

Technical Data Manual

Model Nos. and pricing: see Price List

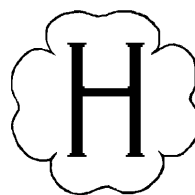


Vitodens 100-W, WB1A
(with preinstalled coaxial vent pipe adaptor)

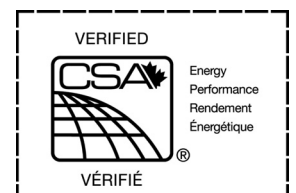
Vitodens 100-W

WB1A Series

Natural Gas-Fired Wall-Mounted Condensing Boiler with modulating stainless steel natural gas cylinder burner and stainless steel Inox-Radial heat exchanger for room air independent operation (using a direct vent system) and room air dependent operation



⚠ For Natural Gas only!

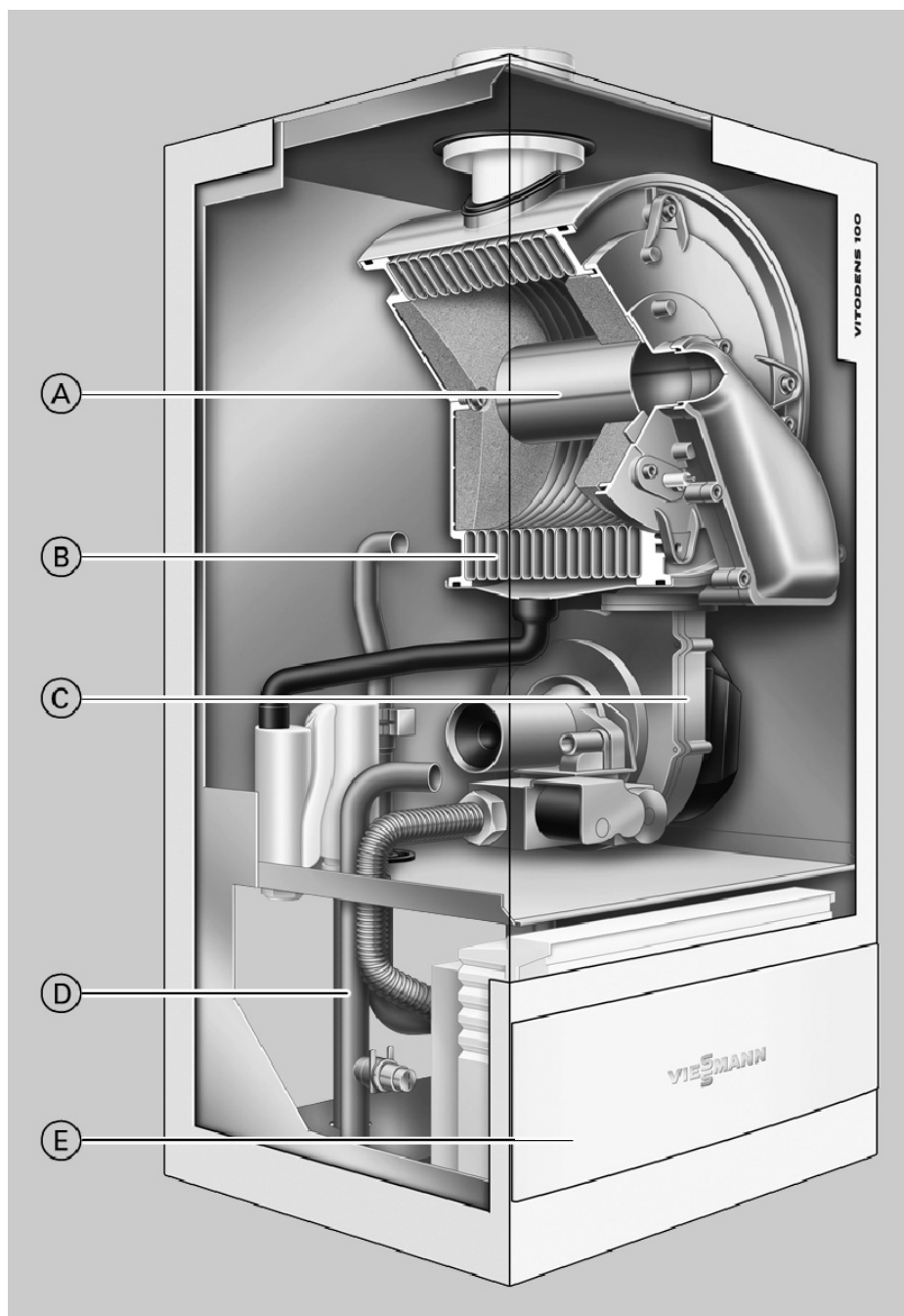


VITODENS 100-W

Equipped with a Viessmann stainless steel heat exchanger for lasting performance and reliability and a modulating natural gas cylinder burner, the Vitodens 100-W wall-mounted condensing boiler is the perfect combination of value, quality and Viessmann technology.

The benefits at a glance:

- **Outstanding efficiency** of 95.1% A.F.U.E. on all models.
- **Lasting performance** with Viessmann-made SA240 316Ti stainless steel Inox-Radial heat exchanger constructed to ASME Section IV and CSA B51.
- **Low-emission combustion** with fully-modulating natural gas stainless steel cylinder burner. Factory calibration eliminates adjustments in the field.
 - < 29 ppm NO_x (at 3% O₂)
 - < 40 ppm CO (at 3% O₂)
- **Control variety** Integrated boiler control interfaces with any level of external control - from room thermostat to outdoor reset and more.
- **Compact, lightweight design** and zero clearance to combustibles make it a great choice for limited-space installations.
- **Extremely quiet operation;** quieter than most refrigerators.
- **Easy installation, service and maintenance** with all pipe connections located at the bottom and serviceable components easily accessible from the front.
- **Multiple venting options**
 - Horizontal or vertical sealed combustion coaxial vent system (factory supplied).
 - Horizontal, vertical or hybrid sealed combustion double-pipe vent system (field supplied).
 - Horizontal or vertical single-wall vent system (field supplied).
- **Suitable for altitude levels** of up to 5000 ft. / 1500 m without deration.
- **Built-in automatic frost protection** allows boiler to be shut off for an extended period of time while protecting it against freeze-up.
- **Limited lifetime warranty** in residential applications.



Legend

- Ⓐ Stainless steel cylinder burner
- Ⓑ Inox-Radial stainless steel heat exchanger
- Ⓒ Burner blower
- Ⓓ Natural gas and hydronic connections
- Ⓔ Boiler control

Product may not look exactly as illustrated.

Vitodens 100-W

Technical Data

Boiler Model		Model No.	Standard heating boiler	
			WB1A 8-24	WB1A 8-30
Natural gas				
CSA input	MBH		29-80	29-100
	kW		8.5-23.4	8.5-29.3
CSA output/DOE ^{*1}	MBH		26-72	26-90
heating capacity	kW		7.6-21	7.6-26.4
Net I = B = R rating ^{*2}	MBH		63	78
Heat exchanger surface area	ft. ²		9.26	9.26
	m ²		0.86	0.86
Min. gas supply pressure				
Natural gas	"w.c.		4	4
Max. gas supply pressure^{*3}				
Natural gas	"w.c.		14	14
A.F.U.E.	%		95.1	95.1
Weight	lbs		95	95
	kg		43	43
Boiler water content	USG		0.82	0.82
	ltr		3.1	3.1
Boiler max. flow rate ^{*4}	GPM		6.2	6.2
	ltr/h		1400	1400
Max. operating pressure at 210 °F/99 °C	psig		45	45
	bar		3	3
Boiler water temperature				
– Adjustable high limit (AHL) range				
space heating	°F/		68 to 176/	
(steady state)	°C		20 to 80	
DHW production (set point)	°F/		172/	
	°C		78	
– Fixed high limit (FHL)				
	°F/°C		210/99	
Boiler connections				
Boiler heating supply and return	NPTM (male) "		¾	¾
Pressure relief valve	NPTF (female) "		¾	¾
Drain valve	(male thread)		¾	¾

^{*1} Output based on 140°F / 60°C, 120 °F / 49°C system supply/return temperature.

^{*2} Net I = B = R 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 "Typical System Flow Rates" on page 9 in this manual.

		Standard heating boiler	
Boiler Model	Model No.	WB1A 8-24	WB1A 8-30
Dimensions			
Overall depth	inches	13.4	13.4
	mm	340	340
Overall width	inches	15.7	15.7
	mm	400	400
Overall height	inches	27.6	27.6
	mm	700	700
Gas supply connection	NPTF "	¾	¾
Flue gas *5			
Temperature (at boiler return temperature of 86 °F/30 °C)			
– at rated full load	°F/°C	127/53	131/55
– at rated partial load	°F/°C	90/32	90/32
Temperature (at boiler return temperature of 140 °F/60 °C)			
	°F/°C	167/75	172/78
Flue gas value			
Mass flow rate (of flue gas)			
– at rated full load	lbs/h	79.2	100.1
	kg/h	36.0	45.5
– at rated partial load	lbs/h	33.0	33.0
	kg/h	15.0	15.0
Available draught	Pa	100	100
	mbar	1.0	1.0
Average condensate flow rate *6			
with natural gas			
– T _S /T _R = 122/86°F/50/30 °C	USG/day	1.8-2.1	2.1-2.4
	ltr/day	7-8	8-9
Condensate connection *7			
	hose		
	nozzle		
	Ø in	1	1
Boiler flue gas connection *8			
	Ø in/mm	2 ³ / ₈ /60	2 ³ / ₈ /60
Combustion air supply connection *8			
	outer Ø in/mm	4/100	4/100

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

*6 Based on typical boiler cycles, including partial load conditions.

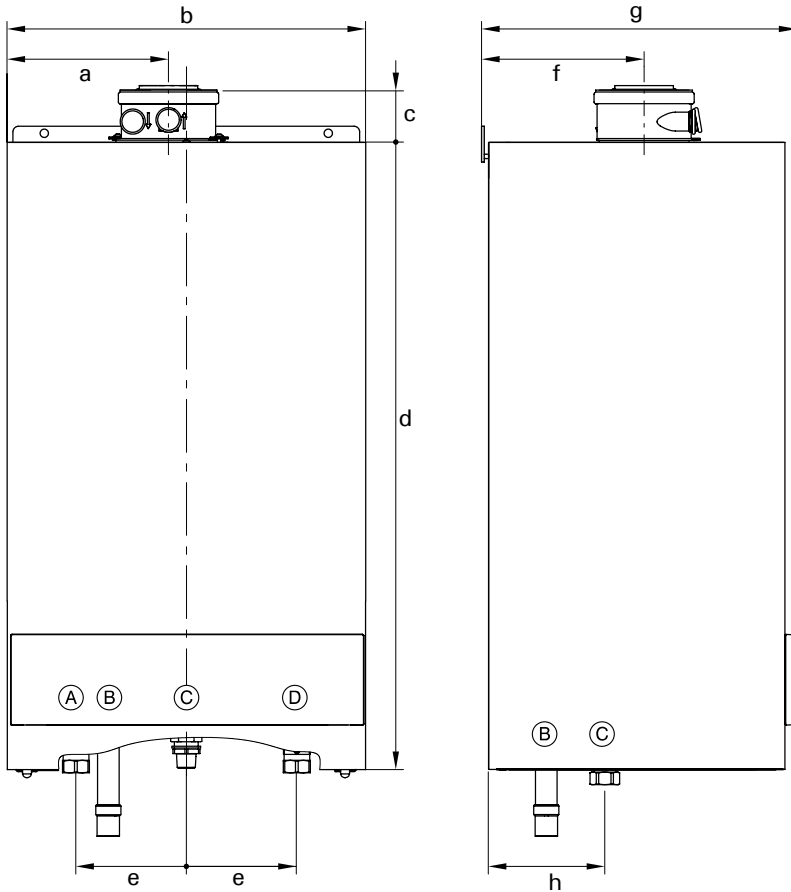
*7 Requires 1"/25 mm tubing. See Vitodens 100-W Installation Instructions for details.

*8 For an overview of venting options refer to the appendix starting on page 19. For detailed information refer to the Vitodens Venting System Installation Instructions (PN 5285 268).

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

Vitodens 100-W

Vitodens 100-W, WB1A 24/30 without piping connections



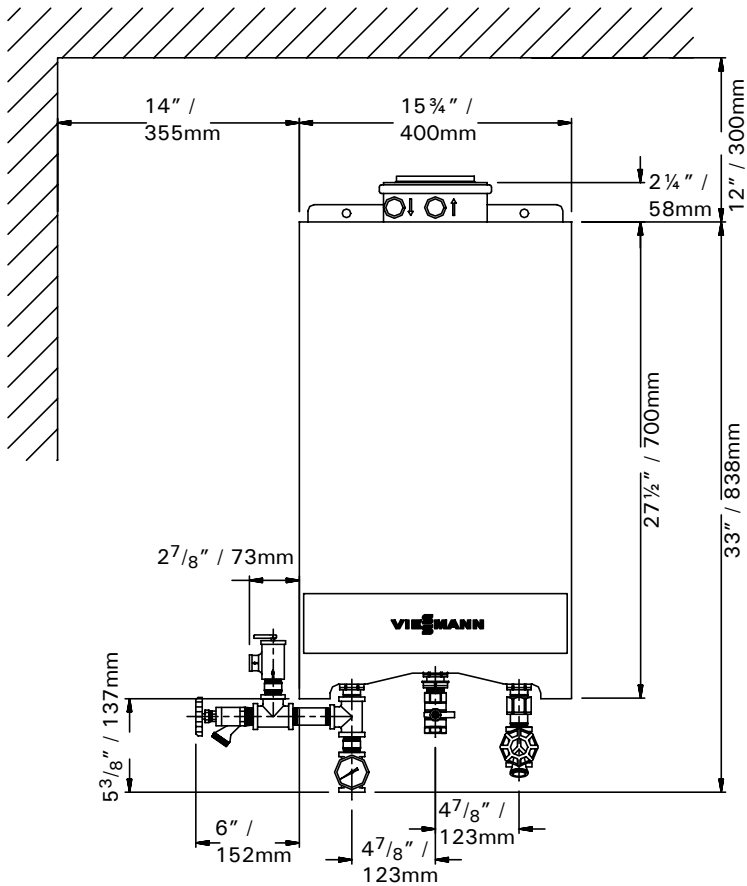
Connections Vitodens 100-W,
WB1A 8-24, 8-30

Vitodens 100-W, WB1A
side view

Legend

- Ⓐ Boiler water supply, NPT $\frac{3}{4}$ "
 - Ⓑ Condensate drain, plastic hose
 $\varnothing 0.87$ " / 22mm
 - Ⓒ Gas connection, NPT $\frac{3}{4}$ "
 - Ⓓ Boiler water return, NPT $\frac{3}{4}$ "
- a 7" / 180 mm
b 15 $\frac{3}{4}$ " / 400 mm
c 2 $\frac{1}{4}$ " / 58 mm
d 27 $\frac{9}{16}$ " / 700 mm
e 4 $\frac{7}{8}$ " / 123 mm
f 7 $\frac{1}{4}$ " / 183 mm
g 13 $\frac{3}{8}$ " / 340 mm
h 5" / 125 mm

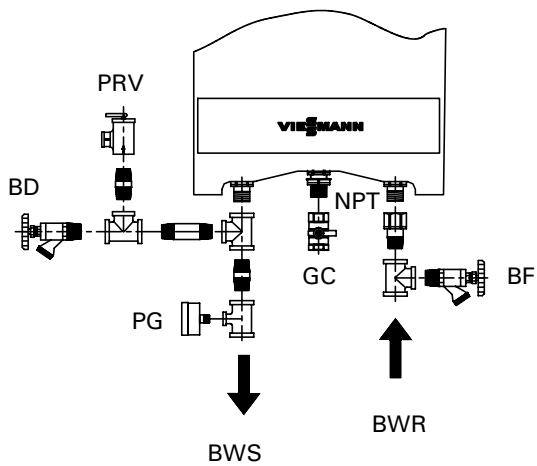
Vitodens 100-W, WB1A 24/30
with piping connections



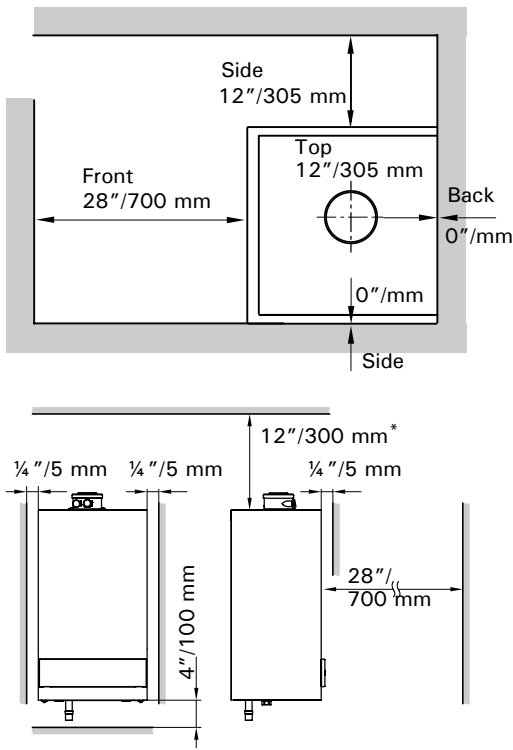
Piping connections for Vitodens
100-W, WB1A 8-24 and 8-30 (factory
supplied)

Legend

- BWR Boiler water return, 3/4"
- BWS Boiler water supply, 3/4"
- BD Boiler drain
- BF Boiler fill
- GC Gas connection, 3/4" NPTM
- PRV Pressure relief valve
- NPT National Pipe Thread
- PG Pressure gauge



Recommended Minimum Service Clearances



Minimum Clearances to Combustibles

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

AL = Alcove

CL = Closet

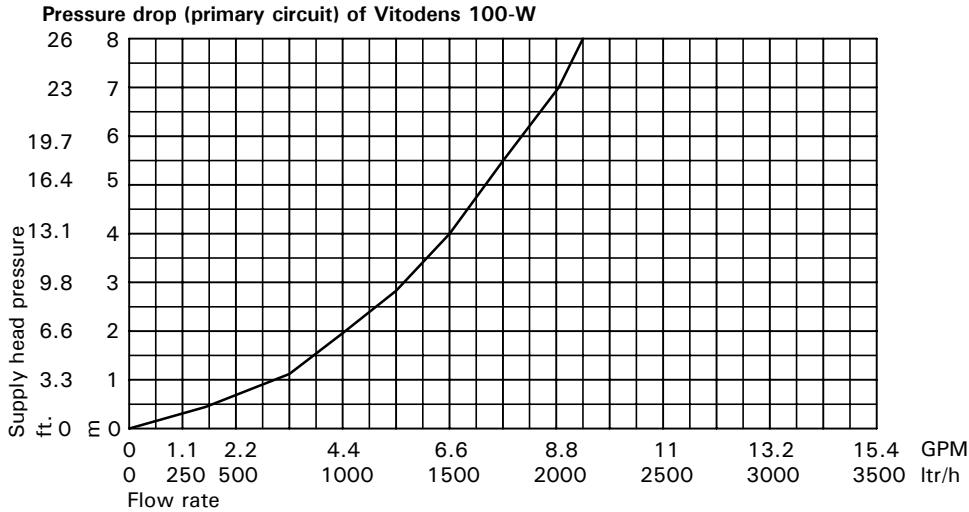
*1 Refer to the Installation Instructions of the Vitodens Venting System for details.

Note:

The Vitodens 100-W boiler has passed the zero inches vent clearance to combustibles testing requirements provided by the boiler Harmonized Standard ANSI Z21.13. CSA 4.9.2005 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 gas vent material. The zero inches vent clearance to combustibles for the Vitodens 100-W boiler supercedes the clearance to combustibles listing that appears on the special venting system label.

Waterside Flow (primary circuit)

The Vitodens 100-W is designed only for closed loop, forced circulation hot water heating systems.



Pressure drop for model WB1A 8-24, 8-30

Typical System Flow Rates

Model	WB1A	8-24	8-30
Δ t for NG			
Output (NG) Btu/h		72 000	90 000
20 °F rise (GPM)		7.2	9.0
25 °F rise (GPM)		5.8	7.2
30 °F rise (GPM)		4.8	6.0
35 °F rise (GPM)		4.1	5.1
40 °F rise (GPM)		3.6	4.5

A low-loss header **must** be used when the **system** flow rate exceeds the maximum or falls below the minimum flow rate of the Vitodens 100-W boiler. An alternative method may be used, such as primary secondary piping using closely spaced tees. A low-loss header offers additional benefits not provided by a pair of closely spaced tees. Viessmann strongly recommends and prefers the use of a low-loss header over closely spaced tees.

Please see page 13 for details.

Use standard friction loss method for pipe sizing.

Observe boiler maximum and minimum flow rate limitations. If system flow rate exceeds boiler maximum flow rate (as stated on page 13) or if system flow rate is unknown, Viessmann strongly recommends the installation of a low-loss header. See page 13 for low-loss header information.

Heating Circuit Pumps

Recommended heating pumps with Vitodens 100-W, WB1A 824, 8-30:

- Grundfos UP 26-64F
 - Grundfos 15-58 (3-speed)
 - Taco 0010
 - Wilo Star 21
- or equivalent

IMPORTANT

Pump selection must be based on accurate system flow and pressure drop calculations (incl. DHW sizing).

Refer to the graph above for the proper waterside boiler friction loss calculations.

DHW Production/Wall Mounting

Domestic Hot Water Production via DHW Storage Tank

Vitodens 100-W boilers can be used in conjunction with the stand-alone DHW storage tanks offered by Viessmann (a separate DHW controller should be field supplied).

All Viessmann DHW storage tanks sold in North America are available in "Vitosilver" finish only.

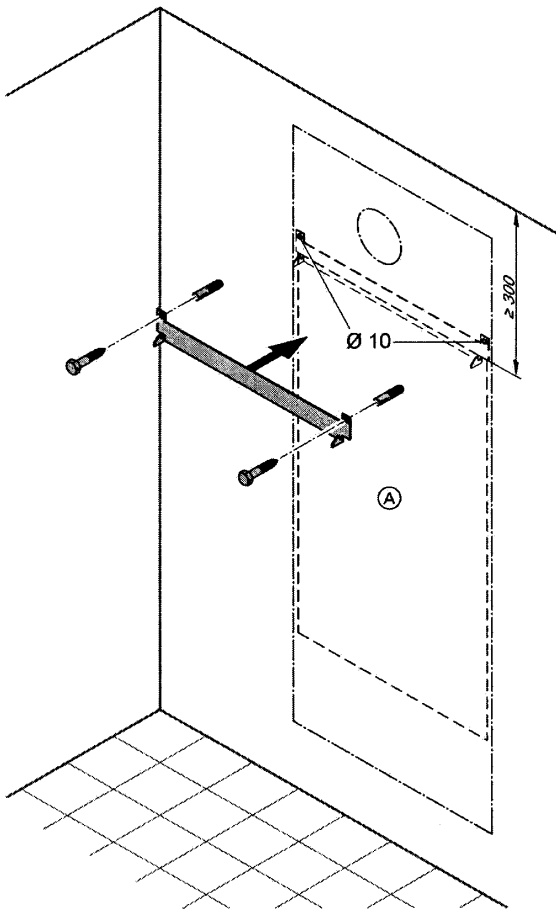
Size and select the DHW storage tank based on the forecast DHW consumption of the building in question.

For further technical information on DHW storage tanks, see the Vitocell-V Technical Data Manuals.

Wall Mounting Information

The Vitodens 100-W (model WB1A 8-24 and 8-30) comes with a template, which allows you to easily mark the location of the screws for the mounting bracket and the location of the flue gas pipe on the wall (Viessmann coaxial PPS vent system only).

The connection to the heating circuits (installation fittings are supplied in the Installation Fittings package supplied with the boiler) must be made on site.



Legend

Ⓐ Mounting template

Condensate Connection

Install the condensate drain pipe (Ø 7/8" / 22mm) with a suitable gradient (min. 2.5%). Discharge condensate from the boiler into the drainage system, either directly or (if required) via a neutralization unit (accessory).

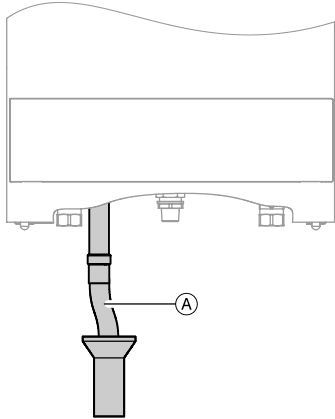
The condensate drain of the Vitodens 100-W boiler is equipped with a built-in siphon trap in order to keep flue gases from being discharged via the condensate drain.

IMPORTANT

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

Condensate Connection for Vitodens 100-W

■ model WB1A 8-24, 8-30



(A) Discharge tubing

Condensate Drainage and Condensate Neutralization

The condensate formed both in the condensing boiler and in the flue gas pipe must be discharged into the public sewage system in accordance with all applicable local regulations.

The condensate produced by a gas-fired heating system has a pH value between 3 and 4.

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

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

Contact Viessmann to order a neutralization unit for the Vitodens 100-W boiler. See Viessmann Price List for order information.

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

If the condensate outlet of the Vitodens 100-W boiler is lower than the drain, a condensate pump must be used.

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

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

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

The following table shows the concentration of (effluent) substances (e.g. heavy metals) contained in the waste water from the Vitodens 100-W condensing boiler.

Condensate (effluent) substances	Values measured in mg/ltr	
	Vitodens 100	
Lead	<	0.01
Cadmium	<	0.005
Chromium	<	0.01
Copper	<	0.01
Nickel	<	0.01
Zinc	<	0.05
Tin	<	0.05

Vitodens 100-W Venting Options

For an overview of venting options refer to the appendix starting on page 19. For detailed information refer to the Vitodens Venting System Installation Instructions (PN 5285 268).

Electrical Connection

All electrical connections are made to the boiler's integrated power pump module (120 VAC/60 Hz). Use disconnect means and power service switch as per local code requirements.

Control Unit

Function and construction

The control is integrated into the Vitodens 100-W boiler.

- Integrated diagnostic system
- For room temperature-dependent operation, an external control or a room temperature thermostat can be connected
- To control DHW temperature, a separate DHW controller may be connected
- External heat demand

The control unit consists of:

- LCD Display
- Selector dial for boiler water temperature adjustment
- Temperature adjustable high limit
- Boiler temperature sensor
- Burner fault display
- Burner fault reset
- Pressure gage
- Fuse

Boiler temperature sensor

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

Frost protection

Frost protection is continuously active. The burner is switched ON when the boiler water temperature reaches 41 °F / 5 °C and is switched OFF again when the boiler water temperature reaches at least 59 °F / 15 °C (but not more than 68 °F / 20 °C).



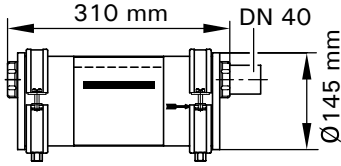
For details on the control, please refer to the Vitodens 100-W Operating Instructions.

Accessories for the Vitodens 100-W

Neutralization Unit for Single-Boiler Applications

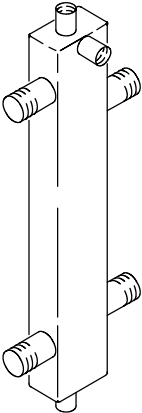
with neutralizing granulate

for Vitodens 100-W, WB1A 8-24, 8-30
Part No. 7134 231



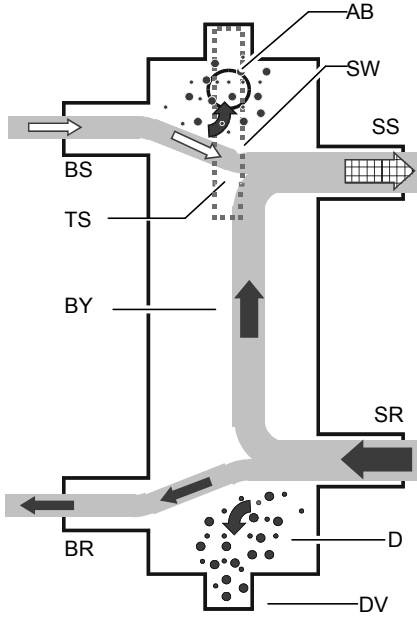
Low-Loss Header

-Type 80/50
Part No. 7134 791
(max. flow rate 17.6 GPM / 4 m³/h)
-Type 120/80
Part No. 7134 792
(max. flow rate 35.2 GPM / 8 m³/h)

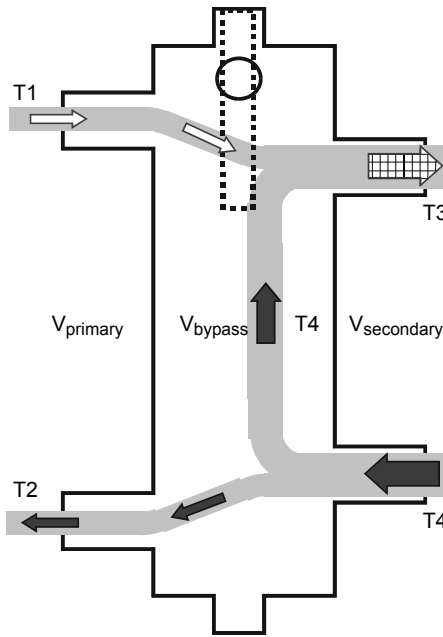


A low-loss header offers additional benefits not provided by a pair of closely spaced tees. Viessmann strongly recommends and prefers the use of a low-loss header over closely spaced tees. When used in conjunction with the Vitodens 100-W boiler, the low-loss header acts as hydraulic break, decoupling boiler and system circuits from each other (no sensor required). It is recommended to use the low-loss header in applications in which the total system flow rate exceeds the maximum or falls below the minimum flow rate of the Vitodens 100-W boiler.

For maximum boiler flow rates, see the table on page 9 in this manual. Viessmann strongly recommends the use of a low-loss header in cases where the system head and flow rates are unknown. In addition, the low-loss header helps eliminate air and debris [D] from the heating system. See figures on the right for an illustration of the principle of operation.



Low-loss header design (Type 80/50 or 120/80)



Principle of Operation

The low-loss header is available in the following sizes. Select the size based on the maximum system flow rate of your application.

Model No.	Max. system flow rate
Type 80/50	17.6 GPM / 4 m ³ /h
Type 120/80	35.2 GPM / 8 m ³ /h

*1 Product does not look exactly as illustrated.

Legend

- AB Air Bleed
- BR Boiler Return
- BS Boiler Supply
- BY Bypass (with laminar flow)
- D Debris and/or air
- DV Drain Valve
- SR System Return
- SS System Supply
- TS Viessmann Temperature Sensor (not used)
- SW Sensor Well

- T1 Boiler supply temperature
- T2 Boiler return temperature
- T3 System supply temperature
- T4 System return temperature
- V_{primary} Boiler circuit flow rate
- V_{secondary} Heating circuit flow rate
- V_{bypass} Bypass flow rate
- Q_{primary} Heat supplied by boiler
- Q_{secondary} Heat consumed by system

$V_{primary} < V_{secondary}$
 $T1 > T3$
 $T2 = T4$
 $Q_{primary} = Q_{secondary}$
 $T1 \leq 176^{\circ}F / 80^{\circ}C$
 $V_{secondary} = V_{primary} + V_{bypass}$

IMPORTANT

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

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

Standard Equipment

The Vitodens 100-W natural gas-fired condensing boiler with Inox-Radial heat exchanger surfaces, modulating stainless steel cylinder gas burner for natural gas c/w

- pressure gage
- installation fittings with 30 psig pressure relief valve, air vent and pressure gauge
- two fill/drain valves
- all mounting hardware

- The boiler comes fully piped and prewired.
- **Venting material (coaxial) is to be supplied by Viessmann only. Side wall vent installations must include Viessmann protective screen!**

Wall mounting componentry

The following wall mounting components are supplied with the Vitodens 100-W boiler:

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

How the Vitodens 100-W boiler operates...

The Vitodens 100-W boiler uses a premix combustion system, which is designed to deliver a certain air-gas mixture to the burner for complete combustion. The gas is injected upstream of the blower. The burner and heat exchanger are part of a forced-draft design. The benefits of forced-draft systems are lower component temperatures, direct air-fuel connection (premix) for improved mixing, and longer service life of the boiler due to mild to moderate ambient conditions.

The cylinder burner, blower and the combination gas valve are factory calibrated and pre-adjusted. A pneumatic link between combustion air and gas flows guarantees optimal boiler performance at all firing rates. Blower speed is automatically increased or decreased based on heat demand, thereby regulating the amount of combustion air drawn. The pneumatic link between air and gas introduces the required amount of gas for optimal combustion to meet the current heat demand, based on a linear relationship between ΔP air and ΔP gas.

Installation Examples

IMPORTANT

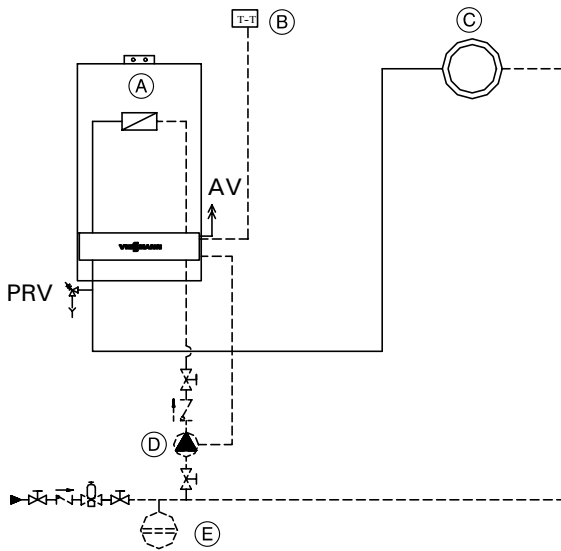
The examples on the following pages depict possible piping layouts of the Vitodens 100-W boiler.

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.

System Layout 1

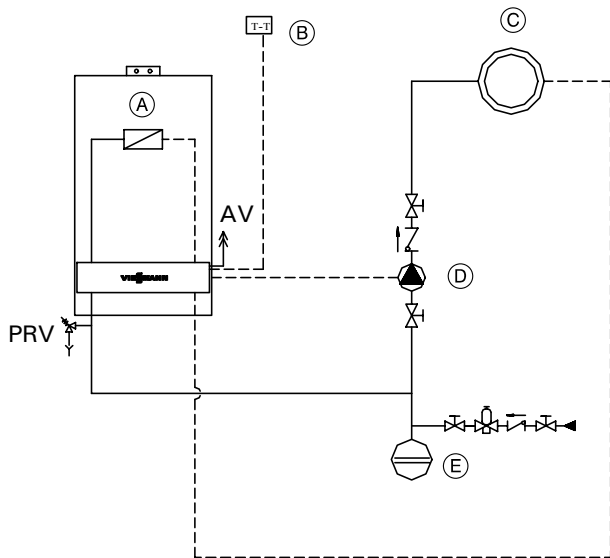
Vitodens 100-W, WB1A 8-24, 8-30 with...
 – one heating circuit



Legend

- AV Air vent
- PRV Pressure relief valve
- (A) Vitodens 100-W
- (B) Room thermostat
- (C) Heating circuit
- (D) Heating circuit pump (field supplied)
- (E) Expansion tank

System Layout 1 - Alternate Option



Please note!
 The use of a low-loss header is recommended if the water flow rate is less than 1.7 GPM / 400 ltr/h or more than 6.2 GPM / 1400 ltr/h.
 The low-loss header is available as accessory part.

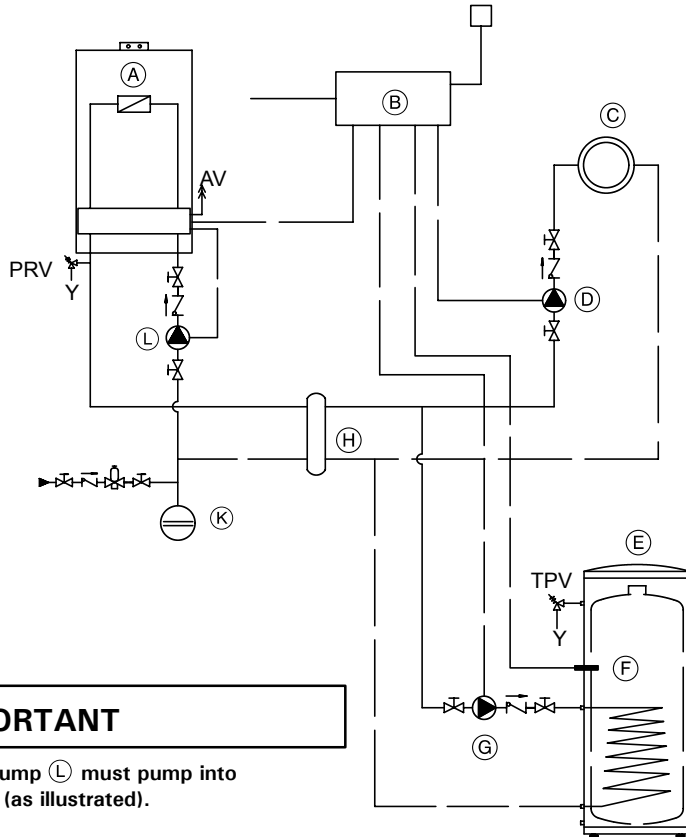
Model No.	Max. flow rate (GPM/ltr/h)
Vitodens 100, WB1A 8-24	6.2/1400
WB1A 8-30	6.2/1400

Installation Examples

System Layout 2

Vitodens 100-W, WB1A 8-24, 8-30 with...

- DHW storage tank
- low-loss header
- one heating circuit



AV Air vent
 PRV Pressure relief valve
 TPV Temperature and pressure relief valve

- (A) Vitodens 100-W gas-fired condensing boiler
- (B) External boiler/DHW controller (field supplied)
- (C) Heating circuit
- (D) Heating circuit pump (field supplied)
- (E) DHW storage tank
- (F) DHW tank temperature aquastat or sensor
- (G) DHW circulating pump (field supplied)
- (H) Low-loss header
- (K) Expansion tank
- (L) Primary pump (boiler circuit, field supplied) *with low-loss header only*

IMPORTANT

Primary pump (L) must pump into the boiler (as illustrated).

Please note!

The use of a low-loss header is recommended if the water flow rate is **less** than 1.7 GPM / 400 ltr/h or **more** than 6.2 GPM / 1400 ltr/h.

The low-loss header is available as accessory part.

See page 13 in this manual for details on the low-loss header.

Model No.	Max. flow rate (GPM/ltr/h)
Vitodens 100-W,	
WB1A 8-24	6.2/1400
WB1A 8-30	6.2/1400

IMPORTANT

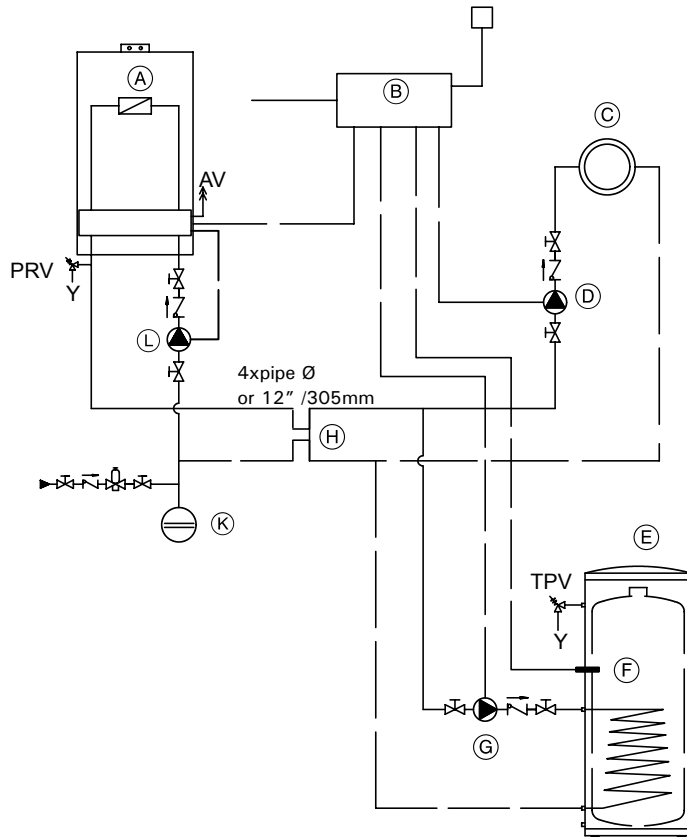
DHW supply and return piping between boiler DHW connections and the Viessmann DHW tank connections, shall be a minimum of 1" nominal pipe diameter (irrespective of the 3/4" DHW connection outlet sizes provided on the boiler and the DHW tank). This ensures that the head of the pump is fully utilized to 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 head to ensure sufficient water flow to the boiler heat exchanger. Failure to heed the above instructions may cause boiler short-cycling and inadequate DHW supply.

System Layout 3

Vitodens 100-W, WB1A 8-24, 8-30 with...

- DHW storage tank
- one heating circuit



AV Air vent
 PRV Pressure relief valve
 TPV Temperature and pressure relief valve

- (A) Vitodens 100-W gas-fired condensing boiler
- (B) External boiler/DHW controller (field supplied)
- (C) Heating circuit
- (D) Heating circuit pump (field supplied)
- (E) DHW storage tank
- (F) DHW tank temperature aquastat or sensor
- (G) DHW circulating pump (field supplied)
- (H) Closely spaced tees, 4xpipe Ø or 12" /305mm*
- (K) Expansion tank
- (L) Primary pump (boiler circuit, field supplied) *with low-loss header only*

*A low-loss header offers additional benefits not provided by a pair of closely spaced tees. Viessmann strongly recommends and prefers the use of a low-loss header over closely spaced tees.

Please see page 13 for details.

IMPORTANT

Primary pump (L) must pump into the boiler (as illustrated).

Please note!

The use of a low-loss header is recommended if the water flow rate is **less** than 1.7 GPM / 400 ltr/h or **more** than 6.2 GPM / 1400 ltr/h.

The low-loss header is available as accessory part.

See page 13 in this manual for details on the low-loss header.

Model No.	Max. flow rate (GPM/ltr/h)
Vitodens 100-W,	
WB1A 8-24	6.2/1400
WB1A 8-30	6.2/1400

IMPORTANT

DHW supply and return piping between boiler DHW connections and the Viessmann DHW tank connections, shall be a minimum of 1" nominal pipe diameter (irrespective of the 3/4" DHW connection outlet sizes provided on the boiler and the DHW tank). This ensures that the head of the 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 head to ensure sufficient water flow to the boiler heat exchanger. Failure to heed the above instructions may cause boiler short-cycling and inadequate DHW supply.

System Design Considerations

IN THE COMMONWEALTH OF MASSACHUSETTS...

-this product shall be installed by a licensed plumber or gas fitter.

-the flexible connector (if used) may not exceed 36".

-any level type shutoff used must be of tee handle type.

Boiler location

As a direct vent appliance, the Vitodens 100-W may be installed for room air independent operation (sealed combustion) **regardless** of size and ventilation method of the room in which it is located. The Vitodens 100-W may be installed, for example, in the main living area of a house, in non-ventilated utility rooms, cupboards, closets and alcoves with no clearance required from combustible materials, as well as in attics with a direct outlet for the flue gas/fresh air system. Follow all local and national codes.

Flue gas system

Viessmann coaxial PPS (Polypropylene) concentric flue gas/fresh air systems and two-pipe stainless steel/CPVC systems for room air independent operation (sealed combustion) and side wall venting are tested to ANSI Z21.13 - CSA 4.9 - 2005 standards and are certified together with the Vitodens 100-W boiler as a constructional unit. The Vitodens 100-W boiler may also be vented vertically or horizontally, using a metallic AL29-4C® special stainless steel, or non-metallic CPVC single-wall, room air dependent venting system (UL/ULC listed for category IV).

For a more detailed description of the direct vent and single-wall vent system, please refer to the Vitodens Venting System Installation Instructions.

Flue gas temperature protection

Viessmann coaxial PPS (Polypropylene) flue pipes used for the Vitodens 100-W are rated for max. flue gas temperatures of up to 248 °F/120 °C.

No flue gas temperature protection is required as the maximum permissible flue gas temperature will not be exceeded in any operating condition or in the event of malfunctioning.

Low water cut-off

A low water cut-off may be required by local codes. If the boiler is installed above the radiation level, a low water cut-off device of approved type must be installed in all instances. An approved low water cut-off device that meets government and local regulations must be provided by the heating contractor. Do not install an isolation valve between the boiler and the low water cut-off.

The Vitodens 100-W boiler has a built-in flow switch, which may be accepted by local codes in lieu of a low water cut-off.

System layout

- The max. boiler water temperature for ...
 - space heating is 176 °F/80 °C.
 - DHW production is 172 °F/78 °C.

To minimize distribution losses, Viessmann recommends that the heating and domestic hot water systems be based on a maximum boiler supply temperature of 158 °F/70 °C.

- Due to the low return temperatures required for gas condensing, avoid the use of mixing valves in the heating circuit whenever possible. If mixing valves are required, e.g. for multi-circuit systems or underfloor heating systems, only 3-way mixing valves may be used.

Do not use 4-way mixing valves in a system with condensing boilers.

Water connections

Vitodens 100-W boilers can be used in any fully pumped hot water heating system. Minimum system pressure is 0.8 bar/12 psig.

Chemical corrosion protection products

Corrosion does not typically occur in sealed heating systems which have been correctly installed and are correctly operated.

Many manufacturers of plastic pipes recommend the use of chemical additives. In this case, only commercially available corrosion protection products that have been approved for boilers with domestic hot water heating via single-wall heat exchangers (instantaneous plate heat exchangers or DHW tanks) may be used.

Underfloor heating systems

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

Oxygen diffusion barrier underfloor tubing

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

Water quality

Treatment for boiler feed water should be considered in areas of known problems, such as where a high mineral content and hardness exist. In areas where freezing might occur, an antifreeze may be added to the system water to protect the system. Please adhere to the specifications given by the antifreeze manufacturer. Do not use automotive silicate based antifreeze. Please observe that an antifreeze/water mixture may require a backflow preventer within the automatic water feed and influence components such as diaphragm expansion tanks, radiation, etc. Maximum antifreeze content is 50% for the Vitodens 100-W boiler. Do **not** use antifreeze other than specifically made for hot water heating systems. The system may also contain components which might be negatively affected by antifreeze. Check total system frequently when filled with antifreeze. Advise system operator/ultimate owner that system is filled with a glycol mix. The heating contractor must provide a MSDS (Material Safety Data Sheet) for the antifreeze used to the system operator/ultimate owner.

Warranty

Our warranty does not cover damages resulting from the following:

- installation or service by unqualified and unlicensed personnel.
- attempting to perform any repair work on the boiler other than that mentioned in the boiler literature.
- tampering with or attempting to readjust the factory settings of the combination gas valve
- leaks resulting from corrosion caused by the use of underfloor plastic tubing without an oxygen diffusion barrier.

For detailed warranty information, please read warranty sheet supplied with product.

Vitodens 100-W Venting Alternatives

Venting Alternatives										Type Diameter
	Viessmann Coaxial PPs Vent			Stainless Steel Vent		CPVC Vent				
	60/100	80/125	100/150	3"	4"	2"	3"	4"		
Max. Equivalent Length										
horizontally vented	20 6	26 8	33 10	52 16	66 20	33 10	52 16	66 20	ft m	
vertically vented	33 10	39 12	46 14	66 20	79 24	40 12	66 20	79 24	ft m	
<p>Layouts on the following pages are for illustrative purposes only. Do not use this manual for installation purposes. This is not a design tool. Always follow Viessmann Vitodens Venting System Installation Instructions (PN 5285 268). Select vent material based on vent configuration, preferred material, and necessary maximum equivalent length.</p>										

Appendix (continued)

Coaxial PPs Vent System

Vent System ¹	Vent System Diameter				
	60/100	80/125	100/150		
Room Air Independent Operation (Sealed Combustion Operation)	20 6	26 8	33 10	ft m	
<p>① Boiler Vent Pipe Adaptor ② 87° Elbow ③ Straight Pipe ² ④ Vent Termination ⑤ Protective Screen ⑥ Mounting Clip ² (each)</p> <p>(A) Combustion Air Intake (B) Flue Gas Outlet</p>	Basic Horizontal Vent Kit Venting pieces can be ordered individually, or as a convenient kit using the Order No. to the right; Basic Vent Kit includes one of each of the items numbered ② to ⑤, including two Mounting Clips ⑥.	7134 768	—	—	Order No.
	① Boiler Vent Pipe Adaptor (included with boiler)	—	—	—	Order No.
	Adaptor, coaxial 60/100 > 80/125 (not shown)	—	7176 765	—	Order No.
	Adaptor, coaxial 60/100 > 100/150 (not shown)	—	—	7142 681	Order No.
	② 87° Elbow EqL = 1.6ft / 0.5m	7176 735	7176 639	7176 674	Order No.
	③ Straight Pipe ² 3.3ft / 1m	7176 733	7176 637	7176 672	Order No.
	④ Vent Termination 2.6ft / 0.8m	7246 524	7246 527	7245 526	Order No.
	⑤ Protective Screen	7134 790	7134 790	7134 790	Order No.
	⑥ Mounting Clip ² (each)	7176 762	7176 664	7176 682	Order No.
	Other Available Vent Pieces not shown in illustration above	87° Inspection Tee EqL = 1.6ft / 0.5m	7176 737	7176 642	7176 677
	87° Inspection Elbow EqL = 1.6ft / 0.5m	7176 738	—	—	Order No.
	Sliding Coupling 0.8ft / 0.25m	7176 761	7176 663	7176 678	Order No.
	Straight Pipe ² 1.6ft / 0.5m	7176 732	7176 636	7176 671	Order No.
	45° Elbow (Set of 2) EqL = 1.0ft / 0.3m	7176 736	7176 640	7176 675	Order No.

¹ Sealed combustion, coaxial vent material to be supplied by Viessmann **only**.

Side wall venting installation **must** include Viessmann Protective Screen!

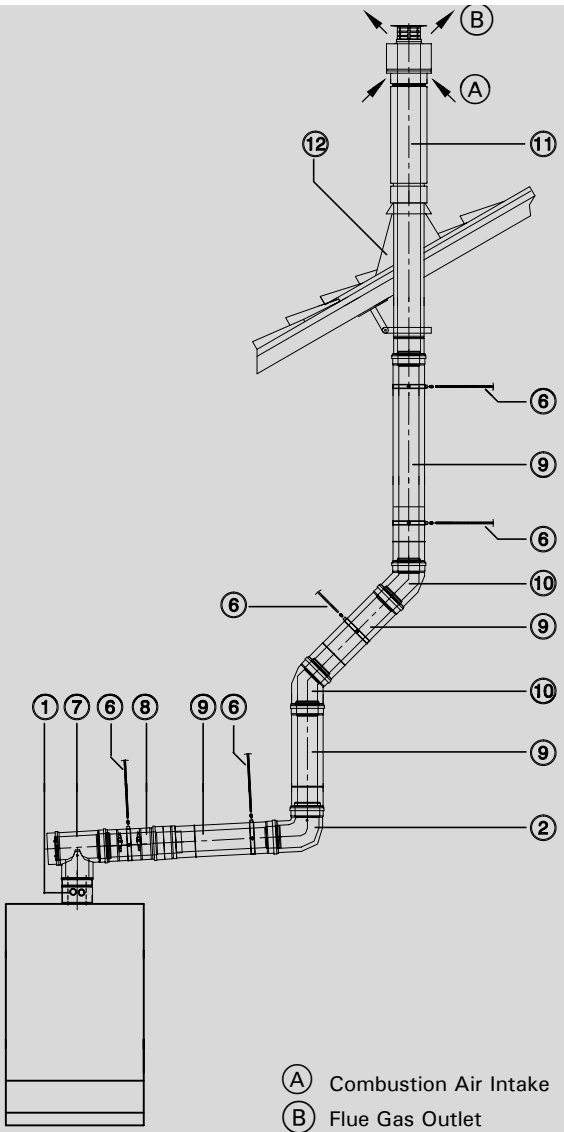
² Order **one** Mounting Clip for **each** straight length of vent pipe installed.

▶ Do **not** include first 87° Elbow in equivalent vent length calculations.

▶ A **maximum** of **5** elbows may be installed in the vent system; do **not** exceed maximum equivalent vent length.

▶ Always follow Viessmann Vitodens Venting System Installation Instructions (PN 5285 268).

Coaxial PPs Vent System (continued)

Vent System ¹		Vent System Diameter			
		60/100	80/125	100/150	
Room Air Independent Operation (Sealed Combustion Operation)	Maximum Equivalent Length	33 10	39 12	46 14	ft m
					
	① Boiler Vent Pipe Adaptor (included with boiler)	—	—	—	Order No.
	Adaptor 60/100 > 80/125 (not shown)	—	7176 765	—	Order No.
	Adaptor 60/100 > 100/150 (not shown)	—	—	7142 681	Order No.
	② 87° Elbow EqL = 1.6ft / 0.5m	7176 735	7176 639	7176 674	Order No.
	⑥ Mounting Clip ² (each)	7176 762	7176 664	7176 682	Order No.
	⑦ 87° Inspection Tee EqL = 1.6ft / 0.5m	7176 737	7176 642	7176 677	Order No.
	<i>or</i>				
	87° Inspection Elbow EqL = 1.6ft / 0.5m	7176 738	—	—	Order No.
	⑧ Sliding Coupling 0.8ft / 0.25m	7176 761	7176 663	7176 678	Order No.
	⑨ Straight Pipe ² 1.6ft / 0.5m	7176 732	7176 636	7176 671	Order No.
	<i>or</i>		<i>or</i>	<i>or</i>	
	Straight Pipe ² 3.3ft / 1m	7176 733	7176 637	7176 672	Order No.
	⑩ 45° Elbow (Set of 2) EqL = 1ft / 0.3m	7176 736	7176 640	7176 675	Order No.
	⑪ Vent Termination 3.9ft / 1.2m	7176 739	7148 007	7339 762	Order No.
	⑫ Roof Flashing and Storm Collar (B-Vent material or better)		field supplied		Order No.

¹ Sealed combustion, coaxial vent material to be supplied by Viessmann **only**.

Side wall venting installation **must** include Viessmann Protective Screen!

² Order **one** Mounting Clip for **each** straight length of vent pipe installed.

▶ Do **not** include first 87° Elbow in equivalent vent length calculations.

▶ A **maximum** of **5** elbows may be installed in the vent system; do **not** exceed maximum equivalent vent length.

▶ Always follow Viessmann Vitodens Venting System Installation Instructions (PN 5285 268).

Appendix (continued)

Stainless Steel Vent System

Vent System ³		Vent System Diameter			
			3"	4"	
Room Air Independent Operation (Sealed Combustion Operation)	Maximum Equivalent Length	$a + b \leq$	52 16	66 20	ft m
<p> A Combustion Air Intake B Flue Gas Outlet </p>		1 Boiler Vent Adaptor (included with boiler)	—	—	Order No.
		2 Double-Pipe Adaptor 60/100 > 80/80	7186 032	7186 032	Order No.
		3 Adaptor(s), stainless steel 80mm > 3" (order 2 pcs)	field supplied	field supplied	Order No.
		3" > 4" (order 2 pcs) (not shown)	—	field supplied	Order No.
		4 Venting Support ⁴	field supplied	field supplied	Order No.
		5 Combustion Air Intake Vent Material Allowable materials: see note below ⁵	field supplied	field supplied	Order No.
		6 ULC/UL listed Stainless Steel Vent Material ³ 45° Elbow EqL = 2ft / 0.6m 90° Elbow EqL = 3ft / 0.9m	field supplied	field supplied	Order No.
	7 Bird Screen c/w Termination	field supplied	field supplied	Order No.	
Room Air Dependent Operation	Maximum Equivalent Length	$a + b \leq$	52 16	66 20	ft m
<p> A Combustion Air Intake B Flue Gas Outlet C Air Opening a = zero </p>		1 Boiler Vent Adaptor (included with boiler)	—	—	Order No.
		2 Adaptor, coaxial 60/100 > 80/125 60/100 > 100/150	7176 765 —	— 7142 681	Order No. Order No.
		3 Adaptor, stainless steel 80mm > 3"	field supplied	—	Order No.
		100mm > 4"	—	field supplied	Order No.
		4 Venting Support ⁴	field supplied	field supplied	Order No.
		6 ULC/UL listed Stainless Steel Vent Material ³ 45° Elbow EqL = 2ft / 0.6m 90° Elbow EqL = 3ft / 0.9m	field supplied	field supplied	Order No.
		7 Bird Screen c/w Termination	field supplied	field supplied	Order No.

³ Stainless steel vent material must be ULC/UL listed, stainless steel AL29-4C® for Category IV boilers.
 Suggested sources: Flex-L International Inc., Flexmaster Canada Ltd. / Z-Flex (US) Inc., Heat-fab Division Selkirk Corp., or ProTech Systems Inc.

⁴ Boiler cannot support weight of vent system. Support venting as prescribed in vent manufacturer's installation instructions.

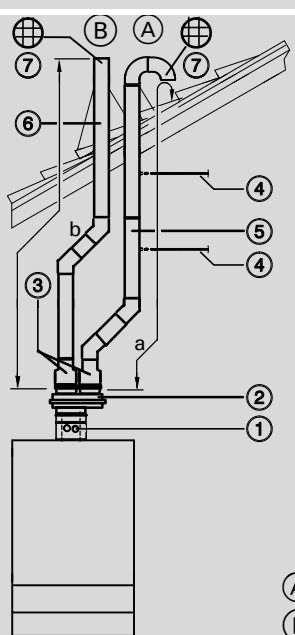
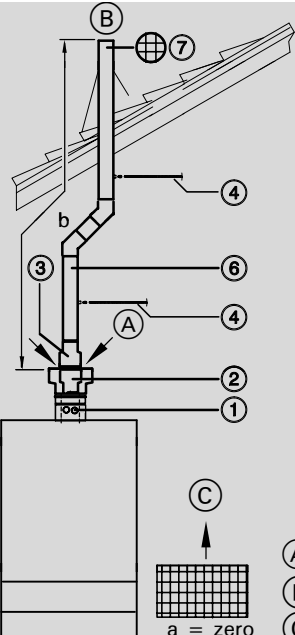
⁵ Combustion air supply pipe may be made of the following materials: ABS, CPVC, PVC, or stainless steel.

▶ A maximum of 5 elbows may be installed in the vent and air intake system; do not exceed maximum equivalent vent length.

▶ Always follow Viessmann Vitodens Venting System Installation Instructions (PN 5285 268).

5347 963 v1.

Stainless Steel Vent System (continued)

Vent System ³		Vent System Diameter				
		3"	4"			
Room Air Independent Operation (Sealed Combustion Operation)	Maximum Equivalent Length	a + b ≤		66 20	79 24	ft m
 <p>(A) Combustion Air Intake (B) Flue Gas Outlet</p>		① Boiler Vent Adaptor (included with boiler)	—	—	Order No.	
		② Double-Pipe Adaptor 60/100 > 80/80	7186 032	7186 032	Order No.	
		③ Adaptor(s), stainless steel 80mm > 3" (order 2 pcs)	field supplied	field supplied	Order No.	
		3" > 4" (order 2 pcs) (not shown)	—	field supplied	Order No.	
		④ Venting Support ⁴	field supplied	field supplied	Order No.	
		⑤ Combustion Air Intake Vent Material Allowable materials: see note below ⁵	field supplied	field supplied	Order No.	
		⑥ ULC/UL listed Stainless Steel Vent Material ³ 45° Elbow EqL = 2ft / 0.6m 90° Elbow EqL = 3ft / 0.9m	field supplied	field supplied	Order No.	
	⑦ Bird Screen c/w Termination	field supplied	field supplied	Order No.		
Room Air Dependent Operation	Maximum Equivalent Length	a + b ≤		66 20	79 24	ft m
 <p>(A) Combustion Air Intake (B) Flue Gas Outlet (C) Air Opening a = zero</p>		① Boiler Vent Adaptor (included with boiler)	—	—	Order No.	
		② Adaptor, coaxial 60/100 > 80/125	7176 765	—	Order No.	
		60/100 > 100/150	—	7142 681	Order No.	
		③ Adaptor, stainless steel 80mm > 3"	field supplied	—	Order No.	
		100mm > 4"	—	field supplied	Order No.	
		④ Venting Support ⁴	field supplied	field supplied	Order No.	
		⑥ ULC/UL listed Stainless Steel Vent Material ³ 45° Elbow EqL = 2ft / 0.6m 90° Elbow EqL = 3ft / 0.9m	field supplied	field supplied	Order No.	
	⑦ Bird Screen c/w Termination	field supplied	field supplied	Order No.		

5347 963 v1.1 ³ Stainless steel vent material must be ULC/UL listed, stainless steel AL29-4C® for Category IV boilers.
 Suggested sources: Flex-L International Inc., Flexmaster Canada Ltd. / Z-Flex (US) Inc., Heat-fab Division Selkirk Corp., or ProTech Systems Inc.
⁴ Boiler cannot support weight of vent system. Support venting as prescribed in vent manufacturer's installation instructions.
⁵ Combustion air supply pipe may be made of the following materials: ABS, CPVC, PVC, or stainless steel.
 ▶ A maximum of 5 elbows may be installed in the vent and air intake system; do not exceed maximum equivalent vent length.
 ▶ Always follow Viessmann Vitodens Venting System Installation Instructions (PN 5285 268).

IMPORTANT :
Do not use any DWV plumbing pipes to vent this boiler.

CPVC Vent System

Vent System ³		Vent System Diameter				
		2"	3"	4"		
Room Air Independent Operation (Sealed Combustion Operation)	Maximum Equivalent Length	$a + b \leq$	n.a.	52 16	66 20	ft m
<p>(A) Combustion Air Intake (B) Flue Gas Outlet</p>		① Boiler Vent Adaptor (included with boiler)	—	—	—	Order No.
		② Double-Pipe Adaptor	—	7186 032	7186 032	Order No.
		③ Adaptor(s), CPVC 80mm > 3" (order 2 pcs) 3" > 4" (not shown)	—	7134 770	7134 770	Order No. and field supplied
		④ Venting Support ⁴	—	field supplied	field supplied	Order No.
		⑤ Combustion Air Intake Vent Material Allowable materials: see note below ⁵	—	field supplied	field supplied	Order No.
		⑥ ULC/UL listed CPVC Vent Material ⁵ 45° Elbow EqL = 3ft / 0.9m 90° Elbow EqL = 5ft / 1.5m	—	field supplied	field supplied	Order No.
		⑦ Bird Screen (order 2 pcs) or Horizontal Vent Termination	—	7134 781 7134 772	7134 782 7134 773	Order No. Order No.
Room Air Dependent Operation	Maximum Equivalent Length	$a + b \leq$	33 10	52 16	66 20	ft m
<p>(A) Combustion Air Intake (B) Flue Gas Outlet (C) Air Opening</p> <p>a = zero</p>		① Boiler Vent Adaptor (included with boiler)	—	—	—	Order No.
		② Flue Adaptor, CPVC 60mm > 2"	7134 769	7134 769	7134 769	Order No.
		③ Adaptor(s), CPVC 2" > 3" 3" > 4" (not shown)	—	field supplied	field supplied and field supplied	Order No. Order No.
		④ Venting Support ⁴	—	field supplied	field supplied	Order No.
		⑥ ULC/UL listed CPVC Vent Material ⁵ 45° Elbow EqL = 3ft / 0.9m 90° Elbow EqL = 5ft / 1.5m	—	field supplied	field supplied	Order No.
		⑦ Bird Screen	7134 780	7134 781	7134 782	Order No.

³ CPVC vent material must be ULC/UL listed, for Category IV boilers. Suggested source: IPEX Inc.

⁴ Boiler cannot support weight of vent system. Support venting as prescribed in vent manufacturer's installation instructions.

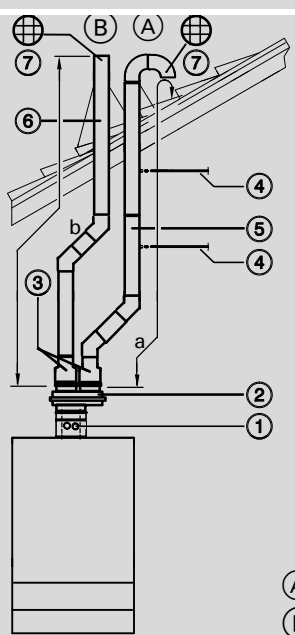
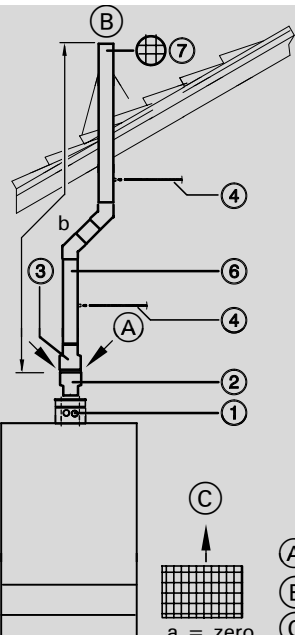
⁵ Combustion air supply pipe may be made of the following materials: ABS, CPVC, PVC, or stainless steel.

▶ A **maximum of 5 elbows** may be installed in the vent and air intake system; do **not** exceed maximum equivalent vent length.

▶ Always follow Viessmann Vitodens Venting System Installation Instructions (PN 5285 268).

IMPORTANT :
Do not use any DWV plumbing pipes to vent this boiler.

CPVC Vent System (continued)

Vent System ³		Vent System Diameter				
		2"	3"	4"		
Room Air Independent Operation (Sealed Combustion Operation)	Maximum Equivalent Length	$a + b \leq$	n.a.	66 20	79 24	ft m
 <p>(A) Combustion Air Intake (B) Flue Gas Outlet</p>		① Boiler Vent Adaptor (included with boiler)	—	—	—	Order No.
		② Double-Pipe Adaptor	—	7186 032	7186 032	Order No.
		③ Adaptor(s), CPVC 80mm > 3" (order 2 pcs) 3" > 4" (order 2 pcs) (not shown)	—	7134 770	7134 770	Order No. and field supplied
		④ Venting Support ⁴	—	field supplied	field supplied	Order No.
		⑤ Combustion Air Intake Vent Material Allowable materials: see note below ⁵	—	field supplied	field supplied	Order No.
		⑥ ULC/UL listed CPVC Vent Material ³ 45° Elbow EqL = 3ft / 0.9m 90° Elbow EqL = 5ft / 1.5m	—	field supplied	field supplied	Order No.
		⑦ Bird Screen (order 2 pcs)	—	7134 781	7134 782	Order No.
Room Air Dependent Operation	Maximum Equivalent Length	$a + b \leq$	40 12	66 20	79 24	ft m
 <p>(A) Combustion Air Intake (B) Flue Gas Outlet (C) Air Opening a = zero</p>		① Boiler Vent Adaptor (included with boiler)	—	—	—	Order No.
		② Flue Adaptor, CPVC 60mm > 2"	7134 769	7134 769	7134 769	Order No.
		③ Adaptor(s), CPVC 2" > 3" 3" > 4" (not shown)	—	field supplied	field supplied and field supplied	Order No. Order No.
		④ Venting Support ⁴	field supplied	field supplied	field supplied	Order No.
		⑥ ULC/UL listed CPVC Vent Material ³ 45° Elbow EqL = 3ft / 0.9m 90° Elbow EqL = 5ft / 1.5m	field supplied	field supplied	field supplied	Order No.
		⑦ Bird Screen	7134 780	7134 781	7134 782	Order No.

³ CPVC vent material must be ULC/UL listed, for Category IV boilers. Suggested source: IPEX Inc.

⁴ Boiler cannot support weight of vent system. Support venting as prescribed in vent manufacturer's installation instructions.

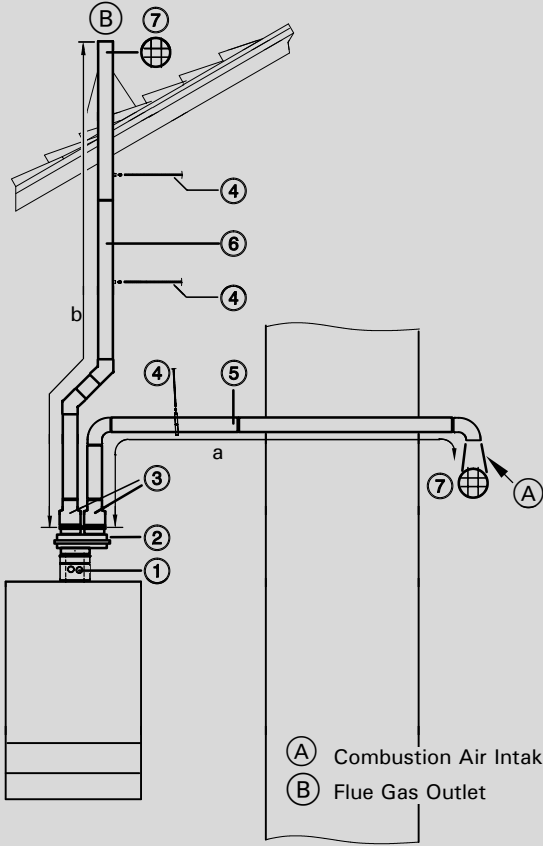
⁵ Combustion air supply pipe may be made of the following materials: ABS, CPVC, PVC, or stainless steel.

▶ A **maximum** of 5 elbows may be installed in the vent and air intake system; do **not** exceed maximum equivalent vent length.

▶ Always follow Viessmann Vitodens Venting System Installation Instructions (PN 5285 268).

IMPORTANT :
Do not use any DWV plumbing pipes to vent this boiler.

CPVC or Stainless Steel Vent System

Vent System ³		Vent System Diameter			
			3"	4"	
Room Air Independent Operation (Sealed Combustion Operation)	Maximum Equivalent Length	a + b ≤	59 18	72 22	ft m
 <p>(A) Combustion Air Intake (B) Flue Gas Outlet</p>		① Boiler Vent Adaptor (included with boiler)	—	—	Order No.
		② Double-Pipe Adaptor 60/100 > 80/80	7186 032	7186 032	Order No.
		③ Adaptor(s), stainless steel 80mm > 3" (order 2 pcs)	field supplied	field supplied	Order No.
		3" > 4" (order 2 pcs) (not shown)	—	and field supplied	Order No.
		or			
		③ Adaptor(s), CPVC 80mm > 3" (order 2 pcs)	7134 770	7134 770	Order No.
		3" > 4" (order 2 pcs) (not shown)	—	and field supplied	Order No.
		④ Venting Support ⁴	field supplied	field supplied	Order No.
		⑤ Combustion Air Supply Pipe Allowable materials: see note below ⁵	field supplied	field supplied	Order No.
		⑥ ULC/UL listed Stainless Steel Vent Material ^{3a} 45° Elbow EqL = 2ft / 0.6m 90° Elbow EqL = 3ft / 0.9m or	field supplied	field supplied	Order No.
	⑥ ULC/UL listed CPVC Vent Material ^{3b} 45° Elbow EqL = 3ft / 0.9m 90° Elbow EqL = 5ft / 1.5m	field supplied	field supplied	Order No.	
	⑦ Bird Screen c/w Termination for stainless steel or	field supplied	field supplied	Order No.	
	⑦ Bird Screen for CPVC (order 2 pcs)	7134 781	7134 782	Order No.	

^{3a} Stainless steel vent material must be ULC/UL listed, stainless steel AL29-4C® for Category IV boilers.
Suggested sources: Flex-L International Inc., Flexmaster Canada Ltd. / Z-Flex (US) Inc., Heat-fab Division Selkirk Corp., or ProTech Systems Inc.

^{3b} CPVC vent material must be ULC/UL listed, for Category IV boilers. Suggested source: IPEX Inc.

⁴ Boiler cannot support weight of vent system. Support venting as prescribed in vent manufacturer's installation instructions.

⁵ Combustion air supply pipe may be made of the following materials: ABS, CPVC, PVC, or stainless steel.

▶ A **maximum of 5 elbows** may be installed in the vent and air intake system; do **not** exceed maximum equivalent vent length.

▶ Always follow Viessmann Vitodens Venting System Installation Instructions (PN 5285 268).

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