

ASME Process Water Heater

**For industrial applications,
all voltages, single or three
phase up to 88 kW**

**Stainless steel ASME Section VIII stamped
pressure vessel provides maximum longevity
and quality**

**Heavy duty construction withstands
demanding industrial use**

**Packaged with all electrical operating
controls for efficient installation**

- Easy to service – when replacing a part no other part needs to be removed
- Small reserve capacity lowers peak power demand and reduces operating costs in systems with ON/OFF cyclical demand
- Most units are easily upgradable for future expansion
- A full range of styles, sizes and optional features are readily available to meet your exact heating needs

Applications

Washing/cleaning systems, OEM packages, heat transfer systems, freeze protection, sanitizing systems, process heating, water treatment systems.



A reliable industrial process water heater

The Hubbell Process V is a dependable and trouble-free water heater in continuous, cyclical or variable flow systems. The Process V has a stainless steel ASME stamped pressure vessel that resists the corrosive effects of hot water and provides maximum longevity. We use high quality materials and components to ensure reliable operation in even the most demanding application. The Process V is ready for immediate installation and service and all electrical operating controls are factory selected, sized and wired.

Over 100 years of water heating expertise

Hubbell water heaters are the right choice for your commercial and industrial applications. We have water heating solutions for most energy sources with storage capacities from 1–10,000 gallons — all designed, engineered, and manufactured for reliability and longevity coupled with unparalleled support and service.



Why Install A Hubbell Industrial Grade Water Heater?

Reliability

The Hubbell Process V heater is designed to provide many years of operation. The tank is all stainless steel construction and is engineered, constructed and stamped in strict conformance to ASME Section VIII.

Lower Operating Costs

The pressure vessel used in the Hubbell Process V is encapsulated in environmentally friendly CFC/HCFC free closed cell foam insulation to minimize stand-by heat loss. This high quality insulation reduces heat loss by more than half when compared to fiberglass type insulation.

Advanced Construction

- Trouble-free system integration, operation, and maintenance
- Digital temperature control
- Adjustable from 32–194°F (0°–90°C) with adjustable temperature differential
- Includes a float type low water cut off to prevent the heating elements from dry firing
- Internal leak detection sensor notification if water is present in the control cabinet
- For ease of service and maintenance, when a component is removed for service no other component needs to be removed
- All sensing functions are integrated into one probe
- Heating element and sensing probe are straight thread screw types that utilize a Viton O-ring to minimize leakage problems



All sensing functions are integrated into one probe which can be replaced without draining the tank

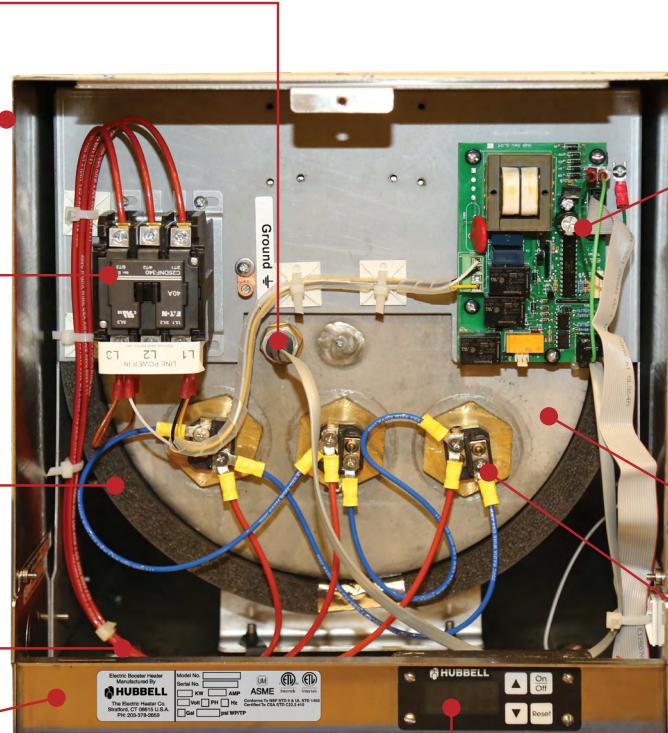
Brushed stainless steel exterior increases life and resists corrosion

Magnetic contactor
Resettable circuit breakers (on units over 120 amps) replace one-shot fuses

Closed cell foam insulation lowers operating costs

Single point power connection

Leak detection system notifies the user if water is detected inside the control area



Electronic control module integrates all control functions into one component

ASME stamped 304L stainless steel tank for extended life

Screw plug elements simplify service



Digital display provides visual set point and fault conditions. Operator controls are easily accessible including ON/OFF, reset, and temperature adjustment

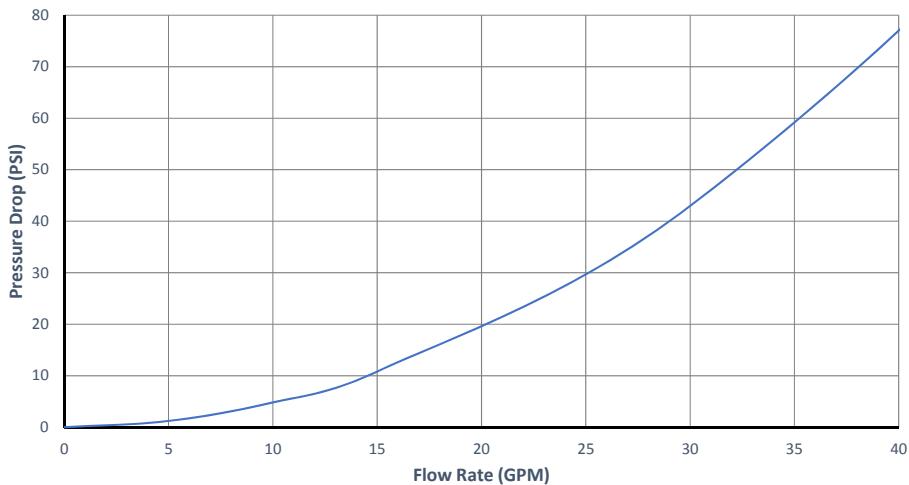
Heater Specifications

Vessel	304L stainless steel	Heating Element	
Storage Capacity	6 or 16 gallons	Type	Screw plug with Buna-N o-ring
Voltage	120–600 volt	Style	Tubular
Phase	1Φ or 3Φ	Sheathing	Copper with brass plug
Connections (1–58kW)		Controller	
Material	Bronze	Degrees	°F or °C (default °F)
Inlet	¾" Male NPT	Differential	1°–20° (default 2°)
Outlet	¾" Male NPT	Display	Shows set point or actual temperature (default set point)
Relief Valve	¾" Female NPT	Low Water Sensing	On or Off (Default: On)
Connections (64–88kW)		Low Water Reset	Manual or Automatic (Default: Automatic)
Material	Bronze	Staging	Up to 3 stages
Inlet	1½" Male NPT	Magnetic Contactor	
Outlet	1½" Male NPT	Type	Definite purpose
Relief Valve	1" Female NPT	Control Circuit	208/240 volt
Temperature Controller		Internal Wiring	Tefzel 750 200°C
Type	Solid state	Digital Display	3-digit 7 segment LED display
Style	Immersion	Fault Indicators	
Range	32–194°F (0–90°C)	Low water	Low water
Hi-Limit		Hi-temperature	Hi-temperature
Type	Solid state	No probe	No probe
Style	Immersion	Leak detection	Leak detection
Reset	Manual	Low Water Type	Conductivity
Range	205°F (fixed)	Design WP	150 psi
		Design TP	225 psi
		Relief Valve	
		Approvals	ASME/CSA
		Temperature	210°F
		Pressure	150 psi
		Material	Bronze
		Insulation	CFC/HCFC free
			Closed cell foam
		Outer Jacket	304L stainless steel
		Warranty	
		Vessel	3 years
		Electrical	1 year

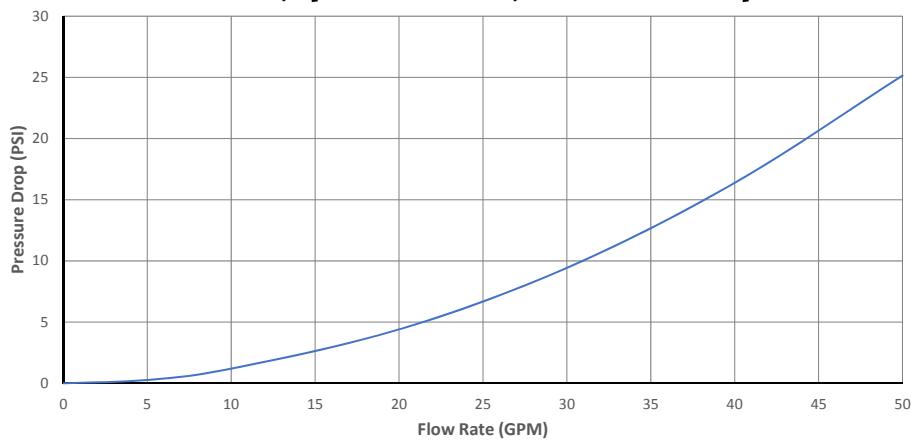
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Pressure Drop Charts

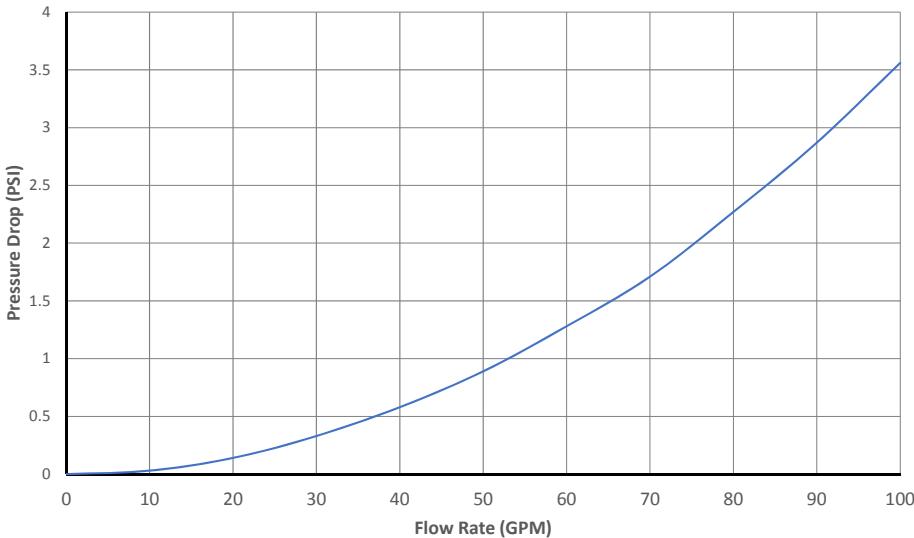
V6 Pressure Drop



V16 (Up to 58.5 kW) Pressure Drop



V16 (Over 58.5 kW) Pressure Drop



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Voltage De-Rating Factors

Rated Voltage	Applied Voltage	De-Rating Factor
600	575	92%
600	550	84%
480	460	92%
480	440	84%
240	230	92%
240	220	84%

When the actual supply voltage (applied voltage) is different than the design voltage (rated voltage) the resulting kW output will be affected. Please see the chart for typical voltage de-rating factors or use the following formula.

$$\frac{\text{Applied Voltage}^2}{\text{Rated Voltage}^2} \times \text{Rated kW} = \text{kW output at applied voltage}$$

Process V kW and Amperage Selection Charts

6 Gallon (Amperage shown in chart below indicates available models)

kW	1 Phase Voltages				3 Phase Voltages			
	120	208	240	480	208	240	480	600
1	8							
1.5	13							
2	17							
3	25							
4		19	17	8				
5		24	21	11				
6		29	25		17	14	7	6
7		34	29		19	17	8	7
9		43	38		25	22	11	9
10.5		50	44		29	25	13	10
12		58	50		33	29	14	12
13.5		65	56		38	33	16	13
15		72	63		42	36	18	14
18		87	75		50	43	22	17
24		115	100		67	58	29	23
27		130	113		75	65	33	26
30		144	125		83	72	36	29
36		173	150		100	87	43	35
39		188	163		108	94	47	38
40.5		195	169		113	98	49	39
45			188		125	108	54	43
54					150	130	65	52
58.5					163	141	70	56

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Process V kW and Amperage Selection Charts

16 Gallon with 3/4" Inlet and Outlet

(Amperage shown in chart below indicates available models)

kW	1 Phase Voltages				3 Phase Voltages			
	120	208	240	480	208	240	480	600
1	8							
1.5	13							
2	17							
3	25							
4		19	17	9				
5		24	21	11				
6		29	25		17	14	7	6
7		34	29		19	17	8	7
9		43	38		25	22	11	9
10.5		50	44		29	25	13	10
12		58	50		33	29	14	12
13.5		65	56		38	33	16	13
15		72	63		42	36	18	14
18		87	75		50	43	22	17
24		115	100		67	58	29	23
27		130	113		75	65	33	26
30		144	125		83	72	36	29
36		173	150		100	87	43	35
39		188	163		108	94	47	38
40		192	167		111	96	48	39
45			188		125	108	54	43
54					150	130	65	52
58.5					163	141	70	56

16 Gallon with 1-1/2" Inlet and Outlet

(Amperage shown in chart below indicates available models)

kW	3 Phase Voltages			
	208	240	480	600
64	178			
68		164	82	66
81	225	195	98	
86	239			83
88		212	106	

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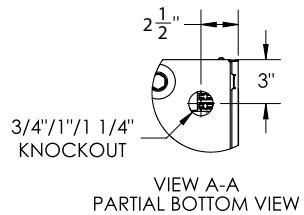
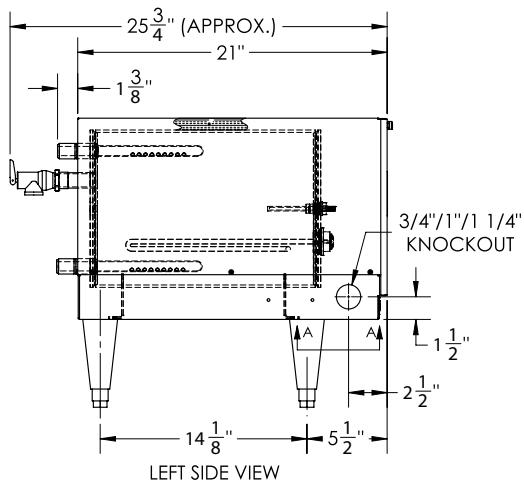
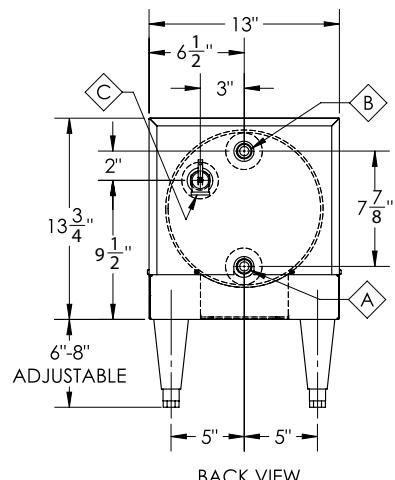
Recovery ratings in GPM

kW Rating	Recovery Rate in GPM for °F Temperature Rise Listed Below (°FΔT)						
	20°	40°	60°	80°	100°	120°	140°
1	0.3	0.2	0.1	0.1	0.1	0.1	0.0
1.5	0.5	0.3	0.2	0.1	0.1	0.1	0.1
2	0.7	0.3	0.2	0.2	0.1	0.1	0.1
3	1.0	0.5	0.3	0.3	0.2	0.2	0.1
4	1.4	0.7	0.5	0.3	0.3	0.2	0.2
5	1.7	0.9	0.6	0.4	0.3	0.3	0.2
6	2.0	1.0	0.7	0.5	0.4	0.3	0.3
7	2.4	1.2	0.8	0.6	0.5	0.4	0.3
9	3.1	1.5	1.0	0.8	0.6	0.5	0.4
10.5	3.6	1.8	1.2	0.9	0.7	0.6	0.5
12	4.1	2.0	1.4	1.0	0.8	0.7	0.6
13.5	4.6	2.3	1.5	1.2	0.9	0.8	0.7
15	5.1	2.6	1.7	1.3	1.0	0.9	0.7
18	6.1	3.1	2.0	1.5	1.2	1.0	1.9
24	8.2	4.1	2.7	2.0	1.6	1.4	1.2
27	9.2	4.6	3.1	2.3	1.8	1.5	1.3
30	10.2	5.1	3.4	2.6	2.0	1.7	1.5
36	12.3	6.1	4.1	3.1	2.5	2.0	1.8
39	13.3	6.7	4.4	3.3	2.7	2.2	1.9
40.5	13.8	6.9	4.6	3.5	2.8	2.3	2.0
45	15.4	7.7	5.1	3.8	3.1	2.6	2.2
54	18.4	9.2	6.1	4.6	3.7	3.1	2.6
58.5	20.0	10.0	6.7	5.0	4.0	3.3	2.9
64	21.8	10.9	7.3	5.5	4.4	3.6	3.1
68	23.2	11.6	7.7	5.8	4.6	3.9	3.3
81	27.6	13.8	9.2	6.9	5.5	4.6	3.9
86	29.3	14.7	9.8	7.3	5.9	4.9	4.2
88	30.0	15.0	10.0	7.5	6.0	5.0	4.3

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Dimensions

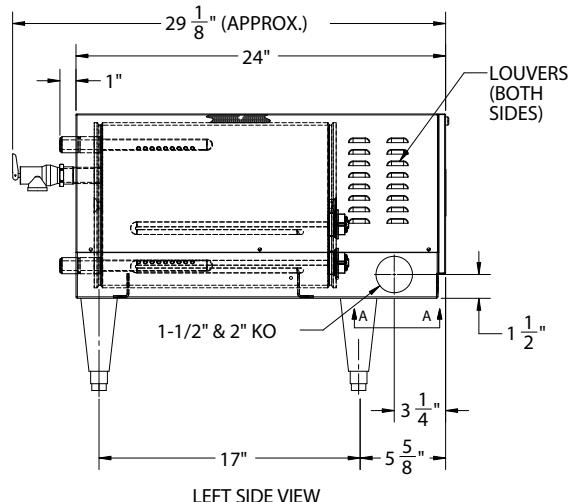
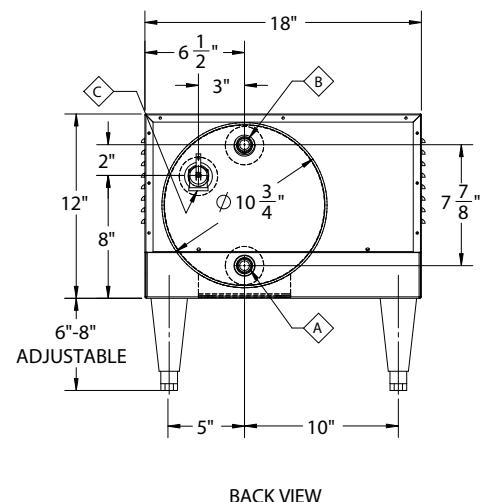
Process V6-(1 to 18 kW) Sample dimensions are for a V612T



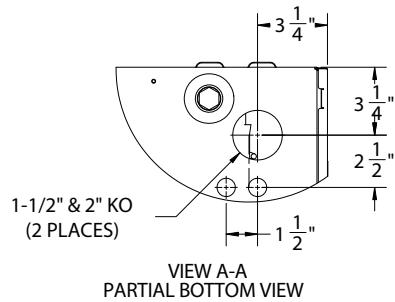
Plumbing Connections

A	Inlet	3/4" MNPT
B	Outlet	3/4" MNPT
C	Relief Valve	3/4" FNPT

Process V6-(24 to 58 kW) Sample dimensions are for a V658T4



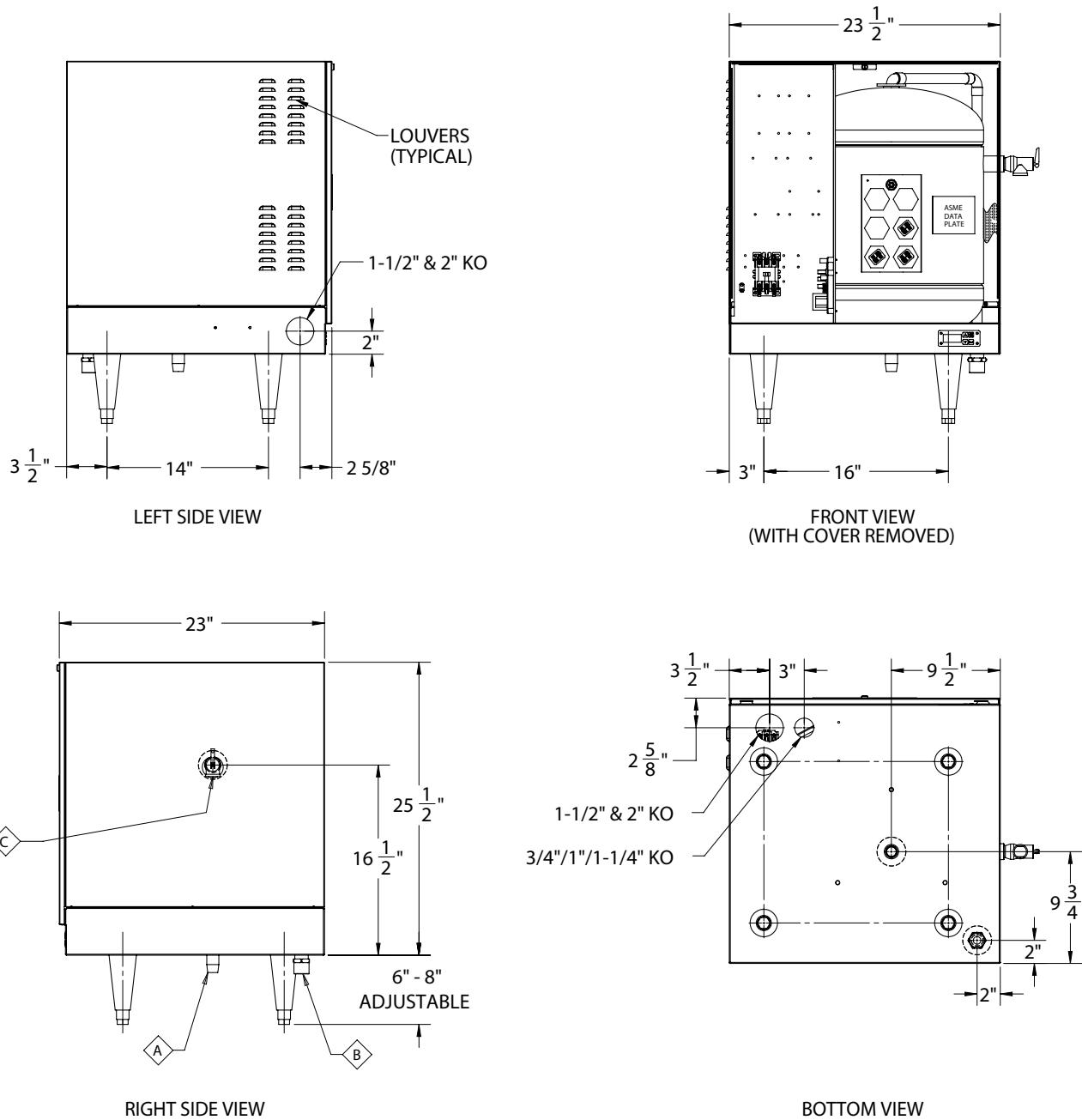
Plumbing Connections		
A	Inlet	3/4" MNPT
B	Outlet	3/4" MNPT
C	Relief Valve	3/4" FNPT



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Dimensions

Process V16 Sample dimensions are for a V1612R



Plumbing Connections		
A	Inlet	3/4" MNPT
B	Outlet	3/4" MNPT
C	Relief Valve	3/4" FNPT

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Process V Sizing Information

Versatile and Cost reducing design

In a continuous flow application...

with a constant flow of water the Hubbell Process V operates similar to an instantaneous, on-demand heater with the kW sized to meet the full GPM flow rate and temperature rise of the system.

In an Intermittent flow application...

with an ON/OFF cyclical demand (as in wash and rinse systems) the Process V will heat to the desired GPM flow

rate and temperature while reducing your peak power load. This is achieved due to the small reserve capacity of the Hubbell Process V which continues to be heated during the cycle OFF period in order to meet the full demand during the cycle ON period. This feature results in a significant reduction in your peak power consumption rate, increased temperature accuracy, and lower installation and operating costs when compared to an instantaneous heater.

IF the application is a continuous demand at a constant GPM then go directly to the recovery rate chart on page 8 and choose the appropriate kW which equals the flow rate at the desired temperature rise.

IF the application is an intermittent on/off cyclical system, the following steps will help determine the appropriate size Process V model

Variables to Solve For:

Step 1:

Determine the variables listed below.

Variables

1. Hot Water Flow Rate: _____ GPM
2. Time hot water at above rate is required: _____ Minutes
3. Time between usages: _____ Minutes
4. Total Cycle Time (Add #2 and #3) _____ Minutes
5. Total Gallons used per cycle (#1 x #2) _____ Gallons
6. Water Temperature:
_____ °F Incoming Cold
_____ °F Outgoing Hot

Step 2:

If variable #5 is between:

- 1–9 gallons then select V6 model and Y=5
- 10–35 gallons then select V16 model and Y=13
- Over 35 gallons see model D brochure for storage type or model CR brochure for large instantaneous Type DI water heaters.

Step 3:

$$\frac{\text{Gallons per cycle} - Y}{(\text{Variable 5})} \times 1.15 = \text{RGPM}$$

$$\text{Time On} \times 0.80$$

$$(\text{Variable 2})$$

Step 4:

$$(\text{RGPM} \times \text{Total Cycle Time}) - \text{Gallons Per Cycle} \geq 0$$

$$(\text{Variable 4}) - (\text{Variable 5})$$

If true, then go to Step 6

If false, then continue to Step 5

Step 5:

If 0 then use the following formula:

$$\frac{\text{Gallons per cycle} (\text{Variable 5})}{\text{Total Cycle Time} (\text{Variable 4})} \times 1.15 = \text{RGPM}$$

Step 6: Take the RGPM value solved for either in Step 3 or Step 5 above and go to the recovery rating GPM chart. Choose the appropriate temperature rise column and find a GPM rating equal or greater than RGPM. Select the appropriate model for the voltage and phase available.

Example: A parts wash station requires 4 GPM of 160°F DI water. The entering cold water is 60°F. The rinse cycle is on for 5 minutes at full flow and then off for 10 minutes. The power available is 480-volt 3 phase.

Step 1

Solve for variables

1. Flow Rate: 4 GPM
2. Cycle Time On: 5 Minutes
3. Cycle Time Off: 10 Minutes
4. Total Cycle Time: 15 Minutes
5. Gallons Per Cycle: 20 Gallons
6. Cold Water: 60°F
7. Hot Water: 160°F

Step 2: Gallons per cycle is 20, therefore the V16 Base Model is used and variable Y=13

Step 3: $20 - 13 = 7 \div (5 \times .80) = 1.75 \times 1.15 = 2.0 \text{ GPM}$

Step 4: $2.0 \times 15 = 30 - 20 = 10 > 0$

Step 5: Not required because step 4 is true

Step 6: From the recovery rating selection chart go to the 100°FAT column and select the kW that will provide at least 2.0 GPM as determined in Step 3.

In this case, select the 36 kW size and the V16 Model as determined in Step 2.

Specify Model V1636T4

Note: In comparison an instantaneous design would require a 58 kW heater.



Packaged System Option

Fully Packaged Systems

- Engineered and built to meet your exact needs
- Factory integrated system simplifies installation
- Factory selected components ensures reliable performance as a system

Contact Factory Sales Engineer to discuss your Packaged System

Left: A 58kW 480V 3Φ packaged system with dual hot water pumps and integrated SCR heater and pump control panel. Factory wired, skid mounted and tested.

The Hubbell Process V also plays an important role in our Omni HHP Heat Pump System. For more information on the Omni HHP contact sales@hubbellheaters.com

Process V Model Number Designation

MODEL	See charts on pages 5 & 6 kW RATING	VOLTAGE / PHASE		OPTIONAL EQUIPMENT
V6	1-88	A = 120/1	R = 208/3	Write/type optional equipment code in the gray box below in alphabetical order. For multiple options separate codes with a dash (-)
V16		RS = 208/1	T = 240/3	
		S = 240/1	T3 = 380/3	
		W = 277/1	T7 = 415/3	
		T4S = 480/1	T5 = 440/3	
			T4 = 480/3	
			T6 = 600/3	

Example: V645T4-C52

An industrial Hubbell Process V water heater with 6 gallons storage capacity, 45 kW rated at 480 volt 3 phase 60 Hz power with optional alternate high temperature set point.

Optional Equipment

Note: Optional equipment must be called out in the written specifications, use the codes below.

Controller

- C35** BACnet Communication Module with T1000 Digital Controller
- C49** Solid State Power Controllers for Increased Temperature Accuracy
- C51** Remote Control Display, Allows the Heater to be Installed in a Remote Location. The 3" X 5" NEMA 4 Display Enclosure can be Located up to 25' from the Heater
- C52** Alternate High Temperature Setpoint
- C53** Low Temperature Interlock Alarm
- C54** Alarm Contact for Hi-Limit or Low Water Condition (Specify N.O. or N.C.)
- C55** Low Temp Alarm Dry Contact
- C56** High Temp Alarm Dry Contact
- C58** 24V Interlock Adapter

Please note: Optional equipment may impact overall dimensions and weight. Please request submittal drawing from factory.

Electrical

- E7** 316L Stainless Steel Heating Elements

General

- G41** Adjustable Stainless Steel Legs
- G42** Flanged Toe Stainless Steel Legs

Vessel

- V10** 1-1/2" Male NPT Inlet and Outlet Water Connections (V16 Only)
- V12** 1-1/4" Inlet/Outlet
- V40** Flanged Inlet and Outlet Connections (ANSI Class 150, Please Specify Size)
- V41** Alternate Threaded Inlet/Outlet Connections Size (V16 Only)
- V42** Sanitary Connections (Specify Size)
- V44** V6 Recirculation Package - Includes 1-1/4" Inlet/Outlet, BACnet Module, and SSR Controls
- V45** V16 Recirculation Package - Includes 1-1/2" Inlet/Outlet, BACnet Module, and SSR Controls

Available Accessories

10-year Warranty: 10-year non pro-rated tank warranty, specify part number "VESSEL WARRANTY"

Slide Brackets: Slide mount bracket for hanging installation (V6 only), specify part number "SLIDE BRACKETS"

Protective Cover: Water resistant rip-stop 18 oz. grey FR vinyl coated polyester scrim cover. Removable and form-fitted with Velcro fasteners and clear window showing digital display. **V6** specify part number "J6-SHROUD," **V16** specify part number "J16-SHROUD"

Accessories Name

Part

Accessories Name

Part

Accessories Name

Part

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