

Technical Data Manual

Model Nos. and pricing: see Price List



Vitogas 100

**GS10 Series – commercial, assembled cast iron block
with separate enclosure panels**

Natural Gas-/Propane-Fired, Two-Stage Boiler

cast iron sectional construction
with atmospheric, fully premix burner
Heating input: 300 to 380 MBH
88 to 111 kW



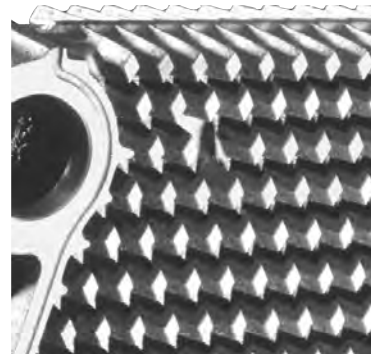
VITOGAS 100

With a rated input of 300 to 380 MBH/ 88 to 111 kW, the Vitogas 100 makes a grand entry into the heating technology industry.

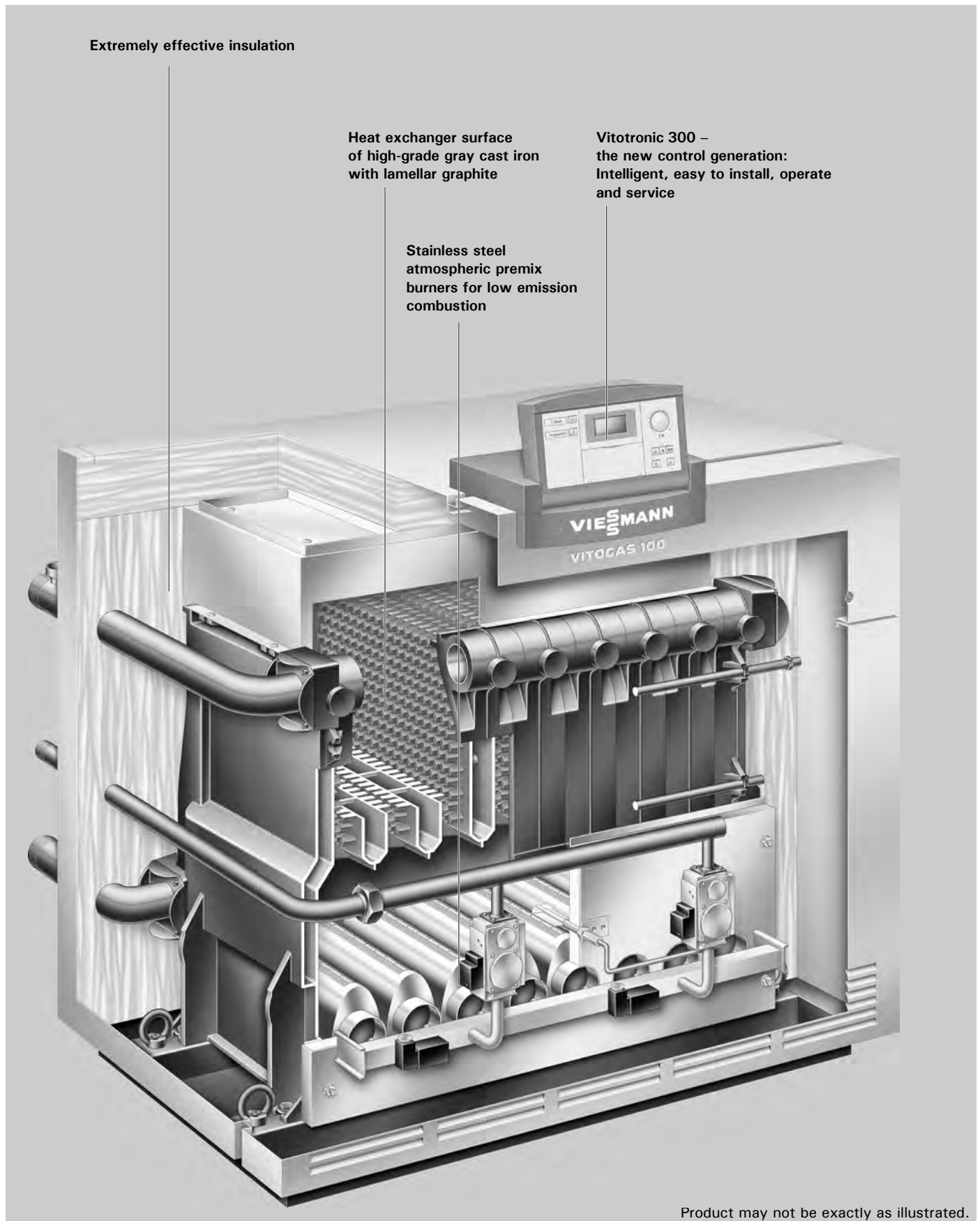
The new Vitotronic control generation, minimum noise levels and economical operation, make the Vitogas 100, GS10 the choice for single- as well as multiple-boiler applications.

The benefits at a glance:

- **High operational reliability and a long service life** due to special high-grade gray cast iron with lamellar graphite and a low thermal load on the heat exchanger surface.
- **Clean combustion** due to atmospheric premix burner with super-stoichiometric premixing: $\text{NO}_x < 27.9 \text{ ppm (air-free)}$, $\text{CO} < 9.2 \text{ ppm (air-free)}$. The Vitogas 100 therefore satisfies the requirements of the German environmental emblem "Blue Angel", Swiss Clean Air Regulations and California Regulations.
- Economical and environmentally friendly operation via modulating boiler water temperatures.
Combustion efficiency of up to 85.6%.
- Even during partial-load operation, the entire combustion chamber is used allowing for balanced usage of burner and boiler.
- Intermittent pilot ignition system provides soft, quiet and **extremely reliable ignition**.



Heat exchanger surfaces of special high-grade gray cast iron for high operational reliability and a long service life



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Product may not be exactly as illustrated.

Technical Data

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Boiler Model		Model No.	GS10-72	GS10-84	GS10-96
CSA input	full load	MBH	300	340	380
		kW	88	100	111
	partial load	MBH	210	238	266
		kW	62	70	78
CSA output	full load	MBH	257	291	325
		kW	75	85	95
	partial load	MBH	180	204	228
		kW	53	60	67
Net I = B = R rating ^{*7}		MBH	224	253	283
		kW	66	74	83
Heat exchanger surface area		ft. ²	67	78	89
		m ²	6.23	7.25	8.26
Max. operating pressure		psig	60	60	60
		bar	4	4	4
Min. gas supply pressure					
Natural Gas		"w.c.	7	7	7
Liquid Propane		"w.c.	11	11	11
Max. gas supply pressure ^{*2}		"w.c.	14	14	14
Combustion efficiency		%	85.6	85.6	85.6
Dimensions boiler shell					
Length boiler shell ^{*3} as delivered		inches	36	36	36
		mm	912	912	912
Overall length		inches	37	37	42
		mm	1007	1007	1057
Overall width		inches	40	44	48
		mm	1010	1120	1220
Overall height		inches	43	43	43
		mm	1088	1088	1088
– with Vitotronic 100, 200 or 300		inches	48	48	48
		mm	1227	1227	1227
Dimensions of cast iron sections					
Side section W × H × T ^{*4}		inches	22 x 29 x 4.7		
		mm	557 × 734 × 120		
Mid section W × H × T		inches	22 x 23 x 4.1		
		mm	557 × 585 × 105		
Number of cast iron sections			7	8	9
Number of burner tubes			6	7	8
Weight boiler shell		lbs	714	805	895
(as delivered incl. burner)		kg	324	365	406
Overall weight		lbs	927	1036	1194
(boiler with insul., burner, boiler control, install. fittings and draft hood)		kg	420	470	542
Boiler water content		USG	9.9	11.4	12.8
		ltr	37.6	43.0	48.3
Boiler connections					
Boiler supply and return		Ø" (NPTM)	2	2	2
Safety supply		Ø" (straight male thread)	1 ½	1 ½	1 ½
Drain valve		Ø" (NPTM)	1	1	1

^{*1}Net I = B = R rating based on piping and pick-up allowance of 1.15.

^{*2}If the gas supply pressure is higher than the maximum permissible value, a separate gas regulator must be installed upstream of the boiler system.

^{*3}In case of difficulties when transporting or installing, boiler supply and return pipes can be removed temporarily, reducing the length of the boiler shell to 27.5 inches/700 mm.

^{*4}W = width, H = height, T = thickness

Technical Data (continued)

Safety header pressure relief valve connection	Ø" (NPTF)	¾	¾	¾
Gas supply connection	Ø" (NPTM)	¾	¾	¾
Flue gas (NG) *5				
Temperature (at boiler water supply temp. of 180 °F/82 °C)				
– at rated full load	°F	237	226	231
	°C	114	108	111
– at rated partial load	°F	195	196	201
	°C	90	91	94
Mass flow rates				
– full load	lbs/h	375	411	498
– partial load	lbs/h	328	364	430
Vent pipe collar	nominal Ø inches	8	9	10
Combustion and dilution air (approx. CFM)		100	115	125
Standby losses	%	0.72	0.69	0.67
at boiler water temperature of 140 °F/60 °C				

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

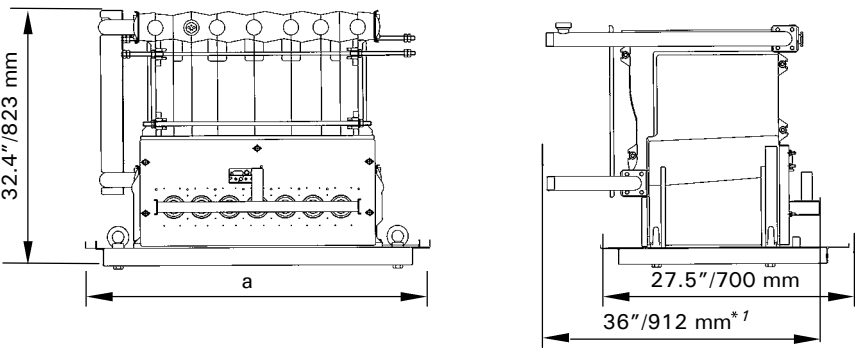
Partial load values are based on an input of 70% of the rated full load input.

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

Technical Data

Dimensions

Boiler shell (delivered as cast iron block)

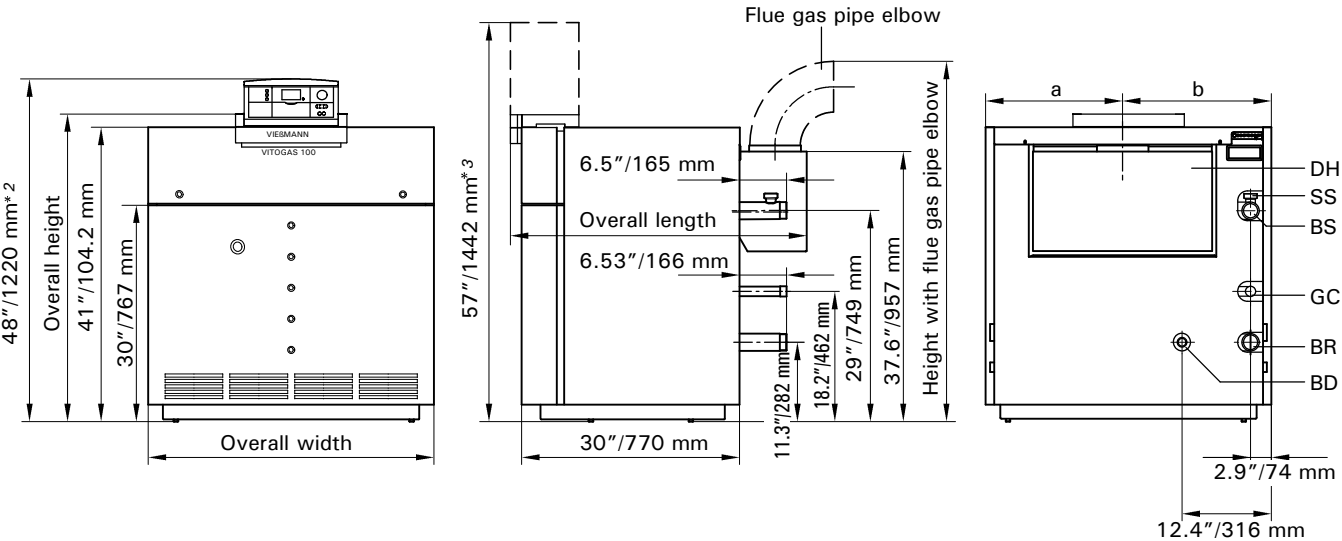


*1For ease of transportation and/or installation, boiler supply and return pipes can be removed temporarily, reducing the length of the boiler shell to 27.5 inches/700 mm.

Dimensions

Boiler Model	Model No.	GS10-72	GS10-84	GS10-96
a	inches/mm	37/950	42/1060	46/1160

Hot water heating boiler with insulation and boiler control



Dimensions

Boiler Model	Model No.	GS10-72	GS10-84	GS10-96
a	inches/mm	19/484	21/542	23/589
b	inches/mm	21/526	23/578	25/631

*2Control in operating position
*3Control in service position

- Legend
- BD Boiler Drain
 - BR Boiler Return
 - BS Boiler Supply
 - DH Draft Hood
 - GC Gas Connection
 - SS Safety Supply

Recommended Minimum Service Clearances

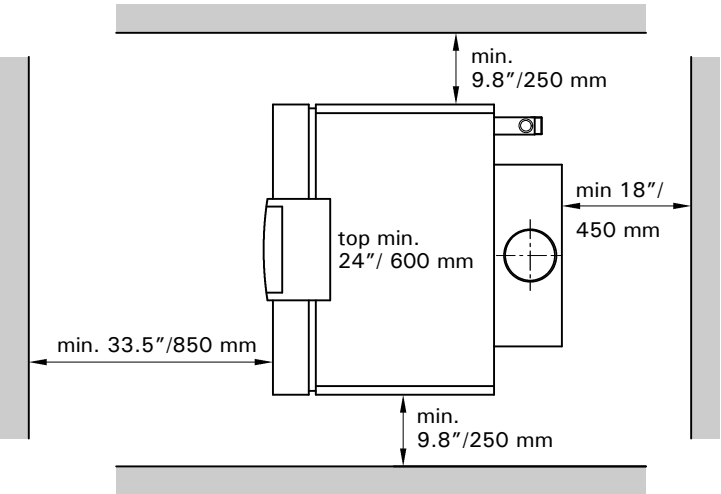


Diagram is not to scale.

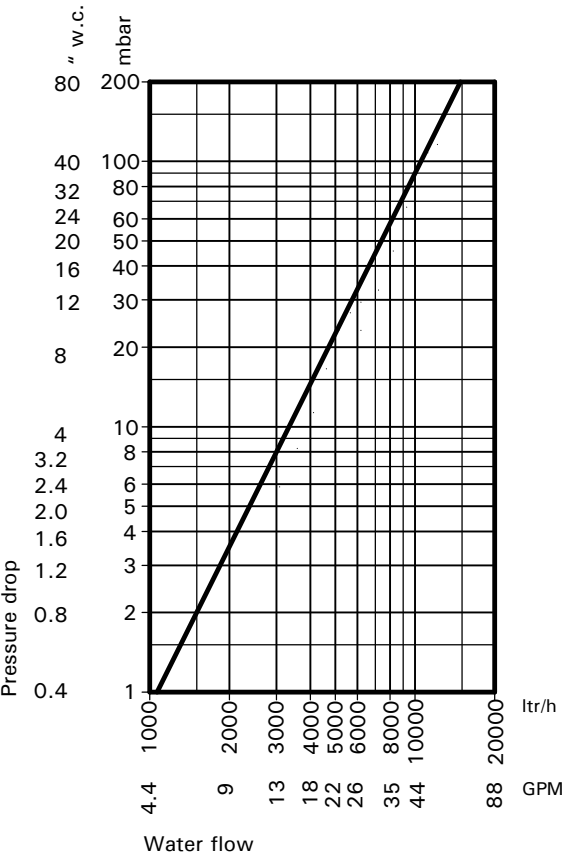
Minimum Clearances to Combustibles

Top panel	Front panel	Rear panel	Left panel	Right panel	Floor	Flue
6	6 AL, CL	6	0	0	Combustible	2" CT 0" CI

AL = Alcove
CL = Closet
CT = Single-wall stainless steel vent
CI = Double-wall insulated stainless steel vent

Waterside Flow (primary circuit)

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



Typical flow rates

Model	GS10-72	84	96
Btu/h output	257 000	291 000	325 000
20 °F rise (GPM)	25.7	29.1	32.5
30 °F rise (GPM)	17.1	19.4	21.7

Use standard friction loss method for pipe sizing.

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Standard and Optional Equipment/ Boiler Control Alternatives

Standard Equipment

Note:

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

Vitogas 100, GS10 boilers are shipped unassembled with the boiler enclosure panels, insulation, draft hood, and control packaged separately from the sectional cast iron block.

Standard shipment is composed of:
1 skid with cast iron block and prewired gas train
1 carton with draft hood and vent pipe adaptor
1 carton with insulation blankets and panels
1 carton with safety header
1 carton with boiler installation fittings (c/w 30 psig pressure relief valve)

Optional Equipment

1 carton containing either a stainless steel vent damper or a Tjernlund power venter (please specify at time of order).

Boiler Control Alternatives

Vitotronic 100, KK10

standard boiler control for high temperature heating systems

Vitotronic 100, KW10

standard boiler control for high temperature heating systems with indoor/outdoor system control

Vitotronic 100, KW10A / KW10B

standard boiler control for high temperature heating systems with indoor/outdoor system control
With or without DHW

Vitotronic 200, KW2

for multiple temperature heating systems with or without a mixing valve, with indoor/outdoor digital boiler and heating system control

Vitotronic 300, KW3

for multiple temperature heating systems with up to two mixing valves, with indoor/outdoor digital boiler and heating system control

For multiple-boiler installations:

Multimatik

for multiple-boiler installations. The Multimatik digital heating system control acts as the master control and communicates digitally with the base control on each Vitogas 100, GS10 boiler. The Multimatik can control up to 6 single-stage boilers or 3 two-stage boilers. A wide range of sophisticated standard and optional features makes the Multimatik a suitable solution for almost any demanding application. For assistance in selecting the appropriate Multimatik control, please contact your regional Viessmann Sales Representative.

Custom control panels

In addition, custom control panels for residential or commercial applications are designed and manufactured by Viessmann to suit any customer's specific requirements. Both Multimatik and custom control panels can have features such as pool heating, hot tub heating, snow melting, telephone tie-in and/or several other functions. Please inquire.

Installation Examples

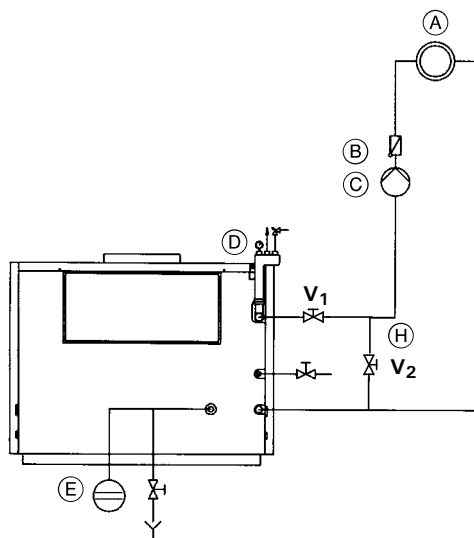
IMPORTANT

These examples depict possible piping layouts for Viessmann product equipped with Viessmann System Technology. For boiler and tank combinations, please install only the feasible combinations listed in the Price List.

These are simplified conceptual drawings only!

Piping and necessary componentry must be field verified.

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



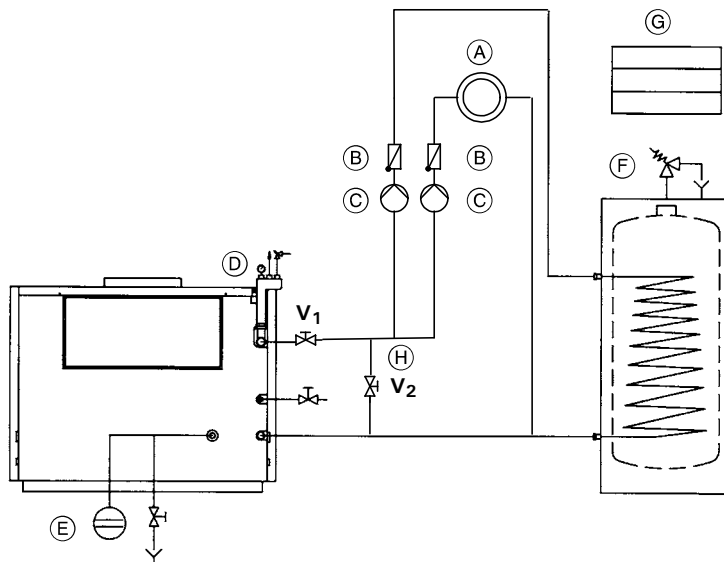
Single-stage operation can only occur when the boiler water temperature is above the minimum temperature and a demand for heat is present. When the water temperature is above the minimum, the boiler control will determine full input operation or partial load operation based on the demand for heat. Refer to boiler control instructions.

Install LWCO where required by local codes.

IMPORTANT

Vitotronic boiler controls are factory set for single-stage operation. The Vitogas 100, GS10 boiler control must be programmed on-site for two-stage operation.

The installation of a flow check valve in the heating supply pipe prevents uncontrolled heat flow to the heating system by gravity during priority switching of domestic hot water heating or during summer operation.

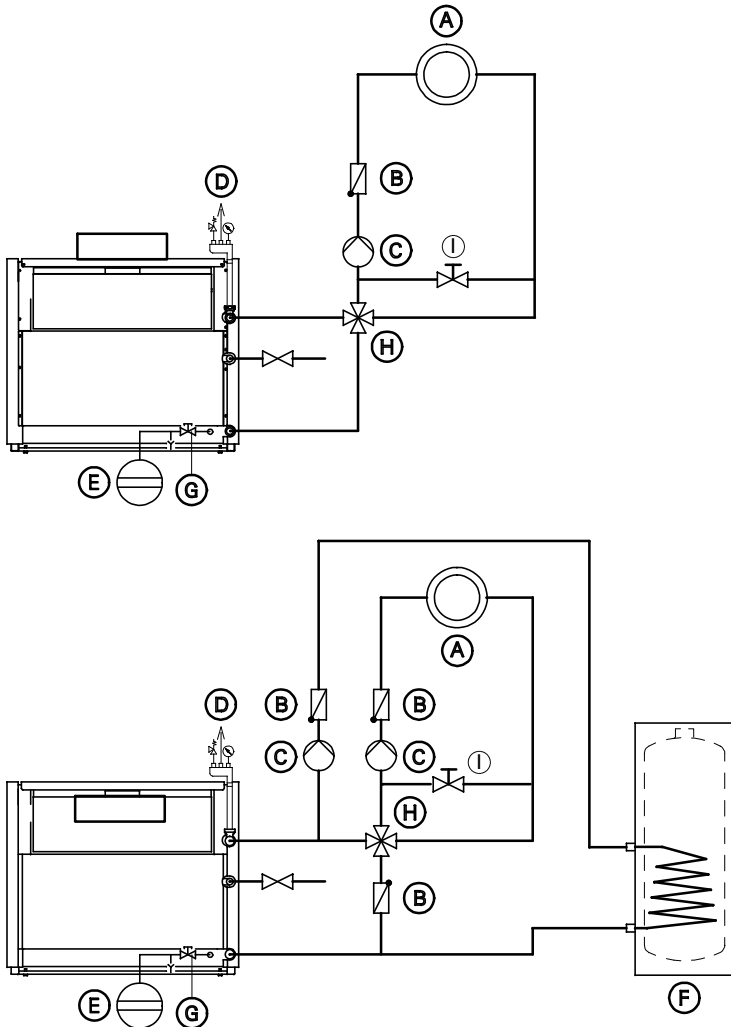


- (A) Heating circuit
- (B) Spring-loaded flow check valve
- (C) Circulation pump
- (D) Safety header with automatic air vent, pressure relief valve, and pressure gage
- (E) Expansion tank
- (F) Domestic hot water storage tank (indirect-fired)
- (G) DHW pump module
- (H) Bypass pipe (highly recommended c/w two regulating valves (V₁, V₂). See Installation Instructions for details.

Installation Examples (continued)

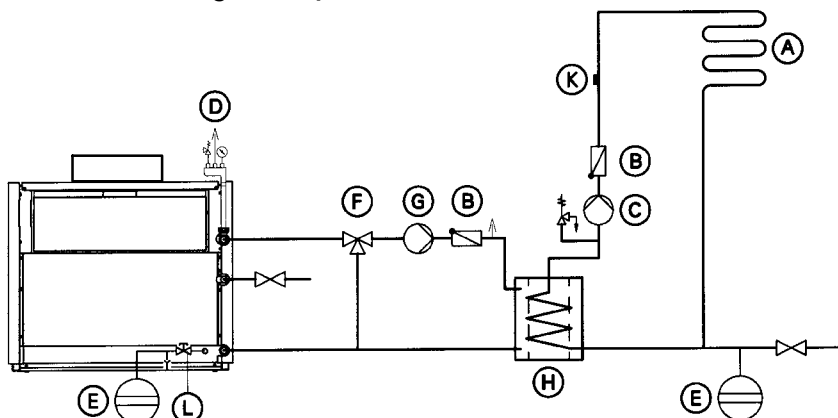
With 4-way mixing valve for heating circuit control

e.g. with Vitotronic 200, KW2 and mixing valve actuator accessory kit



- Ⓐ Heating circuit
- Ⓑ Spring-loaded flow check valve
- Ⓒ Circuit pump
- Ⓓ Safety header with air vent, pressure relief valve and pressure gage
- Ⓔ Expansion tank
- Ⓕ Vitocell-V or -H DHW storage tank (indirect-fired)
- Ⓖ Drain valve
- Ⓗ 4-Way mixing valve
- Ⓘ Bypass pipe with flow regulating valve, for systems with large water content (> 1 USG/13 000 Btu/h / 15 ltr/kW/h of boiler input). See Installation Instructions for details.

Underfloor heating with system isolation



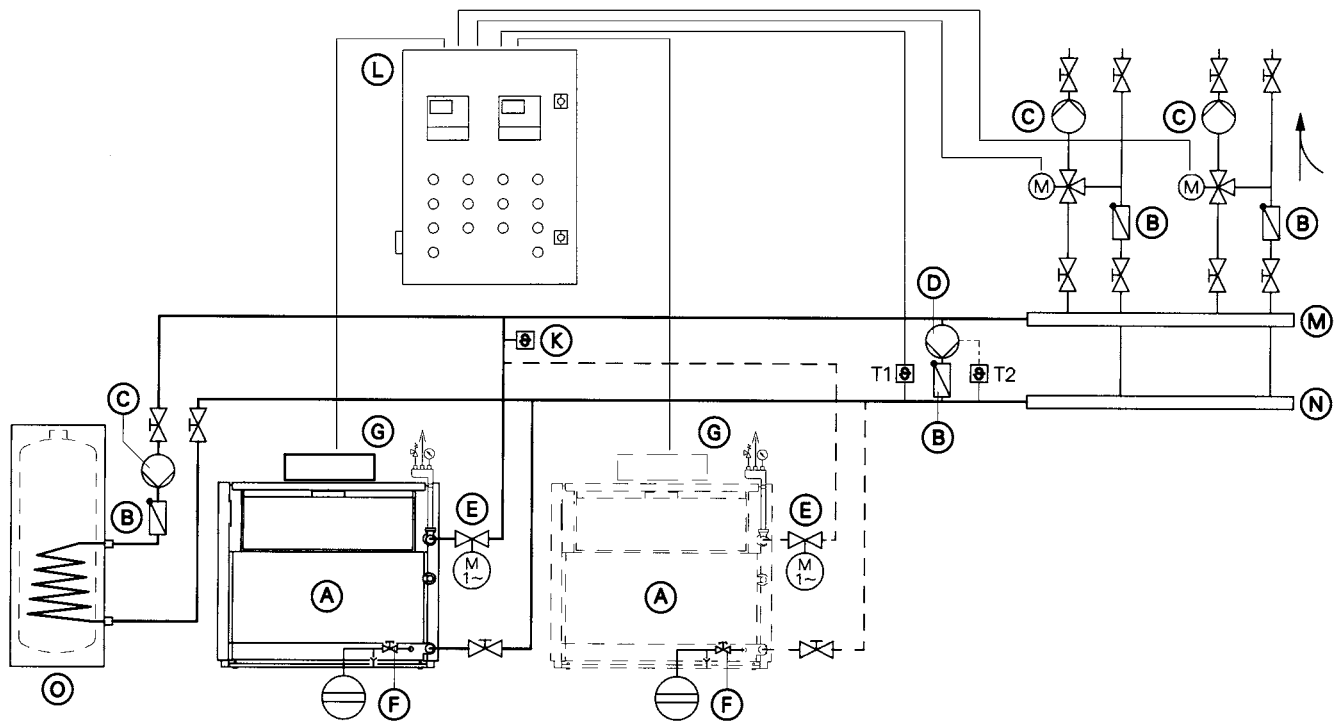
- Ⓐ Underfloor heating circuit
- Ⓑ Spring-loaded flow check valve
- Ⓒ Circuit pump for underfloor heating
- Ⓓ Safety header with air vent, pressure relief valve and pressure gage
- Ⓔ Expansion tank
- Ⓕ 3-Way mixing valve
- Ⓖ Circuit pump for heat exchanger
- Ⓗ Heat exchanger
- Ⓚ Supply temperature sensor
- Ⓛ Drain valve

Installation Examples (continued)

With return sensor and bypass pump

for single- and multiple-boiler applications with large water content,
and controlled space heating system via mixing valve(s)

Bypass pump activates if return temperature drops below minimum boiler temperature.
Mixing valve(s) will close if return temperature drops lower.



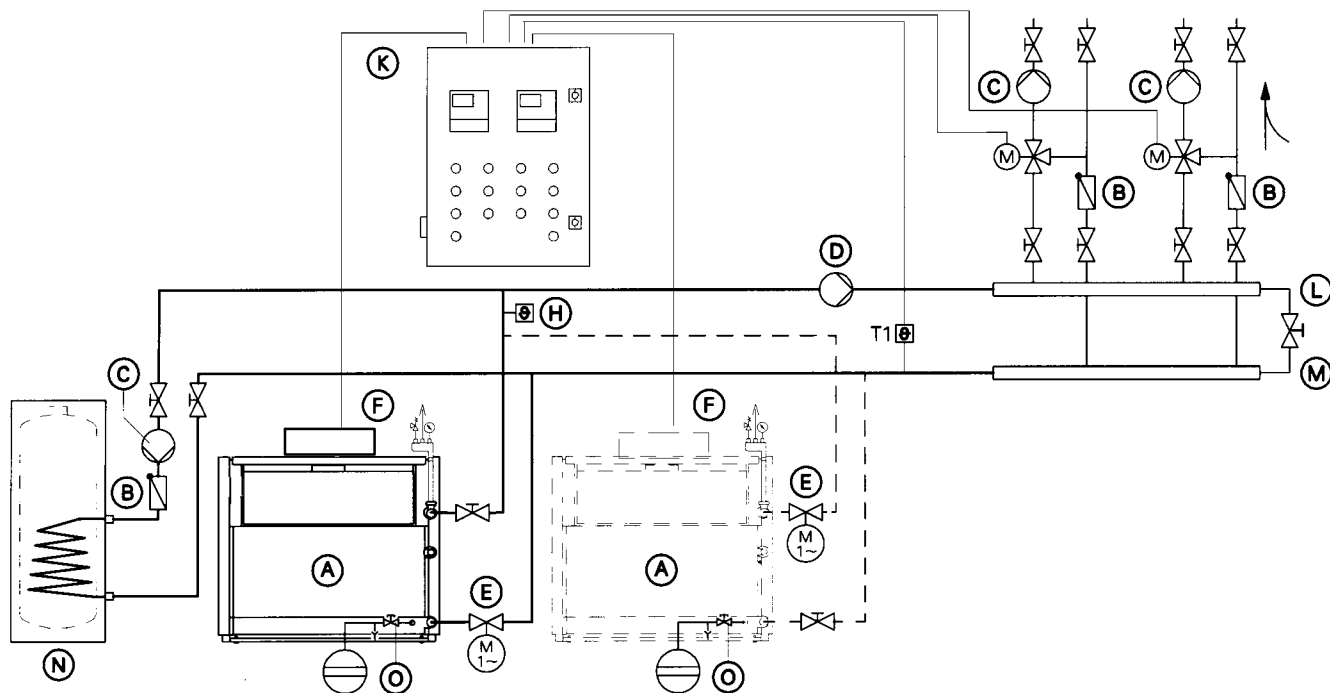
- | | | |
|----------------------------------|---------------------------------|---|
| Ⓐ Boiler | Ⓔ Vitotronic 100 boiler control | ⓪ Vitocell-V or -H DHW storage tank (indirect-fired) |
| Ⓑ Spring-loaded flow check valve | Ⓚ Supply temperature sensor | T1 Temperature sensor (low limit) for priority switching of the heating circuit; switching point 104°F/40°C |
| Ⓒ Circuit pump | Ⓛ Multimatik-D | T2 Return temperature aquastat for pump |
| Ⓓ Shunt pump | Ⓜ Supply distribution header | |
| Ⓔ Motorized isolation valve | Ⓝ Return distribution header | |
| Ⓕ Drain valve | | |

Installation Examples (continued)

Distribution header with bypass and return temperature sensor

for single- and multiple-boiler applications with large water content,
and controlled space heating system via mixing valve(s)

Mixing valve(s) will close if return temperature falls below minimum boiler temperature.



- | | | |
|----------------------------------|---------------------------------|---|
| Ⓐ Boiler | Ⓕ Vitotronic 100 boiler control | Ⓝ Vitocell-V or -H DHW storage tank (indirect-fired) |
| Ⓑ Spring-loaded flow check valve | Ⓖ Supply temperature sensor | Ⓞ Drain valve |
| Ⓒ Circuit pump | Ⓚ Multimatik-D | T1 Temperature sensor (low limit) for priority switching of the heating circuit; switching point 104°F/40°C |
| Ⓓ Distribution header pump | Ⓛ Supply distribution header | |
| Ⓔ Motorized isolation valve | Ⓜ Return distribution header | |

System Design Considerations

Boiler selection

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

Venting

IMPORTANT

This boiler is a high efficiency unit. It operates at an efficiency level which could yield a condensing condition in the venting system only. Care should be taken in providing the proper venting and employing the best principles of application and sizing. This boiler is tested to the latest ANSI/CSA Standard and approved and listed as a Category II appliance.

A Category II boiler operates with a non-positive vent static pressure and with a flue loss of less than 17%.

This type of venting uses natural buoyancy of the heated flue products to generate a negative draft in the flue gas pipe. The Vitogas 100, GS10 boiler requires special venting. Vent material for a Category II vent may be purchased locally. Contact the manufacturer of the vent material if there is a question about the suitability of vent material for application on a Category II vent system.

The vent material must be a Category II single-wall vent pipe or a Category II insulated vent pipe. Vent material must be listed by a nationally recognized testing agency.

Suitable as vent pipe material (vent pipe or flexible chimney liner) is stainless steel of 316L or AL-29-4C grade. **Never install a type A, B, C or L vent with this boiler when vented vertically.** The chimney must be designed to be water-tight.

See vent connection illustration (Fig. 1) and contact information for manufacturers of suitable Category II vent materials.

Intermediate section

The intermediate section of venting between the boiler vent pipe collar and the chimney must be of identical diameter as the vent connection of the boiler. Use the shortest possible path between the boiler and the chimney. A maximum of two elbows may be installed in the intermediate section. Avoid the use of two level 90° elbows.

The intermediate section must be sealed gas-tight at the boiler vent pipe collar and at the chimney connection. Ensure any test port for combustion values is sealed as well.

The chimney connection length between the boiler vent pipe collar and the chimney must be installed with insulation. We recommend consulting a reputable chimney installer for advice in project-specific circumstances.

Recommended manufacturers of Category II vent material

CHEMINEE LINING.E inc.

8195, Champ d'Eau
St-Léonard, PQ H1P 1Y1
Tel.: (514) 955-1731
Fax: (514) 955-7375
e-mail: sales@chemineelining.com
www.chemineelining.com

Flexmaster Canada Ltd.*

Head Office
20 West Pearce Street
Richmond Hill, ON L4B 1E3
Tel.: (905) 731-9411
Fax: (905) 731-7086
www.flexmaster.com

Security Chimneys

International Ltd.*

2125 Monterey
Laval, PQ H7L 3T6
Tel.: (450) 973-9999
Fax: (450) 687-9569

Selkirk Canada

1400 California Ave.
Brockville, ON K6V 5V3
Toll free: 1-800-267-8178
Fax: (613) 342-2735
www.selkirkinc.com

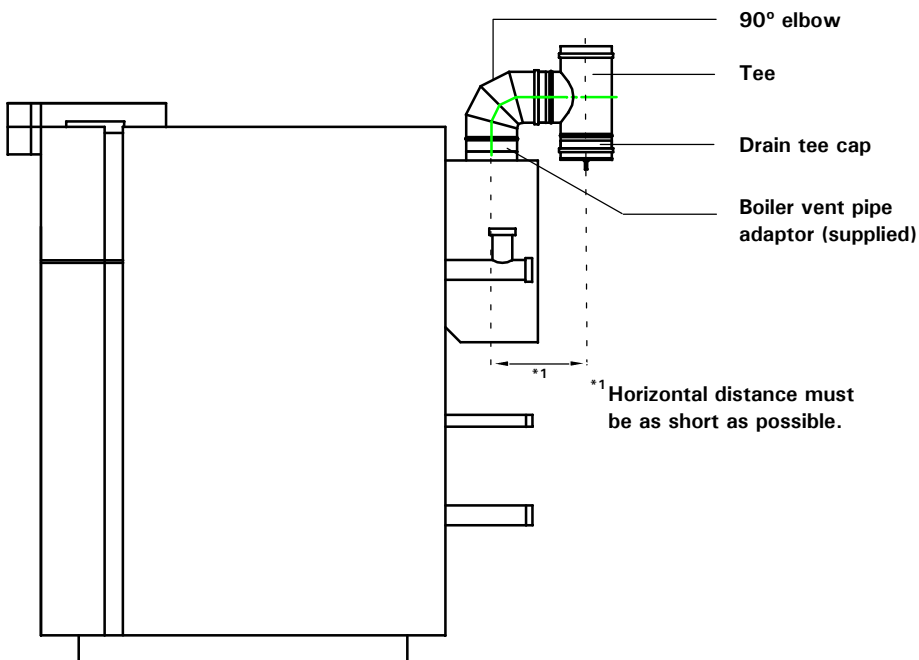


Fig. 1
Recommended venting connection for all Vitogas 100, GS10 installations

System Design Considerations (continued)

Recommended manufacturers of Category II vent material (continued)

Heat-Fab Inc.
130 Industrial Blvd.
Turners Falls, MA 01376
Toll free: 1-800-772-0739
Fax: (413) 863-4803
www.heat-fab.com

Metal-Fab, Inc.
P.O. Box 1138
Wichita, KS 67201-1138
Tel.: (316) 943-2351
Fax: (316) 943-2717
www.mtlfab.com

ProTech Systems, Inc.
26 Gansevoort Street
Albany, NY 12202
Tel.: (518) 463-7284
Fax: (518) 463-5271
Toll free: 1-800-766-3473
e-mail: protech@capital.net
www.protechinfo.com

The Schebler Co.
Hwy. 67 & Fenno Road
P.O. Box 1008
Bettendorf, IA 52722
Tel.: (563) 359-0110
Fax: (563) 359-8430
www.schebler.com

* Stainless steel 316L vent material from Security Chimneys and Flexmaster is approved by CSA to be used on Vitogas 100, GS10 Series boilers without UL stickers.

Flexible liner venting option:

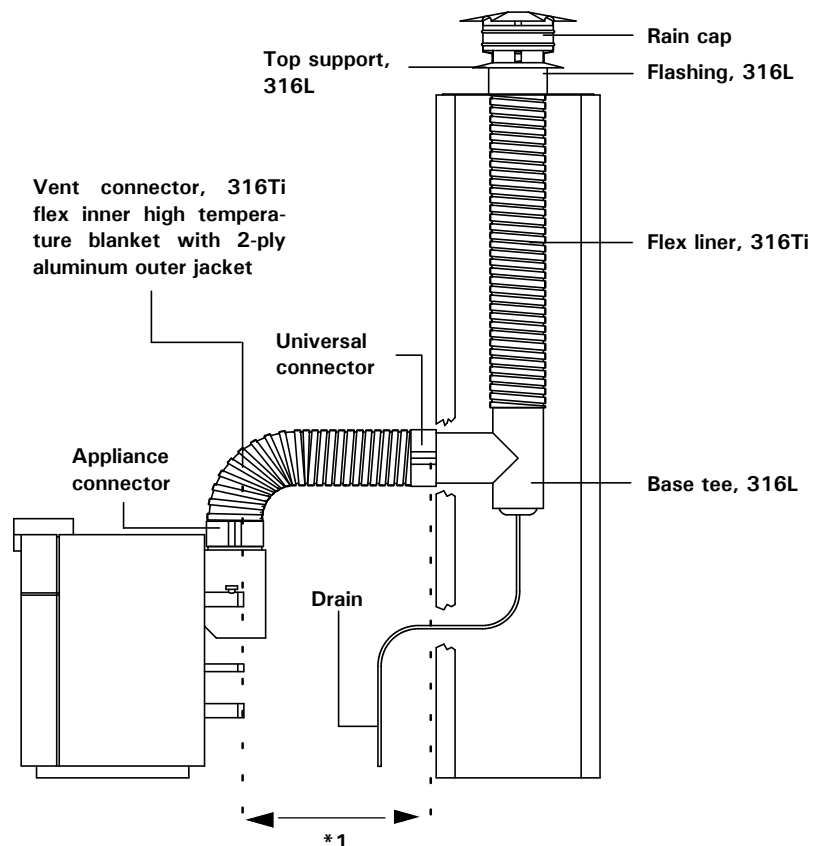
The Vitogas 100, GS10 boiler is CSA approved to be vented using chimney liner supplied by Flexmaster Canada Ltd. **only**.

Follow the installation instructions supplied by Flexmaster.

Flexible liner venting option (continued):

Contact Flexmaster concerning any questions regarding the flexible liner vent system at:

Flexmaster Canada Ltd.
Head Office
20 West Pearce Street
Richmond Hill, ON L4B 1E3
Tel.: (905) 731-9411
Fax: (905) 731-7086
www.flexmaster.com



*1 Horizontal distance of vent connector must be as short as possible.

Vent connector should have a 3° downwards slope toward the chimney liner for proper condensate collection at the base tee.

Fig. 1
Flexible liner venting connections
for all Vitogas 100, GS10 boilers

System Design Considerations (continued)

Side wall vent system

A side wall power vent system (optional) can be ordered from Viessmann. This package includes the appropriate power venter, vent terminal, and adaptor fittings for each Vitogas 100, GS10 boiler model, as well as the installation instructions.

The vent system must terminate so that proper clearances are maintained as cited in the National Fuel Gas Code, ANSI Z223.1 and as detailed in the Side Wall Vent System Installation Instructions. Observe and follow these instructions carefully.



WARNING

When the side wall vent system (optional) is used, the vent damper (optional) MUST NOT be installed.

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

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 if uncertainties exist in regard to a suitable boiler installation location.

This boiler/burner unit needs clean fresh air for safe operation and must be installed so that there are provisions for adequate combustion and ventilation air.

For gas or propane, use the "Natural Gas Installation Code CAN/CSA-B149.1 or B149.2" (Canada), or "National Fuel Gas Code ANSI Z223.1" (USA), and/or provisions of local codes.

The sizing methods outlined in the above codes should be used when installing a round duct to supply combustion air from the outside.

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, we recommend 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

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** use antifreeze other than specifically made for hot water heating systems. The system may contain components which might be negatively affected by antifreeze. Check total system frequently when filled with antifreeze.

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.

Low water cut-off

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

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Warwick, Rhode Island • 02886 • USA
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