

# Technical Data Manual

Model Nos. and pricing: see Price List

**VIESSMANN**

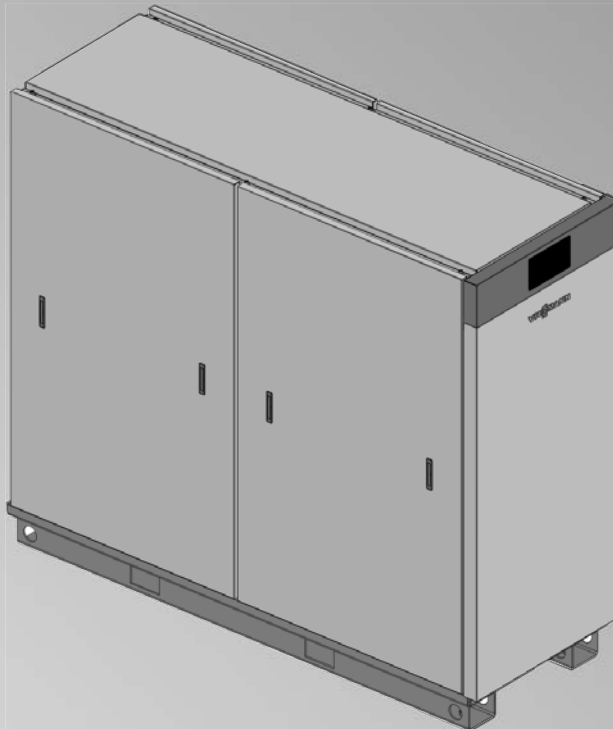
## **Vitotrans 300, S3HA Series**

Indirect Fired Domestic Hot Water Unit – Single Wall

## **Vitotrans 300, D3HA Series**

Indirect Fired Domestic Hot Water Unit – Double Wall

# VITOTRANS 300



*Product may not be exactly as shown*

## **Viessmann Vitotrans 300 Series, Models S3HA 30, D3HA 30, S3HA 60, D3HA 60, S3HA 90 and D3HA 90**

The Viessmann Vitotrans 300 works directly with a boiler in a hot water heating system to provide comfortable domestic hot water for a commercial building or for process water heating applications.

## Vitotrans 300 Series

The Viessmann Vitotrans 300 Series is engineered to be used with hydronic (boiler) heating systems, as a tank-less or on demand water heater, or in combination with a hot water DHW storage tank.

The Vitotrans 300 was designed to ideally work on a large  $\Delta t$  to accommodate gas fired condensing boilers and produce DHW at efficiencies over 96%.

The benefits at a glance:

- Reliable on demand hot water.
- Integrated variable speed boiler supply/return circulating pump.
- Double wall heat exchanger with leak detection option available.
- Each heat exchanger can be individually isolated and serviced during operation without interruption (for 60 and 90 model sizes).
- Built-in ultrasonic flow sensor.
- Built-in temperature sensors.
- Built in domestic water pressure relief valve rated at 150 psi.
- Quiet performance: Engineered and balanced for quiet operation.
- Dependable: Manufactured to precise specifications, using high performance components.
- Plate brazed stainless steel heat exchanger(s) with ASME U stamp, CRN and NSF/ANSI 372.
- BACnet (IP) communication.
- Integrated descaling pump.
- Base equipped with a leak pan and floor levelling bolts.
- Transport access on all four sides.
- Quick access to all components through latched side panels.
- Capable of maintaining DHW supply water setpoint within  $\pm 2^\circ\text{F}$  ( $\pm 1^\circ\text{C}$ ) under steady state conditions.
- Capable of maintaining DHW tank temperature setpoint within  $\pm 5^\circ\text{F}$  ( $\pm 2.5^\circ\text{C}$ ).
- Capable of delivering at setpoint DHW in less than 20 seconds after the start of DHW draw.

The heat exchanger(s) used in the Vitotrans 300 are certified to NSF/ANSI 372 for "lead free" plumbing products as defined by applicable US state laws and by section 1417 of the US Safe Drinking Water Act.

The heat exchanger(s) used in the Vitotrans 300 carry the ASME U Stamp and have a CRN.

Easy installation, service and maintenance with all pipe connections located at the rear and serviceable components (including electrical connections) easily accessible from the sides.

### Control variety

Integrated system control interfaces with the Building Management System using BACnet (IP) communication protocol.

### Compact design

Zero clearance to combustibles make it a great choice for limited-space installations.

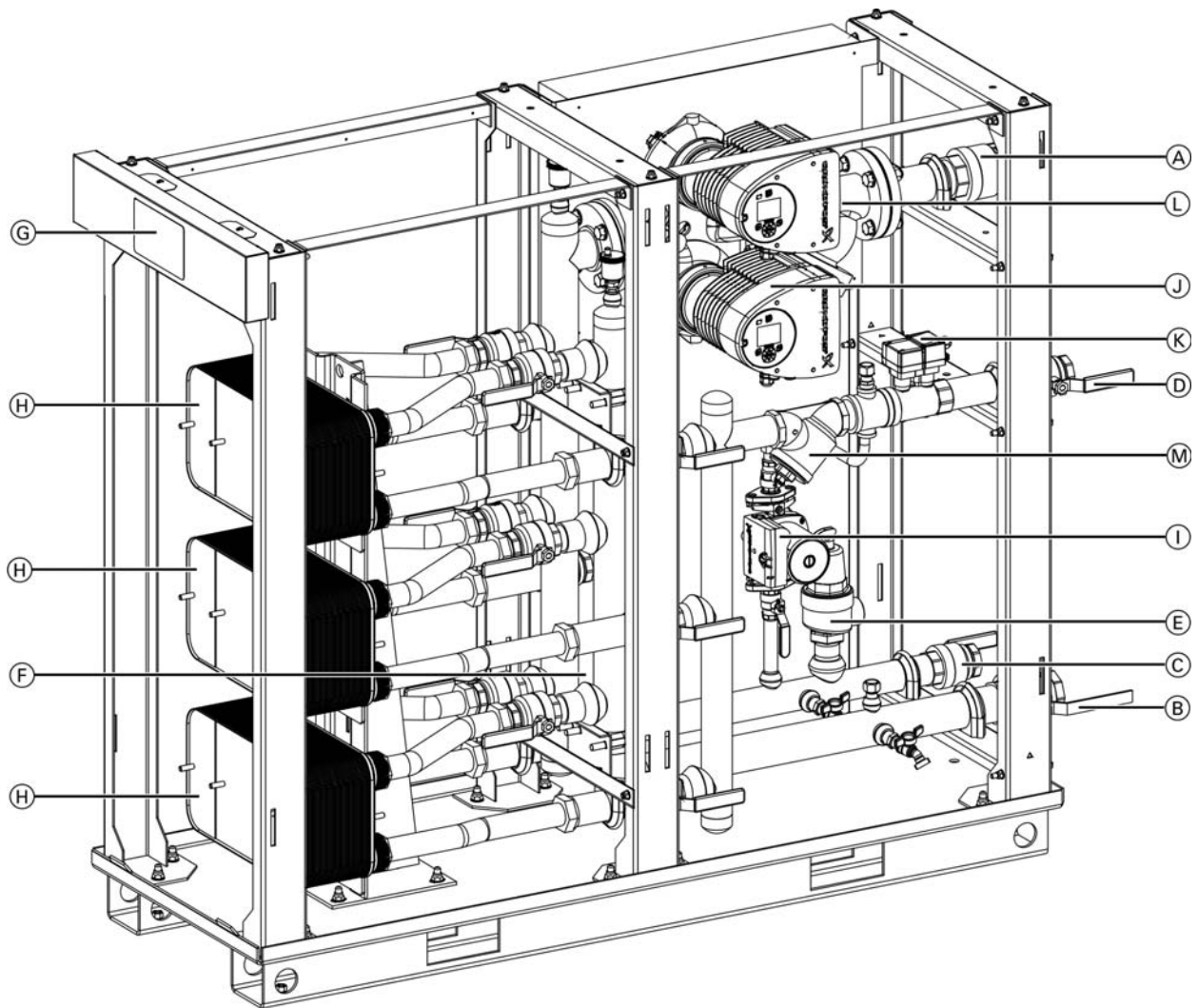
### CAUTION

The Vitotrans 300 series is not suitable for steam or condensate heating applications. The pressure of the heat transfer medium must be limited to a maximum of 150 psig by an approved safety or relief valve.

### CAUTION

For the Vitotrans 300 S3HA series only the heat transfer medium must be water or other non-toxic fluid having a toxicity rating or class of 1, as listed in clinical toxicology of commercial products, 5th edition. The pressure of the heat transfer medium must be limited to a max. of 30 psig by an approved safety or relief valve.

# Components



**Legend**

- (A) Heating system supply
- (B) Heating system return
- (C) Domestic Hot water supply
- (D) Domestic Cold water inlet
- (E) 150 psi pressure relief valve for domestic water
- (F) 210°F (99°C) manual reset fixed high limit (domestic hot water)(not shown)
- (G) Touch screen user interface
- (H) Single wall brazed plate heat exchangers (up to 3) optional double wall brazed plate heat exchanger with leak detection
- (I) Integrated descaling pump
- (J) Fully modulating heating system pump
- (K) Ultrasonic flow meter
- (L) Heating system Wye strainer
- (M) Domestic water Wye strainer

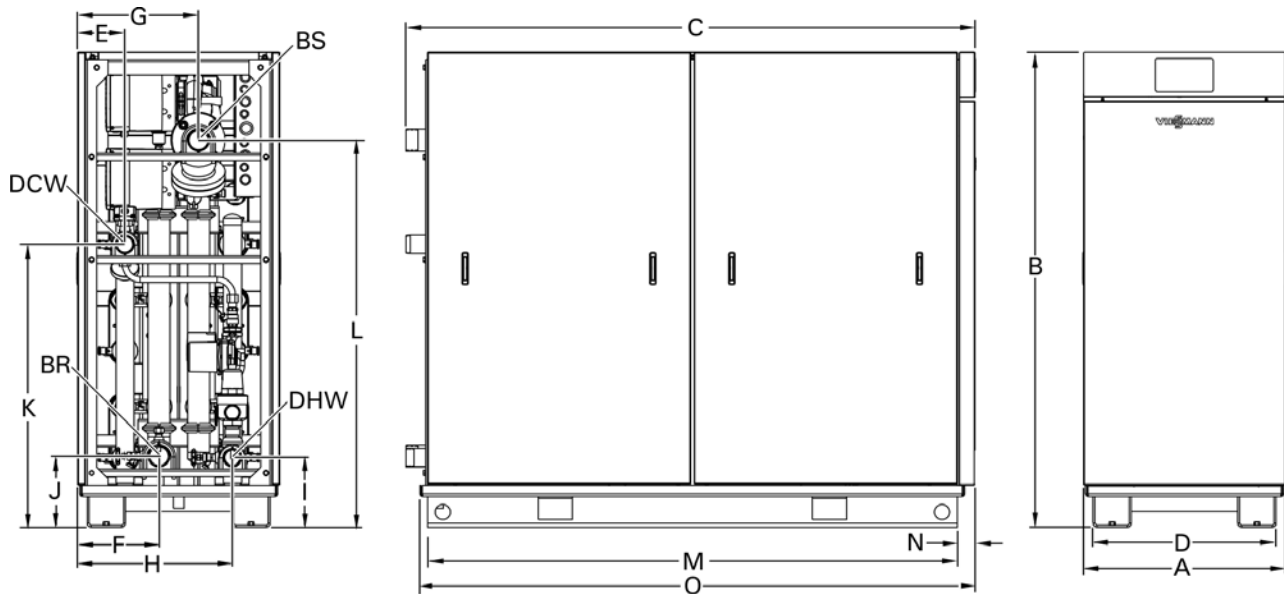
## Technical Data

Models		S3HA 30	D3HA 30	S3HA 60	D3HA 60	S3HA 90	D3HA 90
Heating input	MBH	2100	2100	4200	4200	6300	6300
	(kW)	(615)	(615)	(1231)	(1231)	(1846)	(1846)
Power supply	Voltage (AC)	240	240	240	240	240	240
	Phase	1	1	1	1	1	1
	FLA	20	20	20	20	20	20
	Hz	60	60	60	60	60	60
Overall length	in.	73¾	73¾	73¾	73¾	73¾	73¾
	(mm)	(1896)	(1896)	(1896)	(1896)	(1896)	(1896)
Overall width	in.	26½	26½	26½	26½	26½	26½
	(mm)	673	673	673	673	673	673
Overall height * 1	in.	62¼	62¼	62¼	62¼	62¼	62¼
	(mm)	(1584)	(1584)	(1584)	(1584)	(1584)	(1584)
Weight (without water)	lb.	1037	1082	1123	1223	1273	1408
	(Kg)	(470)	(491)	(509)	(550)	(577)	(639)
Weight (with water)	lb.	1107	1155	1222	1319	1404	1549
	(Kg)	(502)	(524)	(554)	(598)	(637)	(703)
Water content heating system	USG	4.4	4.6	6.2	6.6	8.0	8.6
	(L)	(16.2)	(17.4)	(23.5)	(25.0)	(30.3)	(32.6)
Water content domestic	USG	4	4.2	5.7	6.1	7.7	8.3
	(L)	(15.1)	(15.9)	(21.6)	(23.1)	(29.1)	(31.4)
Heat exchanger surface area	ft. <sup>2</sup>	69.6	81.2	139.2	162.4	208.8	243.6
	(m <sup>2</sup> )	(6.47)	(7.54)	(12.93)	(15.09)	(19.40)	(22.63)
Max. boiler supply temperature	°F	230	230	230	230	230	230
	(°C)	(110)	(110)	(110)	(110)	(110)	(110)
Max. domestic hot water supply temperature (FHL)	°F	210	210	210	210	210	210
	(°C)	(99)	(99)	(99)	(99)	(99)	(99)
Maximum operating pressure	psig	150	150	150	150	150	150
	(bar)	(10.3)	(10.3)	(10.3)	(10.3)	(10.3)	(10.3)
Boiler supply connection (NPT)	in.	2½	2½	2½	2½	2½	2½
	(mm)	65	65	65	65	65	65
Boiler return connection (NPT)	in.	2½	2½	2½	2½	2½	2½
	(mm)	65	65	65	65	65	65
DCW connection (NPT)	in.	2	2	2	2	2	2
	(mm)	50	50	50	50	50	50
DHW connection (NPT)	in.	2	2	2	2	2	2
	(mm)	50	50	50	50	50	50
Max DHW flow	GPM	60	60	120	120	180	180
	(L/min)	(227)	(227)	(454)	(454)	(681)	(681)
Heating system circulating pump * 2	Model	65-150	65-150	65-150	65-150	65-150 Dual	65-150 Dual

\* 1 Overall height does not include leveling feet or seismic brackets.

\* 2 The heating system circulating pump is built for the Vitotrans 300 and any replacement parts must be ordered from Viessmann.

**Dimensions**



**Dimensions**

Models	S3HA 30	D3HA 30	S3HA 60	D3HA 60	S3HA 90	D3HA 90
A in. (mm)	26 ½ (673)	26 ½ (673)	26 ½ (673)	26 ½ (673)	26 ½ (673)	26 ½ (673)
B*1 in. (mm)	62 ¼ (1584)	62 ¼ (1584)	62 ¼ (1584)	62 ¼ (1584)	62 ¼ (1584)	62 ¼ (1584)
C in. (mm)	74 ¾ (1896)	74 ¾ (1896)	74 ¾ (1896)	74 ¾ (1896)	74 ¾ (1896)	74 ¾ (1896)
D in. (mm)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
E in. (mm)	6 ¼ (157)	6 ¼ (157)	6 ¼ (157)	6 ¼ (157)	6 ¼ (157)	6 ¼ (157)
F in. (mm)	10 ¾ (271)	10 ¾ (271)	10 ¾ (271)	10 ¾ (271)	10 ¾ (271)	10 ¾ (271)
G in. (mm)	15 ¾ (403)	15 ¾ (403)	15 ¾ (403)	15 ¾ (403)	15 ¾ (403)	15 ¾ (403)
H in. (mm)	20 ¼ (516)	20 ¼ (516)	20 ¼ (516)	20 ¼ (516)	20 ¼ (516)	20 ¼ (516)
I*1 in. (mm)	9 ¼ (232)	9 ¼ (232)	9 ¼ (232)	9 ¼ (232)	9 ¼ (232)	9 ¼ (232)
J*1 in. (mm)	9 ¼ (237)	9 ¼ (237)	9 ¼ (237)	9 ¼ (237)	9 ¼ (237)	9 ¼ (237)
K*1 in. (mm)	37 ¼ (943)	37 ¼ (943)	37 ¼ (943)	37 ¼ (943)	37 ¼ (943)	37 ¼ (943)
L*1 in. (mm)	50 ¾ (1291)	50 ¾ (1291)	50 ¾ (1291)	50 ¾ (1291)	50 ¾ (1291)	50 ¾ (1291)
M in. (mm)	69 ½ (1765)	69 ½ (1765)	69 ½ (1765)	69 ½ (1765)	69 ½ (1765)	69 ½ (1765)
N in. (mm)	2 ¼ (59)	2 ¼ (59)	2 ¼ (59)	2 ¼ (59)	2 ¼ (59)	2 ¼ (59)
O in. (mm)	72 ¾ (1850)	72 ¾ (1850)	72 ¾ (1850)	72 ¾ (1850)	72 ¾ (1850)	72 ¾ (1850)

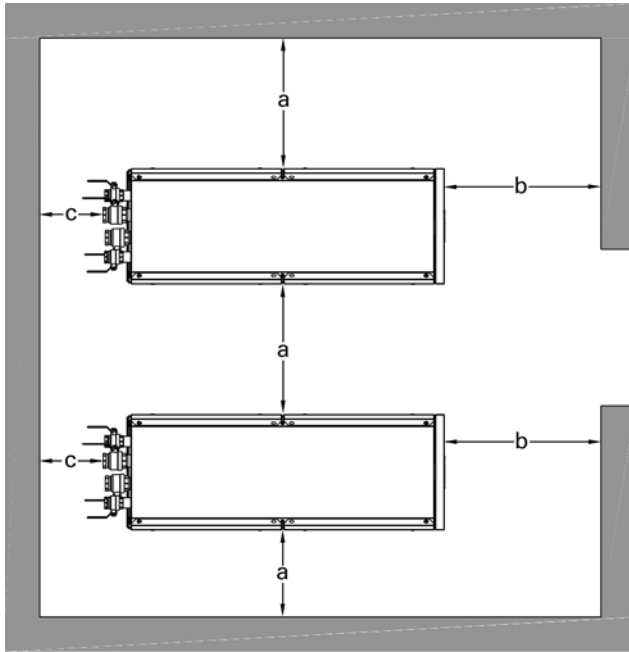
**Note:** dimensional tolerance of ± ¼ in. (± 5 mm)

**Legend**

- BS Boiler Supply (heating system supply)
- BR Boiler Return (heating system return)
- DHW Domestic Hot Water
- DCW Domestic Cold Water

\*1 Height Does not include the use of leveling feet [+ up to 2 in. (50 mm)], or seismic feet [+ 2 ½ in. (60 mm)].

## Recommended Minimum Service Clearances



To enable convenient installation and maintenance, observe the stated clearance dimensions. Maintain the minimum clearances where space is tight.

Models	S3HA 30	D3HA 30	S3HA 60	D3HA 60	S3HA 90	D3HA 90
a in. (mm)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
b in. (mm)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
c in. (mm)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)	24 (610)
Top in. (mm)	12 (300)	12 (300)	12 (300)	12 (300)	12 (300)	12 (300)

### Mechanical room

- Install on a level surface
- Avoid high levels of humidity
- Protect against frost
- Ensure good ventilation

**Note:** The system may suffer faults and/or damage if the above are not followed.

### Minimum clearances to combustibles

Model	S3HA 30	D3HA 30	S3HA 60	D3HA 60	S3HA 90	D3HA 90
Top	0					
Sides	0					
Front	0					
Floor	combustible					

## Operation Overview

### With Direct DHW

In direct DHW production operation (system not equipped with DHW Storage Tank), the Vitotrans 300 is activated based solely on domestic water flow. The domestic water flow rate is measured by the integrated ultrasonic flow meter and based on the 'Minimum activation flow rate' setting will activate the Vitotrans. The minimum activation flow rate setting is a user adjustable and has a range of 5 to 30 GPM. Once the domestic water flow rate meets or exceeds this setting the Vitotrans will send a call for heat to the boiler and activate the integrated variable speed system pump. Initially the system pump will operate at maximum speed to minimize the amount of time required to generate DHW at the user selected set point. As the DHW approaches the set point temperature the pump will modulate down to achieve and maintain the required DHW temperature.

The system pump will modulate up and down to maintain the DHW setpoint temperature even with fluctuations in DHW flow. Once domestic water flow rate has dropped below the minimum flow rate activation set point the Vitotrans will go into standby mode, cancelling the call for heat to the boiler and stopping the internal system pump. **Note:** The standard settings are listed above.

Optional settings;

**Comfort Mode** – When the Vitotrans 300 is in standby, this function will run the internal system pump at a constant minimum speed. This function can be used with a heating system or boiler that is set up to maintain a certain minimum system temperature. This is to ensure that hot water is always available at the Vitotrans 300 and that DHW can be produced without delay.

## Operation Overview *(continued)*

### With DHW Storage Tank

In systems equipped with DHW Storage Tank, the Vitotrans 300 is activated based on domestic water flow, or DHW Tank Temperature setpoint. When there is no or low DHW draw on the tank and there is a drop in temperature measured in the tank the Vitotrans will activate to recover the tank. Alternately, when domestic water flow rate measured by the integrated ultrasonic flow meter exceeds the 'Minimum activation flow rate' setting the Vitotrans will activate. The minimum activation flow rate setting is a user adjustable setting that has a range of 5 to 30 GPM. In both cases whether the Vitotrans is activated by the DHW tank temperature sensor or activated by the minimum flow rate activation setting the Vitotrans will send a call for heat to the boiler, and activate the integrated variable speed system pump. The DHW Storage tank loading pump is only activated based on tank temperature, meaning if the tank is satisfied the loading pump will not run, if the tank temperature is below setpoint the tank loading pump will be in operation. Initially the system pump may operate at maximum speed to minimize the amount of time required to generate DHW at the user selected set point. As DHW approaches the set point temperature, the pump may modulate down to achieve and maintain the required DHW temperature.

The system pump will modulate up and down to maintain the DHW setpoint temperature even with fluctuations in DHW flow. Once domestic water flow rate has dropped below the minimum flow rate activation set point, and the DHW storage tank has been satisfied, the Vitotrans will go into standby mode, cancelling the call for heat to the boiler, stopping the internal system pump, and deactivating the tank loading pump.

**Note:** The standard settings are listed above.

Optional settings;

**Comfort Mode** – When the Vitotrans 300 is in standby, this function will run the internal system pump at a constant minimum speed. This function can be used with a heating system or boiler that is set up to maintain a certain minimum system temperature. This is to ensure that hot water is always available at the Vitotrans 300 and that DHW can be produced without delay.

**DHW Recirculation Pump** – for activation of a building DHW recirculation with a fully programmable 7 day schedule.

**Sanitation function** – temporary elevated tank temperature setpoint which can be used as part of an anti-legionnaire program

## Internal Heating Circuit Pump

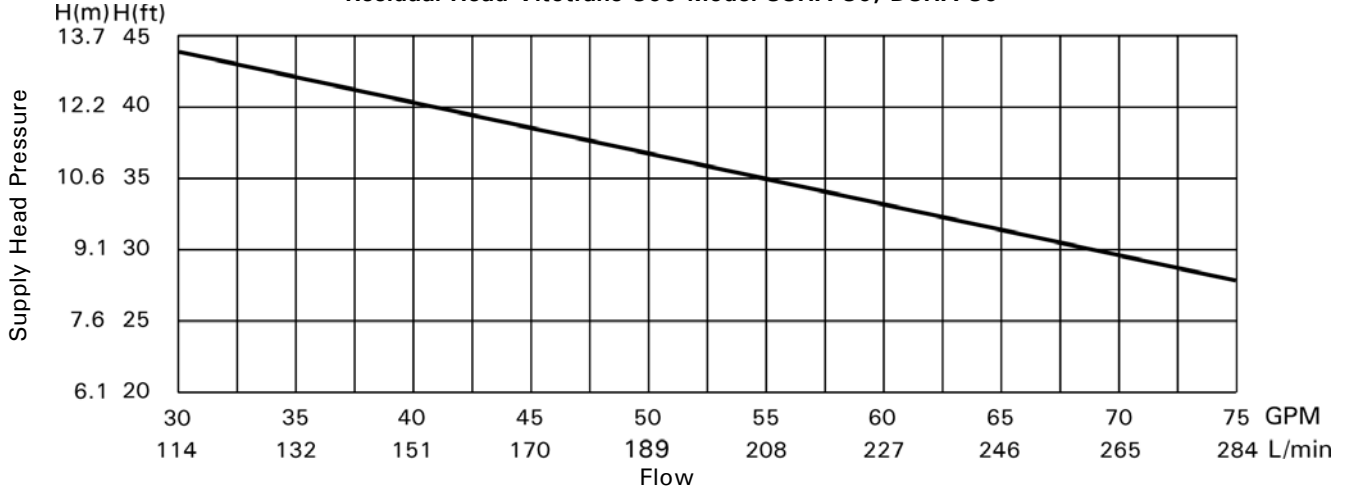
Pump model		65-150	65-150 Dual	
			Head 1	Head 2
<b>Rated voltage</b>	VAC	240	240	240
<b>Rated current</b>	A Max.	5.68	5.68	5.68
	A Min.	0.30	0.30	0.30
<b>Power consumption</b>	W Max.	1301	1301	1301
	W Min.	29	29	29

**Internal Heating Circuit Pump** *(continued)*

**Integrated pump - Residual head**

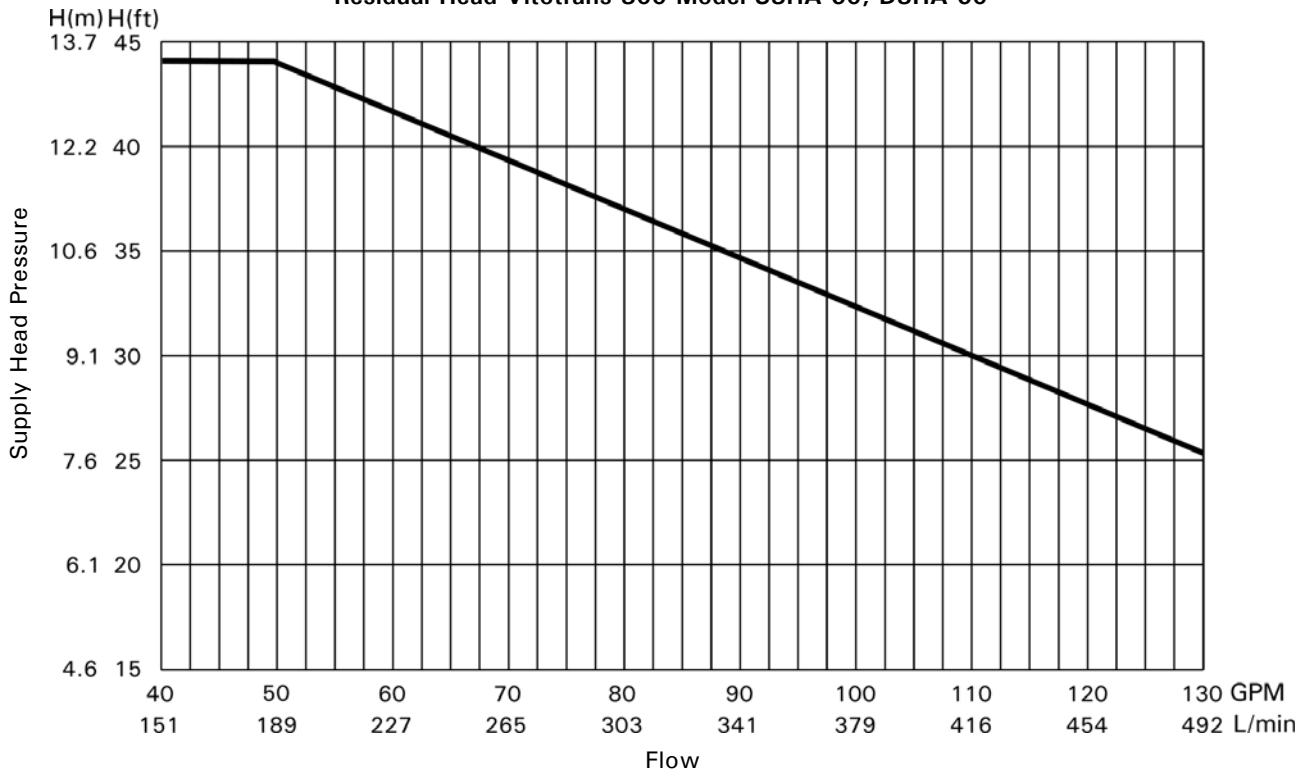
Each model has an integrated fully modulating pump to precisely control outlet hot water temperature by modulating flow on the heating system supply.

**Residual Head Vitotrans 300 Model S3HA 30, D3HA 30**



**Note:** The integrated modulating system pump of the Vitotrans 300 operates within the system flow rates shown above, providing the residual head illustrated in the chart. To achieve maximum DHW production rates, a system flow rate of 75 GPM (284 L/min) is required, providing 27 ft of residual head.

**Residual Head Vitotrans 300 Model S3HA 60, D3HA 60**

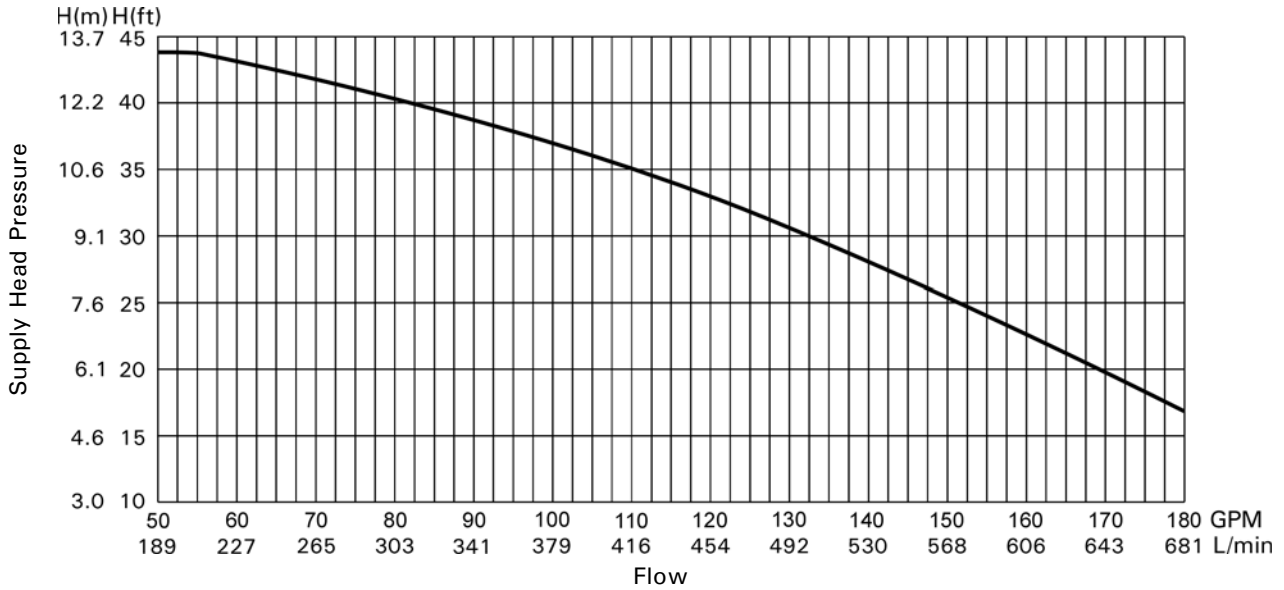


**Note:** The integrated modulating system pump of the Vitotrans 300 operates within the system flow rates shown above, providing the residual head illustrated in the chart. To achieve maximum DHW production rates, a system flow rate of 130 GPM (492 L/min) is required, providing 25 ft of residual head.



**Internal Heating Circuit Pump** *(continued)*

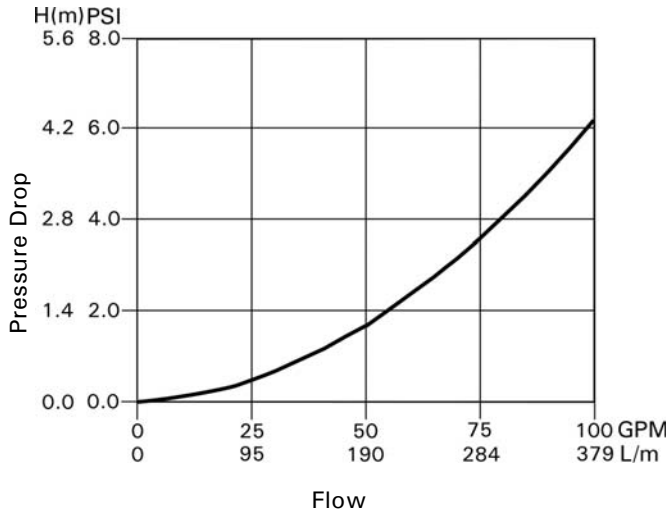
**Residual Head Vitotrans 300 Model S3HA 90, D3HA 90**



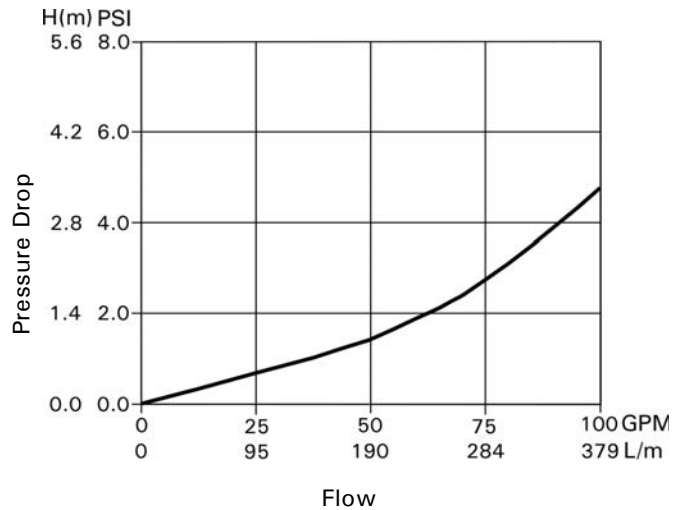
**Note:** The integrated modulating system pump of the Vitotrans 300 operates within the system flow rates shown above, providing the residual head illustrated in the chart. To achieve maximum DHW production rates, a system flow rate of 180 GPM (681 L/min) is required, providing 17 ft of residual head.

**Domestic Side Pressure Drop**

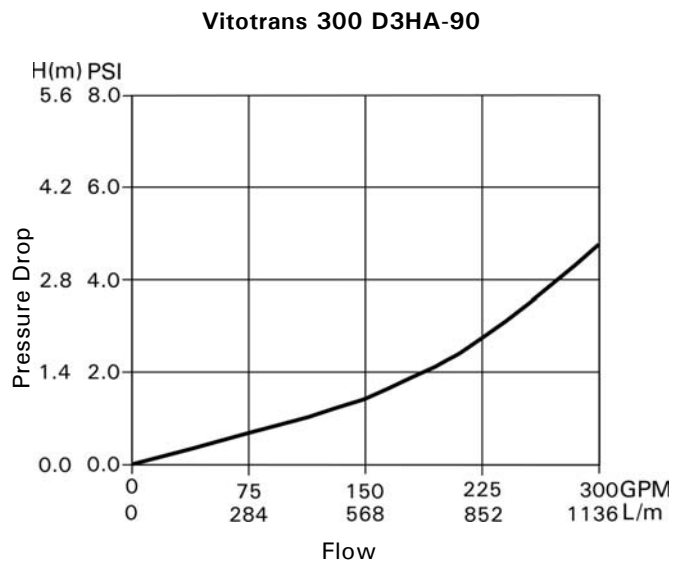
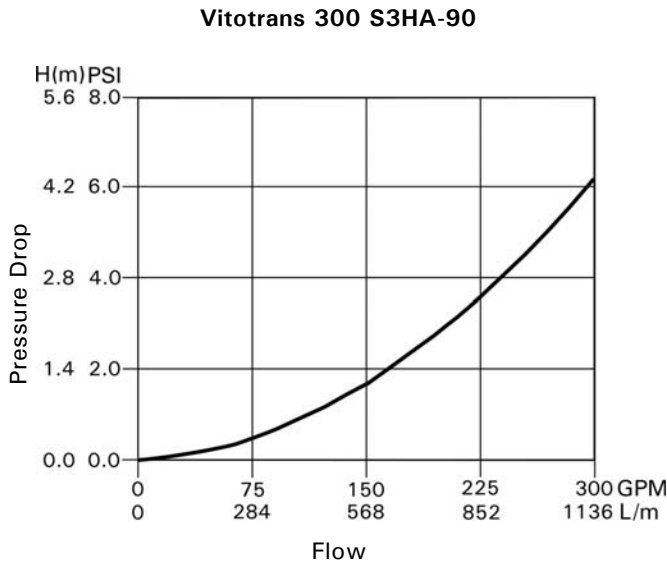
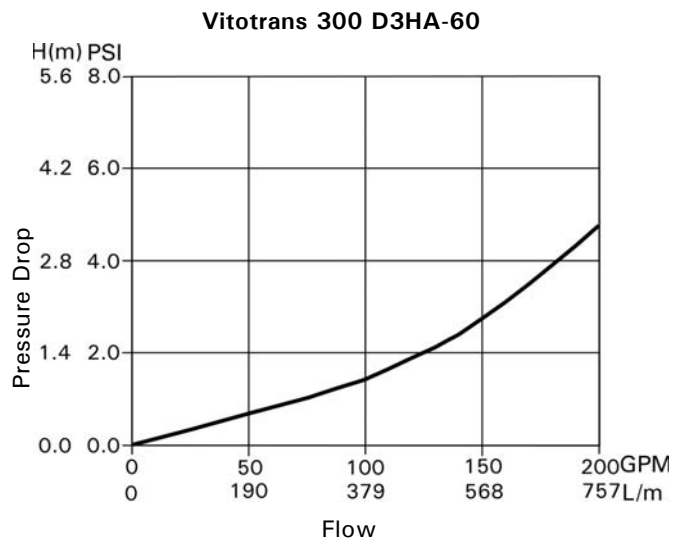
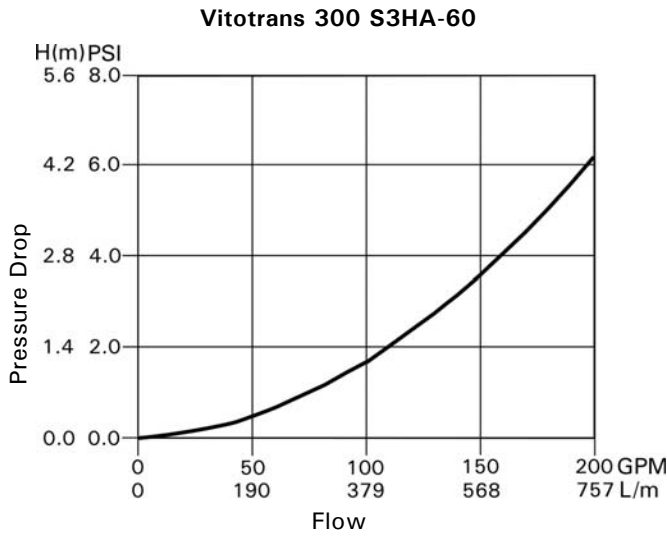
**Vitotrans 300 S3HA-30**



**Vitotrans 300 D3HA-30**



**Domestic Side Pressure Drop** *(continued)*



**DHW Flow Rate**

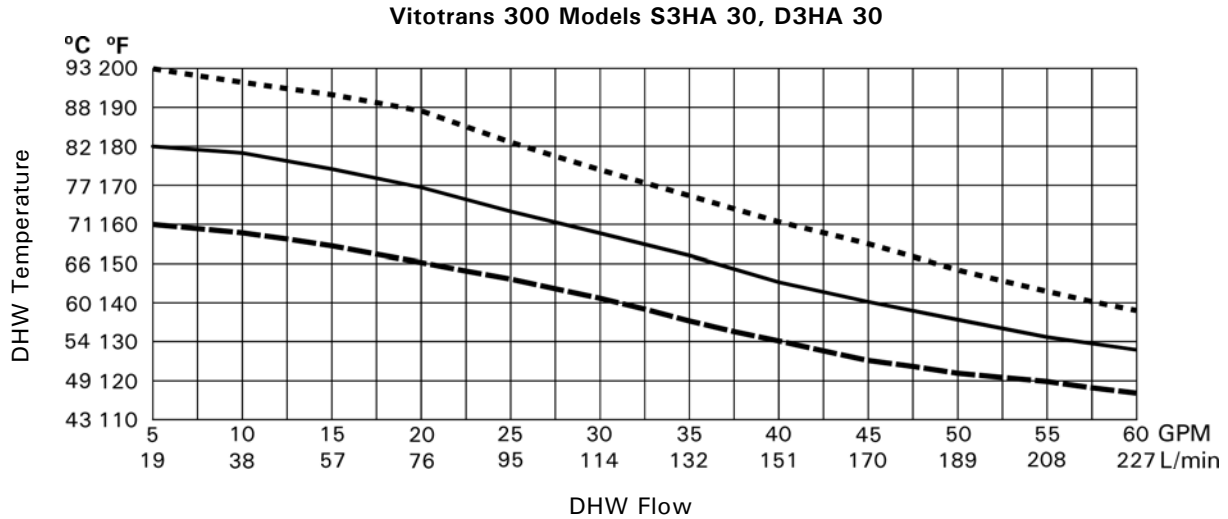
Model	Domestic Water Flow Rate	Domestic Water Temperature Rise
S3HA-30/D3HA-30	15 GPM (57 L/m)	140°F (77°C)
	30 GPM (114 L/m)	115°F (64°C)
	45 GPM (170 L/m)	95°F (53°C)
	60 GPM (227 L/m)	80°F (44°C)
S3HA-60/D3HA-60	30 GPM (114 L/m)	135°F (75°C)
	60 GPM (227 L/m)	115°F (64°C)
	90 GPM (341 L/m)	95°F (53°C)
	120 GPM (454 L/m)	75°F (42°C)
S3HA-90/D3HA-90	30 GPM (114 L/m)	140°F (77°C)
	90 GPM (341 L/m)	115°F (64°C)
	150 GPM (568 L/m)	95°F (53°C)
	180 GPM (681 L/m)	80°F (44°C)

All domestic water flow rates/temperature rise based on a boiler supply water temperature of 200°F (93°C) and an incoming DCW temperature of 60°F (16°C).

**DHW Flow Rate** *(continued)*

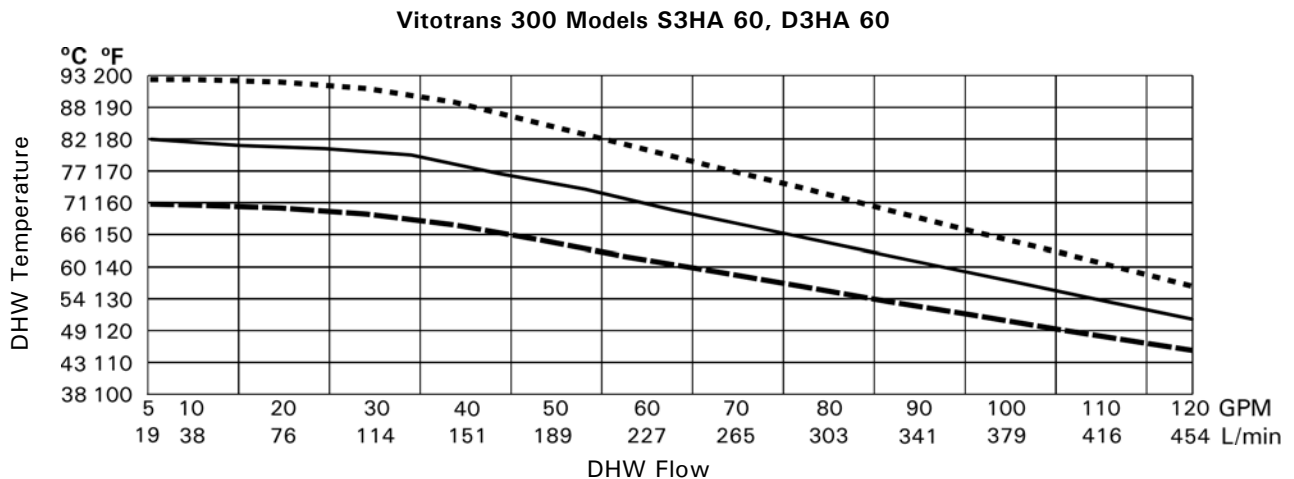
**Domestic Hot Water Production via Instantaneous DHW Plate Heat Exchanger**

The Vitotrans 300 is equipped with electronically monitored and controlled flow through plate heat exchanger(s).



**System supply water temperature**

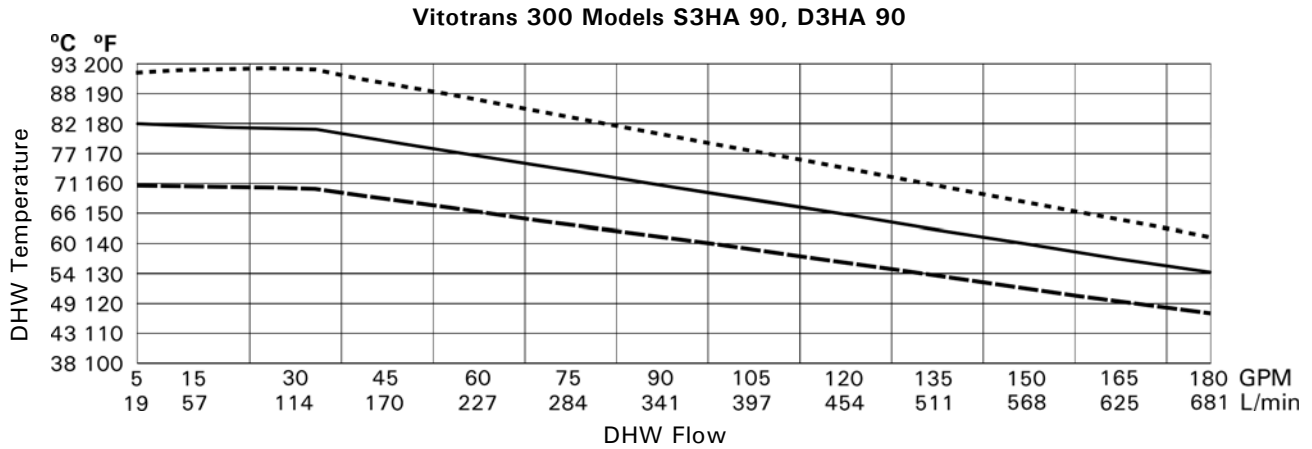
- 200°F (93°C)
  - 180°F (82°C)
  - - - 160°F (71°C)
- This chart illustrates hot water production rate based on a heating system supply temperature of 160°F, 180°F, or 200°F (71°C, 82°C, or 93°C) and a domestic cold water temperature of 40 thru 60°F (4 thru 16°C), stated heating input based on a domestic water flow rate of 30 GPM (114 L/min) at an incoming DCW temperature of 40°F (4°C).  
 Maximum DHW flow rate 60 GPM (227 L/min).  
 Minimum DHW flow rate adjustable from 5 to 30 GPM (19 to 114 L/min). Based on user setting.



**System supply water temperature**

- 200°F (93°C)
  - 180°F (82°C)
  - - - 160°F (71°C)
- This chart illustrates hot water production rate based on a heating system supply temperature of 160°F, 180°F, or 200°F (71°C, 82°C, or 93°C) and a domestic cold water temperature of 40 thru 60°F (4 thru 16°C), stated heating input based on a domestic water flow rate of 60 GPM (227 L/min) at an incoming DCW temperature of 40°F (4°C).  
 Maximum DHW flow rate 120 GPM (454 L/min).  
 Minimum DHW flow rate adjustable from 5 to 30 GPM (19 to 114 L/min). Based on user setting.

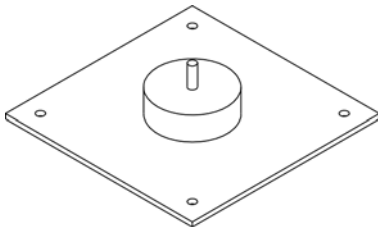
**DHW Flow Rate** *(continued)*



**System supply water temperature**

- 200°F (93°C) This chart illustrates hot water production rate based on a heating system supply temperature of 200°F (93°C) and a domestic cold water temperature of 40 thru 60°F (4 thru 16°C), stated heating input based on a domestic water flow rate of 90 GPM (341 L/min) at an incoming DCW temperature of 40°F (4°C).  
Maximum DHW flow rate 180 GPM (681 L/min).  
Minimum DHW flow rate adjustable from 5 to 30 GPM (19 to 114 L/min). Based on user setting.
- 180°F (82°C)
- · - 160°F (71°C)

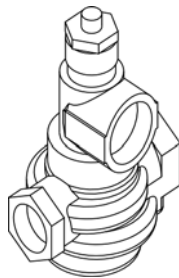
**Accessories**



**Seismic bracket kit**

Part # 7537683

For use with Vitotrans 300 where seismic restraints are required or vibration isolation is desired.



**Point of source DHW Tempering Valve**

A field supplied point of source tempering valve is for use in applications where mandated by local code or in applications where domestic hot water supply temperature regulation is desired or a critical domestic hot water supply temperature must be maintained a point of source tempering valve:

- Watts LFN170 (125 PSI)  
PN: 7725956
- Conbraco 34CLF (150 PSI)  
PN: 7725957

The sizing and number of tempering valves is dependent on the maximum domestic hot water draw rate of the system.

When using a point of source tempering valve the Vitotrans 300 DHW supply temperature setpoint should be set 10°F (5°C) higher than the mixed outlet temperature of the tempering valve.

## DHW Storage Tank

DHW Draw Rate	DHW Storage Tank Volume		
	300 USG (1135 L)	600 USG (2271 L)	900 USG (3407 L)
30 GPM (114 L/min)	10 min	20 min	30 min
60 GPM (227 L/min)	5 min	10 min	20 min
90 GPM (341 L/min)	2.5 min	5 min	10 min

This chart illustrates the approximate buffering time of different volumes of DHW storage tanks, based on the DHW draw rates stated.

The DHW storage tank is field supplied, it is the responsibility of the system designer to ensure that the DHW storage tank is sized based on the specific system criteria. Some of the factors that need to be considered when sizing a DHW storage tank are: system reaction / heat up time particularly during the summer months when the heating system or boiler may not be at operational temperature. It may take several minutes for a heating system / boiler to recognize a call for heat and produce hot water. The type of heating equipment will also be a contributing factor for reaction time (low mass versus high mass boilers). During this time and depending on application, the DHW storage tank should be sized to provide uninterrupted DHW at the system design flow rate.

- Consider tank sensor placement and what percentage of the tank will be depleted and how much reserve is left once a call for recovery is initiated.
- The DHW storage tank loading pump should be sized according to DHW storage tank’s size and desired recovery time. However, it must not exceed the max. flow for the associated Vitotrans 300 model size. It is recommended that the DHW storage tank loading pump should provide at least 30 GPM (114 L/min) of flow and be able to provide sufficient head pressure to overcome the pressure drop between the selected Vitotrans 300 and the piping connecting it to the buffer tank, refer to the Vitotrans 300 pressure drop graphs on pages 8 and 9.
- The ‘flow activation’ setting of the Vitotrans 300 when used with a DHW storage tank, allows for quick reaction to rapidly increased DHW demand. This user adjustable setting can be made so that the Vitotrans will activate above a user adjustable flow rate and start producing DHW even before the DHW storage tank has been depleted or needs recovering. This allows for smaller DHW storage tank sizing. This feature has a setting range of 5 to 30 GPM (19 to 114 L/min). When determining the activation setpoint, consider the size of the DHW storage tank and the anticipated minimum constant DHW draw rate (based on anticipated usage patterns). It is also important to identify the minimum output of the heating system and use this as a factor when choosing the activation set point. This will help reduce short cycling of the heating equipment.

## System Layouts

### **! WARNING**

If a DHW storage tank is used, the installer must verify proper operation of the tank temperature sensor with the original manufacturer of the tank. Viessmann strongly recommends the installation of a thermostatic tempering valve in the DHW supply line. Observe local plumbing code requirements.

### **IMPORTANT**

The examples on the following pages depict possible piping layouts of the Vitotrans 300, equipped with Viessmann System Technology. For system combinations, please install only feasible combinations listed in the Viessmann Price List. Please note that the following examples are simplified conceptual drawings only! Piping, piping diameters and necessary componentry must be field verified. Proper installation and functionality in the field is the responsibility of the heating contractor.

The schematics on the following pages are to be used as guidelines only. They do not display all system varieties, safety devices, or concepts possible. Specific system layouts may be further discussed with the local Viessmann sales representative office.

#### **Clearances**

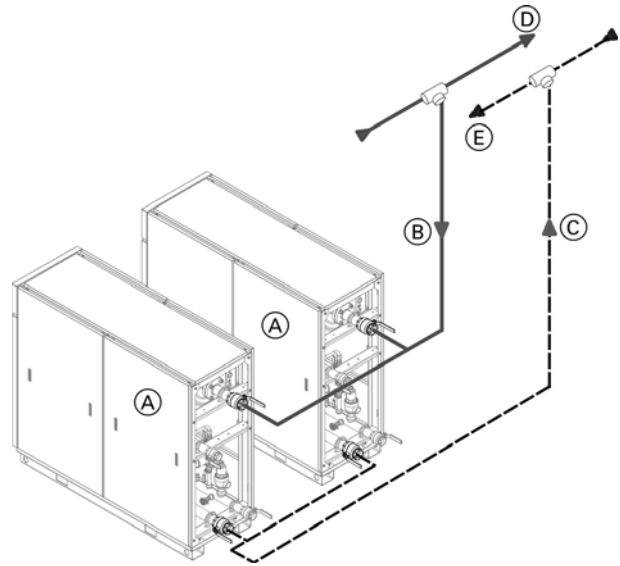
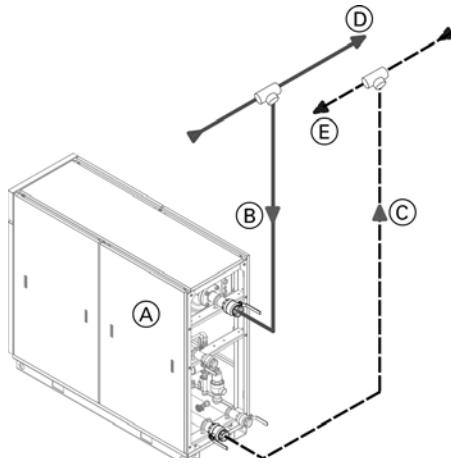
A minimum of 2 in. (51 mm) circumferential clearance from non-insulated hot water pipes to combustible construction must be maintained. In cases where the pipes are insulated with pipe insulation of sufficient thickness and insulation values, the above clearance may be reduced to 0 in. (refer to local codes).

**Note:** In the following piping layout examples all external pumps are field supplied. Observe residual head curves available pump head.

Install isolation valves in all heating, domestic piping and recirculation piping as necessary to service all equipment properly (e.g. pumps).

## Connecting to the Heating System - Supply and Return

Branch off from main heating system supply and return.



#### **Legend**

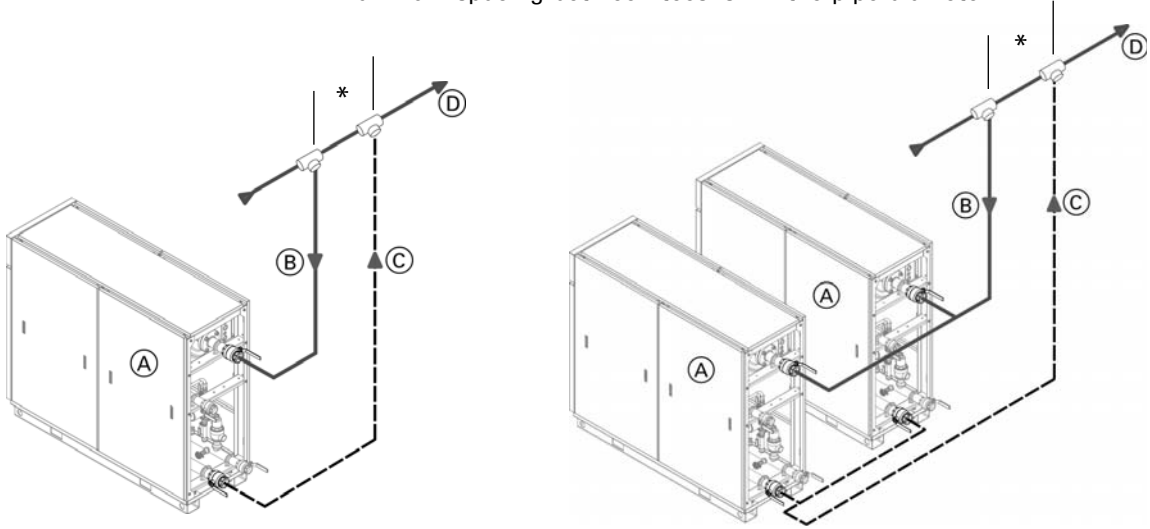
- (A) Vitotrans 300
- (B) Vitotrans supply
- (C) Vitotrans return
- (D) Heating system supply
- (E) Heating system return

The system heat source (boiler) should be set to supply water to the Vitotrans 300 at least 20°F (11°C) higher than the desired DHW setpoint. It is recommended that the Vitotrans 300 is connected close to the heat source.

## Connecting to the Heating System - Closely Spaced Tees

Branch off from main heating system supply.

\* Maximum spacing between tees is 4X the pipe diameter.



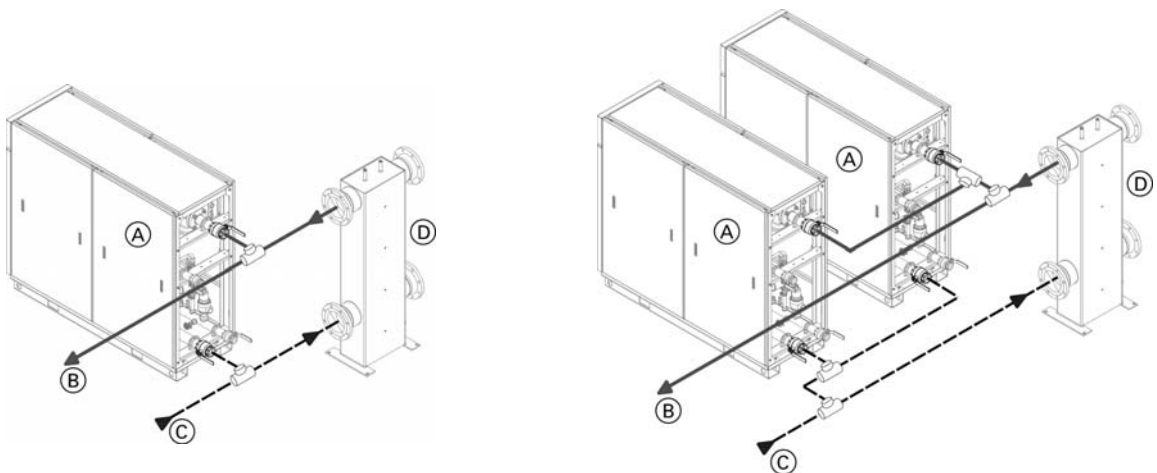
**Legend**

- (A) Vitotrans 300
- (B) Vitotrans supply
- (C) Vitotrans return
- (D) Heating system supply

The system heat source (boiler) should be set to supply water to the Vitotrans 300 at least 20°F (11°C) higher than the desired DHW setpoint. It is recommended that the Vitotrans 300 is connected close to the heat source.

## Connecting to the Heating System - Low Loss Header

Branch off from main heating system supply and return from the system side of the low loss header.

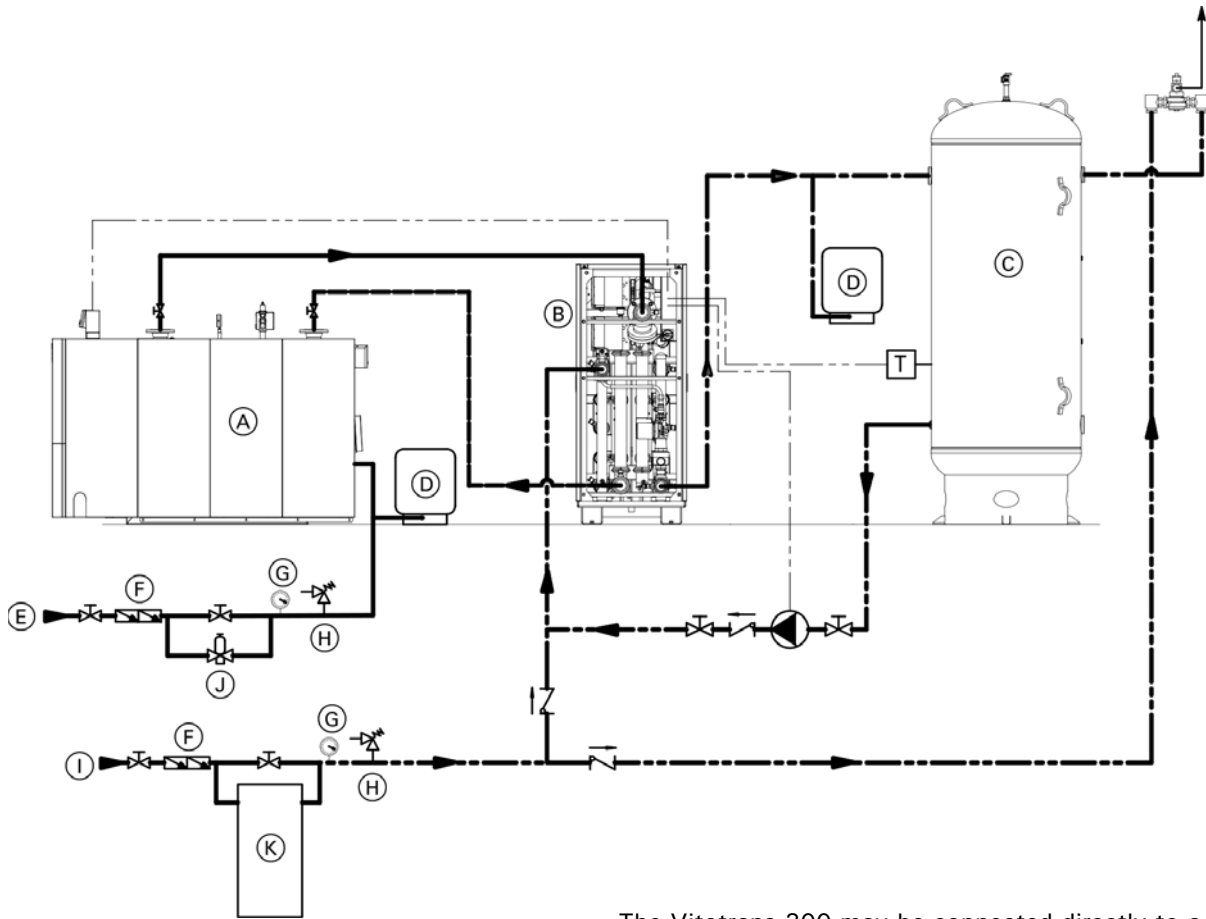


**Legend**

- (A) Vitotrans 300
- (B) Vitotrans supply
- (C) Vitotrans return
- (D) Connection to heating equipment

The system heat source (boiler) should be set to supply water to the Vitotrans 300 at least 20°F (11°C) higher than the desired DHW setpoint. It is recommended that the Vitotrans 300 is connected close to the heat source.

**Connecting to the Heating System – Direct Boiler Connection**



**Legend**

- (A) High Mass Boiler (example: CM2)
- (B) Vitotrans 300
- (C) DHW Storage Tank
- (D) Expansion tank
- (E) System Fill
- (F) Back Flow Preventor
- (G) Pressure Gauge
- (H) Safety Relief Valve
- (I) Domestic Cold Water (DCW)
- (J) Pressure Reducing Valve
- (K) Water Softener

The Vitotrans 300 may be connected directly to a hot water heating boiler when following the system design considerations below;

- DHW load type (constant load with minimal fluctuations) – Vitotrans directly connected to the hot water heating boiler operates optimally with steady DHW flow or gradual fluctuations to DHW flow
- Thermal mass/water content of the hot water heating boiler - High mass boilers are typically better suited for direct connection to the Vitotrans
- Modulation range of the hot water heating boiler – the boiler should be sized and selected based on matching the anticipated minimum and maximum DHW load
- Use with or without a DHW Storage Tank, a DHW storage tank will absorb small fluctuations in DHW temperature generated by rapid changes in DHW load

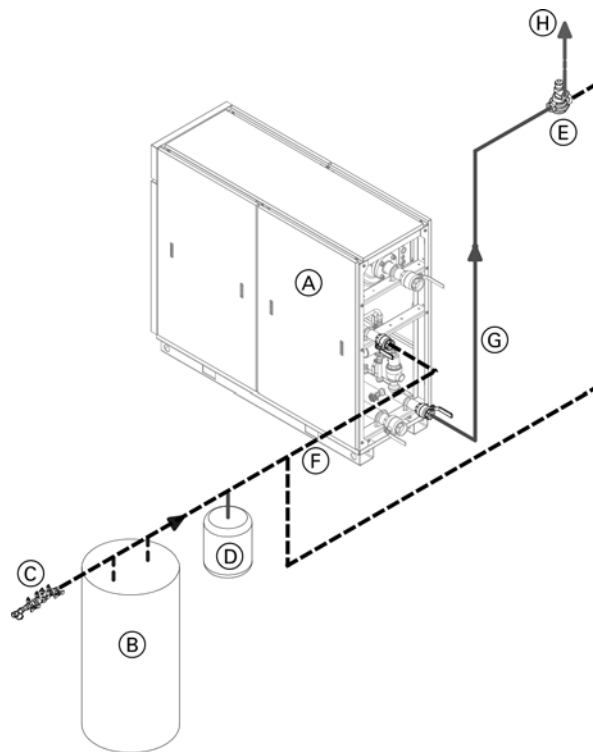
Taking into consideration the points above, the system designer will be able to optimize the system to ensure system performance, occupant comfort and longevity of the system.

The system heat source (boiler) should be set to supply water to the Vitotrans 300 at least 20°F (11°C) higher than the desired DHW setpoint. It is recommended that the Vitotrans 300 is connected close to the heat source.



# System Layout 1

Vitotrans 300 with ....  
direct connection to building DHW system.



**Legend**

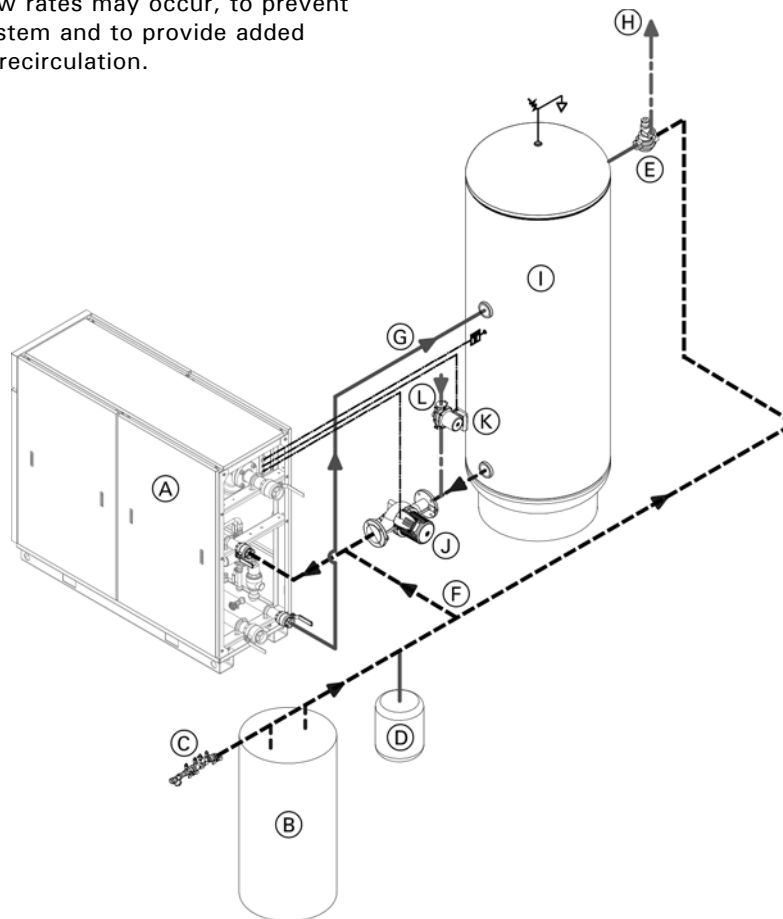
- (A) Vitotrans 300
- (B) Water softening equipment
- (C) Backflow preventer  
**Note:** for the type of backflow preventor consult the local plumbing code requirements.
- (D) Expansion tank - domestic water
- (E) Point of source domestic water tempering valve
- (F) Domestic cold water (DCW)
- (G) Domestic hot water (DHW)
- (H) Tempered DHW building supply

Single Vitotrans 300, for use with direct / instantaneous domestic hot water heating. For use with long steady draws of DHW.

Minimum DHW flow activation adjust between 5 and 30 GPM (19 and 114 L/min). This is a user adjustable setting that can be set based on the DHW system operating characteristics.

## System Layout 2

Vitotrans 300 with ....  
DHW storage tank, for system applications where low or fluctuating DHW flow rates may occur, to prevent short-cycling of the system and to provide added comfort through DHW recirculation.



### Legend

- (A) Vitotrans 300
- (B) Water softening equipment
- (C) Backflow preventer
- Note:** for the type of backflow preventor consult the local plumbing code requirements.
- (D) Expansion tank - domestic water
- (E) Point of source domestic water tempering valve
- (F) Domestic cold water (DCW)
- (G) Domestic hot water (DHW)
- (H) Tempered DHW building supply
- (I) DHW storage tank
- (J) DHW storage tank circulation pump
- (K) DHW recirculation pump
- (L) DHW recirculation line from building

**Note:** It is the responsibility of the system designer to ensure the sizing of the tank loading pump and corresponding DHW storage tank are sized for the required demand.

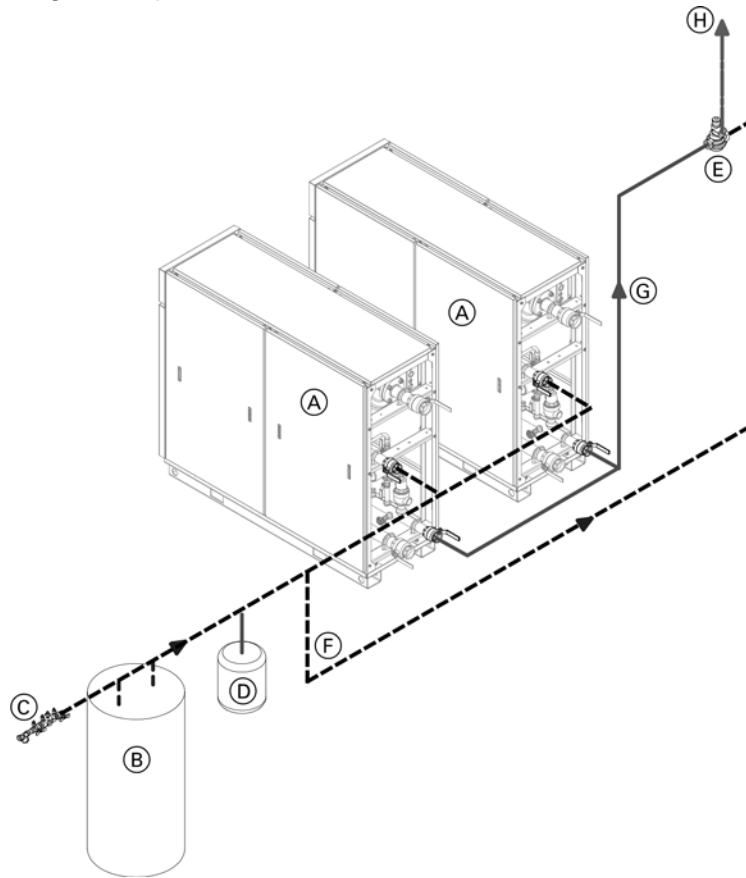
Single Vitotrans 300, for use with DHW storage tank, for stored domestic hot water with integration to the building recirculation pump and tank loading pump.

**Note:** A DHW storage tank is highly recommended for applications where fluctuating DHW system flow rates occur, particularly DHW flow rates below 30 GPM (114 L/min) for all Vitotrans 300 models sizes.

The DHW storage tank loading pump should be sized according to DHW storage tank's size and desired recovery time, but must not exceed the maximum flow for the associated Vitotrans 300 model size. It is recommended that the DHW storage tank loading pump should provide at least 30 GPM (114 L/m) of flow and be able to overcome the head losses of the Vitotrans 300 and the piping connecting it to the DHW storage tank. The minimum flow activation setting for the Vitotrans 300 can be set between 5 and 30 GPM (19 and 114 L/m) when used with a DHW storage tank. When determining the activation setpoint, consider the size of the DHW storage tank and the anticipated minimum constant DHW draw rate (based on usage patterns). It is also important to identify the minimum output of the heating system and use this as a factor when choosing a sufficient activation setting. This will help reduce short cycling of the heating equipment.

## System Layout 3

Multiple Vitotrans 300 with ....  
Direct connection to building DHW system.



### Legend

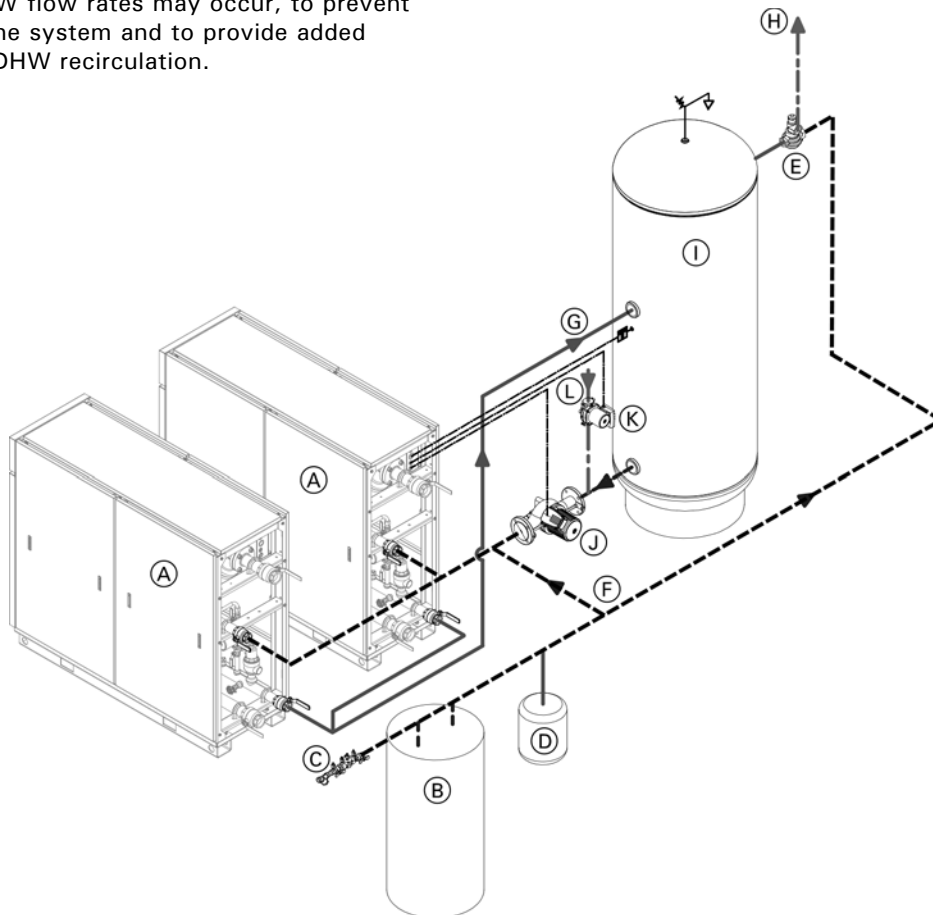
- (A) Vitotrans 300
- (B) Water softening equipment
- (C) Backflow preventer
- Note:** for the type of backflow preventor consult the local plumbing code requirements.
- (D) Expansion tank - domestic water
- (E) Point of source domestic water tempering valve
- (F) Domestic cold water (DCW)
- (G) Domestic hot water (DHW)
- (H) Tempered DHW building supply

Multiple Vitotrans 300, for use with direct / instantaneous domestic hot water heating. For use with long steady draws of DHW.

Minimum DHW flow activation adjust between 5 and 30 GPM (19 and 114 L/min). This is a user adjustable setting that can be set based on the DHW system operating characteristics.

## System Layout 4

Multiple Vitotrans 300 with ...  
DHW storage tank, for system applications where low or fluctuating DHW flow rates may occur, to prevent short-cycling of the system and to provide added comfort through DHW recirculation.



### Legend

- (A) Vitotrans 300
- (B) Water softening equipment
- (C) Backflow preventer
- Note:** for the type of backflow preventer consult the local plumbing code requirements.
- (D) Expansion tank - domestic water
- (E) Point of source domestic water tempering valve
- (F) Domestic cold water (DCW)
- (G) Domestic hot water (DHW)
- (H) Tempered DHW building supply
- (I) DHW storage tank
- (J) DHW storage tank circulation pump
- (K) DHW recirculation pump
- (L) DHW recirculation line from building

**Note:** It is the responsibility of the system designer to ensure the sizing of the tank loading pump and corresponding DHW storage tank are sized for the required demand.

Multiple Vitotrans 300, for use with DHW storage tank, for stored domestic hot water with integration to building recirculation pump and tank loading pump.

**Note:** A DHW storage tank is highly recommended for applications where fluctuating DHW system flow rates, particularly DHW flow rates below 30 GPM (114 L/min) for all Vitotrans 300 models sizes.

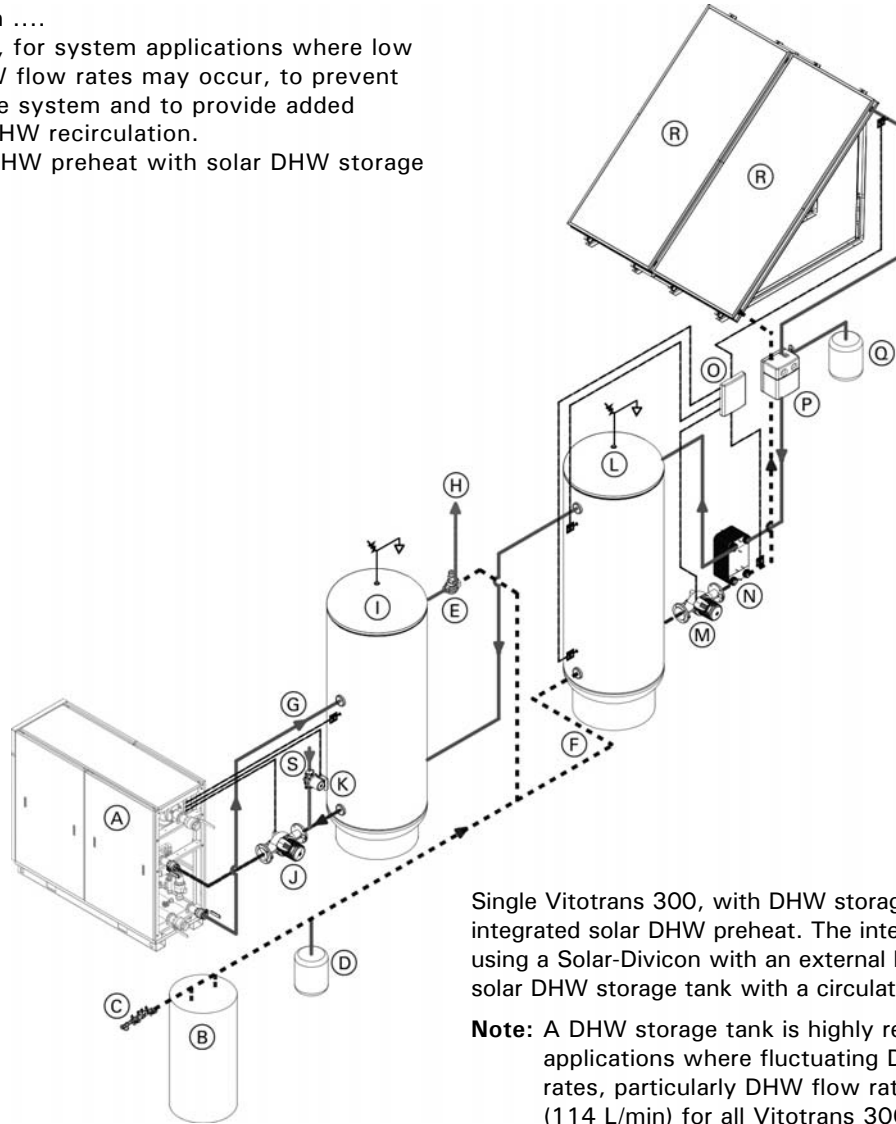
The DHW storage tank loading pump should be sized according to DHW storage tank's size and desired recovery time, but must not exceed the maximum flow for the associated Vitotrans 300 model size. It is recommended that the DHW storage tank loading pump should provide at least 30 GPM (114 L/m) of flow and be able to overcome the head losses of the Vitotrans 300 and the piping connecting it to the DHW storage tank. The minimum flow activation setting for the Vitotrans 300 can be set between 5 and 30 GPM (19 and 114 L/m) when used with a DHW storage tank. When determining the activation setpoint, consider the size of the DHW storage tank and the anticipated minimum constant DHW draw rate (based on usage patterns). It is also important to identify the minimum output of the heating system and use this as a factor when choosing a sufficient activation setting. This will help reduce short cycling of the heating equipment.

## System Layout 5

Vitotrans 300 with ....

DHW storage tank, for system applications where low or fluctuating DHW flow rates may occur, to prevent short-cycling of the system and to provide added comfort through DHW recirculation.

Solar system for DHW preheat with solar DHW storage tank.



### Legend

- (A) Vitotrans 300
- (B) Water softening equipment
- (C) Backflow preventer
- Note:** for the type of backflow preventor consult the local plumbing code requirements.
- (D) Expansion tank - domestic water
- (E) Point of source domestic water tempering valve
- (F) Domestic cold water (DCW)
- (G) Domestic hot water (DHW)
- (H) Tempered DHW building supply
- (I) DHW storage tank
- (J) DHW storage tank circulation pump
- (K) DHW recirculation pump
- (L) Solar DHW storage tank
- (M) Solar tank loading pump
- (N) Heat exchanger
- (O) Solar control unit
- (P) Solar-Divicon
- (Q) Solar expansion tank
- (R) Solar panels
- (S) DHW recirculation line from building

Single Vitotrans 300, with DHW storage tank and integrated solar DHW preheat. The integrated solar includes using a Solar-Divicon with an external heat exchanger and solar DHW storage tank with a circulation pump.

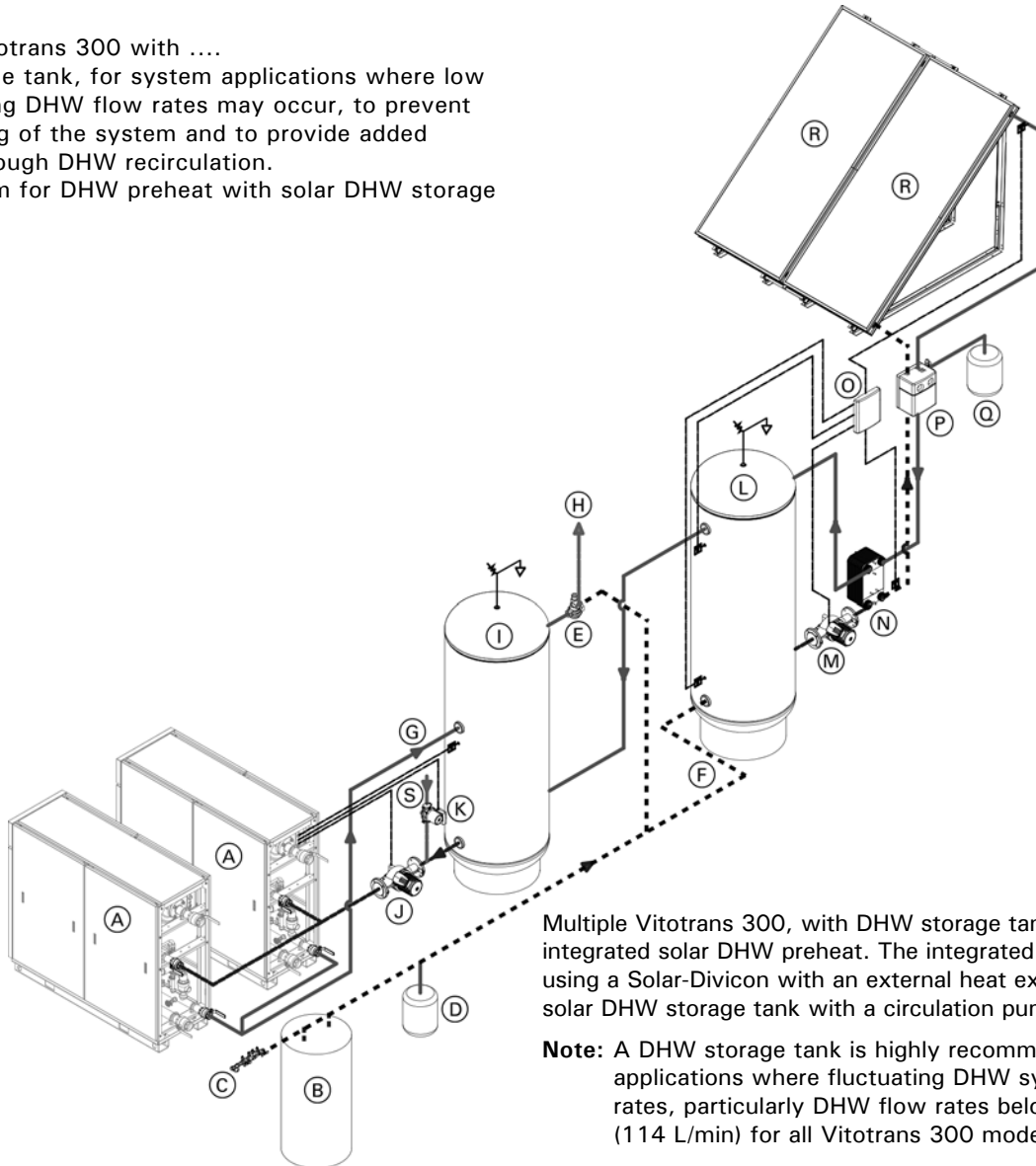
**Note:** A DHW storage tank is highly recommended for applications where fluctuating DHW system flow rates, particularly DHW flow rates below 30 GPM (114 L/min) for all Vitotrans 300 models sizes.

The DHW storage tank loading pump should be sized according to DHW storage tank's size and desired recovery time, but must not exceed the maximum flow for the associated Vitotrans 300 model size. It is recommended that the DHW storage tank loading pump should provide at least 30 GPM (114 L/m) of flow and be able to overcome the head losses of the Vitotrans 300 and the piping connecting it to the DHW storage tank. The minimum flow activation setting for the Vitotrans 300 can be set between 5 and 30 GPM (19 and 114 L/m) when used with a DHW storage tank. When determining the activation setpoint, consider the size of the DHW storage tank and the anticipated minimum constant DHW draw rate (based on usage patterns). It is also important to identify the minimum output of the heating system and use this as a factor when choosing a sufficient activation setting. This will help reduce short cycling of the heating equipment.

**Note:** It is the responsibility of the system designer to ensure the sizing of the tank loading pump and corresponding DHW storage tank are sized for the required demand.

## System Layout 6

Multiple Vitotrans 300 with ....  
 DHW storage tank, for system applications where low or fluctuating DHW flow rates may occur, to prevent short-cycling of the system and to provide added comfort through DHW recirculation.  
 Solar system for DHW preheat with solar DHW storage tank.



Multiple Vitotrans 300, with DHW storage tank and integrated solar DHW preheat. The integrated solar includes using a Solar-Divicon with an external heat exchanger and solar DHW storage tank with a circulation pump.

**Note:** A DHW storage tank is highly recommended for applications where fluctuating DHW system flow rates, particularly DHW flow rates below 30 GPM (114 L/min) for all Vitotrans 300 models sizes.

The DHW storage tank loading pump should be sized according to DHW storage tank's size and desired recovery time, but must not exceed the maximum flow for the associated Vitotrans 300 model size. It is recommended that the DHW storage tank loading pump should provide at least 30 GPM (114 L/m) of flow and be able to overcome the head losses of the Vitotrans 300 and the piping connecting it to the DHW storage tank. The minimum flow activation setting for the Vitotrans 300 can be set between 5 and 30 GPM (19 and 114 L/m) when used with a DHW storage tank. When determining the activation setpoint, consider the size of the DHW storage tank and the anticipated minimum constant DHW draw rate (based on usage patterns). It is also important to identify the minimum output of the heating system and use this as a factor when choosing a sufficient activation setting. This will help reduce short cycling of the heating equipment.

**Note:** It is the responsibility of the system designer to ensure the sizing of the tank loading pump and corresponding DHW storage tank are sized for the required demand.

**Legend**

- (A) Vitotrans 300 CA
- (B) Water softening equipment
- (C) Backflow preventer
- (D) Expansion tank
- (E) Point of source tempering valve
- (F) Domestic cold water (DCW)
- (G) Domestic hot water (DHW)
- (H) Tempered water building supply
- (I) DHW storage tank
- (J) DHW storage tank circulation pump
- (K) Building recirculation pump
- (L) Solar DHW storage tank
- (M) Solar tank loading pump
- (N) Heat exchanger
- (O) Solar control unit
- (P) Solar-Divicon
- (Q) Solar expansion tank
- (R) Solar panels
- (S) DHW recirculation line from building

## Standard Equipment

Vitotrans 300 fitted NPT Threaded connections.

Models	S3HA 30	D3HA 30	S3HA 60	D3HA 60	S3HA 90	D3HA 90
Single wall Brazed plate heat exchanger	1	-	2	-	3	-
Double wall Brazed plate heat exchanger with leak detection	-	1	-	2	-	3
Internal heating circuit pump	1	1	1	1	1	1
Lead free bronze descaling pump	1	1	1	1	1	1
150 psi lead free pressure relief valve	1	1	1	1	1	1
Technical documentation	1	1	1	1	1	1

Installation fittings for standard equipment includes:

- domestic low lead ball valves
- system ball valves
- temperature sensor for dhw storage tank applications
- 4 leveling bolts
- product documentation

## Domestic (Potable) Water Quality

Water treatment should be considered in areas with known problems, such as where a high mineral content and hardness exist (see chart below).

Water Content	Concentration
Chlorides	< 200 ppm
pH	6.0 - 9.0
Total hardness CaCO <sub>3</sub>	150 ppm



### CAUTION

Before the Vitotrans is installed and piped into an existing system, the heating system itself must be properly flushed to remove dirt and system sludge. Accumulations in old heating systems will tend to settle in the Vitotrans and can lead to deposits which can cause hot spots, noise and water-side corrosion. For damages resulting from those kinds of impurities, the warranty will be null and void.

### IMPORTANT

Secure the discharge piping from the pressure relief valve with the appropriate hangers or brackets.

The Vitotrans should be filled and properly bled of air and the cold water fill pressure should not exceed 18-20 psig. All openings, as well as pipe connections on the Vitotrans, should be observed for possible leaks.

## Heating System Water Quality

Treatment of boiler feed water should be considered in areas of known problems, such as high mineral content and hardness. In areas where freezing might occur, an antifreeze may be added to the system water to protect the system (maximum mix ratio - 50% / 50%). This may require double wall heat exchangers with leak detection, check with local code requirements. Please adhere to the specifications given by the antifreeze manufacturer for hydronic heating systems.

### IMPORTANT

**Only use antifreeze specific for hydronic heating systems. Do not use automotive glycol!**

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).



### CAUTION

**Before the Vitotrans is installed and piped into an existing system, the heating system itself must be properly flushed to remove dirt and system sludge. Accumulations in old heating systems will tend to settle in the Vitotrans and can lead to deposits which can cause hot spots, noise and water-side corrosion. For damages resulting from those kinds of impurities, the warranty will be null and void.**

The Vitotrans 300 is only suitable for closed hot water heating systems with pumps.

### IMPORTANT

**Cold water fill pressure must equal expansion tank pressure.**

The Vitotrans should be filled and properly bled of air and the cold water fill pressure should not exceed 18-20 psig. All openings, as well as pipe connections on the Vitotrans, should be observed for possible leaks.



### WARNING

**Fill only suitable water in boiler. Unsuitable water quality may damage the Vitotrans. Refer to the boiler manufactures requirements.**



## System Design Considerations

### Sound attenuation

Please consult a professional engineer who is specialized in noise attenuation for advice. The circulation pumps and other auxiliary equipment used in heating systems generate noise. This noise is transferred from the boiler room via floorboards, ceiling and walls to neighboring rooms where they may cause a nuisance. To avoid this from happening, additional protective measures may be required which should be considered at the design stage. Subsequent measures to reduce noise nuisance frequently require extensive effort and expenditure.

### Anti-vibration measures

Anti-vibration supports can be field supplied as an economical and effective solution to combat noise transmission. When sizing such supports, take the entire operating weight of the boiler system and, when using longitudinal anti-vibration brackets, the condition of the supporting surface into consideration. Effective anti-vibration measures are particularly important when installing heating equipment into an attic. Flexible couplings may be used to physically separate the heating equipment from the building. These should be installed into the system flow, return and safety pipe and as near as possible to the heating equipment. Also insulate any braces or hanging arrangements, if installed, against sound/vibration transmission to the building.

### Warranty

Our warranty does not cover damages resulting from the following:

- Operation with contaminated fill and supplementary feed water
- Exposing the unit to pressures and temperatures higher than its certified rating

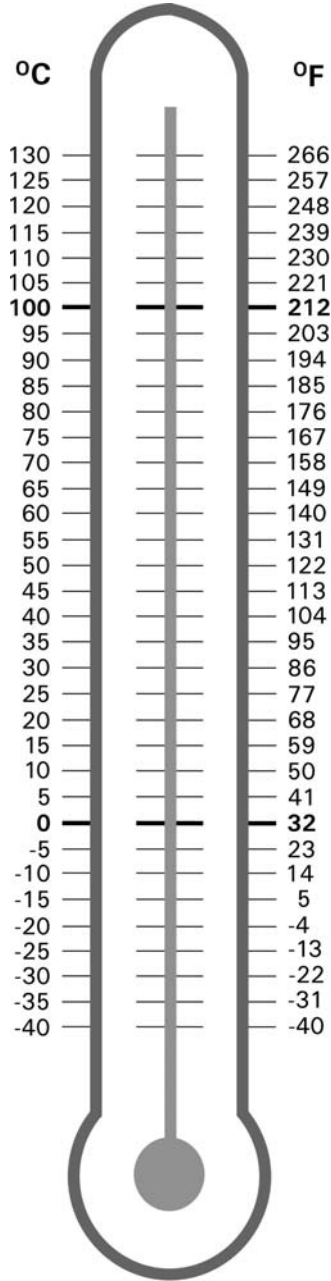
See warranty sheet for details.

## Maintenance

Interval	Maintenance
Weekly	Double-Wall heat exchangers only. Check for leakage.
Quarterly	Every three months. Check the operation of the over high limit switch install on the DHW manifold.
Semi-annually	Evert six months. Check the strainers on both the boiler water and the domestic water piping side.
Annually	Once a year. Check the temperature sensors.
	Once a year. Check the operation of the internal system pump and internal descaling pump.
Periodic	Periodic cleaning of the heat exchanger may be necessary, depending on conditions and settings.







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Viessmann Manufacturing Company Inc.  
750 McMurray Road  
Waterloo, Ontario • N2V 2G5 • Canada  
**TechInfo Line 1-888-484-8643**  
1-800-387-7373 • Fax (519) 885-0887  
[www.viessmann.ca](http://www.viessmann.ca) • [info@viessmann.ca](mailto:info@viessmann.ca)

Viessmann Manufacturing Company (U.S.) Inc.  
45 Access Road  
Warwick, Rhode Island • 02886 • USA  
**TechInfo Line 1-844-649-5886**  
1-800-288-0667 • Fax (401) 732-0590  
[www.viessmann-us.com](http://www.viessmann-us.com) • [info@viessmann-us.com](mailto:info@viessmann-us.com)