

# Installation Instructions

for use by heating contractor



**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*

### IMPORTANT

**Read and save these instructions for future reference.**

## Safety, Installation and Warranty Requirements

Please ensure that these instructions are read and understood before commencing installation. Failure to comply with the instructions listed below and details printed in this manual can cause product/property damage, severe personal injury, and/or loss of life. Ensure all requirements below are understood and fulfilled (including detailed information found in manual subsections).

### ■ Product documentation

Read all applicable documentation before commencing installation. Store documentation near boiler in a readily accessible location for reference in the future by service personnel.

►For a listing of applicable literature, please see section entitled "Important Regulatory and Safety Requirements".



### ■ Warranty

Information contained in this and related product documentation must be read and followed. Failure to do so renders the warranty null and void.



### ■ Licensed professional heating contractor

The installation, adjustment, service and maintenance of this equipment must be performed by a licensed professional heating contractor.

►Please see section entitled "Important Regulatory and Installation Requirements".



### ■ Contaminated air

Air contaminated by chemicals can cause by-products in the combustion process, which are poisonous to inhabitants and destructive to Viessmann equipment.

►For a listing of chemicals which cannot be stored in or near the boiler room, please see subsection entitled "Mechanical room" in the "Installation Instructions".



### ■ Advice to owner

Once the installation work is complete, the heating contractor must familiarize the system operator/ultimate owner with all equipment, as well as safety precautions/requirements, shutdown procedure, and the need for professional service annually before the heating season begins.



### WARNING

Installers must follow local regulations with respect to installation of carbon monoxide detectors. Follow the Viessmann maintenance schedule of the boiler contained in this manual.

### Operating and Service Documentation

It is recommended that all product documentation such as parts lists, operating and service instructions be handed over to the system user for storage. Documentation is to be stored near boiler in a readily accessible location for reference by service personnel.

### ■ Carbon monoxide

Improper installation, adjustment, service and/or maintenance can cause flue products to flow into living space. Flue products contain poisonous carbon monoxide gas.

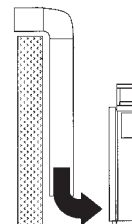
►For information pertaining to the proper installation, adjustment, service and maintenance of this equipment to avoid formation of carbon monoxide, please see subsection entitled "Mechanical room" and "Venting requirements" in the "Installation Instructions".



### ■ Fresh air

This equipment requires fresh air for safe operation and must be installed ensuring provisions for adequate combustion and ventilation air exist.

►For information pertaining to the fresh air requirements of this product, please see subsection entitled "Mechanical room" in the "Installation Instructions".



### ■ Equipment venting

Never operate boiler without an installed venting system. An improper venting system can cause carbon monoxide poisoning.

►For information pertaining to venting and chimney requirements, please see section entitled "Venting Connection". All products of combustion must be safely vented to the outdoors.



### WARNING

This boiler requires fresh air for safe operation and must be installed with provisions for adequate combustion and ventilation air (in accordance with local codes and regulations of authorities having jurisdiction).

Do not operate this boiler in areas with contaminated combustion air. High levels of contaminants such as dust, lint or chemicals can be found at construction sites, home renovations, in garages, workshops, in dry cleaning/laundry facilities, near swimming pools and in manufacturing facilities.

Contaminated combustion air will damage the boiler and may lead to substantial property damage, severe personal injury and/or loss of life. Ensure boiler/burner is inspected and serviced by a qualified heating contractor at least once a year in accordance with the Service Instructions of the boiler.



### WARNING

Do Not operate the boiler without the front cover in place.

## Safety, Installation and Warranty Requirements

### Fiberglass wool and ceramic fiber materials

#### **WARNING**

Inhaling of fiberglass wool and/or ceramic fiber materials is a possible cancer hazard. These materials can also cause respiratory, skin and eye irritation.

The state of California has listed the airborne fibers of these materials as a possible cancer hazard through inhalation. When handling these materials, special care must be applied.

Suppliers of ceramic fiber products recommend the following first aid measures:

- *Respiratory tract (nose and throat) irritation:*  
If respiratory tract irritation develops, move the person to a dust free location.
- *Eye irritation:* If eyes become irritated, flush immediately with large amounts of lukewarm water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Do not rub eyes.
- *Skin irritation:* If skin becomes irritated, remove soiled clothing. Do not rub or scratch exposed skin. Wash area of contact thoroughly with soap and water. Using a skin cream or lotion after washing may be helpful.
- *Gastrointestinal irritation:* If gastrointestinal tract irritation develops, move the person to a dust free environment.

Suppliers of fiberglass wool products recommend the following precautions be taken when handling these materials:

- Avoid breathing fiberglass dust and contact with skin and eyes.
- Use NIOSH approved dust/mist respirator.
- Wear long-sleeved, loose fitting clothing, gloves and eye protection.
- Wash work clothes separately from other clothing. Rinse washer thoroughly.
- Operations such as sawing, blowing, tear-out and spraying may generate airborne fiber concentration requiring additional protection.


#### First aid measures

- If eye contact occurs, flush eyes with water to remove dust. If symptoms persist, seek medical attention.
- If skin contact occurs, wash affected areas gently with soap and warm water after handling.

#### **WARNING**

Boiler materials of construction, products of combustion and the fuel contain alumina, silica, heavy metals, carbon monoxide, nitrogen oxides, aldehydes and/or other toxic or harmful substances which can cause serious injury or loss of life and which are known to the State of California to cause cancer, birth defects and other reproductive harm. Always use proper safety clothing, respirators and equipment when servicing or working nearby the boiler.

## About these Installation Instructions

 Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION", and "IMPORTANT". See below.

#### **WARNING**

Indicates an imminently hazardous situation which, if not avoided, could result in loss of life, serious injury or substantial product/property damage.

- *Warnings draw your attention to the presence of potential hazards or important product information.*

#### **CAUTION**

Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product/property damage.

- *Cautions draw your attention to the presence of potential hazards or important product information.*

#### **IMPORTANT**

- *Helpful hints for installation, operation or maintenance which pertain to the product.*

- *This symbol indicates that additional, pertinent information is to be found.*

- *This symbol indicates that other instructions must be referenced.*



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## Important Regulatory and Installation Requirements

### Codes

The installation of this unit shall be in accordance with local codes or, in the absence of local codes, use CAN/CSA-B149.1 or .2 Installation Codes for Gas Burning Appliances for Canada. For U.S. installations use the National Fuel Gas Code ANSI Z223.1. Always use latest editions of codes.

In Canada all electrical wiring is to be done in accordance with the latest edition of CSA C22.1 Part 1 and/or local codes. In the U.S. use the National Electrical Code ANSI/NFPA 70. The heating contractor must also comply with both the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1, and the Installation Code for Hydronic Heating Systems, CSA B214-01, where required by the authority having jurisdiction.

### Instructing the system user

The installer of the system is responsible to ensure the system operator/ultimate owner is made familiar with the system functioning, its activation, and its shut-down.

### Initial start-up

Initial start-up must be performed by a qualified heating contractor. Proper completion of the Maintenance Record by the heating contractor is also required.

### Working on the equipment

The installation, adjustment, service, and maintenance of this boiler must be done by a licensed professional heating contractor who is qualified and experienced in the installation, service, and maintenance of hot water boilers. There are no user serviceable parts on the boiler, burners, or control.

Ensure main power supply to equipment, the heating system, and all external controls has been deactivated. Close main gas supply valve. Take precautions in all instances to avoid accidental activation of power during service work.

The following topics must be covered:

Proper system operation sequence.

Explain the equipment.

Demonstrate an emergency shut-down, what to do and what not.

Explain that there is no substitute for proper maintenance to help ensure safe operation.

The Maintenance Record is located in the Service Instructions

Please carefully read this manual prior to attempting start-up, maintenance or service. Any warranty is null and void if these instructions are not followed.

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

We offer frequent installation and service seminars to familiarize our partners with our products. Please inquire.

### Technical literature

Literature for the Vitodens boiler:

- Technical Data Manual
- Installation Instructions
- Service Instructions
- Operating Instructions and User's Information Manual
- Instructions of other Viessmann products utilized and installed
- Installation codes mentioned in this manual

The completeness and functionality of field supplied electrical controls and components must be verified by the heating contractor. These include low water cut-offs, flow switches (if used), staging controls, pumps, motorized valves, air vents, thermostats, etc.

Leave all literature at the installation site and advise the system operator/ultimate owner where the literature can be found. Contact Viessmann for additional copies.

This product comes with several safety instruction labels attached.

Do not remove!

Contact Viessmann immediately if replacement labels are required.

## Important Regulatory and Installation Requirements *(continued)*

For installations on the Commonwealth of Massachusetts, the following modifications to NFPA-54 chapter 10 apply:

Excerpt from 248 CMR 5-08:

- 2(a) For all side-wall horizontally vented gas fueled equipment installed in every dwelling, building or structure used in whole or in part for residential purposes, including those owned or operated by the Commonwealth and where the sidewall exhaust vent termination is less than (7) feet above finished grade in the area of the venting, including but not limited to decks and porches, the following requirements shall be satisfied:
1. **INSTALLATION OF CARBON MONOXIDE DETECTORS.** At the time of installation of the side-wall horizontal vented gas fueled equipment, the installing plumber or gasfitter shall observe that a hard wired carbon monoxide detector with an alarm and battery back-up is installed on the floor level where the gas equipment is to be installed. In addition, the installing plumber or gasfitter shall observe that a battery operated or hard wired carbon monoxide detector with an alarm is installed on each additional level of the dwelling, building or structure served by the side-wall horizontal vented gas fueled equipment. It shall be the responsibility of the property owner to secure the services of qualified licensed professional for the installation of hard-wired carbon monoxide detectors.
    - a. In the event that the side-wall horizontally vented gas fueled equipment is installed in a crawl space or an attic, the hard-wired carbon monoxide detector with alarm and battery back-up may be installed on the next adjacent floor level.
    - b. In the event that the requirements of this subdivision can not be met at the time of completion of installation, the owner shall have a period of thirty (30) days to comply with the above requirements; provided, however, that during said thirty (30) day period, a battery operated carbon monoxide detector with an alarm shall be installed.
  2. **APPROVED CARBON MONOXIDE DETECTORS.** Each carbon monoxide detector as required in accordance with the above provisions shall comply with NFPA 720 and be ANSI/UL 2034 listed and IAS certified.
  3. **SIGNAGE.** A metal or plastic identification plate shall be permanently mounted to the exterior of the building at a minimum height of eight (8) feet above grade directly in line with the exhaust vent terminal for the horizontally vented gas fueled heating appliance or equipment. The sign shall read, in print size no less than one-half (1/2) inch in size, "GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS".
  4. **INSPECTION.** The state or local gas inspector of the side-wall horizontally vented gas fueled equipment shall not approve the installation unless, upon inspection, the inspector observes carbon monoxide detectors and signage installed in accordance with the provisions of 248 CMR 5.08(2)(a) 1 through 4.
- (b) **EXEMPTIONS:** The following equipment is exempt from 248 CMR 5.08(2)(a) 1 through 4:
1. The equipment listed in Chapter 10 entitled "Equipment Not Required To Be Vented" in the most current edition of NFPA 54 as adopted by the Board; and
  2. Product Approved side-wall horizontally vented gas fueled equipment installed in a room or structure separate from the dwelling, building or structure used in whole or in part for residential purposes.

CSD-1 Field Testing of High Limit Switches for Vitodens boilers – where required by law.

As per ASME Boiler and Pressure Vessel Code, section IV, subsection HG-613 TEMPERATURE CONTROL requirements, Vitodens 200-W hot water boilers are protected from over-temperature by two temperature-operated controls. These temperature control devices conform to Standards for Limit Controls, and are accepted by CSA, a nationally recognized testing agency. Each boiler is equipped with a manual reset high temperature limit control and a temperature control that will cut off fuel supply when the system water temperature reaches a preset operating temperature. **VISSMANN IS NOT RESPONSIBLE FOR ANY DAMAGES THAT THE FOLLOWING TEST PROCEDURE MAY RESULT IN BY OVERHEATING THE SYSTEM.**

The Vitodens 200 boilers are equipped with flow switches or sensors that when activated enable the burner to operate. The fixed high limit, when tripped, produces a fault that will require manual reset of the boiler control.

## High Limit Safety Cut-out Test

### IMPORTANT

**To ensure proper operation of the high limit cut-out test in cascade systems, only activate it at one boiler at a time. While running the test the other boilers should be switched off or set to standby. Vitoguide is required to activate the high limit test on lag boilers.**

Tap the following buttons:

1. "≡"
2. "Service"
3. Enter password "viservice".
4. Confirm with ✓.
5. "Test modes"
6. "High limit safety cut-out test"
7. Confirm with ✓.  
Note: Ensure adequate heat transfer.
8. Use ↶ to end the Test.



## Applicability

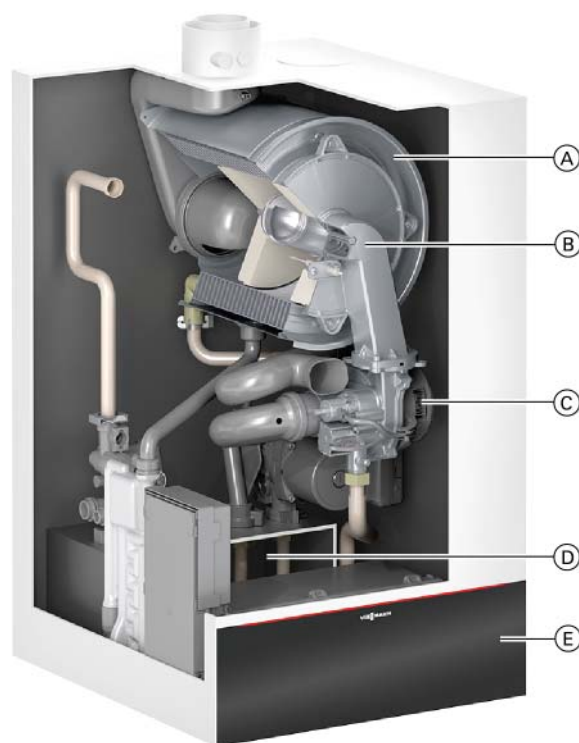
### CAUTION

The boiler serial number must be provided when ordering replacement parts. Some replacement parts are not reverse compatible with previous versions of the Vitodens 200-W B2HE boiler.

### IMPORTANT

When ordering replacement parts, provide either the 16-digit boiler serial number (on the rating plate) or the 12-digit ASME/NB serial number, located as shown underneath boiler front enclosure panel. Refer to page 15 for instructions on how to remove front enclosure panel.

Model No.	Serial No.
B2HE 85	7722778□□□□□□□□
B2HE 120	7722779□□□□□□□□
B2HE 150	7722780□□□□□□□□
B2HE 199	7722781□□□□□□□□



*Product may not be exactly as shown*

- Ⓐ 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 boiler control unit

## Intended Use

The boiler is only intended to be installed and operated in sealed unvented heating systems, with due attention paid to the associated installation, service and operating instructions. It is only designed for the heating of water that is of potable water quality.

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

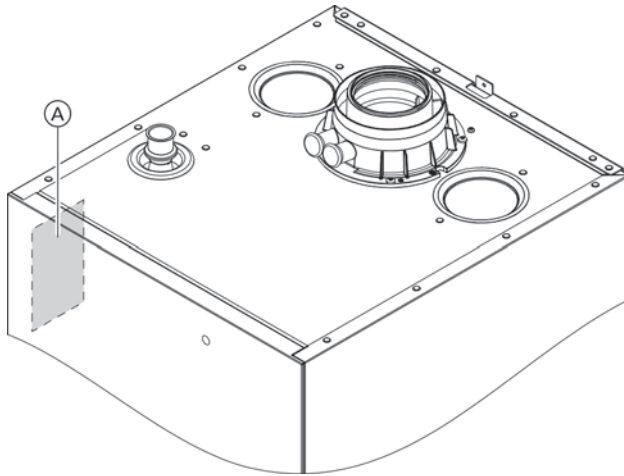
Commercial or industrial usage for a purpose other than heating the building or DHW shall be deemed inappropriate.

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

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



## Product Information



Ⓐ Rating plate with access code for boiler registration

### Vitodens 200-W, type B2HE

Wall mounted gas condensing boiler with Inox-Radial heat exchanger and the following integrated components:

- Modulating MatrixPlus burner for natural gas or LPG
- Hydraulics with 3-way diverter valve and variable speed high efficiency circulation pump
- Weather-compensated or constant temperature control unit
- DHW production

Vitodens 200-W boilers are for operation with natural gas. For a fuel conversion to liquid propane gas refer to the service instructions for details.

Boiler model must be selected based on an accurate heat loss calculation of the building. Ensure boiler model is compatible with connected radiation.

Vitodens 200-W, boilers are factory-tested and calibrated. Further gas valve adjustments are not typically required during field start-up.

The rating plate of the boiler contains extensive product information and is boiler-specific. Access code with the marking "i" for direct access to product-specific information and product registration on the internet. The access code contains the credentials for the registration and product information portal, as well as the 16-digit serial number.

**Note:** A further label with the access code is enclosed with the boiler.

Stick the label in the operating and service instructions so it can be easily found again for later use.

## System Examples

System examples with hydraulic and electrical connection schemes and function descriptions are available to help setting up the heating system, refer to the system layouts starting on page 38.

## Fittings and Sealing Points

All connections must be fitted with new gaskets after opening or loosening.



### WARNING

**Risk of electric shock from escaping heating water or DHW. When commissioning and after carrying out maintenance work, check all water side connections for leaks.**

## Mechanical Room

During the early stages of designing a new home, we recommend that proper consideration be given to constructing a separate mechanical room dedicated to the gas- or oil-fired heating equipment and domestic hot water storage tank(s).

The boiler must be located in a heated indoor area, near a floor drain, and as close as possible to a wall. Whenever possible, install the boiler near an outside wall so that it is easy to duct the venting system to the boiler.

Locate the boiler on a wall capable of supporting 179 lb. (81 kg) [the weight of the boiler]. Ensure that the boiler location does not interfere with the proper circulation of combustion and ventilation air of other fuel burning equipment within the mechanical room (if applicable).

The maximum room temperature of the mechanical room where the boiler is located must not exceed 95°F (35°C).

### Installation area conditions



#### WARNING

Incorrect ambient conditions can lead to damage to the heating system and put safe operation at risk.

- Ensure ambient temperatures are higher than 32°F (0°C) and lower than 95°F (35°C).
- Prevent the air from becoming contaminated by halogenated hydrocarbons (e.g. as contained in paint solvents or cleaning fluids) and excessive dust (e.g. through grinding or polishing work). Combustion air for the heating process, and ventilation of the boiler room must be free of corrosive contaminants. To that end, any boiler must be installed in an area that has no chemical exposure. The list to the right indicates the main, currently known sources.
- Avoid continuously high levels of humidity (e.g. through frequent drying of laundry).
- Never close existing ventilation openings.



#### WARNING

If you notice fire coming from the boiler, call the fire department immediately! Do not attempt to extinguish the fire unless qualified to do so.

### IMPORTANT

The service life of the boiler's exposed metallic surfaces, such as the casing and fan housing, is directly influenced by proximity to damp and salty marine environments. In such areas, higher concentration levels of chlorides from sea spray, coupled with relative humidity, can lead to degradation of the exposed metallic surfaces mentioned above. Therefore, it is imperative that boilers installed in such environments not be installed using direct vent systems which draw outdoor air for combustion. Such boilers must be installed using room air dependent vent systems; i.e. using room air for combustion. The indoor air will have a much lower relative humidity and, hence, potential corrosion will be minimized.

### Sources of combustion and ventilation air contaminants

#### Areas likely to contain contaminants:

- New building construction
- Swimming pools
- Remodelling areas, hobby rooms
- Garages with workshops
- Furniture refinishing areas
- Dry cleaning/laundry areas and establishments
- Auto body shops
- Refrigeration repair shops
- Metal fabrication plants
- Plastic manufacturing plants
- Photo processing plants
- Beauty salons

#### Products containing contaminants:

- Chlorine-type bleaches, detergents and cleaning solvents found in household laundry rooms
- Paint and varnish removers
- Hydrochloric acid, muriatic acid
- Chlorine-based swimming pool chemicals
- Spray cans containing chlorofluorocarbons
- Chlorinated waxes and cleaners
- Cements and glues
- Refrigerant leaks
- Calcium chloride used for thawing
- Sodium chloride used for water softening salt
- Permanent wave solutions
- Adhesives used to fasten building products and other similar items
- Antistatic fabric softeners used in clothes dryers

Boiler operation in marine environments (damp, salty coastal areas)



#### WARNING

Fire causes a risk of burns and explosion!

- Shut down the boiler
- Close fuel shut-off valves
- Use a tested fire extinguisher, class ABC.

# Before Set-up

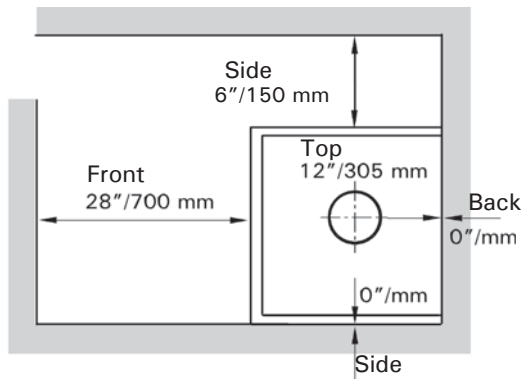
Before placing boiler in its installation location, ensure all necessary accessories are installed.



## CAUTION

The boiler must be installed in such a way that gas ignition system components are protected from water (spraying, splashing, etc.) during boiler operation and service.

# Minimum Clearances



## Recommended minimum service clearances

**Note:** The Vitodens 200-W, B2HE boiler has passed the zero inches vent clearance to combustibles testing requirements dictated by the boiler 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) or UL/ULC-listed CPVC/PPs gas vent material. The zero inches vent clearance to combustibles for the Vitodens 200-W, B2HE boiler supercedes the clearance to combustibles listing that appears on the special venting system label.

Top clearance 12 in. (300 mm)

**Table 1 Clearances**

Top	Front	Rear	Left	Right	Vent pipe
0	0 AL CL	0	0	0	0

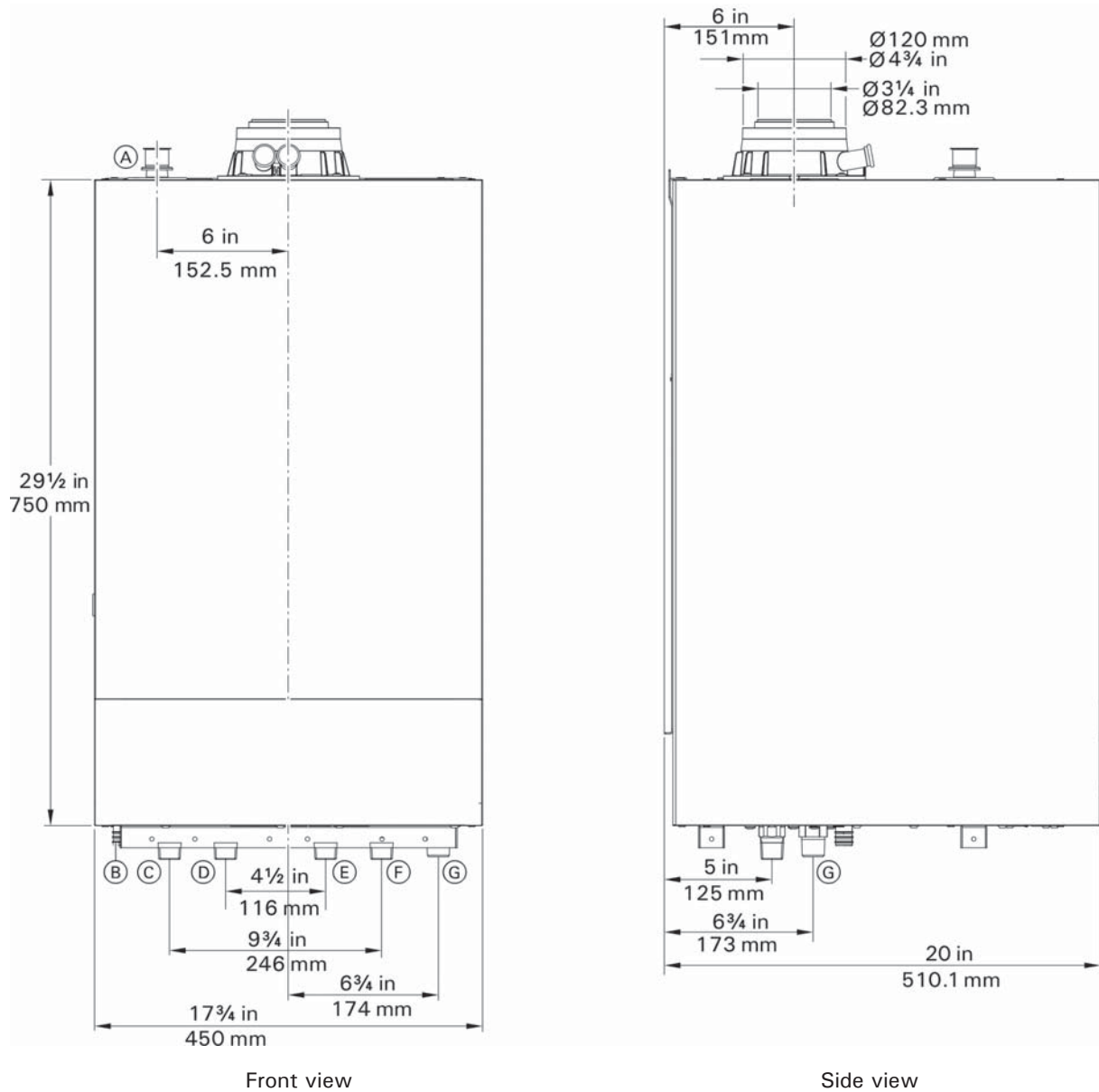
AL = Alcove

CL = Closet



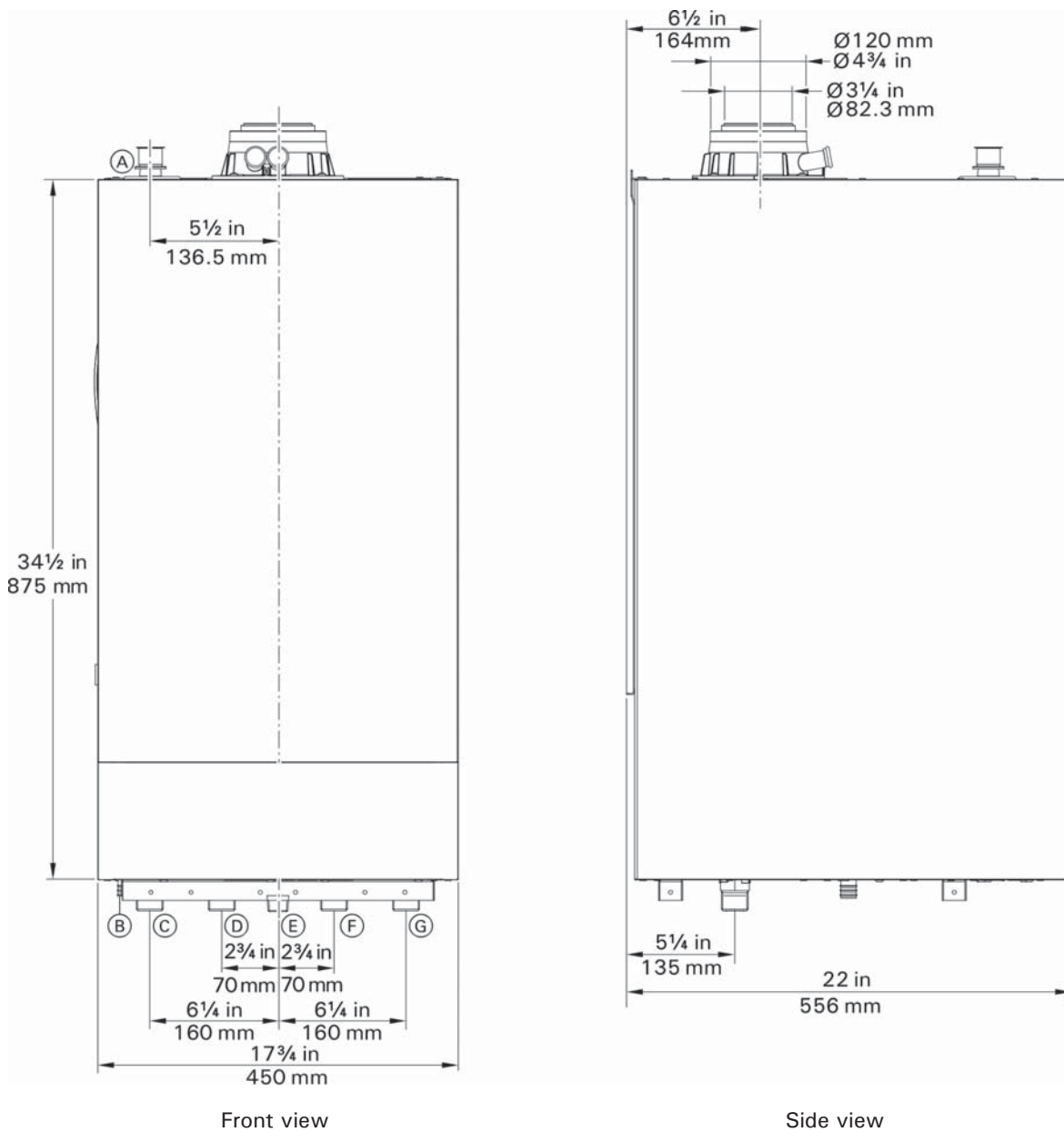
See the Vitodens 200-W B2HE Venting System Installation Instructions for details.

## Models 200-W, B2HE 85, 120



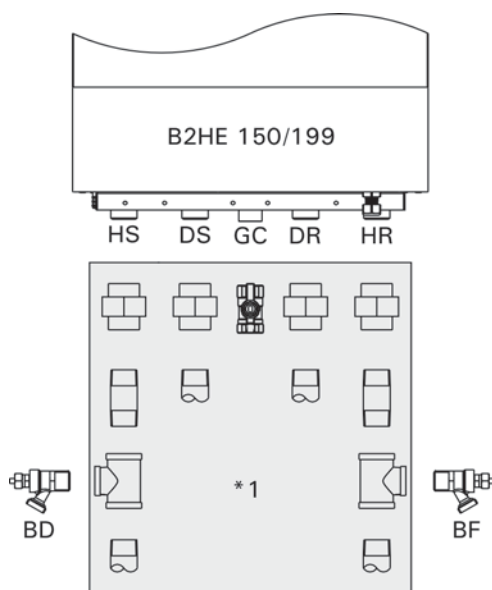
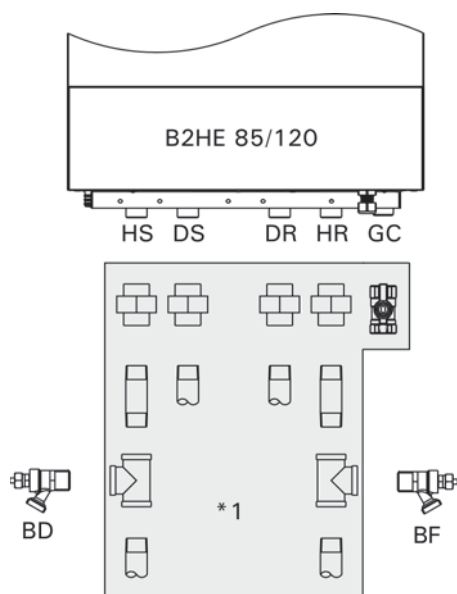
### Legend

- Ⓐ 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****Legend**

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

## Preparing the 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
- GC Gas Connection
- PRV Pressure Relief Valve (supplied with boiler, see page 25)
- BD Boiler Drain (supplied with boiler)
- BF Boiler Fill (supplied with boiler)
- PG Pressure Gauge (supplied with boiler, see page 25)

\* 1 Field supplied installation fittings

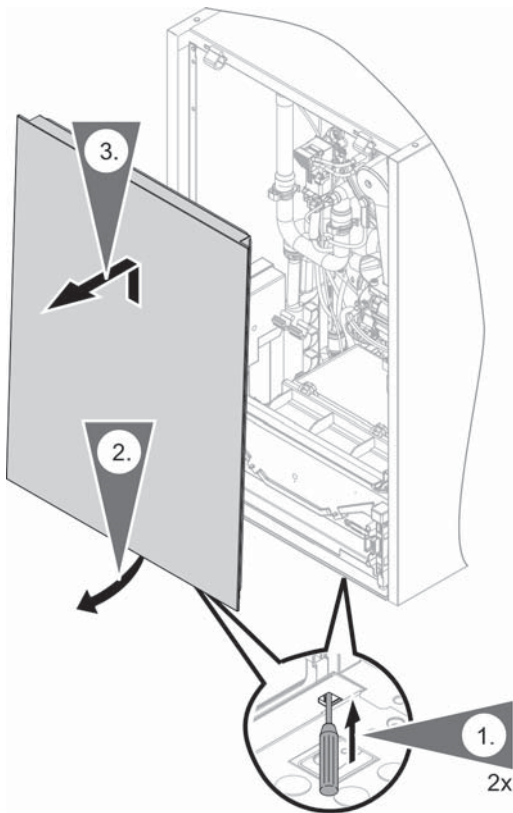
**Note:** Install a temperature gauge (field supplied) anywhere in the supply piping near the boiler (not shown).

**Note:** See page 49 for Alternate DHW connection.

### IMPORTANT

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

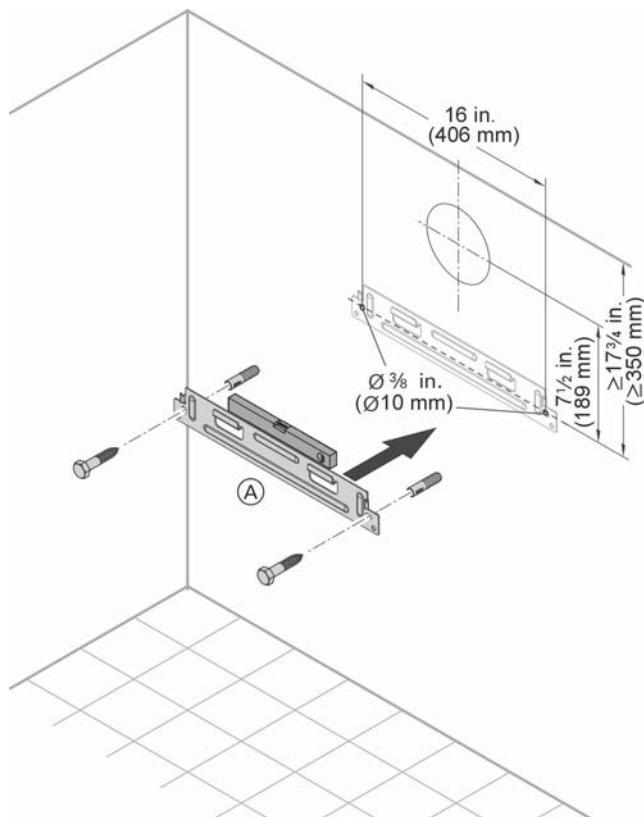
## Removing the Front Panel



1. Unlock the front panel on the underside (push in), using a screwdriver or similar tool.
2. Swivel the front panel forward slightly and lift away upwards.
3. Slightly lift away and upwards.



## Wall Mounting



### Legend

Ⓐ Vitodens wall mounting bracket

### Fitting the wall mounting bracket

Following are the installation instructions for the mounting bracket on each material. See the instructions applicable to your installation requirements.

### Installing the wall mounting bracket

The Vitodens 200-W B2HE can be wall-mounted on a concrete wall.

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

### Installation of mounting bracket on brick/concrete wall

1. Mark out the rawl plug holes.
2. Drill holes  $\varnothing \frac{3}{8}$  in. ( $\varnothing 10$  mm) and insert the rawl plugs supplied.
3. Fit the wall mounting bracket with the screws supplied.

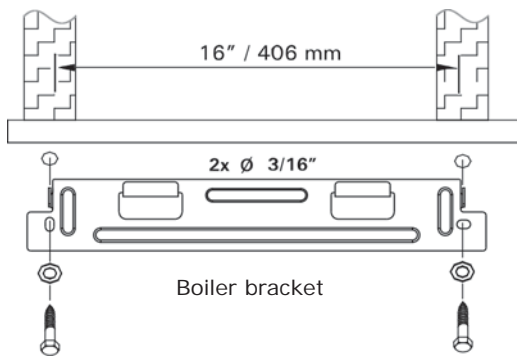
**Note:** Check the condition of the wall where the boiler is to be installed. For the suitability of the supplied rawl plugs for various building materials, see the manufacturer's instructions.

For other construction materials, use fixing materials with sufficient load bearing capacity.

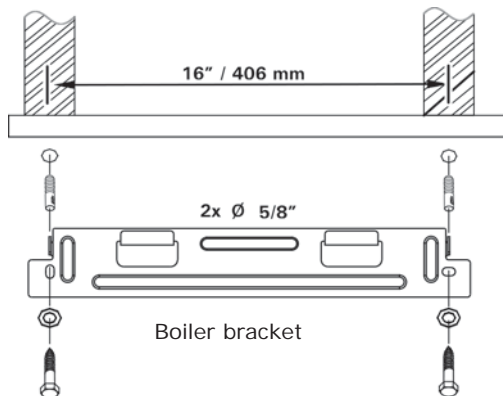
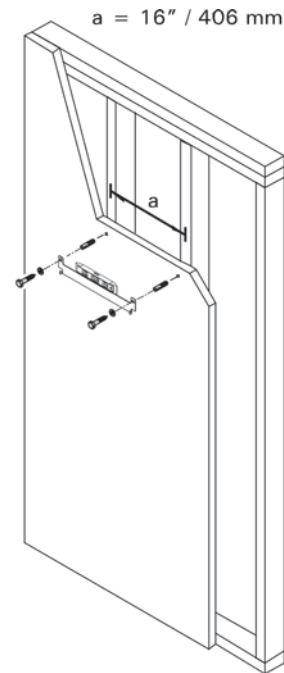


### CAUTION

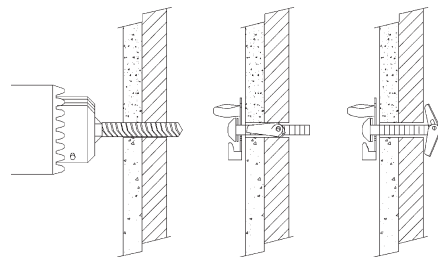
Whichever mounting method is used, ensure that the bracket is tightly and securely fastened to wall. Failure to secure boiler properly could cause boiler to loosen, posing a severe safety hazard.

**Wall Mounting** *(continued)***Boiler mounting bracket installation on wood studs**

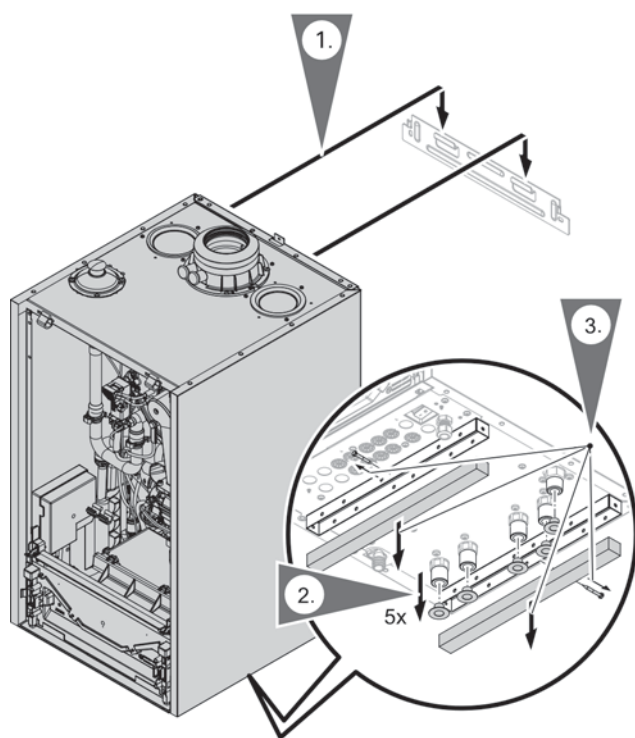
Install mounting bracket on wood studs as per illustration. Drill  $\frac{3}{16}$  in. pilot holes to insert mounting bolts. Ensure that holes are located in the center of each wood stud. Secure with bolts to wooden studs as shown.

**Boiler mounting bracket installation on metal studs**

Install mounting bracket on metal studs as per illustration. Drill  $\frac{5}{8}$  in. pilot holes to insert anchors. Ensure that holes are located in the center of each metal stud. Use fasteners to mount boiler mounting bracket to metal studs (supplied). Secure with bolts to metal studs as shown. Ensure the mounting bracket is level.



## Fitting the Boiler to the Wall Mounting Bracket

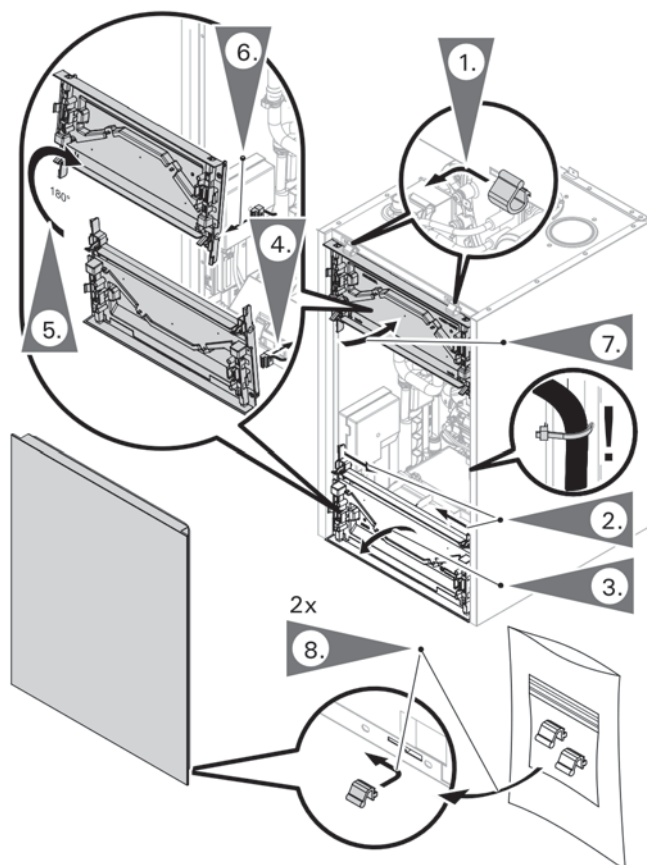


**Note:** Various installation components can be found in the installation fittings kit. Keep the installation components safe, as they will be required for later installation.

**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 tabs 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.

## Fitting the Programming Unit Mounting Bracket on the Top of the Boiler



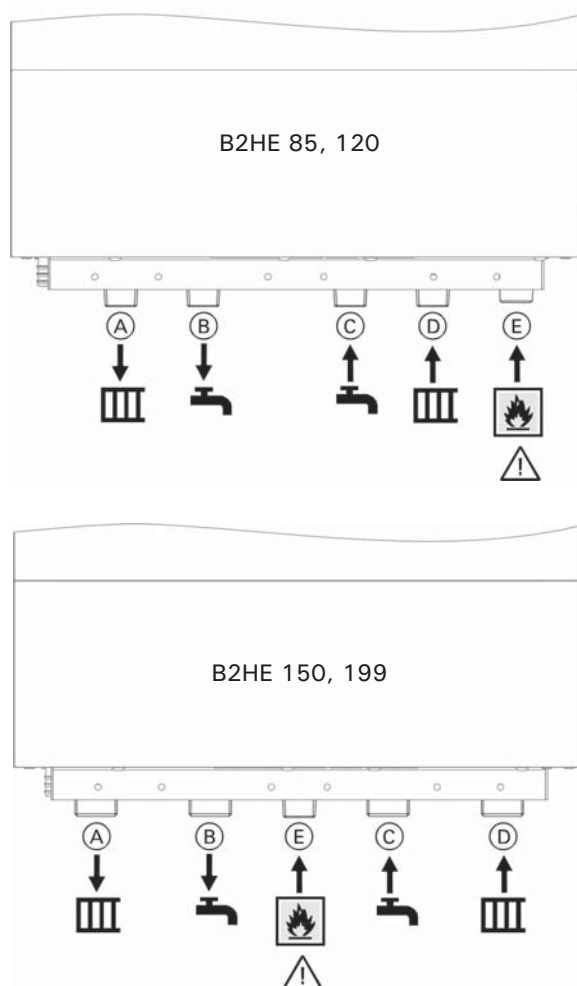
In the delivered condition, the programming unit is located on the underside of the boiler. If required for ease of operation, the programming unit can be located on the top of the boiler. To do so, reposition the bracket at the top.

1. Remove the hinges and store them in case they need to be reinstalled at a later date.
2. Pull in the tabs to release the control housing.
3. Pull forward on the control housing to remove it from the jacketing.
4. Disconnect the plug of the connecting cable from the bracket.

**Note:** Incorrect routing of the cable can lead to heat damage and impairment of the EMC properties. Do not change the position of the cable or its fixture (fixing point on casing).

5. Rotate the control housing 180 degrees.
6. Insert the plug on the right-hand side again.
7. Re-install the control housing into the up jacket.
8. Install the clips provided into the openings in the bottom of the front cover.

## Connections on the Heating System and DHW Tank Heating



### Legend

- Ⓐ Heating system supply  
85, 120 ¾ in. NPT  
150, 199 1 in. NPT
- Ⓑ DHW Tank heating supply  
85, 120 ¾ in. NPT  
150, 199 1 in. NPT

### Connections on the heating water and DHW sides

If the connections have not been fitted previously, make the connections on the heating water and DHW sides.

**Note:** If no tank is connected, close off the tank supply and return with caps.

**Note:** If the boiler is used for directly connected DHW only a bypass must be installed from boiler supply to boiler the boiler return.

### Heating water connections

1. Thoroughly flush heating system (particularly before connecting the boiler to an existing system).
2. Connect boiler to the heating system.

**Note:** Use an approved pipe sealant or teflon tape when connecting the installation fittings.

Max. allowable working pressure (MAWP):

B2HE 85/120 .....45 psig (3 bar)

B2HE 150/199 .....60 psig (4 bar)



### WARNING

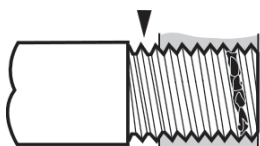
Exposing the boiler to pressures and temperatures in excess of those listed will result in damages, and will render warranty null and void.

- Use a two-hand wrench method when tightening fittings or piping onto the boiler connectors. Use one wrench to prevent the boiler pipes from twisting and the second wrench to tighten the fitting or piping. Failure to support the boiler connection could damage the boiler and its internal piping.
- All plumbing must meet or exceed all local state and national plumbing codes.

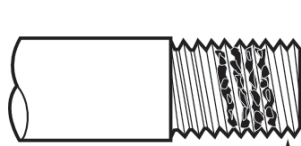
- Ⓒ DHW Tank heating return  
85, 120 ¾ in. NPT  
150, 199 1 in. NPT
- Ⓓ Heating system return  
85, 120 ¾ in. NPT  
150, 199 1 in. NPT
- Ⓔ Gas connection NPT ¾ in. (male thread)

## Piping Connections

2 imperfect threads



Use moderate amount of dope



Leave 2 threads bare

### Proper piping practice

Support piping by proper suspension method.

Piping must not rest on or be supported by boiler.

See following page for details on gas connection and piping.

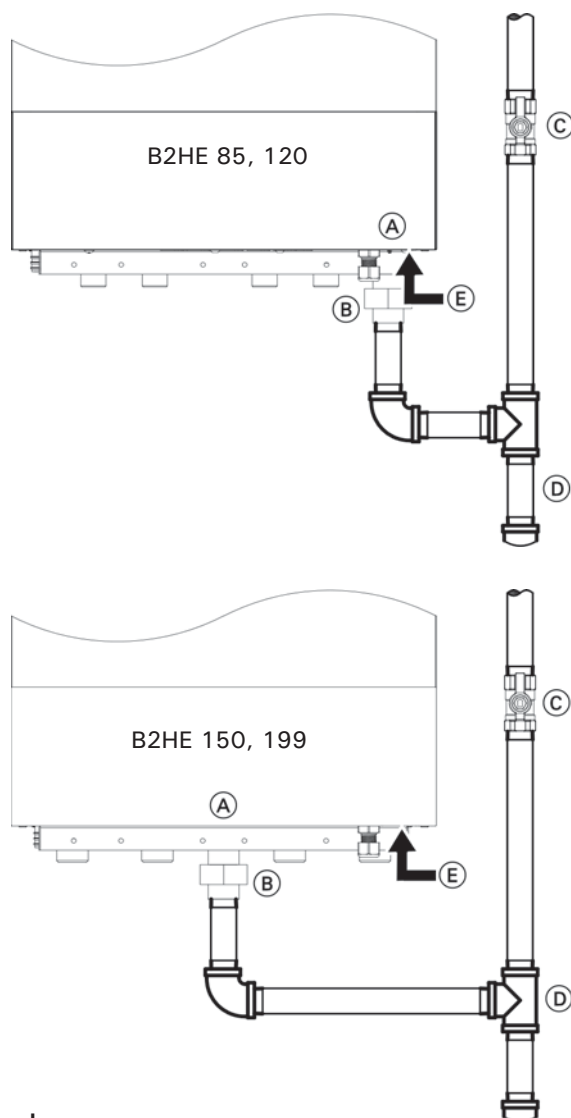


### WARNING

Do not damage the gas pipe!

The gas pipe must not come into contact with any other components in the appliance.

Keep the gas pipe from twisting during tightening by using the two wrench system. Do not use pliers!

**Piping Connections** *(continued)***Legend**

- (A) Gas connection to boiler
- (B) Union
- (C) Accessible manual gas shutoff
- (D) Drip leg
- (E) Boiler gas control switch

**IMPORTANT**

Max. gas supply pressure: 14 "w.c.  
 $\frac{1}{2}$  psig = 14 "w.c.

**WARNING**

Never check for gas leaks with an open flame.

**WARNING**

Exposing boiler gas pressure regulator and gas valve to extreme pressures renders warranty null and void.

**Gas connection and piping** *(continued)*

1. Make gas connections in accordance with codes CAN/CSA B149.1 or 2 in Canada.  
 In the United States, use the National Fuel Gas Code ANSI Z223.1/NFPA 54, as well as local codes for gas piping requirements and sizing. Pipe size to the boiler must be determined based on:
  - pipe length
  - number of fittings
  - maximum input requirements of all gas boilers in the residence.

**IMPORTANT**

Design piping layout in such a way that piping does not interfere with serviceable components.

2. Before connecting boiler to gas line, install ground joint union, capped drip leg and a manual equipment shutoff valve. Valves must be listed by a nationally recognized testing agency. Make boiler gas connection as shown on the left.

Gas connection (NPT)..... $\frac{3}{4}$  in.

3. Perform gas piping pressure test as described in the following subsection.
4. Identify shutoff valves as such with a tab and familiarize operator / ultimate owner of boiler with these valves.

**WARNING**

The gas supply piping must be leak tested before placing the boiler in operation.

**CAUTION**

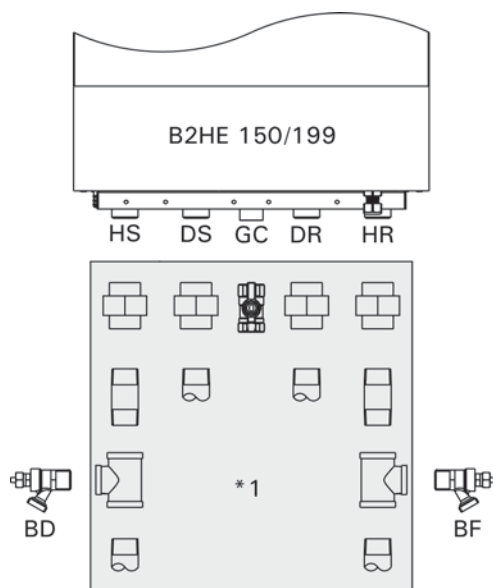
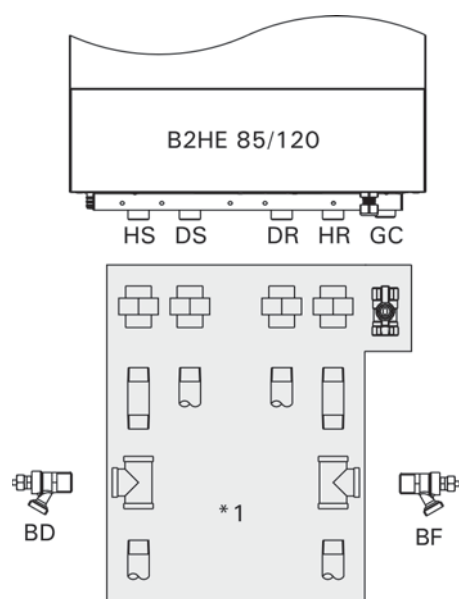
Ensure that gas piping is large enough for all boilers in the residence. No noticeable gas pressure drop in the gas line must occur when any unit (or combination of units) lights or runs.

**Gas piping pressure test**

When performing the gas piping pressure test, ensure the following requirements are met.

1. Isolate the boiler from the gas supply piping system using the individual manual shutoff valve during pressure tests equal to or less than  $\frac{1}{2}$  psig (14 "w.c.)
2. The boiler and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of  $\frac{1}{2}$  psig (14 "w.c.)
3. Perform leak test. Use approved liquid spray solution for bubble test. Ensure that no liquid is sprayed on any electrical components, wires or connectors. Do not allow leak detection fluid to contact gas valve regulator or regulator vent opening.
4. Correct any and all deficiencies.
5. Remove air from gas line.

## Piping Connections *(continued)*



### Legend

DS	DHW tank heating supply
DR	DHW tank heating return
HS	Heating system supply
HR	Heating system return
BD	Boiler drain
BF	Boiler fill
GC	Gas connection

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

### Heating water connections

1. Thoroughly flush heating system (particularly before connecting the boiler to an existing system).

2. Connect boiler to the heating system.

**Note:** Use an approved pipe sealant or teflon tape when connecting the installation fittings.

Max. allowable working pressure (MAWP):

B2HE 85/120 .....45 psig (3 bar)

B2HE 150/199 .....60 psig (4 bar)



### WARNING

Exposing the boiler to pressures and temperatures in excess of those listed will result in damages, and will render warranty null and void.

- Use a two-hand wrench method when tightening fittings or piping onto the boiler connectors. Use one wrench to prevent the boiler pipes from twisting and the second wrench to tighten the fitting or piping. Failure to support the boiler connection could damage the boiler and its internal piping.
- All plumbing must meet or exceed all local state and national plumbing codes.

### IMPORTANT

**SUPPORT ALL PIPING USING HANGERS. DO NOT** support piping by the boiler or its components.

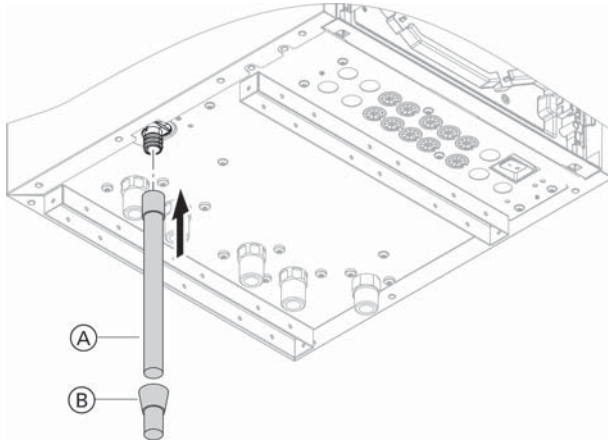
- Use isolation valves to isolate system components.
- The B2HE DHW tank heating supply and return ports must be capped if the DHW tank connection is not used.

### General

A distance of 2 in. (50 mm) from uninsulated hot water pipes to combustible components must be maintained. If the pipes are provided with a suitable pipe insulation of sufficient thickness and insulation, the distance mentioned above is not necessary (see also local gas regulations).



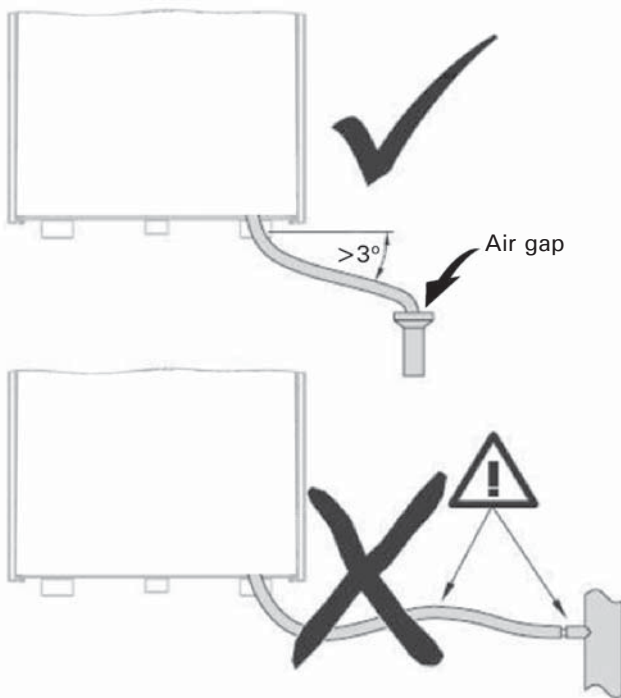
## Condensate Connection



### Legend

- Ⓐ Flexible discharge tubing
- Ⓑ Discharge tubing

Condensate installation example:



### Condensate connection

The Vitodens 200-W B2HE boiler comes with a built-in condensate trap. An external trap is not required when connecting the field drain to flexible discharge tubing. Discharge tubing (field supplied) must be of 1 in. diameter.

Use CPVC, PVC or other material approved by codes listed below.

The drain pipe and fittings must conform to ANSI standards and ASTM D1785 or D2846. CPVC or PVC cement and primer must conform to ASTM D2564 or F493. In Canada use CSA or ULC listed schedule 40 CPVC or PVC drain pipe, fittings and cement.

If the condensate outlet of the Vitodens 200-W boiler is lower than the drain, a condensate pump must be installed. Select a pump which is approved for condensing boiler applications. To avoid condensate spillage, select a pump with an overflow switch. The drain connection must terminate into an open or vented drain as close to the boiler as possible to prevent siphoning of the boiler drain.

1. Install the condensate drain pipe onto the boiler with a suitable gradient. Ensure that there is no unnecessary bends are created inside the boiler. Check tightness of siphon connection.

### IMPORTANT

As shipped, the flexible discharge tubing Ⓐ will be found with the installation fittings. Ensure the condensate drain pipe is installed and positioned to allow the condensate to properly drain.

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



Installation Instructions of Neutralization Unit (if applicable)

### IMPORTANT

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

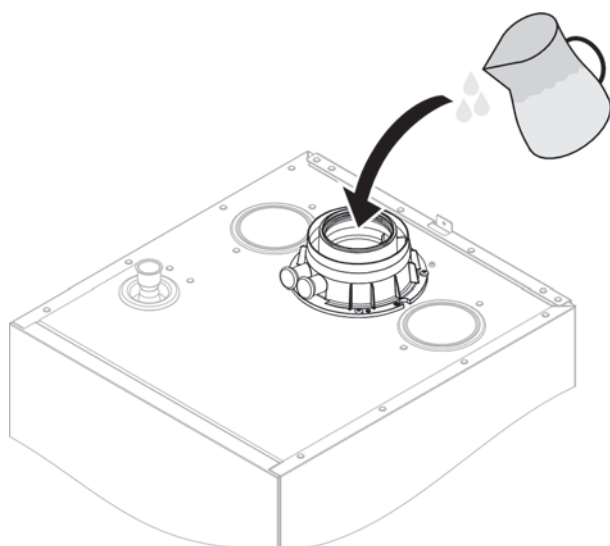
### IMPORTANT

Do not connect the drain pipe from any other boiler, such as water softener backwash pipe, to Vitodens condensate drain pipe.

3. Ensure the condensate discharge tubing is vented to the atmosphere prior to being plumbed into the neutralization unit.



## Filling the Siphon Trap with Water



Pour at least 10 fl oz. (0.3 L) of water into the flue gas connection.

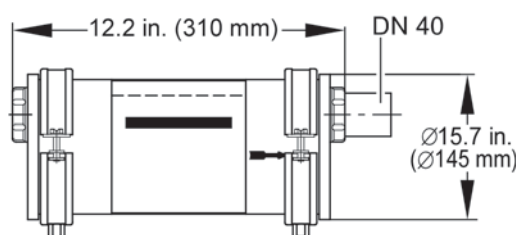
### IMPORTANT

During commissioning, flue gas may escape from the condensate drain.

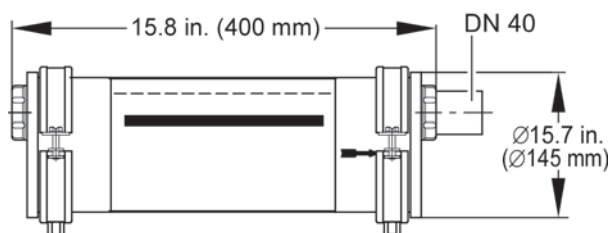
**Always fill the siphon trap with water before commissioning.**

**Note:** If there is a risk of frost, only fill the siphon trap just before commissioning.

## Neutralization Unit



for models B2HE 85, 120



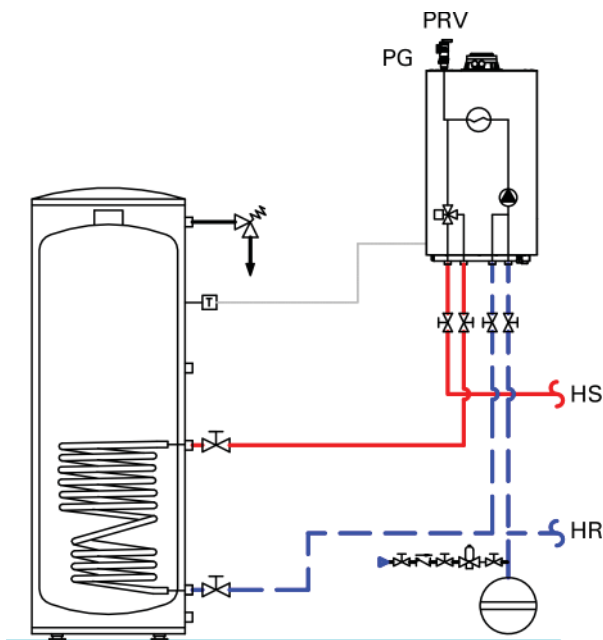
for models B2HE 150, 199

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

### Neutralization Pellets

2 x 1.3 kg for refill or replacement purposes

## DHW



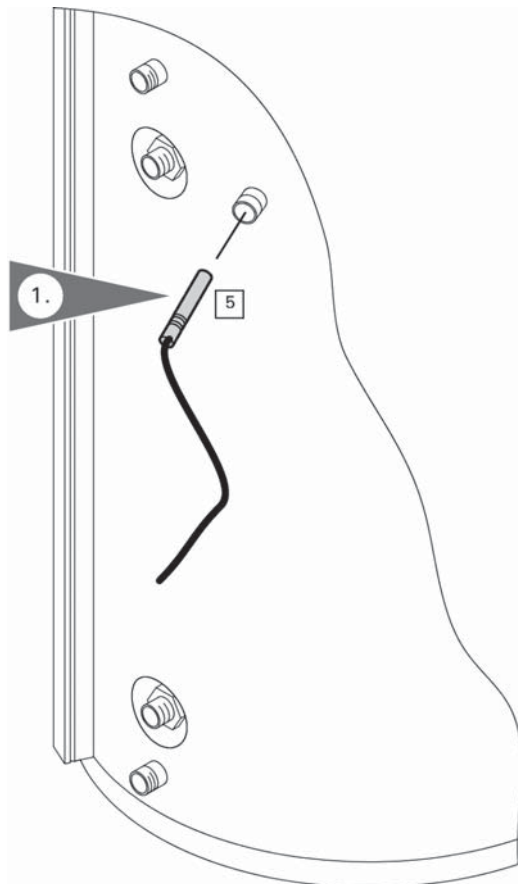
Vitodens 200-W boilers can be used in conjunction with the stand-alone DHW storage tanks offered by Viessmann.

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

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.

**Note:** the Vitodens 200-W can be used with a field supplied DHW temperature switch (i.e. Aquastat).

HS Heating system supply  
HR Heating system return



### DHW storage tank information

The DHW water sensor or DHW switch (such as an aquastat) is required when using a stand-alone DHW storage tank with the Vitodens 200-W B2HE heating boiler. The boiler is supplied with a DHW sensor DHW switch is field supplied (all other fittings are field supplied).



See Vitodens 200-W B2HE Service Instructions for applicable system coding information.

## IMPORTANT

Apply sufficient amount of thread sealant (supplied) when making the connections.

### Making the DHW connections

1. With a Vitocell 300 series tanks locate the DHW temperature sensor well and install the DHW temperature sensor [5] using the installation instructions provided with the DHW storage tanks.

## IMPORTANT

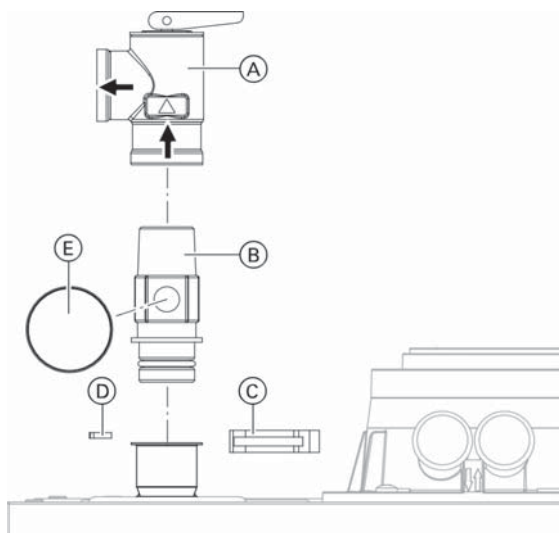
Follow the Installation Instructions supplied with the Viessmann DHW storage tank when mounting and securing DHW tank temperature sensor [5].



## WARNING

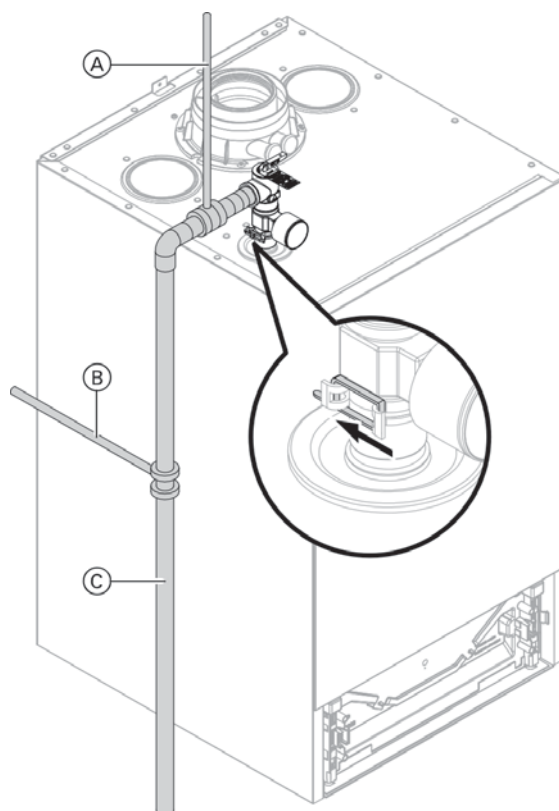
If a DHW storage tank other than a Viessmann Vitocell 300 tank is used, the installer must verify proper operation of the Viessmann DHW tank temperature sensor with original manufacturer of the tank. Viessmann strongly recommends the installation of a temperature tempering valve in the DHW supply line.

## Safety Valve



### Legend

- (A) Pressure relief valve
- (B) Brass adapter
- (C) Retaining clip
- (D) Cable ties
- (E) Pressure gauge



### Legend

- (A) Ceiling bracket (field supplied)
- (B) Wall mounting bracket (field supplied)
- (C) Drain pipe (field supplied)

Fit the safety valve:

1. Install safety valve (A) onto brass adapter (B) and tighten.
2. Screw pressure gauge (E) onto brass adapter (B).
3. Fit brass adapter (B) to the boiler with retaining clip (C). Secure retaining clip (C) with cable tie (D).



The boiler water pressure reading is displayed on an analog gauge.



### WARNING

The pressure gauge is a sensitive component and may be damaged if the boiler connections are not supported by using a second wrench when tightening fittings and/or piping.

Minimum connection diameters:

- Pressure relief valve.....  $\frac{3}{4}$  in.
- Discharge pipe .....  $\frac{3}{4}$  in.

### IMPORTANT

Install the (approved) factory supplied pressure relief valve. Removal of air from the system must occur via use of air vent(s) in the system supply. To ensure the boiler can be purged of all air, ensure supply/return water lines do not contain restrictive piping where air could be trapped.

1. Install discharge pipe on pressure relief valve in such a way that...
  - the end of the pipe is not threaded.
  - the pressure relief discharge pipe extends to a floor drain and ends approximately 6 in. (150 mm) above the drain.

Ensure that...

- there is no shutoff valve installed in the discharge pipe.
- discharge pipe diameter is not reduced.
- discharge is not piped to outdoors.



### WARNING

Do not install an isolation valve between boiler and pressure relief valve.

The discharge pipe for the pressure relief valve must be oriented to prevent scalding of attendants.

Pipe pressure relief valve discharge pipe close to floor drain. Never pipe discharge pipe to the outdoors.

### Pressure relief valve discharge pipe

The pressure relief valve discharge pipe (C) must be supported using either a ceiling mounted support (A) or a wall mounted support (B). Piping must be installed free of stress.

## Flue Gas Connection

### WARNING

Leaking or blocked flue systems, or an inadequate supply of combustion air can cause life threatening poisoning from carbon monoxide in the flue gas. Ensure the flue system is in good working order. Vents for supplying combustion air must be nonclosable. Prevent condensate drainage via a wind protector.



Refer to the Vitodens Venting System installation instructions

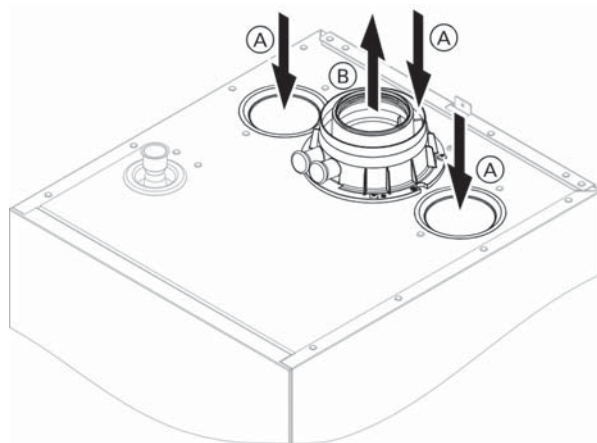
Only carry out commissioning when the following conditions have been met:

- Unrestricted flow in the flue gas routes.
- Positive pressure flue system is gas-tight.
- Inspection port covers checked for secure and tight seating.
- Apertures for supplying sufficient combustion air are open and cannot be closed.
- All current regulations on installing and commissioning flue systems have been observed.

1. Do not damage the sealing lip on the outside ring of the sealing plug. Carefully detach the inner part of the sealing plug, preferably without using a tool.
2. **Note:** If the boiler is direct vent with a two pipe system, the coaxial vent seal must be fitted!

For direct vent applications the combustion air gaskets position can be interchanged.

One gasket is sized for a 3½ in. (89 mm) (for CPVC/PVC/ABS) outside diameter combustion air pipe, the other is sized for a 3⅝ in. (80 mm) (for PPs) outside diameter combustion air pipe.

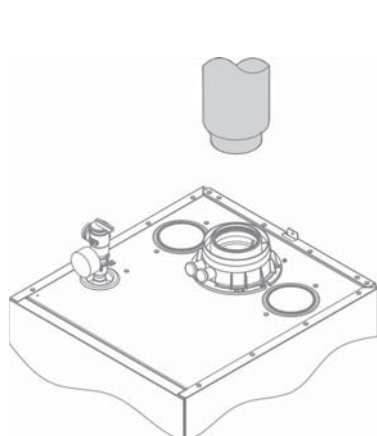


#### Legend

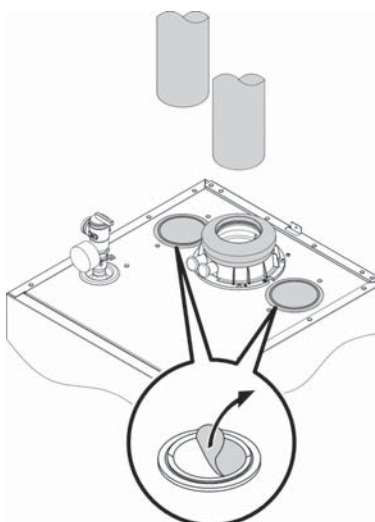
- Ⓐ Combustion air  
Ⓑ Flue gas

### CAUTION

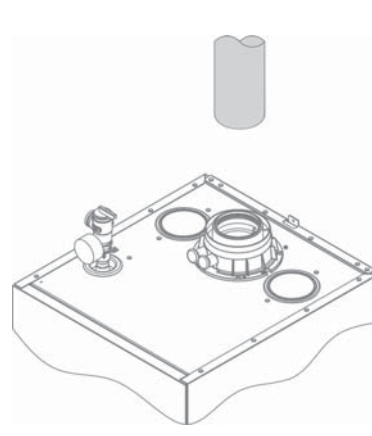
Under certain climatic conditions some building materials may be affected by flue products expelled in close proximity to unprotected surfaces. Sealing or shielding of the exposed surfaces with a corrosion resistant material (e.g. aluminum sheeting) may be required to prevent staining or deterioration. The protective material should be attached and sealed (if necessary) to the building before attaching the vent termination. It is strongly recommended to install the vent termination on the leeward side of the building.



Coaxial

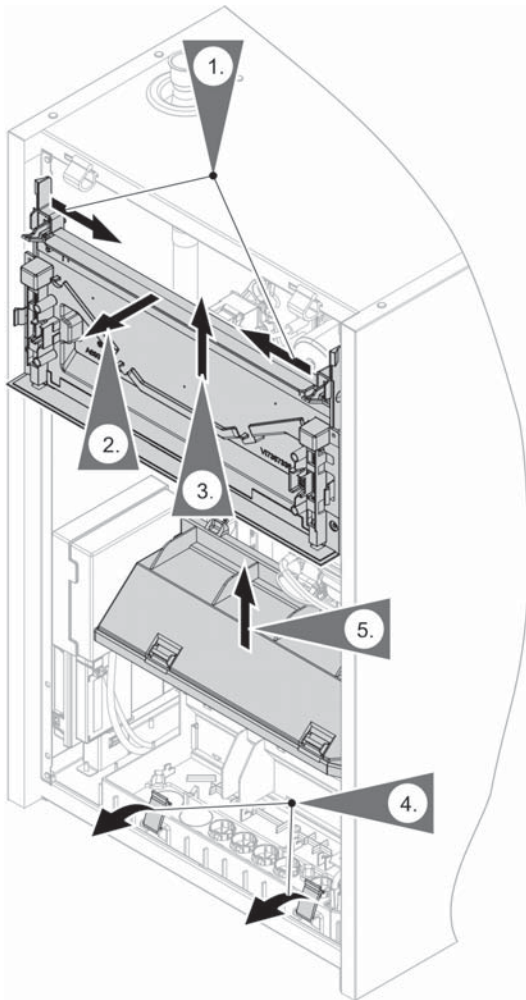


Direct Vent



Room Air Dependant

## Electrical Connections



### IMPORTANT

Electronic assemblies can be damaged by electrostatic discharge.

Before beginning work, touch grounded objects, such as heating or water pipes, to discharge any static.

#### Placing the control base in the service position

1. Release tabs on the boiler control base.
2. Pull the control base straight out.
3. Place the control base in the service position, there are positioning tabs located at the rear of the control base to be aligned with the holes in the boiler jacket and lock in place with the control base clips.

**Note:** Steps 1 to 3 are required only if the programming unit is located at the bottom.

Do not disconnect the plug from the mounting panel.

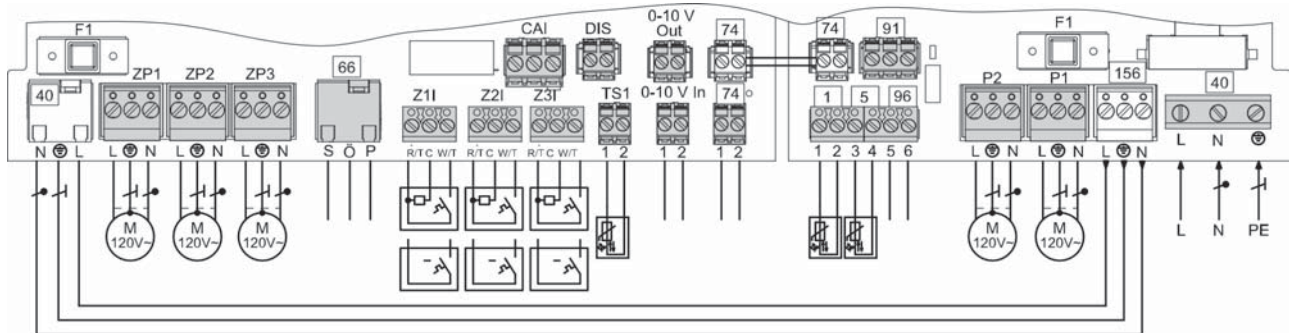
Do not change the position of the cable or its strain relief on the boiler jacketing

#### Opening the junction box

4. Release junction box cover clamps.
5. Lift the junction box cover.

**Electrical Connections** *(continued)*

**Note:** For additional information on the connections, see the following chapters.

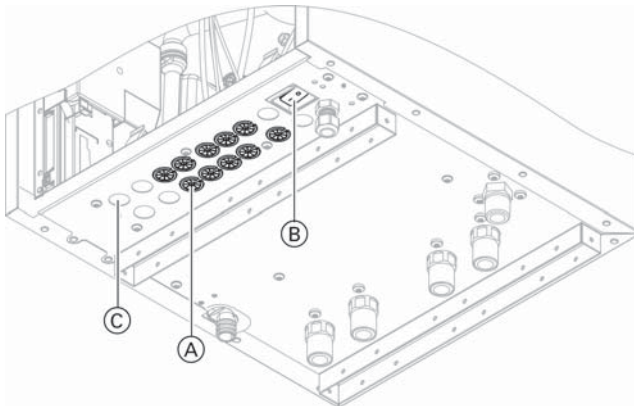


<b>40</b>	Power cable (already connected)	<b>66</b>	Potential-free changeover contact
<b>P1</b>	Output 120V for: DHW pump downstream of low loss header If no DHW pump is installed: Heating circuit pump for heating circuit without mixing valve A1 in conjunction with low loss header and heating circuits with mixing valve	<b>S</b>	Normally closed (NC)
<b>P2</b>	Output 120V for: Heating circuit pump for heating circuit without mixing valve A1 in conjunction with low loss header and heating circuits with mixing valve or DHW recirculation pump	<b>O</b>	Normally open (NO)
<b>96</b>	External call for heat	<b>P</b>	COM
<b>1</b>	Outside temperature sensor, terminals 1 and 2	<b>Z1I</b>	Zone 1 thermostat (dry contact or 24VAC) or safety input (low water indicator)
<b>5</b>	DHW tank temperature sensor or DHW tank temperature switch, terminals 3 and 4	<b>ZI2</b>	Zone 2 thermostat (dry contact or 24VAC) or safety input (gas pressure too low)
<b>91</b>	CanBus connection	<b>ZI3</b>	Zone 3 thermostat (dry contact or 24VAC) or safety input (gas pressure too high)
<b>74</b>	PlusBus	<b>CAI</b>	Combustion air supply (24VAC)
<b>F1</b>	Fuse 6.3 A (slow), 120V	<b>DIS</b>	Digital input (no function)
<b>ZP1</b>	Zone 1, pump	<b>TS1</b>	Low loss header sensor
<b>ZP2</b>	Zone 2, pump	<b>0-10V OUT</b>	Output 0-10V (burner modulation feedback)
<b>ZP3</b>	Zone 3, pump	<b>0-10V IN</b>	Input 0-10V (external demand setpoint)

**Note on connecting accessories**

When connecting accessories observe the installation instructions provided with them.



**Electrical Connections** *(continued)*

View of B2HE 120/150

**Legend**

- (A) Diaphragm grommets for low voltage connections
- (B) On/Off switch
- (C) Knockouts for line voltage connections

**On-site connections**

Bundle cables using cable ties.

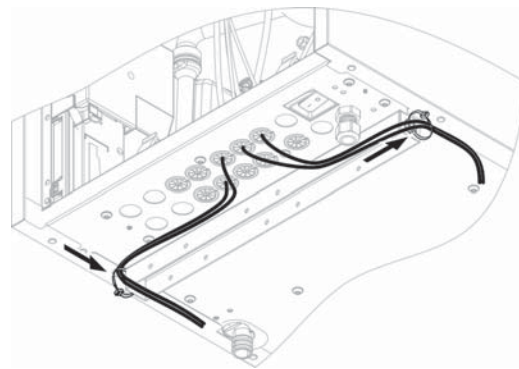
Never route low voltage cables next to line voltage (120VAC or greater).

Secure the cables on the underside using the supplied cable ties.

Do not route cables over sharp edges.

**IMPORTANT**

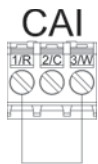
If connecting cables/leads come into contact with hot components, they will be damaged. When routing and securing cables/leads on site, ensure that the maximum permissible temperatures for these cables/leads are not exceeded.

**Connecting the combustion air device to the CAI plug**

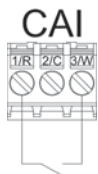
A motorized combustion air supply (e.g. fan or combustion air damper) with or without feedback signal can be connected to the CAI plug.

When the boiler receives a call for heat, the burner does not start until the feedback signal is present. If a device without feedback signal is used, the jumper across R and W must remain in place.

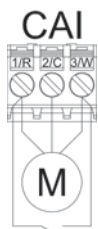
If a device with feedback signal is used, the jumper must be removed.



No connected combustion air device



Dry contact combustion air device feedback



24VAC combustion air device with dry contact feed back

Each boiler operates the CAI individually and receives the status (OPEN/CLOSED) of the CAI as feedback. Each boiler individually monitors the status of the CAI. In the event of an error (CAI does not open within the specified time), a corresponding error message is output. The boiler then reacts directly to the error event and excludes the boiler from heat production until the been connected. As long as the error event (CAI does not open) is active, the controller must permanently control the air damper. Background: For safety reasons, the air damper must be controlled when the error event is active so that it is possible to rectify the error. If there is a problem with the air damper, the boiler within a cascade system (boiler not present) is no longer taken into account. The request to the boiler is reset. In the event of a fault, the CAI must be permanently activated so that the possibility of rectifying the fault is given.



**Electrical Connections** *(continued)***0-10V In connection**

A target supply temperature or a target modulation value for the boiler can be specified via the input.

The maximum supply temperature depends on the boiler.

Temperature:

■ 0V - 0.9V = Off with boiler frost protection

■ 1V = 10°C/50°F...

■ 8V = 80°C/176°F...

■ 10V = 100°C/212°F

Target modulation value:

■ 0V - 0.9V = Off with boiler frost protection

■ 1V = 10%...

■ 10V = 100%

For settings, see system configuration, Boiler" group parameters in the service instructions

**0-10V Out connection**

The current modulation level of the boiler can be read out via the output.

■ 0V = Off

■ 1V = 10%...

■ 10V = 100%

The minimum modulation level depends on the boiler

**Outside temperature sensor 1**

Fitting location for outside temperature sensor

■ North or north-westerly wall, 6 to 8 ft. (2 to 2.5 m) above ground level; in multi storey buildings, in the upper half of the second floor

■ Not above windows, doors or vents

■ Not immediately below balconies or gutters

■ Never render over

Connecting the outside temperature sensor 2 wire cable lead, length up to 115 ft. (35 m) with a cross-section of 16 AWG (1.5 mm<sup>2</sup>).

**Connecting the low loss header sensor**

The sensor of the low loss header is connected to the boiler connection, plug TS1 (in a multiboiler system this is connected to the lead boiler). See page 52.

**Connecting the storage tank temperature sensor or storage tank with temperature switch (e.g. Aquastat)**

Connect storage tank temperature sensor 5 or storage tank with temperature switch (e.g. Aquastat) to terminals 3 and 4. See page 52.

# Electrical Connections *(continued)*



## Legend

- Ⓐ Circulation pump
- Ⓑ Plug on connection PCB

Rated current	2A
Rated voltage	120VAC

## Connecting the circulation pumps to P1, P2, ZP1, ZP2 and ZP3.

**Note:** Observe the priority of the connections.

### Possible connections to P1 and priority of connections:

1. DHW pump
2. If no DHW pump is installed:  
Heating circuit pump for heating circuit without mixing valve A1 in connection with low loss header and heating circuits with mixing valve

### Possible connections to P2 and priority of connections:

1. Heating circuit pump for heating circuit without mixing valve A1 in connection with low loss header and heating circuits with mixing valve
2. If no heating circuit A1 pump is installed:  
DHW recirculation pump

**Note:** If a heating circuit pump for heating circuit without mixing valve is installed, connect the DHW recirculation pump to the P1 extension (accessories). Connect DHW recirculation pumps with standalone functions externally.  
The function of connections P1 and P2 is selected in the commissioning assistant by selecting the connected component in the heating system.

## Connections at ZP1/ZP2/ZP3

This boiler has the ability to control up to 3 zone pumps, each pump is controlled by the corresponding zone input (Z11/Z12/Z13) as configured using the commissioning assistant.

## Connecting plug 96

The changeover contact can be used as a fault message output or alternatively for a demand to an external boiler. For settings, see system parameters in the service instructions.

## Connecting 96

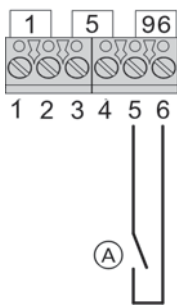
The changeover contact can be used either as a fault message output or for a demand from an external boiler. Connection to 96, terminals 5 and 6

One of the following functions can be connected:

- External demand
- External blocking
- DHW recirculation pump external demand (pushbutton function, pump runs for 5 min).
- Room temperature controller (room thermostat)  
In operating mode Continuous operation with room temperature controller
- Call for heat:  
In "constant" operation, a target supply temperature can be set.  
In "weather-compensated" operation, a constant target supply temperature or a heating curve can be specified; see operating instructions.

The call for heat setting is shown on the display as "Heating zone 4".

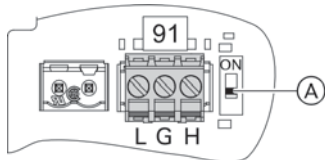
Assigning functions in the commissioning assistant  
See commissioning assistant in "Commissioning".



## Legend

- Ⓐ Dry contact

## Electrical Connections *(continued)*

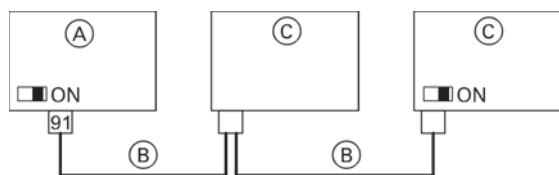


### Checking the CAN bus terminator switch setting

The CAN bus resistor is switched using switch (A) in the junction box.

### Connecting a cascade via CAN bus

Connect two wire cable (with minimum wire gauge of 24 AWG) of the previous and following boiler to plug [91]: Loosen the screws in the terminals, insert the wires and tighten the screws. Ensure correct polarity!

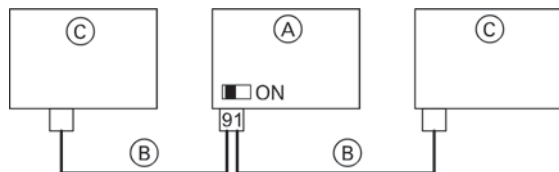


#### Legend

- (A) Boiler
- (B) CAN bus cable
- (C) Other subscribers

■ If the device is not integrated into a CAN bus system: Switch (A) must not be set to "ON".

■ If the device is integrated into a CAN bus system and is located at the beginning or end of this system (not in the middle) of the CAN bus system: Set switch (A) to "ON" (switched on).



#### Legend

- (A) Boiler
- (B) CAN bus cable
- (C) Other subscribers

■ If the device is integrated into a CAN bus system and is not located at the beginning or end of the CAN bus system: Do not set switch (A) to "ON" (switched off).

## Electrical Connections *(continued)*

### Cascade operation

As delivered, the boiler sequences are defined in ascending order:

Leading unit, first lag boiler, second lag boiler, etc.

The regular boiler sequence can be influenced by a variety of settings and events.

Alternatively, the boiler sequence can be user specified via the software tool.

In the delivered state, the boilers are put into operation in ascending order according to their boiler ID number and taken out of operation again in reverse order (no boiler sequence control active).

The following strategies can be selected:

- Manual presetting of a boiler switch-on/switch-off sequence.
- Selection of a fixed first boiler
- Selection of a fixed last boiler
- Dynamic specification of boiler sequence according to burner operating hours.

Regular switch-on/switch-off sequence: In normal operation, the boilers are switched on in ascending order according to their boiler number (ID) and switched off again in reverse order. Example for a system with 4 boilers: switch on 1 -2- 3 -4. switch off 4-3 -2 -1

Manual presetting of the boiler sequence The preset boiler sequence can be set manually by the user via the software tool. These settings (except for special cases such as boiler error) have the highest priority. The boiler sequence is set manually if this is explicitly set by the user. The setting is stored permanently. Other configurable influences on the boiler sequence are not evaluated (exception e.g. fault operation).

The setting can be made via the control unit.

Configurable default boiler sequence

If no manual boiler sequence is defined, the sequence can be influenced by the following events. The initial boiler sequence (1..2..3 ...) can be influenced statically or dynamically by various configuration settings. These events can also occur in parallel/simultaneously. Corresponding priorities must be observed.

Setting options:

- Fix first boiler
- Fix last boiler
- Burner runtime optimization

First fixed boiler: By specifying a boiler ID number, a fixed first boiler can be set this boiler is permanently configured as the first lead boiler. This setting has the highest priority after the manual setting.

A fixed first boiler can be specified. This boiler will always be the first to start up.

Example for a system with 4 boilers, boiler 3 should always be switched on first; switch on 3 - 1 - 2 - 4 / switch off 4 - 2 - 1 - 3

Fixed last boiler: A fixed last boiler can be defined by specifying a boiler number. A boiler is configured as the last boiler "fixed". This setting has the highest priority after the manual setting.

Example for a system with 4 boilers, boiler 1 should always be switched on last; Switch on 2 - 3 - 4 - 1 Switch off 1 -4 -3 -2

The settings for "Fixed last" and "Fixed first" must be plausible. If the setting is not plausible (e.g. Fixed first = Fixed last) and both are activated, Fixed last is ignored.

Boiler sequence Switching according to burner operating hours: After a user selectable time of burner operating hours for the first boiler within the boiler sequence has elapsed, the boiler sequence can be re-sorted based on the burner operating hours of the individual boilers.

Dynamic adjustment of boiler sequence according to burner runtime. The user can set a burner runtime of 1 ...1000 hours, after which the boiler order will be re-sorted based on the burner runtimes at the lead boiler.

After time has elapsed, the boiler sequence is sorted according to the burner runtime (the boiler with the lowest burner runtimes comes to the front).

The setting must be made via the lead boiler.

Based on the burner runtime of the lead boiler, the boilers are re-sorted according to the burner runtime when the threshold value is reached. The burner runtime of the respective lead boiler is used as the reference value. If the lead boiler changes (e.g. domestic hot water preparation, SP operation, boiler not available ...), the reference value (current burner runtime of the lead boiler) is reinitialized. Thus, the prerequisite for the dynamic boiler sequence calculation is the continuous operation of the lead boiler).

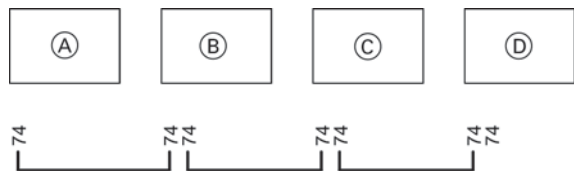
Influence of operating conditions can lead to the fact that the boiler can no longer participate in the heat generation.

The individual boiler reports this situation. The following events may cause a boiler to be unavailable:

- The air damper (CAI) of the boiler could not be opened.
- Fault of the boiler
- The boiler is in emissions test mode
- The boiler performs local hot water preparation

Electrical Connections (continued)

Accessories with direct power supply

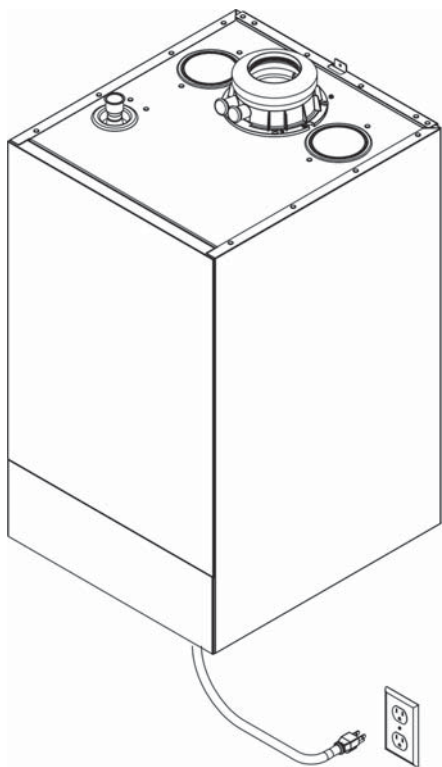


Legend

- (A) Boiler wiring panel
- (B) Mixing valve extension kit
- (C) Mixing valve extension kit
- (D) EM-EA1 extension and/or EM-S1 extension
- 74 PlusBus

**WARNING**  
Incorrect wiring can lead to serious injury from electrical current and result in boiler damage.

- Never route this cable next to line voltage (120VAC or greater).
- Strip as little of the insulation as possible, directly before the terminals, and bundle close to the corresponding terminals.
- Secure cables with cable ties.



PlusBus connection of accessories

PlusBus system length max. 164 ft. (50 m) for 26 AWG (0.34 mm<sup>2</sup>) shielded cable.  
If the current draw to the connected components (e.g. circulation pumps) is higher than the fuse rating of the relevant accessory, only use the output concerned to control an on-site relay.

Accessories	Internal fuse protection
EM-M1, mixing valve extension kit	2A
EM-EA1 extension	2A
EM-S1 extension	2A
EM-P1 extension	2A

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

- 3 EM-M1 extensions
- 2 Vitotrol 200-E
- 3 EM-EA1 extensions
- 1 EM-S1 extension
- 1 EM-P1 extension

Boiler power supply

The Vitodens 200-W comes with a pre-installed convenience plug for the boiler power supply, if required this convenience plug can be removed in the junction box for field wiring of the boiler power supply requirements:  
120VAC/60Hz/12A  
Refer to the wiring diagram on page 52.

**WARNING**  
Incorrectly executed electrical installations can result in injuries from electrical current and in damage to the boiler.

**WARNING**  
The control must be grounded.  
Ensure that 'L', 'N' and 'G' are not interchanged.

IMPORTANT

Electrical installations must comply with the latest edition of:

- In the U.S.A., the National Electrical Code (NEC), ANSI/NFPA 70 and any other state, local codes and/or regulations.
- In Canada, the Canadian Electrical Code (CEC), CSA C22.1 Part 1 and any other province, territory, local codes and/or regulations.

## WiFi Operational Reliability and System Requirements

### WiFi router system requirement

- WiFi router with activated WiFi:  
The WiFi router must be protected by a sufficiently secure WPA2 password.  
The WiFi router must always have the latest firmware update.  
Do not use unencrypted connections between the boiler and the WiFi router.
- Internet connection with high availability:  
Flat rate (flat rate tariff without restriction on time or data volume)
- Dynamic IP addressing (DHCP, factory setting) in the network (WiFi):  
Have this checked on site, and if required set up, by an IT expert prior to commissioning.
- Set routing and security parameters in the IP network (LAN):  
Enable port 80, port 123, port 443 and port 8883 for direct outward connections.  
Have this checked and, if necessary, set up on site by an IT expert before commissioning.

### Wireless signal range of WiFi connection

The range of wireless signals may be reduced by walls, ceilings and interior fixtures. These weaken the wireless signal, causing poor reception due to the following circumstances.

- On their way between transmitter and receiver, wireless signals are damped, e.g. by air or when penetrating walls.
- Wireless signals are reflected by metallic objects, e.g. reinforcements embedded in walls, metal foil of thermal insulation and thermal glazing with metallized thermal vapour deposit.
- Wireless signals are isolated by service ducts and lift shafts.
- Wireless signals are disrupted by devices that also operate with high frequency signals. Maintain a distance of at least 6 ft. (2 m) from these devices:
  - Computers
  - Audio and video systems
  - Devices with active WiFi connection
  - Electronic transformers
  - Pre-ballasts

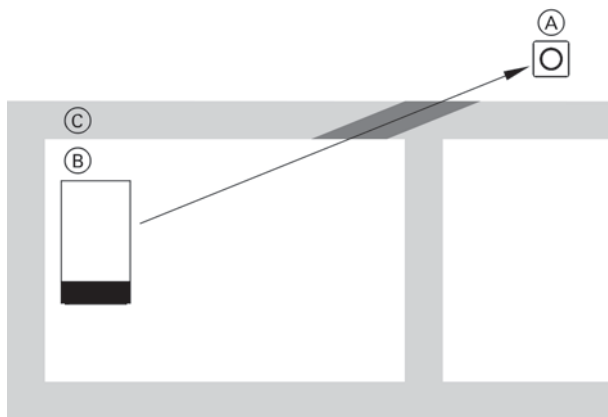
Install the boiler as close as possible to the WiFi router to ensure a good WiFi connection. The signal strength can be displayed on the boiler (see the operating instructions).

**Note:** The WiFi signal strength can be increased with commercially available WiFi repeaters.

### Angle of penetration

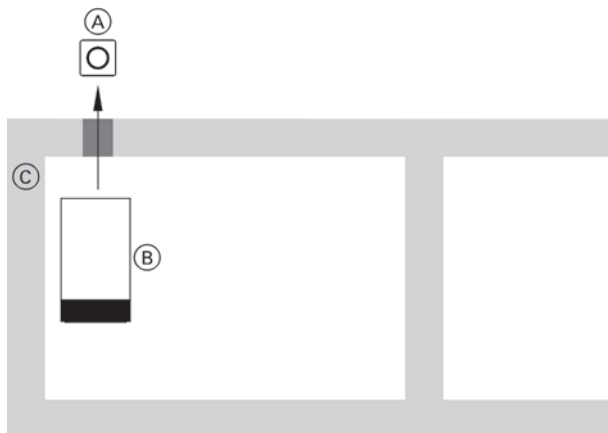
The reception quality remains best if wireless signals hit the walls vertically.

Depending on the angle of penetration, the effective wall thickness changes and so does the extent to which the electromagnetic waves are damped.



#### Legend

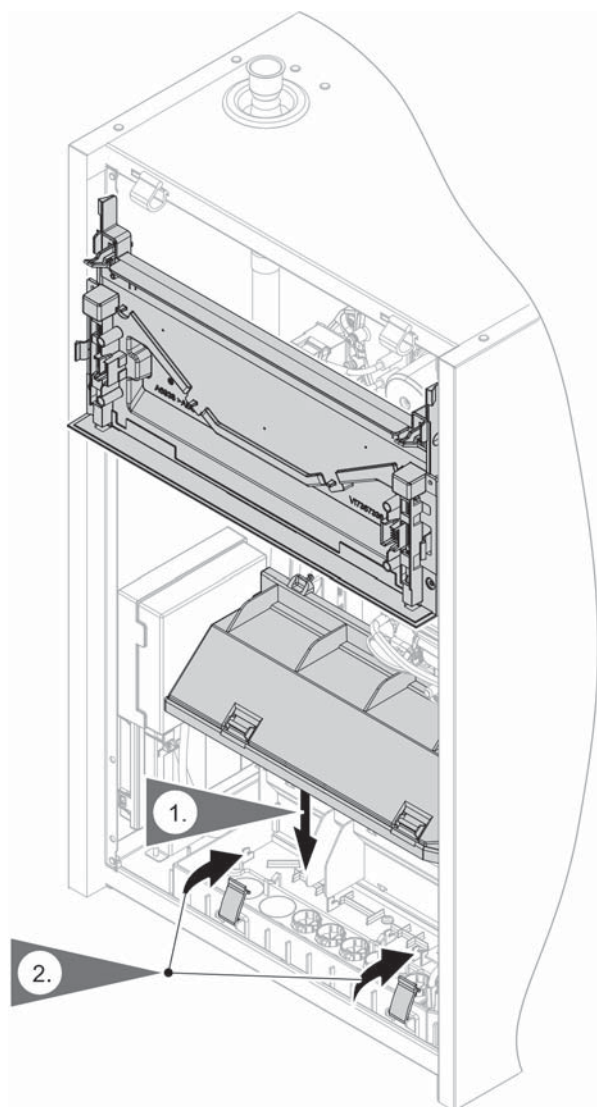
- (A) WiFi router
- (B) Boiler
- (C) Wall



#### Legend

- (A) WiFi router
- (B) Boiler
- (C) Wall

## Closing the Junction Box



### IMPORTANT

Do not operate the control unit without the junction box lid in place.

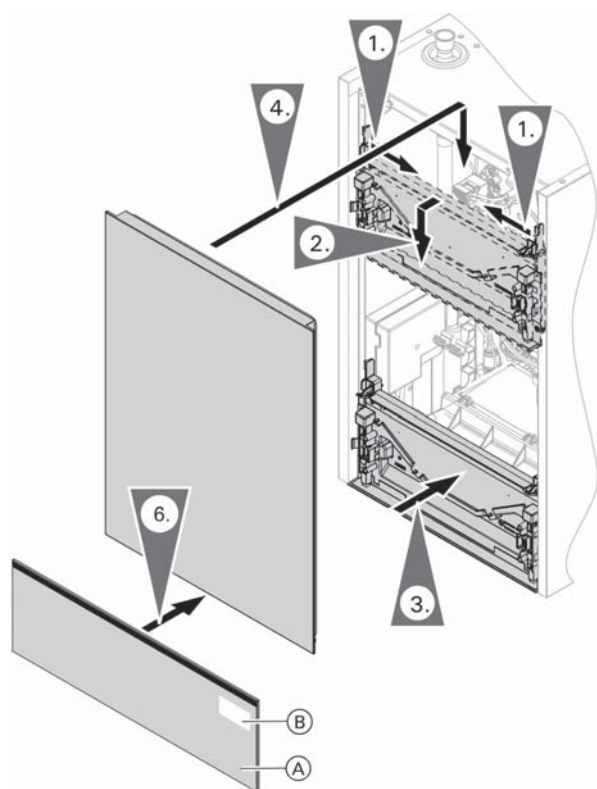
The junction box lid in the control unit enclosure separates the mains and extra low voltage potential and seals the junction box off from the rest of the boiler.

The junction box lid must be refitted when replacing the control unit.

1. Place the junction box lid on the junction box.
2. Secure in place with latches.



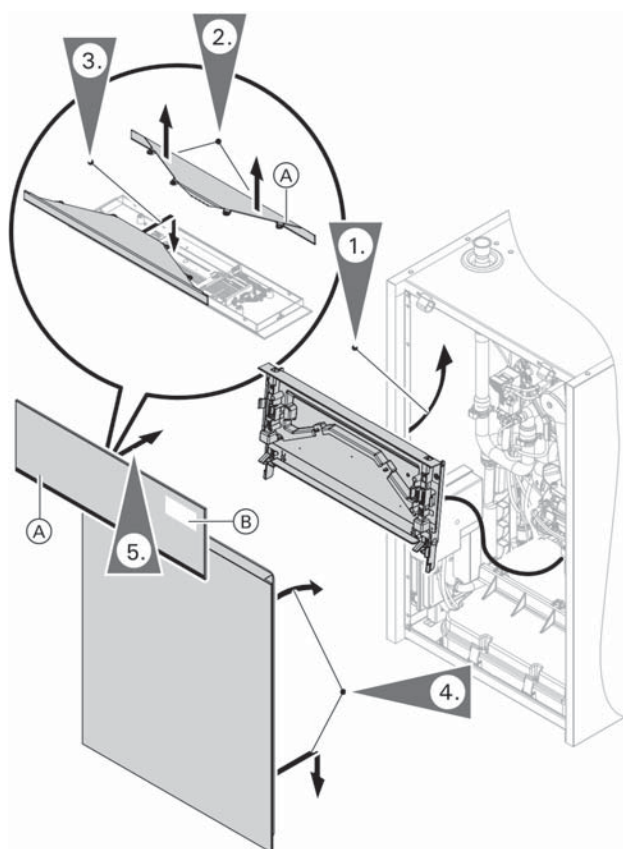
## Fitting the Programming Unit and Front Panel



Lightguide (A) at the top  
WiFi label sticker (B)

### Programming unit located at the bottom

1. Release the tabs on the boiler control base.
2. Pull the control base straight out.
3. Re-install the control base into the base of the boiler.  
**Note:** steps 1 to 3 are only required if the control base is in the service position.
4. Install the front panel.
5. Install the programming unit in the control base.



1. Install the control base at the top. See page 18. Reconnect the plugs to the mounting panel on the right. Do not alter where and how the cable is secured (fixing point of the cable tie).
2. Pull Lightguide (A) out of all 4 detents at once and remove. As you do so, pull it upwards between 2 detents, in the middle and at the same time. Ensure that the locking tabs do not break off.
3. Turn Lightguide (A) around and clip it into place at the bottom of the programming unit.
4. Install the front panel.
5. Install the programming unit with Lightguide (A) at the bottom.

**Note:** Before installing the programming unit remove the WiFi labels from the back of the programming unit and apply one label (B) on the programming unit and one in the bottom of the service instructions and operating instructions.

### IMPORTANT

The front cover also serves to seal off the air box. Ensure the front panel is seated correctly.

## Adjusting Pump Rate of Integrated Circulation Pump

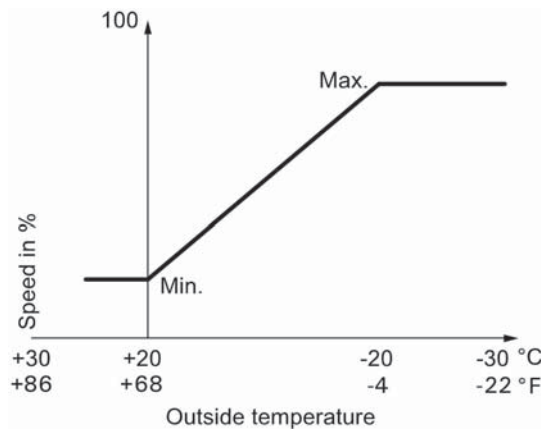
### Operation of the integral circulation pump as heating circuit pump for heating circuit 1

The pump speed and consequently the pump rate are controlled subject to the outside temperature and the switching times for heating operation or reduced mode. The minimum and maximum speeds for heating operation can be matched to the existing heating system at the control unit.

- 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

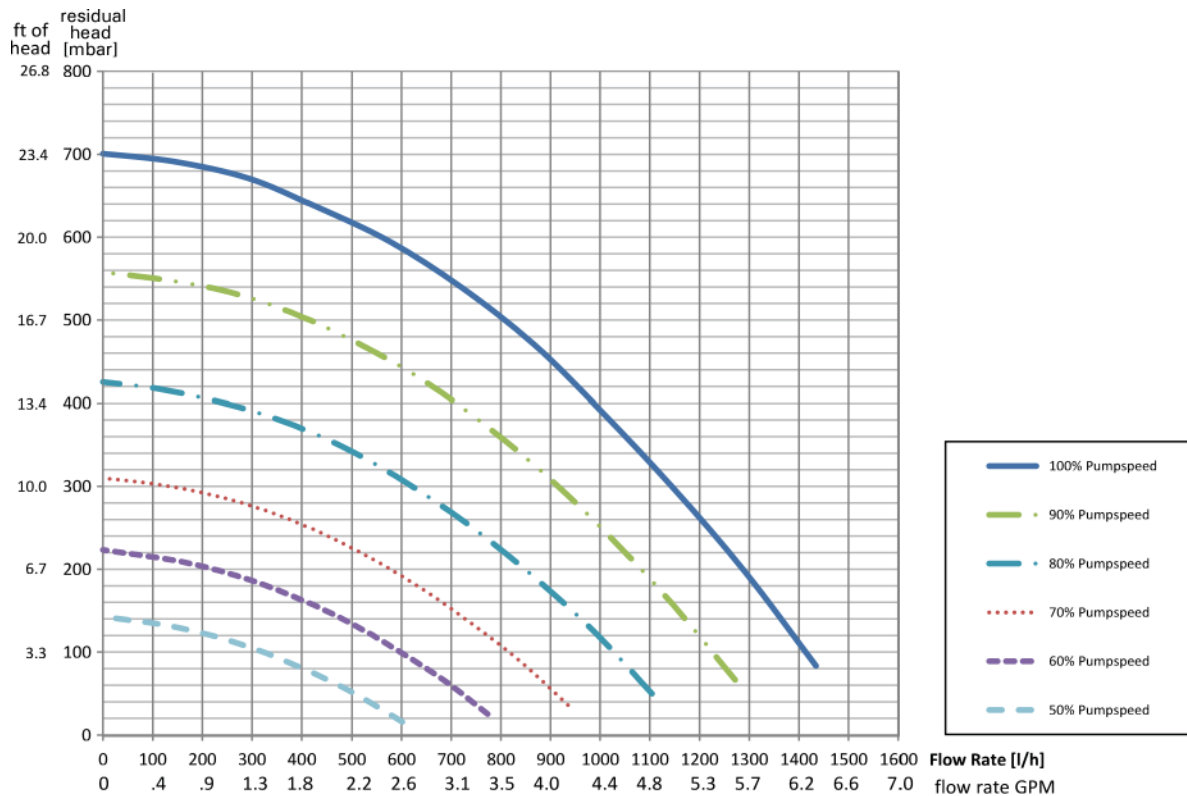
- In the following system conditions, the internal circulation pump is operated at a constant speed:
    - Low loss header or heating water buffer tank and heating circuits with mixing valve
    - Constant supply temperature operation
- Speed setting (%): Parameter 1100.2 in the Boiler group



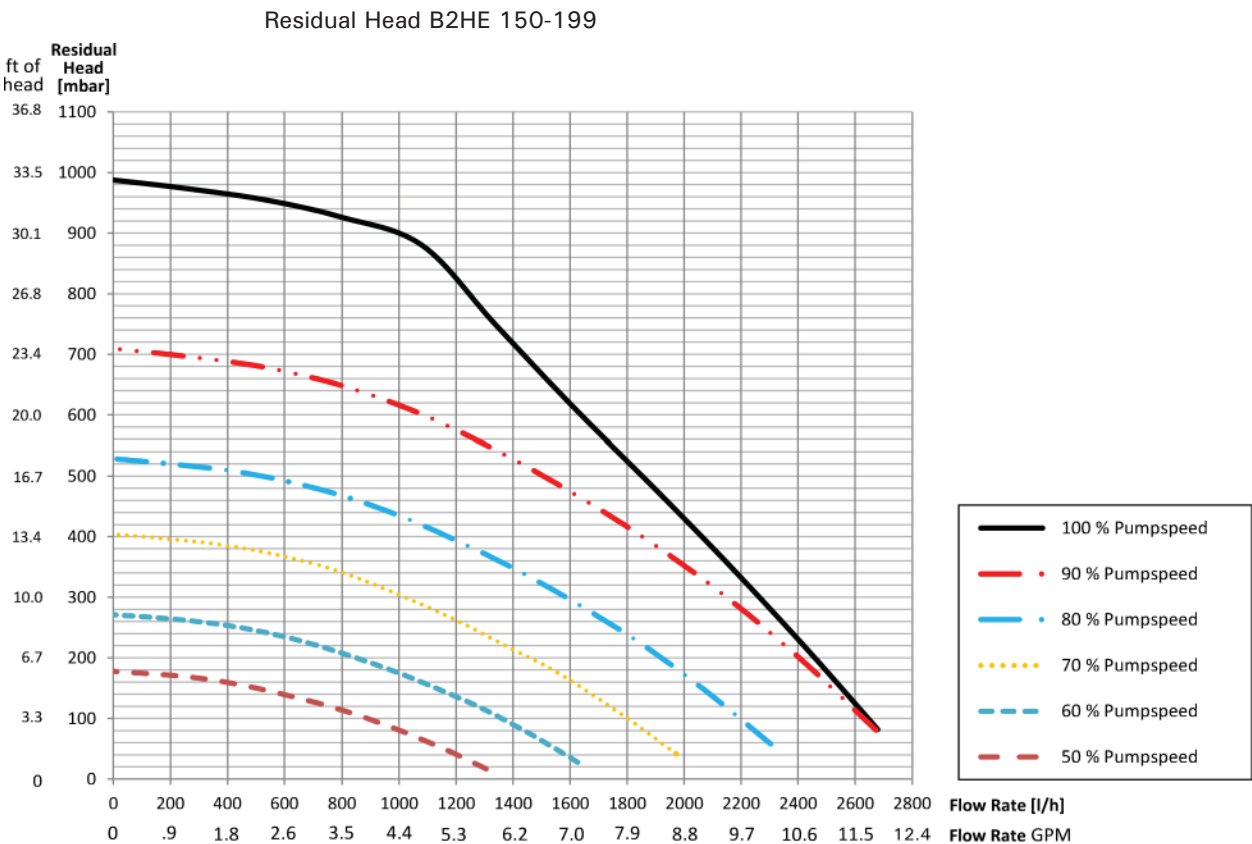
Setting (%) in Heating circuit 1 group:

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

Residual Head B2HE 85-120



Adjusting Pump Rate of Integrated Circulation Pump (continued)



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.

IMPORTANT

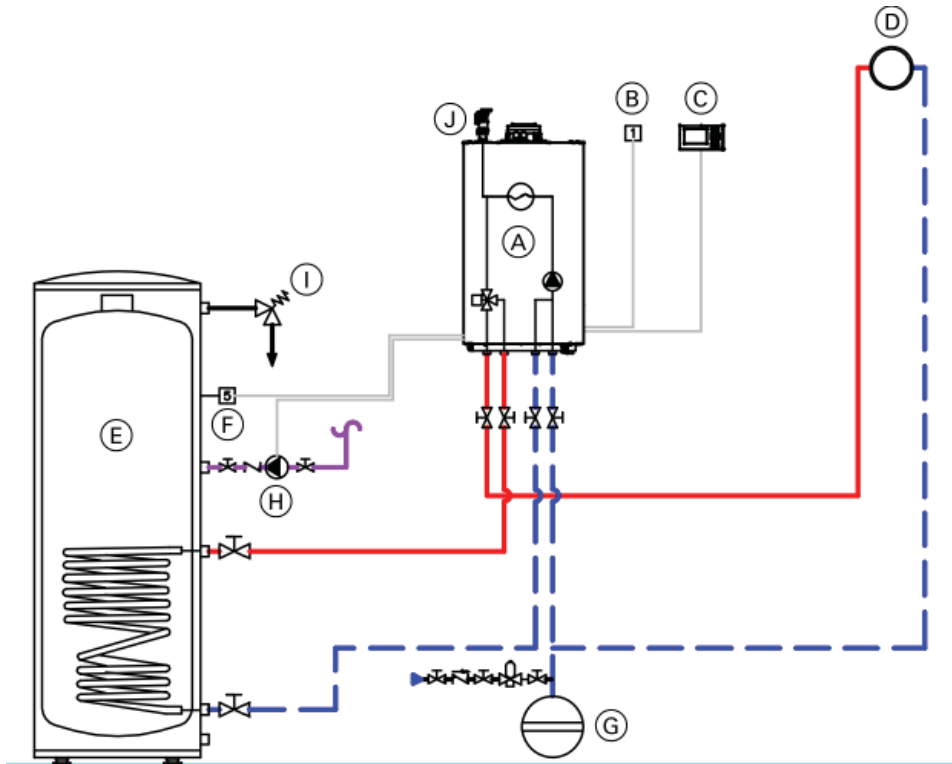
DHW supply and return piping between boiler DHW connections and the Viessmann DHW tank connections, shall be a minimum of 1¼ in. nominal pipe diameter connection outlet sizes provided on the boiler and the DHW tank). This will ensure the residual head of the field supplied pump is fully utilized to overcome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

**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.

# System Layout 1

Vitodens 200-W, B2HE with 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:

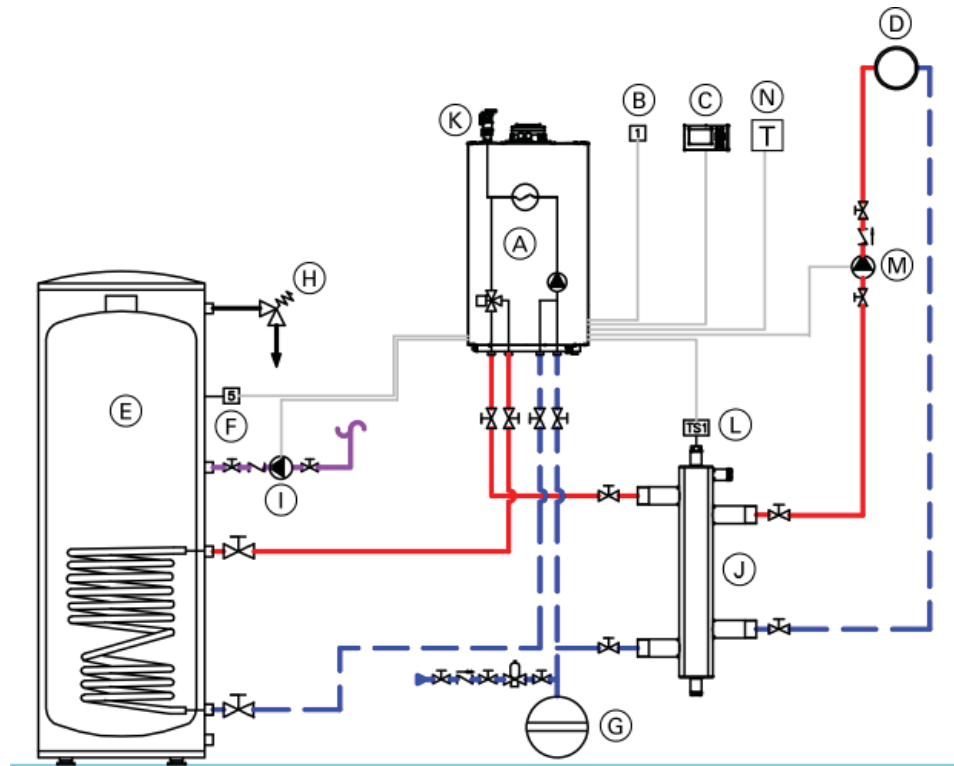
The flow rate of the heating circuit is less than the maximum possible water flow rate of the Vitodens 200-W B2HE boiler (see pages 37 and 38 for maximum water flow rate of boiler).

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 pages 37 and 38, 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 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 [TSI]
- (M) Heating zone pump
- (N) Thermostat for heating zone

\* 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 greater than the maximum possible water flow rate of the Vitodens 200-W B2HE boiler (see pages 37 and 38 for maximum water flow rate of boiler).

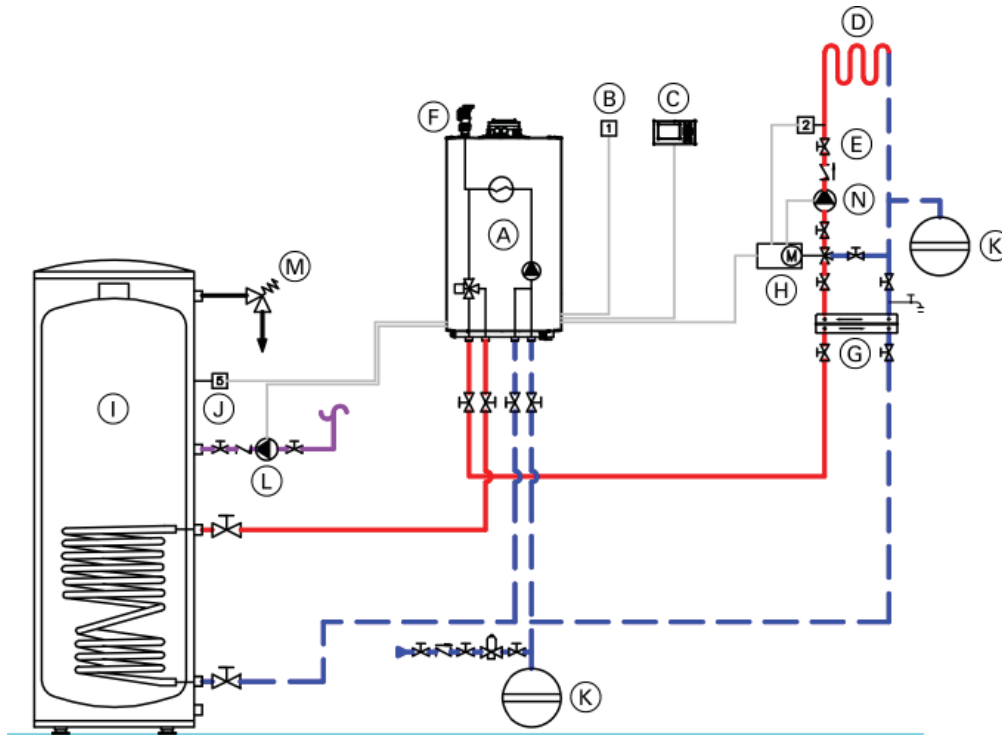
The use of a low-loss header is strongly recommended if the maximum water flow rate in the application concerned exceeds the values shown on pages 37 and 38, or if the system flow rates are unknown.

The low-loss header is available as accessory part.

## 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 pages 37 and 38 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.

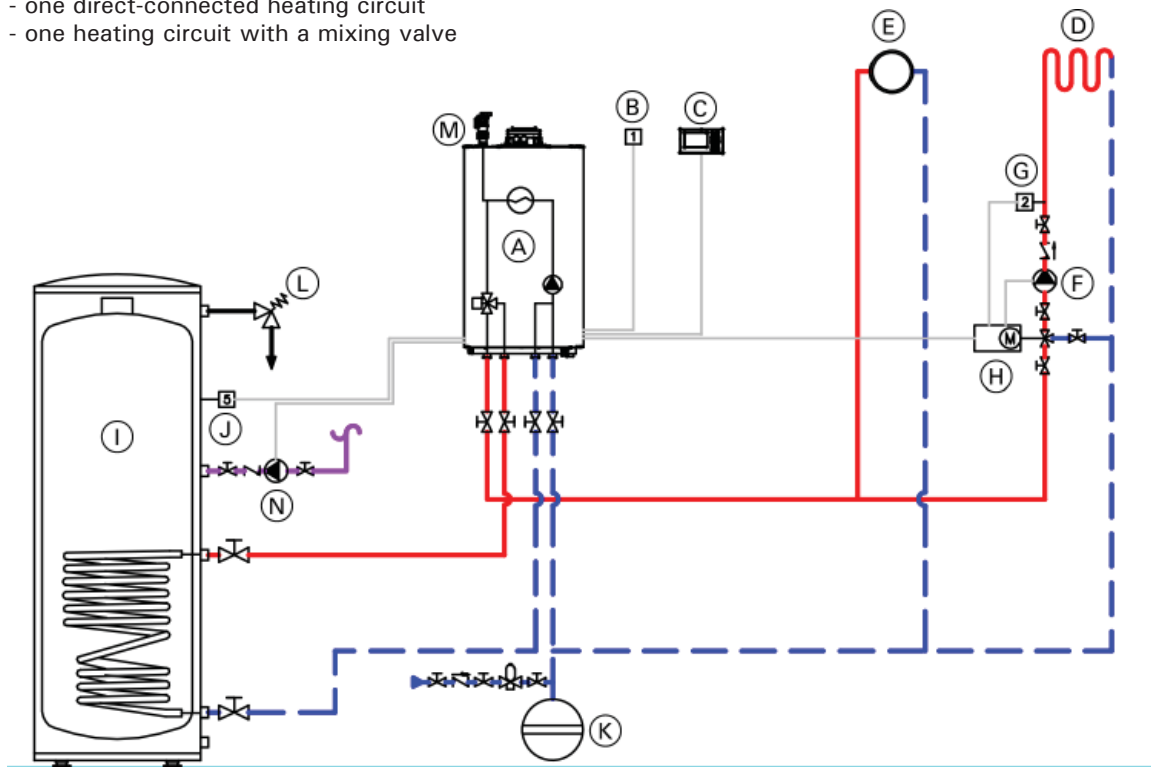
### IMPORTANT

**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.**

## 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-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 pages 37 and 38 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

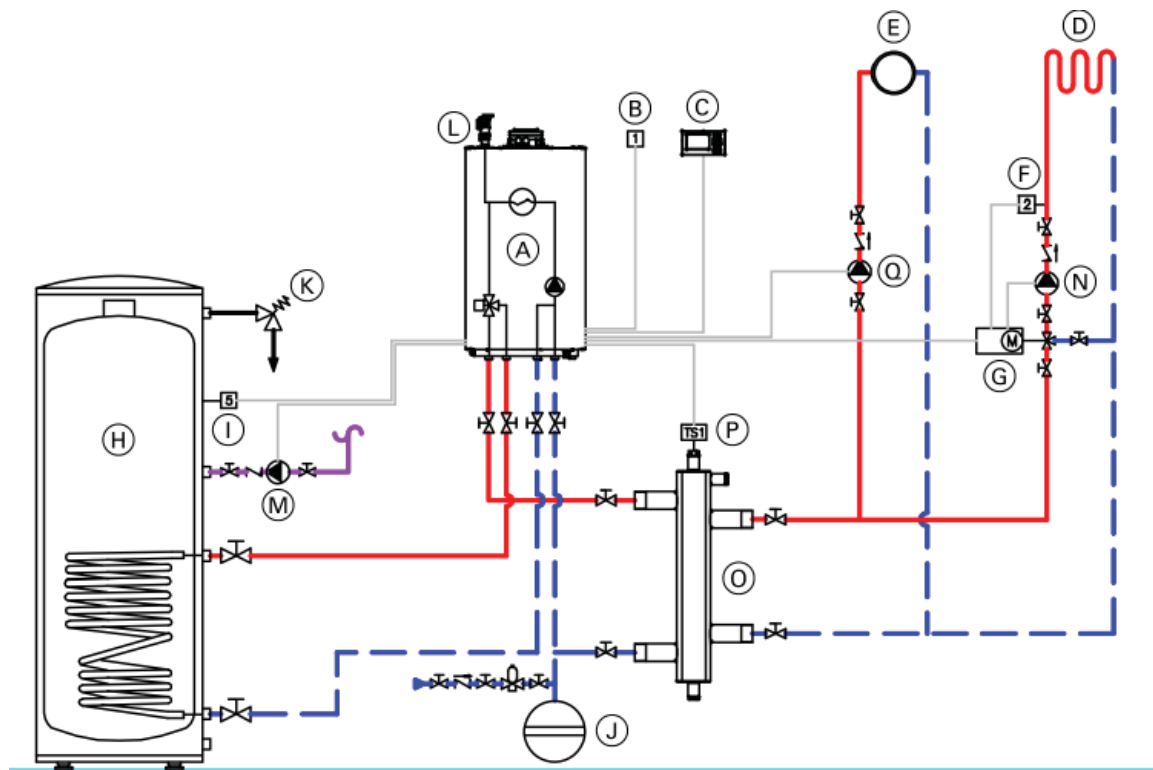
See pages 37 and 38 for the residual head of the boiler. An undersized pump may cause short-cycling and/or improper operation of the boiler. Viessmann STRONGLY recommends using a low-loss header and a boiler pump in this system layout.



## 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 pages 37 and 38 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.

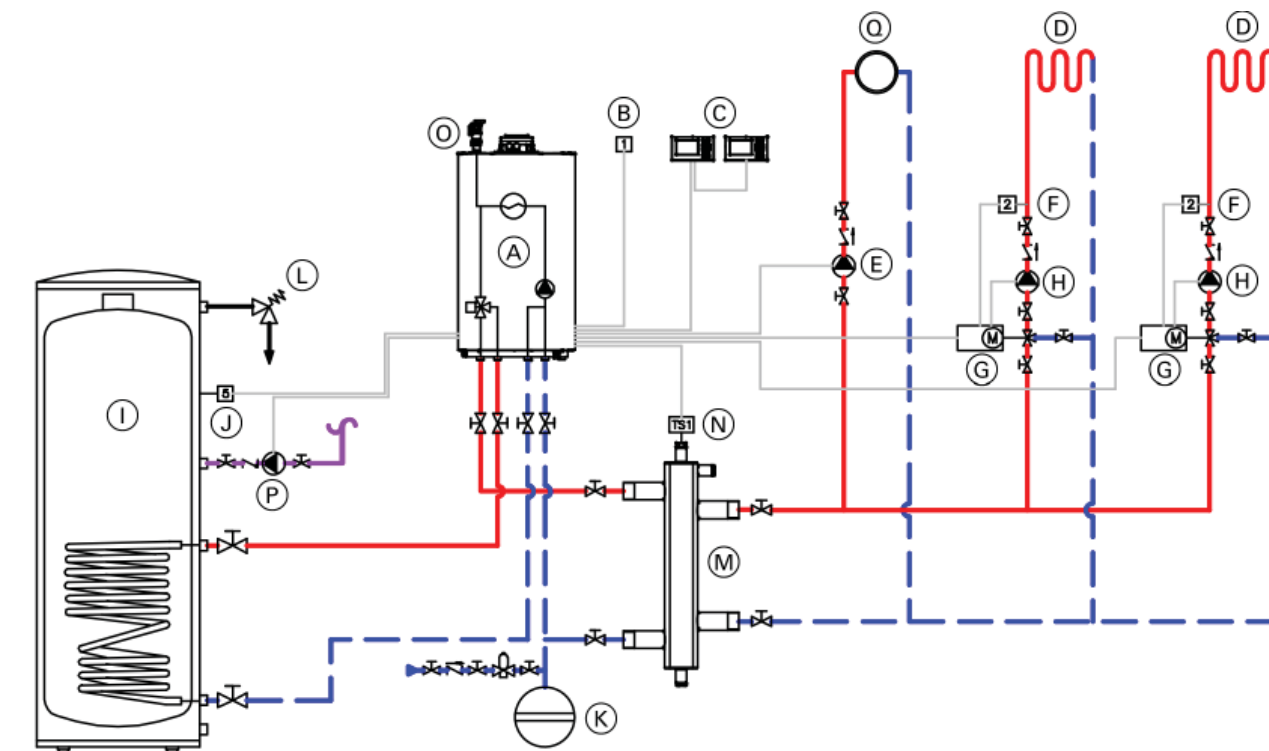
The 3-way mixing valve, built-in to achieve the low-temperature level of the under floor heating circuit, is controlled by an accessory kit for a heating circuit with mixing valve.

\* 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 pages 37 and 38 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.

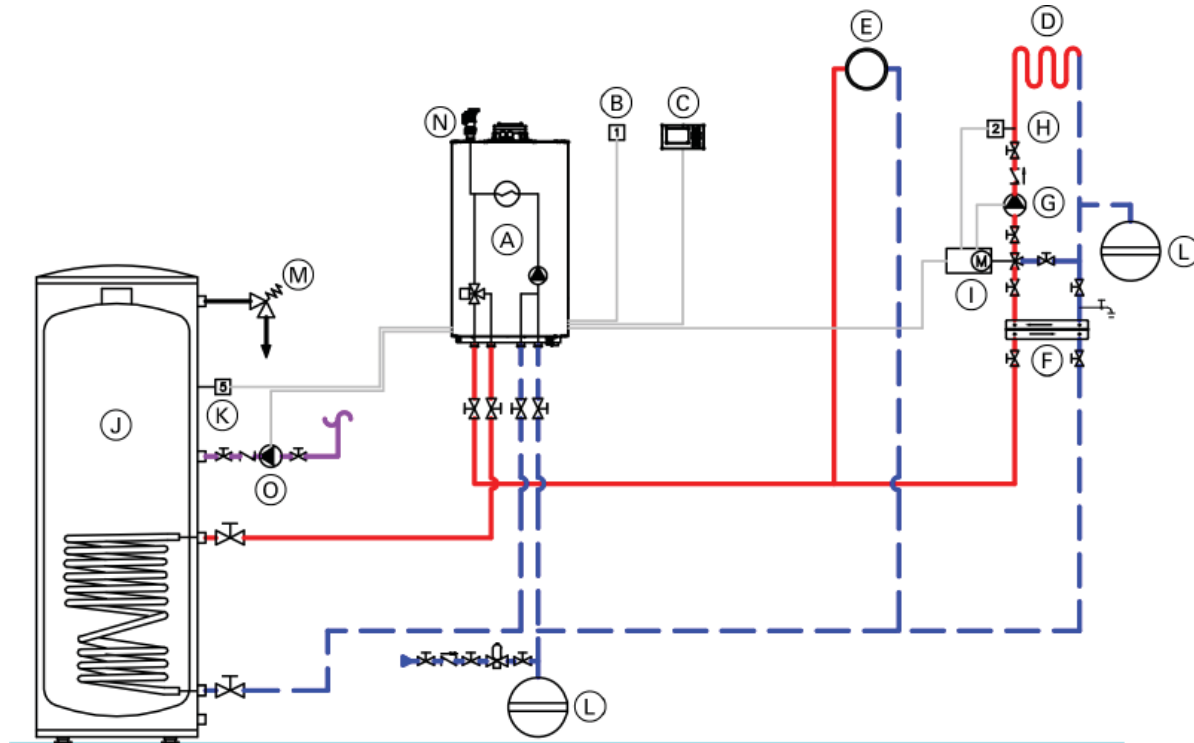
The 3-way mixing valve, built-in to achieve the low-temperature level of the under floor heating circuit, is controlled by an accessory kit for a heating circuit with a mixing valve.

\* 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



### 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 pages 37 and 38 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.

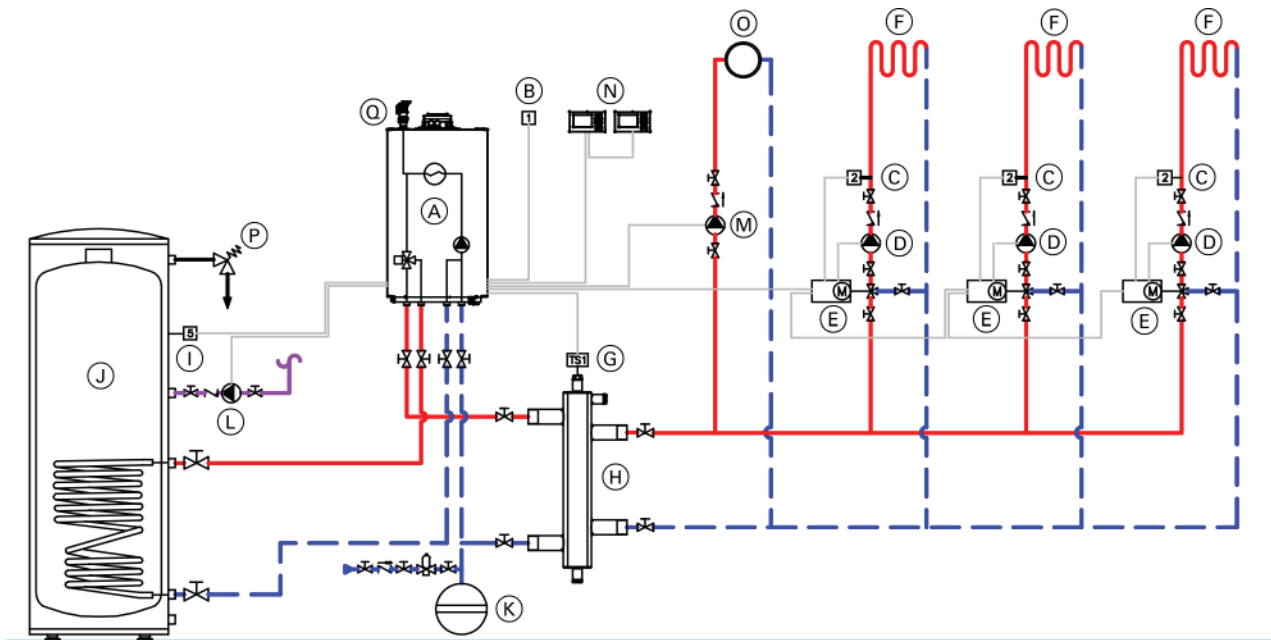
### IMPORTANT

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

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

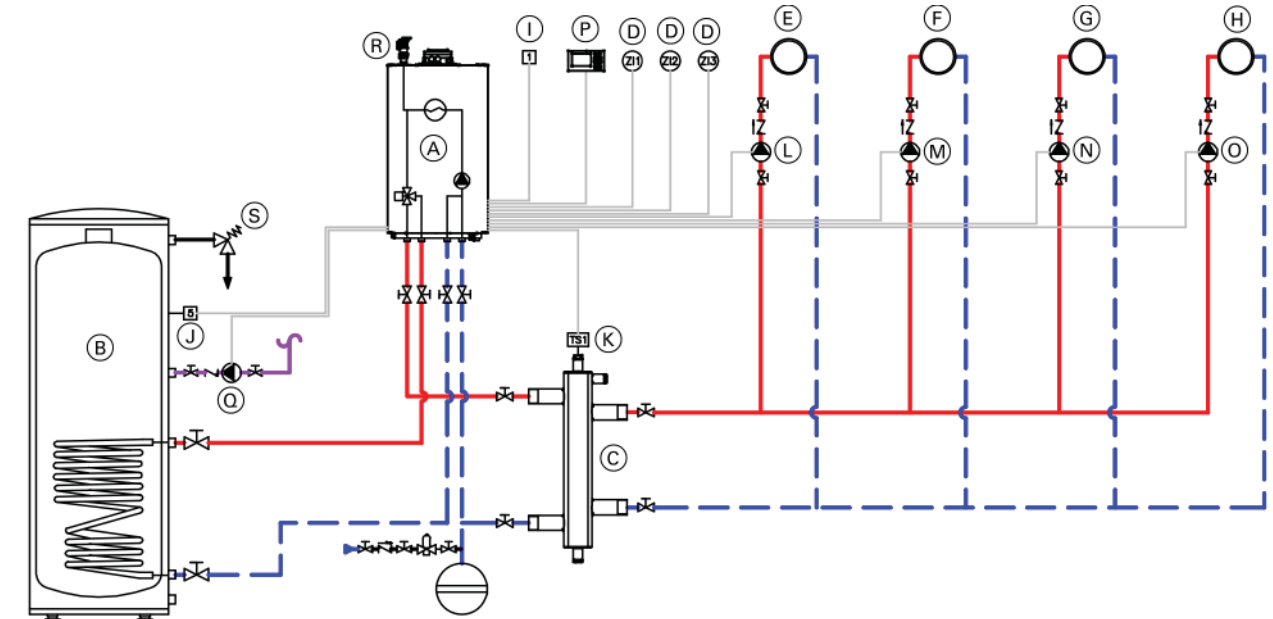
### IMPORTANT

Please note location of expansion tank (K).

## 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) 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.

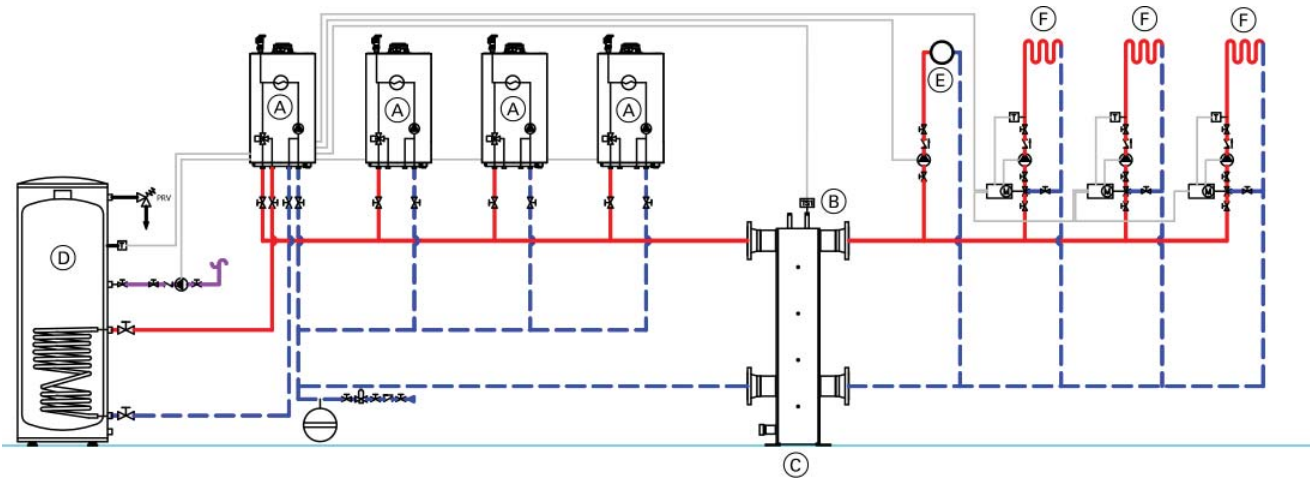
The use of a low-loss header is strongly recommended.

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



### Legend

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

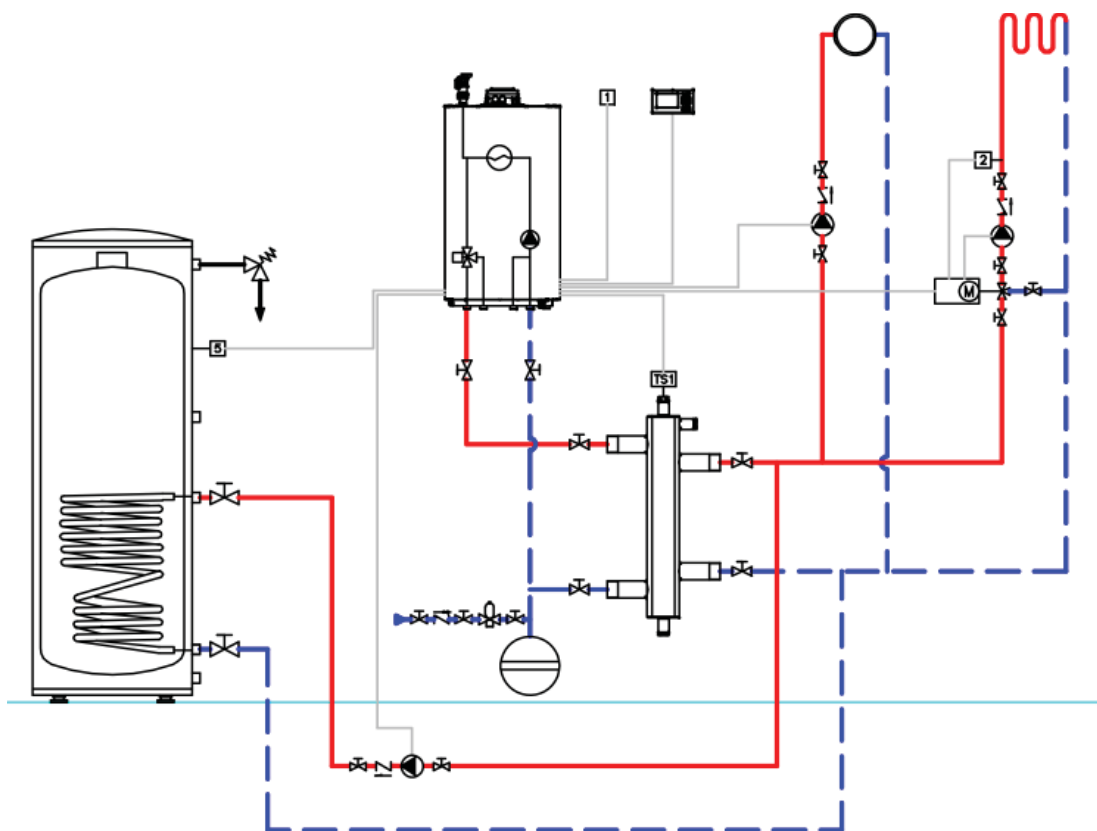
### WARNING

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

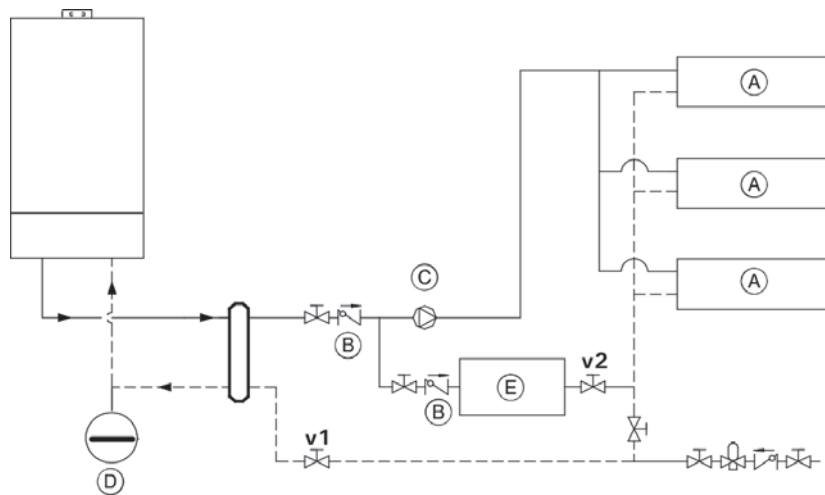
The following piping diagram reflects an alternative connection for the DHW tank only and applies to system layouts 2, 5, 6, 8, 9 and 10. The boiler control pump logic function must be programmed in the Service Instructions.



**\*Note:** When using a low loss header in the system, the DHW connections can be made downstream of the low loss header. Functionality of the DHW pump is set using the start-up assistant.



## Boiler in Heating/Cooling Application



### Legend

- Ⓐ Heating/Cooling unit
- Ⓑ Spring-loaded flow check valve
- Ⓒ Circulation pump
- Ⓓ Expansion tank
- Ⓔ Water chiller

### IMPORTANT

Viessmann strongly suggests that the valves pictured above be labelled "v1" and "v2".

The boiler, when used in connection with a refrigeration system, must be installed ensuring the chilled medium is piped in parallel to the boiler with appropriate valves to prevent the chilled medium from entering the boiler.

The boiler piping system of a hot water heating boiler connected to heating coils located in air handling units where they may be exposed to refrigerated air circulation must be equipped with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle.

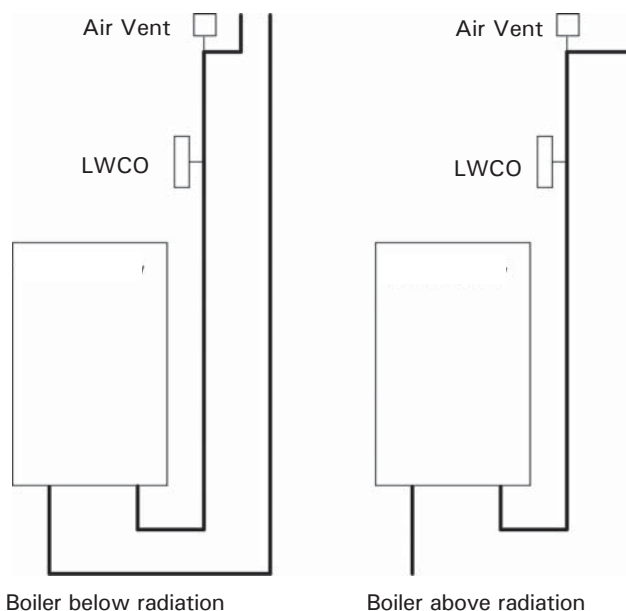
Check installation instructions of the chiller manufacturer carefully for additional requirements.

#### Cooling season starts:

Close valve v1 and open valve v2.

#### Heating season starts:

Close valve v2 and open valve v1.

**Boiler with Low Water Cut-off (remote-mounted, field supplied)**

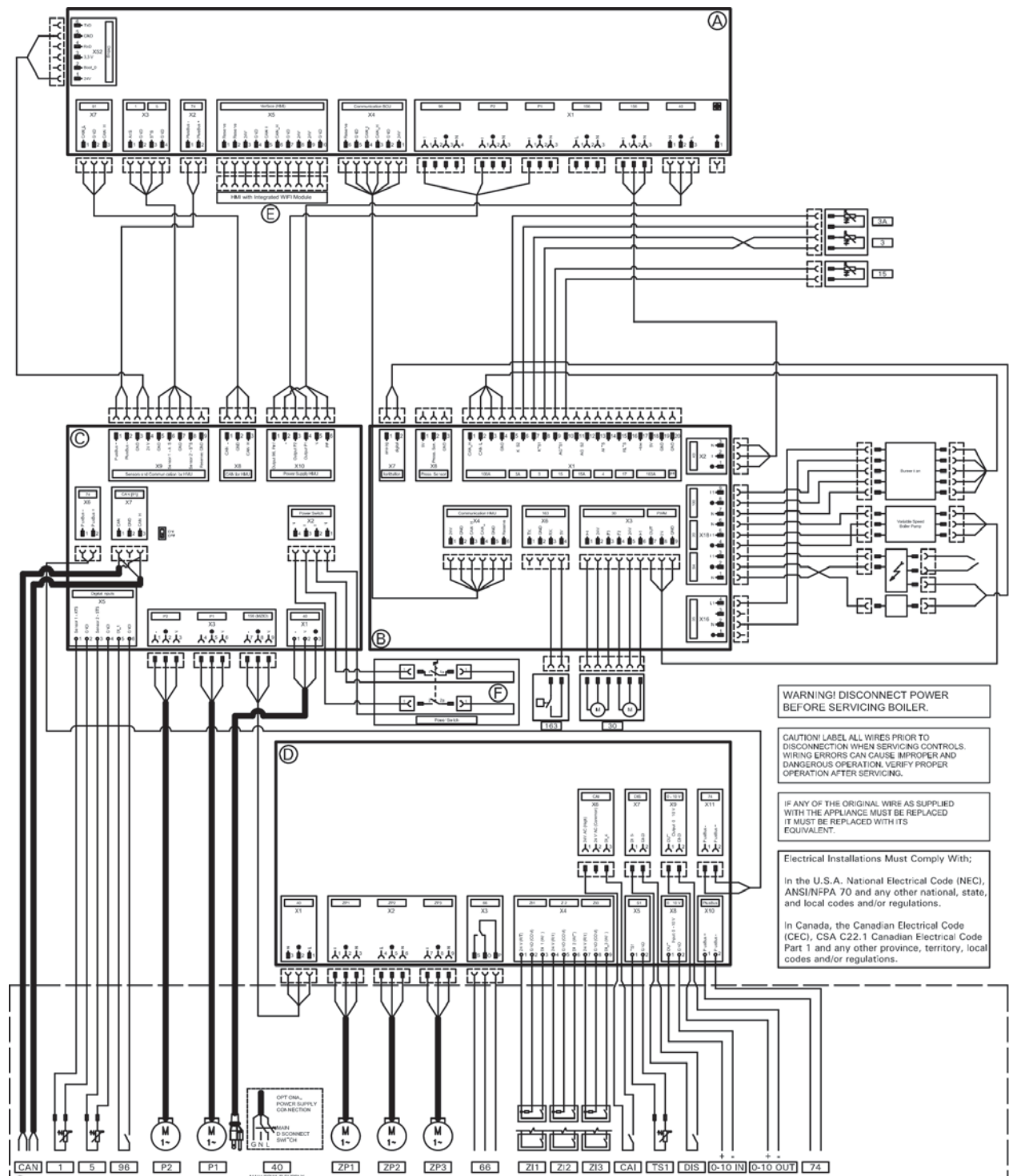
A low water cut-off may be required by local codes. Do not install an isolation valve between boiler and low water cut-off.

Follow the installation instructions of the low water cut-off manufacturer.

For low water cut-off wiring information specific to your application, refer to applicable wiring diagram on the boiler front panel.

**Note:** The Vitodens 200-W boiler has a built-in flow switch, which may be accepted by local codes in lieu of a low water cut-off.

# Overview of Electrical Connections



<p>① IMU Control Board</p> <p>② BCU Control Board</p> <p>③ WP Control Board</p> <p>④ MZIO Control Board</p> <p>⑤ IMI 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 (911) 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>Z12 Zone Input 2 (24VAC/Dry Contact/LGP Switch)*</p> <p>Z13 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

## 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	1203	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 pages 37 and 38 in this manual.

## Technical Data

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)	111 (44)
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>					
Natural gas					
- at rated heating output (DHW heating)	lb/h (kg/h)	86.9 (39.4)	126.0 (57.1)	155.9 (70.7)	207.0 (93.9)
- at partial load	lb/h (kg/h)	8.9 (4.0)	8.9 (4.0)	14.5 (6.6)	14.5 (6.6)
<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
NOx @ 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.

## Lighting and Operating Instructions

### FOR YOUR SAFETY READ BEFORE OPERATING

**W A R N I N G:** If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- A. This boiler does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do Not try to light the burner by hand.
- B. **BEFORE OPERATING** smell all around the boiler area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

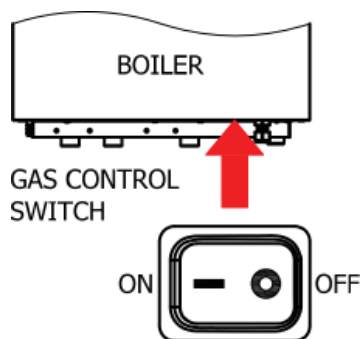
#### WHAT TO DO IF YOU SMELL GAS

- Do not try to light any boiler.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

- C. Use only your hand to push the main gas supply switch. Never use tools. If the main gas supply switch will operate by hand, don't try to repair it, call a qualified service technician.  
Force or attempted repair may result in a fire or explosion.
- D. Do not use this boiler if any part has been under water. Immediately call a qualified service technician to inspect the boiler and to replace any part of the control system and any gas control which has been under water.

### OPERATING INSTRUCTIONS

1. **STOP!** Read the safety information above.
2. Set thermostat or other operating control to lowest setting.
3. Turn off all electric power to the boiler.



4. This boiler is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
5. Close main gas shut-off valve.
6. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, **STOP!** Follow "B" in the safety information above. If you don't smell gas, go to the next step.
7. Open main gas shut-off valve.
8. Turn on all electric power to the boiler.
9. Set thermostat or other operating control to desired setting.
10. If the boiler will not operate, follow the instructions "To Turn Off Gas To Boiler" and call your service technician or gas supplier.

### TO TURN OFF GAS TO BOILER

1. Set thermostat or other operating control to lowest setting.
2. Turn off all electric power to the boiler if service is to be performed.
3. Turn off the control gas switch.



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