# Technical Data Manual

Model Nos. and pricing: see Price List

## Vitocell 300-V
## EVI Series

Indirect-fired domestic hot water storage tank
53 USG to 119 USG (200 L to 450 L) capacity

Product may not be exactly as shown

Vertical indirect-fired domestic hot water storage tank of high-grade stainless steel with two coils.

**CAUTION**

**This tank version is not suitable for steam heating applications.**

C US C US
NSF/ANSI 372

5672 342 - 02 10/2015

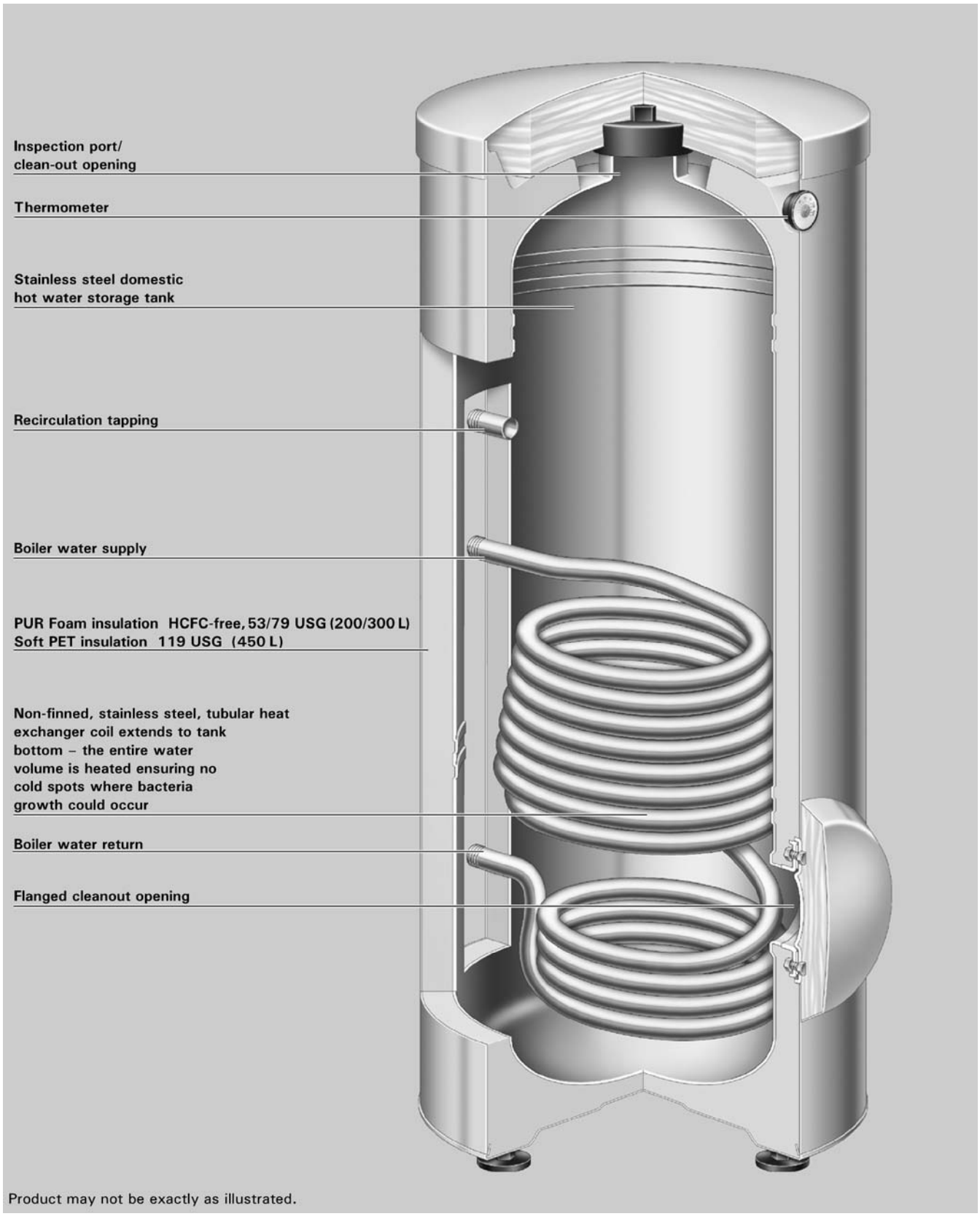
# Benefits

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

**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 in. (34 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 in. (58 mm) highly effective, foamed-in-place or 4 in. (100 mm) wrap-around PET HCFC-free insulation.
- Easy transport into mechanical room due to low weight and compact construction.
- Certified to CSA Low Lead Content Certification Program;
  including US Safe Drinking Water Act, NSF/ANSI 372 as well as other applicable US State requirements.

## Cross Section




Product may not be exactly as illustrated.

# 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 (L) | 53 (200) | 79 (300) | 119 (450) |
| **Recovery rates*1** with a DHW 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 (kW) | 215 (63) | 280 (82) | 276 (81) |
| | | GPH (L/h) | 286 (1084) | 372 (1410) | 368 (1393) |
| | 176°F (80°C) | MBH (kW) | 164 (48) | 201 (59) | 212 (62) |
| | | GPH (L/h) | 218 (826) | 268 (1014) | 282 (1066) |
| | 158°F (70°C) | MBH (kW) | 99 (29) | 140 (41) | 147 (43) |
| | | GPH (L/h) | 132 (499) | 186 (705) | 195 (739) |
| **Supply flow rate** for the recovery rates stated | | GPM ($m^3$/h) | 22.0 (5.0) | 22.0 (5.0) | 28.6 (6.5) |
| **Insulation** | | | PUR Foam | | Soft PET |
| **Standby losses*2** | | MBH/24 h | 5.5 | 6.8 | 9.2 |
| **Dimensions*3** | | | | | |
| Tank length without insulation | | in. (mm) | -- | -- | 28 (715) |
| Overall length with insulation | | in. (mm) | 23 (581) | 25 (633) | 36⅜ (925) |
| Tank width without insulation | | in. (mm) | -- | -- | 36 (914) |
| Overall width with insulation | | in. (mm) | 25½ (649) | 27¾ (704) | 38⅜ (975) |
| Tank height without insulation | | in. (mm) | -- | -- | 65⅝ (1667) |
| Overall height with insulation*4 | | in. (mm) | 56 (1420) | 70 (1779) | 68½ (1738) |
| Tilt height without insulation | | in. (mm) | -- | -- | 66½ (1690) |
| Tilt height with insulation | | in. (mm) | 58 (1471) | 71¾ (1821) | -- |
| **Weight** Tank with insulation | | lbs (kg) | 76 (168) | 100 (220) | 111 (245) |
| **Heating water content** (heat exchanger pipe coil) | | USG (L) | 2.64 (10) | 2.91 (11) | 4.0 (15) |
| **Heat exchanger surface area** | | $ft.^2$ ($m^2$) | 14 (1.3) | 16 (1.5) | 20.5 (1.9) |
| **Connections** | | | | | |
| Heating water supply/return | | in. (male NPT thread) | 1 | 1 | 1¼ |
| Domestic cold/hot water | | in. (male NPT thread) | 1 | 1 | 1¼ |
| Temp. and press. relief valve | | in. (male NPT thread) | 1 | 1 | 1¼ |
| Recirculation | | in. (male NPT thread) | 1 | 1 | 1¼ |

***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%.

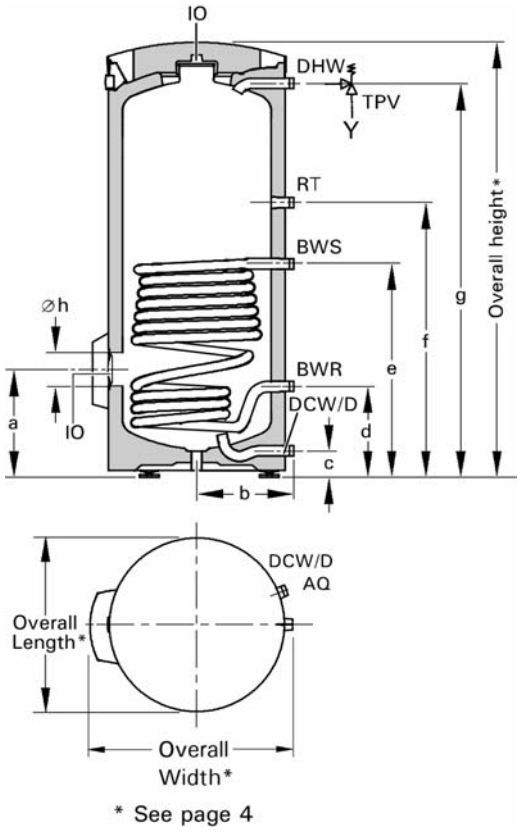
***3*** For other dimensions, see illustrations and table on page 4.

***4*** Adjustable feet can be adjusted up to 2 in. (50 mm).

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

# 79 USG (300 L) Tank Dimensions

53 USG (200 L) and 79 USG (300 L) Tanks



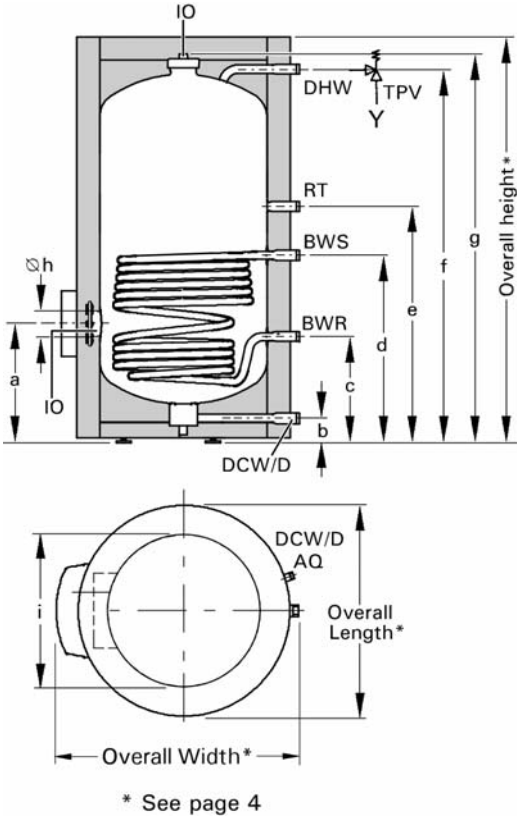

* See page 4

| Dimensions | | | |
|---|---|---|---|
| **Storage capacity** | **USG (L)** | **53 (200)** | **79 (300)** |
| a | in. (mm) | 14 (353) | 14¼ (357) |
| b | in. (mm) | 12½ (317) | 13½ (343) |
| c | in. (mm) | 3½ (87) | 3½ (87) |
| d | in. (mm) | 11¾ (297) | 12 (301) |
| e | in. (mm) | 27½ (697) | 29½ (751) |
| f | in. (mm) | 35⅓ (897) | 37½ (951) |
| g | in. (mm) | 50⅝ (1286) | 64½ (1640) |
| h | in. (mm) | 4 (100) | 4 (100) |

**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 |

119 USG (450 L) Tank




* See page 4

| Dimensions | | |
|---|---|---|
| **Storage capacity** | **USG (L)** | **119 (450)** |
| a | in. (mm) | 20 (508) |
| b | in. (mm) | 4 (102) |
| c | in. (mm) | 18 (453) |
| d | in. (mm) | 31⅝ (802) |
| e | in. (mm) | 40 (1012) |
| f | in. (mm) | 63 (1601) |
| g | in. (mm) | 65⅝ (1667) |
| h | in. (mm) | 4 (100) |
| i | in. (mm) | 28 (715) |

**Legend**

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

# Water Flow

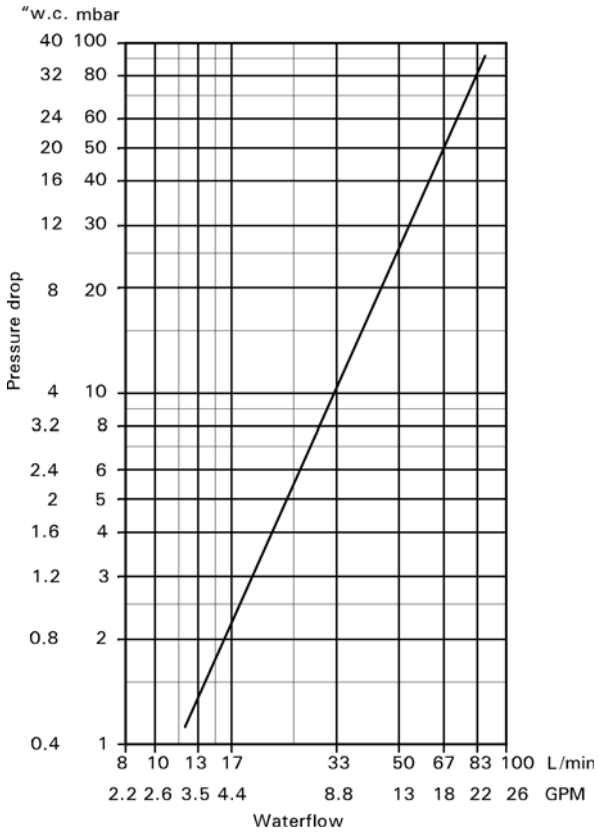
**Domestic hot water draw rate**
Storage tank contents heated to 140°F (60°C), boiler not reheating.

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

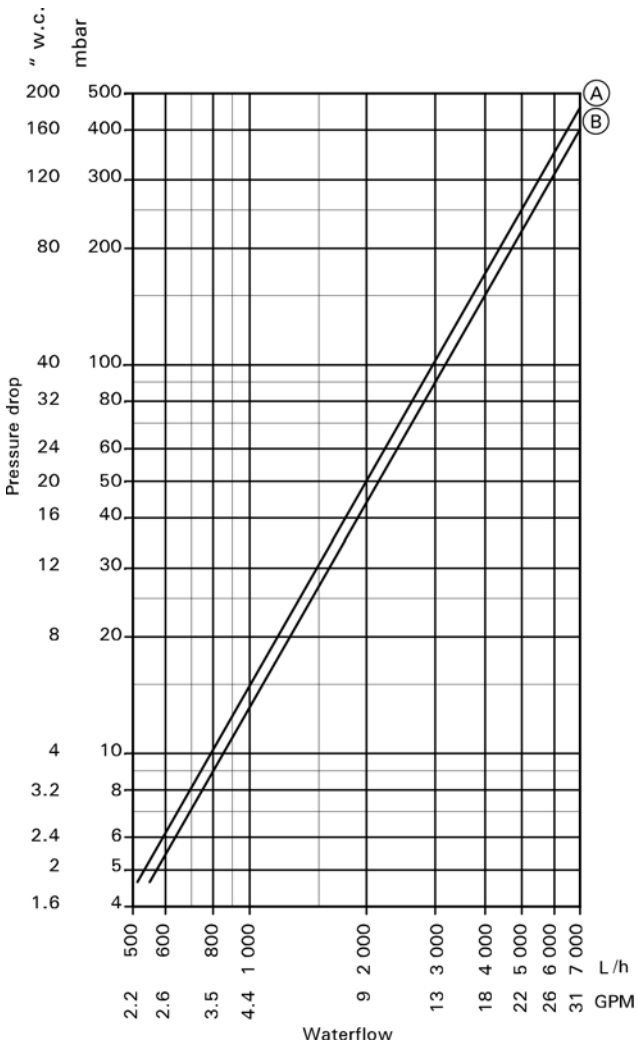
**Heat-up time**
The stated heating times are achieved when the maximum recovery rate of the domestic hot water tank is made available at the respective supply temperature and with a domestic hot water rise from 50 to 140°F (10 to 60°C).

| Storage capacity | USG (L) | 53 (200) | 79 (300) | 119 (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)**




**Legend**
Ⓐ 79 USG (300 L) and 119 USG (450 L) storage capacity
Ⓑ 53 USG (200 L) storage capacity



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# Multiple Tank Installation

**Technical data**

The 79 and 119 USG (300 and 450 L) tank sizes may be combined into a battery consisting of between 2 and 3 tanks. Tank batteries consisting of more than 3 tanks can be installed by creating up to 4 batteries, each consisting of 3 tanks. The heating contractor is responsible to ensure proper piping on both the primary and secondary circuits.

| **Tank storage capacity** | | **USG (L)** | **79 (300)** | **119 (450)** | |
|---|---|---|---|---|---|
| **Total capacity of tank battery** | | USG (L) | 158 (600) | 238 (900) | 357 (1350) |
| **Number of storage tanks** | | | 2 | 2 | 3 |
| **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 (kW)<br>GPH (L/h) | 560 (164)<br>74.5 (2820) | 553 (162)<br>73.8 (2786) | 829 (243)<br>1104 (4179) |
| | 176°F (80°C) | MBH (kW)<br>GPH (L/h) | 403 (118)<br>534 (2028) | 423 (124)<br>564 (2132) | 635 (186)<br>846 (3198) |
| | 158°F (70°C) | MBH (kW)<br>GPH (L/h) | 280 (82)<br>372 (1410) | 293 (86)<br>390 (1479) | 440 (129)<br>588 (2217) |
| **Supply flow rate** for the recovery rates stated | | GPH ($m^3/h$) | 2640 (10) | 3420 (13) | 5160 (19.5) |
| **Standby losses*2** | | MBH/24 h | 13.6 | 18.4 | 27.6 |
| **Heat exchanger surface area** | | $ft.^2$ ($m^2$) | 30.1 (2.8) | 38.8 (3.6) | 58.1 (5.4) |

***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)**

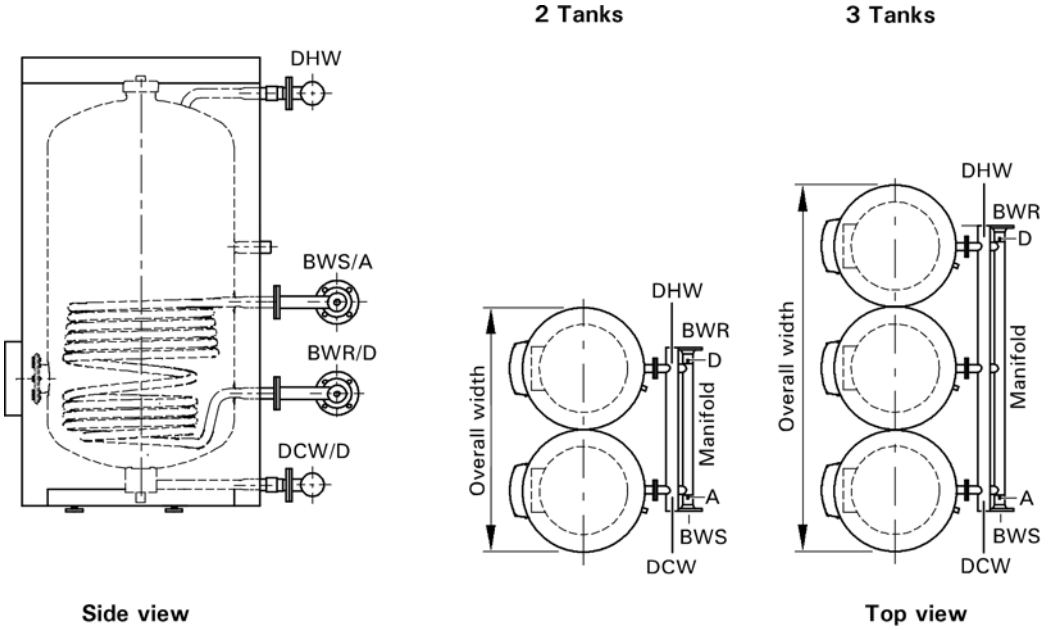
**WARNING**

**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 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.

## Multiple Tank Installation *(continued)*

For domestic hot water heating applications which utilize modulating and low temperature hot water heating boilers
Examples of multiple tank installations (shown below) - All fittings including manifolds are field supplied.




**Legend**

| | |
|---|---|
| A | Air vent |
| DCW | Domestic cold water |
| DHW | Domestic hot water |
| BWR | Boiler water return |
| BWS | Boiler water supply |
| D | Drain |

| **Storage tank capacity** | | **79 USG (300 L)** | **119 USG (450 L)** | |
|---|---|---|---|---|
| **Number of storage tanks** | | 2 | 2 | 3 |
| **Common header size boiler supply / return** | in. (mm) | 2 (51) | 2 (51) | 2 (51) |
| **Common header size domestic hot / cold water** | in. (mm) | 1¼ (32) | 1¼ (32) | 1½ (38) |
| **Dimensions with insulation** Overall width*1* | in. (mm) | 52 (1321) | 70 (1778) | 106 (2692) |

***1*** Overall width includes 2″ clearance space between the tanks.



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## Multiple Tank Installation *(continued)*

**Domestic hot water draw rate**
Storage tank content heated to 140°F (60°C),
boiler not reheating

| **Storage tank capacity** | **USG (L)** | **79 USG (300 L)** | **119 USG (450 L)** | |
|---|---|---|---|---|
| **Number of storage tanks** | | 2 | 2 | 3 |
| **Battery storage capacity** | USG (L) | 158 (600) | 238 (900) | 357 (1350) |
| **DHW draw rate** | GPM (L/min) | 7.9 (30) | 7.9 (30) | 11.9 (45) |
| **Domestic hot water draw** Water with t = 140°F (60°C) (constant) | USG (L) | 143.7 (544) | 243 (920) | 365 (1380) |
| **% of battery volume** | | 93 | 92 | 92 |

**Quick recovery (over 10-minute period)**
Domestic hot water rise from 50 to 113°F (10 to 45°C)

| **Storage tank capacity** | **USG (L)** | **79 USG (300 L)** | **119 USG (450 L)** | |
|---|---|---|---|---|
| **Number of storage tanks** | | 2 | 2 | 3 |
| **Battery storage capacity** | USG (L) | 158 (600) | 238 (900) | 357 (1350) |
| **Heating water supply temperature** | | Quick DHW recovery (over 10-minute period) | | |
| 194°F (90°C) | USG/10 min | 237 | 314 | 422 |
| | (L/10 min) | (898) | (1190) | (1600) |
| 176°F (80°C) | USG/10 min | 229 | 314 | 422 |
| | (L/10 min) | (870) | (1190) | (1600) |
| 158°F (70°C) | USG/10 min | 184 | 277 | 388 |
| | (L/10 min) | (698) | (1050) | (1470) |

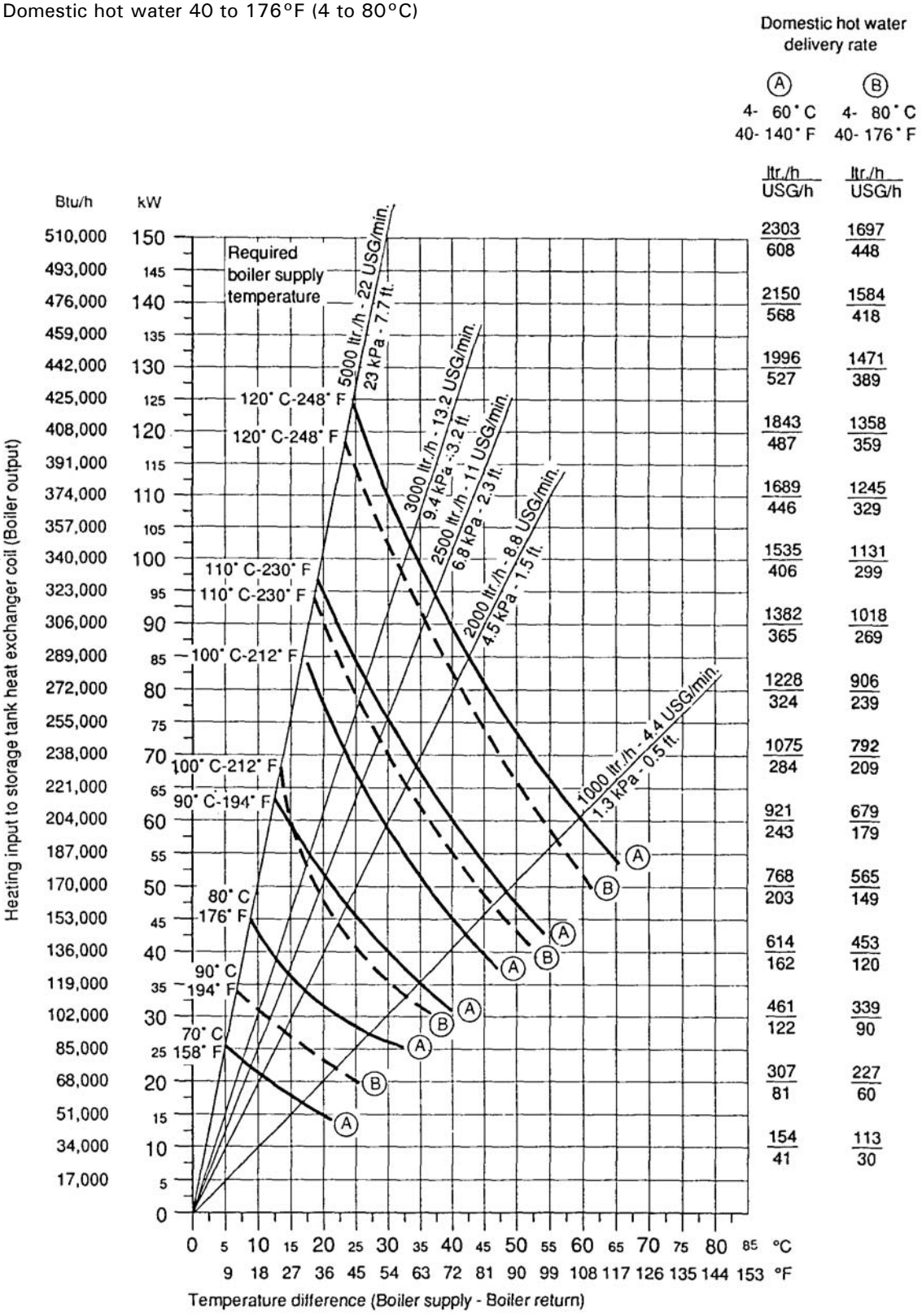
**Max. domestic hot water draw rate (over 10-minute period)**
Domestic hot water rise from 50 to 113°F (10 to 45°C)

| **Storage tank capacity** | **USG (L)** | **79 USG (300 L)** | **119 USG (450 L)** | |
|---|---|---|---|---|
| **Number of storage tanks** | | 2 | 2 | 3 |
| **Battery storage capacity** | USG (L) | 158 (600) | 238 (900) | 357 (1350) |
| **Heating water supply temperature** | | Max. DHW draw rate (over 10-minute period) | | |
| 194°F (90°C) | GPM (L/min) | 23.5 (90) | 32 (120) | 42.3 (160) |
| 176°F (80°C) | GPM (L/min) | 23 (87) | 32 (120) | 42.3 (160) |
| 158°F (70°C) | GPM (L/min) | 18.5 (70) | 26.6 (101) | 39 (148) |

# Water Flow

**Continuous Flow Capacity Chart for 53 USG (200 L)**

Curve Ⓐ Domestic hot water 40 to 140°F (4 to 60°C)
Curve Ⓑ Domestic hot water 40 to 176°F (4 to 80°C)



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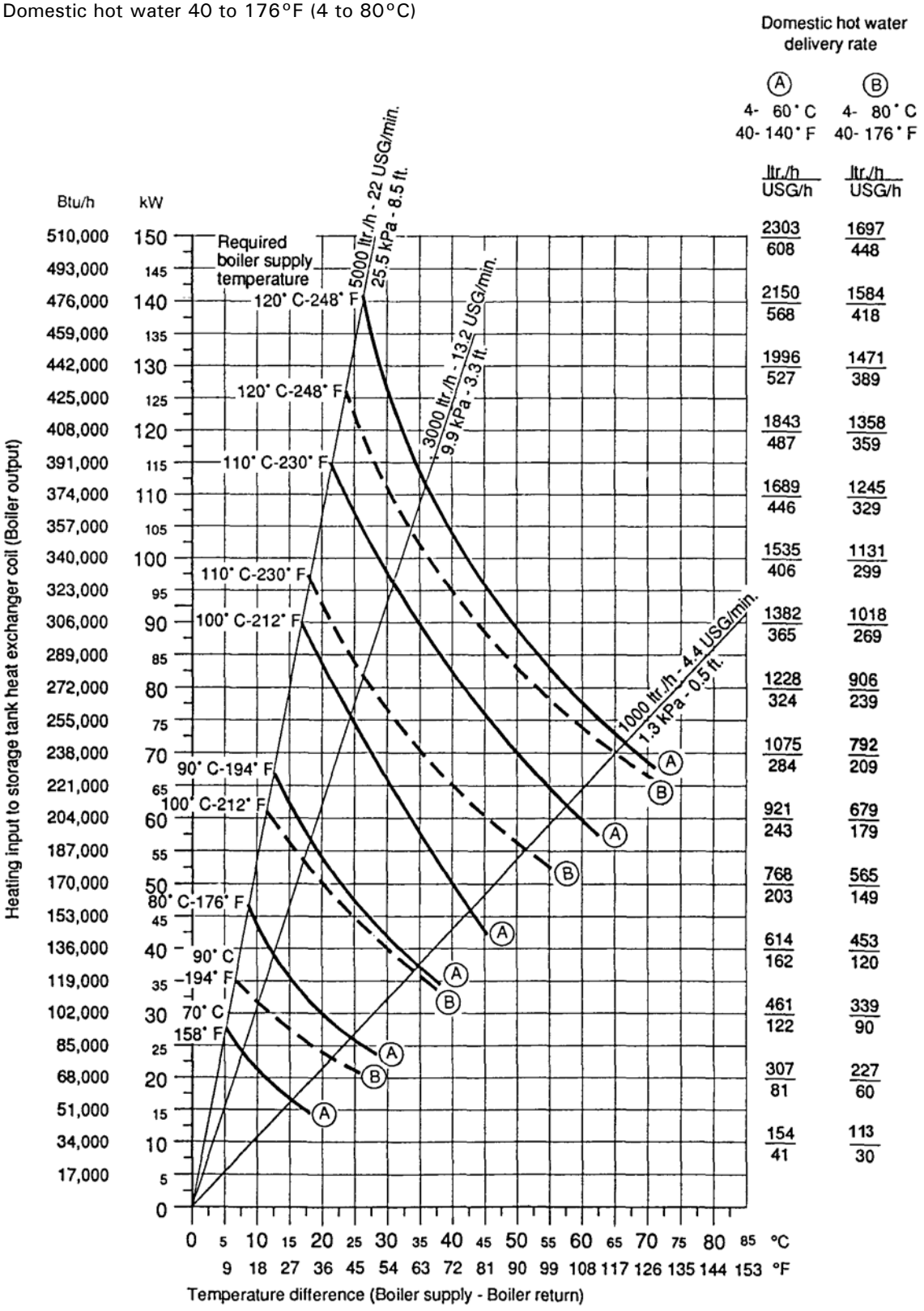
## Water Flow *(continued)*

**Continuous Flow Capacity Chart for 79 USG (300 L)**

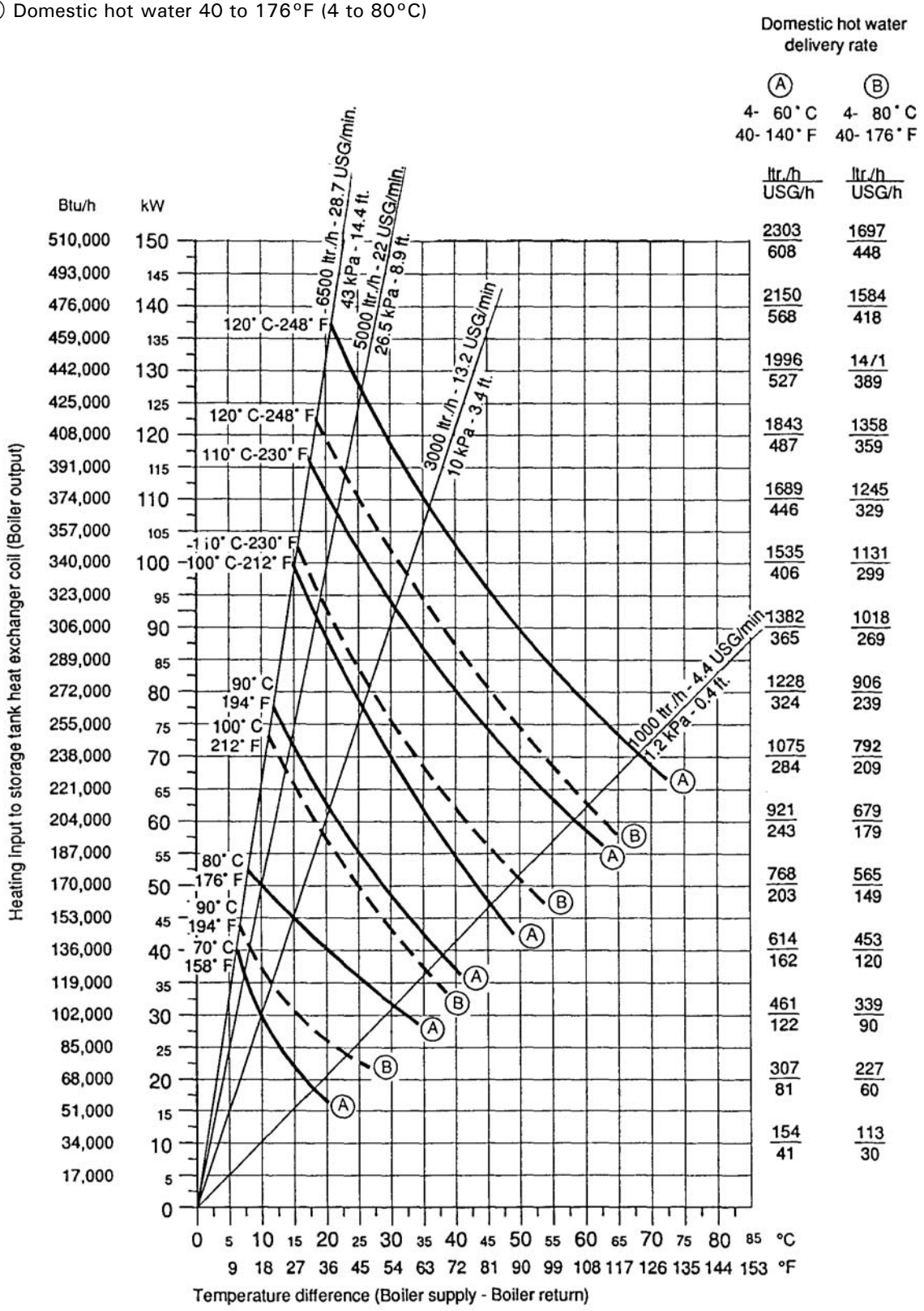
Curve Ⓐ Domestic hot water 40 to 140°F (4 to 60°C)
Curve Ⓑ Domestic hot water 40 to 176°F (4 to 80°C)



## Water Flow *(continued)*

**Continuous Flow Capacity Chart for 119 USG (450 L)**

Curve Ⓐ Domestic hot water 40 to 140°F (4 to 60°C)
Curve Ⓑ Domestic hot water 40 to 176°F (4 to 80°C)



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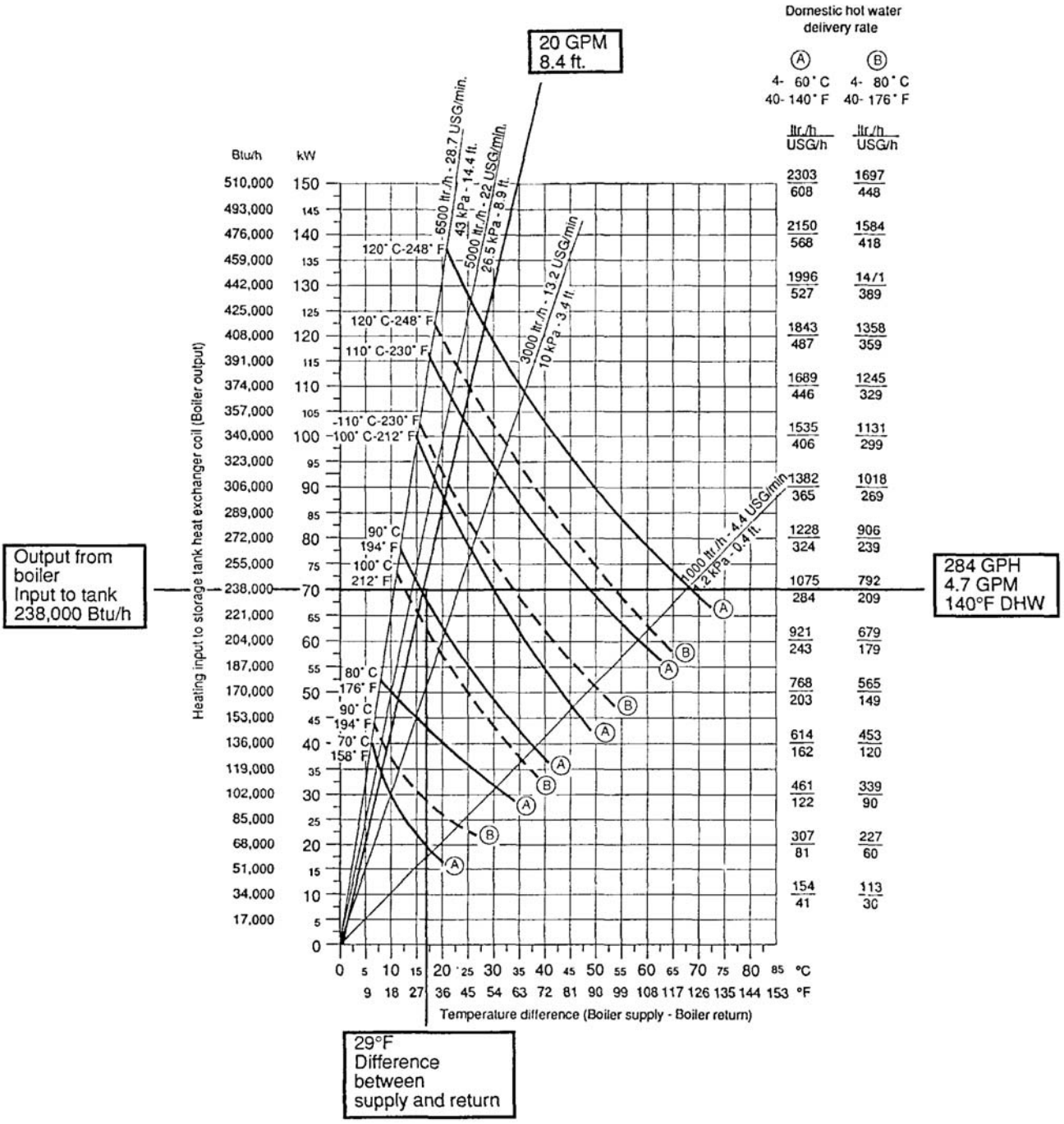
## Water Flow *(continued)*

**Example: Vitocell 300-V, 119 USG (450 L) 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 L) 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.



## Standard Equipment

**53 USG (200 L) and 79 USG (300 L) 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
- sensor well with insulation
- temperature and pressure relief valve.

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

**119 USG (450 L) capacity**

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

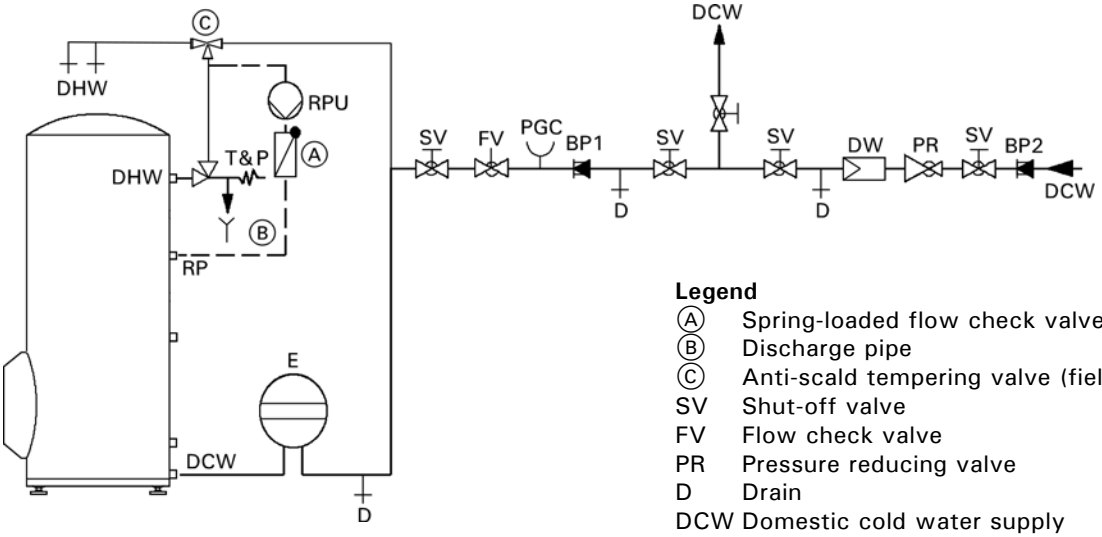
The following is packed separately and attached to the crate:
- installation fittings package: with the necessary brass adaptors, other necessary hardware
- sensor well with insulation
- temperature and pressure relief valve.

Synthetic wrap-around enclosure panel in a Vitosilver finish.

## 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 connections**




**Legend**

| | |
|---|---|
| Ⓐ | 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 gauge 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 |



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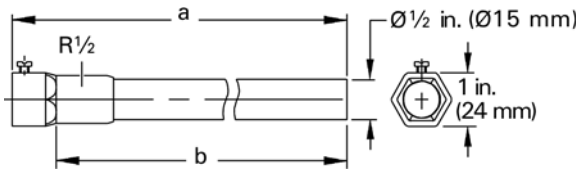
# System Design Guidelines

**Sensor well**
The supplied stainless steel sensor wells are to be used for control sensors to ensure maximum operational safety. Should the supplied sensors not fit into the sensor wells, other stainless steel sensor wells must be used.
For solar heating systems, Viessmann recommends placement of the DHW tank temperature sensor in the solar collector return. This requires a brass elbow with sensor well included in the accessory pack.




| Storage capacity | USG (L) | 53 (200) | 79 (300) | 119 (450) |
|---|---|---|---|---|
| a | in. | 8¾ | 8¾ | 13 |
| | (mm) | (220) | (220) | (330) |
| b | in. | 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 temperature 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 150 psi 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 Canadian Registration Number (CRN) is required. Maximum operating pressure is 150 psig.

The T&P relief valve supplied with the tank is tested under ANSI Z21.22 Code for Relief Valves and Automatic Gas Shut-off Devices for Hot Water Supply Systems.

| T&P Valve | 100 psig (where CRN is required) | 150 psig |
|---|---|---|
| ASME pressure steam rating | see ratings marked on T&P valve | |
| CSA temperature steam rating | 205 MBH | 205 MBH |
| Relief temperature | 210°F (99°C) | 210°F (99°C) |
| Inlet thread | ¾" male | ¾" male |
| Outlet thread | ¾" female | ¾" female |

**Warranty consideration**
Viessmann DHW tanks require 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 sheet.



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