

Technical Data Manual

for use by heating contractor

VIESSMANN®

Vitorond 200, VD2A Series
Triple-pass hot water heating boiler
490 to 1096 MBH (144 to 321 kW)



VITOROND 200



Product may not be exactly as shown

Oil-/Gas-fired boiler

triple-pass sectional cast iron design with Eutectoplex heat transfer surface
and Therm-Control integrated low temperature protection logic
for operation with modulating water temperatures

Heating input: 490 to 1096 MBH
(144 to 321 kW)



Safety and Installation Requirements

Please ensure that these instructions are read and understood before starting any service work. Failure to comply with these instructions may cause product/property damage, severe personal injury and/or loss of life.

Working on the equipment

The installation, adjustment, service and maintenance of this product must be performed 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, burner or control.

Ensure that main power to the equipment being serviced is off.

Ensure that the main fuel supply valve to the boiler is closed.

Take precautions to avoid accidental activation of power or fuel during service work.

Do not perform service work on any component part without ensuring safe operation of the heating system. When replacing parts, use original Viessmann or Viessmann approved replacement parts.



Refer to the Installation Instructions applicable to this boiler.

Product Information

VITOROND 200

The Vitorond 200 is a triple-pass sectional cast iron oil-/gas-fired boiler for commercial heating applications. Its Eutectoplex heat exchanger provides high operational reliability and a long service life, while the triple-pass design ensures efficient, low-emission combustion. The VD2A Series features Therm-Control integrated low-temperature protection logic and a redesigned return water distribution system for a simplified design and system integration.

The benefits at a glance:

- Efficient and reliable operation.
Modulated boiler water temperatures help conserve energy by closely matching system output to actual demand. Viessmann system controls ensure consistent, maximum system efficiency.

Combustion efficiency up to:
- oil 87.7%.
- gas 84.8%.
Thermal efficiency up to:
- oil 87.9%.
- gas 85.2%.
- Simplified design and system integration with Therm-Control integrated low-temperature protection logic, eliminating the need for a low-temperature protection package or shunt pump.
No minimum boiler return water temperature when used with Viessmann Vitotronic controls.
- Simplified water connection. Wide water galleries and a large water content provide excellent natural circulation and a reliable heat transfer. No minimum heating water flow rate required.
- High operational reliability and a long service life are achieved by the special Eutectoplex gray cast iron heat exchanger. A uniform heat transfer and controlled water flow, together with inherent characteristics of the cast iron sections, eliminate stress fractures, counteract the formation of condensate and extend the life cycle of the boiler.

- Low environmental impact thanks to low-emission combustion achieved by the boiler’s triple-pass design.
- Problem-free transport into difficult-to-access boiler rooms thanks to sectional construction and low weight of individual sections. The Fastfix system facilitates a quick and easy installation.
- Simple, quick assembly of the individual cast iron sections with new tongue-and-groove system with silicone sealant. The gasket seal is secured in place by the double groove, and therefore not subject to mechanical stresses.
- Easy cleaning access facilitated by a hinged left- or right-swing combustion chamber door providing easy access to all three flue gas passageways from the front of the boiler, reducing side clearance.
- Efficient and safe operation of the heating system with Vitotronic digital boiler and heating system controls. Tailored to suit every requirement, these controls cover all known control strategies and applications. Standardized LON BUS enables complete integration into building management systems. Optional integration into the Vitocontrol control panel.
- Consistent and reliable DHW production with indirect-fired Vitocell 100 steel or Vitocell 300 stainless steel tanks.
Tanks may be combined into multiple-tank batteries for applications requiring larger quantities of hot water.
- Comprehensive standard equipment saves valuable time in installation and sourcing of product. The supply and return header system is pre-built for left or right connections and positions components properly.
- Boilers, controls, domestic hot water tanks, and heating system components are design-matched to work together. All components are compatible and are therefore quickly and easily installed.

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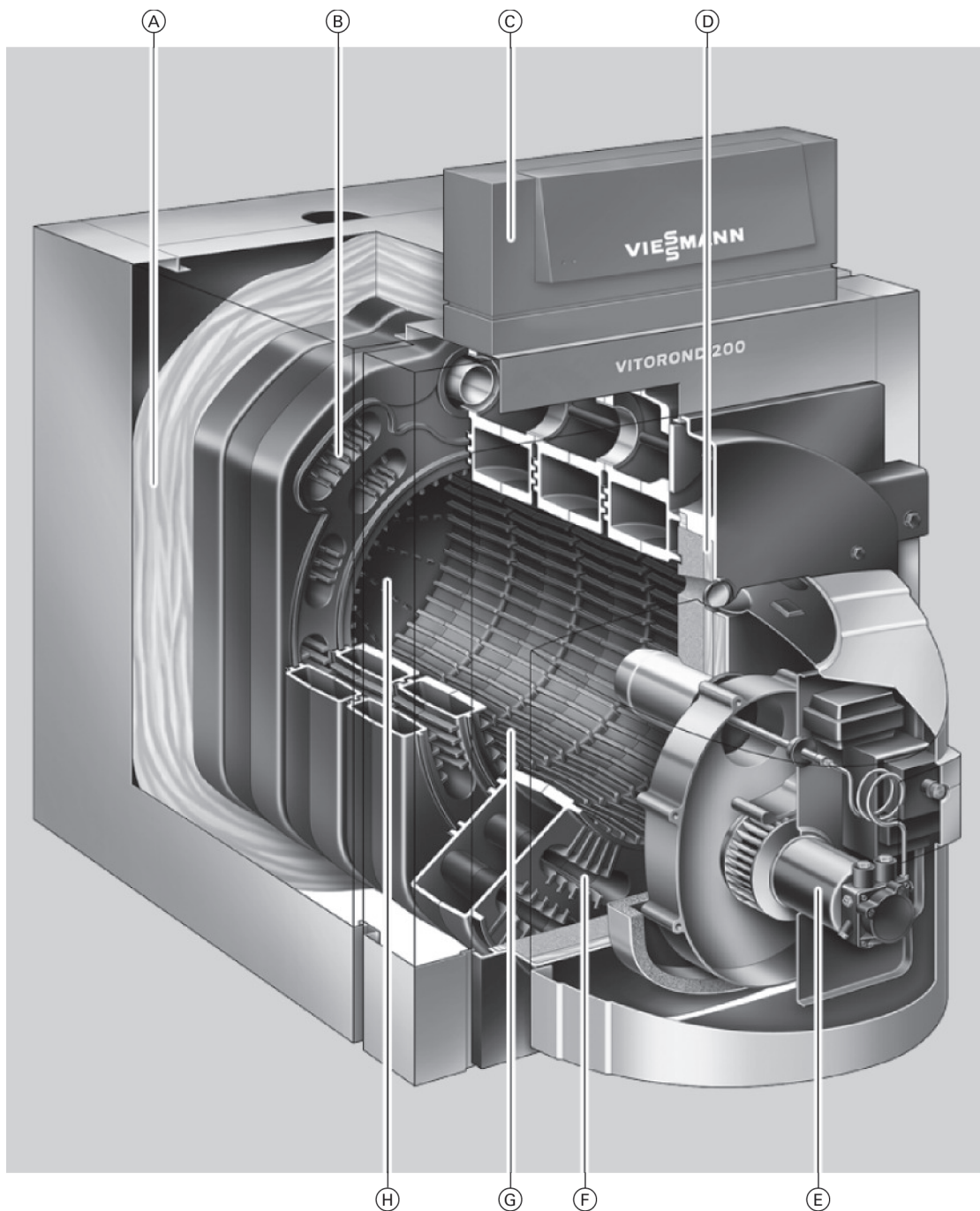
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Cross-Section



Viessmann North America offers the side-mounted control option only.

Legend

- | | |
|---|--|
| Ⓐ Extremely effective 4 in. (100 mm) thick insulation | Ⓔ Low-emission burner (Weishaupt or Riello) |
| Ⓑ Third pass | Ⓕ Second pass |
| Ⓒ Vitotronic control - intelligent and easy to install, operate and service | Ⓖ Eutectoplex heat exchanger surface constructed from homogeneous special gray cast iron |
| Ⓓ Burner door insulation | Ⓗ Combustion chamber |

Technical Data

Boiler Model	VD2A-	125	160	195	230	270
Input (oil)* ¹	MBH (kW)	490 (144)	628 (184)	765 (224)	902 (264)	1059 (310)
Input (gas)* ¹	MBH (kW)	508 (149)	650 (190)	792 (232)	934 (274)	1096 (321)
Output (oil/gas)* ²	MBH (kW)	433 (127)	553 (162)	672 (197)	794 (232)	932 (272)
Combustion efficiency (oil)	%	87.7	87.3	87.3	87.3	87.3
Combustion efficiency (gas)	%	84.7	84.8	84.8	84.8	84.8
Thermal efficiency (oil)	%	87.9	87.6	87.4	87.3	87.2
Thermal efficiency (gas)	%	85.2	85.1	84.8	84.8	84.7
Number of cast iron sections		4	5	6	7	8
Cast iron block dimensions* ³						
Length (dimension f)	in. (mm)	26½ (670)	33 (840)	39¾ (1010)	46½ (1180)	53¼ (1650)
Width (dimension c)	in. (mm)	31 (790)	31 (790)	31 (790)	31 (790)	31 (790)
Height (dimension b)	in. (mm)	35 (884)	35 (884)	35 (884)	35 (884)	35 (884)
Cast iron section dimensions* ³						
Front section (with combustion chamber door) (dimension j)	in. (mm)	35 x 31 x 11½ (885 x 790 x 290)				
Intermediate section (dimension i)	in. (mm)	34 x 26¾ x 6¾ (860 x 680 x 170)				
Rear section (with flue gas collar)	in. (mm)	35 x 34 x 10½ (885 x 860 x 270)				
Dimensions (with insul. jacket) * ³						
Total length (dimension g)	in. (mm)	35¾ (905)	42¼ (1075)	49 (1240)	55½ (1410)	62¼ (1580)
Total width with side-mounted Vitotronic control (dimension e)	in. (mm)	40½ (1030)	40½ (1030)	40½ (1030)	40½ (1030)	40½ (1030)
Total width (dimension d)	in. (mm)	34 (860)	34 (860)	34 (860)	34 (860)	34 (860)
Total height with boiler base (dimension h)	in. (mm)	39½ (1007)	39½ (1007)	39½ (1007)	39½ (1007)	39½ (1007)
Total height with supply header (dimension a)	in. (mm)	58½ (1485)	58½ (1485)	58½ (1485)	58½ (1485)	58½ (1485)

*¹ Input ratings are based on ANSI Z21.13a*CSA 4.9a-2007 - Gas Fired Steam and Hot Water Boilers; CSA B140.7-05 - Oil Burning Equipment - Steam and Hot Water Boilers; CSA B140.0-03 - Oil Burning Equipment - General Requirements; UL 726 - 7th ed. - Oil-Fired Boiler Assemblies; and UL 795 - Commercial Industrial Gas Heating Equipment.

*² Tested to AHRI BTS-2000 "method to determine efficiency of commercial space heating boilers".

*³ Inch dimensions are rounded to the nearest ¼ in.

Technical Data *(continued)*

Boiler Model	VD2A-	125	160	195	230	270
Weight Front section (with combustion chamber door)	lbs. (kg)	352 (160)	352 (160)	352 (160)	352 (160)	352 (160)
Intermediate section	lbs. (kg)	220 (100)	220 (100)	220 (100)	220 (100)	220 (100)
Rear section (with flue gas collar)	lbs. (kg)	242 (110)	242 (110)	242 (110)	242 (110)	242 (110)
Cast iron heat exchanger block	lbs. (kg)	1122 (510)	1353 (615)	1584 (720)	1760 (800)	1991 (905)
Overall weight (complete with jacket, without burner)	lbs. (kg)	1201 (545)	1441 (655)	1675 (760)	1874 (850)	2127 (965)
Boiler water content	USG (L)	32 (122)	41 (154)	49 (186)	57 (217)	66 (249)
Max. boiler temperature *4 (= fixed high limit)	°F (°C)	250 (121)	250 (121)	250 (121)	250 (121)	250 (121)
Max. allow. operating pressure *5	psig	85	85	85	85	85
Boiler connections *6 Boiler supply and return	in.	2½	2½	2½	2½	2½
Drain valve Boiler supply and return	in.	¾	¾	¾	¾	¾
Heating surface area Flue gas side	ft² (m²)	53 (4.9)	70 (6.5)	85 (7.9)	102 (9.5)	117 (10.9)
Water side	ft² (m²)	43 (4.0)	57 (5.3)	71 (6.6)	85 (7.9)	99 (9.2)
Flue gas - Temperature (gross) *7	°F (°C)	365 (185)	365 (185)	365 (185)	365 (185)	365 (185)
- Flue gas mass flow rate	lbs./h (kg/h)	470 (213)	602 (273)	732 (332)	864 (390)	1014 (457)
With minimum heating input and a 2-stage burner (operation of stage 1)						
- Temperature	°F (°C)	257 (125)	257 (125)	257 (125)	257 (125)	257 (125)
- Flue gas mass flow rate at min. input rate	lbs./h (kg/h)	282 (128)	362 (164)	439 (199)	516 (234)	604 (274)
Standby loss based on max. heating input and hot water supply and return temps. of 167 / 140° F (75 / 60° C)	%	0.40	0.38	0.28	0.25	0.25
Vent pipe collar outer Ø *8	in. (mm)	8 (200)	8 (200)	8 (200)	8 (200)	8 (200)
Flue gas resistance	"w.c.	0.26	0.38	0.40	0.48	0.64
Flue gas volume of combustion chamber and flue gas passageways	ft.³ m³	4.909 (0.139)	6.039 (0.171)	7.169 (0.203)	8.299 (0.235)	9.429 (0.267)
Required flue draft Category I	Pa "w.c.	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Positive pressure Category III	Pa "w.c.	20 (0.08)	20 (0.08)	20 (0.08)	20 (0.08)	20 (0.08)

*4 The maximum supply operating temperature (= max. adjustable high limit) lies approx. 27° F (15° C) below the fixed high limit setting.

*5 May be less in some Canadian provinces.

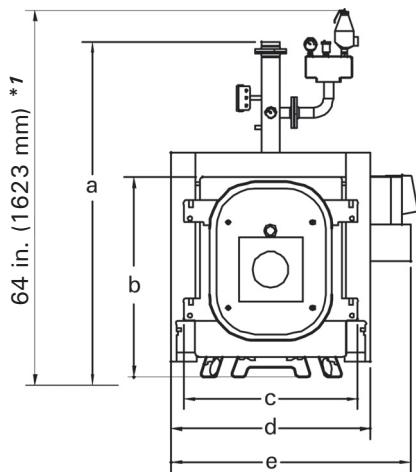
*6 Connections for boiler connection kit (standard equipment).

*7 Combustion results are based on 13.0% CO₂ with fuel oil #2 and 10% CO₂ with natural gas, as well as a system supply temperature of 167° F (75° C), and a system return temperature of 140° F (60° C). Measured flue gas temperature with a combustion air temperature of 68° F (20° C) and a boiler water temperature of 176° F (80° C).

*8 Vent pipe collar diameter does not automatically indicate vent/chimney size. See page 23 for different venting options (categories).

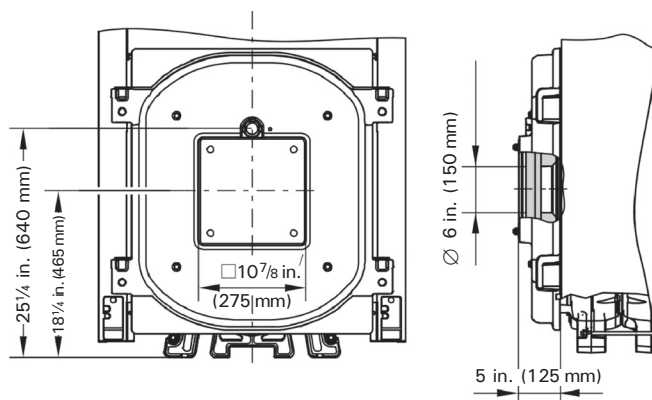
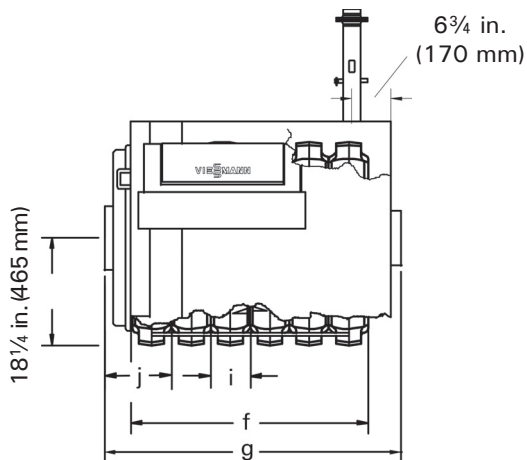
► The combustion burner head material must be suitable for temperatures of at least 932° F (500° C).

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

Technical Data (continued)

*1 Dimension includes sub-base.

Note: Inch dimensions are rounded to the nearest 1/4 in.

**Burner Installation**

The burner must be fitted to the burner plate; installations direct to the boiler door are not feasible.

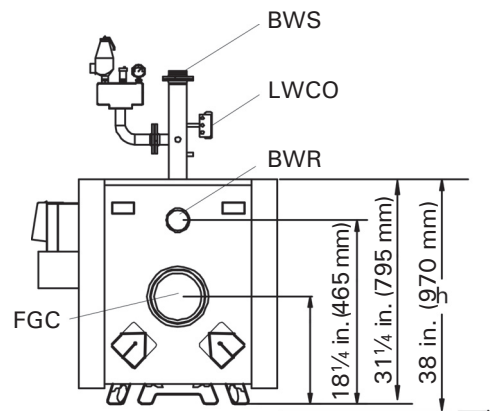
Viessmann supplies a pre-drilled end burner plate in accordance with the supplied burner dimensions.

Note: For mounting burners with blast tube diameters over 6 in. (150 mm), the door insulation (refractory material) can be cut to the required size.

The blast tube must protrude from the thermal insulation on the boiler door.

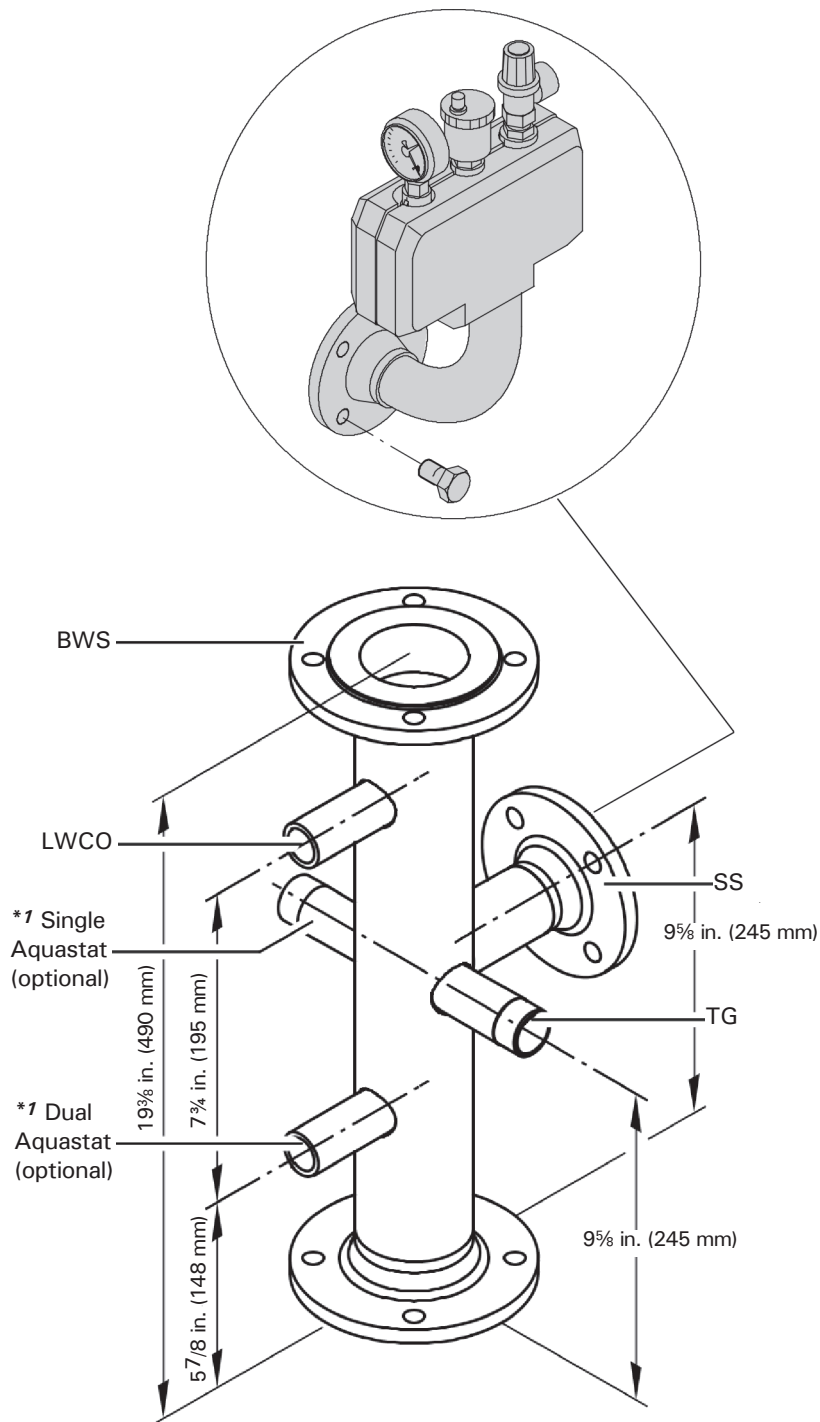
**CAUTION**

Viessmann North America offers the side-mounted control option only. Refer to the side-mounted control dimension on page 4.

**Legend**

- BD Boiler drain 3/4 in.
- BWR Boiler water return
- BWS Boiler water supply
- CO Clean-out opening
- FGC Flue gas collar
- SG Sight glass
- LWCO Low water cut-off

Boiler Connection Kit (standard equipment)



Legend

- SS Safety supply - connection to pressure relief valve
- LWCO Low water cut-off
- TG Temperature gauge
- BWS Boiler water supply

Note: Inch dimensions are rounded to the nearest 1/4 in.

IMPORTANT

- *1** Boiler must be controlled via Viessmann Vitotronic Therm-Control logic in order to prevent the formation of flue gas condensation at all local site return water temperatures. Consult your local Viessmann Technical Representative for other possible control options.

Clearances to Combustibles

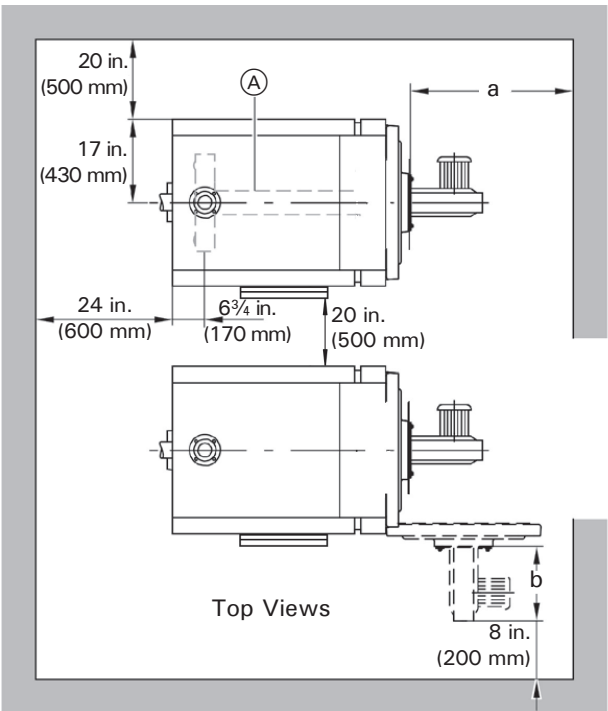
Boiler model VD2A-	125	160	195	230	270
Top	6 in. (150 mm)				
Sides	6 in. (150 mm)				
Flue (oil)	9 in. (229 mm)				
Flue (gas)	6 in. (150 mm)				
Front	6 in. (150 mm)				
Floor	non-combustible				

Boiler model VD2A-	125	160	195	230	270
a ¹ in. (mm)	47 ¼ (1200)	55 (1400)	63 (1600)	71 (1800)	79 (2000)
b ²	Dependent on burner model				

Inch dimensions rounded to the nearest ¼ in.

- ¹ Minimum clearance in front of boiler
- ² Burner length [plus 8 in. (200 mm) for door clearance to wall].

Recommended Service Clearances



- Avoid air contamination by halogenated hydrocarbons (e.g. as in sprays, paints, solvents and cleaning agents)
- Avoid very dusty conditions
- Avoid high levels of humidity
- Protect against frost and ensure good ventilation

Otherwise, the system may suffer faults and damage. In rooms where air contamination through halogenated hydrocarbons may occur, install the boiler only if adequate measures can be taken to provide a supply

IMPORTANT

Maintain 1 in. air clearance from uninsulated hot water pipes to combustible material.

IMPORTANT

Boiler must not be installed on combustible floor material

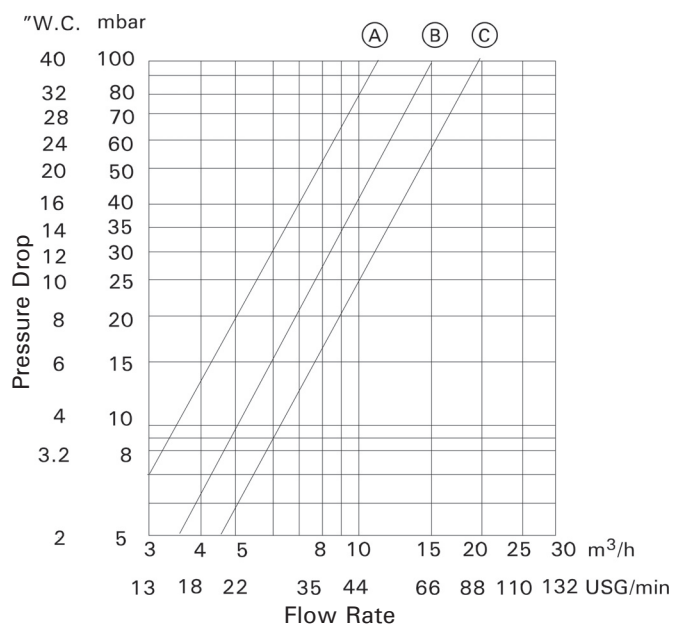
The combustion chamber door is factory assembled to hinge on the left-hand side. A right-hand hinge is feasible by rebuilding the door hinge hardware.

Front clearances (dimension “a”) will allow for easy removal of flue gas turbulator inserts, as well as for full insertion of bristle brush for heat exchanger cleaning.

IMPORTANT

Minimum side clearance of 20 in. (500 mm) must be maintained for side-mounted Vitotronic controls.

Waterside Flow



The Vitorond 200 boiler is designed for closed loop, forced circulation, hot water heating systems only.

The recommended water flow rate through the Vitorond 200 is based on a temperature difference of between 20° F and 40° F (11° C and 22° C) (see table below).

When a balancing valve is used for proper balancing and water flow through the boiler, the valve should be installed 5 pipe diameters from any fittings and 10 pipe diameters from circulation pumps to allow for laminar flow.

The consulting engineer or contractor should review the system design if more balancing valves are required to properly balance the system.

Viessmann can supply TA (Victaulic) balancing valves upon request. The balancing should be carried out by a certified balancing firm prior to boiler start-up. Please contact Viessmann for your closest certified balancing firm.

Legend

- A VD2A-125, VD2A-160
- B VD2A-195
- C VD2A-230 and VD2A-270

Recommended Flow Rates

Boiler model	VD2A-	125	160	195	230	270
20° F Δt	GPM	43	55	67	79	92
40° F Δt	GPM	21	27	33	39	46
11° C Δt	L/s	2.7	3.4	4.2	5.0	5.8
22° C Δt	L/s	1.3	1.7	2.1	2.5	2.9

Δt = temperature difference

Burner Calibration

Weishaupt burners / Riello burners

A Vitorond 200, VD2A boiler with a high-performance gas burner installed can achieve a thermal efficiency of up to 85.2%, and up to 87.9% if equipped with a #2 oil burner as follows:

Gas-fired

10% volume CO₂, 280° F (138° C) net stack temperature, CO in ppm < 50

Oil-fired

13% volume CO₂, 300° F (149° C) net stack temperature, smoke spot 0 - 1 (on the Bacharach Scale)

See separate instructions supplied with the burner.

The maximum input published for each boiler size must not be exceeded.

Model	Flue gas resistance	
	mbar	"w.c.
VD2A-125	0.65	0.26
VD2A-160	0.95	0.38
VD2A-195	1.0	0.40
VD2A-230	1.2	0.48
VD2A-270	1.6	0.64

Burner manufacturer

Weishaupt or Riello

Burner/Gas train approval

Standard approvals are CSA (for Canada) and UL (for U.S.). IRI and FM approved equipment is also available - please inquire.

Electrical requirements

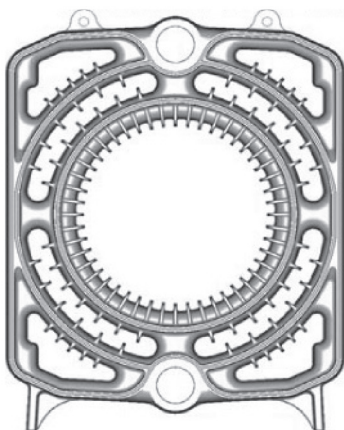
Weishaupt W Series and Riello burners are available in 120 VAC, single-phase, in a 60 Hz configuration. It is generally acceptable to use voltages within ten percent of the supply voltage. Available voltage inside boiler room must be provided at time of order. Ensure appropriate disconnect means and overcurrent protection.

Natural gas pressure

Natural gas pressures and heating values as provided by the gas utilities vary greatly across North America. Select the appropriate gas train accordingly. Low pressure gas trains have a maximum input of 14 "w.c.; high pressure gas trains have a maximum pressure of 5 psig.

Minimum gas pressures apply - please inquire. Gas pressures and heating values at site must be provided at time of order.

New Casting Design and Therm-Control Functionality

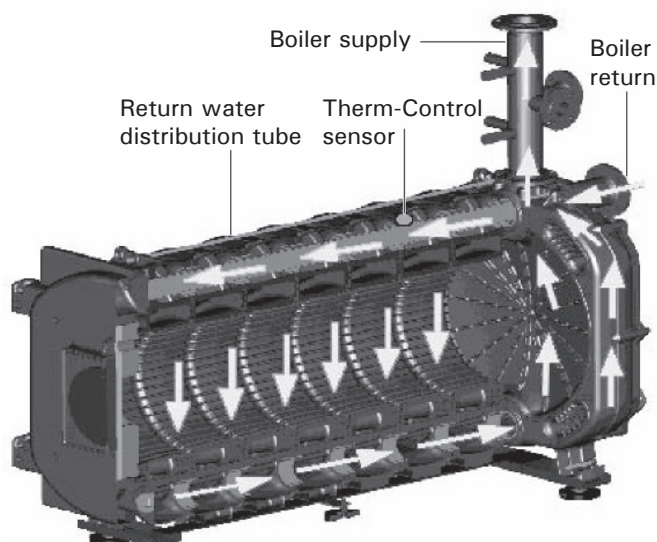


VD2 cast iron section



VD2A cast iron section

Redesigned Return Water Distribution System



A specific, matching boiler control is part of the standard equipment of the Vitorond 200, VD2A.

Boiler protection is assured by the following:

- Therm-Control logic
- Control of a shunt pump
- Flow rate reduction in the heating circuits
- Constant return temperature control

The cast iron mid-sections were re-designed to increase the heat exchanger surface area and water volume, and the number of cast iron sections was reduced by one section.

Together with the redesigned return water distribution system and the Therm-Control low-temperature protection logic, this eliminates the need for a minimum return water temperature.

The larger water volume and increased width of the flue passages also ensure even heating of the water and reduced burner cycling.

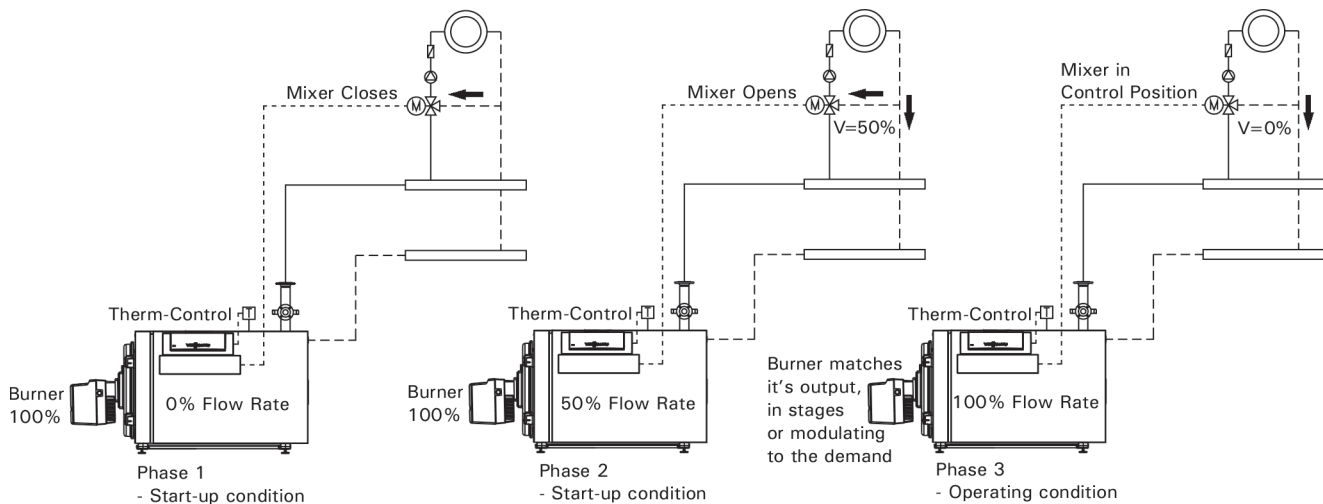
A new tongue-and-groove system with silicone sealant replaces the fiber-rope seal between sections used with the VD2 Series.

System return water enters the cast iron sections of the VD2A boiler via a return water distribution tube now located at the top of the cast iron block (see illustration). Heated supply water flows at the bottom of the cast iron block towards the rear section and upward to the supply connection. The return water temperature is elevated when passing through the rear cast iron section where the supply water flows upward to the boiler supply connection.

The pre-heated return water is then distributed to the cast iron sections through two upward-pointing openings in the distribution tube at each section. The size of the opening is proportional to the amount of heat input of each cast iron section. In each section the return water flows downward and mixes with heated water. Once fully heated, the supply water flows through the bottom of the cast iron block up the rear section and out the boiler supply to the system.

The even temperature distribution ensured by this design reduces the thermal stress on the heat exchanger and, in conjunction with the Vitotronic Therm-Control logic, prevents the formation of flue gas condensate at all return water temperatures, eliminating the need for a shunt pump or return temperature elevation provided by a Low Temperature Protection (LTP) Package.

Therm-Control Low-Temperature Protection Logic



A specific, matching boiler control is part of the standard equipment of the Vitorond 200, VD2A. Boiler protection is assured by the following:

- Therm-Control logic
- Control of a shunt pump
- Flow rate reduction in the heating circuits
- Constant return temperature control

Therm-Control is an integrated low-temperature protection logic provided by the Vitotronic control.

The control uses a Therm-Control temperature sensor specifically positioned in the casting close to the boiler return (shown in Fig. 8 on page 11) to capture the thermal state of the boiler (i.e. the temperature of the system return mixed with the boiler water) and react as early as possible. The Therm-Control Logic shuts off the system pump (and, if applicable, closes the mixing valve) and brings the burner to full fire until the boiler minimum setpoint temperature is reached during start-up, preventing the formation of flue gas condensation and allowing for maximum heat transfer to the system.

This ensures steady supply temperatures with only minimal fluctuations, and eliminates the need for a shunt pump or return temperature elevation provided by a Low Temperature Protection (LTP) Package.

Example:

Take a heating system with one heating circuit and a mixing valve.

In the start-up phase, the set Therm-Control temperature is not achieved at the Therm-Control sensor.

The mixing valve downstream of the boiler receives a signal via the control to reduce the flow rate and to operate the burner at full fire (Phase 1 as shown).

The boiler temperature and that captured by the Therm-Control sensor now rapidly rise. The mixing valve opens when the set temperature is exceeded at the Therm-Control sensor, and the flow rate (in this example 50 %) inside the boiler is steadily increased (Phase 2).

The return water temperature rises after a certain time has elapsed which is a function of the system water volume. As the return temperature rises, the mixing valve opens further until the maximum flow rate (100%) is achieved. Now the control will modulate the burner firing rate to achieve the required setpoint (burner modulation), and weather-responsive boiler water temperature modulation will take place.

Standard Equipment

Note: Boiler controls and burners are purchased separately. Please see Price List for details.

- The cast iron sections are delivered as individual units on skids.
- The combustion chamber door is mounted on the front section.
- The flue gas collector, with two inspection opening covers (fastened with screws), is mounted on the rear section.

1 carton containing supply and return headers
1 carton containing insulation panels and cleaning brushes
1 carton containing the boiler control
1 carton containing installation fittings with safety header

Standard equipment includes:

- Boiler base with leveling bolts
- Connection piping with counter flanges and gaskets
- Turbulators are packed in a bag and placed inside the combustion chamber

When cast iron sections are delivered as individual units:

- Push nipples, high temperature silicone and linseed oil with graphite based sealant are packed in a carton and placed inside the combustion chamber

IMPORTANT

Ensure specific regional, provincial, or state requirements, such as fuel train and additional safety control requirements etc., are known before the product order is placed, to determine proper burner selection and pricing.

Boiler Control Alternatives

For single-boiler installations:

Vitotronic 100, GC1/GC1B *1

- Electronic boiler control unit for a constant boiler water temperature or weather-compensated operation in conjunction with a Vitocontrol panel with Vitotronic 300-K (type MW1S) or an external control unit
- For two-stage or modulating burners
- With control unit for DHW primary system with mixing valve assembly or as an alternative to the control of a constant return temperature with a regulated three-way valve
- With internal diagnostic system
- A function extension to default the set boiler water temperature via 0 - 10 V input can be connected (optional)

External demand:

- Enable boiler/open butterfly valve
- Burner stage 1 ON
- Burner stage 1 and 2 ON
- Isolation valve "close"

Provide a potential free contact for each demand. Connect the potential free contacts to plug-in connectors **143** and/or **146**.

Vitotronic 300, GW2/GW2B *1

- Weather-compensated, digital boiler and heating circuit control unit
- For single-boiler systems
- For up to 2 heating circuits with mixing valve
- For two-stage or modulating burners
- With time switch offering individual and 7-day programs
- Programming unit with plain text prompts
- With separately adjustable periods and heating curves
- With control for DHW primary systems with mixing valve assembly or alternatively, for the control of a constant return temperature with a regulated three-way valve
- With internal diagnostic system
- A function extension to default the set boiler water temperature via 0 - 10 V input can be connected (optional)

An extension kit is required for each heating circuit with mixing valve. The LON communication module is required to enable communication.

For multiple-boiler installations:

Vitotronic 100, GC1/GC1B *1

Digital boiler control systems for modulating boiler and common supply temperature control.

- Electronic boiler control unit
- For two-stage or modulating burners
- Optional communication via LON

Vitocontrol-S MW1/Vitotronic 300-K, MW1B *1

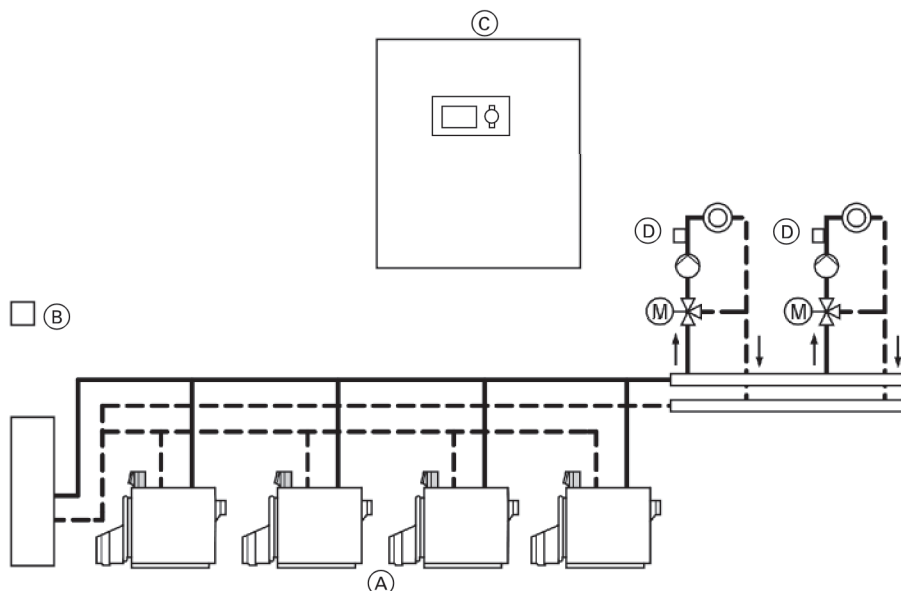
- Weather-compensated cascade control unit for multi-boiler systems with up to 4 boilers with the Vitotronic 100 (GC1/GC1B)
- For up to 2 heating circuits with mixing valve with time switch offering individual and 7-day programs
- Programming unit with plain text prompts
- With control unit for DHW primary systems with mixing valve assembly
- With lead boiler selection
- Optional communication via LON
- With integral diagnostic system and additional functions
- A function extension to default a set system flow temperature via a 0 - 10 V input can be connected (optional)

An extension kit is required for each heating circuit with mixing valve

*1 See respective product manuals for details. Please inquire with your Viessmann Representative for further assistance.

Boiler Control Alternatives *(continued)*

Vitocontrol equipment for multiple-boiler system



Legend

- Ⓐ Up to 4 boilers with a Vitotronic 100, GC1/GC1B
- Ⓑ Outside temperature sensor
- Ⓒ Vitocontrol control panel with Vitotronic 300-K, MW1S/Vitotronic 300-K, MW1B
- Ⓓ Flow temperature sensor

Custom control panels

For single-boiler or multiple-boiler installations:

Custom control panels for residential or commercial applications are designed and manufactured by Viessmann to suit any customer's specific requirements. Custom control panels can have features such as pool heating, hot tub heating, snow melting, telephone tie-in, integration with Building Management Systems, as well as several other functions. Please inquire.

Note: The control of the Vitorond 200, VD2A boiler can be mounted either on the left- or right-hand side of the boiler.
Please specify control location at the time of order.

Vitotronic 100, GC1/GC1B *1

- Electronic boiler control unit
- For two-stage or modulating burners
- Optional communication via LON

Vitotronic 300-K, MW1S/Vitotronic 300-K, MW1B *1

- Weather-compensated cascade control unit for multi-boiler systems with up to 4 boilers with the Vitotronic 100, GC1/GC1B
- For up to 2 heating circuits with mixing valves
- With time switch offering individual and 7-day programs
- Programming unit with plain text prompts
- With DHW thermostat
- With control unit for DHW primary systems with mixing valve assembly
- With lead boiler selection
- Optional communication via LON
- With integral diagnostic system and additional functions
- A function extension to default a set system flow temperature via a 0-10 V input can be connected (accessories)

An extension kit is required for each heating circuit with mixing valve.

*1 See respective product manuals for details. Please inquire with your Viessmann Representative for further assistance.

Single-Boiler System: Vitorond 200, VD2A with Therm-Control

Applications

Heating system with manifold installed close to the boiler. The boiler water flow rate must be able to be reduced.

Main components

Single boiler system with:

- Vitorond 200, VD2A, 125 to 270.
- Vitotronic 300, GW2/GW2B model or Vitotronic 100, GC1/GC1B model with Vitocontrol panel and integral weather-compensated Vitotronic 200-H, HK1M/HK1B model or Vitotronic 100, GC1/GC1B model and external weather-compensated control unit.
- Therm-Control for operating boilers without low temperature return package.

Function description

The Therm-Control will affect the heating control unit(s) or the heating circuit pump(s), if the factory-set temperatures are not reached at the Therm-Control temperature sensor. In the start-up phase (e.g. during commissioning or after a night or weekend shutdown), the boiler water flow rate must be reduced by at least 50%.

The boiler is protected to an optimum level when using the Vitotronic 300, GW2/GW2B model or if the heating circuits are regulated via a Vitotronic 200-H connected to the boiler control unit. No additional on-site protective measures are required.

When it is impossible to reduce the boiler water flow rate, e.g. in older systems, we recommend contacting Viessmann for other possible piping layouts.

No minimum return water temperature needs to be maintained. Shunt pumps and/or boiler circuit pumps/costly mixing valves are not required for elevating the return temperature.

DHW heating

The DHW is heated up when the actual temperature falls below the DHW temperature selected for the tank temperature sensor, subject to tank heating being enabled by the time switch.

The boiler water temperature is raised to the set DHW temperature + 20 K (36° F) and the tank primary pump is started, if the boiler water temperature is 7 K (12.6° F) above the actual DHW temperature.

The heating circuit pumps M2 and M3 are closed, subject to absolute priority being enabled, if the heating circuits are regulated via the Vitotronic. Subject to modulating priority, the heating circuit pumps M2 and M3 remain switched ON and the mixing valves M2 and M3 are closed far enough for the set boiler water temperature for tank heating to be achieved.

Heating operation

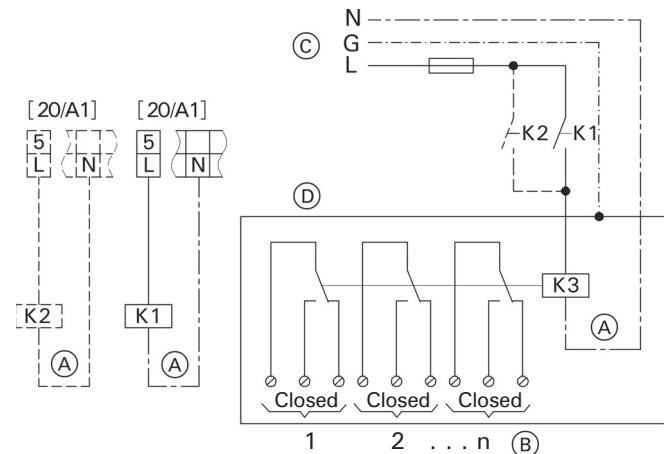
Depending on the control unit used, the flow temperature of heating circuits can be operated in modulating mode, subject to the outside temperature. The boiler water temperature is regulated 8 K (14.4° F) higher than the set flow temperature.

Wiring Diagram

The Therm-Control wiring in heating systems with heating circuit control units, is not connected to the boiler control unit via the LON.

Required coding:

Change "4C" to "2" - use the plug-in connector [20]A1 to close the downstream mixing valve. Change "OD" to "1" - the Therm-Control acts on the mixing valve of the downstream heating circuits (for Vitotronic 200 and 300, factory set condition).

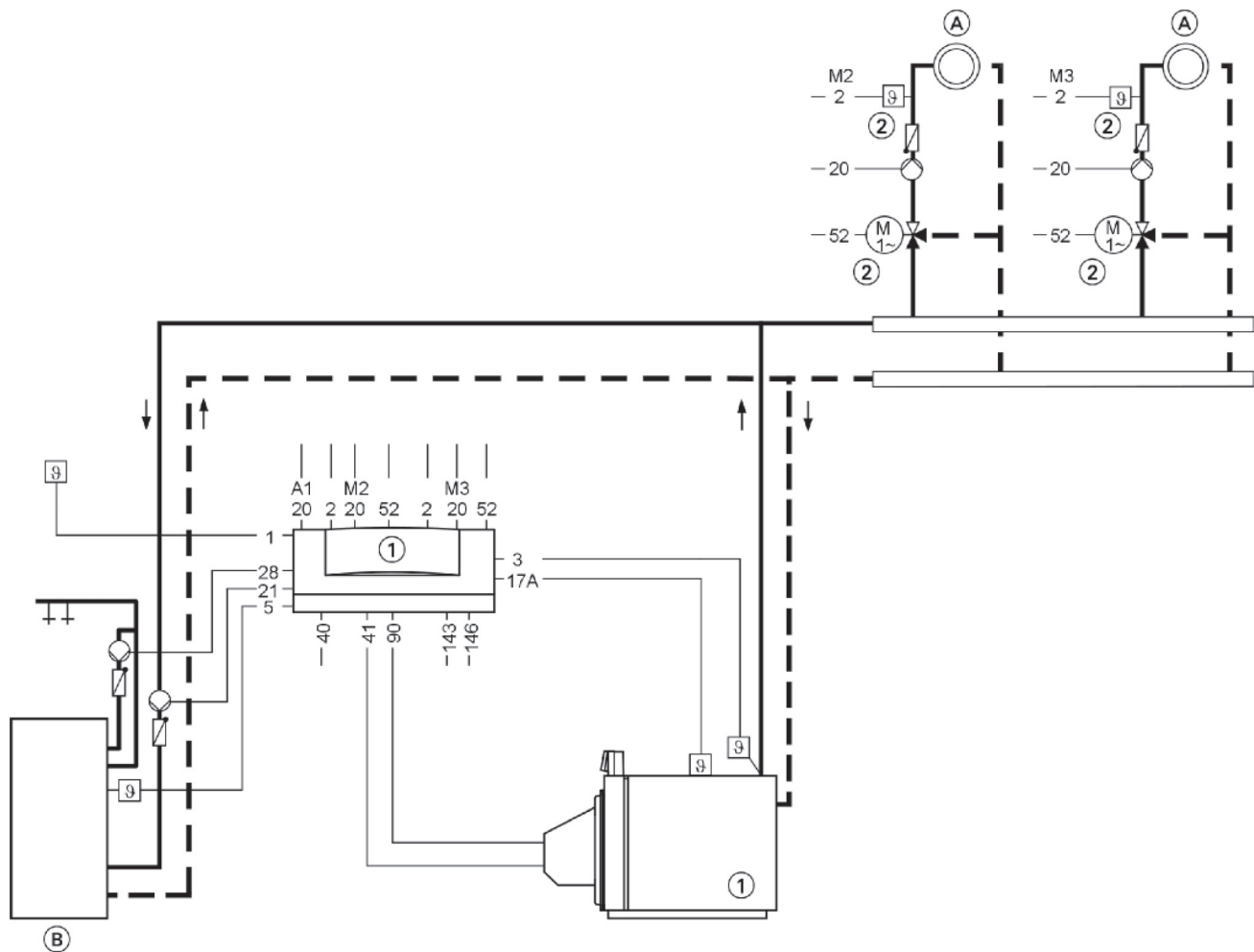


Legend

- (A) Contactor relay, field supplied
- [20]A1 Closing mixing valves (Vitotronic 100, GC1/GC1B)
- (A) Contactor relay, field supplied
- (B) Downstream heating circuit control unit
- Switching contact closed: signal for close mixing valve(s)
- (C) Power connection 120 VAC 60 Hz
- (D) Junction box, field supplied

Single-Boiler System: Vitorond 200, VD2A with Therm-Control *(continued)*

Installation Example



Legend

- Ⓐ Heating circuit with mixing valves
- Ⓑ DHW tank

Plug

- 1 Outdoor temperature sensor
(only for Vitotronic 200 HK1M/HK1B and Vitotronic 300 GW2/GW2B)
- 2 M2 Flow temperature sensor, mixing valve
(only for the Vitotronic 300 GW2/GW2B)
- 2 M3 Flow temperature sensor, mixing valve
- 3 Boiler water temperature sensor
- 5 DHW tank temperature sensor
(accessory for the Vitotronic 100 GC1/GC1B)
- 17 A Therm-Control temperature sensor
- 20 M2 Heating circuit pump, mixing valve
(only for Vitotronic 300 GW2/GW2B)

- 20 M3 Heating circuit pump, mixing valve
(only for Vitotronic 300 GW2/GW2B)
- 20 A1 Closing the mixing valves with external heating circuit control units
- 21 DHW primary pump
- 28 DHW circulation pump
(only for the Vitotronic 200 HK1M/HK1B and Vitotronic 300 GW2/GW2B)
- 41 Burner (stage 1)
- 52 M2 Mixing valve motor (only for Vitotronic 300 GW2/GW2B)
- 52 M3 Mixing valve motor (only for Vitotronic 300 GW2/GW2B)
- 90 Burner (burner stage 2 / mod.)



Please refer to the control manuals Vitotronic 100 GC1/Vitotronic-S or Vitotronic 100 GC1B/Vitotronic 300-K

Multi-Boiler System: Vitorond 200, VD2A with Therm-Control

Applications

Heating system with manifold installed close to the boiler. The boiler water flow rate will be reduced via the motorized butterfly valve.

Main components

Multi-boiler system with:

- Vitorond 200, VD2A, 125 to 270.
- Vitotronic 200-H and
 - Vitotronic 100, GC1/GC1B, for every boiler in a multi-boiler system and Vitocontrol-S MW1/Vitotronic 300-K, MW1B, one required for multi-boiler systems or
 - Vitotronic 100, GC1/GC1B, for every boiler in a multi-boiler system and Vitocontrol control panel and integral weather-compensated control unit Vitocontrol-S MW1/Vitotronic 300-K, MW1B
 - external, weather-compensated cascade control unit with tank thermostat
- Therm-Control for operating boilers without return temperature elevating package.

Function description

The Therm-Control will regulate the motorized butterfly valves or the heating circuit control unit(s), if the factory-set temperatures are not reached at the Therm-Control temperature sensor. In the starting phase (e.g. during commissioning or after a night or weekend shutdown), the boiler water flow must be proportionally reduced.

Reduce the flow rate via the heating mixing valve using the Vitotronic-S MW1/Vitotronic 300-K, MW1B or when regulating the heating circuits via a Vitotronic 200-H connected to the boiler control unit. No additional protection measures are required on-site.

No minimum return temperature needs to be maintained.

No shunt pumps and/or boiler circuit pumps/costly mixing valves are required for raising the return temperature.

DHW heating

DHW is heated up when the actual temperature falls below the DHW temperature selected for the tank temperature sensor, subject to tank heating being enabled by the time switch. The boiler water temperature is raised to the set DHW temperature + 20 K (36° F) and the tank primary pump is started, if the boiler water temperature is 7 K (12.6° F) above the actual tank temperature.

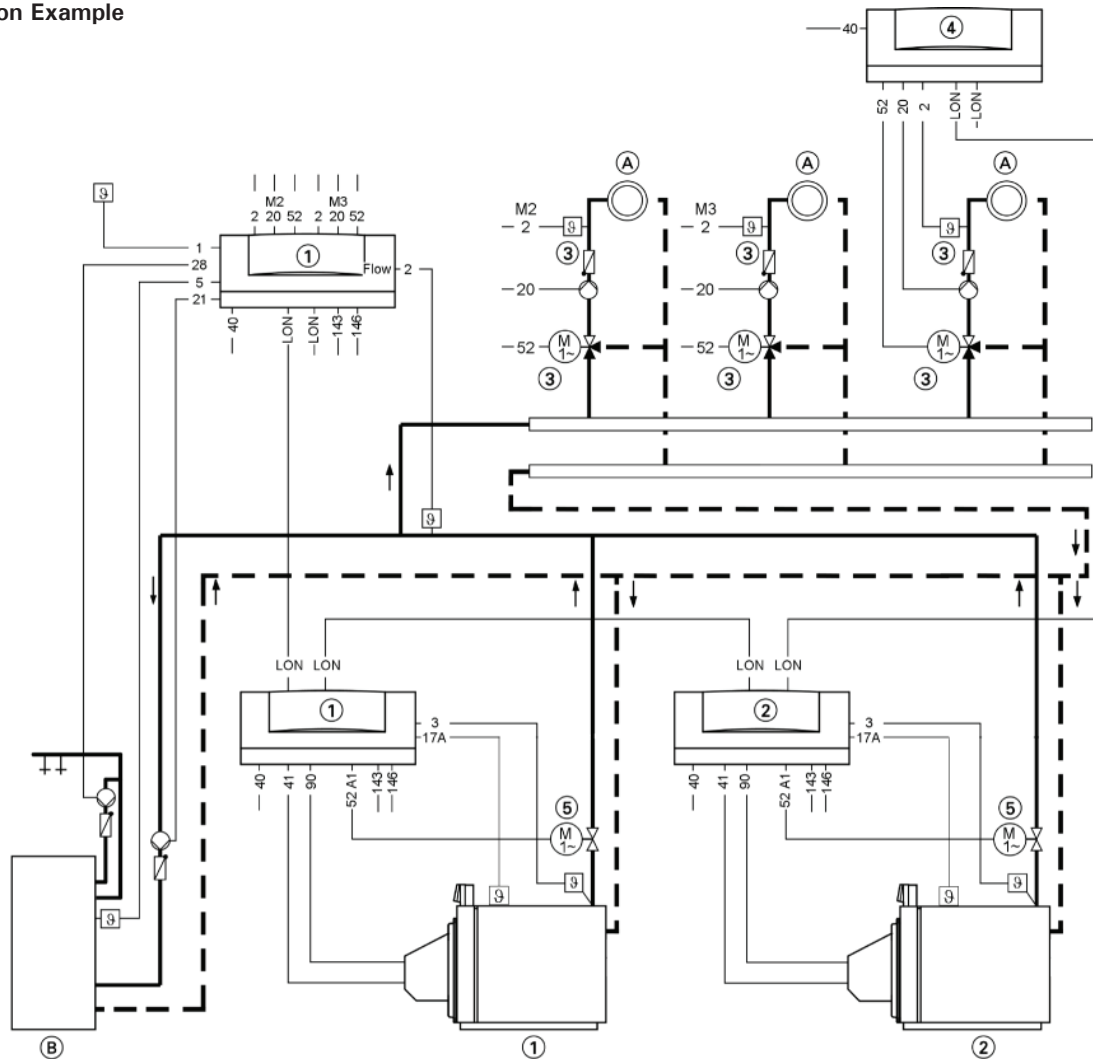
The heating circuit pumps M2 and M3 are switched OFF and the mixing valves M2 and M3 are closed, subject to absolute priority being enabled, if the heating circuits are regulated via the Vitotronic.

Heating operation

Depending on the control unit used, the flow temperature of heating circuits can be operated in modulating mode, subject to the outside temperature. The boiler water temperature is regulated 8K (14.4° F) higher than the set-point.

Multi-Boiler System, Vitorond 200, VD2A with Therm-Control *(continued)*

Installation Example



Legend

LON LON connection (available connections with terminator)

- (A) Heating circuit with mixing valves
- (B) DHW tank

Plug

- [1] Outdoor temperature sensor (only for Vitocontrol-S MW1/Vitotronic 300-K, MW1B)
- [2] Flow Flow temperature sensor, common heating flow (only for Vitocontrol-S MW1/Vitotronic 300-K, MW1B)
- [2]M2 Flow temperature sensor, mixing valve (only for Vitocontrol-S MW1/Vitotronic 300-K, MW1B)
- [2]M3 Flow temperature sensor, mixing valve (only for Vitocontrol-S MW1/Vitotronic 300-K, MW1B)
- [2] Flow temperature sensor Vitotronic 200-H
- [3] Boiler water temperature sensor
- [5] DHW tank temp. sensor (only for Vitocontrol-S MW1 /Vitotronic 300-K, MW1B)
- [17]A Therm-Control temperature sensor
- [20]M2 Heating circuit pump, mixing valve (only for Vitocontrol-S MW1/Vitotronic 300-K, MW1B)

- [20]M3 Heating circuit pump, mixing valve (only for Vitocontrol-S MW1/Vitotronic 300-K, MW1B)
- [20] Heating circuit pump Vitotronic 200-H
- [28] DHW circulation pump (only for Vitocontrol-S MW1/Vitotronic 300-K, MW1B)
- [40] Power supply, 120 VAC 60 Hz
Install the main isolator in accordance with regulations
- [41] Burner (stage 1)
- [52]A1 Motorized butterfly valve
- [52]M2 Mixing valve motor (only for Vitocontrol-S MW1 /Vitotronic 300-K, MW1B)
- [52]M3 Mixing valve motor (only for Vitocontrol-S MW1 /Vitotronic 300-K, MW1B)
- [52]M3 Mixing valve motor, Vitotronic 200-H
- [90] Burner (burner stage 2 / mod.)
- [143]/[146] External connections



Please refer to the control manuals Vitotronic 100, GC1/GC1B and Vitotronic Vitocontrol-S MW1/300-K MW1B.

System Design Considerations

Burner calibration

With 2-stage and fully modulating burners, ensure that the chimney is compatible with the lower flue gas temperatures associated with partial load conditions set on the burner.

WARNING

When installing or insulating (overhead) piping or venting, do not stand on top panel of boiler. Advise other trades accordingly!



Never operate boiler without an installed venting system which safely vents all products of combustion to the outdoors.

The vent system must comply with all applicable local and/or national codes.

Vitorond 200, VD2A boilers are Category I and III boilers as defined in ANSI Z21.13 when used with natural gas and LP. Venting systems shall be sized and constructed in accordance with approved engineering methods (ASHRAE, HVAC Systems and Equipment Handbook, Chapter 31 "Chimney, Gas Vent, and Fireplace Systems") including the chimney and boiler manufacturer's instructions.

In Canada

For gas-fired boilers install venting system in accordance with all applicable local codes.

In the absence of local codes, follow national codes CAN/CSA B149.1 or .2 or latest edition.

For oil-fired boilers follow CSA B-139 or latest edition.

In U.S.A.

For gas-fired boilers connecting to gas vents or chimneys, vent installations shall be in accordance with Venting of Equipment of the National Fuel Gas Code, ANSI Z223.1 or applicable provisions of the local building codes.

For oil-fired boilers follow NFPA 31. Always use latest code editions.

Venting (option #1)

The Vitorond 200, VD2A boiler is approved as a Category I appliance and must be vented accordingly.

CAUTION

The Vitorond 200, VD2A boiler is not approved for side wall venting.

Chimney

For proper operation of the Vitorond 200, VD2A boiler, all products of combustion must be safely vented to the outdoors, while ensuring that flue gases do not cool prematurely.

It is critical that the chimney system be properly designed to handle the relatively cool flue gas temperatures produced by the Vitorond 200, VD2A boiler.

If the chimney system lacks sufficient insulation and/or the chimney diameter is too large, corrosive and damaging condensation will result due to flue gases cooling too quickly. If a calculated chimney diameter lies between two values, the larger diameter should be selected.

The chimney connection length between the boiler vent pipe collar and the chimney must be installed with insulation.

Vent pipe collar diameter does not automatically indicate vent/chimney size.

We recommend consulting a reputable chimney installer for advice in project-specific circumstances.

When installing the Vitorond 200, VD2A boiler, it is necessary to install a barometric draft regulator in the chimney/vent for proper operation of the boiler.

Install the barometric draft regulator within 5 to 7 ft. (1 ½ to 2 m) from the breeching outlet located at the rear of the boiler.

System Design Considerations *(continued)***Barometric draft regulator type**

For natural gas or propane applications, use a double-acting type.

For #2 fuel oil applications, use a single-acting type.

Barometric draft regulator diameter

The barometric draft regulator must be the same diameter opening as the chimney for which the vent is sized.

For example, a 14 in. chimney would require a 14 in. barometric draft regulator. Do not size the barometric draft regulator to the breeching outlet of the boiler, unless the chimney is also intended to be of that diameter.

IMPORTANT

The flue size outlet on the boiler does not automatically determine the horizontal breeching, or the actual chimney diameter.

The chimney size must be designed for the actual boiler model and its respective input.



Barometric draft regulator

Venting (option #2)

The Vitorond 200 boiler is a Category III positive pressure non-condensing boiler.

Each boiler must be vented individually.

The vent system must be properly designed and suitable materials must be selected. The chimney must be gas tight.

Use an AL29-4C® special stainless steel venting system (UL/ULC listed for Category III) for single-wall vertical venting of the Vitorond 200 boiler.

For more details on the positive pressure venting option, see the Viessmann installation instructions for the positive pressure venting system.

The following manufacturers may be contacted for suitable stainless steel chimneys:

ProTech Systems Inc.
www.protechinfo.com

Selkirk Canada Corporation
Web: www.selkirkchimney.com

Security Chimneys International Ltd.
Web: www.securitychimneys.com

System Design Considerations *(continued)*

Combustion air supply

The boiler must not be located in areas or rooms where chemicals containing chlorine, bromine, fluorine, or other corrosive chemicals are stored. Examples include refrigerants, bleach, paint, paint thinner, hair spray, cleaning solvents, water softener salt, etc. The combustion air must not be contaminated with any amount of the above mentioned chemicals.

Boiler should never be installed in areas where excessive dust, high humidity, or risk of frost exist. Ensure adequate ventilation and supply of fresh combustion air.

Consult Viessmann with uncertainties in regard to a suitable boiler installation location.

This boiler/burner unit needs clean fresh air for safe operation. Provisions for combustion and ventilation air must be made in accordance with applicable local codes. 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 section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code ANSI Z223.1.

For oil burning installations use CSA B-139 for oil installations in Canada and NFPA 31 Standard for the Installation of Oil Burning Equipment in the US. Always use latest editions of codes.

Whenever possible, install boiler near an outside wall so that it is easy to duct fresh air directly to the boiler area. Refer to national codes for duct sizing and allowable lengths. Round ducts can be used.

The boiler location must never be under negative pressure. Exhaust fans, attic fans, or dryer fans may cause air to be exhausted at a rate higher than air can enter the structure for safe combustion.

System layout

The boiler water temperature limit is factory set to 167° F (75° C).

The boiler water temperature limit can be increased by altering the adjustable high limit to increase the supply water temperature.

To minimize piping losses of the system, however, Viessmann recommends that the radiation and domestic hot water production in the system be designed for a 158° F (70° C) boiler supply water temperature.

Water quality and freeze protection

Treatment for boiler feed water should be considered in areas of known problems, such as where a high mineral content and hardness exist. In areas where freezing might occur, an antifreeze may be added to the system water to protect the system.

Please adhere to the specifications given by the antifreeze manufacturer. Do not use automotive silicate-based antifreeze. Please observe that an antifreeze/water mixture may require a backflow preventer within the automatic water feed and influence components such as diaphragm expansion tanks, radiation, etc.

A 40% antifreeze content will provide freeze-up protection to -10° F (-23° C). Do not exceed 50% antifreeze mix ratio and do not use antifreeze other than specifically made for hot water heating systems. System also may contain components which might be negatively affected by antifreeze. Check total system frequently when filled with antifreeze.

Follow the instructions of antifreeze manufacturer.

Oxygen diffusion barrier underfloor tubing

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

Viessmann recommends the use of underfloor plastic tubing with an oxygen diffusion barrier.

Factory pre-wired components

Custom factory pre-wiring by Viessmann ensures optimal functionality, compliance with regional requirements, and ease of installation in the field. Pricing provided by Viessmann includes all necessary hardware items such as junction panel, burner power supply, boiler door safety switch (where necessary), and all essential pressure switches, as well as interconnection with conduit between control and burner.

Electrical drawings provided upon product delivery.

Boiler/Burner start-up

Vitorond 200, VD2A boilers with Weishaupt burners require start-up by Viessmann.

Please inquire to obtain details regarding the necessary prerequisites of boiler/burner start-up procedures.

IMPORTANT

To minimize delivery lead times, please ensure that critical technical information is provided at time of order. Viessmann will not process an order without site-specific information regarding available voltage and gas pressure. In addition Viessmann recommends that gas pressure information be provided in writing by the local gas utility.

System Design Considerations *(continued)***Sound attenuation**

Please consult a professional engineer who is specialized in noise attenuation for advice.

The burner/boiler systems, circulation pumps and other auxiliary equipment used in heating systems generate noise. This noise is transferred from the boiler room via floorboards, ceiling and walls to neighboring rooms and via the flue gas system as well as the ventilation air and exhaust air apertures into other rooms and into the open, where they may cause a nuisance.

To avoid this from happening, additional protective measures may be required which should be considered at the design stage. Subsequent measures to reduce noise nuisance frequently require extensive effort and expenditure.

Airborne noise attenuation

Frequently, modern boilers are equipped with silencer hoods or sound insulated ventilation air inlet housings. Additional silencer hoods may be used where more stringent anti-noise measures are required. These measures may be implemented later with minimal effort.

Silencer hoods are offered (usually by the burner manufacturer) for various levels of noise attenuation and are generally designed and built in accordance with specific system conditions (boiler type, fuel supply, building characteristics).

For larger systems, it may be necessary to route the ventilation air through a sound-insulated channel, in order to avoid noise nuisance outside the building.

Flue gas silencers are generally only required where higher noise protection measures are called for. Whether or not a flue gas silencer is required can be difficult to predict, because of the complexity of the creation and propagation of flame noise, the interaction between the burner, boiler and the flue gas system as well as the operating mode (flue gas system operating with positive or negative pressure).

It is advisable, therefore, to assess the noise emission into the neighborhood and to consider the sound pressure level measured at the flue gas system outlet. It should be considered at the planning stage whether silencers might become necessary later.

In planning for its possible use, it is important that sufficient space for the flue gas silencer is available behind the boiler.

Good engineering practice mandates that the exhaust pressure drop of the silencer be included in the vent size calculation.

Anti-vibration measures

Anti-vibration supports can be field supplied as an economical and effective solution to combat noise generated.

When sizing such supports, take the entire operating weight of the boiler system and, when using longitudinal anti-vibration brackets, the condition of the supporting surface into consideration.

Effective anti-vibration measures are particularly important when installing boilers into an attic. Compensators may be used to physically separate the combustion equipment from the building.

These should be installed into the boiler flow, return and safety pipe and as near as possible to the boiler.

Also insulate any braces or hanging arrangements, if installed, against sound/ vibration transmission to the building.

Seismic restrainer

Viessmann offers an engineered seismic restraining kit for compliance with local seismic requirements for buildings and structures. Please contact your local Viessmann Sales Representative for more details.

Warranty

Our warranty does not cover damages resulting from the following:

- Corrosion caused by flue gas condensation due to low boiler water and/or return water temperatures.
- Operation with contaminated fill and supplementary feed water.

Burner Alternatives

Weishaupt Burners - Linkageless

Boiler model	VD2A-	125	160	195	230	270
No. 2 oil-fired 2-stage	Model	WL20		WL30		
Natural gas-fired 2-stage	Model	WG20 - LN		WG30 - LN		
Natural gas-fired fully modulating	Model	WG20 - LN		WG30 - LN		
Propane gas-fired 2-stage	Model	WG20 - LN		WG30 - LN		
Propane gas-fired fully modulating	Model	WG20 - LN		WG30 - LN		

Riello Burners

Boiler model	VD2A-	125	160	195	230	270
No. 2 oil-fired 1-stage	Model	F15		F20	n.a.	
No. 2 oil-fired 2-stage	Model	n.a.		RL28/2		
No. 2 oil-fired VD2A fully modulating	Model	n.a.		RL28/M		
Natural gas-fired 1-stage with assembled gas train	Model	G750		n.a.		
Propane gas-fired 1-stage with assembled gas train	Model	G750		n.a.		
Natural gas-fired 2-stage with assembled gas train	Model	n.a.		G900	n.a.	
Propane gas-fired 2-stage with assembled gas train	Model	n.a.		G900	n.a.	
Natural gas-fired fully modulating	Model	n.a.		RS28/M		
Propane gas-fired fully modulating	Model	n.a.			RS28/M	
Combination 2-stage NG, 2-stage oil	Model	n.a.			RLS28/M	
Natural gas-fired fully modulating low NO _x	Model	n.a.		RS45/M LN		

Note: The burner is selected based on the project elevation less than 2000 ft. (610 m) ASL. Contact your local Viessmann Technical Representative for boiler/burner combinations above 2000 ft (610 m).

