

Technical Data Manual

Model Nos. and pricing: see Price List



Vitogas 100

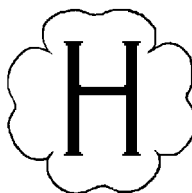


Vitogas 100 with boiler stand
beside Vitocell-V 100 domestic hot water storage tank

Vitogas 100

GS1 Series – residential, fully assembled boiler

Natural Gas-/Propane-Fired, Single-Stage Boiler
cast iron sectional construction
atmospheric, fully premix burner
Heating input: 90 to 240 MBH
26 to 70 kW

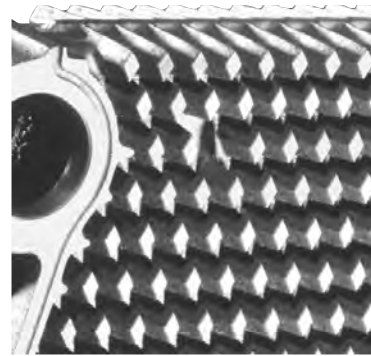


Vitogas 100

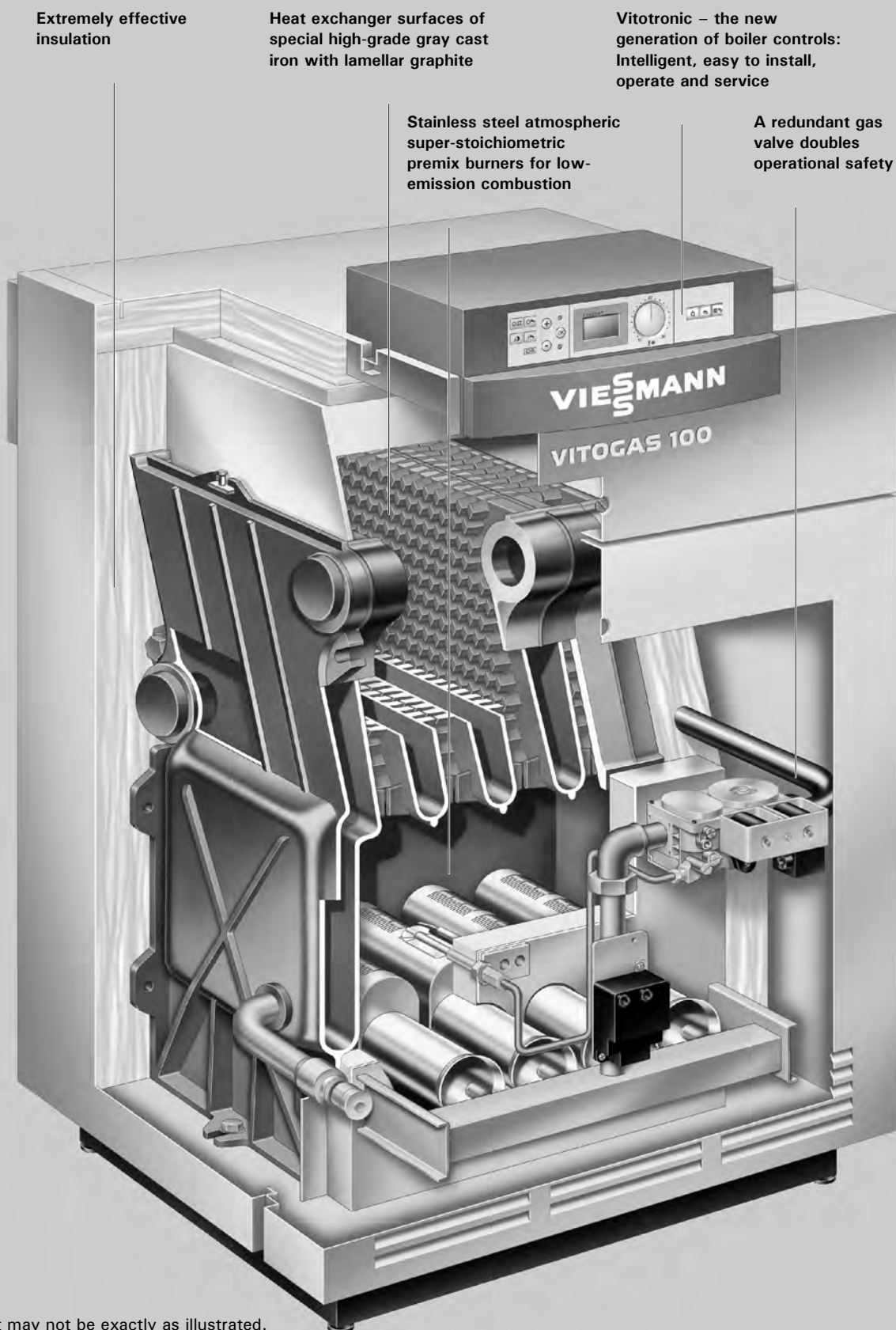
Top performance in a small package. Thanks to its compact dimensions, the Vitogas 100 is ideal for installation in closets and alcoves. Apart from saving space, the Vitogas 100 is economical in terms of energy consumption with reduced emissions.

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 meets the toughest emission requirements in North America, such as California regulations (SMAQMD).
- Economical and environmentally friendly operation via modulating boiler water temperatures.
Annual fuel utilization efficiency (A.F.U.E.) of up to 85.6 %.
- Intermittent pilot ignition system provides soft, quiet and **extremely reliable ignition**.
- **Compact dimensions** – therefore suitable for installation in a boiler room, a utility room or even in an open living area.
- **Problem-free transport into difficult-to-access** boiler rooms due to light weight and compact design.



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



Technical Data

Technical data

Boiler Model	Model No.	GS1-22	GS1-29	GS1-35	GS1-42	GS1-48	GS1-60
CSA input	MBH	90	115	145	165	190	240
	kW	26	34	42	48	56	70
CSA output / DOE heating capacity	MBH	76	98	123	140	161	203
	kW	22	29	36	41	47	60
Net I = B = R rating ^{*1}	MBH	66	85	107	122	140	177
	kW	19	25	31	36	41	52
Heat exchanger surface area	ft ²	16.25	21.42	26.48	31.54	36.60	46.82
	m ²	1.51	1.99	2.46	2.93	3.40	4.35
Min. gas supply pressure							
Natural gas	"w.c.	5	5	5	5	5	5
Liquid propane	"w.c.	11	11	11	11	11	11
Max. gas supply pressure ^{*2}	"w.c.	14	14	14	14	14	14
A.F.U.E. ^{*3}	%	85.6	85.5	85.5	85.5	85.5	85.4
Overall dimensions ^{*4}							
Overall length	inches	33 ¾	33 ¾	34	34	34	34
	mm	844	844	864	864	864	864
Overall width	inches	25 ½	25 ½	33	33	36 ½	43 ¾
	mm	650	650	840	840	930	1110
Width	inches	21 ½	21 ½	29	29	32 ½	39 ½
	mm	546	546	736	736	826	1006
Overall height (operation)	inches	33 ¾	33 ¾	33 ¾	33 ¾	33 ¾	33 ¾
	mm	845	845	845	845	845	845
– Height 1 (control unit in position for operation)	inches	37 ½	37 ½	37 ½	37 ½	37 ½	37 ½
	mm	955	955	955	955	955	955
– Height 2 (control unit in position for servicing)	inches	46 ½	46 ½	46 ½	46 ½	46 ½	46 ½
	mm	1180	1180	1180	1180	1180	1180
Height incl. flue pipe elbow	inches	39	39 ¾	39 ¾	39 ¾	42 ½	42 ½
	mm	992	1012	1012	1012	1082	1082
Height of boiler stand	inches	9 ¾	9 ¾	9 ¾	9 ¾	9 ¾	9 ¾
	mm	250	250	250	250	250	250
Height of DHW tank positioned under the boiler							
– 42 to 53 USG/ 160 to 200 liter capacity	inches	26	26	26	26	—	—
	mm	660	660	660	660		
Weight, boiler with insulation, burner and boiler control unit	lbs	273	326	375	428	481	582
	kg	124	148	170	194	218	264
Boiler water content	USG	2.6	3.1	3.6	4.2	4.7	5.8
	ltr	9.7	11.7	13.8	15.9	17.9	21.9
Max. operating pressure	psig	60	60	60	60	60	60
Number of intermediate cast iron sections		2	3	4	5	6	8
Number of burners		3	4	5	6	7	9

Technical data (continued)

Boiler connections							
Boiler supply and return	" (male thread)	1 ½	1 ½	1 ½	1 ½	1 ½	1 ½
Safety supply	" (male thread)	1 ½	1 ½	1 ½	1 ½	1 ½	1 ½
Drain valve	" (male thread)	¾	¾	¾	¾	¾	¾
Gas supply connection	" (NPT)	½	½	½	½	½	½
Flue gas ^{*5}							
Temperature (gross)	°F	230	230	235	266	230	252
	°C	110	110	113	130	110	122
Mass flow rate							
– with natural gas	lbs/h	161	216	236	231	342	353
	kg/h	73	98	107	105	155	160
– with liquid propane	lbs/h	148	209	209	223	322	337
	kg/h	67	95	95	101	146	153
Vent pipe collar	outside Ø"	5	6	6	6	7	7

^{*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.

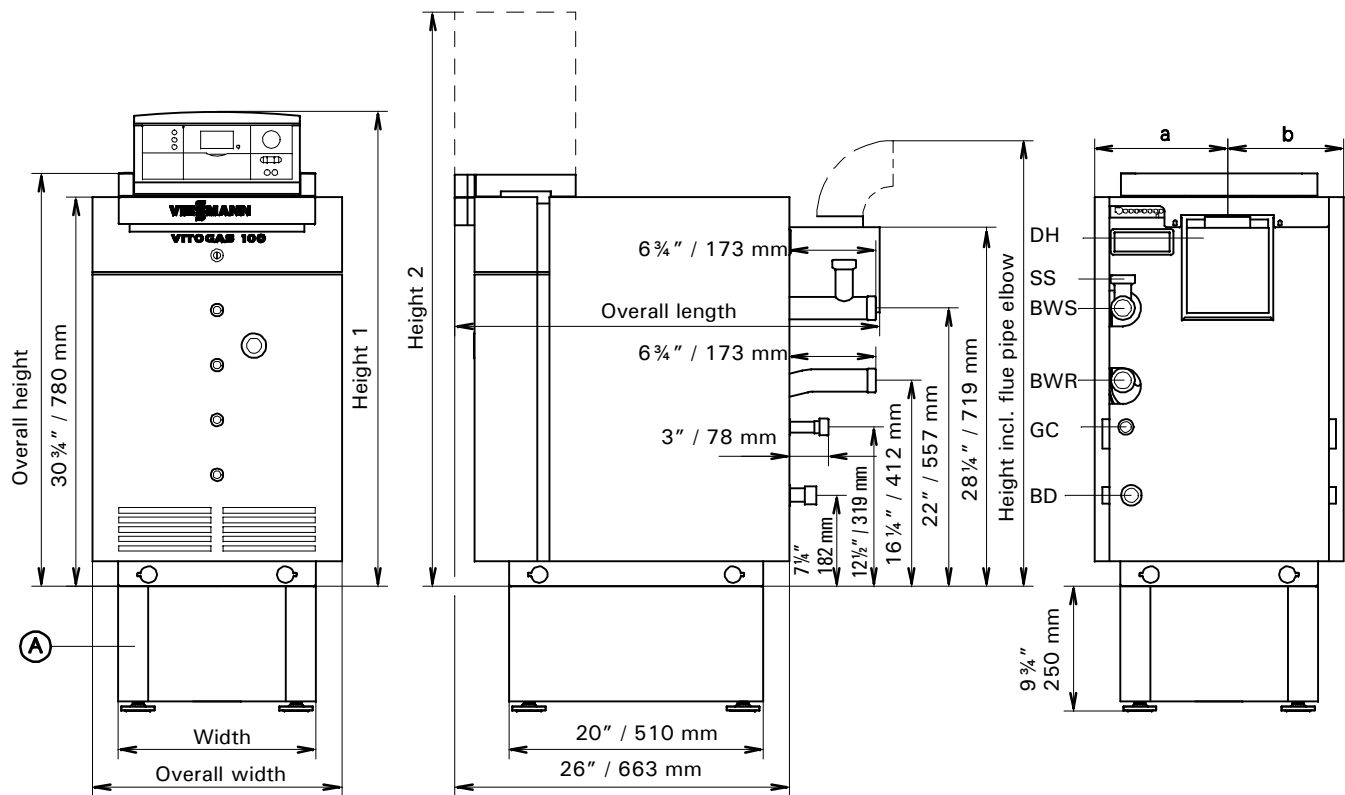
^{*3}With intermittent pilot electronic ignition system and vent damper.

^{*4}Height dimensions for Vitogas 100 include leveling bolts.

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

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

Technical Data



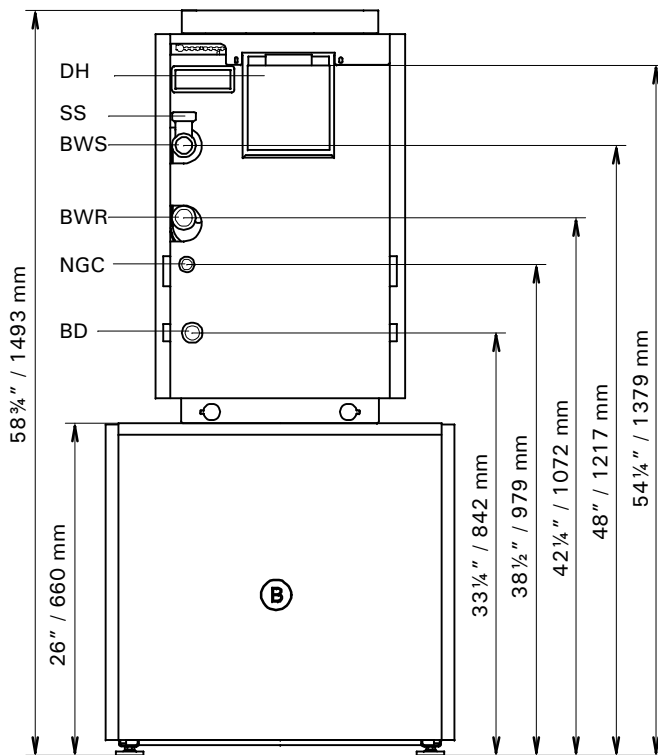
Legend

- BD Boiler Drain
- BWR Boiler Water Return
- BWS Boiler Water Supply
- DH Draft Hood
- GC Gas Connection
- SS Safety Supply

- (A) Boiler Stand (Accessory)
- (B) Vitocell-H – only those combinations which are stated in the Price List are possible. See Boiler/Tank Compatibility Chart on following page.

Dimensions

Boiler Model	GS1	-22	-29	-35	-42	-48	-60
a	inches	12 1/4	14 1/4	15 3/4	17 3/4	19 1/2	23
	mm	313	359	402	448	494	587
b	inches	13 3/4	11 1/2	17 3/4	15 1/2	17 3/4	20 1/2
	mm	337	291	438	392	436	523



Boiler/Tank Compatibility

Support bars may be required when mounting a Vitogas 100, GS1 boiler on a Viessmann Vitocell-H Series tank. Refer to the following chart to determine whether support bars are required for your application.

Order numbers are listed for boiler/tank combinations requiring support bars.

Certain boilers (listed with a "◆" in the chart) are directly compatible with the Vitocell-H tank and thus do not require additional hardware.

Combinations listed with "n.a." are incompatible. Do **not** attempt to install these combinations.

For more information see Viessmann Price List.

Boiler/Tank Compatibility

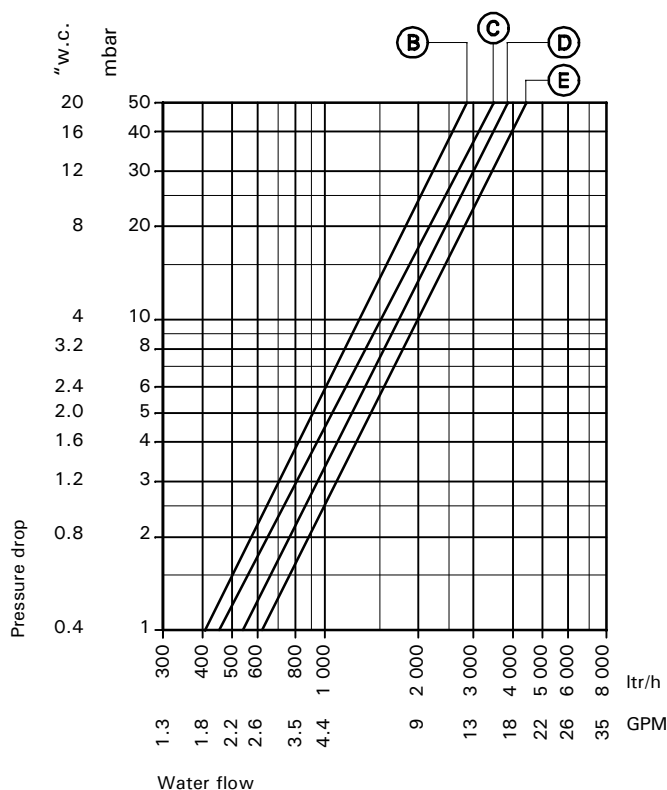
Vitogas 100	Vitocell-H 100 DHW storage tank		Vitocell-H 300 DHW storage tank			
	CHA-160	CHA-200	EHA-160	EHA-200	EHA-350	EHA-450
GS1-22/-29	◆	◆	◆	◆	n.a.	n.a.
GS1-35	◆	◆	◆	◆	◆	n.a.
GS1-42	n.a.	◆	n.a.	◆	◆	n.a.
GS1-48	n.a.	n.a.	n.a.	n.a.	◆	Z001 060
GS1-60	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Order No. = Support bars are required.

◆ = Support bars are not required. Boiler/tank are directly compatible.

n.a. = Boiler/tank are incompatible. Neither mounting with support bars, nor direct-mounting possible.

Waterside Flow (primary circuit)



- (B) GS1-22
- (C) GS1-29
- (D) GS1-35 and -42
- (E) GS1-48 and -60

Typical Flow Rates

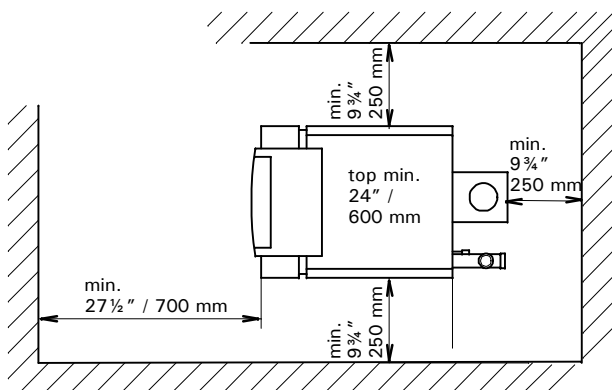
Boiler Model	GS1	-22	-29	-35	-42	-48	-60
20°F rise	GPM	7.5	9.8	12.3	14.0	16.1	24
	m ³ /h	1.7	2.2	2.8	3.2	3.6	5.4
30°F rise	GPM	5.0	6.5	8.2	9.3	10.7	16.0
	m ³ /h	1.1	1.5	1.9	2.1	2.4	3.6

Use standard friction loss method for pipe sizing.

Technical Data

Standard Equipment/Boiler Control Alternatives

Recommended Minimum Service Clearances



Minimum Clearances to Combustibles

Boiler Model	GS1	-22	-29	-35	-42	-48	-60
Rear (from draft hood)	inches	6	6	6	6	6	6
	mm	150	150	150	150	150	150
Sides	inches	0	0	0	0	0	0
	mm	0	0	0	0	0	0
Flue	inches	6	6	6	6	6	6
	mm	150	150	150	150	150	150
Top	inches	6	6	6	6	6	6
	mm	150	150	150	150	150	150
Floor	Combustible						

All clearances are measured from boiler enclosure panel.

Standard Equipment

Note:

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

Boiler shell with mounted insulating jacket and atmospheric premix burners for natural gas or liquid propane conforming to local regulations.
 1 carton with boiler installation fittings
 1 carton with safety header
 1 carton containing either a vent damper or a power venter (please specify at time of order).

Carrying handles (accessory) are available to facilitate transport to the boiler location. See Price List.

See previous page and/or Price List for possible boiler/DHW tank combinations.

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

System Design Considerations

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

Boiler selection

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

Venting

For proper operation of the Vitogas 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 Vitogas boiler.

Flue gases which cool too quickly and produce condensation lead to damages if the chimney diameter is too large and the chimney system is not well insulated. If a calculated chimney diameter lies between two values, the larger diameter should be selected.

The Vitogas 100, GS1 boiler is a Category I boiler as defined in the ANSI Z21.13 CSA 4.9 Standard. Use approved vent material (such as B-vent) only.

Intermediate section

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 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.

Warranty

Our warranty does not cover damages resulting from the following:

- installation or service by unqualified and not licensed personnel
- corrosion caused by flue gas condensation due to low boiler water and/or return water temperatures
- operation with contaminated fill and supplementary feed water

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

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. System also 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.

Installation Examples

IMPORTANT

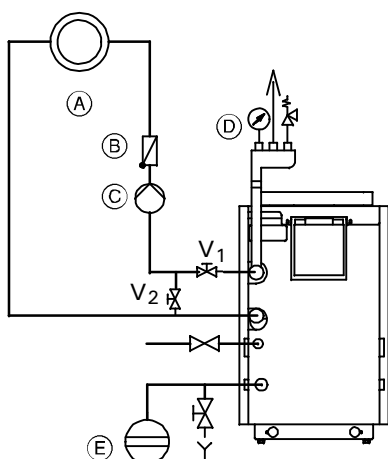
These examples depict possible piping layouts for Viessmann product equipped with Viessmann System Technology. For boiler and tank combinations, please install only the feasible combinations listed in the Price List.

These are simplified conceptual drawings only! Piping and necessary componentry must be field verified.

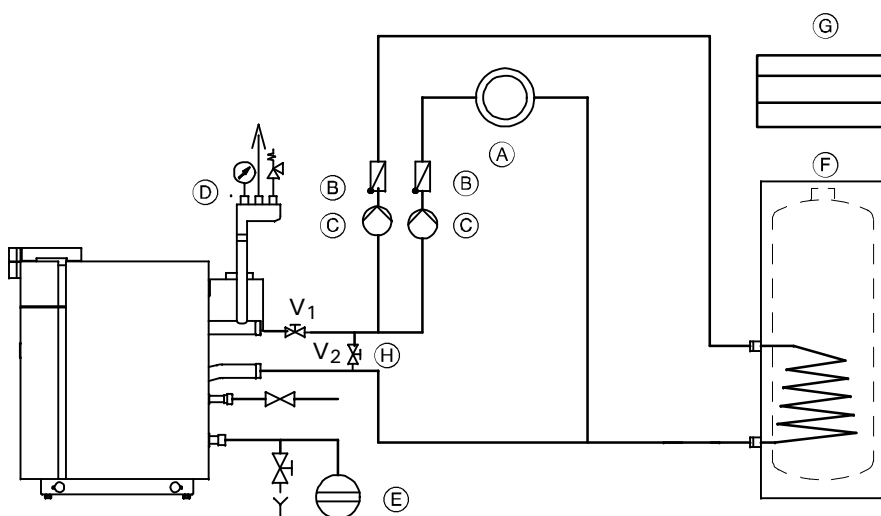
Proper installation and functionality in the field is the responsibility of the heating contractor.

Without mixing valve

e.g. with Vitotronic 100



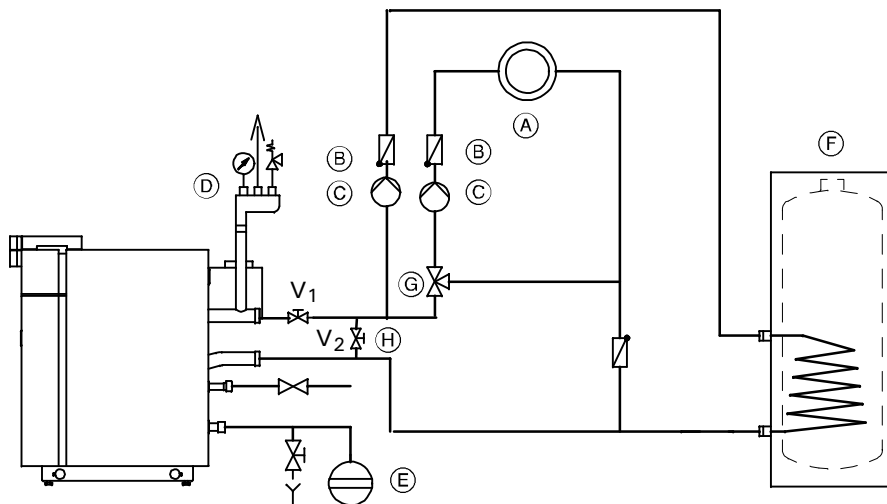
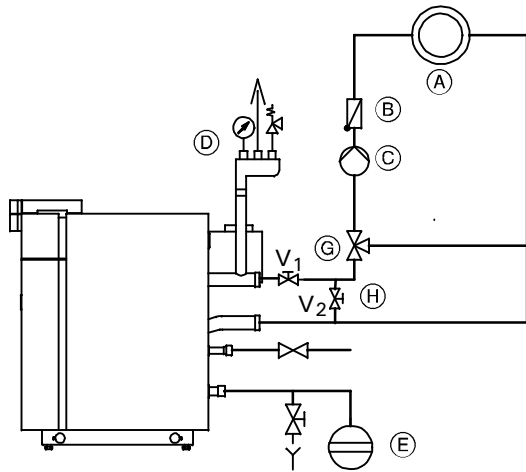
The installation of the check valve to restrict gravity circulation in the heating supply pipe prevents uncontrolled heat flow to the heating system by gravity during priority switching of domestic hot water heating or during summer operation.



- (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.

With 3-way mixing valve to regulate heating circuit

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

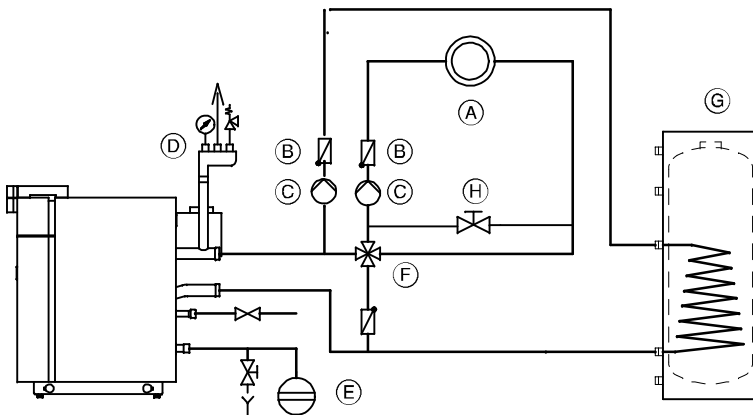
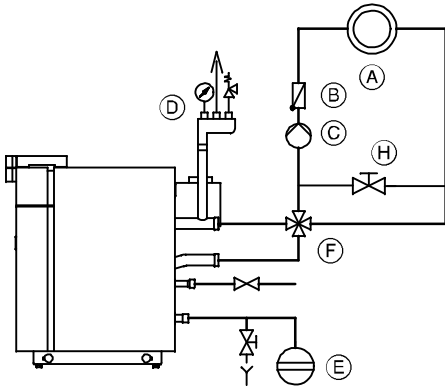


- Ⓐ Heating circuit
 - Ⓑ Spring-loaded flow check valve
 - Ⓒ Circulation pump
 - Ⓓ Safety header with automatic air vent, pressure relief valve, and pressure gage
 - Ⓔ Expansion tank
 - Ⓕ Domestic hot water storage tank (indirect-fired)
 - Ⓖ 3-way mixing valve
 - Ⓗ Bypass pipe (highly recommended) c/w two regulating valves (V₁, V₂)
- See Installation Instructions for details.

Installation Examples

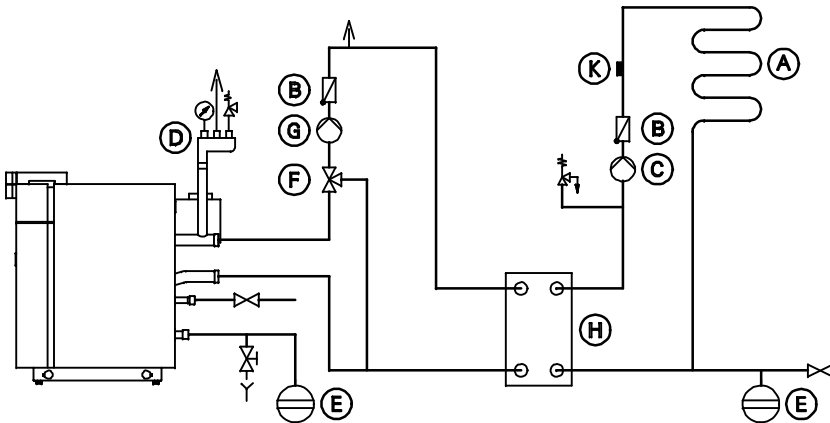
With 4-way mixing valve to regulate heating circuit

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



- Ⓐ Heating circuit
- Ⓑ Spring-loaded flow check valve
- Ⓒ Circulation pump
- Ⓓ Safety header with automatic air vent, pressure relief valve, and pressure gage
- Ⓔ Expansion tank
- Ⓕ 4-way mixing valve
- Ⓖ Domestic hot water tank (indirect-fired)
- Ⓗ 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 system with system separation



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