

# Technical Data Manual

Model Nos. and pricing : See Price List

# VIESSMANN®



## VITOCELL® 100-VH/-BH



*Product may not be exactly as shown*

### NCVA and NCVB Series

Indirect-fired domestic hot water storage tank with one or two heat exchanger coils. With or without an optional electric heating element.

Storage capacity: 79 USG (300 L)  
119 USG (450 L)

Anticorrosive according to DIN 4753, Mg-Safety Anode or Correx Anode

**A.G.A. Requirement for Indirect Water Heaters  
For Use With External Heat Source, No. 1-91**



**Intertek**  
4000699

Conforms to UL 174, IAS 1-91  
Certified to CSA C22.2 no. 110

## Vitocell 100

### Benefits at a glance:

- Upright storage tank made of steel S235JR with one or two large surface bare-tube heat exchangers.
- Glass-lined (enameled) tank in accordance with DIN 4753 part 3 on the inside, primer coated on the outside.
- Vitocell 100, NCVB-BH series for a dual-mode DHW heating with solar panels in conjunction with a boiler.
- Magnesium protection anode of 1¼ in. provided for completion of the cathodic corrosion protection in accordance with DIN 4753 part 6.
- Temperature probe can be placed in variable positions due to the use of sensor terminal blocks.
- Nylon insulation jacket is dent-resistant.
- Standby losses minimized by highly effective 2 in. (50 mm) foamed-in-place CFC-free insulation.
- Thermometer included.
- Sensor tube included.
- Fitted with 1½ in. sleeve for re-fitting of an electric heating inspection opening.
- All external threads are flat sealing.
- CFC free soft PU-foam insulation with a thickness of 2 in. (50 mm) and a PVC coating. Bottom insulation included, in accordance with DIN 4753 Part 8.
- Compressive strength 150 psi (10 bar).

### Standard Equipment

#### 79 USG (300 L) capacity Tank

DHW tank made from high-grade steel with fitted CFC free soft PU-foam thermal insulation.

- 1 temperature and pressure relief valve
- thermometer °F/°C

Must be ordered separately:

- Electric heater

#### 119 USG (450 L) capacity Tank

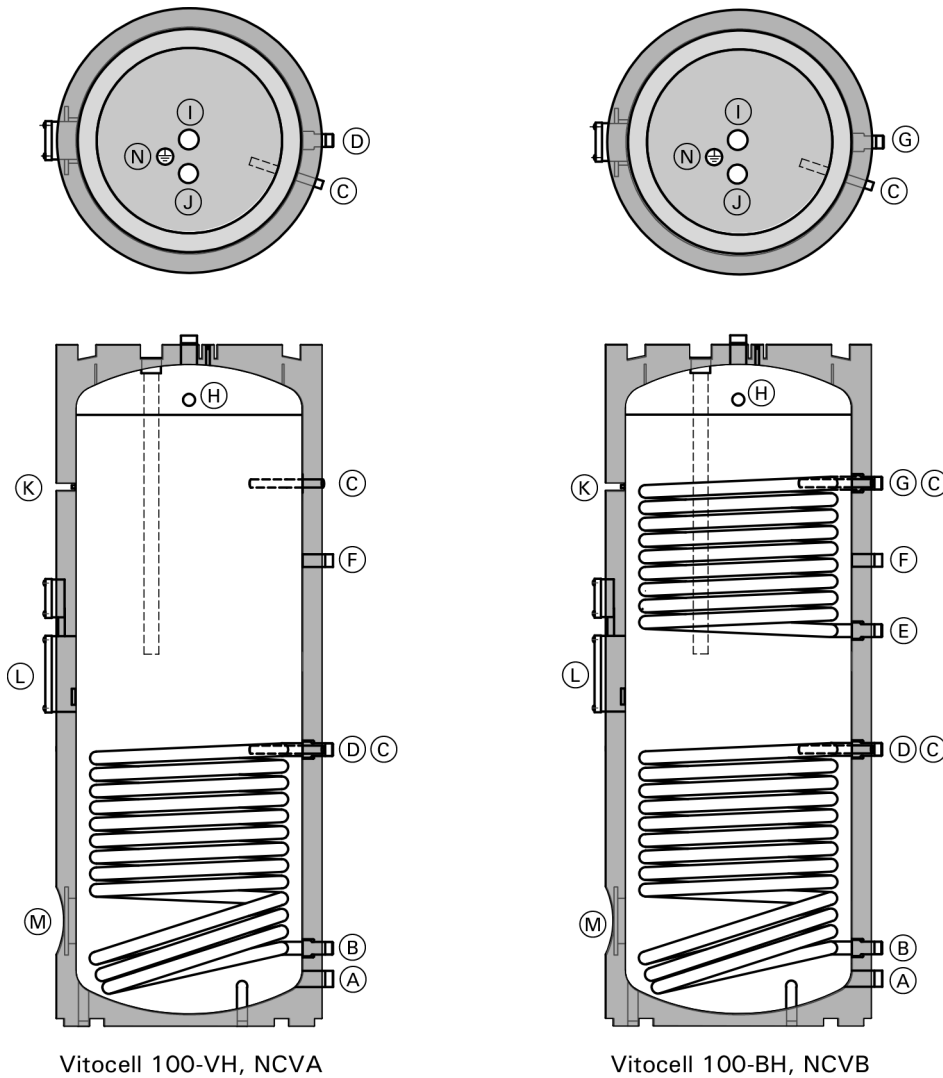
DHW tank made from high-grade steel with fitted CFC free soft PU-foam thermal insulation.

- 1 temperature and pressure relief valve
- thermometer °F/°C

Must be ordered separately:

- Electric heater

**Connections**



**Legend**

- (A) DCW connection
- (B) Solar - Return (lower coil)
- (C) Sensor sleeve
- (D) Solar - Supply (lower coil)
- (E) Heating - Return (upper coil)
- (F) Recirculation
- (G) Heating - Supply (upper coil)
- (H) 3/4 in. NPT for safety valve
- (I) DHW connection
- (J) Magnesium Anode or impressed-current anode
- (K) Thermometer option
- (L) Electric heater option
- (M) Inspection/maintenance opening
- (N) Ground connection

Connections		Vitocell 100-VH, NCVA 79 USG (300 L)	Vitocell 100-VH, NCVA 119 USG (450 L)	Vitocell 100-BH, NCVB 79 USG (300 L)	Vitocell 100-BH, NCVB 119 USG (450 L)
(A)	Ø" male	1 in.	1 1/4 in.	1 in.	1 1/4 in.
(B)	Ø" male	1 in.	1 in.	1 in.	1 in.
(D)	Ø" male	1 in.	1 in.	1 in.	1 in.
(E)	Ø" male	--	--	1 in.	1 in.
(F)	Ø" male	3/4 in.	1 in.	3/4 in.	1 in.
(G)	Ø" male	--	--	1 in.	1 in.
(I)	Ø" male	1 in.	1 1/4 in.	1 in.	1 1/4 in.

**Technical Data**

Model #		Vitocell 100-VH NCVA	Vitocell 100-VH NCVA	Vitocell 100-BH NCVB	Vitocell 100-BH NCVB
Coil(s)		Lower	Lower	Upper/Lower	Upper/Lower
Storage Capacity	USG	79.2	119	79.2	119
	L	300	450	300	450
Water Content Heating Circuit	USG	--	--	1.3	2.5
	L			5.6	9.4
Water/Glycol content Solar Circuit	USG	2.5	3.1	2.5	3.1
	L	9.4	11.9	9.4	11.9
Tube Length (top)	ft.	--	--	24.9	37.1
	m			7.6	11.3
Tube Length (bottom)	ft.	37.1	59.1	37.1	59.1
	m	11.3	18.0	11.3	18.0
<b>Max. Operating Pressure</b>					
Domestic water	psi	150	150	150	150
	bar	10.34	10.34	10.34	10.34
Heating Circuit	psi	230	230	230	230
	bar	16	16	16	16
Solar Circuit	psi	230	230	230	230
	bar	16	16	16	16
<b>Test Pressure</b>					
Domestic water	psi	300	300	300	300
	bar	20.7	20.7	20.7	20.7
Heating Circuit	psi	--	--	300	300
	bar			20.7	20.7
Solar Circuit	psi	300	300	300	300
	bar	20.7	20.7	20.7	20.7
<b>Max. Operating Temp.</b>					
Warmwater	°F	210	210	210	210
	°C	98.9	98.9	98.9	98.9
Heating Circuit	°F	--	--	320	320
	°C			160	160
Solar Circuit	°F	320	320	320	320
	°C	160	160	160	160
<b>Electric Heating</b>					
Normal thermostat Setting	°F	120	120	120	120
	°C	49	49	49	49
Element Rating	kW	4.5	4.5	4.5	4.5
Rated Voltage	Volts	240	240	240	240
Frequency	Hz	60	60	60	60
Single Phase					

**Technical Data** *(continued)*

For DHW production in conjunction with solar systems and heating boilers, and heating systems without low limit for dual coil operation.

Suitable for heating systems with:

- max. working pressure on heat exchanger side up to 230 psig at 230° F (110° C)
- max. working pressure on DHW water side of up to 150 psig at 210° F (99° C)
- max. testing pressure on DHW side of 300 psig

Model #		Vitocell 100-VH NCVA	Vitocell 100-VH NCVA	
Storage Capacity	USG	79.2	119	
	L	300	450	
Coil		Lower *1	Lower *1	
Recovery Rate*2 with a DHW temperature increase from 50° F to 113° F (10° C to 45° C) and a supply water temperature of . . . .	90°C	MBH (kW)	181 (52.92)	
		GPH (L/h)	343.4 (1300)	
	80°C	MBH (kW)	150 (43.96)	
		GPH (L/h)	285.3 (1080)	
	70°C	MBH (kW)	112 (32.97)	
		GPH (L/h)	214.0 (810)	
	60°C	MBH (kW)	78 (23.00)	
		GPH (L/h)	149.3 (565)	
	50°C	MBH (kW)	61 (17.99)	
		GPH (L/h)	116.8 (442)	
	Recovery Rate*2 with a DHW temperature increase from 50° F to 140° F (10° C to 60° C) and a supply water temperature of . . . .	90°C	MBH (kW)	153 (44.95)
			GPH (L/h)	204.2 (773)
80°C		MBH (kW)	116 (33.90)	
		GPH (L/h)	154.0 (583)	
70°C		MBH (kW)	78 (22.91)	
		GPH (L/h)	104.1 (394)	
Standby Losses *3	MBH / 24h	8.2	10.2	
	kWh / 24h	2.4	3.0	
Weight (with insulation)	lb.	243	377	
	kg	110	171	

\*1 The lower coil is designated for connection to solar collector panels, heat pumps or hot water heating boiler.

\*2 When planning for the recovery rate as stated or calculated, allow for the corresponding circulation pump. The stated recovery rate is only achieved when the rated output of the boiler is equal to or greater than that stated under "Recovery Rate".

\*3 Measured values are based on a room temperature of 68° F (20° C) and a domestic hot water temperature of 149° F (65° C) and can vary by 5%.

**Technical Data** *(continued)*

For DHW production in conjunction with solar systems and heating boilers, and heating systems without low limit for dual coil operation.

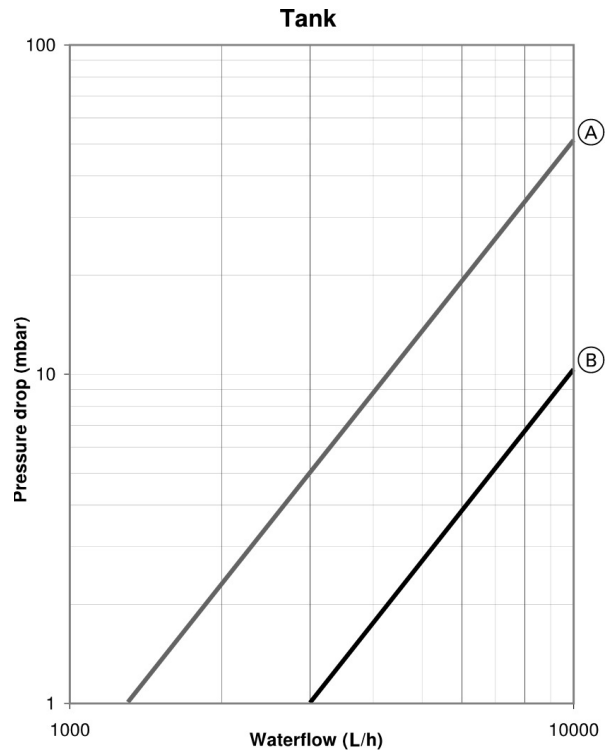
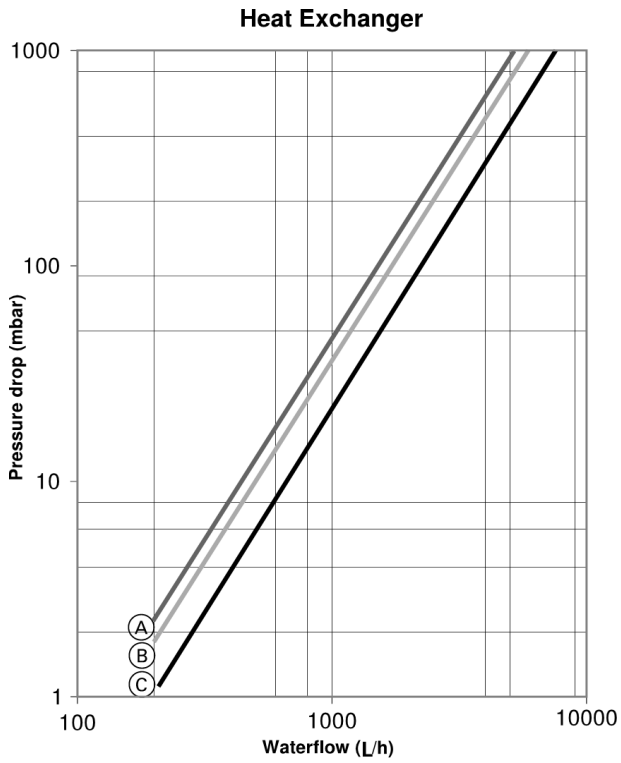
Suitable for heating systems with:

- max. working pressure on heat exchanger side up to 230 psig at 230° F (110° C)
- max. working pressure on DHW water side of up to 150 psig at 210° F (99° C)
- max. testing pressure on DHW side of 300 psig

Model #		Vitocell 100-BH NCVB		Vitocell 100-BH NCVB			
Storage Capacity	USG	79.2		119			
	L	300		450			
Coil		Upper *1	Lower *2	Upper *1	Lower *2		
Recovery Rate*3 with a DHW temperature increase from 50° F to 113° F (10° C to 45° C) and a supply water temperature of . . . .	90° C	MBH (kW)	110 (32.36)	181 (52.92)	142 (41.76)	239 (70.01)	
		GPH (L/h)	210.0 (795)	343.4 (1300)	271.0 (1026)	454.4 (1720)	
	80° C	MBH (kW)	92 (26.87)	150 (43.96)	118 (34.60)	198 (58.00)	
		GPH (L/h)	174.4 (660)	285.3 (1080)	224.5 (850)	376.4 (1425)	
	70° C	MBH (kW)	69 (20.15)	112 (32.97)	92 (26.87)	154 (45.02)	
		GPH (L/h)	130.8 (495)	214.0 (810)	174.4 (660)	292.2 (1106)	
	60° C	MBH (kW)	48 (14.04)	78 (23.00)	65 (19.09)	109 (32.03)	
		GPH (L/h)	91.1 (345)	149.3 (565)	123.9 (469)	207.9 (787)	
	50° C	MBH (kW)	37 (10.99)	61 (17.99)	49 (14.29)	82 (23.98)	
		GPH (L/h)	71.3 (270)	116.8 (442)	92.7 (351)	155.6 (589)	
	Recovery Rate*3 with a DHW temperature increase from 50° F to 140° F (10° C to 60° C) and a supply water temperature of . . . .	90° C	MBH (kW)	94 (27.50)	153 (44.95)	108 (31.58)	181 (52.97)
			GPH (L/h)	125.0 (473)	204.2 (773)	143.4 (543)	240.7 (911)
80° C		MBH (kW)	71 (20.70)	116 (33.90)	90 (26.23)	150 (44.02)	
		GPH (L/h)	94.0 (356)	154.0 (583)	119.1 (451)	200.0 (757)	
70° C		MBH (kW)	48 (14.01)	78 (22.91)	67 (19.65)	112 (32.97)	
		GPH (L/h)	63.7 (241)	104.1 (394)	89.3 (338)	149.8 (567)	
Standby Losses*4	MBH / 24h	8.9		10.9			
	kWh / 24h	2.6		3.2			
Weight (with insulation)	lb.	277		435			
	kg	126		197			

- \*1 The upper coil is designated for connection to a hot water heating boiler or a heat pump.
- \*2 The lower coil is designated for connection to solar collector panels or heat pumps.
- \*3 When planning for the recovery rate as stated or calculated, allow for the corresponding circulation pump. The stated recovery rate is only achieved when the rated output of the boiler is equal to or greater than that stated under "Recovery rate".
- \*4 Measured values are based on a room temperature of 68°F (20° C) and a domestic hot water temperature of 149°F (65° C) and can vary by 5%.

**Flow Rate**

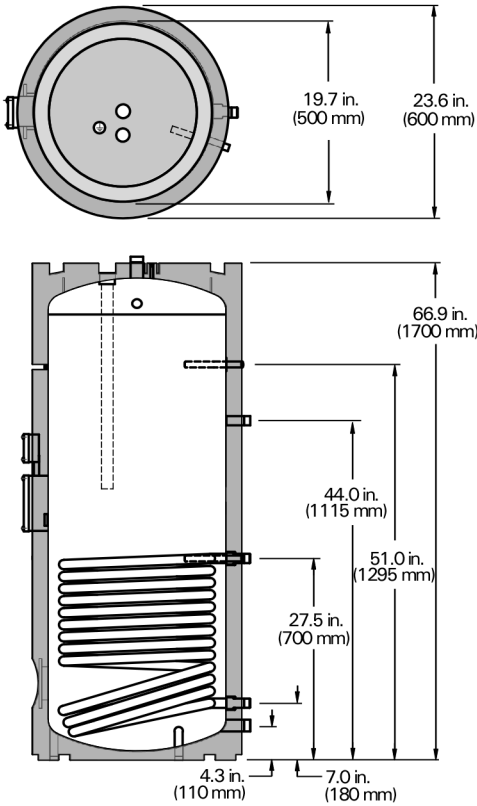


- Ⓐ Lower coil, 119 USG (450 L) capacity
- Ⓑ 79 USG (300 L) Lower coil and 119 USG (450 L) Upper coil
- Ⓒ 79 USG (300 L) Upper coil

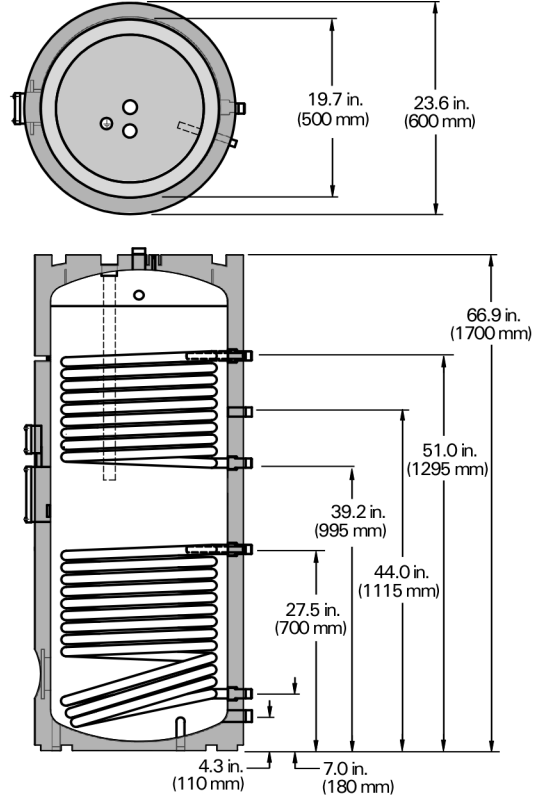
- Ⓐ 79 USG (300 L)
- Ⓑ 119 USG (450 L)

**Dimensions**

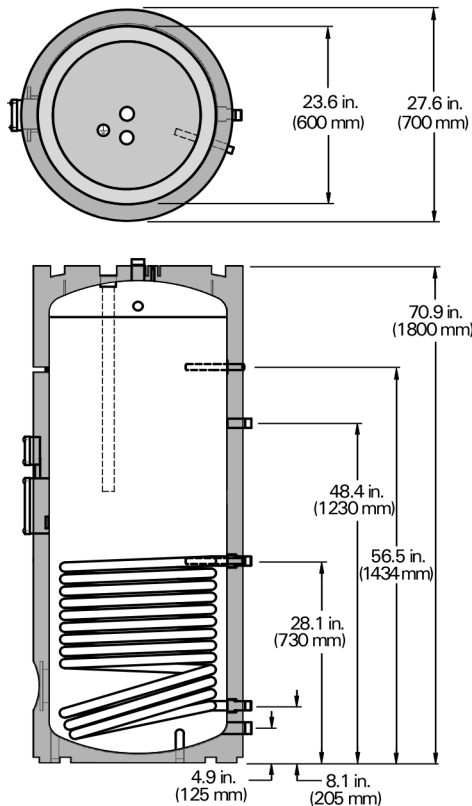
**Vitocell 100-VH, NCVA**



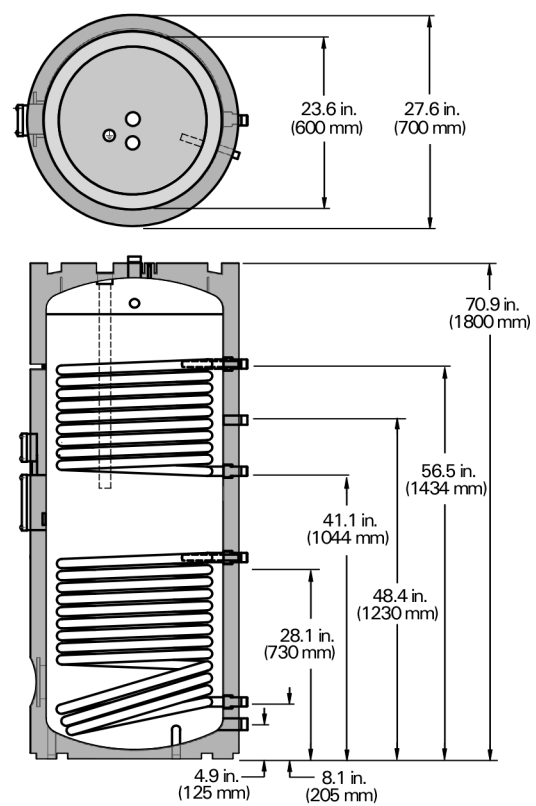
**Vitocell 100-BH, NCVB**



**Vitocell 100-VH, NCVA**

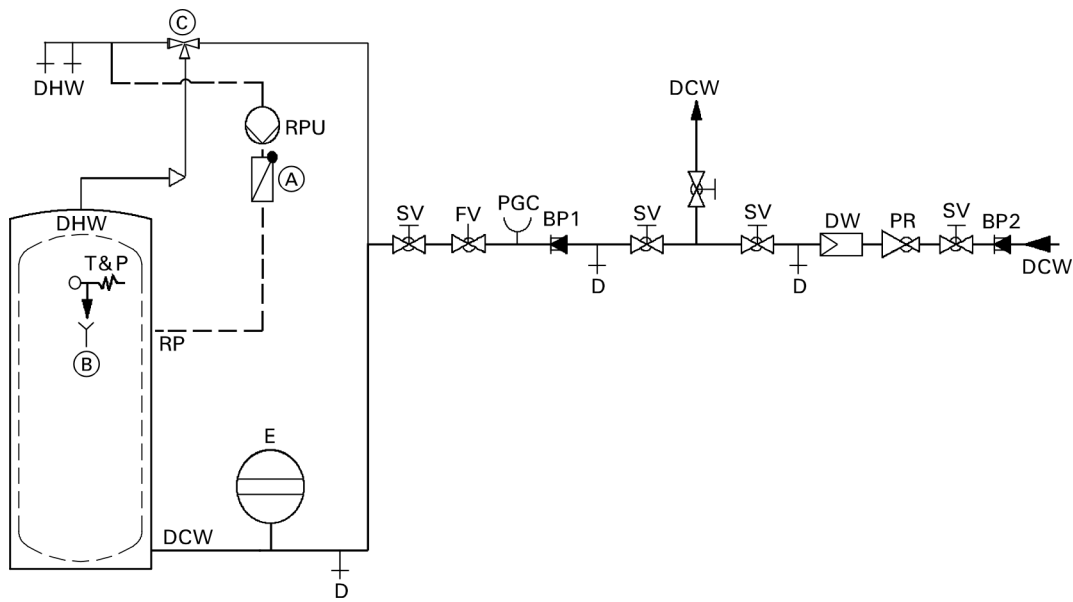


**Vitocell 100-BH, NCVB**



# Installation Example

## Heating system connection

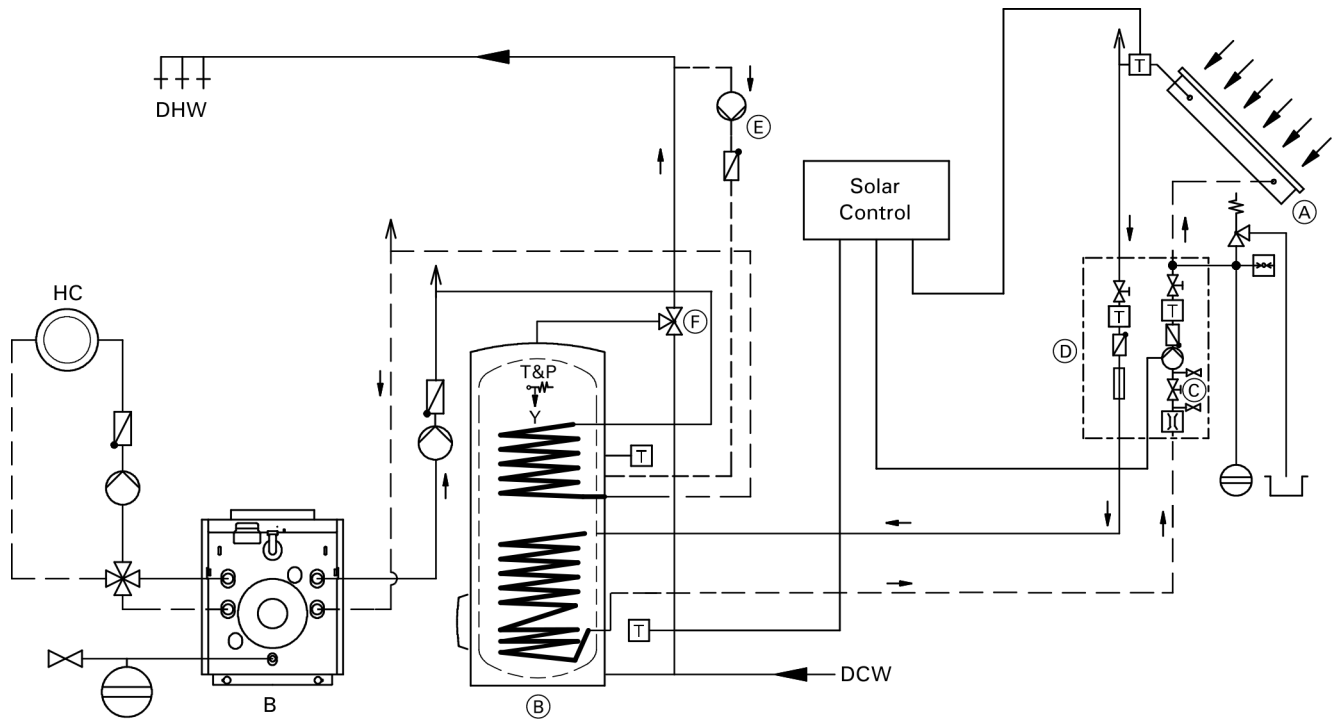


### Legend

- (A) Spring-loaded flow check valve
- (B) Discharge pipe
- (C) Anti-scald tempering valve (field supplied)
- SV Shut-off valve
- FV Flow check valve
- PR Pressure reducing valve
- D Drain
- DCW Cold water supply lines
- PGC Pressure gage connection
- E Precharged expansion tank (required where backflow preventer is installed; check local plumbing codes and requirements)
- BP1 Backflow preventer
- BP2 Backflow preventer
- T&P Temperature and pressure relief valve
- DW Water filter
- DHW Domestic hot water supply
- RP Recirculation pipe
- RPU Recirculation pump

**Installation Example** *(continued)*

**Solar connection**



**Legend**

- (A) Solar collector
- (B) Vitocell 100
- (C) Filling valve
- (D) Solar-Divicon (pumping station)
- (E) Recirculating pump
- (F) Anti-scald tempering valve
- HC Heating circuit
- B Oil/Gas-fired boiler
- DCW Domestic cold water
- DHW Domestic hot water
- T&P Temperature and pressure relief valve

## System Design

### Sensor well

The stainless steel sensor wells are to be used for control sensors to ensure maximum operational safety. The top sensor well is used for the DHW sensor connected to the boiler control.

For solar heating systems, Viessmann recommends placement of the DHW tank temperature sensor in the solar collector return.

### **! WARNING**

To ensure optimum, safe operation, the stainless steel well must be installed. The well diameter is large enough to accommodate a wide variety of sensing bulbs. Always use spring clip to ensure proper contact of capillary bulb against the stainless steel well for proper sensing/heat transfer!

Heating water supply temperature over 230° F (110°C).

These operating conditions require the installation of an additional safety high limit into the DHW storage tank, preventing the temperature from rising above 203°F (95°C).

### **IMPORTANT**

A domestic hot water tempering valve must be used.

### Temperature and pressure relief valve

The heating contractor must install a temperature and pressure relief valve (T&P relief valve) on each tank in a method meeting code requirements. If local codes require a different relief valve, substitute the manufacturer's supplied valve. The tank is approved for 100 psig where a CRN is required. Maximum operating pressure is 150 psig. Maximum operating temperature is 210° F (99° C). The T&P relief valve must be tested under ANSI Z21.22 Code for Relief Valves and Automatic Gas Shut-off Devices for Hot Water Supply Systems.

### Backflow preventers

Where backflow preventers are required, a domestic water expansion tank installation must be installed in the cold water inlet piping before the cold water enters the Vitocell. For the backflow device, observe local plumbing codes and regulations.

### Electric heating element 4.5 kW

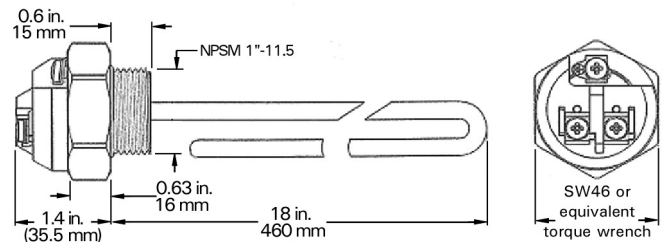
The optional screw-in electric heating element is used in enameled solar and domestic water storage tanks as auxiliary or emergency heating. It should be mounted in a horizontal position by heating contractor.

### **! WARNING**

To avoid damage to the screw head and/or heating element, do not operate the heating element without a medium.

### **! WARNING**

Ensure the heating element ground wire is securely connected to ground.



### **! WARNING**

Do not operate the heating element without a medium. Damage to the heating element and screw head may occur if operated without a medium.



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Technical information subject to change without notice.

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