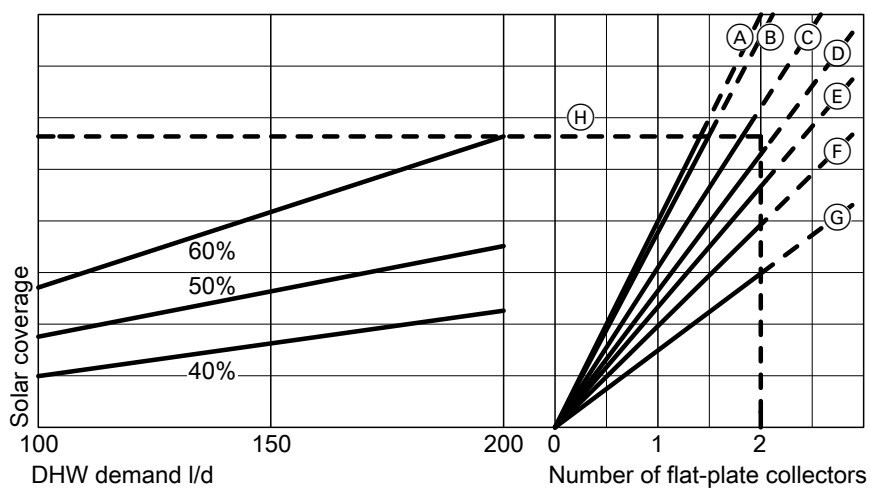
## Design information (cont.)

### Collector type Vitosol 100-F



- |                                     |                   |
|-------------------------------------|-------------------|
| (A) South 30°                       | (E) Southeast 90° |
| (B) Southwest 30° and southeast 30° | (F) West 90°      |
| (C) West 30° and east 30°           | (G) East 90°      |
| (D) Southwest 90° and south 90°     | (H) Sizing limit  |

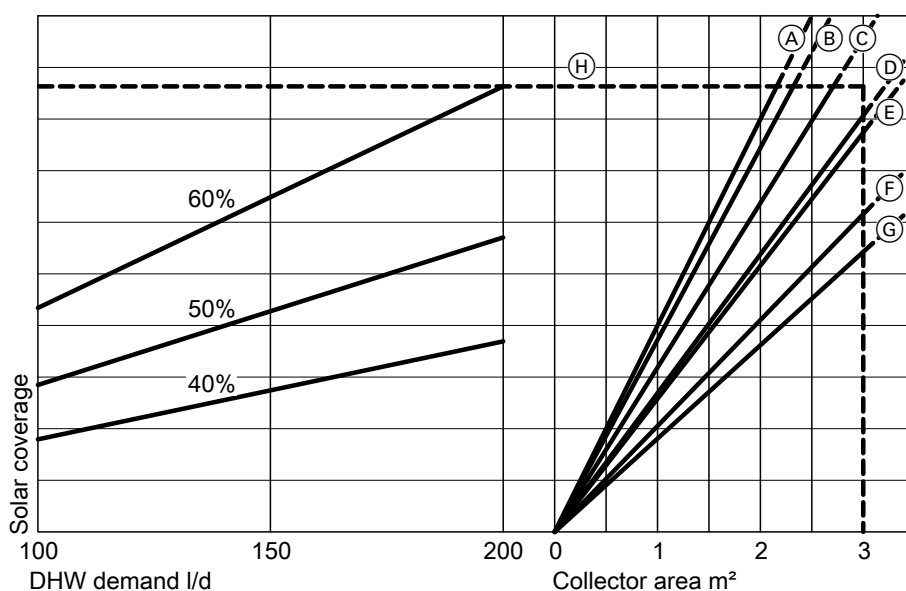
### Collector type Vitosol 200-F and 300-F



- |                                     |                   |
|-------------------------------------|-------------------|
| (A) South 30°                       | (E) Southeast 90° |
| (B) Southwest 30° and southeast 30° | (F) West 90°      |
| (C) West 30° and east 30°           | (G) East 90°      |
| (D) Southwest 90° and south 90°     | (H) Sizing limit  |

## Design information (cont.)

Collector type Vitosol 200-T and 300-T



- Ⓐ South 30°
- Ⓑ Southwest 30° and southeast 30°
- Ⓒ West 30° and east 30°
- Ⓓ Southwest 90° and south 90°

- Ⓔ Southeast 90°
- Ⓕ West 90°
- Ⓖ East 90°
- Ⓗ Sizing limit

## Control units

### 7.1 Vitotronic 100, type HC1A, for constant temperature operation

#### Structure and functions

##### Modular design

The control unit is integrated into the boiler.

The control unit comprises a standard unit, electronics modules and a programming unit.

Standard unit:

- ON/OFF switch
- Optolink laptop interface
- Operating and fault display
- Reset button
- Fuses



Programming unit:

- Easy operation through display with large font and depiction with good contrast
- Removable programming unit; can be mounted as option on the wall with separate accessory
- User prompts through pictograms
- Control keys for:
  - Navigation
  - Confirmation
  - Adjustments/menu
- Setting the:
  - Boiler water temperature
  - DHW temperature
  - Heating program
  - Codes
  - Actuator tests
  - Test mode
- Displaying:
  - Boiler water temperature
  - DHW temperature
  - Information
  - Operating details
  - Diagnostic details
  - Fault messages

##### Functions

- Electronic boiler control unit for operation at a constant boiler water temperature
- Room temperature-dependent operation requires a Vitotrol 100, type UTA, UTDB or UTDB-RF (according to EnEV [Germany])
- Heating system frost protection

5822 431 GB

## Control units (cont.)

- Anti-seizing pump protection
- Integral diagnostic system
- Cylinder thermostat with priority
- Control of solar DHW heating and central heating backup in conjunction with the solar control module, type SM1
- Auxiliary function for DHW heating (short-term heating to a higher temperature)
- Maintenance display
- External starting and blocking (in conjunction with extension EA1)

### Control characteristics

PI characteristics with modulating output.

### Setting the heating programs

The heating system frost protection (see frost protection function) applies to all heating programs.

The following heating programs can be selected:

- Heating and DHW
- Only DHW
- Standby mode

### Frost protection function

The frost protection function is active in all heating programs.

The burner is switched ON at a boiler water temperature of 5 °C and will be switched OFF again at a boiler water temperature of 20 °C.

The circulation pump will be switched ON simultaneously with the burner and switched OFF after a delay.

The DHW cylinder will be heated to approx. 20 °C.

To protect the system against frost, the circulation pump may be started at certain intervals (up to 24 times per day) for periods of approx. 10 minutes.

### Summer mode

Heating program "☀"

The burner starts only when the DHW cylinder needs to be heated up again.

### Boiler water temperature sensor

The boiler water temperature sensor is connected to the control unit and built into the boiler.

### Specification

Sensor type Viessmann NTC, 10 kΩ at 25 °C

Permissible ambient temperature

– during operation 0 to +130 °C  
– during storage and transport -20 to +70 °C

### Cylinder temperature sensor

For Vitodens with primary store or solar cylinder also an additional outlet temperature sensor.

These sensors are connected to the control unit and built into the boiler or cylinder.

### Specification

IP rating IP 32  
Sensor type Viessmann NTC 10 kΩ at 25 °C

Permissible ambient temperature

– during operation 0 to +90 °C  
– during storage and transport -20 to +70 °C

## Specification, Vitotronic 100

Rated voltage 230 V~

Rated frequency 50 Hz

Rated current 6 A

Protection class I

Function Type 1 B to EN 60730-1

Permissible ambient temperature

– during operation 0 to +40 °C

Installation in living spaces or boiler rooms  
(standard ambient conditions)

– during storage

and transport -20 to +65 °C

Electronic temperature

limiter setting

(heating mode) 82 °C (change not possible)

Setting range for  
the DHW temperature

– Vitodens with primary store

10 to 63 °C

– Vitodens with  
DHW cylinder

with internal indirect coil

10 to 68 °C

## 7.2 Vitotronic 200, type HO1A, for weather-compensated operation

### Structure and functions

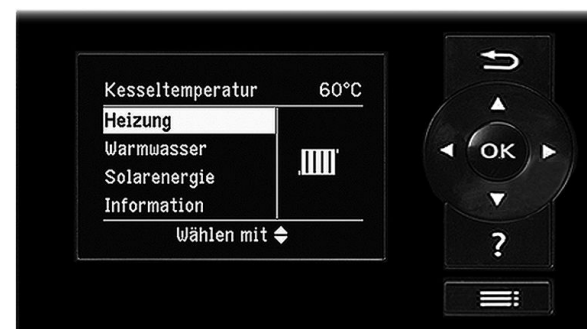
#### Modular structure

The control unit is integrated into the boiler.

The control unit comprises a standard unit, electronics modules and a programming unit.

Standard unit:

- ON/OFF switch
- Optolink laptop interface
- Operating and fault display
- Reset button
- Fuses



## Control units (cont.)

Programming unit:

- Easy operation through:
  - Plain text display with graphic ability
  - Large font and black/white depiction for good contrast
  - Context-sensitive help
  - Removable programming unit; can be mounted as option on the wall with separate accessory
- With digital time switch
- Control keys for:
  - Navigation
  - Confirmation
  - Help
  - Extended menu
- Setting the:
  - Room temperature
  - Reduced room temperature
  - DHW temperature
  - Heating program
  - Time programs for central heating, DHW heating and DHW circulation
  - Economy mode
  - Party mode
  - Holiday program
  - Heating curves
  - Codes
  - Actuator tests
  - Test mode
- Displaying:
  - Boiler water temperature
  - DHW temperature
  - Information
  - Operating details
  - Diagnostic details
  - Fault messages

### Functions

- Weather-compensated control of the boiler water and/or flow temperature
- Control of one heating circuit without mixer and two heating circuits with mixer
- Electronic maximum and minimum temperature limit
- Demand-dependent heating circuit pump and burner off control
- Adjustment of a variable heating limit
- Anti-seizing pump protection
- Heating system frost protection
- Integral diagnostic system
- Maintenance display
- Cylinder thermostat with priority
- Control of solar DHW heating in conjunction with solar control module SM1 (only with Vitodens 343-F)
- Display of the solar yield (only with Vitodens 343-F)
- Auxiliary function for DHW heating (short-term heating to a higher temperature)
- Screed drying program
- External starting and blocking (in conjunction with extension EA1)

The requirements of DIN EN 12831 for the heating load calculation are met. To reduce the heat-up load, the reduced room temperature will be raised in case of low outside temperatures. The flow temperature will be raised for a limited time to reduce the heat-up time after a set-back period.

According to the Energy Savings Order [Germany], the temperature in each room must be individually controlled, e.g. through thermostatic radiator valves.

### Control characteristics

PI characteristics with modulating output.

### Time switch

- Individual and 7-day program
- Automatic summer/winter time changeover

- Automatic function for DHW heating and DHW circulation pump
- Time, day and standard switching times for central heating, DHW heating and the DHW circulation pump are factory-set
- Switching times are individually programmable, i.e. up to four switching periods per day

Shortest switching interval: 10 minutes

Power backup: 14 days

### Setting the operating programs

The heating system frost protection (see frost protection function) applies to all heating programs.

The following heating programs can be selected:

- Heating and DHW
- Only DHW
- Standby mode

External heating program changeover in conjunction with EA1 extension.

### Frost protection function

- The frost protection function will be started when the outside temperature drops below approx. +1 °C. With frost protection, the heating circuit pump is switched ON and the boiler water is maintained at a lower temperature of approx. 20 °C. The DHW cylinder will be heated to approx. 20 °C.
- The frost protection function will be stopped when the outside temperature rises above approx. +3 °C.

### Summer mode

Heating program "☀"

The burner starts only when the DHW cylinder needs to be heated up again.

### Adjusting the heating curves (slope and level)

The Vitotronic 200 controls the boiler water temperature (= 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) in weather-compensated mode. The boiler water temperature is automatically boosted by between 0 and 40 K higher than the currently required set flow temperature (delivered condition 8 K).

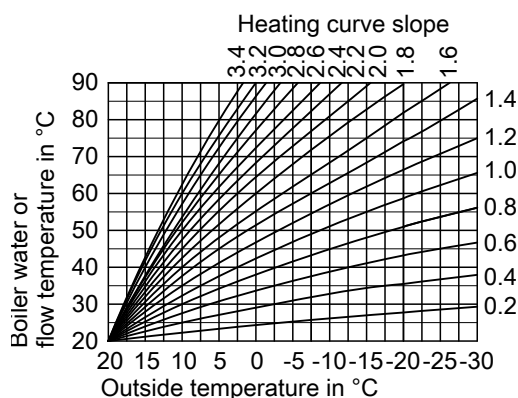
The flow temperature required to reach a specific room temperature depends on the heating system and the thermal insulation of the building to be heated.

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

Heating curves:

The upper boiler water temperature is limited by the temperature limiter and the temperature set at the electronic maximum thermostat.

The flow temperature cannot exceed the boiler water temperature.



## Control units (cont.)

### Heating systems with low loss header

When using a hydraulic separation (low loss header), connect a temperature sensor for use in the low loss header.

### Boiler water temperature sensor

The boiler water temperature sensor is connected to the control unit and built into the boiler.

#### Specification

Sensor type Viessmann NTC, 10 kΩ at 25 °C

Permissible ambient temperature

– during operation 0 to +130 °C  
– during storage and transport -20 to +70 °C

### Cylinder temperature sensor

For Vitodens with primary store or solar cylinder also an additional outlet temperature sensor.

These sensors are connected to the control unit and built into the boiler or cylinder.

#### Specification

IP rating IP 32  
Sensor type Viessmann NTC 10 kΩ at 25 °C

Permissible ambient temperature

– during operation 0 to +90 °C  
– during storage and transport -20 to +70 °C

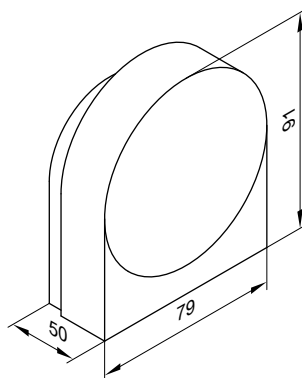
### Outside temperature sensor

Installation location:

- North or north-western 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 lead immediately next to 230/400 V cables



#### Specification

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

## Specification Vitotronic 200, type HO1A

Rated voltage 230 V~  
Rated frequency 50 Hz  
Rated current 6 A  
Protection class I  
Permissible ambient temperature  
– during operation 0 to +40 °C  
Installation in living spaces or boiler rooms (standard ambient conditions)  
– during storage and transport -20 to +65 °C  
Electronic temperature limiter setting (heating mode) 82 °C (change not possible)

Setting range for the DHW temperature  
– Vitodens with primary store 10 to 63 °C  
– Vitodens with DHW cylinder with internal indirect coil 10 to 68 °C  
Heating curve setting range  
Slope 0.2 to 3.5  
Level -13 to 40 K

## Solar control module, type SM1

Included in the standard delivery of the Vitodens 242-F.

### Construction

The solar control module contains:

- PCB
- Connection terminals for:
  - 2 sensors
  - Solar circuit pump
  - KM BUS
  - Power supply (on-site ON/OFF switch)
- PWM output for controlling the solar circuit pump

The standard delivery includes collector temperature sensor and cylinder temperature sensor.

### Collector temperature sensor

For connection inside the appliance.

On-site extension of the connecting lead:

- 2-core lead, length max. 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

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



## Control units (cont.)

### Cylinder temperature sensor

Installed in the Vitodens and connected.

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

#### Functions

- Switching the solar circuit pump
- Electronic limiter for the temperature in the DHW cylinder (safety shutdown at 90 °C)
- Collector safety shutdown
- Solar circuit pump speed control via wave pack control or solar circuit pump with PWM input (Grundfos)
- Suppression of DHW cylinder reheating by the boiler (auxiliary function for DHW heating is possible)
- Load balancing and diagnostic system

### Specification

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	1.5 W
Protection class	II
IP rating	IP 20 to EN 60529; ensure through design/installation
Function	Type 1B to EN 60730-1
Permiss. ambient temperature	
– during operation	0 to +40 °C use in the living space or in boiler rooms (standard ambient conditions)
– during storage and transport	-20 to +65 °C
Rated capacity of the relay outputs	
– Semi-conductor relay 1	1 (1) A, 230 V~
– Total	max. 2 A

## 7.3 Accessories for the Vitotronic

### Allocation to control unit types

Vitotronic	100	200
Type	HC1A	HO1A
<b>Accessories</b>		
Vitotrol 100, type UTA	x	
Vitotrol 100, type UTDB	x	
External extension H4	x	
Vitotrol 100, type UTDB-RF	x	
Vitotrol 200A		x
Vitotrol 300A		x
Room temperature sensor for Vitotrol 300A		x
Mounting base for programming unit	x	x
Radio clock receiver		x
Vitocom 100	x	x
Extension kit for one heating circuit with mixer with integral mixer motor		x
Extension kit for one heating circuit with mixer with separate mixer motor		x
Immersion thermostat for underfloor heating systems		x
Contact thermostat for underfloor heating systems		x
LON communication module		x
Open Therm extension	x	
LON cable		x
LON coupling		x
LON plug-in connector		x
LON socket		x
Terminator		x
KM BUS distributor		x
Immersion temperature sensor		x
Internal extension H1	x	x
Internal extension H2	x	x
Extension AM1	x	x
Extension EA1	x	x

### Vitotrol 100, type UTA

#### Part no. 7170 149

Room thermostat

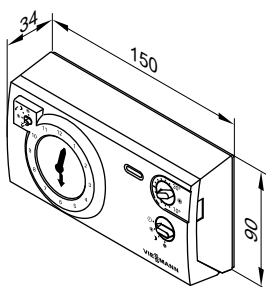
- With switching output (two-point output)
- With analog time switch
- With adjustable individual day program
- Standard switching times are factory-set (individually programmable)
- Shortest switching interval 15 minutes

Install the Vitotrol 100 in the main living room on an internal wall opposite radiators, but not inside shelf units, recesses, immediately by a door or a 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> (without green/yellow) for 230 V~.

## Control units (cont.)



Protection	IP 20 to EN 60529 safeguard through appropriate design and installation
Permissible ambient temperature	
– during operation	0 to +40 °C
– during storage and transport	-20 to +60 °C
Set value range for standard and reduced mode	10 to 30 °C
Set room temperature in standby mode	6 °C

### Specification

Rated voltage	230 V/50 Hz
Rated breaking capacity of the contact	6(1) A 250 V~

## Vitotrol 100, type UTDB

### Part no. Z007 691

Room temperature controller

- With switching output (two-point output)
- With digital time switch
- With individual and seven-day programs
- Programming unit 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

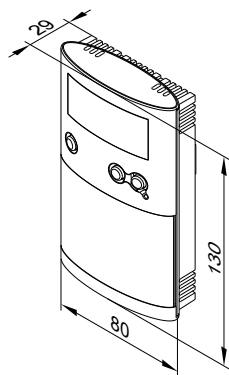
Installation in the main living room on an internal wall opposite radiators. Never install inside shelving units, in recesses, or immediately by a door or heat source (e.g. direct sunlight, fireplace, TV set, etc.). Operation without power supply (two 1.5 V round alkaline batteries, type LR6/AA, which run for approx. 1.5 years).

Control unit connection:

2-core lead 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 zero volt contact	
– max.	6(1) A, 230 V~
– min.	1 mA, 5 V–
IP rating	IP 20 to EN 60529; ensure through appropriate design/installation RS Type 1B to EN 60730-1
Function	
Permissible ambient temperature	
– during operation	0 to +40 °C
– during 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



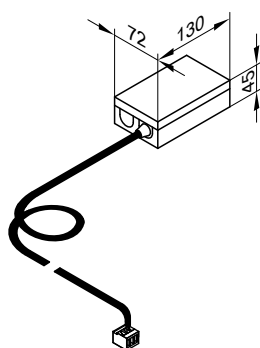
## External extension H4

### Part no. 7197 227

Connection extension for connecting the Vitotrol 100, type UTDB or 24 V clock thermostats via a LV cable.

With cable (0.5 m long) and plug for the connection to the Vitotronic 100.

## Control units (cont.)



### Specification

Rated voltage	230 V~
Output voltage	24 V~
Rated frequency	50 Hz
Power consumption	2.5 W
Load 24 V~ (max.)	10 W
Protection class	I
IP rating	IP 41
Permissible ambient temperature	0 to +40 °C
– during operation	Installation in living spaces or boiler rooms (standard ambient conditions)
– during storage and transport	-20 to +65 °C

## Vitotrol 100, type UTDB-RF

### Part no. Z007 692

Room temperature controller with integral wireless transmitter and one receiver

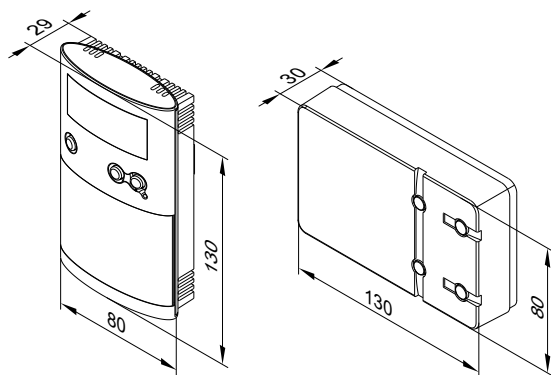
- With digital time switch
- With individual and seven-day programs
- Programming unit with user prompts:
  - 3 preselected time programs, individually adjustable
  - Constant manual mode with adjustable set room temperature
  - Frost protection mode
  - Holiday program
- With selector keys for party 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 without power supply (two 1.5 V round alkaline batteries, type LR6/AA, which run for 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 core 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



### Specification, room temperature controller

Rated voltage	3 V–
Transmission frequency	868 MHz
Transmission Range	< 10 mW approx. 25 to 30 m inside buildings, subject to construction
IP rating	IP 20 to EN 60529; ensure through appropriate design/installation
Function	RS Type 1B to EN 60730-1
Permissible ambient temperature	0 to +40 °C
– during operation	
– during 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 zero volt contact	
– max.	6(1) A, 230 V~
– min.	1 mA, 5 V–
IP rating	IP 20 to EN 60529; ensure through appropriate design/installation
Protection class	II to EN 60730-1 subject to correct installation
Permissible ambient temperature	0 to +40 °C
– during operation	
– during storage and transport	-25 to +65 °C

## Notes regarding room temperature hook-up (RS function) for remote control units

Never activate the RS function for underfloor heating circuits (inertia).

In heating systems with a heating circuit without mixer and heating circuits with mixer, the RS function must only affect the heating circuit with mixer.

## Control units (cont.)

### Information regarding the Vitotrol 200A and 300A

Vitotrol 200A and 300A may be combined in a single heating system.

The Vitotrol 200A can regulate one heating circuit, the Vitotrol 300A up to 3 heating circuits.

#### Vitotrol 200A

##### Part no. Z008 341

KM BUS subscriber

A Vitotrol 200A can be used for each heating circuit in a heating system. Up to 2 remote controls may be connected to the control unit.

##### Functions:

- Display of room temperature, outside temperature and the operating condition.
- Setting the standard room temperature (day temperature) and operating program via the standard display.

##### Note

*The reduced room temperature (night temperature) is set at the control unit.*

- Party and economy mode can be enabled via keys
- Only for heating circuit with mixer:  
Room temperature sensor for room temperature hook-up

##### Note

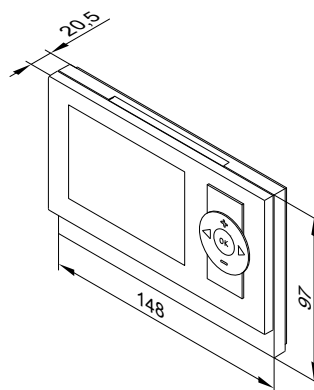
*For room temperature hook-up, the Vitotrol 200A must be installed in the living space (lead room).*

##### Installation location:

- Weather-compensated mode:  
Installation at any point in the building.
- Room temperature hook-up:  
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.). The integral room temperature sensor captures the actual room temperature and effects any necessary correction of the flow temperature as well as a rapid heat-up at the start of the heating operation (if suitably encoded).

##### Connection:

- 2-core lead, length max. 50 m (even if connecting several remote control units)
- Never route this lead immediately next to 230/400 V cables
- LV plug as standard delivery



##### Specification

Power supply via KM BUS

Power consumption

Protection class

IP rating

0.2 W

III

IP 30 to EN 60529;  
ensure through appropriate design/installation

Permissible ambient temperature

– during operation

– during storage and transport

Set room temperature range

0 to +40 °C

-20 to +65 °C

3 to 37 °C

#### Vitotrol 300A

##### Part no. Z008 342

KM BUS subscriber

Up to 3 heating circuits can be operated with one Vitotrol 300A; alternatively one Vitotrol 300A can be employed for each heating circuit in a single heating system.

Up to 2 remote controls may be connected to the control unit.

##### Functions:

- Displaying:
  - Room temperature
  - Outside temperature
  - Heating program
  - Operating condition
  - Solar yield as graphic display
- Settings:
  - Set room temperatures for standard mode (day temperature) and reduced mode (night temperature) via the standard display
  - Heating program, switching times for heating circuits, DHW heating and DHW circulation pump plus further settings via plain text menu on the display

- Party and economy mode can be enabled via the menu

- Only for heating circuit with mixer:

Room temperature sensor for room temperature hook-up

##### Note

*For room temperature hook-up, the Vitotrol 300A must be installed in the living space (lead room).*

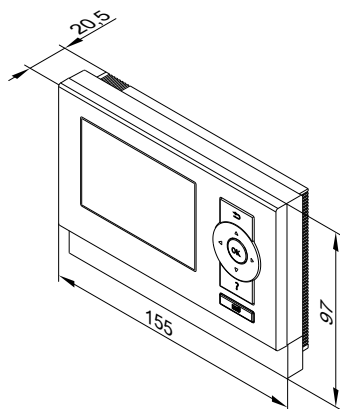
##### Installation location:

- Weather-compensated mode:  
Installation anywhere in the building.
- Room temperature hook-up:  
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.). The integral room temperature sensor captures the actual room temperature and effects any necessary correction of the flow temperature as well as a quick heat-up at the start of the heating operation (if suitably encoded).

##### Connection:

- 2-core lead, length max. 50 m (even if connecting several remote control units)
- Never route this lead immediately next to 230/400 V cables
- LV plug as standard delivery

## Control units (cont.)



### Specification

Power supply via KM BUS	
Power consumption	0.5 W
Protection class	III
IP rating	IP 30 to EN 60529; ensure through appropriate design/installation
Permissible ambient temperature	
– during operation	0 to +40 °C
– during storage and transport	–20 to +65 °C
Set room temperature range	3 to 37 °C

## Room temperature sensor

### Part no. 7438 537

Separate room temperature sensor as supplement to the Vitotrol 300A; to be used if the Vitotrol 300A cannot be installed inside the main living room or in a suitable position where the unit could capture and adjust the temperature.

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

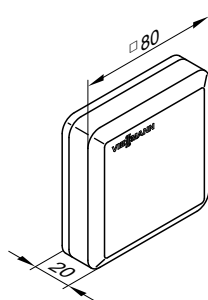
Connect the room temperature sensor to the Vitotrol 300A.

Connection:

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

### Specification

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



## Mounting base for programming unit

### Part no. 7299 408

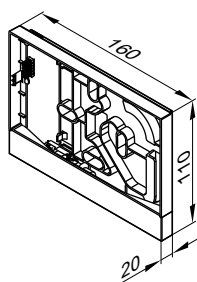
To be able to freely position the programming unit of the control unit anywhere outside the appliance.

To be fitted directly to the wall or a surface box.

Distance from the boiler: Observe the lead length incl. plugs of 5 m.

Comprising:

- Wall mounting base with fixing materials
- 5 m long cable with plugs
- Cover for the control unit aperture on the boiler



## Control units (cont.)

### Radio clock receiver

#### Part no. 7450 563

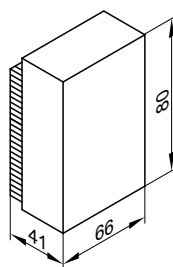
For receiving the DCF 77 time signal (location: Mainflingen near Frankfurt/Main).

Radio controlled setting of time and date.

Install on an outside wall, facing the transmitter. The reception may be reduced by metallic elements in the building structure, e.g. steel reinforced concrete, neighbouring buildings and sources of electro-magnetic interference, e.g. HV and public transport lines.

Connection:

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



### Vitocom 100, type GSM

- Without SIM card

#### Part no. Z004594

- With contract SIM card for the operation of the Vitocom 100 via mobile phone

#### Part no. Z004615

#### Note

For further information regarding the conditions of contract, see the Viessmann pricelist.

#### Functions:

- Remote switching via GSM mobile phone networks
- Remote scanning via GSM mobile phone networks
- Remote monitoring via SMS to 1 or 2 mobile phones
- Remote monitoring of additional systems via digital input (230 V)

#### Configuration:

Mobile phones via SMS

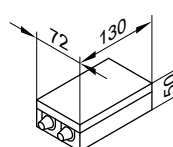
#### Standard delivery:

- Vitocom 100 (subject to order with or without SIM card)
- Power supply cable with Euro plug (2.0 m long)
- GSM aerial (3.0 m long), magnetic foot and adhesive pad
- KM BUS cable (3.0 m long)

#### On-site requirements:

Good reception for GSM communication of the selected mobile phone operator.

Total length of all KM BUS subscriber cables up to 50 m.



#### Specification

Rated voltage	230 V ~
Rated frequency	50 Hz
Rated current	15 mA
Power consumption	4 W
Protection class	II
Protection	IP 41 to EN 60529; safeguard through appropriate design and installation
Function	Type 1B to EN 60 730-1
Permissible ambient temperature – during operation	0 to +55 °C Installation in living spaces or boiler rooms (standard ambient conditions)
– during storage and transport	-20 to +85 °C
On-site connection	
Fault input DE 1	230 V~

### Extension kit for one heating circuit with mixer with integral mixer motor

#### Part no. 7301 063

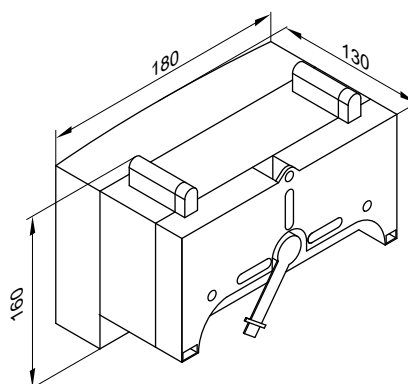
KM BUS subscriber

Components:

- Mixer PCB with mixer motor for Viessmann mixer DN 20 to 50 and R ½ to 1¼
- Flow temperature sensor (contact temperature sensor), lead length 2.2 m, fully wired, for specification see below
- Connecting plug for the heating circuit pump
- Power cable (3.0 m long)
- BUS cable (3.0 m long)

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

#### Mixer PCB with mixer motor



## Control units (cont.)

### Specification

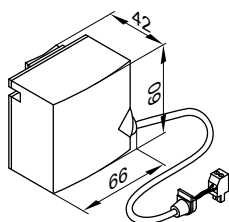
Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	5.5 W
IP rating	IP 32D to EN 60529 ensure through appropriate design/installation
Protection class	I
Permissible ambient temperature	
– during operation	0 to +40 °C
– during storage and transport	–20 to +65 °C
Rated breaking capacity of the relay output for heating circuit pump [20]	2(1) A 230 V~
Torque	3 Nm
Runtime for 90 ° <	120 s

Secured with a tie.

### Specification

IP rating	IP 32D to EN 60529 ensure through appropriate design/installation
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– during operation	0 to +120 °C
– during storage and transport	–20 to +70 °C

### Flow temperature sensor (contact sensor)



## Extension kit for one heating circuit with mixer for separate mixer motor

### Part no. 7301 062

KM BUS subscriber

For the connection of a separate mixer motor.

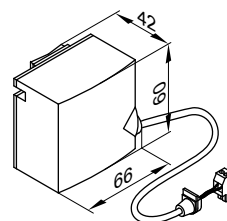
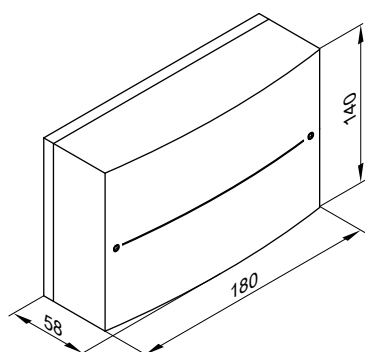
Components:

- Mixer PCB for the connection of a separate mixer motor
- Flow temperature sensor (contact temperature sensor), lead length 5.8 m, fully wired
- Connecting plug for the heating circuit pump
- Mixer motor terminals
- Power cable (3.0 m long)
- BUS cable (3.0 m long)

Protection class	I
Permissible ambient temperature	
– during operation	0 to +40 °C
– during storage and transport	–20 to +65 °C
Rated capacity of the relay outputs	
Heating circuit pump [20]	2(1) A 230 V~
Mixer motor	0.1 A 230 V~
Required runtime of the mixer motor for 90° <	approx. 120 s

### Flow temperature sensor (contact sensor)

### Mixer PCB



Secured with a tie.

### Specification

IP rating	IP 32D to EN 60529 ensure through appropriate design/installation
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– during operation	0 to +120 °C
– during storage and transport	–20 to +70 °C

### 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 appropriate design/installation

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VITODENS

VIESSMANN 91

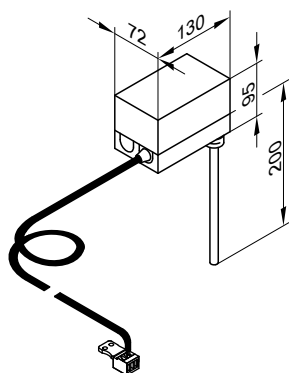
## Control units (cont.)

### Immersion thermostat

#### Part no. 7151 728

May be used as a maximum temperature limiter for underfloor heating systems.

The temperature limiter is installed into the heating flow and switches the heating circuit pump OFF if the flow temperature is too high.



#### Specification

Lead length  
Setting range  
Switching differential  
Breaking capacity  
Setting scale  
Stainless steel sensor well  
DIN reg. no.

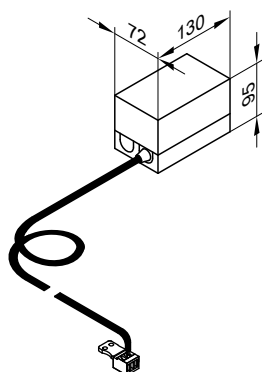
4.2 m, fully wired  
30 to 80 °C  
max. 11 K  
6(1.5) A 250 V~  
inside the casing  
R 1/2" x 200 mm  
DIN TR 116807  
or  
DIN TR 96808

### Contact thermostat

#### Part no. 7151 729

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

The temperature limiter is installed into the heating flow and switches the heating circuit pump OFF if the flow temperature is too high.



#### Specification

Lead length  
Setting range  
Switching differential  
Breaking capacity  
Setting scale  
DIN reg. no.

4.2 m, fully wired  
30 to 80 °C  
max. 14 K  
6(1.5) A 250V~  
inside the casing  
DIN TR 116807  
or  
DIN TR 96808

### LON communication module

PCB for data exchange with the Vitotronic 200-H, Vitocom 200 and for connecting to a higher level building management system.

Part no. 7179 113

### Open Therm extension

#### Part no. 7426 563

PCB for the connection of an external Open Therm controller.

For installation in the Vitotronic.

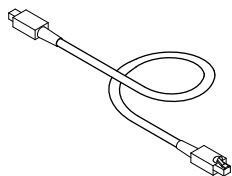


## Control units (cont.)

### LON connecting cable for data exchange between control units

Part no. 7143 495

Cable length 7 m, fully wired.



### Extension of the connecting cable

- Installation spacing 7 to 14 m:
  - 2 connecting cables (7.0 m long)  
**Part no. 7143 495**
  - 1 LON coupling RJ45  
**Part no. 7143 496**
- Installation distance 14 to 900 m with plug-in connectors:
  - 2 LON plug-in connectors  
**Part no. 7199 251**
  - 2-core cable:
    - CAT5, screened
    - or
    - Solid conductor AWG 26-22 / 0.13 mm<sup>2</sup> - 0.32 mm<sup>2</sup>,  
Conductor AWG 26-22 / 0.14 mm<sup>2</sup> - 0.36 mm<sup>2</sup>  
Ø 4.5 mm - 8 mm
  - on-site**
- Installation distance 14 to 900 m with junction boxes:
  - 2 connecting cables (7.0 m long)  
**Part no. 7143 495**
  - 2-core cable:
    - CAT5, screened
    - or
    - Solid conductor AWG 26-22 / 0.13 mm<sup>2</sup> - 0.32 mm<sup>2</sup>,  
Conductor AWG 26-22 / 0.14 mm<sup>2</sup> - 0.36 mm<sup>2</sup>  
Ø 4.5 mm - 8 mm
  - on-site**
  - 2 LON sockets RJ45, CAT6  
**Part no. 7171 784**

### Terminator (2 pce.)

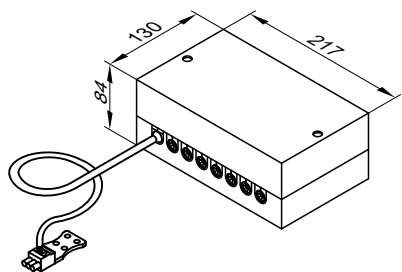
Part no. 7143 497

To terminate the LON BUS at the first and last control unit.

### KM BUS distributor

Part no. 7415 028

For the connection of 2 to 9 devices to the Vitotronic KM BUS.



#### Specification

Lead length  
Protection

3.0 m, fully wired  
IP 32 to EN 60529;  
safeguard through appropriate design and installation

Permissible ambient temperature  
– during operation  
– during storage and transport

0 to +40 °C  
-20 to +65 °C

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### Immersion temperature sensor

Part no. 7179 488

To capture the low loss header temperature.

## Control units (cont.)

### Specification

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

## Internal extension H1

### Part no. 7179 057

The internal extension H1 is part of the standard delivery and is integrated.

Using the extension enables the following functions to be achieved:

Function	Rated breaking capacity of the relay output
– Connection of an external safety solenoid valve (LPG)	1(0.5) A 250 V~
and <b>one</b> of the following functions (only for Vitodens 333-F, type FR3B):	2(1) A 250 V~
– Connection of a heating circuit pump for a directly connected heating circuit	
– Connection of a central fault message	
– Only with Vitotronic 200, type HO1A:	
Connection of a DHW circulation pump	

### Specification

Rated voltage	230 V~
Rated frequency	50 Hz

## Internal extension H2

### Part no. 7179 144

PCB for installation in the control unit, in place of the integral internal extension H1.

Using the extension enables the following functions to be achieved:

Function	Rated breaking capacity of the relay output
– External extractor interlock	6(3) A 250 V~
and <b>one</b> of the following functions (only for Vitodens 333-F, type FR3B):	2(1) A 250 V~
– Connection of a heating circuit pump for a directly connected heating circuit	
– Connection of a central fault message	
– Only with Vitotronic 200, type HO1A:	
Connection of a DHW circulation pump	

### Specification

Rated voltage	230 V~
Rated frequency	50 Hz

## Extension AM1

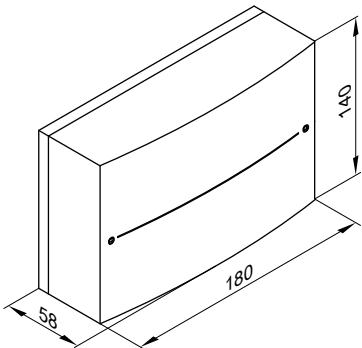
### Part no. 7429 152

Function extension inside the casing for wall mounting.

Using the extension enables up to two of the following functions to be achieved:

Function	Rated breaking capacity of the relay output
– Switching the DHW circulation pump (only with the Vitotronic 200, type HO1A)	every 2(1) A 250 V~
– Switching the heating circuit pump for a directly connected heating circuit	total max. 4 A~
– Switching the circulation pump for cylinder heating (not for boilers with integral DHW cylinder)	

Control units (cont.)



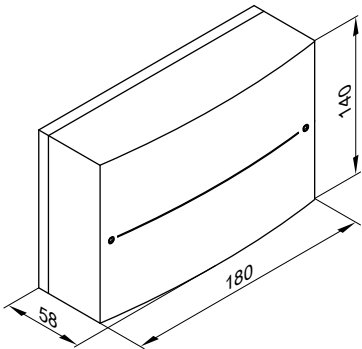
<b>Specification</b>	
Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	4 A
Power consumption	4 W
Protection class	I
IP rating	IP 20 D to EN 60529 ensure through appropriate design/installation
Permissible ambient temperature	
– during operation	0 to +40 °C Installation in living spaces or boiler rooms (standard ambient conditions)
– during storage and transport	-20 to +65 °C

Extension EA1

**Part no. 7429 151**  
Function extension inside the casing for wall mounting.

Using the inputs and outputs enables up to 5 functions to be achieved:

Function	Rated breaking capacity of the relay output
1 switching output (zero volt changeover contact) – Central fault message output – Switching a feed pump to a substation – Switching the DHW circulation pump (only with the Vitotronic 200, type HO1A)	2(1) A 250 V~
1 analogue input (0 to 10 V) – Set boiler water temperature default	
3 digital inputs – External heating program changeover for 1 to 3 heating circuits (only with Vitotronic 200, type HO1A) – External blocking – External blocking with central fault message – Minimum boiler water temperature demand – Fault messages – Brief operation, DHW circulation pump	



<b>Specification</b>	
Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	4 A
Power consumption	4 W
Protection class	I
IP rating	IP 20 D to EN 60529 ensure through appropriate design/installation
Permissible ambient temperature	
– during operation	0 to +40 °C Installation in living spaces or boiler rooms (standard ambient conditions)
– during storage and transport	-20 to +65 °C

Appendix

8.1 Regulations / Directives

Regulations and Directives

The design and operational characteristics of the Vitodens gas condensing boilers from Viessmann meet the requirements of EN 297. They are CE-designated.  
They may be installed in sealed heating systems with permissible flow temperatures (= safety temperatures) up to 100 °C compliant with EN 12828. The maximum flow temperature is approx. 15 K below the safety temperature.

Observe all standards and guidelines applicable to the installation and operation of this system in your country.  
Only qualified contractors must carry out the installation, the mains gas and flue gas connections, the commissioning, the electrical connection as well as general maintenance and repair work.  
The installation of a condensing boiler may need to be notified to and approved by your local gas supply utility.

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## Appendix (cont.)

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In some regions, permits may be required for the flue system and condensate drain into the public sewer.

In some countries, the relevant flue gas inspector and water authorities must be informed prior to commencing the installation.

We recommend that you carry out maintenance and cleaning procedures annually. As part of the maintenance procedure, check the correct function of the entire system. Remedy any faults.

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

Only recognised contractors may convert this boiler for use in countries other than those stated on the type plate. That contractor must also arrange the acceptance in accordance with the statutes of that country.

EnEV [Germany]	Energy Savings Ordinance
1. BImSchV	First order for the implementation of the German Immissions Act (order regarding small and medium-sized combustion equipment)
FeuVo [Germany]	Fire Regulations of the Federal States
DIN 1986	Materials for dewatering system
DIN 1988	Potable water pipe systems on properties
DIN 4753	Water heaters and DHW systems for DHW and process water
DIN 18160	Domestic chimneys
DIN 18380	Heating systems and central DHW heating systems (VOB)
DIN 57116	Electrical equipment for combustion systems
EN 677	Gas condensing boiler
EN 12828	Heating systems in buildings – design of hot water heating systems
EN 12831	Heating systems in buildings - process for calculating the standard heat load
EN 13384	Flue gas systems – thermal and flow technical calculations
ATV DVWK A 251	Introduction of condensate from gas and oil combustion systems [into public sewers]
DVGW G 260	Gas condition
DVGW G 600	Technical rules for gas installations (TRGI)
DVGW G 688	Gas consumption equipment, condensing technology
DVGW/DVFG	Technical rules for LPG (TRF)
DVGW VP 113	Systems comprising combustion equipment and flues
VDI 2035	Guidelines for the prevention of losses through corrosion and scaling in hot water heating systems
VdTÜV 1466	Water quality datasheet
VDE Regulations and special regulations of local energy supply companies.	

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Viessmann Werke GmbH&Co KG  
D-35107 Allendorf  
Telephone: +49 6452 70-0  
Fax: +49 6452 70-2780  
[www.viessmann.com](http://www.viessmann.com)

Viessmann Limited  
Hortonwood 30, Telford  
Shropshire, TF1 7YP, GB  
Telephone: +44 1952 675000  
Fax: +44 1952 675040  
E-mail: [info-uk@viessmann.com](mailto:info-uk@viessmann.com)

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