VIESSMANN®

VITOCELL® 3(

Indirect-fired domestic hot water storag

53 to 119 USG / 200 to 450 ltr

Inspections Division
Date: 10/31/13

Technical Data Manual

Model Nos. and pricing: see Price List

53 and 79 USG /
200 and 300 liter capacity

119 USG / 450 liter
capacity

Vitocell 300-V

EVI Series

Vertical indirect-fired domestic hot water storage tank of high-grade stainless steel

This tank version is not suitable for steam heating applications.

CERTIFIED

DESIGN CERTIFIED

5167 410 v2.5 12/2012

Inspections Division
Date: 10/31/13

Vitocell 300-V

Fully hygienic, efficient and economical domestic hot water production with DHW tanks of high-grade stainless steel – vertical version.

The benefits at a glance:

- Corrosion-resistant tank of **high-grade SA 240-316 Ti stainless steel** offers a long service life.
- Fully hygienic due to **high quality homogeneous stainless steel surfaces**.
- The high alloy material is immune to cracking or peeling. The tank stays hygienic and requires only minimum service.
- **Does not require a consumable anode** for corrosion protection.
- The entire water content is heated by a **1¼" / 32 mm diameter stainless steel heat exchanger surface which extends to the bottom of the tank**.
- The positioning of the tubular heat exchanger coil further ensures that 82 to 97% of the tank volume can be drawn at **constant water temperature**.
- The stainless steel heat exchanger coil is self-venting towards the top and self-draining towards the bottom, therefore not susceptible to reduced heat transfer due to air lock or deposits.
- **Universally suitable** – for applications requiring larger quantities of hot water, multiple vertical tanks can be combined via headers to form tank batteries.
- **Standby losses minimized** by 2¼"/ 58 mm highly effective, foamed-in-place or 4"/100 mm wrap-around PET insulation HCFC-free insulation.
- **Easy transport** into mechanical room due to low weight and compact construction.

5167 410 v2.5

Inspections Division
Date: 10/31/13

Product may not be exactly as illustrated.

5167 410 v2.5

Inspections Division
Date: 10/31/13

Technical data

For domestic hot water heating applications which utilize modulating and low temperature hot water heating boilers

Suitable for heating systems with:
- max. working pressure on **heat exchanger** side up to **220 psig** at 392°F / 200°C
- max. working pressure on **DHW water side** of up to **150 psig** at 210°F / 99°C

Storage capacity		USG	53	79	119
		ltr	200	300	450
Recovery rates[*1] with a temperature rise of the domestic hot water from **50 to 140°F** / **10 to 60°C** and **heating water** supply temperature of ..... at the supply flow rate stated below	194°F 90°C	MBH	215	280	276
		GPM	4.7	6.2	6.1
		ltr/h	1084	1410	1393
	176 °F 80°C	MBH	164	201	212
		GPM	3.6	4.5	4.7
		ltr/h	826	1014	1066
	158 °F 70°C	MBH	99	140	147
		GPM	2.1	3.1	3.3
		ltr/h	499	705	739
Supply flow rate for the recovery rates stated		GPM	22.0	22.0	28.6
		m^3/h	5.0	5.0	6.5
Standby losses[*2]		MBH/24 h	5.5	6.8	9.2
Overall dimensions with insulation[*3]					
Overall width	inches		22 7/8	25	36 1/3
	mm		581	633	923
Overall depth	inches		25 ½	27 ¾	38 3/8
	mm		649	704	974
Overall height	inches		56	70	68 ½
	mm		1420	1779	1740
Tilt height	inches		58	71 ¾	66 ½
	mm		1471	1821	1690
Weight		lbs	168	220	245
Tank with insulation		kg	76	100	111
Heating water content		USG	2.64	2.91	4.0
(heat exchanger pipe coil)		ltr	10	11	15.0
Heat exchanger surface area		ft^2	14	16	20.5
		m^2	1.3	1.5	1.9
Connections					
Heating water supply/return		∅'' (male thread)	1	1	1 ¼
Domestic cold/hot water		∅'' (male thread)	1	1	1 ¼
Temp. and press. relief valve		∅'' (male thread)	1	1	1 ¼
Recirculation		∅'' (male thread)	1	1	1 ¼

*[*1] 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 rates".
Please also refer to the corresponding sizing chart at the end of this manual.

*[*2] 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 %.*

*[*3] For other dimensions, see illustration and table on page 5.*

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

5167 410 v2.5

Inspections Division
Date: 10/31/13

Vitocell 300-V, 53 and 79 USG / 200 and 300 ltr with PUR Foam insulation

Dimensions

Storage capacity	USG / ltr	53 / 200	79 / 300
a	inches	13¾	14½
	mm	353	357
b	inches	12½	13½
	mm	317	343
c	inches	3½	3½
	mm	87	87
d	inches	11¾	11¾
	mm	297	301
e	inches	27½	29½
	mm	697	751
f	inches	35 1/3	37½
	mm	897	951
g	inches	50 2/3	64½
	mm	1286	1640
h	inches	24¼	26¼
	mm	614	665

Legend

AQ Aquastat well
BWR Boiler water return
BWS Boiler water supply
D Drain
DCW Domestic cold water
DHW Domestic hot water
IO Inspection and clean-out opening
RT Recirculation tapping
TPV Temperature and pressure relief valve

Vitocell 300-V, 119 USG / 450 ltr with wrap-around foam insulation

Dimensions

Storage capacity	USG / ltr	119 / 450
a	inches	20
	mm	508
b	inches	18¾
	mm	476
c	inches	19 2/3
	mm	498
d	inches	4
	mm	102
e	inches	17 7/8
	mm	453
f	inches	31½
	mm	802
g	inches	39 7/8
	mm	1012
h	inches	63
	mm	1601
i	inches	65 2/3
	mm	1667
j	inches	36
	mm	914
k *1	inches	28
	mm	715

*1 *Without insulation jacket.*

Legend

AQ Aquastat well
BWR Boiler water return
BWS Boiler water supply
D Drain
DCW Domestic cold water
DHW Domestic hot water
IO Inspection and cleanout opening
TPV Temperature and pressure relief valve
RT Recirculation tapping

5167 410 v2.5

Inspections Division
Date: 10/31/13

Domestic hot water draw rate

Storage tank contents heated to 140°F / 60°C, boiler not reheating

Storage capacity	USG	53	79	119
	ltr	200	300	450
Domestic hot water draw rate	GPM	2.6	4.0	4.0
	ltr/min	10	15	15
Domestic hot water draw Water with t = 140°F/60°C (constant)	USG	37	72	109
	ltr	139	272	413
Percentage tank volume		70%	91%	92%

Heat-up time

The stated heating times are achieved when the maximum recovery rate of the domestic hot water tank is made available at the respective supply temperature and with a domestic hot water rise from 50 to 140°F / 10 to 60°C.

Storage capacity	USG	53	79	119
	ltr	200	300	450
Heating water supply temperature		**Heat-up time** (minutes)		
194°F / 90°C		11.4	15.5	20
176°F / 80°C		15	21.5	24
158°F / 70°C		23.5	32.5	35

Pressure drop on domestic hot water side (secondary circuit)

Pressure drop on heating water side (primary circuit)

Ⓐ 79 USG / 300 ltr and 119 USG / 450 ltr storage capacity
Ⓑ 53 USG / 200 ltr storage capacity

5167 410 v2.5

Inspections Division
Date: 10/31/13

Technical data

The 79 and 119 USG / 300 and 450 ltr tank sizes may be combined into a battery consisting of between 2 and 4 tanks.
Tank batteries consisting of more than 4 tanks can be installed by creating up to 4 batteries, each consisting of 4 tanks. The heating contractor is responsible to ensure proper piping on both the primary and secondary circuits.

Tank storage capacity		USG ltr	79 300	119 450		
Total capacity of tank battery		USG ltr	158 600	238 900	357 1350	476 1800
Number of storage tanks			2 ●●	2 ●●	3 ●●●	4 ●●●●
Recovery rates*1 with a temperature rise of the domestic hot water from **50 to 140°F / 10 to 60°C** and **heating water** supply temperature of ..... at the supply flow rate stated below	194°F 90°C	MBH GPM ltr/h	560 12.4 2820	553 12.3 2786	829 18.4 4179	1105 24.5 5572
	176°F 80°C	MBH GPM ltr/h	403 8.9 2028	423 9.4 2132	635 14.1 3198	846 18.8 4264
	158°F 70°C	MBH GPM ltr/h	280 6.2 1410	293 6.5 1479	440 9.8 2217	587 13.0 2956
Supply flow rate for the recovery rates stated		GPM m^3/h	44 10	57 13	86 19.5	114 26
Standby losses*2		MBH/24 h	13.6	18.4	27.6	36.9
Overall dimensions with insulation						
Overall width	inches mm		57½ 1461	75¾ 1926	114¾ 2914	153½ 3902
Overall depth	inches mm		43⅝ 1109	50¼ 1278	50¼ 1278	51 1298
Overall height	inches mm		70 1779	69½ 1767	69½ 1767	69½ 1767
Heat exchanger surface area		ft^2 m^2	30.1 2.8	38.8 3.6	58.1 5.4	77.5 7.2

**1 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 rates".

**2 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 %.*

Installation of additional aquastat(s)

WARNING

In a multiple-tank installation, it is recommended that an additional high limit aquastat be installed in the common domestic hot water supply header to the system. This aquastat should be wired in series to the operating aquastat on the tank battery. The setting on this additional high limit aquastat should be approximately 9°F / 5°C higher than the operating high limit.

Ensure that temperature tempering valve(s) is/are installed if the domestic hot water storage tank temperature exceeds 140°F / 60°C to protect from scalding.

Consult plumbing codes and authorities for local requirements.

Inspections Division
Date: 10/31/13

For domestic hot water heating applications which utilize modulating and low temperature hot water heating boilers

Side view

Top view

Legend

A	Air vent	DCW	Domestic cold water
AQ	Aquastat well	DHW	Domestic hot water
BWR	Boiler water return	IO	Inspection and cleanout opening
BWS	Boiler water supply	RT	Recirculation tapping
D	Drain	TPV	Temperature and pressure relief valve

Storage tank capacity		79 USG / 300 ltr	119 USG / 450 ltr		
Total capacity of tank battery	USG	158	238	357	476
	ltr	600	900	1350	1800
Number of storage tanks		2	2	3	4
a	inches	3 3/8	4	4	4
	mm	87	102	102	102
b	inches	11 7/8	17 7/8	17 7/8	17 7/8
	mm	301	453	453	453
c	inches	29 ½	31 ½	31 ½	31 ½
	mm	751	802	802	802
d	inches	64 ½	63	63	63
	mm	1640	1601	1601	1601
e	inches	13 ½	19 ½	19 ½	19 ½
	mm	343	498	498	498
f	inches	5	5	5 ¼	5 ½
	mm	127	130	135	139
g	inches	9 3/8	8 ½	8 ½	9
	mm	237	217	217	226
h	inches	8 1/8	14 ¼	14 ¼	14 ¼
	mm	206	359	359	359
Common header size	inches	2	2	2	2 ½
boiler supply / return	mm	51	51	51	64
Common header size	inches	1 ¼	1 ¼	1 ½	2
domestic hot / cold water	mm	32	32	38	51

5167 410 v2.5

Inspections Division
Date: 10/31/13

Domestic hot water draw rate

Storage tank content heated to 140°F / 60°C, boiler not reheating

Storage capacity	USG	79	119		
	ltr	300	450		
Battery storage capacity	USG	158	238	357	476
	ltr	600	900	1350	1800
No. of tanks		2	2	3	4
DHW draw rate	GPM	7.9	7.9	11.9	15.9
	ltr/min	30	30	45	60
Domestic hot water draw Water with t = 140°F / 60 °C (constant)	USG	143.7	243	365	486
	ltr	544	920	1380	1840
Percentage of battery volume		93%	92%	92%	92%

Quick recovery (over 10-minute period)

Domestic hot water rise from 50 to 113°F / 10 to 45°C

Storage capacity	USG	79	119		
	ltr	300	450		
Battery storage capacity	USG	158	238	357	476
	ltr	600	900	1350	1800
No. of tanks		2	2	3	4
Heating water supply temperature		**Quick DHW recovery (over 10-minute period)**			
194°F / 90°C	USG/10 min	237	314	422	528
	ltr/10 min	898	1190	1600	2000
176°F / 80°C	USG/10 min	229	314	422	528
	ltr/10 min	870	1190	1600	2000
158°F / 70°C	USG/10 min	184	277	388	475
	ltr/10 min	698	1050	1470	1800

Max. domestic hot water draw rate (over 10-minute period)

Domestic hot water rise from 50 to 113°F / 10 to 45°C

Storage capacity	USG	79	119		
	ltr	300	450		
Battery storage capacity	USG	158	238	357	476
	ltr	600	900	1350	1800
No. of tanks		2	2	3	4
Heating water supply temperature		**Max. DHW draw rate (over 10-minute period)**			
194°F / 90°C	GPM	23.5	32	42.3	52.8
	ltr/min	90	120	160	200
176°F / 80°C	GPM	23	32	42.3	52.8
	ltr/min	87	120	160	200
158°F / 70°C	GPM	18.5	26.6	39	47.5
	ltr/min	70	101	148	180

Inspections Division
Date: 10/31/13

Standard Equipment

Vitocell 300-V,
53 and 79 USG / 200 and 300 ltr
capacity

Domestic hot water tank of high-grade stainless steel with PUR Foam insulation with
– thermometer and
– adjustable leveling bolts.

The following is packed separately and attached to the crate:
– installation fittings package: with the necessary brass adaptors, other necessary hardware, and Loctite 55
– sensor well with insulation
– temperature and pressure relief valve.

Electrostatically powder coated sheet metal enclosure panel in a Vitosilver finish.

Vitocell 300-V,
119 USG / 450 ltr
capacity

Domestic hot water tank of high-grade stainless steel with wrap-around PET insulation with
– thermometer and
– adjustable leveling bolts.

The following is packed separately and attached to the crate:
– installation fittings package: with the necessary brass adaptors, other necessary hardware, and hemp
– sensor well with insulation
– temperature and pressure relief valve.

Synthetic wrap-around enclosure panel in a Vitosilver finish.

Product Installation

Domestic hot water connections

IMPORTANT

This is a simplified conceptual drawing only! Piping and necessary componentry must be field verified. Proper installation and functionality in the field is the responsibility of the heating contractor.

Ⓐ Spring-loaded flow check valve
Ⓑ Discharge pipe
Ⓒ Anti-scald tempering valve (field supplied)
SV Shut-off valve
FV Flow check valve
PR Pressure reducing valve
D Drain
DCW Domestic cold water supply
PGC Pressure guage 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
DHW Domestic hot water supply
DW Water filter
RP Recirculation pipe
RPU Recirculation pump

5167 410 v2.5

Inspections Division
Date: 10/31/13

Sensor Well

Vitocell 300-V,
53 to 119 USG / 200 to 450 ltr capacity

Storage Capacity	USG	53	79	119
	ltr	200	300	450
a	inches	8¾	8¾	13
	mm	220	220	330
b	inches	7¾	7¾	12¼
	mm	200	200	310

WARNING

To ensure optimum, safe operation, the supplied 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 temperatures over 230°F / 110°C

For these operating conditions, an approved high limit safety aquastat must be installed to limit the domestic hot water temperature to 203°F / 95°C in the tank.

Recirculation tapping

The recirculation tapping is on a separate tapping (see page 5). Cap this opening if the tank is not installed with recirculation.

Backflow preventers

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

Temperature and pressure relief valve

A temperature and pressure relief valve (T&P relief valve) is supplied with the tank. The heating contractor must install the 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.

The T&P relief valve supplied with the tank is ASME pressure steam rated for 998 MBH and CSA temperature steam rated for 200 MBH. It is tested under ANSI Z21.22 code for Relief Valves and Automatic Gas Shut-off Devices for Hot Water Supply Systems.

Watts Model 40XL-8	100 psig (Canada where CRN is required)	150 psig (US and Canada)
ASME pressure steam rating	998 MBH	1438 MBH
CSA temperature steam rating	205 MBH	
Relief temperature	210°F (99°C)	
Inlet thread	¾" male	
Outlet thread	¾" female	

Warranty excerpt

Our warranty for domestic hot water tanks states that the water heated should be of drinking water quality and that any water treatment equipment in use must function correctly.

If the product has been improperly installed or misapplied by the installer, contractor or final user, Viessmann accepts no responsibility for damage howsoever caused and reserves the right to withdraw the product warranty. In order to qualify for product warranty, strict adherence to the installation and service manuals must be observed. In the event that components not approved by Viessmann are utilized, Viessmann reserves the right to withdraw all expressed or implied warranties without written notice.

The water to be heated with the Vitocell must be drinking (potable) water quality. If the tank is used to heat other media, the warranty will be null and void. Damage resulting from excessive pressure or temperature is clearly not the responsibility of Viessmann.

The amount of chloride and sulfate acceptable to the tank is limited. In areas where high concentrations of chloride and sulfate are present in drinking water, please consult Viessmann for directions.

For full warranty details, please read the product warranty card.

Inspections Division
Date: 10/31/13

Vitocell 300-V,
53 USG / 200 ltr capacity

Curve Ⓐ
Domestic hot water 40 to 140°F / 4 to 60°C

Curve Ⓑ
Domestic hot water 40 to 176°F / 4 to 80°C

Domestic hot water delivery rate Ⓐ 4- 60°C 40- 140°F ltr./h / USG/h	Ⓑ 4- 80°C 40- 176°F ltr./h / USG/h
2303 / 608	1697 / 448
2150 / 568	1584 / 418
1996 / 527	1471 / 389
1843 / 487	1358 / 359
1689 / 446	1245 / 329
1535 / 406	1131 / 299
1382 / 365	1018 / 269
1228 / 324	906 / 239
1075 / 284	792 / 209
921 / 243	679 / 179
768 / 203	565 / 149
614 / 162	453 / 120
461 / 122	339 / 90
307 / 81	227 / 60
154 / 41	113 / 30

5167 410 v2.5

Inspections Division
Date: 10/31/13

Vitocell 300-V,
79 USG / 300 ltr capacity

Curve Ⓐ
Domestic hot water 40 to 140°F / 4 to 60°C

Curve Ⓑ
Domestic hot water 40 to 176°F / 4 to 80°C

5167 410 v2.5

Inspections Division
Date: 10/31/13

Vitocell 300-V,
119 USG / 450 ltr capacity

Curve Ⓐ
Domestic hot water 40 to 140°F / 4 to 60°C

Curve Ⓑ
Domestic hot water 40 to 176°F / 4 to 80°C

Domestic hot water delivery rate

Ⓐ 4- 60°C 40- 140°F ltr./h / USG/h	Ⓑ 4- 80°C 40- 176°F ltr./h / USG/h
2303 / 608	1697 / 448
2150 / 568	1584 / 418
1996 / 527	1471 / 389
1843 / 487	1358 / 359
1689 / 446	1245 / 329
1535 / 406	1131 / 299
1382 / 365	1018 / 269
1228 / 324	906 / 239
1075 / 284	792 / 209
921 / 243	679 / 179
768 / 203	565 / 149
614 / 162	453 / 120
461 / 122	339 / 90
307 / 81	227 / 60
154 / 41	113 / 30

5167 410 v2.5

Inspections Division
Date: 10/31/13

Example: Vitocell 300-V, 119 USG / 450 ltr capacity

Assume boiler output to tank is 238 MBH. Enter chart at left and draw horizontal line across to recovery rate of 284 GPH / 4.7 GPM for 140°F / 60°C domestic hot water under column A. Where the horizontal line intersects the 194°F / 90°C curve is the point of intersection for the diagonal line used to size the pump. The diagonal line begins at the origin and goes through the point of intersection extending up to the top of the chart. Read between the reference diagonal lines to get a pump specification of 20 GPM at 8.4 ft. To summarize: For a Vitocell-V 300 with 119 USG / 450 ltr capacity and 238 MBH input, the boiler water temperature is 194°F / 90°C, difference between boiler return and supply water temperature is 29°F / 16°C, recovery rate is 4.7 GPM of 140°F / 60°C DHW, and the pump required is 20 GPM, 8.4 ft. plus pressure drop in piping and boiler. If a multiple-tank application is required, i.e. 4 tanks at 238 MBH input each, then the pump selection would be (4 x 20 GPM) 80 GPM at 8.4 ft. plus piping pressure drop.

5167 410 v2.5

Inspections Division
Date: 10/31/13

Printed on environmentally friendly (recycled and recyclable) paper.

Technical information subject to change without notice.

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5167 410 v2.5