

# Technical Data Manual

Model Nos. and pricing: see Price List



## Vitodens 200-W, B2HE

### Models 85 to 199

Wall mounted gas-fired condensing boiler with 7 inch color touchscreen display

For operation with natural gas or liquid propane gas

Heating Input: 8.5 to 199 MBH

2.5 to 58.3 kW



## VITODENS 200-W



*Product may not be exactly as shown*

### Vitodens 200-W, Series B2HE

Gas-Fired Wall-Mounted Condensing Boiler with modulating MatrixPlus cylinder burner for room air independent operation (using a direct vent system) or room air dependent operation.



## Vitodens 200-W

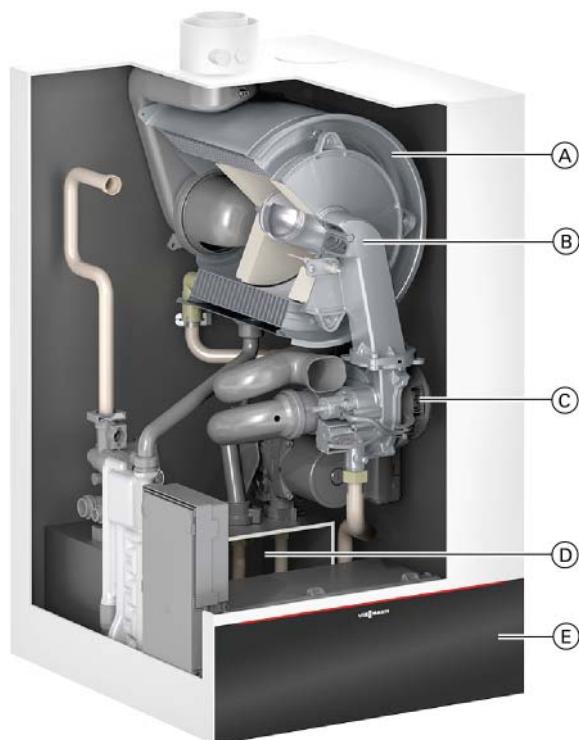
Equipped with the industry's first intelligent combustion management system and powerful control technology, the new generation Vitodens 200-W gas-fired wall-mount condensing boiler delivers unparalleled performance, reliability and comfort.

### The benefits at a glance:

- Best value in its class with new industry-leading technology and the most standard features.
- Highest Efficiency up to 98% at full modulation and up to 95% A.F.U.E.
- Lasting performance with industry-leading Viessmann made SA240 / S43932 stainless steel Inox-Radial heat exchanger constructed to CSA B51 and ASME Section IV.
- Low Emission Combustion with Viessmann made stainless steel MatrixPlus cylinder burner. Factory calibrated.
- Fast Installation and Reduced Maintenance with Lambda Pro, industry-first intelligent combustion management system: Adjusts automatically to gas type and quality. No fuel conversion kit required.
- Powerful and User-friendly  
Viessmann 7 in. color touchscreen control with on-board multi-function outdoor reset boiler and system control for multi-temperature space and DHW heating.
- Zone circuit capabilities provide 4 input connections that allow easy integration of third party components such as thermostats, SIM controls, Multizone controllers, and other smart or on/off control technologies.
- Commission assistant that prompts the installer for the relevant information necessary to setup the system without having to go into complex settings parameters.
- The unique capability allows the installer to combining temperature setpoint operation and outdoor reset capability. This means that one or all of the 4 zone circuits control can operate on a set temperature, or vary based on the outdoor reset curve that is selected in the start-up wizard.
- Control of up to 3 mixing valve circuits using mixing valve extension module (optional accessory).
- Greater Venting Flexibility with increased vent length up to 180 ft. (55 m) and multiple venting options.
  - Horizontal or vertical sealed combustion coaxial venting (field supplied).
  - Horizontal, vertical or hybrid sealed combustion double-pipe venting (field supplied).
  - Horizontal or vertical single-wall venting (field supplied).
- Compact, Esthetic Product Design and zero clearance to combustibles.
- Extremely Quiet Operation; quieter than most refrigerators.
- True High-Altitude Operation up to 10,000 ft. (3,000 m) with simple electronic adjustment.
- Efficiency up to 98% through intensive condensation. The flue gas temperature is only approximately 9-27°F (5-15°C) above boiler return temperature (see chart below).
- Integrated variable speed boiler pump.

# Cross-Section

Vitodens 200-W B2HE 85, 120, 150, 199



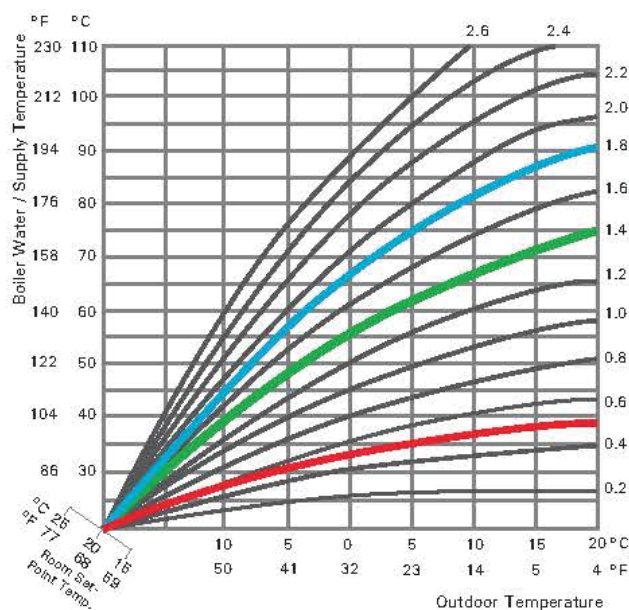
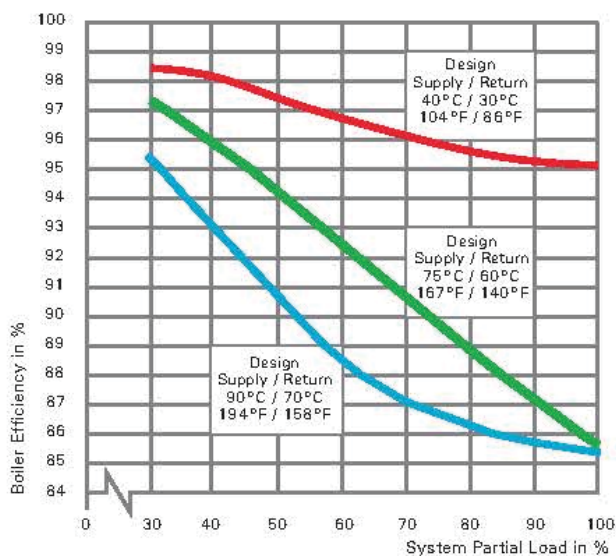
## Legend

- Ⓐ Inox-Radial heat exchanger made from stainless steel – for high operational reliability and a long service life. Large heating output in the smallest of spaces
- Ⓑ Modulating MatrixPlus cylinder burner for extremely clean combustion and quiet operation
- Ⓒ Variable speed combustion fan for quiet and economical operation
- Ⓓ Gas and water connections
- Ⓔ 7 in. color touch screen digital boiler control unit

## Delivered condition

Wall mounted gas condensing boiler with Inox-Radial heat exchanger, modulating MatrixPlus cylinder burner for natural gas and LPG, plus wall mounting bracket. 7 in. touchscreen display with weather-compensated operation. Preset for operation with natural gas. Fully plumbed and wired. White epoxy-coated casing.

The flue gas temperature is only approximately 9-27°F (5-15°C) above boiler return temperature (see chart below).



## Technical Data

Boiler Model No. 200-W B2HE		85	120	150	199
CSA input Natural Gas (NG)	MBH	8.5-85	8.5-120	14-150	14-199
	kW	2.5-24.9	2.5-35.2	4.1-44.0	4.1-58.3
CSA input Liquid Propane Gas (LPG)	MBH	14-85	14-120	22.7-150	22.7-199
	kW	4.1-24.9	4.1-35.2	6.7-44.0	6.7-58.3
CSA output/DOE *1 heating capacity NG	MBH	8-80	8-113	13-141	13-187
	kW	2.3-23.4	2.3-33.1	3.8-41.3	3.8-54.8
CSA output/DOE *1 heating capacity LPG	MBH	13-80	13-113	21-141	21-187
	kW	3.8-23.4	3.8-33.1	6.1-41.3	6.1-54.8
Net AHRI rating *2	MBH	70	98	123	163
	kW	20.5	28.7	36.0	47.8
Heat exchanger surface area	ft. <sup>2</sup>	12.96	12.96	27.44	27.44
	m <sup>2</sup>	1.20	1.20	2.55	2.55
Min. gas supply pressure					
Natural gas	"w.c.	4	4	4	4
Liquid propane gas	"w.c.	10	10	10	10
Max. gas supply pressure *3					
Natural gas and liquid propane gas	"w.c.	14	14	14	14
A.F.U.E.	%	95	95	95	95
Weight	lbs	108	108	179	179
	(kg)	49	49	81	81
Boiler water content	USG	1.02	1.02	2.5	2.5
	L	3.88	3.88	9.50	9.50
Boiler max. flow rate *4	GPM	5.3	6.2	9.3	10.6
	L/h	1204	1408	2112	2408
Max. operating pressure at 210°F (99°C)	psig	45	45	60	60
	bar	(3)	(3)	(4)	(4)
Boiler water temperature					
- Adjustable high limit (AHL) range space heating (steady state)	°F	68-180	68-180	68-180	68-180
	°C	20-82	20-82	20-82	20-82
DHW production	°F	194	194	194	194
	°C	90	90	90	90
- Fixed high limit (FHL)	°C (°F)	99 (210)	99 (210)	99 (210)	99 (210)
Boiler connections					
Boiler heating supply and return	NPTM	¾ in.	¾ in.	1 in.	1 in.
Pressure relief valve	NPTF	¾ in.	¾ in.	¾ in.	¾ in.
Drain valve	(male thread)	¾ in.	¾ in.	¾ in.	¾ in.
Boiler supply/return for indirect-fired DHW storage tank	NPT	¾ in.	¾ in.	1 in.	1 in.
Gas valve connection	NPTF	¾ in.	¾ in.	¾ in.	¾ in.

\*1 Output based on 140°F (60°C), 120°F (49°C) system supply/return temperature.

\*2 Net AHRI rating based on piping and pick-up allowance of 1.15.

\*3 If the gas supply pressure exceeds the maximum gas supply pressure value, a separate gas pressure regulator must be installed upstream of the heating system.

\*4 See "Waterside Flow" starting on page 8 in this manual.

**Technical Data** *(continued)*

Boiler Model No. 200-W B2HE		85	120	150	199
<b>Dimensions</b>					
Overall depth	in. (mm)	19 ¾ (500)	19 ¾ (500)	21 ¾ (550)	21 ¾ (550)
Overall width	in. (mm)	17 ¾ (450)	17 ¾ (450)	17 ¾ (450)	17 ¾ (450)
Overall height	in. (mm)	33 ¾ (859)	33 ¾ (859)	39 (989)	39 (989)
<b>Flue gas *5</b>					
Temperature (at boiler return temperature of 86°F (30°C))					
- at rated full load	°F (°C)	99 (37)	102 (39)	106 (41)	104 (40)
- at rated partial load	°F (°C)	95 (35)	95 (35)	111 (44)	113 (45)
Temperature (at boiler return temperature of 140°F (60°C))	°F (°C)	144 (62)	145 (63)	151 (66)	149 (65)
<b>Flue gas parameters</b>					
<b>Mass flow rate</b>					
- at rated heating output	lb/h	86.9	126.0	155.9	207.0
(DHW heating)	kg/h	39.4	57.1	70.7	93.9
- at partial load	lb/h	8.9	13.0	16.1	20.8
	kg/h	4.0	5.9	7.3	9.4
<b>Max. condensate flow rate *6</b>					
with natural gas and T <sub>S</sub> /T <sub>R</sub> = 122/86°F (50/30°C)	USG/h (L/h)	0.8 (3.2)	1.2 (4.4)	1.5 (5.5)	1.9 (7.4)
<b>Condensate connection *7</b>					
hose nozzle Ø in		¾ in.	¾ in.	¾ in.	¾ in.
<b>Boiler flue gas connection *8</b>					
Ø in (mm)		3 (80)	3 (80)	3 (80)	3 (80)
<b>Combustion air supply connection</b>					
Coaxial Outer Ø in (mm)		5 (125)	5 (125))	5 (125))	5 (125))
Single Ø in (mm)		3 (80)	3 (80)	3 (80)	3 (80)
<b>Sound Rating</b>					
- at maximum input	dB	52	59	51	55
- at minimum input	dB	34	34	31	31
NO <sub>x</sub> @ 3% O <sub>2</sub>		< 20 ppm			

\*5 Measured flue gas temperature with a combustion air temperature of 68°F (20°C).

\*6 Based on maximum input rate.

\*7 Requires ¾ inch (19 mm) tubing. See the Installation Instructions of the Vitodens 200-W, B2HE for details.

\*8 For side wall vent installations (coaxial system):

Do not exceed max. equivalent length specified in the Installation Instructions of the Vitodens 200-W, B2HE Venting System.

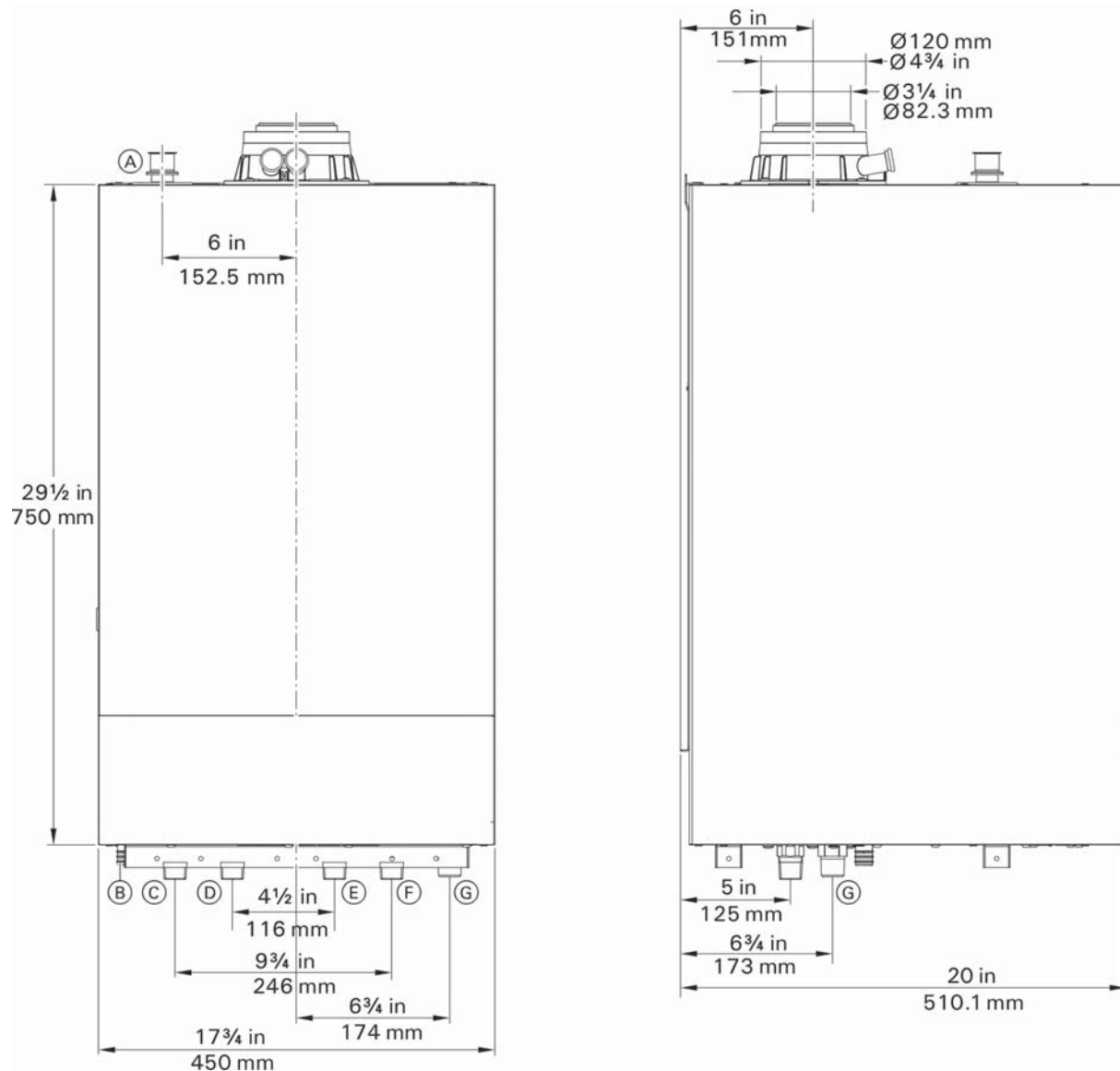
The Vitodens 200-W B2HE can only be common vented with other Vitodens 200-W B2HE boilers of the same size and series.

Side wall co-axial vent installation must include Viessmann protective screen!

For details refer to the Installation Instructions for the Vitodens 200-W, B2HE Venting System.

For information regarding other Viessmann System Technology componentry, please reference documentation of respective product.

# Models 200-W, B2HE 85, 120



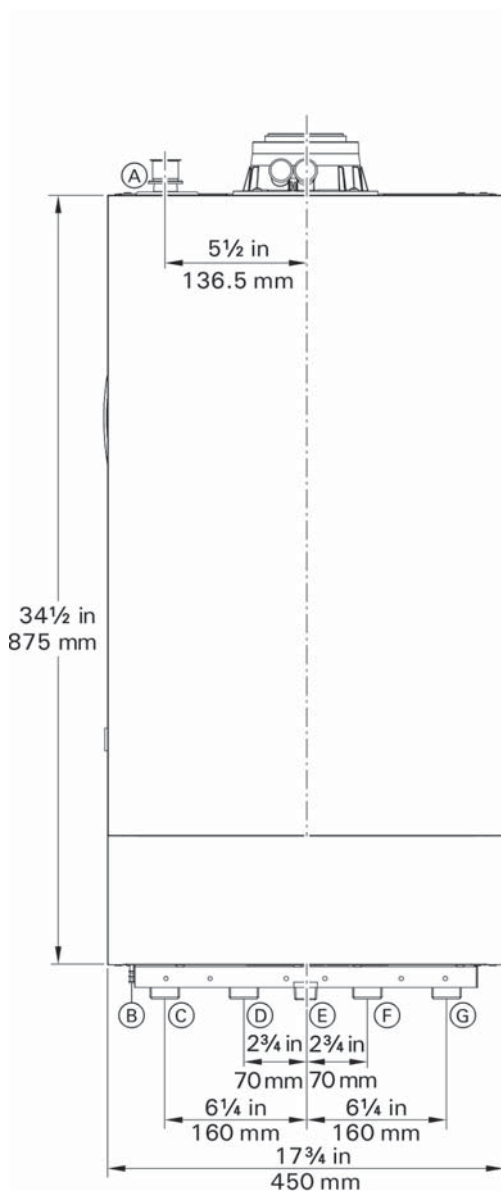
Front view

Side view

## Legend

- Ⓐ Safety valve, pressure gauge connection
- Ⓑ Condensate drain
- Ⓒ Heating system supply
- Ⓓ DHW tank heating supply
- Ⓔ DHW tank heating return
- Ⓕ Heating system return
- Ⓖ Fuel gas connection

## Models 200-W, B2HE 150, 199



Front view

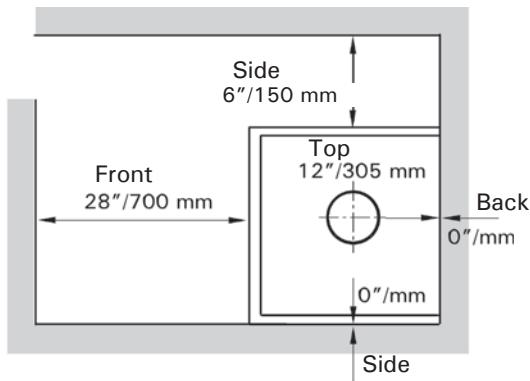


Side view

### Legend

- Ⓐ Safety valve, pressure gauge connection
- Ⓑ Condensate drain
- Ⓒ Heating system supply
- Ⓓ DHW tank heating supply
- Ⓔ Fuel gas connection
- Ⓕ DHW tank heating return
- Ⓖ Heating system return

# Recommended Minimum Service Clearances



**Note:** The Vitodens boiler has passed the zero inches vent clearance to combustibles testing requirements dictated by the Harmonized Standard ANSI Z21.13. CSA 4.9 (latest edition) and therefore is listed for zero clearance to combustibles when vented with a single wall special venting system (AL-29-4C material). The zero inches vent clearance to combustibles for the Vitodens boiler supercedes the clearance to combustibles listing that appears on the special venting system label.

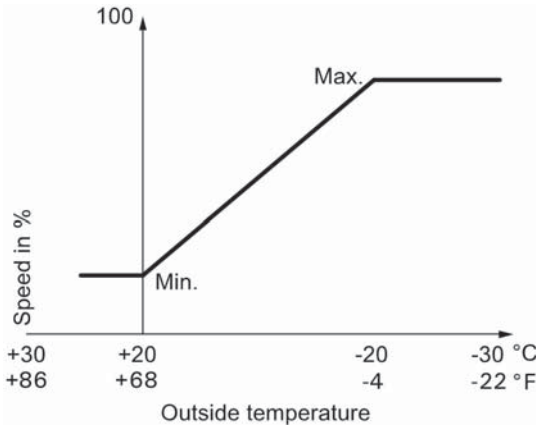
## Minimum Clearances to Combustibles

Top	Front	Rear	Left	Right	Vent pipe * 1
0	0 AL, CL	0	0	0	0

AL = Alcove  
CL = Closet

\* 1 Refer to the Installation Instructions of the Vitodens 200-W, B2HE Venting System for details.

# Adjusting Pump Rate of Integral Circulation Pump



■ The minimum pump rate and the maximum pump rate are factory-set to the following values:

Boiler model	Factory-set speed settings in %	
	Min. pump rate	Max. pump rate
B2HE-85	50	85
B2HE-120	50	100
B2HE-150	50	75
B2HE-199	50	100

■ In the following system conditions, the internal circulation pump is operated at a constant speed:

- Low loss header or heating water buffer tank and heating circuits with mixing valve
- Constant supply temperature operation

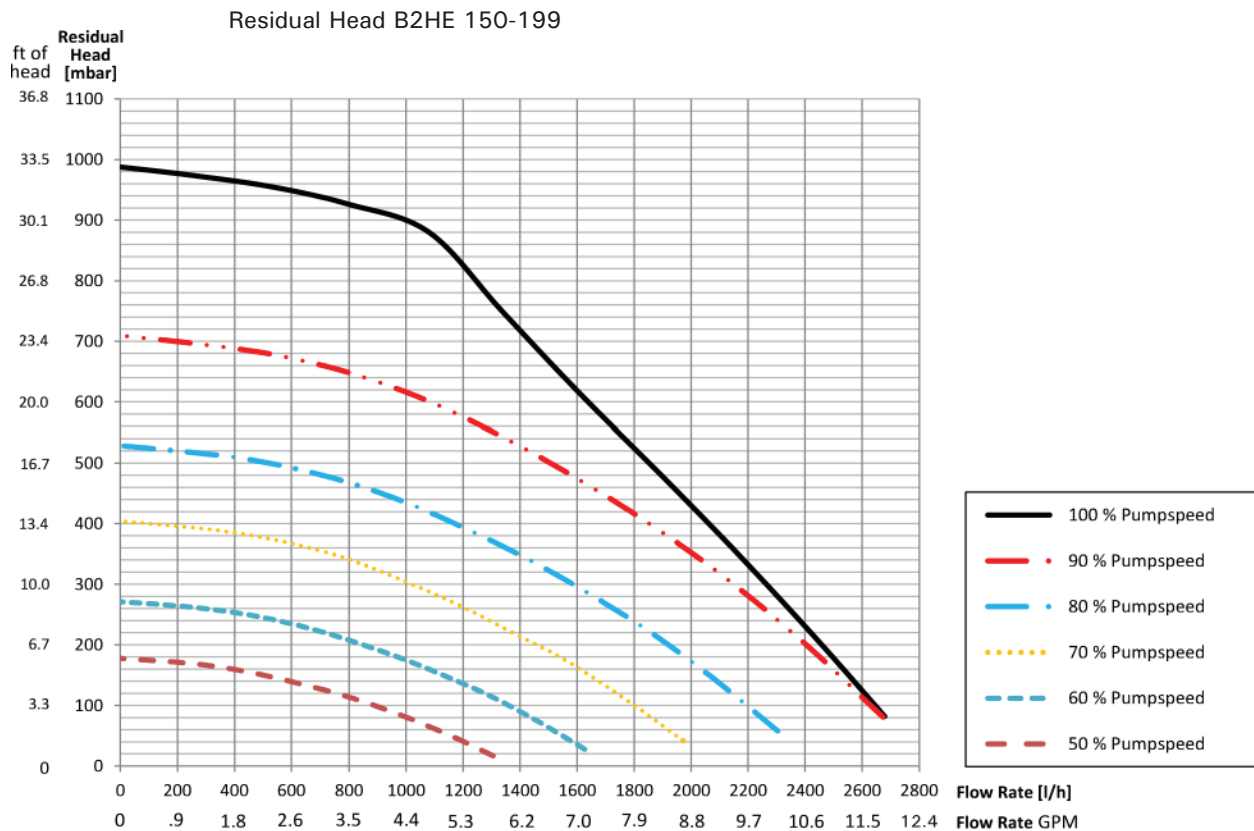
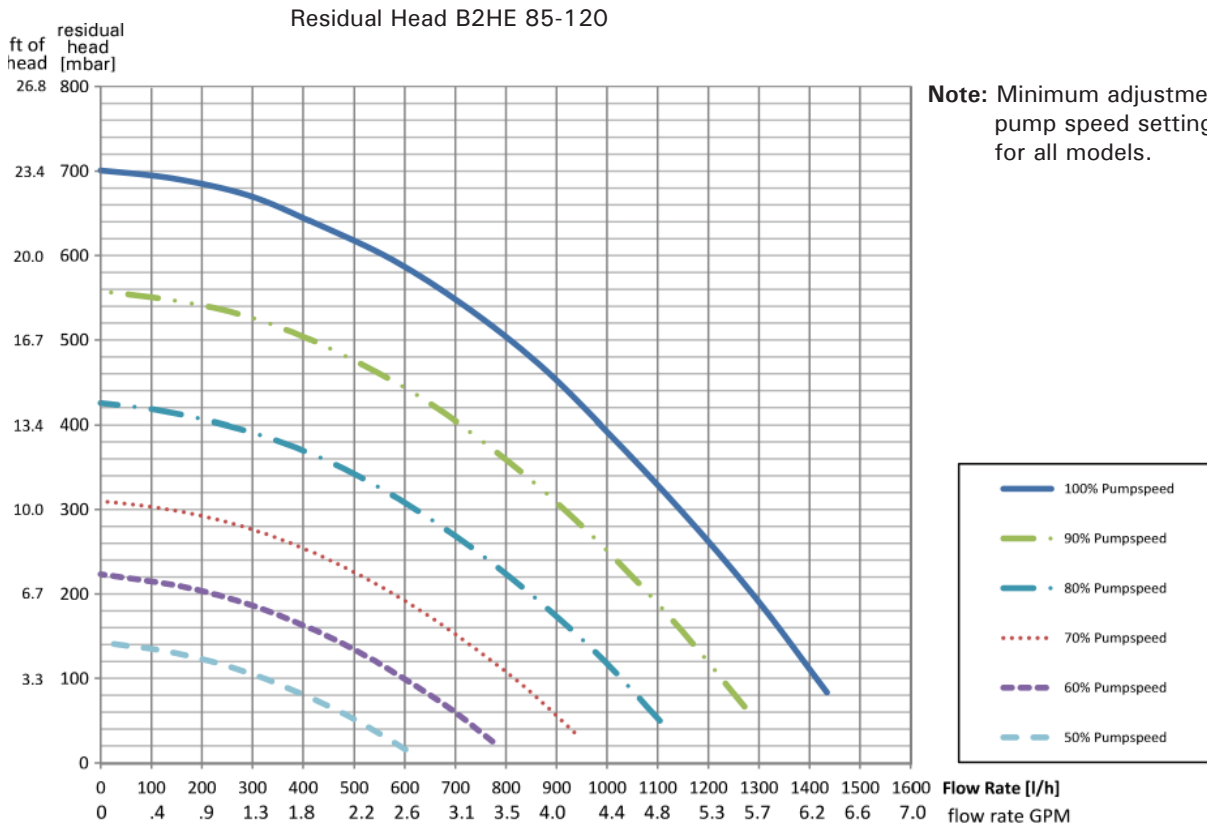
# Waterside Flow (primary circuit)

The Vitodens 200-W, B2HE is designed for closed loop, forced circulation hot water heating systems only. Use standard friction loss method for pipe sizing. Observe boiler maximum and minimum flow rate limitations. If system flow rate exceeds boiler maximum flow rate falls below the minimum flow rate or if system flow rate is unknown, Viessmann strongly recommends the installation of a low-loss header. An alternative method may be used, such as primary secondary piping using closely spaced tees.

A low-loss header offers additional benefits not provided by a pair of closely spaced tees. Viessmann therefore strongly recommends and prefers the use of a low-loss header over closely spaced tees. See pages 30 and 31 for low-loss header information. Once the low-loss header is connected, the built-in low-loss header logic of the Vitodens 200-W boiler ensures the required  $\Delta t$  across the system through the sensory communication between the low-loss header and the boiler.



# Waterside Flow (primary circuit) *(continued)*



## System Flow Rates

Vitodens 200-W B2HE -85										
No. of Boilers	Boiler Max. Flow Rate	Total Flow Rate	Typical System Flow Rates							Viessmann wLow-loss Temp. Sensor Required
			$\Delta t$ *1	$^{\circ}\text{F}$ $^{\circ}\text{C}$	20 11	25 14	30 17	35 19.5	40 22	
1	5.3 (1204)	5.3 (1204)	System Flow Rate LLH Required LLH Model	GPM L/h	8 1817 Yes 80/60	6.4 1454 Yes 80/60	5.3 1363 Yes 80/60	4.6 1045 Yes 80/60	4.0 909 Yes 80/60	Optional
2	5.3 (1204)	10.6 (2271)	System Flow Rate LLH Required LLH Model	GPM L/h	16 3634 Yes 80/60	12.8 2907 Yes 80/60	10.7 2430 Yes 80/60	9.1 2067 Yes 80/60	8.0 1817 Yes 80/60	Yes
3	5.3 (1204)	15.9 (3611)	System Flow Rate LLH Required LLH Model	GPM L/h	24 5451 Yes 120/80	19.2 4361 Yes 80/60	16 3634 Yes 80/60	13.7 3112 Yes 80/60	12.0 2726 Yes 80/60	Yes
4	5.3 (1204)	21.2 (4815)	System Flow Rate LLH Required LLH Model	GPM L/h	32 7268 Yes 120/80	25.6 5814 Yes 120/80	21.3 4838 Yes 120/80	18.3 4156 Yes 80/60	16.0 3634 Yes 80/60	Yes
5	5.3 (1204)	26.5 (6019)	System Flow Rate LLH Required LLH Model	GPM L/h	40 9085 Yes 160/80	32 7268 Yes 120/80	26.7 6064 Yes 120/80	22.9 5201 Yes 120/80	20.0 4542 Yes 120/80	Yes
6	5.3 (1204)	31.8 (7223)	System Flow Rate LLH Required LLH Model	GPM L/h	48 10902 Yes 200/120	38.4 8631 Yes 200/120	32 7268 Yes 120/80	27.4 6223 Yes 120/80	24 5451 Yes 120/80	Yes
7	5.3 (1204)	37.1 (8426)	System Flow Rate LLH Required LLH Model	GPM L/h	56 12792 Yes 200/120	44.8 10175 Yes 200/120	37.3 8472 Yes 200/120	32 7268 Yes 120/80	28 6359 Yes 120/80	Yes
8	5.3 (1204)	42.4 (9630)	System Flow Rate LLH Required LLH Model	GPM L/h	64 14536 Yes 200/120	51.2 11629 Yes 200/120	42.7 9698 Yes 200/120	36.6 8313 Yes 200/120	32 7268 Yes 120/80	Yes

\* 1 For system  $\Delta t < 20^{\circ}\text{F}$  use low-loss header sizes for  $\Delta t 20^{\circ}\text{F}$ .

**System Flow Rates** *(continued)*

Vitodens 200-W B2HE -85 (continued)										
No. of Boilers	Boiler Max. Flow Rate	Total Flow Rate	Typical System Flow Rates							Viessmann Low-loss Temp. Sensor Required
			$\Delta t$ *1	$^{\circ}\text{F}$ $^{\circ}\text{C}$	20 11	25 14	30 17	35 19.5	40 22	
9	5.3 (1204)	47.7 (10834)	System Flow Rate LLH Required LLH Model	GPM L/h	72 16353 Yes 200/120	57.6 13082 Yes 200/120	48.0 10902 Yes 200/120	41.1 9335 Yes 160/80	4.0 909 Yes 160/80	Yes
10	5.3 (1204)	53 (12038)	System Flow Rate LLH Required LLH Model	GPM L/h	80 18170 Yes 200/120	64 14536 Yes 200/120	53.3 12106 Yes 200/120	45.7 10380 Yes 200/120	40 9084 Yes 160/80	Yes
11	5.3 (1204)	58.3 (13241)	System Flow Rate LLH Required LLH Model	GPM L/h	88 19987 Yes 250/150	70.4 15990 Yes 200/120	58.7 13332 Yes 200/120	50.3 11424 Yes 200/120	44 9993 Yes 160/80	Yes
12	5.3 (1204)	63.6 (14445)	System Flow Rate LLH Required LLH Model	GPM L/h	96 21804 Yes 250/150	76.8 17443 Yes 200/120	64 14536 Yes 200/120	54.9 12469 Yes 200/120	48 10902 Yes 200/120	Yes
13	5.3 (1204)	68.9 (15649)	System Flow Rate LLH Required LLH Model	GPM L/h	104 23621 Yes 250/150	83.2 18897 Yes 250/150	69.3 15740 Yes 200/120	59.4 13491 Yes 200/120	52 11811 Yes 200/120	Yes
14	5.3 (1204)	74.2 (16853)	System Flow Rate LLH Required LLH Model	GPM L/h	112 25438 Yes 250/150	89.6 20350 Yes 250/150	74.7 16466 Yes 200/120	64 14536 Yes 200/120	56 12719 Yes 200/120	Yes
15	5.3 (1204)	79.5 (18056)	System Flow Rate LLH Required LLH Model	GPM L/h	120 27255 Yes 300/200	96 21804 Yes 250/150	80 18170 Yes 200/120	68.6 15581 Yes 200/120	60 13627 Yes 200/120	Yes

\*1 For system  $\Delta t < 20^{\circ}\text{F}$  use low-loss header sizes for  $\Delta t 20^{\circ}\text{F}$ .

**System Flow Rates** *(continued)*

Vitodens 200-W B2HE-120										
No. of Boilers	Boiler Max. Flow Rate	Total Flow Rate	Typical System Flow Rates							Viessmann Low-loss Temp. Sensor Required
			$\Delta t$ *1	°F °C	20 11	25 14	30 17	35 19.5	40 22	
1	6.2 (1408)	6.2 (1408)	System Flow Rate LLH Required LLH Model	GPM L/h	11.3 2567 Yes 80/60	9.0 2044 Yes 80/60	7.5 1703 Yes 80/60	6.5 1476 Yes 80/60	5.7 1295 Yes 80/60	Optional
2	6.2 (1408)	12.4 (2816)	System Flow Rate LLH Required LLH Model	GPM L/h	22.6 5133 Yes 120/80	18.1 4111 Yes 80/60	15.1 3430 Yes 80/60	12.9 2930 Yes 80/60	11.3 2567 Yes 80/60	Yes
3	6.2 (1408)	18.6 (4225)	System Flow Rate LLH Required LLH Model	GPM L/h	33.9 7700 Yes 120/80	27.1 6155 Yes 80/60	22.6 5133 Yes 80/60	19.4 4406 Yes 80/60	17.0 3861 Yes 80/60	Yes
4	6.2 (1408)	24.8 (5633)	System Flow Rate LLH Required LLH Model	GPM L/h	45.2 10266 Yes 200/120	36.2 8222 Yes 120/80	30.1 6836 Yes 120/80	25.8 5860 Yes 120/80	22.6 5133 Yes 120/80	Yes
5	6.2 (1408)	31 (7041)	System Flow Rate LLH Required LLH Model	GPM L/h	56.5 12833 Yes 200/120	45.2 10226 Yes 200/120	37.7 8563 Yes 120/80	32.3 7336 Yes 120/80	28.3 6428 Yes 120/80	Yes
6	6.2 (1408)	37.2 (8449)	System Flow Rate LLH Required LLH Model	GPM L/h	67.8 15399 Yes 200/120	54.2 11210 Yes 200/120	45.2 10226 Yes 200/120	38.7 8790 Yes 200/120	33.9 7700 Yes 120/80	Yes
7	6.2 (1408)	43.4 (9857)	System Flow Rate LLH Required LLH Model	GPM L/h	79.1 17966 Yes 200/120	63.3 14377 Yes 200/120	57.2 11696 Yes 200/120	45.2 10226 Yes 200/120	39.6 8994 Yes 120/80	Yes
8	6.2 (1408)	49.6 (11265)	System Flow Rate LLH Required LLH Model	GPM L/h	90.4 20441 Yes 250/150	72.3 16421 Yes 200/120	60.3 13696 Yes 200/120	51.7 11742 Yes 200/120	45.2 10226 Yes 200/120	Yes

\*1 For system  $\Delta t < 20^\circ\text{F}$  use low-loss header sizes for  $\Delta t 20^\circ\text{F}$ .

**System Flow Rates** *(continued)*

Vitodens 200-W B2HE-120 (continued)										
No. of Boilers	Boiler Max. Flow Rate	Total Flow Rate	Typical System Flow Rates							Viessmann Low-loss Temp. Sensor Required
			$\Delta t$ *1	$^{\circ}\text{F}$ $^{\circ}\text{C}$	20 11	25 14	30 17	35 19.5	40 22	
9	6.2 (1408)	55.8 (12674)	System Flow Rate LLH Required LLH Model	GPM L/h	101.7 23099 Yes 250/150	81.4 18488 Yes 250/150	67.8 15399 Yes 200/120	58.1 13196 Yes 200/120	50.9 11561 Yes 200/120	Yes
10	6.2 (1408)	62 (14082)	System Flow Rate LLH Required LLH Model	GPM L/h	113.0 25665 Yes 250/150	90.4 20532 Yes 250/150	75.3 17103 Yes 200/120	64.6 14672 Yes 200/120	56.5 12833 Yes 200/120	Yes
11	6.2 (1408))	68.2 (15445)	System Flow Rate LLH Required LLH Model	GPM L/h	124.3 28232 Yes 300/200	99.4 22576 Yes 250/150	82.7 18783 Yes 250/150	71.0 16126 Yes 200/120	62.2 14127 Yes 200/120	Yes
12	6.2 (1408)	75 (17034)	System Flow Rate LLH Required LLH Model	GPM L/h	135.6 31025 Yes 300/200	108.5 24643 Yes 250/150	90.4 20532 Yes 250/150	77.5 17602 Yes 200/120	67.8 15399 Yes 200/120	Yes
13	6.2 (1408)	81.2 (18443)	System Flow Rate LLH Required LLH Model	GPM L/h	146.9 33365 Yes 300/200	117.5 26687 Yes 250/150	97.9 22236 Yes 250/150	83.9 19056 Yes 250/150	73.5 16694 Yes 200/120	Yes
14	6.2 (1408)	87.4 (19851)	System Flow Rate LLH Required LLH Model	GPM L/h	158.2 35931 Yes 300/200	126.6 28754 Yes 300/200	105.5 23962 Yes 250/150	90.4 20532 Yes 250/150	79.1 17966 Yes 200/120	Yes
15	6.2 (1408)	93.6 (21259)	System Flow Rate LLH Required LLH Model	GPM L/h	169.5 38498 Yes 300/200	135.6 30798 Yes 300/200	113.0 25665 Yes 250/150	96.9 22008 Yes 250/150	84.8 19260 Yes 250/150	Yes

\*1 For system  $\Delta t < 20^{\circ}\text{F}$  use low-loss header sizes for  $\Delta t 20^{\circ}\text{F}$ .

**System Flow Rates** *(continued)***Vitodens 200-W B2HE-150**

No. of Boilers	Boiler Max. Flow Rate	Total Flow Rate	Typical System Flow Rates							Viessmann Low-loss Temp. Sensor Required
			$\Delta t$ *1	$^{\circ}\text{F}$ $^{\circ}\text{C}$	20 11	25 14	30 17	35 19.5	40 22	
1	9.3 (2112)	9.3 (2112)	System Flow Rate LLH Required LLH Model	GPM L/h	14.1 3202 Yes 80/60	11.3 2567 Yes 80/60	9.4 2135 Yes 80/60	8.1 1840 Yes 80/60	7.1 1630 Yes 80/60	Optional
2	9.3 (2112)	18.6 (4225)	System Flow Rate LLH Required LLH Model	GPM L/h	28.2 6405 Yes 120/80	22.6 5133 Yes 120/80	18.8 4270 Yes 80/60	16.1 3657 Yes 80/60	14.1 3202 Yes 80/60	Yes
3	9.3 (2112)	27.9 (6337)	System Flow Rate LLH Required LLH Model	GPM L/h	42.3 9607 Yes 160/80	33.8 7677 Yes 120/80	28.2 6405 Yes 120/80	24.2 5496 Yes 120/80	21.2 4815 Yes 120/80	Yes
4	9.3 (2112)	37.2 (8449)	System Flow Rate LLH Required LLH Model	GPM L/h	56.4 12810 Yes 200/120	45.1 10243 Yes 200/120	37.6 8540 Yes 160/80	32.2 7313 Yes 120/80	28.2 6405 Yes 120/80	Yes
5	9.3 (2112)	46.5 (10561)	System Flow Rate LLH Required LLH Model	GPM L/h	70.5 16012 Yes 200/120	56.4 12810 Yes 200/120	47.0 10675 Yes 200/120	40.3 9153 Yes 160/80	35.3 8018 Yes 200/120	Yes
6	9.3 (2112)	55.8 (12674)	System Flow Rate LLH Required LLH Model	GPM L/h	84.6 19215 Yes 250/150	67.7 15376 Yes 200/120	56.4 12810 Yes 200/120	48.3 10970 Yes 200/120	42.3 9607 Yes 160/80	Yes
7	9.3 (2112)	65.1 (14786)	System Flow Rate LLH Required LLH Model	GPM L/h	98.7 22417 Yes 250/150	79.0 17943 Yes 200/120	65.8 14945 Yes 200/120	56.4 12810 Yes 200/120	49.4 11220 Yes 200/120	Yes
8	9.3 (2112)	74.4 (16898)	System Flow Rate LLH Required LLH Model	GPM L/h	112.8 25620 Yes 250/150	90.2 20487 Yes 250/150	75.2 17018 Yes 200/120	64.5 14650 Yes 200/120	56.4 12810 Yes 200/120	Yes

\*1 For system  $\Delta t < 20^{\circ}\text{F}$  use low-loss header sizes for  $\Delta t 20^{\circ}\text{F}$ .

**System Flow Rates** *(continued)*

Vitodens 200-W B2HE-150 (continued)										
No. of Boilers	Boiler Max. Flow Rate	Total Flow Rate	Typical System Flow Rates							Viessmann Low-loss Temp. Sensor Required
			$\Delta t$	<sup>*1</sup>	°F	20	25	30	35	
				°C	11	14	17	19.5	22	
9	9.3 (2112)	83.7 (19010)	System Flow Rate LLH Required LLH Model	GPM L/h	126.9 28822 Yes 300/200	101.5 23053 Yes 250/150	84.6 19215 Yes 250/150	72.5 16467 Yes 200/120	63.5 14422 Yes 200/120	Yes
10	9.3 (2112)	93 (21123)	System Flow Rate LLH Required LLH Model	GPM L/h	141.0 32024 Yes 300/200	112.8 25620 Yes 250/150	94.0 21350 Yes 250/150	80.6 18306 Yes 250/150	70.5 16012 Yes 200/120	Yes
11	9.3 (2112)	102.3 (23235)	System Flow Rate LLH Required LLH Model	GPM L/h	155.1 35227 Yes 300/200	124.1 28186 Yes 300/200	103.4 23485 Yes 250/150	88.6 20123 Yes 250/150	77.6 17625 Yes 200/120	Yes
12	9.3 (2112)	111.6 (25347)	System Flow Rate LLH Required LLH Model	GPM L/h	169.2 38430 Yes 300/200	135.4 30753 Yes 300/200	112.8 25620 Yes 250/150	96.7 21963 Yes 250/150	84.6 19215 Yes 250/150	Yes
13	9.3 (2112)	120.9 (27459)	System Flow Rate LLH Required LLH Model	GPM L/h	183.3 41632 Yes 300/200	146.6 33296 Yes 300/200	122.2 27755 Yes 300/200	104.7 23780 Yes 250/150	91.7 20827 Yes 250/150	Yes
14	9.3 (2112)	130.2 (29572)	System Flow Rate LLH Required LLH Model	GPM L/h	197.4 44834 Yes 400/200	157.9 35863 Yes 300/200	131.6 29890 Yes 300/200	112.8 25620 Yes 250/150	98.7 22417 Yes 250/150	Yes
15	9.3 (2112)	139.5 (31684)	System Flow Rate LLH Required LLH Model	GPM L/h	211.5 48037 Yes 400/200	169.2 48430 Yes 300/200	141.0 32025 Yes 300/200	120.9 27459 Yes 300/200	105.8 24030 Yes 250/150	Yes

\* 1 For system  $\Delta t < 20^{\circ}\text{F}$  use low-loss header sizes for  $\Delta t 20^{\circ}\text{F}$ .

**System Flow Rates** *(continued)*

Vitodens 200-W B2HE-199										
No. of Boilers	Boiler Max. Flow Rate	Total Flow Rate	Typical System Flow Rates							Viessmann Low-loss Temp. Sensor Required
			Δt	*1	°F °C	20 11	25 14	30 17	35 19.5	
1	10.6 (2408)	9.3 (2112)	System Flow Rate LLH Required LLH Model	GPM L/h	18.7 4247 Yes 80/60	15.0 3407 Yes 80/60	12.5 2830 Yes 80/60	10.7 2430 Yes 80/60	9.4 2135 Yes 80/60	Optional
2	10.6 (2408))	21.2 (4815)	System Flow Rate LLH Required LLH Model	GPM L/h	37.4 8494 Yes 120/80	29.9 6791 Yes 120/80	24.9 5655 Yes 120/80	21.4 4860 Yes 120/80	18.7 4247 Yes 80/60	Yes
3	10.6 (2408)	31.8 (7223)	System Flow Rate LLH Required LLH Model	GPM L/h	56.1 12472 Yes 200/120	44.5 10107 Yes 200/120	37.4 8494 Yes 120/80	32.1 7291 Yes 120/80	28.1 6382 Yes 120/80	Yes
4	10.6 (2408)	42.4 (9630)	System Flow Rate LLH Required LLH Model	GPM L/h	74.8 16989 Yes 200/120	59.8 13582 Yes 200/120	49.9 11333 Yes 200/120	42.7 9698 Yes 160/80	37.4 8494 Yes 120/80	Yes
5	10.6 (2408)	53 (12038)	System Flow Rate LLH Required LLH Model	GPM L/h	93.5 21236 Yes 250/150	74.8 16989 Yes 200/120	62.3 14150 Yes 200/120	53.4 12128 Yes 200/120	46.8 10629 Yes 200/120	Yes
6	10.6 (2408)	63.6 (14445)	System Flow Rate LLH Required LLH Model	GPM L/h	112.2 25483 Yes 250/150	89.8 20396 Yes 250/150	74.8 16989 Yes 200/120	64.1 14559 Yes 200/120	56.1 12742 Yes 200/120	Yes
7	10.6 (2408)	74.2 (16853)	System Flow Rate LLH Required LLH Model	GPM L/h	130.9 29731 Yes 300/200	104.7 23780 Yes 250/150	87.3 19828 Yes 200/120	74.8 16989 Yes 200/120	65.5 14877 Yes 200/120	Yes
8	10.6 (2408)	84.8 (19260)	System Flow Rate LLH Required LLH Model	GPM L/h	149.6 33978 Yes 300/200	119.7 27187 Yes 300/200	99.7 22644 Yes 250/150	85.5 19419 Yes 250/150	74.8 16989 Yes 200/120	Yes

\*1 For system  $\Delta t < 20^\circ\text{F}$  use low-loss header sizes for  $\Delta t 20^\circ\text{F}$ .



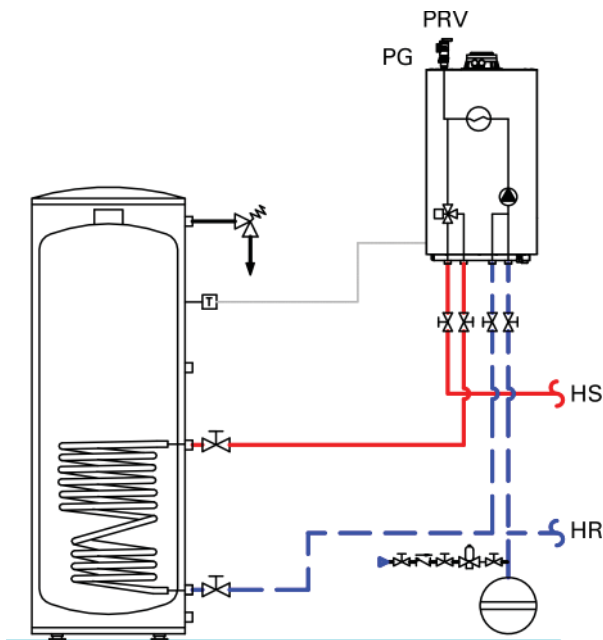
**System Flow Rates** *(continued)*

Vitodens 200-W B2HE-199 (continued)

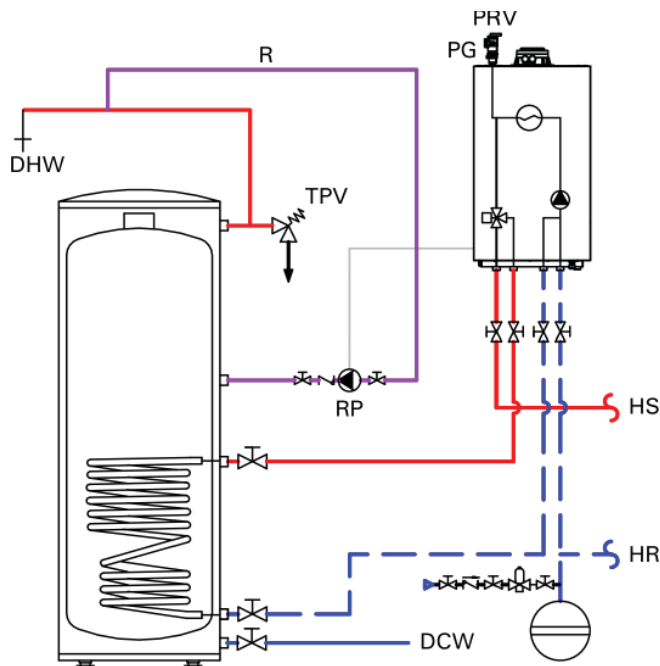
No. of Boilers	Boiler Max. Flow Rate	Total Flow Rate	Typical System Flow Rates							Viessmann Low-loss Temp. Sensor Required
			$\Delta t$ *1	$^{\circ}\text{F}$ $^{\circ}\text{C}$	20 11	25 14	30 17	35 19.5	40 22	
9	10.6 (2408)	95.4 (21668)	System Flow Rate LLH Required LLH Model	GPM L/h	168.3 38225 Yes 300/200	134.6 30571 Yes 300/200	112.2 25483 Yes 250/150	96.2 21849 Yes 250/150	84.2 19124 Yes 250/150	Yes
10	10.6 (2408))	106 (24075)	System Flow Rate LLH Required LLH Model	GPM L/h	187.0 42472 Yes 300/200	149.6 33978 Yes 300/200	124.7 28322 Yes 300/200	106.9 24280 Yes 250/150	93.5 21236 Yes 250/150	Yes
11	10.6 (2408)	116.6 (26483)	System Flow Rate LLH Required LLH Model	GPM L/h	205.7 46720 Yes 400/200	164.6 37385 Yes 300/200	137.1 31139 Yes 300/200	117.5 26687 Yes 250/150	102.9 23371 Yes 250/150	Yes
12	10.6 (2408)	127.2 (28890)	System Flow Rate LLH Required LLH Model	GPM L/h	224.4 50967 Yes 400/200	179.5 40769 Yes 300/200	149.6 33978 Yes 300/200	128.2 29117 Yes 300/200	112.2 25483 Yes 250/150	Yes
13	10.6 (2408)	137.8 (31298)	System Flow Rate LLH Required LLH Model	GPM L/h	243.1 55214 Yes 400/200	194.5 44176 Yes 400/200	162.1 36817 Yes 300/200	138.9 31548 Yes 300/200	121.6 27618 Yes 300/200	Yes
14	10.6 (2408)	148.4 (33705)	System Flow Rate LLH Required LLH Model	GPM L/h	261.8 59461 Yes 450/250	209.4 47560 Yes 400/200	174.5 39633 Yes 300/200	149.6 33978 Yes 300/200	130.9 29731 Yes 300/200	Yes
15	10.6 (2408)	159 (36113)	System Flow Rate LLH Required LLH Model	GPM L/h	280.5 63708 Yes 450/250	224.4 50967 Yes 400/200	187.0 42472 Yes 300/200	160.3 36408 Yes 300/200	140.3 31866 Yes 300/200	Yes

\* 1 For system  $\Delta t < 20^{\circ}\text{F}$  use low-loss header sizes for  $\Delta t \geq 20^{\circ}\text{F}$ .

## Domestic Hot Water Production



Vitocell stand-alone DHW storage tank



### Legend

DCW	Domestic Cold Water
DHW	Domestic Hot Water
TPV	Temperature and Pressure Relief Valve
R	DHW Recirculation Line
RP	DHW Recirculation Pump
HS	Heating system supply
HR	Heating system return
PRV	Pressure relief valve
PG	Pressure gauge

**Note:** See page 44 for Alternate DHW connection.

Vitodens 200-W boilers can be used in conjunction with the stand-alone DHW storage tanks offered by Viessmann.

Size and select the DHW storage tank based on the forecasted DHW consumption of the building in question. For further technical information on DHW storage tanks, see the Vitocell Technical Data Manuals.

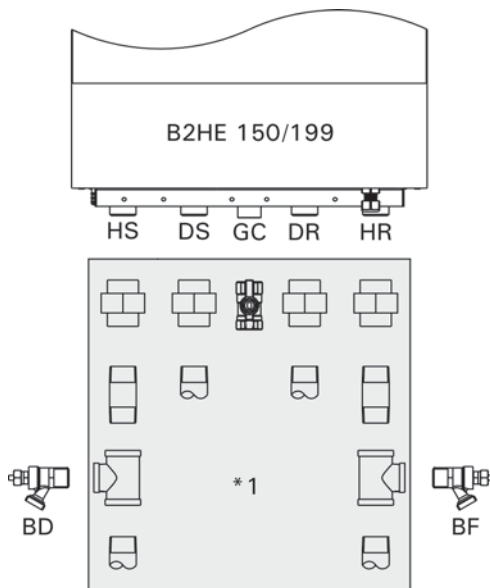
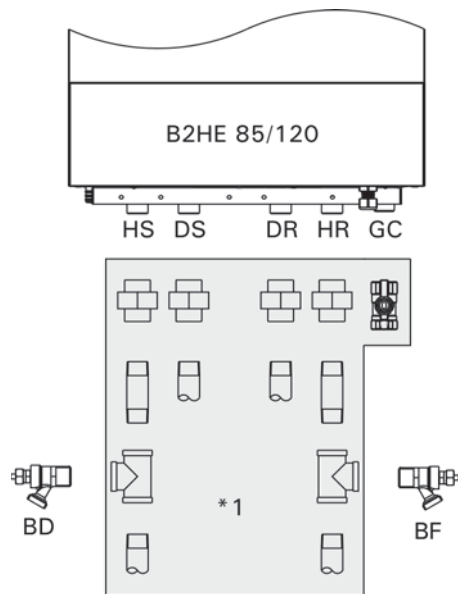
For the connection of a stand-alone DHW tank, installation fittings (field supplied), and a DHW temperature sensor (supplied) or DHW temperature switch (i.e. aquastat, field supplied) are required.

DHW recirculation lines increase the level of comfort and convenience of the domestic hot water supply and reduce water consumption.

These advantages directly derive from the immediate availability of domestic hot water at all draw points.

Poor insulation of the DHW recirculation line, however, can result in considerable heat loss. Viessmann therefore recommends that effective insulation be provided and used for DHW recirculation lines of 23 ft. (7 m) in length or longer.

## Boiler Piping Connections



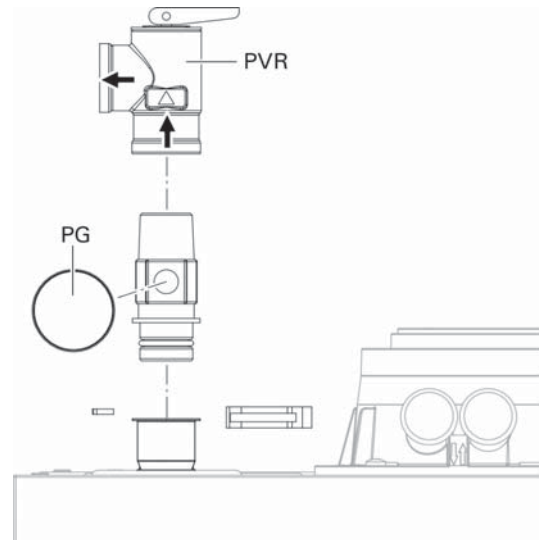
### Legend

- DR Boiler heating return for domestic hot water tank heating
- DS Boiler heating supply for domestic hot water tank heating
- HR Heating System Return
- HS Heating System Supply
- BD Boiler Drain (supplied with boiler)
- GC Gas Connection
- PRV Pressure Relief Valve (supplied with boiler)
- BF Boiler Fill (supplied with boiler)
- PG Pressure Gauge (supplied with boiler)
- \* 1 Boiler fittings including gas shutoff valve are field supplied.

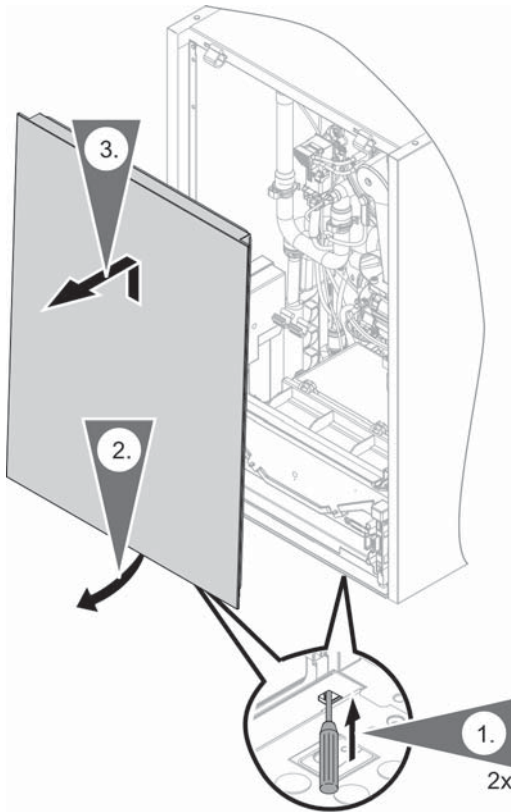
**Note:** Install a temperature gauge (field supplied) anywhere in the supply piping near the boiler (not shown).

### IMPORTANT

An adequately sized pre-charged expansion tank must be used. See Installation Examples for details.



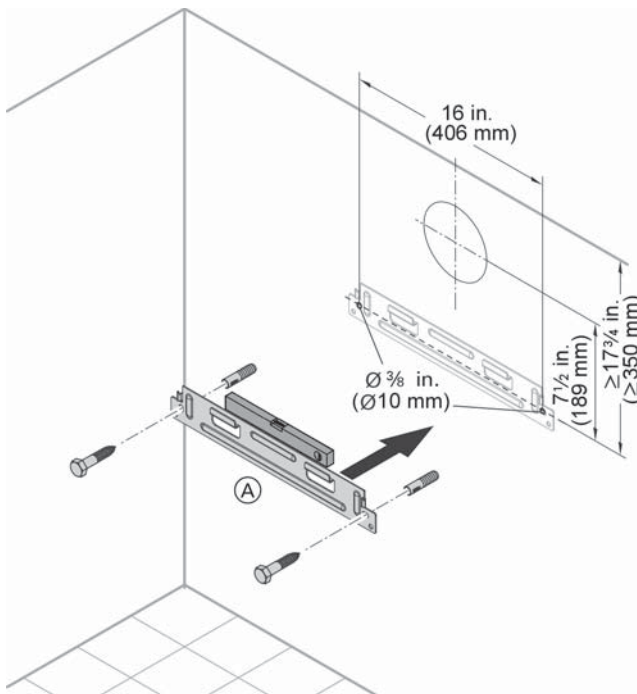
## Removing the Front Panel



1. Using a screwdriver push up on the two retaining tabs.
2. Pull the lower edge of the boiler cover out.
3. Lift off the boiler cover.

## Wall Mounting Bracket

### Mounting Vitodens 200-W boiler



#### Legend

- (A) Vitodens wall mounting bracket

### Fitting the wall mounting bracket

The Vitodens 200-W B2HE can be wall-mounted on a brick/concrete wall or stud wall (wood or metal).



Refer to the installation Instructions.

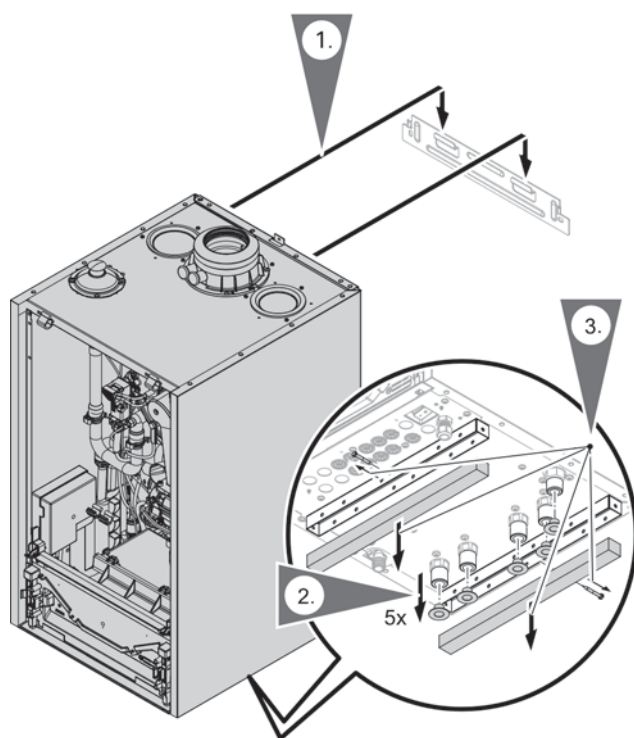
**Note:** The enclosed screws and plastic anchors are only suitable for concrete. For other construction materials, use bolts and anchors that are suitable for 179 lb (81 kg) loads.



### CAUTION

Whichever mounting method is used, ensure that the bracket is tightly and securely fastened to wall. Failure to secure boiler properly could cause boiler to loosen, posing a severe safety hazard.

## Hanging the Boiler



**Note:** Various installation components can be found in the installation fittings kit. Keep the installation components safe, as they will be required for later installation.

**Note:** To prevent dirt from entering the connections: Do not remove the protective caps until you are about to fit the boiler.

1. Mount the boiler on the wall mounting bracket. Ensure that all four mounting tabs of the wall mounting bracket have locked into the boiler.
2. Remove plastic shipping caps from the boiler connections.
3. Remove the wooden blocks from the bottom rails of the boiler.

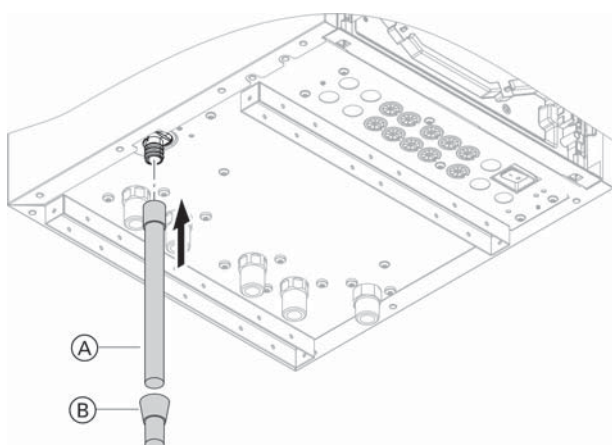
## Condensate Connection

### Condensate Connection

Install the condensate drain pipe Ø ¾ in. (Ø 19 mm) with a suitable gradient (min. 2.5%).

Discharge condensate from the boiler into the drainage system, either directly or (if required) via a neutralization unit (accessory).

### Condensate connection for Vitodens 200-W



#### Legend

- (A) Flexible discharge tubing
- (B) Discharge tubing

The condensate drain of the Vitodens 200-W boiler is equipped with a built-in siphon trap in order to keep flue gases from being discharged via the condensate drain.

## IMPORTANT

Pipe ventilation must take place between the siphon trap and the neutralization unit (if applicable).

### Condensate Drainage and Neutralization

The condensate formed both in the condensing boiler and in the flue gas pipe must be discharged into the public sewage system in accordance with all applicable local regulations. The condensate produced by a gas-fired heating system has a pH value between 3 and 4.

Some local codes may require the use of a separate neutralization unit to treat the aggressive and corrosive nature of the condensate. With a neutralization unit installed, all condensate from the boiler and the flue gas pipe enters into the neutralization unit where it is treated and released into the public sewage system with a safe pH value of above 6.5.

The use of neutralization granulate (performing the neutralizing process) is dependent on the operation of the heating system. To determine the required refill amount, check granulate level several times during the first year of operation. In some cases one granulate fill may last an entire year.

Contact Viessmann to order a neutralization unit for the Vitodens 200-W boiler.

See Viessmann Price List for order information.

The condensate discharge outlet to the drainage system connection must be clearly visible. It must be installed with a suitable gradient and provided with a stretch trap.

If the condensate outlet of the Vitodens 200-W boiler is lower than the drain, a condensate pump must be used.

Only corrosion-resistant materials must be used for condensate drainage purposes (e.g. braided hose). Do not use galvanized materials or materials containing copper for piping, couplings etc. The condensate drain must have a trap to prevent flue gas leakage.

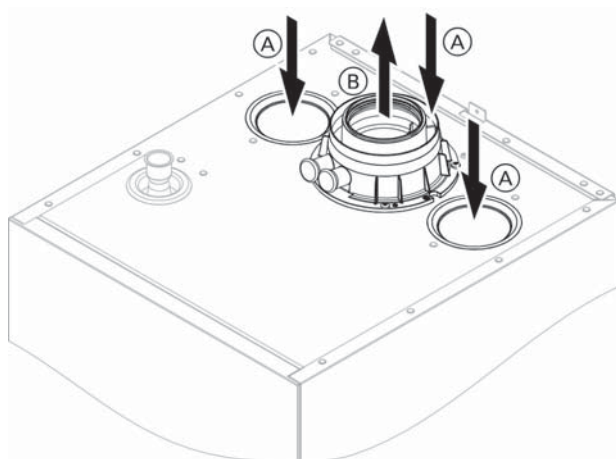
Please note that other requirements might apply depending on local regulations and/or project-specific details.

It is advisable to contact your local waterworks office (authority responsible for waste water regulations) well before commencing with the installation of the neutralization unit in order to establish details of local regulations that apply.

The following table shows the concentration of (effluent) substances (e.g. heavy metals) contained in the waste water from the Vitodens 200-W condensing boiler.

Condensate (effluent) substances	Values measured in mg/L Vitodens 200-W
Lead	< 0.01
Cadmium	< 0.005
Chromium	< 0.01
Copper	< 0.01
Nickel	< 0.01
Zinc	< 0.05
Tin	< 0.05

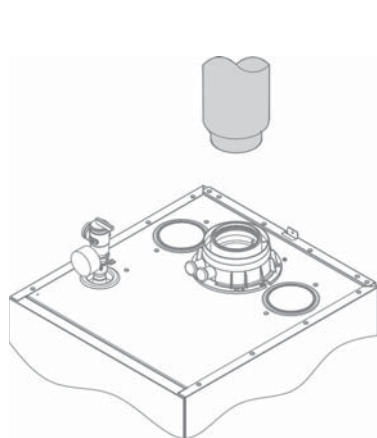
## Boiler Flue and Combustion Air Connections



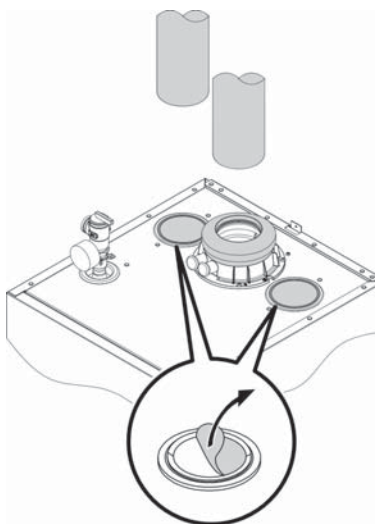
### Legend

- Ⓐ Combustion air
- Ⓑ Flue gas

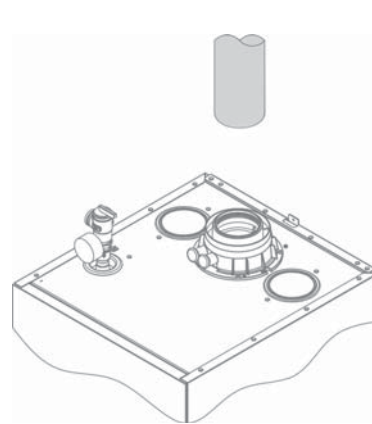
For direct vent applications the combustion air gaskets position can be interchanged. One gasket is sized for 3½ in. (89 mm) outside diameter (for CPVC/PVC/ABS), combustion air piping the other is sized for a 3⅝ in. (80 mm) outside diameter (for PPs) combustion air piping.



Coaxial



Direct Vent



Room Air Dependant

## Electrical Connections

### Power Supply

The Vitodens 200-W requires a standard 120VAC power outlet 15A fuse protected circuit. Refer to the installation instructions shipped with the boiler for wiring details, or reference the "Overview of Electrical Connections" on page 45 of this manual.

### Power Supply Connection of Accessories

The power supply connection of accessories can be made directly at the boiler control. The connection is activated and deactivated with the system gas control switch. Accessory extension modules (EM EA1, mixing valve extension kit, EM-SI, EM-P1) will require a separate 120VAC power supply from the wall receptacle.

### Wire cabling required for:

- Outdoor temperature sensor
- Accessory kit for heating circuit with mixing valve
- Vitotrol 200E remote control
- Remote switching of operating mode
- Remote disable
- Alarm output



## On-Board 7 Inch Touchscreen Control

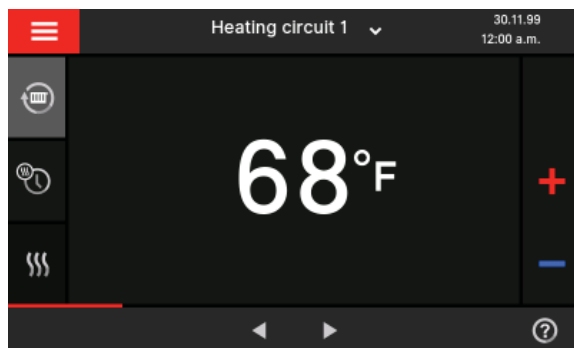


### Modular structure

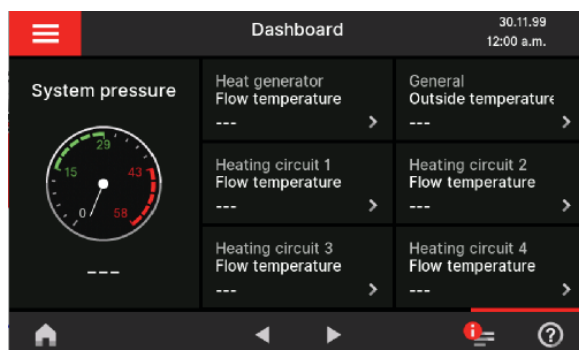
The control unit is integrated into the boiler. The control unit comprises a standard unit, electronics modules and a programming unit.

Standard unit:

- ON/OFF switch
- Operating and fault indicators
- Fuses
- Integrate WiFi
- Light guide



Display - Heating circuit operation



Display - Dashboard

### Programming unit:

- Easy operation through:
  - commissioning assistant with intuitive system configuration
  - Plain text display and graphics
  - Large font for easy readability
  - Context-sensitive help text
- With digital time switch for daylight savings time
- Setting the:
  - Normal room temperature
  - Comfort room temperature
  - Reduced room temperature
  - DHW temperature
  - Heating program
  - Individual 7 day time programs for central heating, DHW heating and DHW recirculation, with 4 time phases per day
  - Economy mode
  - Comfort mode
  - Holiday program
  - Holiday @ home program
  - Heating curves
  - Parameter settings
  - Actuator tests
  - Test mode
- Displaying the:
  - Boiler water temperature
  - DHW temperature (when using tank temperature sensor)
  - Heat circuit temperatures
  - Outside temperatures
  - System pressure
  - Operating details
  - Diagnostic details
  - Fault messages
  - Service messages



## Design and Function

### Functions

- Weather-compensated control of the boiler water and/or supply temperature
- Control of one heating circuit without mixer and three heating circuits with mixer
- Demand-dependent heating circuit pump and burner off control
- Adjustment of a variable heating limit
- Anti-seizing pump protection
- Integral diagnostic system
- Maintenance display
- DHW temperature control with priority
- Control of solar DHW heating and central heating backup in conjunction with the EM-SI solar extension module
- Display of the solar energy yield
- Auxiliary function for DHW heating (short-term heating to a higher temperature), and one time tank heating
- 0-10V External temperature or modulation setpoint signal input
- 0-10V output signal
- Zone circuit operation of up to 4 zone circuits with temperature setpoint or outdoor reset operation.

### Control Characteristics

PI characteristics with modulating output.

### Time Switch

Digital time switch.

- Individual and 7-day program
- Automatic daylight savings time changeover
- Automatic function for DHW heating and DHW recirculation pump
- Time, day and standard switching times for space heating, DHW heating and the DHW recirculation 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.
- 3 space heating temperature setpoint - reduced, normal and comfort.

### Setting the Operating Programs


The heating system frost protection (see frost protection function) applies to all heating programs. You can select the following heating programs with the program keys:

- Heating and DHW
- DHW only
- Standby mode
- Zone circuits
- External heating program changeover.

### Frost protection

- The frost protection function will be started when the outside temperature drops below approx. 34°F (1°C). With the frost protection function, the heating circuit pump will be switched ON and the boiler water is maintained at a lower temperature of approx. 68°F (20°C).  
The DHW tank will be heated to approx. 68°F (20°C).
- The frost protection function will be stopped when the outside temperature rises above approx. 37°F (3°C) (default settings).

### Summer Operation

Heating program “”

The burner is only activated upon a call for domestic hot water from the DHW storage tank (controlled by DHW tank temperature sensor).

## Design and Functions *(continued)*

## Technical Data

Rated supply voltage:	120VAC
Rated frequency:	60 Hz
Rated current:	12 A
Max. ambient temp.	
- at operation:	32 to 104°F (0 to 40°C) Installation in living spaces or boiler rooms (standard ambient conditions)
- when storing or transporting:	-4 to +158°F (-20 to +70°C)
Max. operating temp.	
setting (space heating):	180°F (82°C)
DHW production:	194°F (90°C)
Setting fixed high limit: (not adjustable)	210°F (99°C)
Adjustment range of DHW tank set-point temperature:	50 to 154°F (10 to 68°C)

## Heating curve settings

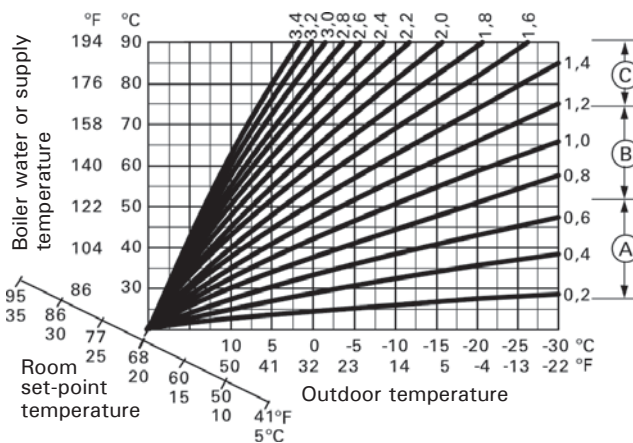
- Heating curve slope: 0.2 to 3.5
- Heating curve shift: -12 to +33°C  
-13 to 40 K

### Heating Curve Adjustment (slope and shift)

The control unit regulates the boiler water temperature (= supply temperature of heating circuit without mixing valve) and the supply temperature of the heating circuit with mixing valve (in conjunction with the accessory mixing valve extension kit) according to the outdoor temperature.

The supply temperature that is required to achieve a given room temperature depends on the heating system and the thermal insulation of the building that is being heated.

The adjustment of the heating curves is used to match the boiler water temperature and the supply temperature to these conditions. The boiler water temperature is limited upwards by the fixed high limit and the temperature set for the electronic high limit. The supply temperature cannot rise above the boiler water temperature.



### Legend

- Ⓐ Low temperature heating system,  
e.g. radiant floor heating
- Ⓑ Medium temperature heating system,  
e.g. cast iron radiation, staple-up radiant floor heating
- Ⓒ High temperature heating system,  
e.g. fintube radiation, fan coils

## Sensors *(supplied)*

### Boiler Temperature Sensor

The boiler temperature sensor is connected at the control unit for weather-responsive operation and is built into the boiler.

Specification sensor type: Viessmann NTC 10K ohms at 77°F (25°C)

Max. ambient temp.

- at operation: 32 to 266°F (0 to 130°C)
- when storing or transporting: - 4 to + 158°F (-20 to + 70°C)

### Immersion Temperature Sensor

Supplied with:

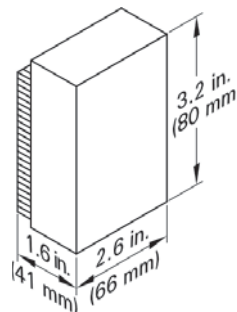
- Cable length approx. 12 ft. (3.75 m), ready to plug in
- All pipe connections are field supplied.

#### Specification

Max. ambient temp.

- at operation: 32 to 194°F (0 to 90°C)
- when storing or transporting: - 4 to + 158°F (-20 to + 70°C)
- Sensor type: Viessmann NTC 10K ohms @ 77°F (25°C)

### Outdoor Temperature Sensor



Sensor location:

- North or northwest wall of building
- 6.6 to 8.2 ft. (2 to 2.5 m) above ground or in case of a multi-storey building approximately halfway up the second floor

Electrical connection:

- 2-wire cable, max. cable length 115 ft. (35 m) with a wire size of min. AWG 16 copper
- Cable to the outdoor sensor must not be laid near line voltage wiring (120V or greater)

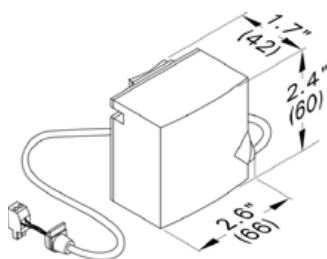
Max. ambient temperature during transport, storage and operation:

-40 to 194°F (-40 to 90°C)

## Optional Accessories

### Strap-on Temperature Sensor

(included with mixing valve motor kit),



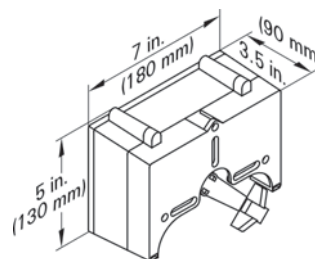
Installed with a strapping band.

Cable length 19.7 ft. (6 m), ready to plug in.

Max. ambient temp.

- at operation: 32 to 212°F (0 to 100°C)
- when storing or transporting: -4 to + 149°F (-20 to + 70°C)

### Mixing Valve Motor Kit



The mixing valve actuator is mounted directly on the Viessmann ¾ to 2½" mixing valve.

The mixing valve actuator is a motor-driven control unit. The rotational direction is reversible.

Rated voltage: 120VAC

Rated frequency: 60 Hz

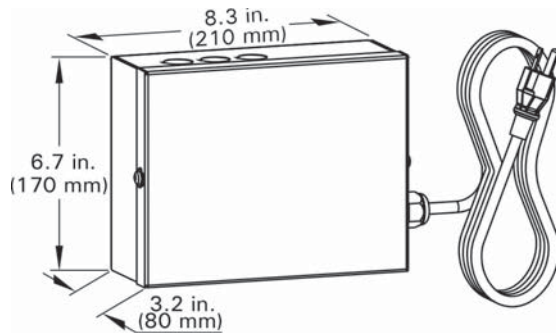
Power consumption: 4W max. ambient temperature  
- at operation: 32°F to 104°F (0°C to 40°C)

application in living areas and installation sites (normal ambient conditions)

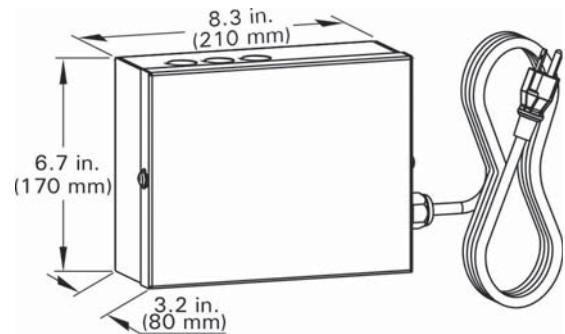
-storage & shipping: -4°F to 149°F (-20°C to 65°C)

Actuator torque: 3 Nm

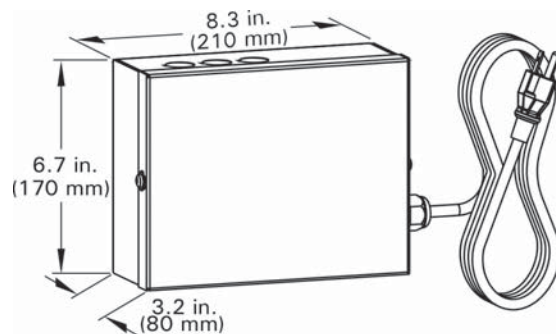
Time of 90°: 120 seconds

**Optional Accessories** *(continued)***Mixing Valve Extension Kit**

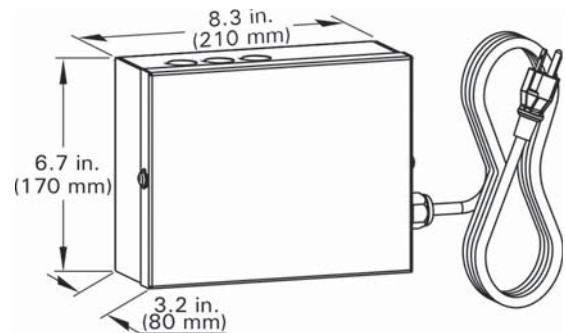
Rated voltage:	120VAC
Rated frequency:	60 Hz
Rated current:	2A
Power consumption:	2W
Max. ambient temp.	
- at operation:	32 to 104°F (0 to 40°C)
- when storing or transporting:	-4 to +149°F (-20 to +65°C)
Relay output for heating circuit pump:	1A, 120VAC
Relay output for mixing valve motor	1A

**EM-S1 Extension**

Rated voltage:	120VAC
Rated frequency:	60 Hz
Rated current:	2A
Power consumption:	2W
Max. ambient temp.	
- at operation:	32 to 104°F (0 to 40°C)
- when storing or transporting:	-4 to +149°F (-20 to +65°C)
Relay output for pump:	1A, 120VAC

**EM-P1 Extension**

Rated voltage:	120VAC
Rated frequency:	60 Hz
Rated current:	2A
Power consumption:	2W
Max. ambient temp.	
- at operation:	32 to 104°F (0 to 40°C)
- when storing or transporting:	-4 to +149°F (-20 to +65°C)
Relay output for pump:	1A, 120VAC

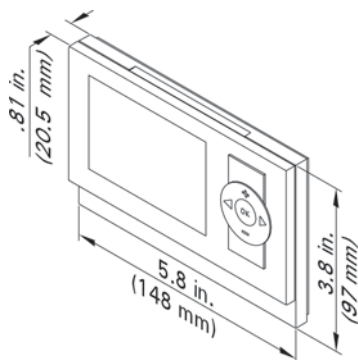
**EM-EA1 Extension**

Rated voltage:	120VAC
Rated frequency:	60 Hz
Rated current:	2A
Power consumption:	2.8W
Max. ambient temp.	
- at operation:	32 to 104°F (0 to 40°C)
- when storing or transporting:	-4 to +149°F (-20 to +65°C)
Relay output <span style="border: 1px solid black; padding: 0 2px;">66</span> :	1A, 120VAC
Relay output <span style="border: 1px solid black; padding: 0 2px;">21</span> :	1A, 120VAC

## Optional Accessories *(continued)*

### Vitotrol 200E

Up to two Vitotrol 200E controls may be connected to the boiler.



#### Plus BUS Participant

The Vitotrol 200E remote control regulates the required set room temperature in standard mode, from any room in the house.

- Party and economy mode can be enabled via keys
- Only for heating circuit with mixing valve
- Fitted room temperature sensor for room temperature hook-up

#### WS function:

Installation anywhere in the building.

#### RS function:

**Note:** Never activate the RS function for underfloor heating circuits (inertia). In heating systems with a heating circuit without mixing valve and heating circuits with mixing valve, the RS function must only affect the heating circuit with mixing valve.

#### Room temperature hook-up:

Installation in the main living room on an internal wall opposite radiators. Never install inside shelf units, recesses, 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 corrections of the supply temperature as well as a rapid heat-up at the start of the heating operation (if appropriately programmed).

#### Connection:

- 2-core lead 18 AWG, length max. 164 ft.(50 m) (even if connecting several remote control units)
- Never route this lead immediately next to line voltage (120V or greater)
- LV plug as standard delivery must be installed in the main living room (lead room).

#### Specification:

Power supply via Plus BUS

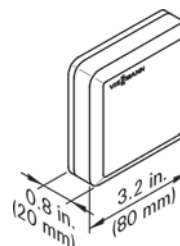
Power consumption: 0.2 W

#### Max. ambient temp.

- at operation: 32 to 104°F (0 to 40°C)
  - when storing or transporting: -4 to + 149°F (-20 to + 65°C)
- Set room temp. range 37 to 99°F (3 to 37°C)

The set room temperature for reduced mode is adjusted at the control unit.

### Room Temperature Sensor



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

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

Connect the room temperature sensor to the Vitotrol 200E.

#### Electrical connection:

- 2-wire cable with a wire size of min. AWG 18 copper
- The cable length between the control unit, remote control unit and room temperature sensor must not exceed 98 ft. (30 m)

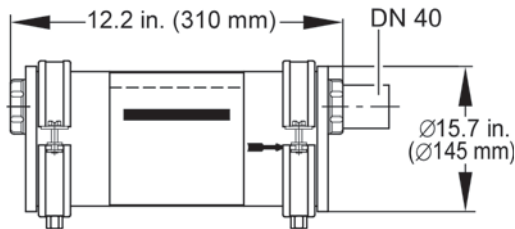
#### Max. ambient temp.

- at operation: 32 to 104°F (0 to 40°C)
- when storing or transporting: -4 to + 149°F (-20 to + 65°C)

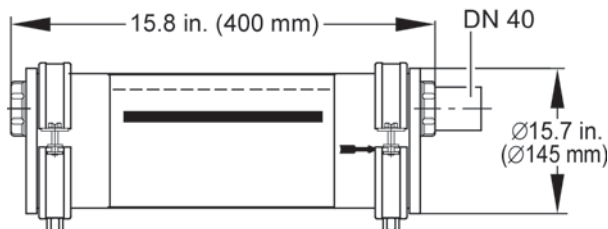
## Accessories for Vitodens 200-W

### Neutralization Unit for Single-Boiler Applications with neutralizing granulate

for models B2HE 85, 120



for models B2HE 150, 199



### Neutralization Pellets

2 x 1.3 kg for refill or replacement purposes

### Fuel Conversion Label Kit (NG > LPG)

(included in boiler technical literature set)

The Vitodens 200-W, B2HE boiler comes factory set for operation with natural gas. All B2HE models can be field converted to operate with liquid propane gas (as well as back to natural gas as required). The kit includes instructions and labels for field conversion.

### Low-Loss Header



When used in conjunction with the Vitodens 200-W boiler, the low-loss header acts as hydraulic break, decoupling boiler and system circuits from each other. It is recommended to use the low-loss header in applications in which the total system flow rate exceeds the maximum (or minimum) boiler flow rate. For maximum boiler flow rates, starting on page 8 of this manual.

Viessmann strongly recommends the use of a low-loss header in cases where the system head and flow rates are unknown.

The temperature sensor connection [TS] typically located at the top of the low-loss header ensures low return temperatures to the Vitodens 200-W boiler at all times, increasing operational efficiency.

In addition, the low-loss header helps eliminate air and debris [D] from the heating system.

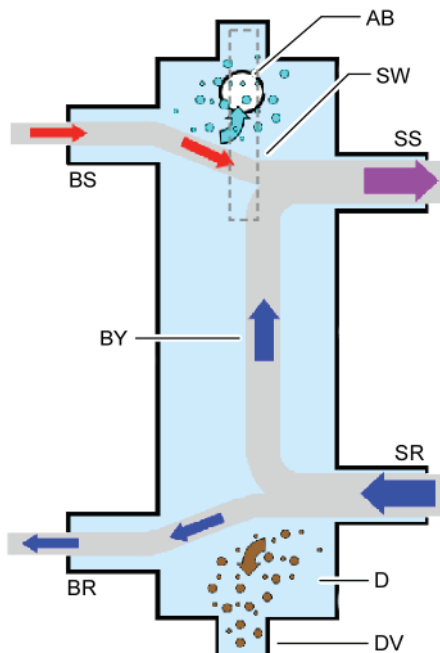
See illustrations for design and principle of operation on page 31.

The low-loss header is available in various sizes (see page 31). Select the size based on the maximum system flow rate of your application.

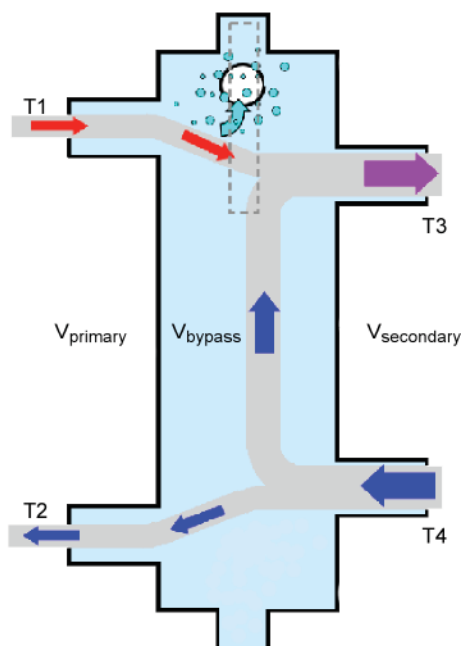
## Accessories for Vitodens 200-W *(continued)*

### Low-Loss Header *(continued)*

#### Low-loss header design (Typical)



#### Principle of Operation



### IMPORTANT

Use only a Viessmann supplied temperature sensor.

Do not use any other manufacturer's temperature sensor.

#### Legend

AB	Air Bleed
BR	Boiler Return
BS	Boiler Supply
BY	Bypass (with laminar flow)
D	Debris
DV	Drain Valve
SR	System Return
SS	System Supply
SW	Sensor Well

### IMPORTANT

When installing a low-loss header, the system mixed supply temperature (T3) must be calculated as follows:

$$T3 = \frac{T1 \times V_{primary} + T4 \times V_{bypass}}{V_{secondary}}$$

#### Legend

T1	Boiler supply temperature
T2	Boiler return temperature
T3	System supply temperature
T4	System return temperature
Vprimary	Boiler circuit flow rate
Vsecondary	Heating circuit flow rate
Vbypass	Bypass flow rate
Qprimary	Heat supplied by boiler
Qsecondary	Heat consumed by system

$$V_{primary} < V_{secondary}$$

$$T1 > T3$$

$$T2 = T4$$

$$Q_{primary} = Q_{secondary}$$

$$T1 \ 167^{\circ}\text{F} \ (75^{\circ}\text{C})$$

$$V_{secondary} = V_{primary} + V_{bypass}$$

Model No.	Max. system flow rate
Type 80/60	19.5 GPM (4.4 m <sup>3</sup> /h)
Type 120/80	35.2 GPM (8 m <sup>3</sup> /h)
Type 160/80 * 1	44 GPM (10 m <sup>3</sup> /h)
Type 200/120 * 1	80 GPM (18 m <sup>3</sup> /h)
Type 250/150 * 1	119 GPM (27 m <sup>3</sup> /h)
Type 300/200 * 1	189 GPM (43 m <sup>3</sup> /h)
Type 400/200 * 1	251 GPM (57 m <sup>3</sup> /h)
Type 450/250 * 1	374 GPM (85 m <sup>3</sup> /h)

\* 1 Floor-mounted version (typically used for multiple-boiler installations).



## Standard Equipment

The Vitodens 200-W gas-fired condensing boiler with Inox-Radial heat exchanger, modulating MatrixPlus cylinder burner for liquid propane gas and natural gas (available on all models), comes standard with:

- pressure gauge
- installation fittings with 30 psig pressure relief valve
- DHW sensor
- boiler control unit with outdoor temperature sensor
  - The boiler comes prewired and fully piped internally for field connections
  - Side wall co-axial vent installations must include Viessmann protective screen!
  - Enclosure finish:  
black steel, powder-coated white
  - The Vitodens 200-W comes ready for use with natural gas and can be fuel converted to liquid propane gas in the field.
  - Air vent

### Wall mounting componentry

The following wall mounting components are supplied with the Vitodens 200-W boiler:

- Mounting bracket
- Mounting bolts
- Installation fittings
- Screws for mounting bracket on
  - wood studs (2" x 4")
  - metal studs
  - brick/concrete wall

## Hydraulic Connection

### System design

Viessmann condensing boilers can generally be installed in any pumped hot water heating system (closed system). The circulation pump is an integral part of the appliance. Minimum system pressure 12 psi (0.8 bar).

The boiler water temperature is limited to 180°F (82°C) for space heating and 194°F (90°C) for DHW.

To minimize distribution losses, we recommend that you size the heat distribution system to a max. supply temperature of 158°F (70°C).

To reduce burner cycling in low energy houses with a correspondingly low heat demand, we recommend the use of a low loss header.



## Installation Examples

Please note that in the following piping layout examples all pumps are field supplied.

### IMPORTANT

The examples on the following pages depict possible piping layouts of the Vitodens 200-W boiler equipped with Viessmann System Technology.

For boiler and tank combinations, please install only feasible combinations listed in the Viessmann Price List.

Please note that the following examples are simplified conceptual drawings only!

Piping and necessary componentry must be field verified.

A low water cut-off (LWCO) must be installed where required by local codes.

Proper installation and functionality in the field is the responsibility of the heating contractor.



### WARNING

If a DHW storage tank other than a Viessmann Vitocell 300 tank is used, the installer must verify proper operation of the Viessmann DHW tank temperature sensor with the original manufacturer of the tank. Viessmann strongly recommends the installation of a temperature tempering valve in the DHW supply line.

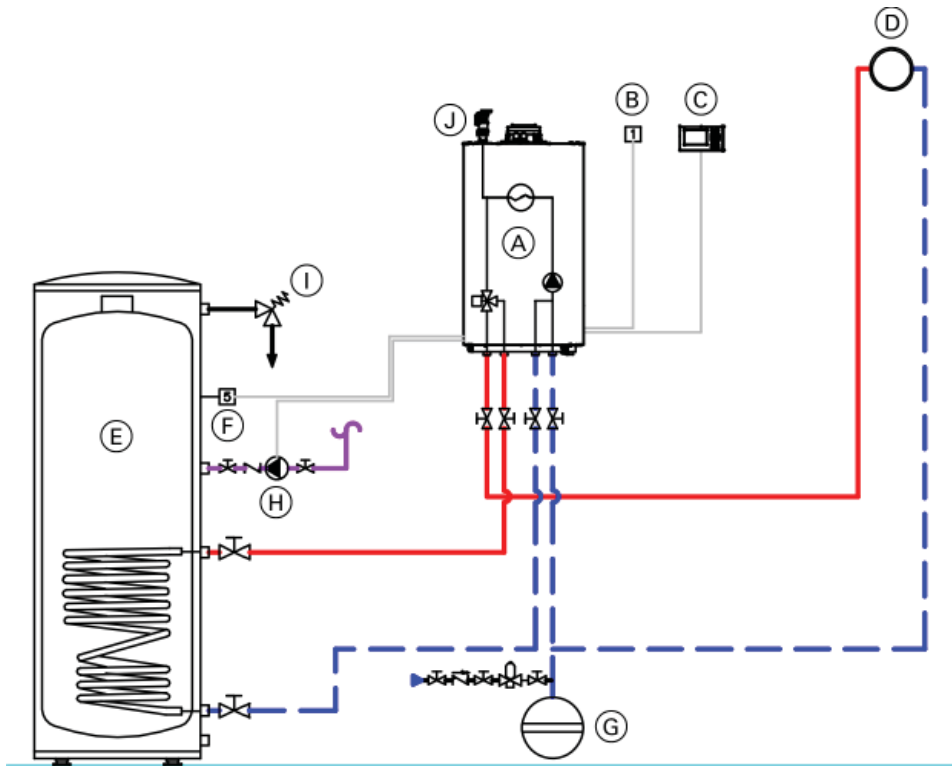
### IMPORTANT

DHW supply and return piping between boiler DHW connections and the Viessmann DHW tank connections, shall be a minimum of 1¼ in. nominal pipe diameter connection outlet sizes provided on the boiler and the DHW tank). This will ensure the residual head of the field supplied pump is fully utilized to overcome the resistance of the DHW heat exchanger coil and to provide sufficient water flow to the boiler heat exchanger.

In non-Viessmann DHW tank applications, perform, in addition to the above, accurate calculations for DHW tank coil pressure drop versus boiler pump (field supplied) residual head to ensure sufficient water flow to the boiler heat exchanger. Failure to heed the above instructions may cause boiler short-cycling and inadequate DHW supply.

# System Layout 1

Vitodens 200-W, B2HE with a DHW storage tank and a direct-connected heating circuit



## Legend

- (A) Vitodens 200-W B2HE boiler with integrated outdoor reset control, and variable speed boiler pump.
- (B) Outdoor temperature sensor [1]
- (C) Vitotrol remote (optional)
- (D) Heating circuit
- (E) DHW storage tank
- (F) DHW tank temperature sensor [5]
- (G) Expansion tank
- (H) DHW recirculation pump [P2] \*
- (I) Temperature and pressure relief valve
- (J) Pressure relief valve

\* Based on system configuration set using the commissioning assistant.

Installation of ...

- radiator heating circuit (high-temp. circuit)
- DHW production

... with the following flow conditions:

The flow rate of the heating circuit is less than the maximum possible water flow rate of the Vitodens 200-W B2HE boiler (see page 8 for maximum water flow rate of boiler).

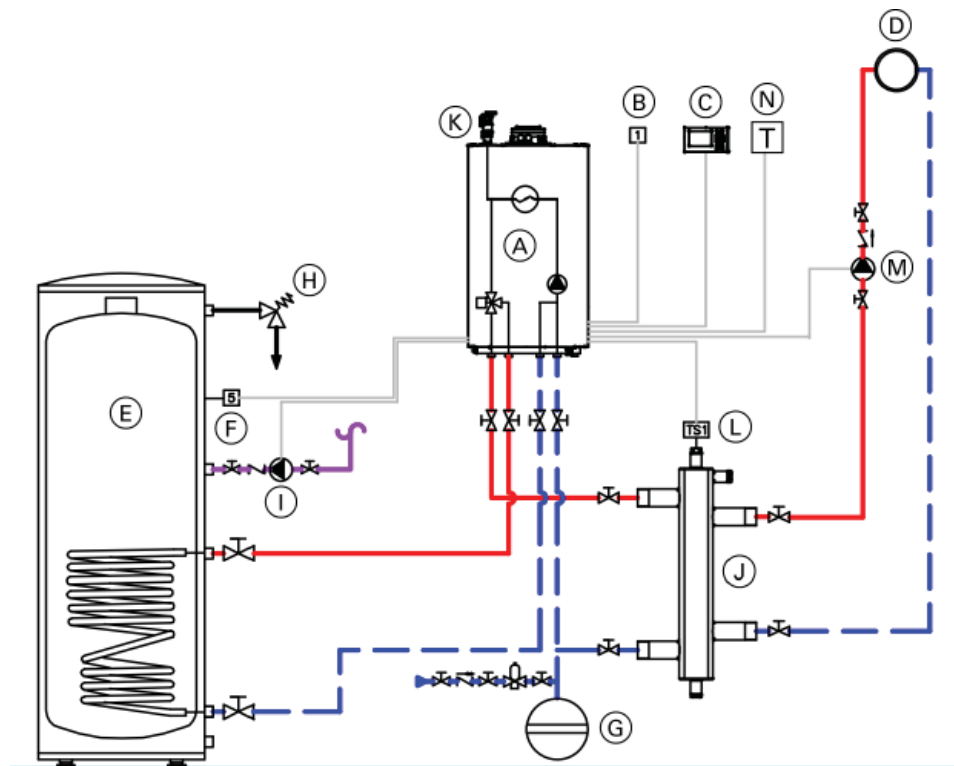
The use of a low-loss header is strongly recommended if the maximum water flow rate in the application concerned exceeds the values shown in the applicable table on page 8, or if the system flow rates are unknown.

The low-loss header is available as accessory part.

See following pages for installation examples with a low-loss header.

## System Layout 2

Vitodens 200-W, B2HE with a DHW storage tank and one heating zone and low-loss header



### Legend

- (A) Vitodens 200-W B2HE boiler with integrated outdoor reset control and variable speed boiler pump
- (B) Outdoor temperature sensor [1]
- (C) Vitotrol remote (optional)
- (D) Heating circuit
- (E) DHW storage tank
- (F) DHW tank temperature sensor [5]
- (G) Expansion tank
- (H) Temperature and pressure relief valve
- (I) DHW recirculation pump [P2]\*
- (J) Low-loss header
- (K) Pressure relief valve
- (L) Viessmann temperature sensor for low-loss header [TS1]
- (M) Heating zone pump
- (N) Thermostat for heating zone

### Installation of ...

- radiator heating circuit (high-temp. circuit)
- DHW production

... with the following flow conditions:

The flow rate of the heating circuit is greater than the maximum possible water flow rate of the Vitodens 200-W B2HE boiler (see page 8 for maximum water flow rate of boiler).

The use of a low-loss header is strongly recommended if the maximum water flow rate in the application concerned exceeds the values shown on page 8, or if the system flow rates are unknown.

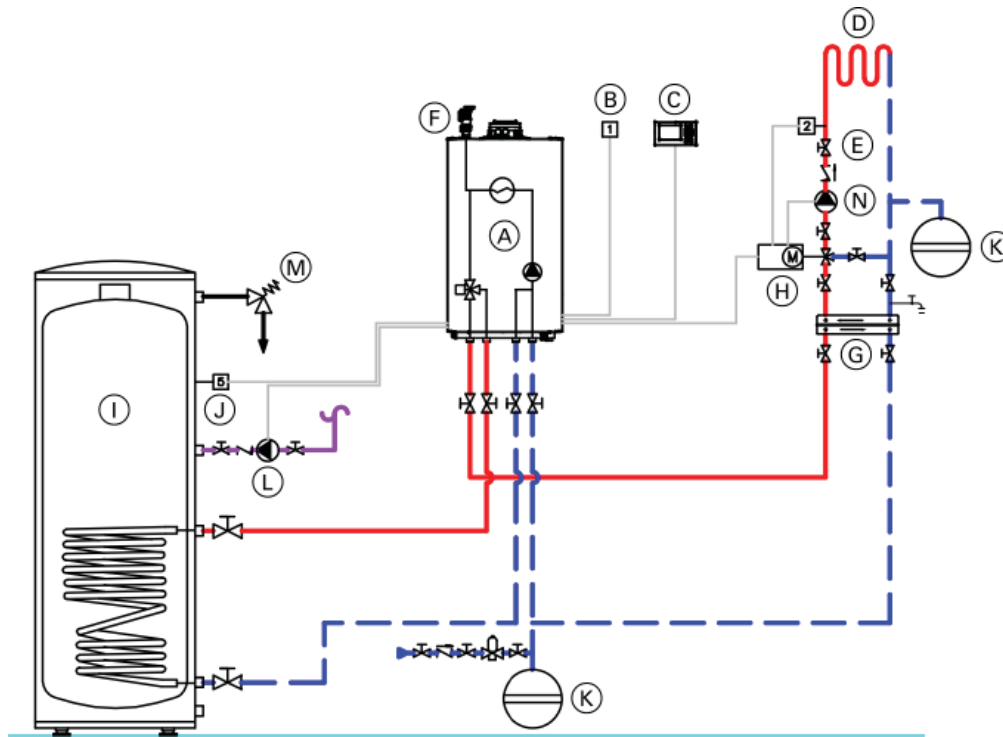
The low-loss header is available as accessory part.

\* Based on system configuration set using the commissioning assistant.

## System Layout 3

Vitodens 200-W, B2HE with...

- DHW storage tank
- one heating circuit with mixing valve and system separation



### Legend

- (A) Vitodens 200-W B2HE boiler with integrated outdoor reset control and variable speed boiler pump
- (B) Outdoor temperature [1]
- (C) Vitotrol remote (optional)
- (D) Underfloor heating circuit
- (E) Mixing valve temperature sensor [2]
- (F) Pressure relief valve
- (G) Plate heat exchanger for system separation
- (H) Accessory kit for heating circuit with mixing valve
- (I) DHW storage tank
- (J) DHW tank temperature sensor [5]
- (K) Expansion tank
- (L) DHW recirculation pump [P2]\*
- (M) Temperature and pressure relief valve
- (N) Heating circuit pump (mixing circuit)

\* Based on system configuration set using the commissioning assistant.

Installation of ...

- underfloor heating circuit with 3-way mixing valve and system separation (low-temp. circuit)
- DHW production

... with the following flow conditions:

The flow rate of the heating circuit is less than the maximum possible water flow rate of the Vitodens 200-W B2HE boiler.

See page 8 for maximum water flow rate of the Vitodens 200-W B2HE boilers. The use of a low-loss header is recommended if the system water flow rate is unknown. The low-loss header is available as accessory part.

See following pages for installation examples with a low-loss header.

### IMPORTANT

**System separation is required of underfloor heating systems employing non-oxygen diffusion barrier tubing. All components on the secondary side of the heat exchanger must be made of corrosion-resistant materials.**

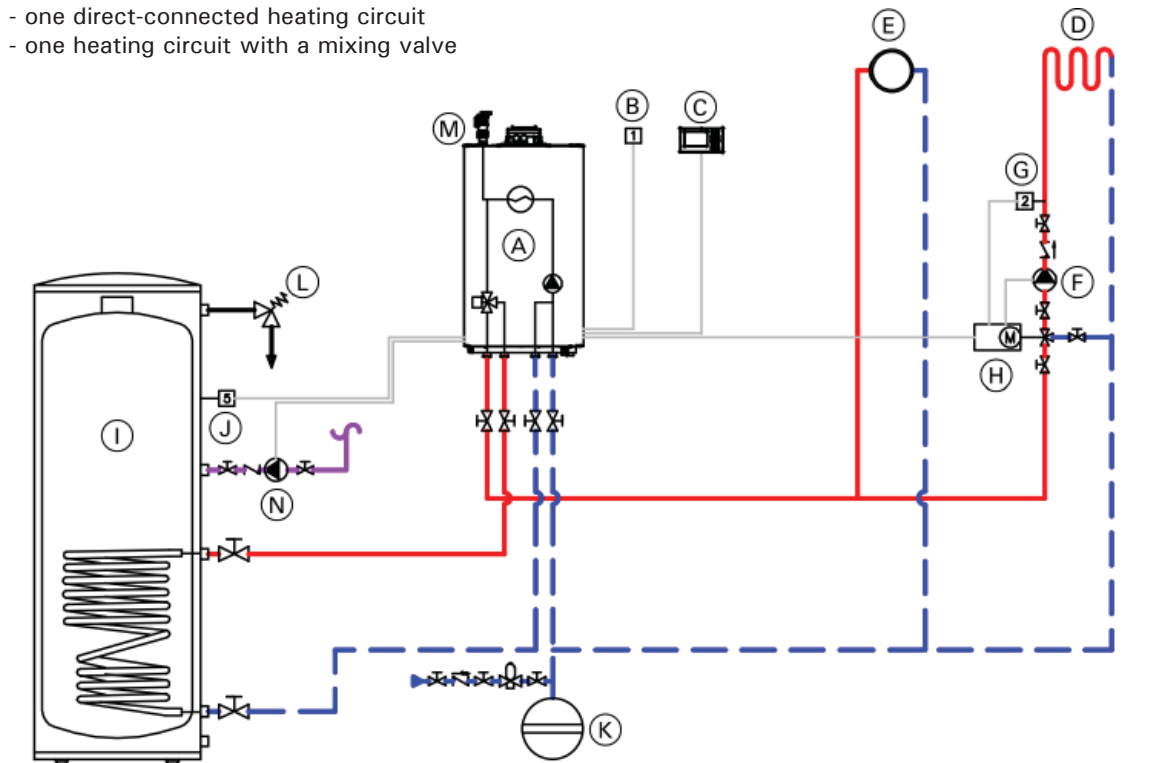
### IMPORTANT

See page 9 for the supply head pressure drop of the boiler. An undersized pump may cause short-cycling and/or improper operation of the boiler. Viessmann **STRONGLY** recommends using a low-loss header and a heating circuit pump in this system layout.

## System Layout 4

Vitodens 200-W, B2HE with...

- DHW storage tank
- one direct-connected heating circuit
- one heating circuit with a mixing valve



### Legend

- (A) Vitodens 200-W B2HE boiler with integrated outdoor reset control and variable speed boiler pump
- (B) Outdoor temperature sensor [1]
- (C) Vitotrol remote (optional)
- (D) Under floor heating circuit
- (E) Radiator heating circuit
- (F) Heating circuit pump (mixing circuit)
- (G) Mixing valve temperature sensor [2]
- (H) Accessory kit for heating circuit with mixing valve
- (I) Domestic hot water storage tank
- (J) DHW tank temperature sensor [5]
- (K) Expansion tank
- (L) Temperature and pressure relief valve
- (M) Pressure relief valve
- (N) DHW recirculation pump [P2]\*

\* Based on system configuration set using the commissioning assistant.

Installation of ...

- radiator heating circuit (high-temperature circuit)
- underfloor heating circuit with 3-way mixing valve and system separation (low-temperature circuit)
- DHW production

... with the following flow conditions:

The flow rate of the heating circuit is less than the maximum possible water flow rate of the Vitodens 200-W B2HE boiler.

See page 8 for maximum water flow rate of the Vitodens 200-W B2HE boilers. The use of a low-loss header is recommended if the system water flow rate is unknown. The low-loss header is available as accessory part.

See following pages for installation examples with a low-loss header.

### IMPORTANT

System separation is required of underfloor heating systems employing non-oxygen diffusion barrier tubing. All components on the secondary side of the heat exchanger must be made of corrosion-resistant materials.

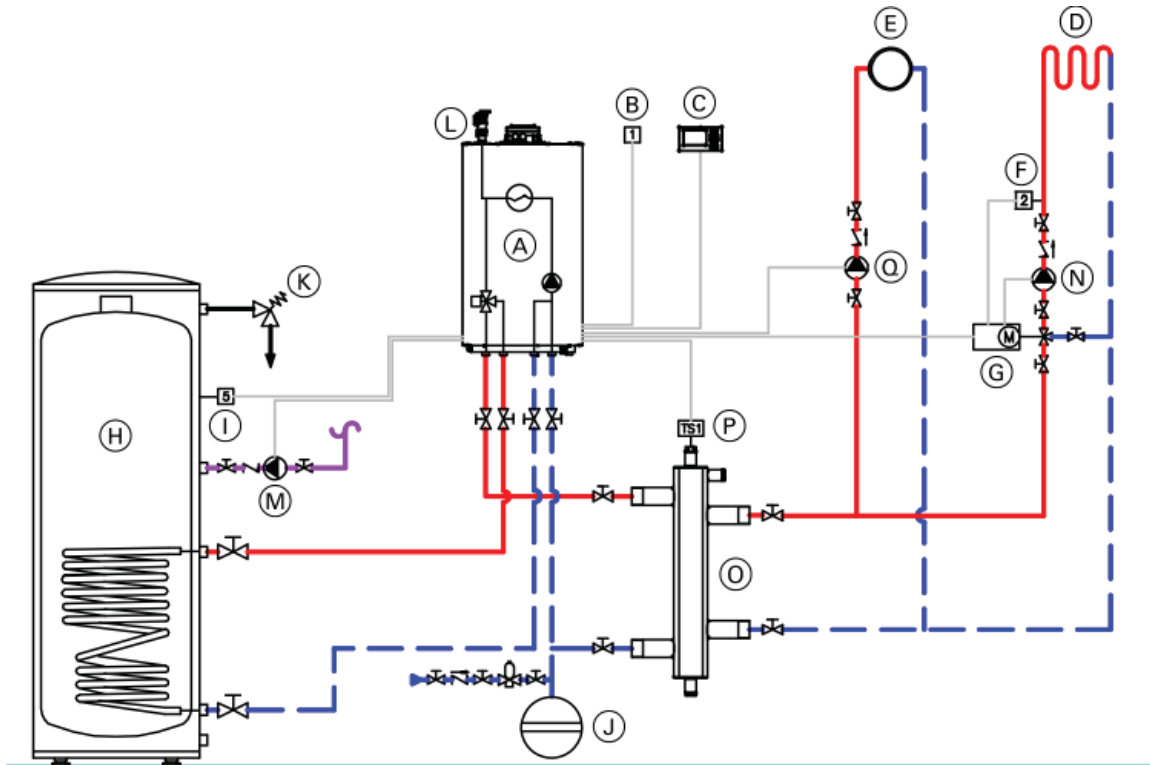
### IMPORTANT

See page 9 for the supply head pressure drop of the boiler. An undersized pump may cause short-cycling and/or improper operation of the boiler. Viessmann **STRONGLY** recommends using a low-loss header and a boiler pump in this system layout.

## System Layout 5

Vitodens 200-W, B2HE with...

- DHW storage tank
- one heating circuit with mixing valve
- one heating circuit without mixing valve and low-loss header



### Legend

- (A) Vitodens 200-W B2HE boiler with integrated outdoor reset control and variable speed boiler pump
- (B) Outdoor temperature sensor [1]
- (C) Vitotrol remote (optional)
- (D) Under floor heating circuit
- (E) Radiator heating circuit
- (F) Mixing valve temperature sensor [2]
- (G) Kit for heating circuit with mixing valve
- (H) Domestic hot water storage tank
- (I) DHW tank temperature sensor [5]
- (J) Expansion tank
- (K) Temperature and pressure relief valve
- (L) Pressure relief valve
- (M) DHW recirculation pump [P2]\*
- (N) Heating circuit pump (mixing circuit)
- (O) Low-loss header
- (P) Viessmann temperature sensor for low-loss header [TSI]
- (Q) Heating circuit pump [P1]\*

### Installation of different heating circuits...

- radiator heating circuit (high-temp. circuit)
- under floor heating circuit with 3-way mixing valve (low-temp. circuit)
- DHW production

... with the following flow conditions:

The total flow rate of the two heating circuits is greater than the maximum possible water flow rate of the Vitodens 200-W B2HE boiler (see page 8 for maximum water flow rate of boiler).

The use of a low-loss header is strongly recommended. The low-loss header is available as accessory part.

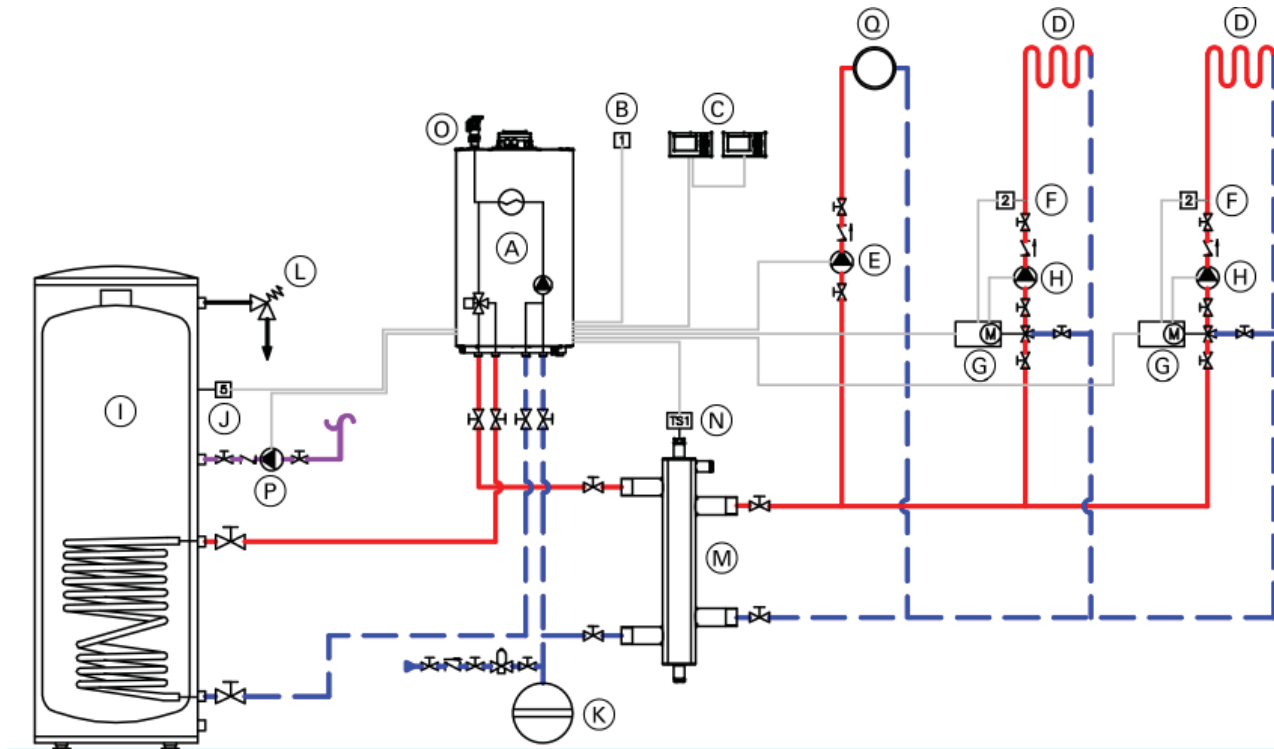
The 3-way mixing valve, built-in to achieve the low-temperature level of the under floor heating circuit, is controlled by an accessory kit for a heating circuit with mixing valve.

\* Based on system configuration set using the commissioning assistant.

## System Layout 6

Vitodens 200-W, B2HE with...

- DHW storage tank
- one heating circuit without a mixing valve
- two heating circuits with a mixing valve
- low-loss header



### Legend

- (A) Vitodens 200-W B2HE boiler with integrated outdoor reset control and variable speed boiler pump
- (B) Outdoor temperature sensor [1]
- (C) Vitotrol remote (optional)
- (D) Under floor heating circuit
- (E) Heating circuit pump [P1]\*
- (F) Mixing valve temperature sensor [2]
- (G) Accessory kit for heating circuit with mixing valve
- (H) Heating circuit pumps (mixing circuit)
- (I) DHW storage tank
- (J) DHW tank temperature sensor [5]
- (K) Expansion tank
- (L) Temperature and pressure relief valve
- (M) Low-loss header
- (N) Viessmann temperature sensor for low-loss header [TSI]
- (O) Pressure relief valve
- (P) DHW recirculation pump [P2]\*
- (Q) Radiator heating circuit

### Installation of different heating circuits...

- radiator heating circuit (high-temperature circuit)
- two heating circuits with 3-way mixing valve (low-temp. circuit)
- DHW production

... with the following flow conditions:

The total flow rate of the two heating circuits is greater than the maximum possible water flow rate of the Vitodens 200-W B2HE boiler (see page 8 for maximum water flow rate of boiler).

The use of a low-loss header is strongly recommended. The low-loss header is available as accessory part.

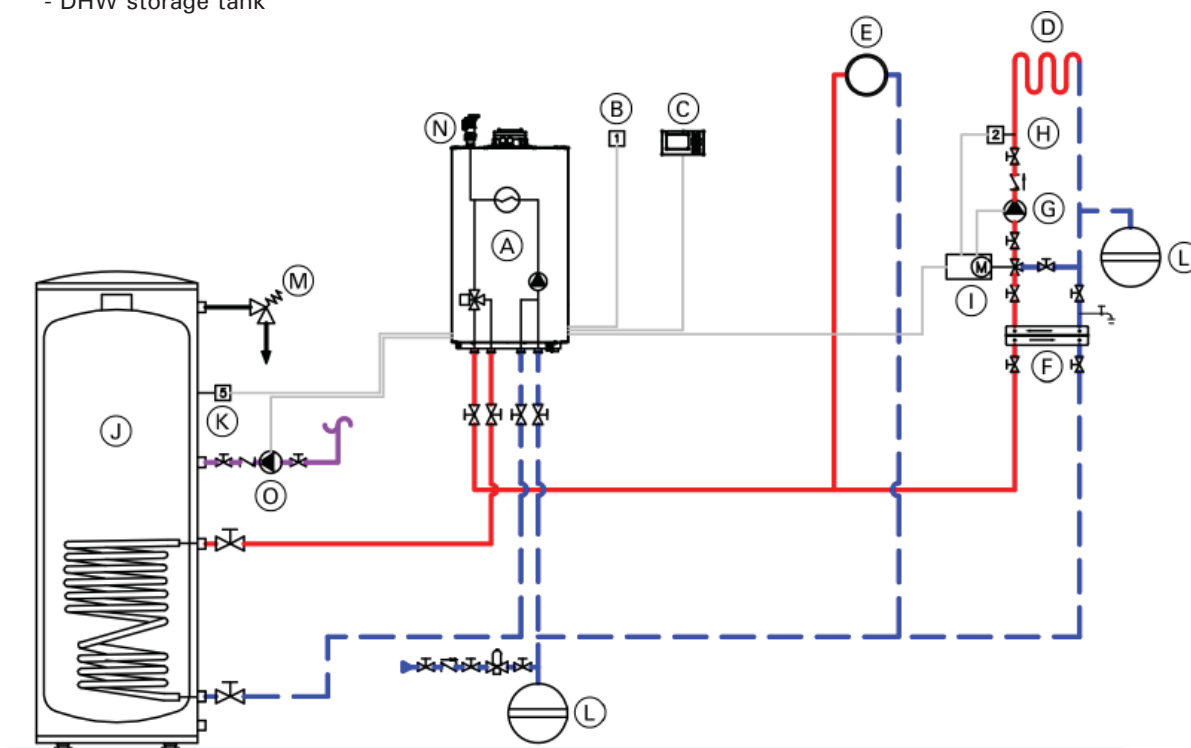
The 3-way mixing valve, built-in to achieve the low-temperature level of the under floor heating circuit, is controlled by an accessory kit for a heating circuit with a mixing valve.

\* Based on system configuration set using the commissioning assistant.

## System Layout 7

Vitodens 200-W, B2HE with...

- direct-connected heating circuit
- one heating circuit with system separation
- DHW storage tank



### Legend

- (A) Vitodens 200-W B2HE boiler with integrated outdoor reset control and variable speed boiler pump
- (B) Outdoor temperature sensor [1]
- (C) Vitotrol remote (optional)
- (D) Under floor heating circuit
- (E) Radiator heating circuit
- (F) Plate heat exchanger for system separation
- (G) Heating circuit pump (mixing circuit)
- (H) Mixing valve temperature sensor [2]
- (I) Accessory kit for heating circuit with mixing valve
- (J) DHW storage tank
- (K) DHW tank temperature sensor [5]
- (L) Expansion tanks
- (M) Temperature and pressure relief valve
- (N) Pressure relief valve
- (O) DHW recirculation pump [P2]\*

\* Based on system configuration set using the commissioning assistant.

Installation of different heating circuits...

- radiator heating circuit (high-temp. circuit)
- under floor heating circuit with 3-way mixing valve (low-temp. circuit)
- DHW production

... with the following flow conditions:

The total flow rate of the two heating circuits is less than the maximum possible water flow rate of the Vitodens 200-W B2HE boiler (see page 8 for maximum water flow rate of boiler).

The use of a low-loss header is strongly recommended if the maximum water flow rate in the application concerned exceeds the max. boiler flow rate, or if the system flow rates are unknown. The low-loss header is available as accessory part.

The 3-way mixing valve, built-in to achieve the low-temperature level of the under floor heating circuit, is controlled by an accessory kit for a heating circuit with mixing valve (I). The boiler pump supplies the radiator heating circuit and the plate heat exchanger for system separation.

### IMPORTANT

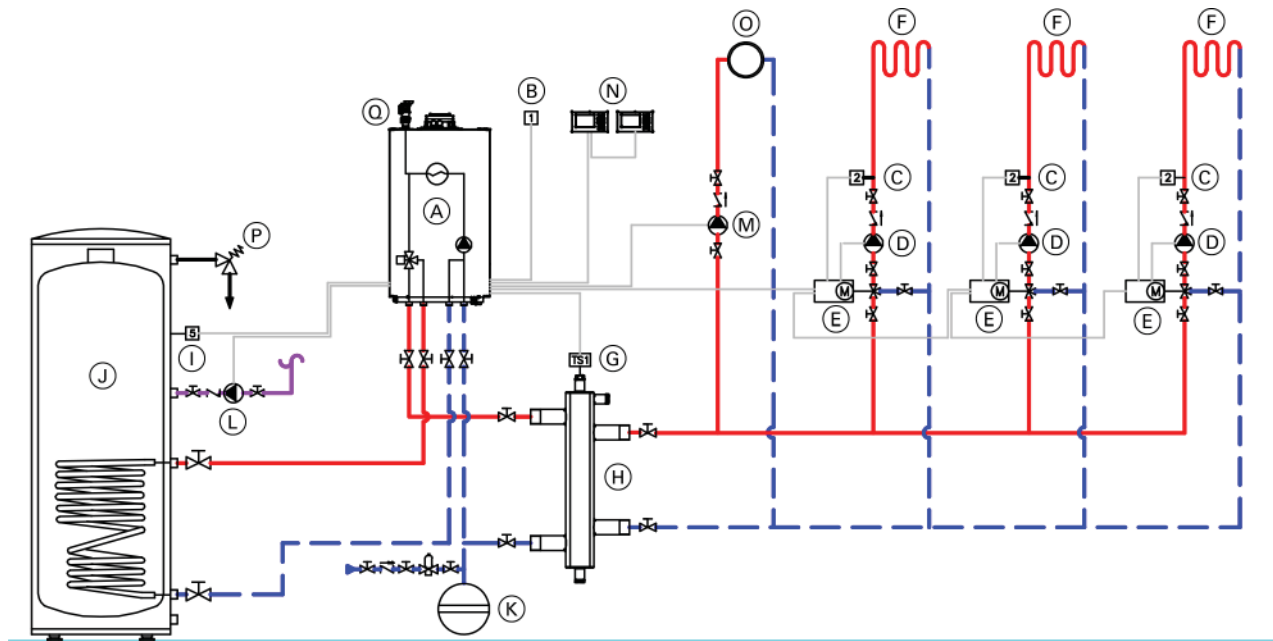
The pressure drop (secondary circuit) of the plate heat exchanger (F) must be less/equal to the pressure drop of the 3-way mixing valve. This must be taken into account when sizing the plate heat exchanger.



## System Layout 8

Vitodens 200-W, B2HE with...

- DHW storage tank
- low-loss header
- multiple heating circuits with mixing valves
- one heating circuit without mixing valve



When designing a system as illustrated above, please contact your local Viessmann Sales Representative for assistance.

### Legend

- (A) Vitodens 200-W B2HE boiler with integrated outdoor reset control and variable speed boiler pump
- (B) Outdoor temperature [1]
- (C) Mixing valve temperature sensor [2]
- (D) Heating circuit pumps (mixing circuit)
- (E) Accessory kit for heating circuit with mixing valve
- (F) Heating circuits with mixing valves
- (G) Viessmann temperature sensor for low-loss header [TSI]
- (H) Low-loss header
- (I) DHW tank temperature sensor [5]
- (J) DHW storage tank
- (K) Expansion tank
- (L) DHW recirculation pump [P2] \*
- (M) Heating circuit pump [P1] \*
- (N) Vitotrol remote (optional)
- (O) Radiator heating circuit
- (P) Temperature and pressure relief valve
- (Q) Pressure relief valve

### IMPORTANT

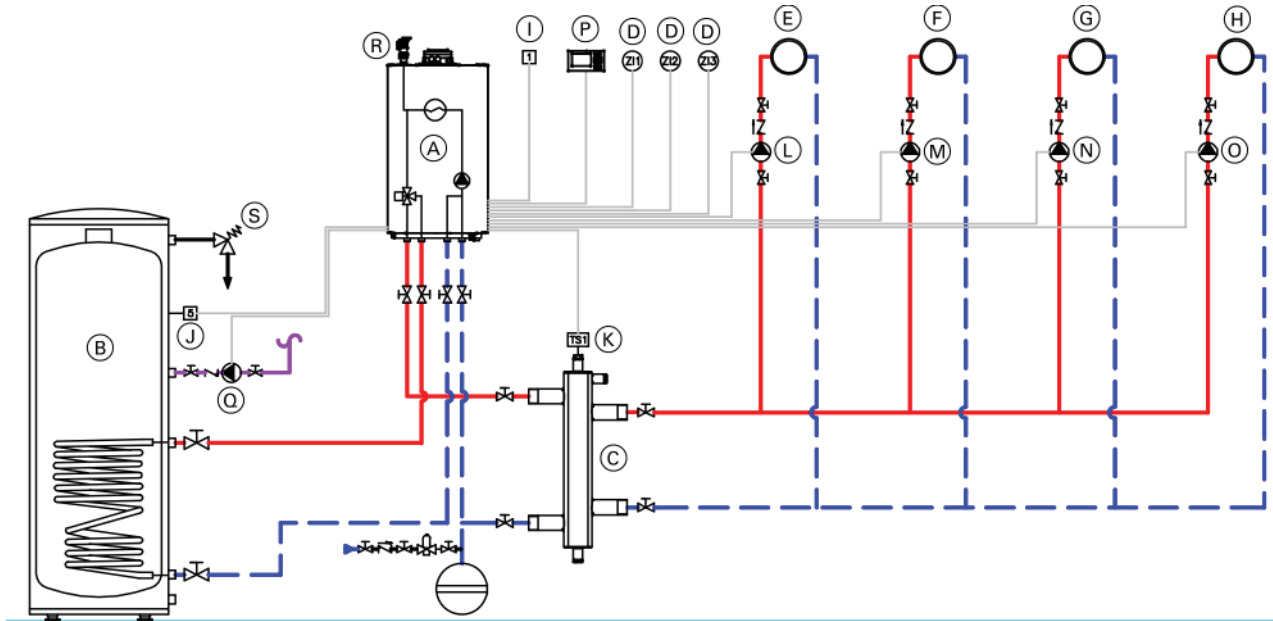
Please note location of expansion tank (K).

\* Based on system configuration set using the commissioning assistant.

## System Layout 9

Vitodens 200-W, B2HE with...

- DHW storage tank
- low-loss header
- four zone circuits



### Legend

- (A) Vitodens 200-W boilers with integrated outdoor reset and variable speed boiler pump
- (B) DHW storage tank
- (C) Low-loss header
- (D) Thermostat zone circuits 2, 3, 4 (Z11, Z12, Z13)
- (E) Zone circuit 1
- (F) Zone circuit 2
- (G) Zone circuit 3
- (H) Zone circuit 4
- (I) Outdoor temperature sensor [1]
- (J) DHW temperature sensor [5]
- (K) low loss header temperature sensor [TSI]
- (L) Zone circuit 1 pump [P1]
- (M) Zone pump 1 (ZP1)
- (N) Zone pump 2 (ZP2)
- (O) Zone pump 3 (ZP3)
- (P) Vitotrol remote control (or dry contact thermostat)
- (Q) DHW recirculation pump [P2]
- (R) Pressure relief valve
- (S) Temperature and pressure relief valve

### Installation of different heating circuits...

- DHW production
- 4 zone circuits

... with the following flow conditions:

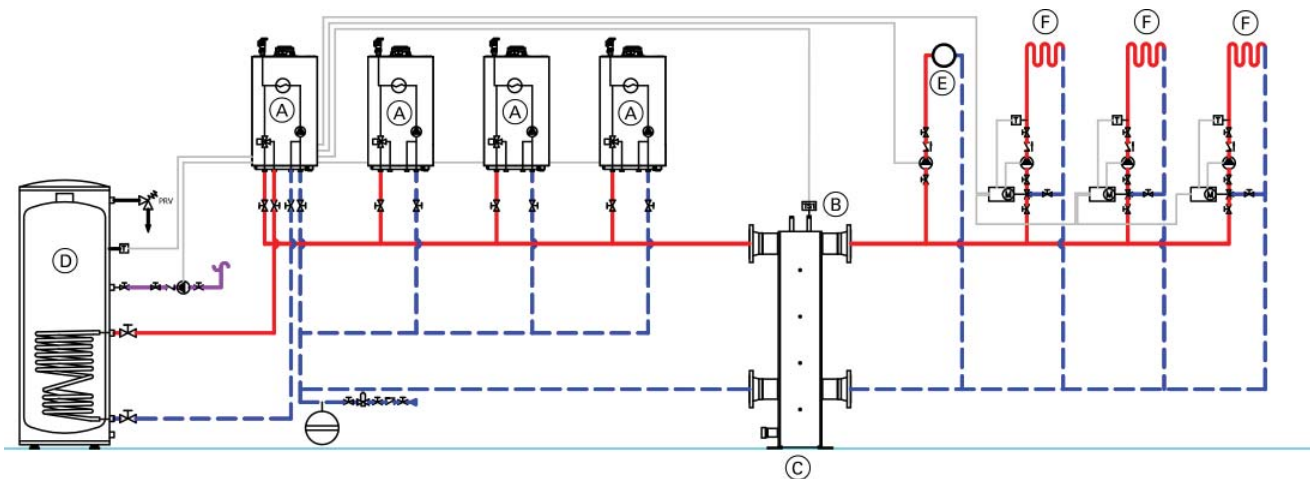
The total flow rate of the three heating circuits is greater than the maximum possible water flow rate of the Vitodens 200-W B2HE boiler.

The use of a low-loss header is strongly recommended. The low-loss header is available as accessory part.

## System Layout 10

Multiple (up to 15) Vitodens 200-W, models B2HE with...

- multiple heating circuits with mixing valves
- low-loss header
- DHW tank (direct connect to lead boiler)



### Legend

- Ⓐ Vitodens boiler
- Ⓑ Low-loss header/common supply temperature sensor
- Ⓒ Low-loss header
- Ⓓ DHW storage tank
- Ⓔ High temperature heating circuit
- Ⓕ Low temperature heating circuit

When designing a multiple Vitodens system as shown above, please reference applicable multiple Vitodens technical documentation, and contact your local Viessmann Sales Representative for further assistance.

This installation example depicts a possible piping layout for multiple Vitodens 200-W, B2HE boilers equipped with Viessmann System Technology. Please note that this example is based on a simplified conceptual drawing only! Piping and necessary componentry must be field verified. A low water cut-off (LWCO) must be installed where required by local codes. Proper installation and functionality in the field is the responsibility of the heating contractor.



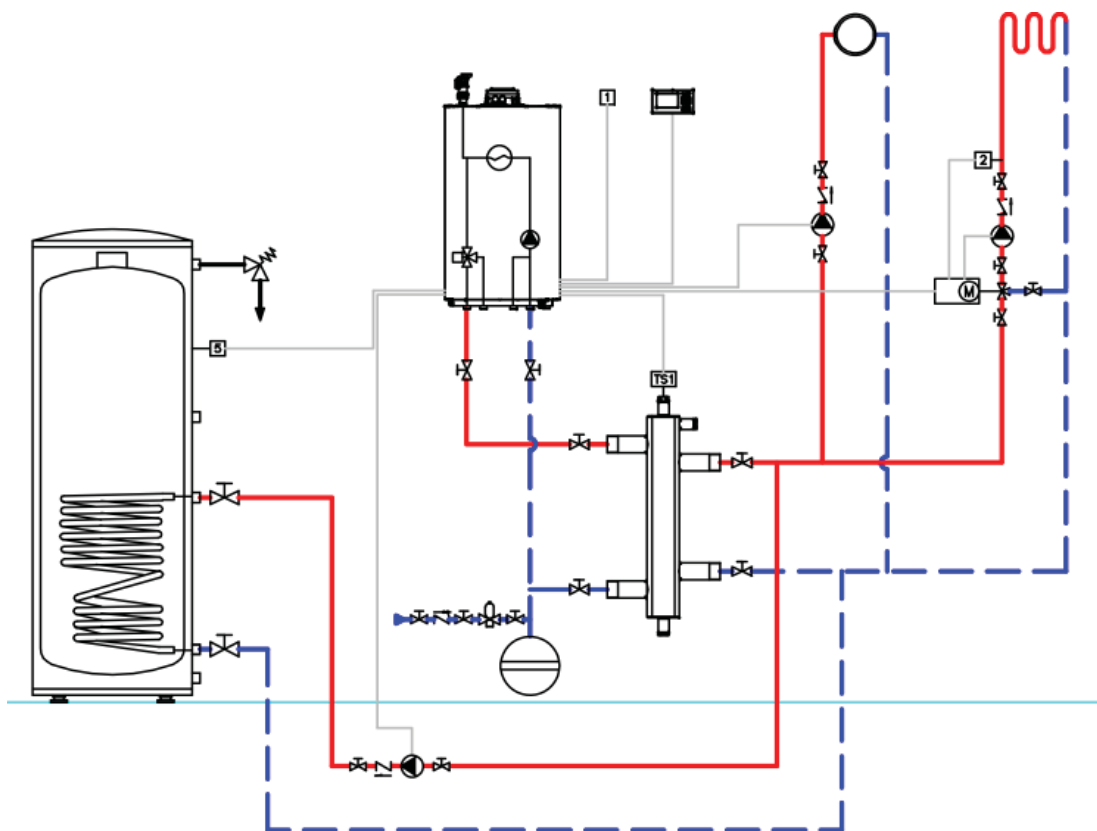
### WARNING

If a DHW storage tank other than a Viessmann Vitocell 300 tank is used, the installer must verify proper operation of the Viessmann DHW tank temperature sensor with the original manufacturer of the tank. Viessmann strongly recommends the installation of a temperature tempering valve in the DHW supply line.

**Note:** Only the lead boiler can be directly connected to a DHW tank in a multi boiler system. For systems using multiple tanks or larger DHW leads connect DHW down stream of the low loss header (refer to page 49).

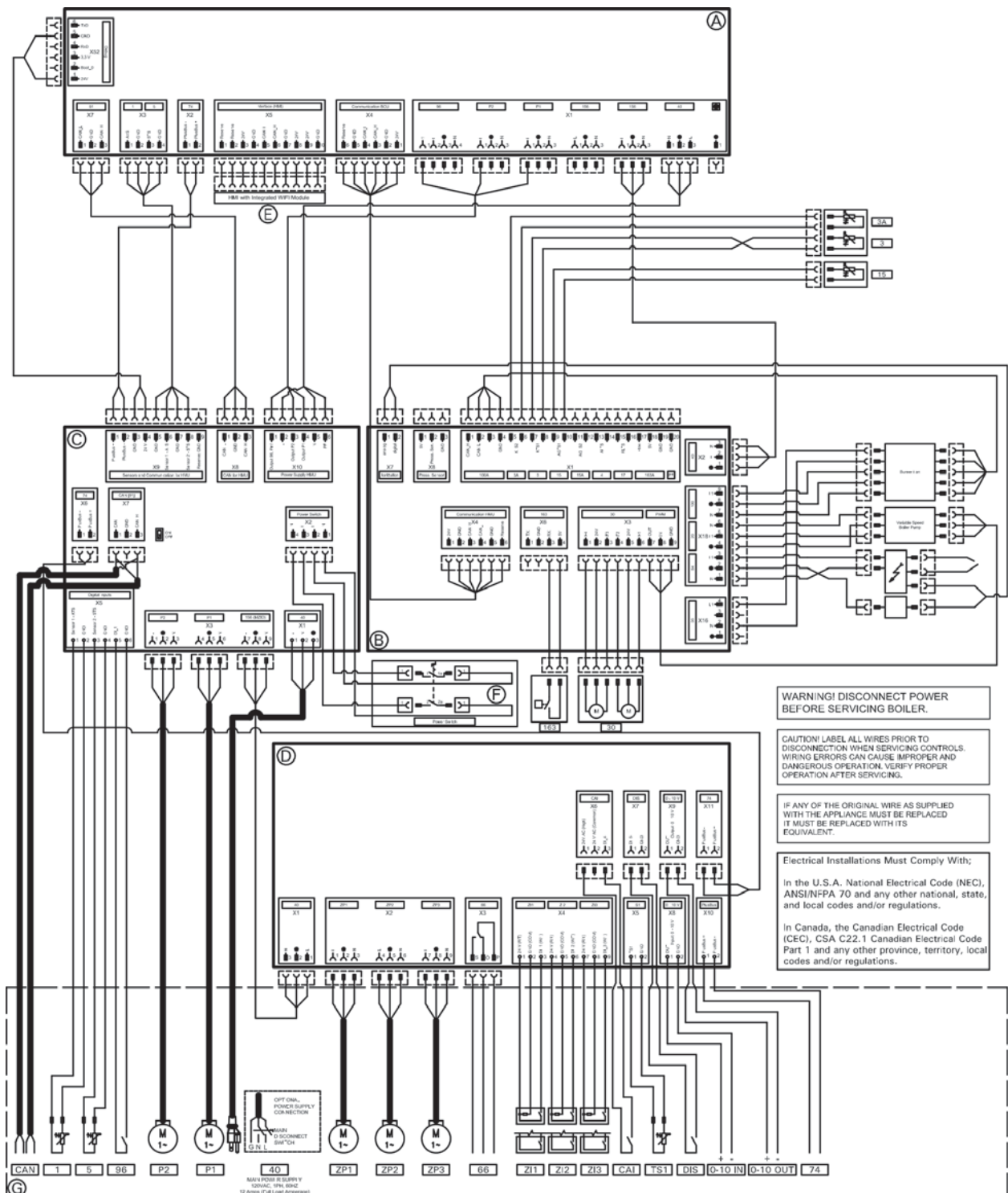
## Alternative DHW Connection

The following piping diagram reflects an alternative connection for the DHW tank only and applies to system layouts 2, 5, 6, 7, 8, 9 and 10. The boiler control pump logic function must be programmed in the Service Instructions.



**\*Note:** When using a low loss header in the system, the DHW connections can be made downstream of the low loss header.  
System configuration automatically set with commissioning assistant.

# Overview of Electrical Connections



**WARNING! DISCONNECT POWER BEFORE SERVICING BOILER.**

**CAUTION! LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING CONTROLS. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION. VERIFY PROPER OPERATION AFTER SERVICING.**

**IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED IT MUST BE REPLACED WITH ITS EQUIVALENT.**

**Electrical Installations Must Comply With:**

In the U.S.A. National Electrical Code (NEC), ANSI/NFPA 70 and any other national, state, and local codes and/or regulations.

In Canada, the Canadian Electrical Code (CEC), CSA C22.1 Canadian Electrical Code Part 1 and any other province, territory, local codes and/or regulations.

<p>① HMCU Control Board</p> <p>② BCU Control Board</p> <p>③ WP Control Board</p> <p>④ MZIO Control Board</p> <p>⑤ HMI With WiFi Module</p> <p>⑥ Power Switch</p> <p>⑦ Field Wiring Connections</p>	<p>1 Outdoor Temperature Sensor</p> <p>3 Boiler Temperature Sensor 1</p> <p>3A Boiler Temperature Sensor 2</p> <p>5 DHW Temperature Sensor/Dry Contact</p> <p>11 Ionization Signal</p> <p>15 Flue Gas Temperature Sensor</p> <p>20 Variable Speed Boiler Pump (Internal)</p> <p>30 Diverting Valve Stepper Motor</p> <p>35 Gas Valve</p> <p>40 Power Supply</p> <p>54 Ignition Transformer</p> <p>66 Potential Free Switching Contact**</p> <p>74 PlusBus Communication</p> <p>96 Configurable Dry Contact Input*</p>	<p>100 Burner Fan Motor Power Supply</p> <p>100A Burner Fan Motor Speed Control</p> <p>156 120VAC Output</p> <p>163 Boiler Flow Switch</p> <p>0-10 IN 0-10 VDC External Setpoint Demand</p> <p>0-10 OUT 0-10 VDC Output Signal</p> <p>CAI Combustion Air Interlock</p> <p>CAN (BT) CANBus Connection (Cascade)</p> <p>DIS Digital Input Signal</p> <p>PWM Internal Pump Speed Control</p> <p>P1 DHW Pump/Heating 1 Circuit Pump*</p> <p>P2 Heating Circuit 1 Pump/DHW Re-Circulation Pump*</p> <p>TS1 LLH Temperature Sensor</p> <p>Z1 Zone Input 1 (24VAC/Dry Contact/LWCO)*</p>	<p>Z2 Zone Input 2 (24VAC/Dry Contact/LGP Switch)*</p> <p>Z3 Zone Input 3 (24VAC/Dry Contact/HGP Switch)*</p> <p>ZP1 Zone Pump 1</p> <p>ZP2 Zone Pump 2</p> <p>ZP3 Zone Pump 3</p>
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\*FUNCTIONALITY AUTOMATICALLY SET BASED ON SYSTEM CONFIGURATION SELECTED IN THE COMMISSIONING ASSISTANT

\*\*FUNCTIONALITY SELECTED IN PARAMETER SETTINGS

System Design Considerations

IN THE COMMONWEALTH OF MASSACHUSETTS...

- this product shall be installed by a licensed plumber or gas fitter.
- the flexible connector (if used) cannot exceed 36".
- any level type shutoff used must be of tee handle type.

Boiler location

As a direct vent appliance, the Vitodens 200-W can be installed for room air independent operation (sealed combustion) regardless of size and ventilation method of the room in which it is located. The Vitodens 200-W can be installed, for example, in the main living area of a house, in non-ventilated utility rooms, cupboards, closets and alcoves with no clearance required from combustibile materials, as well as in attics with a direct outlet for the flue gas/fresh air system. Follow all local and national codes.

Flue gas system

PPS (Polypropylene) concentric flue gas/fresh air systems for room air independent operation (sealed combustion) and side wall venting are tested to ANSI Z21.13 - CSA 4.9 (current edition) standards and are certified together with the Vitodens 200-W boiler as a constructional unit. The Vitodens 200-W boiler may also be vented vertically, using an AL29-4C® special stainless steel, single-wall, room air dependent venting system (UL listed for category IV). For a more detailed description of the direct vent and single-wall vent system, please refer to the Vitodens 200-W Venting System Installation Instructions.

Flue gas temperature protection

Flue pipes used for the Vitodens 200-W are suitable for max. flue gas temperatures of up to 230°F (110°C). No flue gas temperature protection is required as the maximum permissible flue gas temperature is not exceeded in any operating condition or in the event of malfunctioning.

Low water cut-off

The Vitodens 200 boiler is certified with an internal flow switch, however a low water cut-off may be required by local jurisdiction. If required, an approved type low water cut-off device must be provided by the heating contractor. Do not install an isolation valve between the boiler and the low water cut-off.

Water connections

Vitodens 200-W boilers can be used in any fully pumped hot water heating system. Minimum system pressure is 12 psig (0.8 bar). Chemical corrosion protection products Corrosion does not typically occur in sealed heating systems which have been correctly installed and are correctly operated. Many manufacturers of plastic pipes recommend the use of chemical additives. In this case, only those commercially available corrosion protection products approved for boilers with domestic hot water heating via single-wall heat exchangers (instantaneous plate heat exchangers or DHW tanks) must be used.

Water quality

Treatment for boiler feed water should be considered in areas of known problems, such as where a high mineral content and hardness exist. In areas where freezing might occur, an antifreeze may be added to the system water to protect the system. Please adhere to the specifications given by the antifreeze manufacturer. Do not use automotive silicate based antifreeze. Please observe that an antifreeze/water mixture may require a backflow preventer within the automatic water feed and influence components such as diaphragm expansion tanks, radiation, etc. Maximum antifreeze content is 50% for the Vitodens 200-W boiler. Do not use antifreeze other than specifically made for hot water heating systems. System also may contain components which might be negatively affected by antifreeze. Check total system frequently when filled with antifreeze. Advise system operator/ultimate owner that system is filled with a glycol mix. The heating contractor must provide a MSDS (Material Safety Data Sheet) for the antifreeze used to the system operator/ultimate owner.

Total permissible hardness of the fill and top-up water

Total heating output	Specific heating volume					
	< 5 USG per 3412 BTU		≥ 5USG per 3412 BTU to < 13USG per 3412 BTU		≥ 13USG per 3412 BTU	
MBH						
≤ 170	300 ppm	17.5 gpg	200 ppm	11.7 gpg	2 ppm	0.11 gpg
> 170 to ≤ 682	200 ppm	11.7 gpg	150 ppm	8.8 gpg	2 ppm	0.11 gpg
> 682 to ≤ 2050	150 ppm	8.8 gpg	2 ppm	0.11 gpg	2 ppm	0.11 gpg
> 2050	2 ppm	0.11 gpg	2 ppm	0.11 gpg	2 ppm	0.11 gpg

ppm - parts per million  
gpg - grains per gallon

**Note:** The pH value of the heating water should be between 6.5 and 9.5

## System Design Considerations *(continued)*

### System layout

- The max. boiler water temperature for space heating is 180°F (82°C) and 194°F (90°C) for DHW production. To minimize distribution losses, Viessmann recommends that the heating and domestic hot water systems be based on a maximum boiler supply temperature of 158°F (70°C).
- Due to the low return temperatures required for gas condensing, no mixing valves should be used in the heating circuit whenever possible. If mixing valves are required, e.g. for multi-circuit systems or underfloor heating systems, only 3-way mixing valves must be used.  
Do not use 4-way mixing valves with condensing boilers.

### Underfloor heating systems

For underfloor heating systems Viessmann recommends the use of plastic tubing with an oxygen diffusion barrier in order to prevent the diffusion of oxygen through tubing. If plastic tubing without an oxygen diffusion barrier is used in underfloor heating systems, Viessmann recommends that such systems be separated from the boiler with a heat exchanger.

Underfloor heating systems and heating circuits containing a very large volume of water must be connected to the boiler via a 3-way mixing valve; please refer to the applicable installation example in this manual.

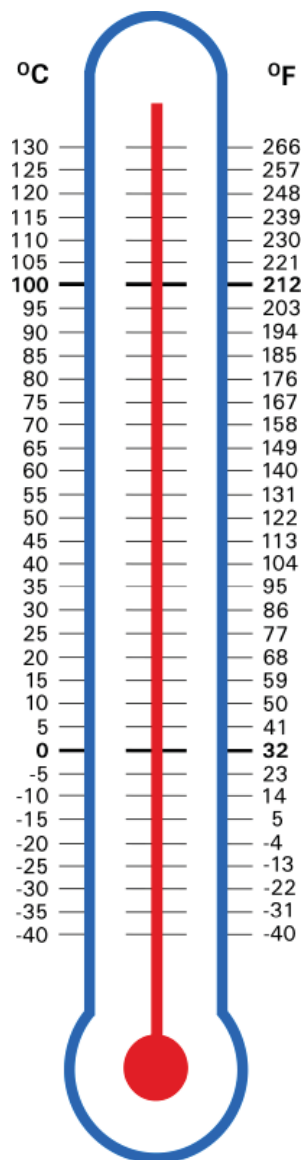
### Oxygen diffusion barrier underfloor tubing

The boiler warranty does not cover leaks resulting from corrosion caused by the use of underfloor plastic tubing without an oxygen diffusion barrier. Such systems must have the non-oxygen diffusion barrier tubing separated from the boiler with a heat exchanger. Viessmann recommends the use of underfloor plastic tubing with an oxygen diffusion barrier.

### Warranty

Our warranty does not cover damages resulting from the following:

- installation or service by unqualified and unlicensed personnel.
- attempting to perform any repair work on the boiler other than that mentioned in the boiler literature.
- tampering with or attempting, without Viessmann permission, to readjust the factory settings of the;
  - combination gas valve
  - combustion air opening of the burner blower
- leaks resulting from corrosion caused by the use of underfloor plastic tubing without an oxygen diffusion barrier. For detailed warranty information, please read warranty sheet supplied with product.



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