VIESMANN

VITOCELL-V 100

Indirect-fired domestic hot water storage tank
42 to 120 USG / 160 to 450 ltr

Technical Data Manual

Model Nos. and pricing: see Price List

Vitocell-V 100
42 to 79 USG / 160 to 300 ltr

Vitocell-V 100
120 USG / 450 ltr

Vitocell-V 100

CVA Series

**Indirect-fired domestic hot water storage tank
steel construction, with Ceraprotect two-coat enamel finish**

5167 518 v2.0 10/2003

VITOCELL-V 100

The vertical tank solution for cost-efficient domestic hot water supply. The Vitocell-V 100 DHW tank offers storage capacities of up to 120 USG / 450 ltrs.

The benefits at a glance:

- Corrosion-protected steel tank shell with **Ceraprotect two-coat enamel finish.** Magnesium anode provides additional cathodic tank protection.
- **Heat exchanger coil extends to the bottom of the tank**, thereby heating the entire water content.
- **Extremely convenient domestic hot water supply** assured by fast, uniform heating via generously sized heat exchanger surfaces.
- **Universally suitable** - for applications requiring larger quantities of hot water, multiple Vitocell-V 100 tanks may be connected to a header to form a tank battery.
- **Standby losses minimized** by 2¼"/ 58 mm highly effective, foamed-in-place or 4"/100 mm wrap-around HCFC-free insulation.

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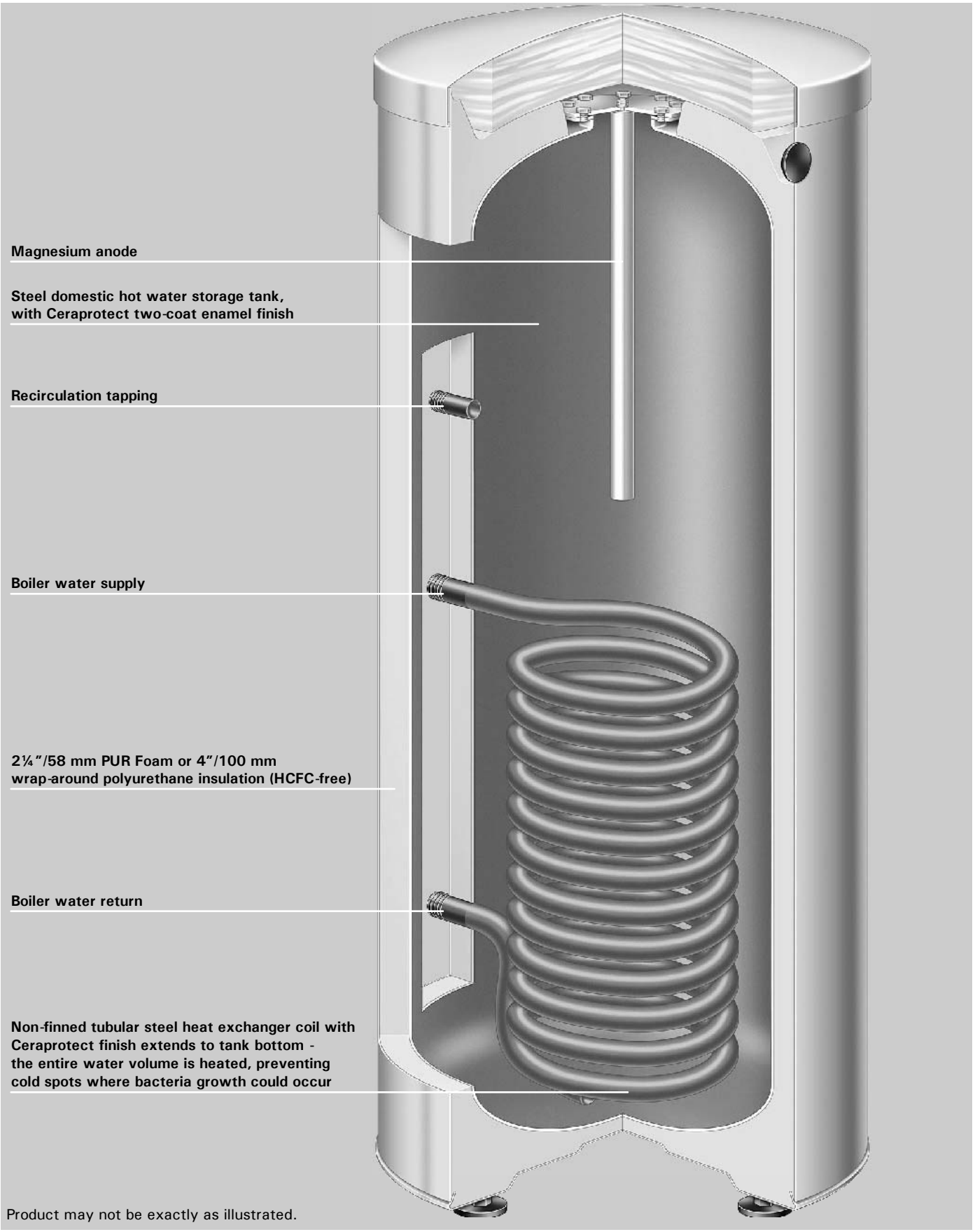

Product may not be exactly as illustrated.

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Technical Data

For domestic hot water heating applications in conjunction with hot water heating boilers

Suitable for heating systems with
- max. working pressure on the heat exchanger side of up to 150 psig / 10 bar
- max. working pressure on DHW side of up to 150 psig / 10 bar
- max. supply temperature on the heat exchanger side of up to 230 °F / 110 °C
- max. DHW supply temperature of up to 150 °F / 65.6 °C

Storage Capacity		USG	42	53	79	120
		ltr	160	200	300	450
Recovery rate *1 with a temperature rise of the domestic hot water from **50 to 113 °F / 10 to 45 °C** and **boiler water** supply temperature of.... at the supply flow rate stated **below**	194 °F 90 °C	MBH	136	136	180	238
		GPM	4.3	4.3	5.7	7.6
		ltr/h	982	982	1302	1720
	176 °F 80 °C	MBH	109	109	150	198
		GPM	3.5	3.5	4.8	6.3
		ltr/h	786	786	1081	1425
	158 °F 70 °C	MBH	85	85	113	153
		GPM	2.7	2.7	3.6	4.9
		ltr/h	614	614	811	1106
	140 °F 60 °C	MBH	58	58	78	109
		GPM	1.8	1.8	0.3	3.5
		ltr/h	417	417	565	786
	122 °F 50 °C	MBH	31	31	61	82
		GPM	1	1	1.9	2.6
		ltr/h	221	221	442	589
Recovery rate *1 with a temperature rise of the domestic hot water from **50 to 140 °F / 10 to 60 °C** and **boiler water** supply temperature of.... at the supply flow rate stated below	194 °F 90 °C	MBH	123	123	153	181
		GPM	2.7	2.7	3.4	4
		ltr/h	619	619	774	911
	176 °F 80 °C	MBH	95	95	116	150
		GPM	2	2	2.6	3.3
		ltr/h	482	482	584	756
	158 °F 70 °C	MBH	65	65	78	113
		GPM	1.4	1.4	1.7	2.5
		ltr/h	327	327	395	567
Supply flow rate for the recovery rates stated		GPM	13.2	13.2	13.2	13.2
		m^3/h	3.0	3.0	3.0	3.0
Standby losses *2		MBH/24 h	5.1	5.8	7.5	9.6
Overall dimensions with insulation						
Width (∅)		inches	23	23	25	33½
		mm	581	581	633	850
Depth		inches	24	24	27¾	35¼
		mm	605	605	705	898
Height		inches	47	55½	68¾	77
		mm	1189	1409	1746	1955
Tilt height		inches	50	57½	70½	73¼
		mm	1260	1460	1792	1860
Weight		lbs	190	214	333	399
Tank with insulation		kg	86	97	151	181
Heating water content		USG	1.45	1.45	2.6	3.3
		ltr	5.5	5.5	10	12.5
Heat exchanger surface area		$ft.^2$	10.8	10.8	16.1	20.5
		m^2	1	1	1.5	1.9
Connections						
Heating water supply/return		∅" (male thread)	1	1	1	1
Domestic cold/hot water		∅" (male thread)	¾	¾	1	1¼
T&P valve		∅" (female thread)	¾	¾	¾	¾
Recirculation		∅" (male thread)	¾	¾	1	1

*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 rate". Please also refer to the corresponding sizing chart at the end of this manual.*

*2 *Measured values are based on a room temp. of 68°F / 20 °C and a domestic hot water temp. of 149°F / 65 °C and can vary by 5%.*

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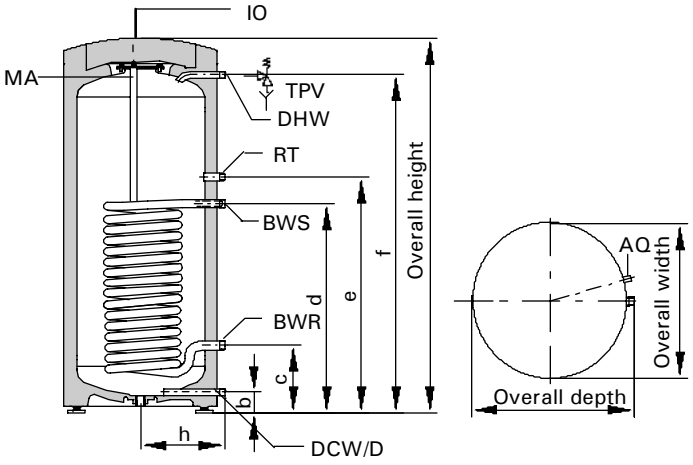
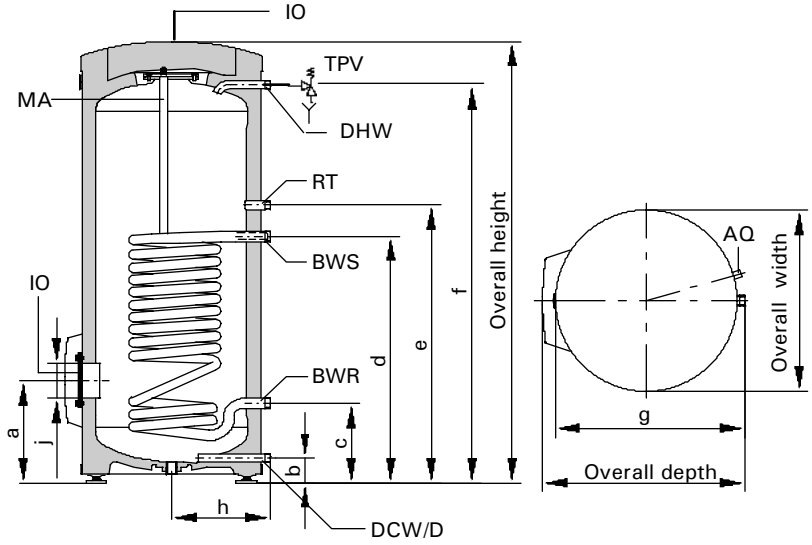
Vitocell-V 100 (42 and 53 USG / 160 and 200 ltr)



Dimensions

Storage capacity	USG	42	53	79	120
	ltr	160	200	300	450
a	inches	––	––	13	16½
	mm	––	––	336	422
b	inches	2¾	2¾	3	4
	mm	72	72	76	107
c	inches	9¾	9¾	10	13¾
	mm	249	249	260	349
d	inches	25	25	34½	36¼
	mm	634	634	875	924
e	inches	35	35	44	48½
	mm	884	884	1115	1230
f	inches	41	41	63	70¼
	mm	1050	1270	1600	1784
g	inches	––	––	26	33
	mm	––	––	660	837
h	inches	12½	12½	13½	18
	mm	317	317	343	455
j Ø	inches	––	––	4½	4½
	mm	––	––	114	114

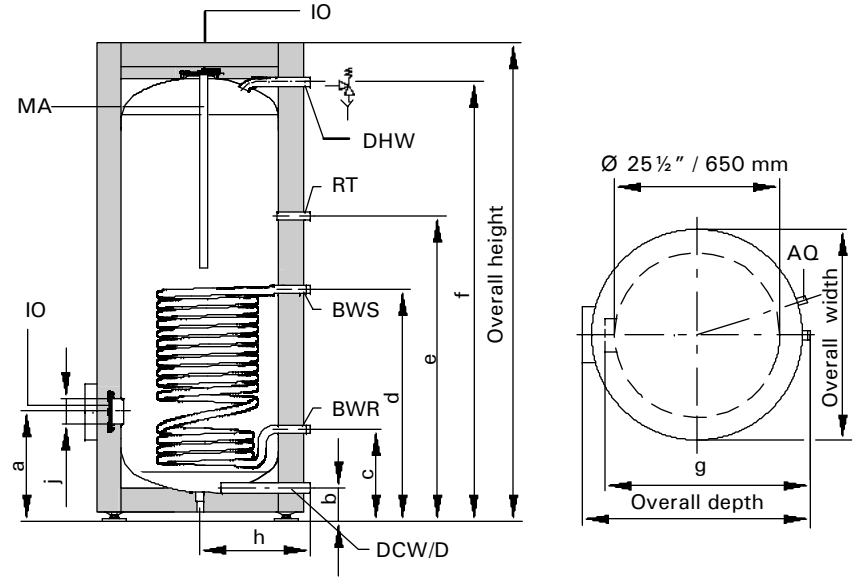
Vitocell-V 100 (79 USG / 300 ltr)



Legend

IO Inspection and clean-out opening
D Drain
BWR Boiler water return
BWS Boiler water supply
DCW Domestic cold water
AQ Aquastat well (at same height as boiler water supply connection)
MA Magnesium anode
DHW Domestic hot water
RT Recirculation tapping
TPV Temperature and pressure relief valve

Vitocell-V 100 (120 USG / 450 ltr)



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Domestic hot water draw rate

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

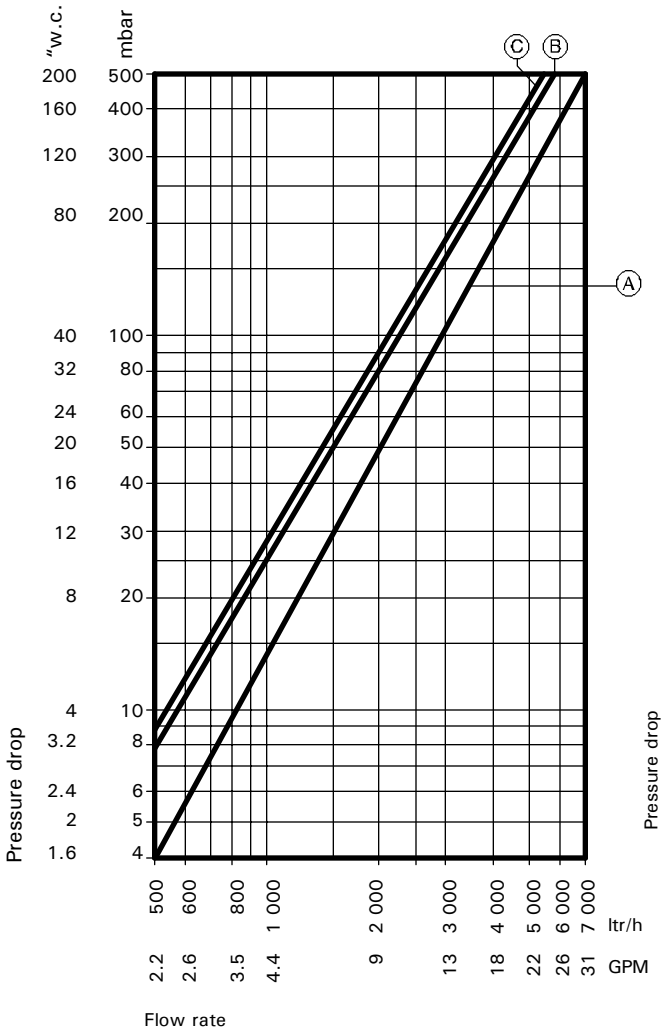
Storage capacity	USG	42	53	79	120
	ltr	160	200	300	450
DHW draw rate	GPM	2.6	2.6	4.0	4.0
	ltr/min	10	10	15	15
Domestic hot water draw Water with t = 140 °F / 60 °C (constant)	USG	32	38	63	111
	ltr	120	145	240	420
Percentage tank volume		75%	73%	80%	93%

Heat-up time

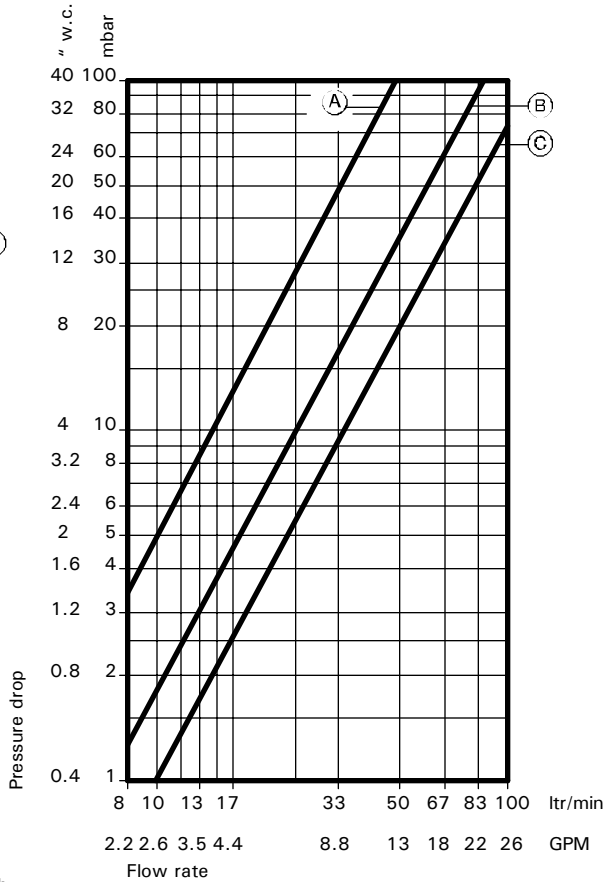
The stated heating times are achieved when the maximum recovery rate of the domestic hot water tank is made available at the respective supply temperature and with a domestic hot water rise from 50 to 140 °F / 10 to 60 °C.

Storage capacity	USG	42	53	79	120
	ltr	160	200	300	450
Heating water supply temperature		Heat-up time (minutes)			
194 °F / 90 °C		19	19	23	28
176 °F / 80 °C		24	24	31	36
158 °F / 70 °C		34	37	45	50

Pressure drop on heating water side (primary circuit)



Pressure drop on domestic hot water side (secondary circuit)



(A) 42 USG / 160 ltr and 53 USG / 200 ltr storage capacities
(B) 79 USG / 300 ltr storage capacity
(C) 120 USG / 450 ltr storage capacity

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Technical Data

The 79 and 120 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.

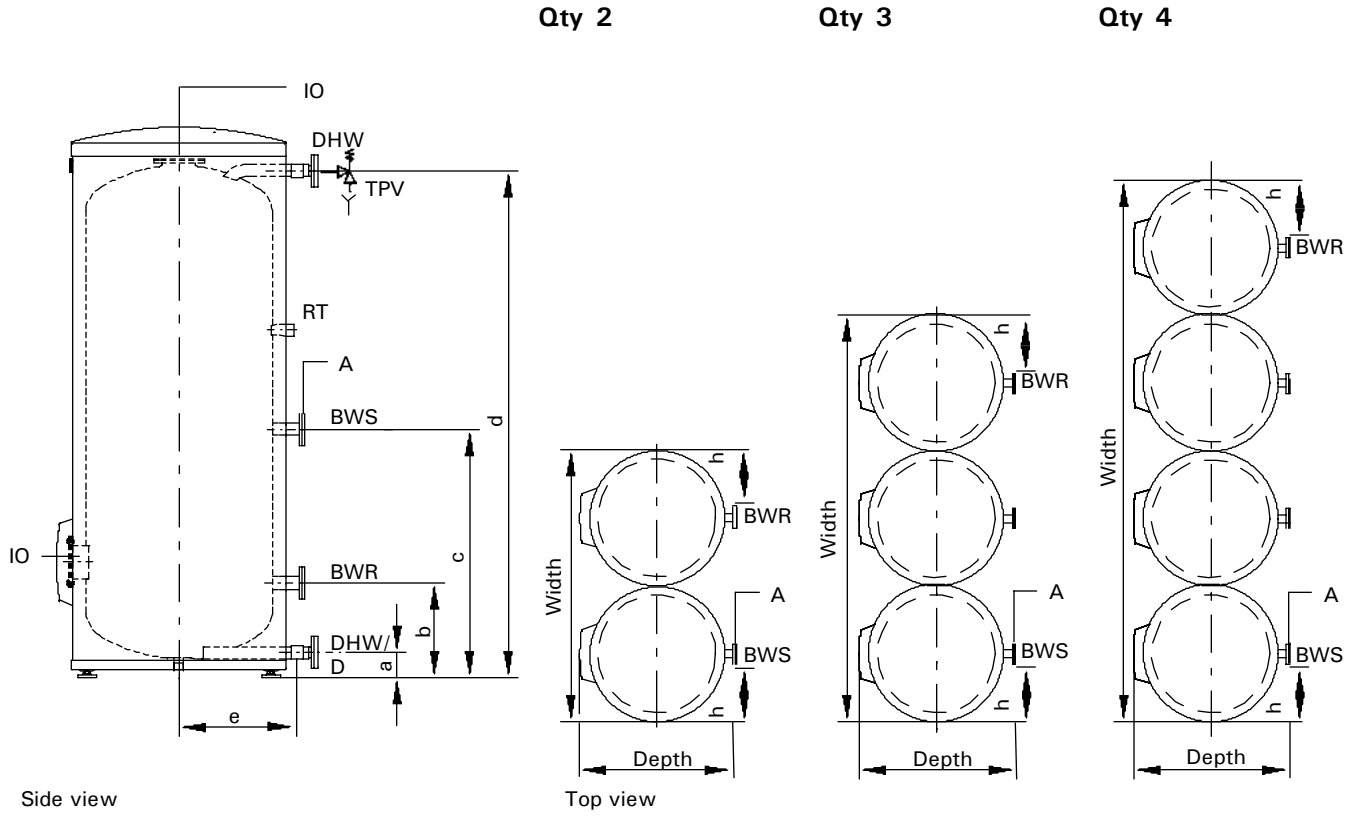
Tank storage capacity		USG	79		120	
		ltr	300		450	
Total capacity of tank battery		USG	159	240	360	480
		ltr	600	900	1350	1800
Number of storage tanks			2 ●●	2 ●●	3 ●●●	4 ●●●●
Recovery rate *1 with a temperature rise of the domestic hot water from **50 to 113 °F / 10 to 45 °C** and **boiler water** supply temperature of ..... at the supply flow rate **stated below**	194 °F 90 °C	MBH	361	477	716	955
		GPM	11.5	15.1	22.7	30.3
		ltr/h	2604	3440	5160	6880
	176 °F 80 °C	MBH	300	396	593	791
		GPM	9.5	12.5	18.8	25.1
		ltr/h	2162	2850	4275	5700
	158 °F 70 °C	MBH	225	307	460	614
		GPM	7.1	9.7	14.6	19.5
		ltr/h	1622	2212	3318	4424
	140 °F 60 °C	MBH	157	218	327	436
		GPM	5	6.9	10.4	13.8
		ltr/h	1130	1572	2358	3144
	122 °F 50 °C	MBH	123	164	246	327
		GPM	3.9	5.2	7.8	10.4
		ltr/h	884	1178	1767	2356
Recovery rate *1 with a temperature rise of the domestic hot water from **50 to 140 °F / 10 to 60 °C** and **boiler water** supply temperature of ..... at the supply flow rate stated below	194 °F 90 °C	MBH	307	361	542	723
		GPM	6.8	8.0	12.0	16.0
		ltr/h	1548	1822	2733	3644
	176 °F 80 °C	MBH	232	300	450	600
		GPM	5.1	6.7	10.0	13.3
		ltr/h	1168	1512	2268	3024
	158 °F 70 °C	MBH	157	225	338	450
		GPM	3.5	5.0	7.5	10.0
		ltr/h	790	1134	1701	2268
Supply flow rate for the recovery rates stated		GPM	26.4	26.4	39.6	50.8
		m^3/h	6	6	9	12
Standby losses *2		MBH/24 h	15	19.2	28.8	38.4
Overall dimensions with insulation						
Overall width		inches	57½	72½	111¼	150
		mm	1461	1838	2826	3814
Overall depth		inches	43½	48	48	48¾
		mm	1109	1218	1218	1237
Overall height		inches	69	77	77	77
		mm	1752	1955	1955	1955
Weight Tank with insulation		lbs	736¼	932	1409	1913
		kg	334	423	639	868
Heating water content (heat exchanger pipe coil)		USG	6½	8½	13¾	20¾
		ltr	25	32	50	79
Heat exchanger surface area		$ft.^2$	32¼	42	62½	84
		m^2	3.0	3.9	5.8	7.8

*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 rate". 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 %.*

Multiple Tank Installation (79 and 120 USG / 300 and 450 ltr only)

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



Legend

IO	Inspection and clean-out opening	BWR	Boiler water return	DHW	Domestic hot water
D	Drain	BWS	Boiler water supply	RT	Recirculation tapping
A	Air vent	DCW	Domestic cold water	TPV	T&P valve

Dimensions

Storage capacity	USG	79		120	
	ltr	300		450	
Total capacity of battery	USG	159	240	360	480
	ltr	600	900	1350	1800
Number of storage tanks		2	2	3	4
a	inches	3	4¼	4¼	4¼
	mm	76	107	107	107
b	inches	10¼	13¾	13¾	13¾
	mm	260	349	349	349
c	inches	34½	36¼	36¼	36¼
	mm	875	924	924	924
d	inches	63	70¼	70¼	70¼
	mm	1600	1784	1784	1784
e	inches	16½	18	18	18
	mm	343	455	455	455
h	inches	8	12½	12½	12½
	mm	206	315	315	315

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Domestic hot water draw rate

Storage tank content heated to 140 °F / 60 °C

Storage capacity	USG	79		120	
	ltr	300		450	
Battery storage capacity	USG	159	240	360	480
	ltr	600	900	1350	1800
Number of tanks		2	2	3	4
DHW draw rate	GPM	7.9	7.9	7.9	11.9
	ltr/min	30	30	30	45
Domestic hot water draw Water with t = 140 °F / 60 °C (constant)	USG	127	222	333	444
	ltr	480	840	1260	1680
Percentage of battery volume		80%	84%	84%	84%

Quick recovery (over 10-minute period)

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

Storage capacity	USG	79		120	
	ltr	300		450	
Battery storage capacity	USG	159	240	360	480
	ltr	600	900	1350	1800
Number of tanks		2	2	3	4
Heating water supply temperature		Quick DHW recovery (over 10-minute period)			
194 °F / 90 °C	USG/10 min	201	317	441	540
	ltr/10 min	759	1200	1670	2045
176 °F / 80 °C	USG/10 min	197	310	431	502
	ltr/10 min	745	1175	1630	1900
158 °F / 70 °C	USG/10 min	192	284	396	478
	ltr/10 min	728	1075	1498	1810

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		120	
	ltr	300		450	
Battery storage capacity	USG	159	240	360	480
	ltr	600	900	1350	1800
Number of tanks		2	2	3	4
Heating water supply temperature		Max. DHW draw rate (over 10-minute period)			
194 °F / 90 °C	GPM	20.1	32	44.1	54
	ltr/min	76	120	167	204
176 °F / 80 °C	GPM	20	31.3	43.2	50.4
	ltr/min	74	118	163	190
158 °F / 70 °C	GPM	19.3	28.4	40	48
	ltr/min	73	107	150	181

Standard Equipment

Vitocell-V 100
42 to 79 USG / 160 to 300 ltr capacity

Domestic hot water storage tank of high-grade steel with PUR Foam insulation (HCFC-free) and Ceraprotect two-coat enamel finish with:

- thermometer
- adjustable leveling feet
- built-in aquastat well
- Magnesium anode

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

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

Vitocell-V 100
120 USG / 450 ltr capacity

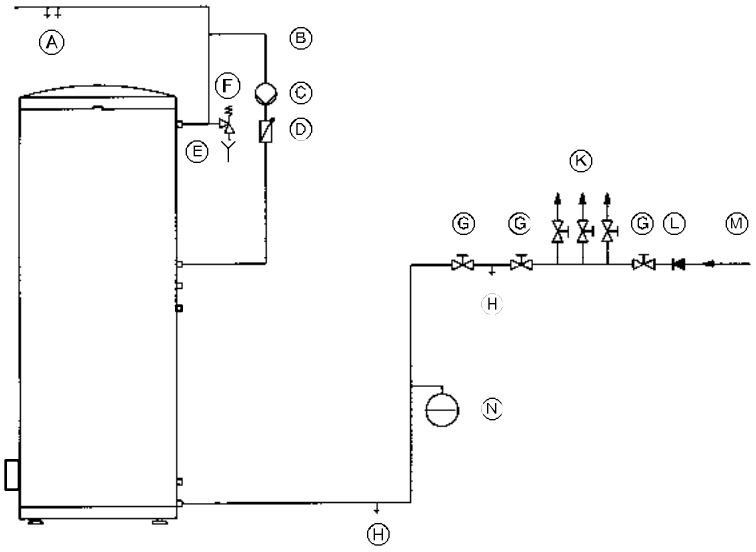
Domestic hot water storage tank of high-grade steel with wrap-around polyurethane soft foam insulation (HCFC-free) and Ceraprotect two-coat enamel finish with:

- thermometer
- adjustable leveling feet
- built-in aquastat well
- Magnesium anode

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

Synthetic wrap-around enclosure panel in a Vitosilver finish.

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.

- Ⓐ Domestic hot water supply
- Ⓑ DHW recirculation line
- Ⓒ DHW recirculation pump
- Ⓓ Spring-loaded flow check valve
- Ⓔ Discharge pipe
- Ⓕ Temperature and pressure relief valve (TPV)
- Ⓖ Shut-off valve
- Ⓗ Drain
- Ⓚ Domestic cold water supply lines
- Ⓛ Backflow preventer
- Ⓜ Domestic cold water inlet
- Ⓝ Precharged expansion tank (required where backflow preventer is installed; check local plumbing codes and requirements)

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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 150 psig. Maximum operating pressure is 150 psig.
The T&P relief valve supplied with the tank is manufactured by Watts Industries (Model 40XL-8), set to 150 psig for US and Canadian installations. The valve 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.
The relief temp. is set at 210°F / 99°C. The valve has a male threaded inlet and female threaded outlet, both ¾" sizes.

IMPORTANT

Since the heat exchanger coil allows for high MBH input (see Vitocell flow charts), confirmation that the appropriate and correct size pressure and temperature relief valve is used and installed, is necessary.

WARNING

The heating contractor must ensure the T&P valve is sized correctly. If the factory supplied T&P valve is too small, it must be upgraded in the field by installing an adequately sized valve.

Warranty

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

Viessmann accepts no responsibility for damage howsoever caused and reserves the right to withdraw the product warranty if the product has been improperly installed or misapplied by the installer, contractor or final user. In order to qualify for product warranty, strict adherence to the installation and service manuals must be assured. In the event that Viessmann non-approved components are utilized, Viessmann reserves the right to withdraw all expressed or implied warranties without written notice.

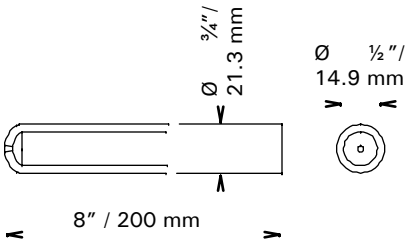
The water to be heated with the Vitocell must be drinking (potable) water quality. If the tank is used to heat other media, the warranty will be null and void. Damage resulting from excessive pressure or temperature is clearly not the responsibility of Viessmann.

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.

Sensor Well

Vitocell-V 100
42 to 120 USG / 160 to 450 ltr capacity

The sensor well is welded into the domestic hot water storage tank.

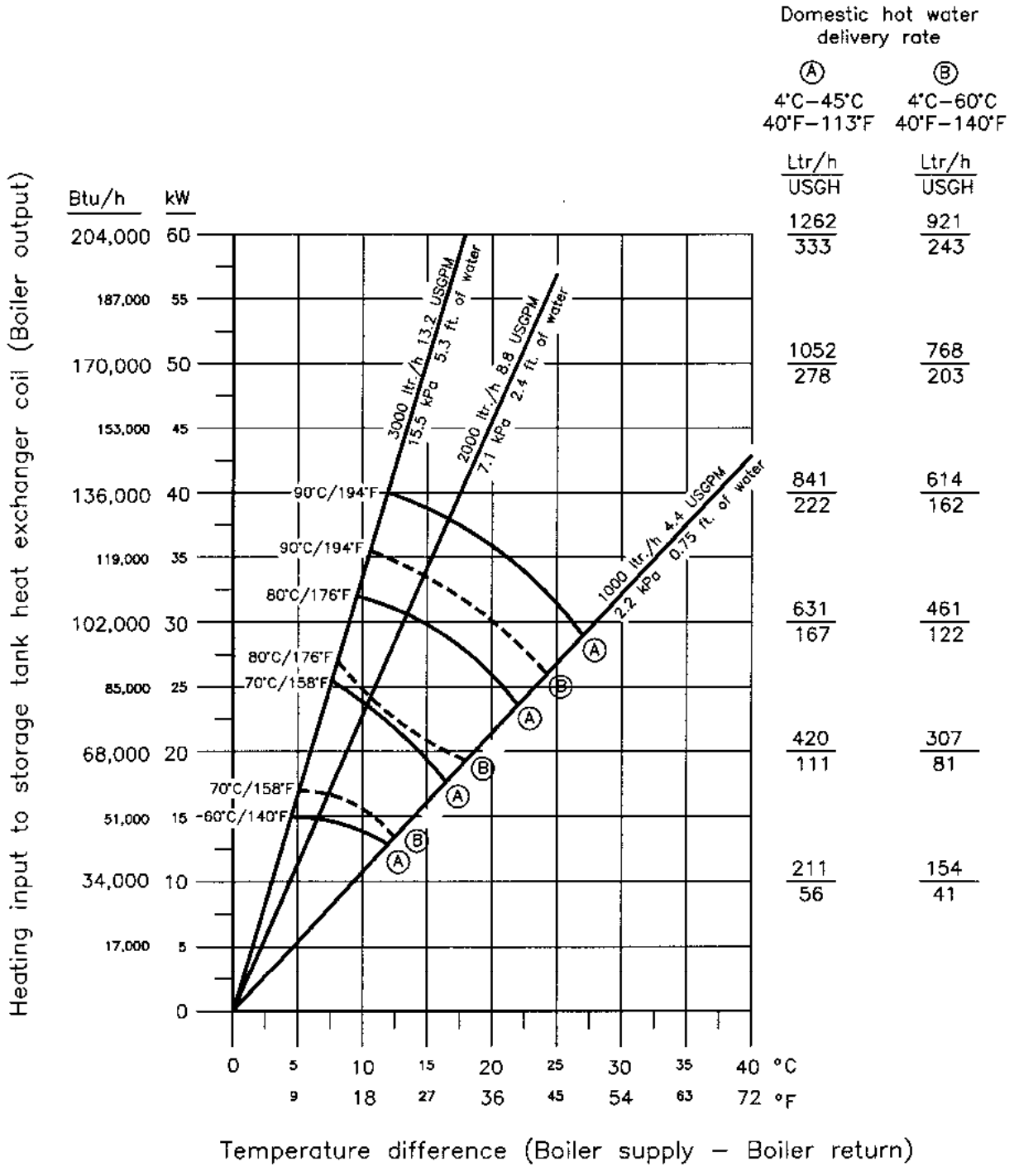


Vitocell-V 100 Sizing
Continuous Flow Capacity Chart

Vitocell-V 100,
42 and 53 USG / 160 and 200 ltr capacities

Curve Ⓐ
Domestic hot water 40 to 113°F / 4 to 45°C

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



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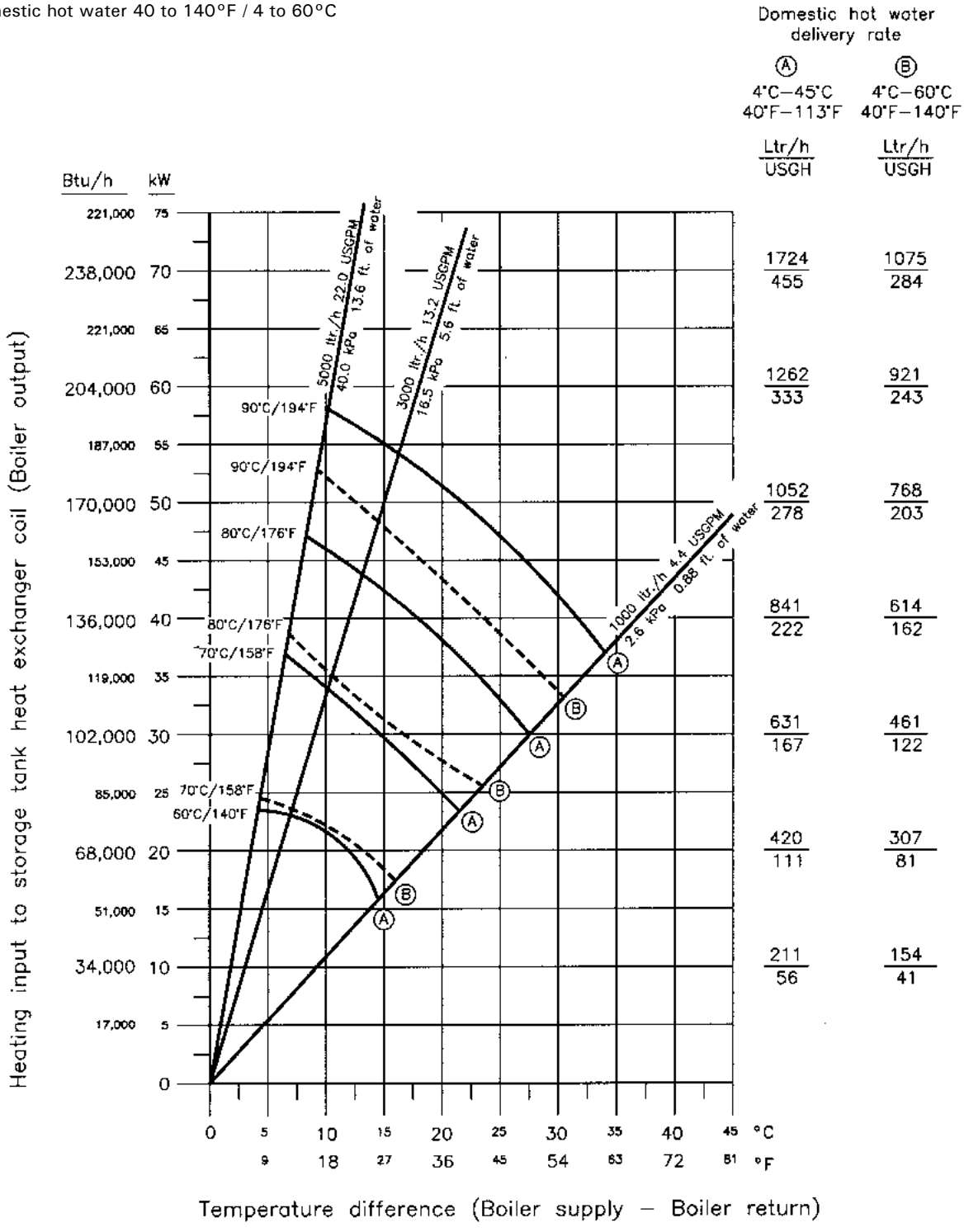
Vitocell-V 100,
79 USG / 300 ltr capacity

Curve Ⓐ
Domestic hot water 40 to 113°F / 4 to 45°C

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



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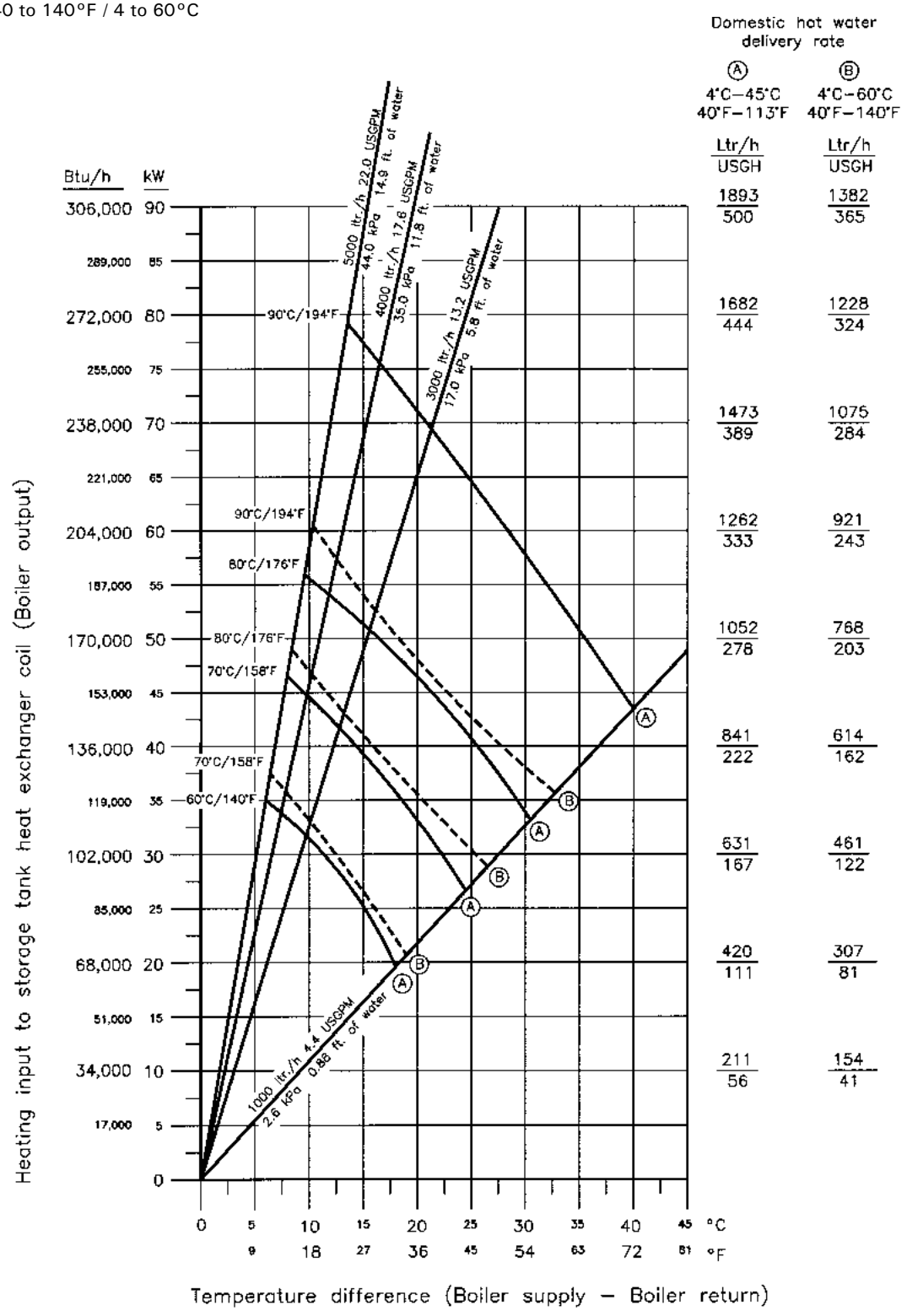
Vitocell-V 100,
120 USG / 450 ltr capacity

Curve Ⓐ
Domestic hot water 40 to 113°F / 4 to 45°C

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



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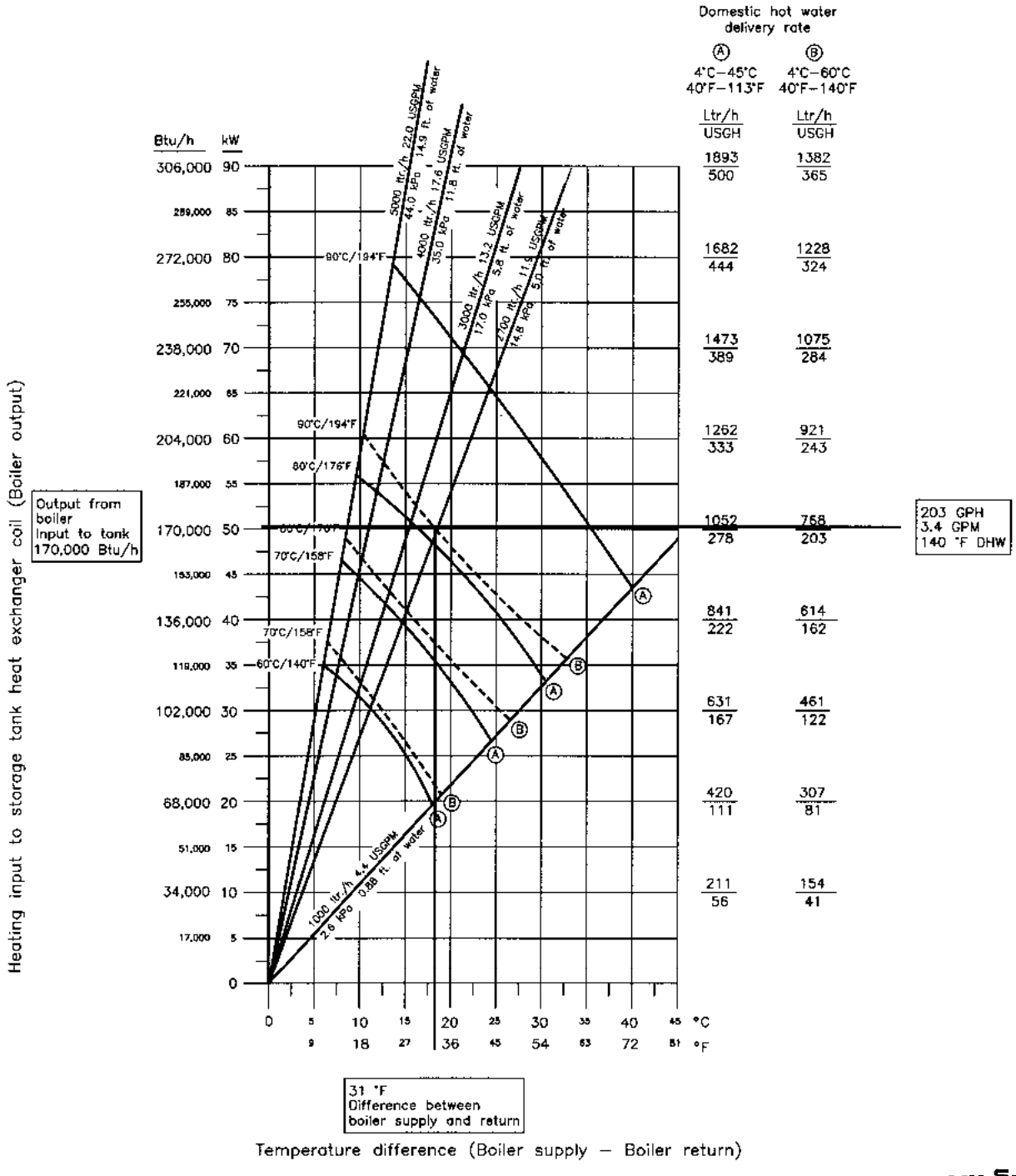
Example: Vitocell-V 100, 120 USG / 450 ltr capacity

Assume boiler output to tank is 170 MBH. Enter chart at left and draw horizontal line across to recovery rate of 203 GPH / 3.4 GPM for 140°F / 60°C domestic hot water under column B. 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 11.9 GPM at 5 ft. To summarize: For a Vitocell-V 100 with 120 USG / 450 ltr capacity and 170 MBH input, the boiler water temperature is 194°F / 90°C, difference between boiler return and supply water temperature is 31°F / 17°C, recovery rate is 3.4 GPM of 140°F / 60°C DHW, and the pump required is 11.9 GPM, 5.0 ft. plus pressure drop in piping and boiler.



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