



## Deionized (RO/DI) ASME Water Heater

**For heating ultra pure and mildly corrosive water. Point-of-use heater up to 88 kW in single or three phase voltages**

**Type 316L stainless steel construction resists corrosion**

**Heating elements are all 316L SS to ensure long operating life**

**Packaged with all electrical operating controls for trouble-free installation, service and operation**

**Small reserve capacity lowers peak power demand and reduces operating costs**

- Easy to service – when replacing a part no other part needs to be removed
- High grade construction materials provide maximum longevity
- Most models are easily upgradable to handle future expansion
- Full range of sizes available to meet your exact heating needs

### Applications

Industrial finishing and cleaning systems for electronic and fabricated metal parts such as PC boards, microchips, capacitors, metal parts, jewelry, aerospace quality bearings, cosmetic and drug packaging systems, glass products, ultrasonic cleaning systems, food processing systems, water purification and RO systems.



### A reliable deionized water heater

The Hubbell UltraPure HD is a dependable water heater for continuous, cyclical, or variable flow systems in a wide range of applications that require DI/RO water. The UltraPure HD has a 316L stainless steel ASME stamped pressure vessel that resists the corrosive effects of hot deionized water and provides maximum longevity. Only the highest quality materials and components are used to ensure reliable operation in even the most demanding application. The UltraPure HD 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 Ultrapure HD RO/DI Water Heater?

### Reliability

The Hubbell HD tank is all 316L stainless steel construction and engineered, constructed, and stamped in strict conformance to ASME Section VIII.

### Lower Operating Costs

Environmentally friendly CFC/HCFC free closed cell foam insulation minimizes stand-by heat loss. This high-quality insulation reduces heat loss by more than half when compared to fiberglass type insulation.

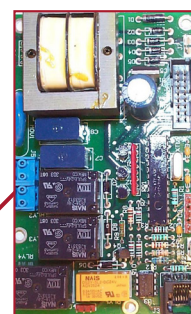
### Reduced service and maintenance costs

- The digital display controller provides exact set point temperature (there is no calibration necessary), as well as visual error indication.
- Controller is 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.
- All components are removable without disturbing any other component, making maintenance easy.
- The heating elements and sensing probe are straight thread screw types that utilize an O-ring to minimize leakage.



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

Brushed stainless steel exterior increases life and looks great



Electronic control module integrates all control functions into one component

Magnetic contactor provides load switching

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

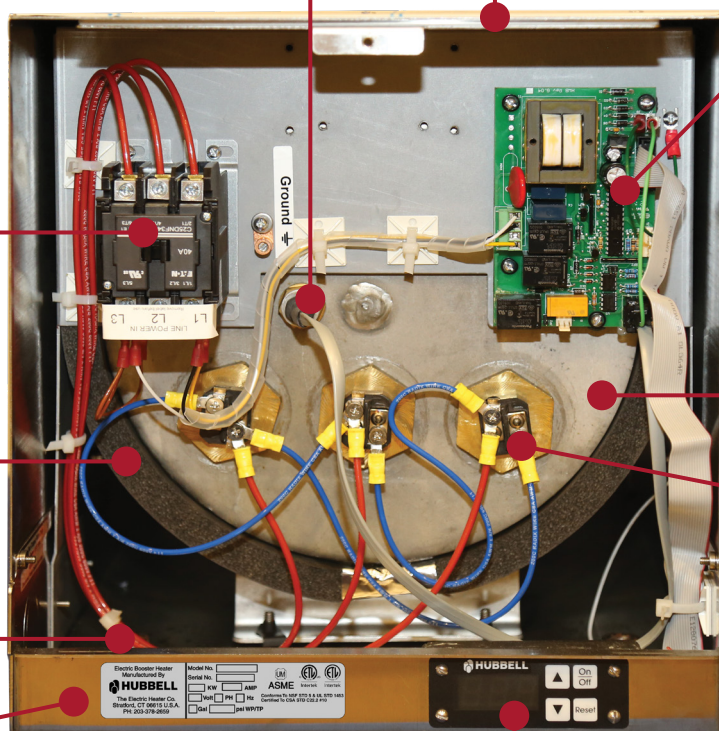
Closed cell foam insulation lowers operating costs

Single point power connection

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

ASME stamped all 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

<b>Vessel</b>	316L stainless steel
<b>Storage Capacity</b>	6 or 16 gallons
<b>Voltage</b>	120–600 volt
<b>Phase</b>	1Φ or 3Φ
<b>Connections (1.5–58kW)</b>	
Material	316L stainless steel
Inlet	¾" Male NPT
Outlet	¾" Male NPT
Relief Valve	¾" Female NPT
<b>Connections (64–88kW)</b>	Available for HD16 only
Material	316L stainless steel
Inlet	1-½" Male NPT
Outlet	1-½" Male NPT
Relief Valve	1" Female NPT
<b>Temperature Controller</b>	
Type	Solid state
Style	Immersion
Range	32°–194°F (0–90°C)
<b>Hi-Limit</b>	
Type	Solid state
Style	Immersion
Reset	Manual
Range	205°F (fixed)

Pressure Drop	HD6	HD16 ( ¾")	HD16 ( 1-½")
<b>5 GPM</b>	0.11 psi	0.15 psi	<1psi
<b>10 GPM</b>	0.43 psi	0.58 psi	<1psi
<b>25 GPM</b>	2.6 psi	3.6 psi	<1psi
<b>50 GPM</b>	10.5 psi	14.4 psi	<1psi

<b>Heating Element</b>	
Type	Screw plug with Viton O-ring
Style	Tubular
Sheathing	316L stainless steel passivated and electropolished
<b>Controller</b>	
Degrees	°F or °C (default °F)
Differential	1°–20° (default 2°)
Display	Shows set point or actual temperature (default set point)
Low Water Sensing	On or Off (Default: On)
Low Water Reset	Manual or Automatic (Default: Automatic)
Staging	Up to 3 stages
<b>Magnetic Contactor</b>	
Type	Definite purpose
<b>Control Circuit</b>	208/240 volt
<b>Internal Wiring</b>	Tefzel 750 200°C
<b>Digital Display</b>	3-digit 7 segment LED display
<b>Fault Indicators</b>	Hi-temperature No probe Leak detection
<b>Low Water Type</b>	Float 316L stainless steel
<b>Design WP</b>	150 psi
<b>Design TP</b>	225 psi
<b>Relief Valve</b>	
Approvals	ASME/CSA
Temperature	210°F
Pressure	150 psi
Material	316L stainless steel
<b>Insulation</b>	CFC/HCFC free Closed cell foam
<b>Outer Jacket</b>	316L stainless steel
<b>Warranty</b>	
Vessel	3 years
Electrical	1 year

## UltraPure HD and HDF 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	208	240	480	600
1.5	13						
2.5	21						
4		19	17				
6		29	25	17	14	7	6
7		34	29	19	17	8	7
9		43	38	25	22	11	9
10		48		28			
12		58	50	33	29	14	12
13.5		65	56	38	33	16	13
18		87	75	50	43	22	17
24		115	100	67	58	29	23
27		130	113	75	65	33	26
36		173	150	100	87	43	35
40.5		195		113			39
45			188	125	108	54	
54				150	130	65	52
58.5				163	141	70	56

**Note:** The 6, 7 and 9kW models in 208 and 240 volt can be field converted from either 1 phase to 3 phase or from 3 phase to 1 phase.

**HDF 6 Gallon (Clean-in-Place, see page 8)** (Amperage shown in chart below indicates available models)

kW	1 Phase Voltages			3 Phase Voltages			
	120	208	240	208	240	480	600
1.5	13						
2.5	21						
4		19	17				
6		29	25	17	14	7	6
7		34	29	19	17	8	7
9		43	38	25	22	11	9
10		48		28			
12		58	50	33	29	14	12
13.5		65	56	38	33	16	13
18		87	75	50	43	22	17
24		115	100	67	58	29	23
27		130	113	75	65	33	26
36		173	150	100	87	43	35
40.5		195		113			39
45			188	125	108	54	
54				150	130	65	52
58.5				163	141	70	56

**Note:** Dimensionally all HDF6 models are identical to model HD6 (24 – 58.5 kW). See page 6 for dimensional details.

All information is subject to change without notice. Consult factory for submittal drawings.

## kW and Amperage Selection Charts

**16 Gallon** (Amperage shown in chart below indicates available models)

kW	1 Phase Voltages				3 Phase Voltages			
	120	208	240	480	208	240	480	600
1.5	13							
2.5	21			8				
4		19	17					
6		29	25		17	14	7	6
7		34	29		19	17		7
9		43	38		25	22	11	9
10		48			29			
12		58	50		33	29	14	12
13.5		65	56		38	33	16	13
18		87	75		50	43	22	17
24		115	100		67	58	29	23
27		130	113		75	65	33	26
36		173	150		100	87	43	35
40.5		195			113			39
45			188		125	108	54	
54					150	130	65	52
58.5					163	141	70	56
64					178			
68						164	82	
81					225	195	98	
86					239			83
88						212	106	

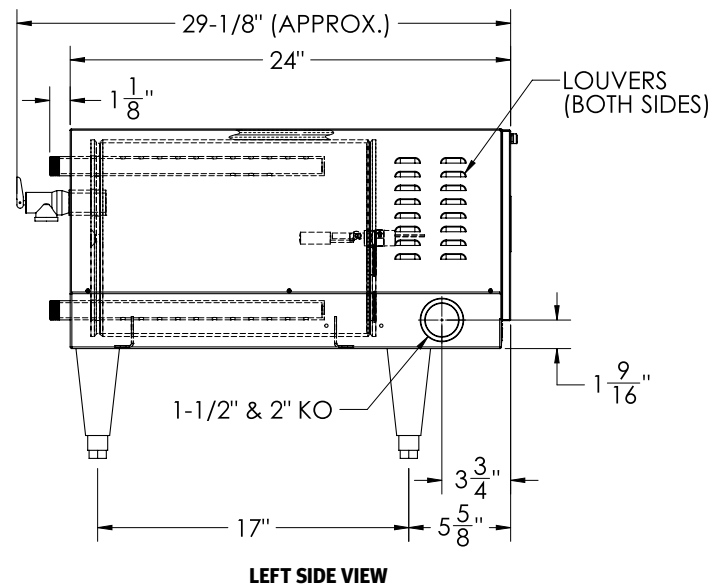
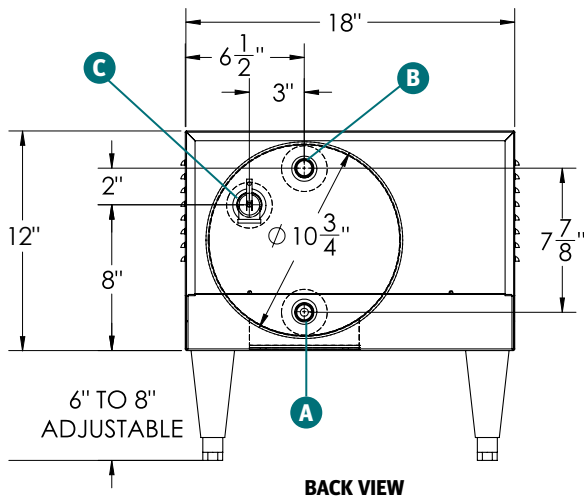
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## Dimensions

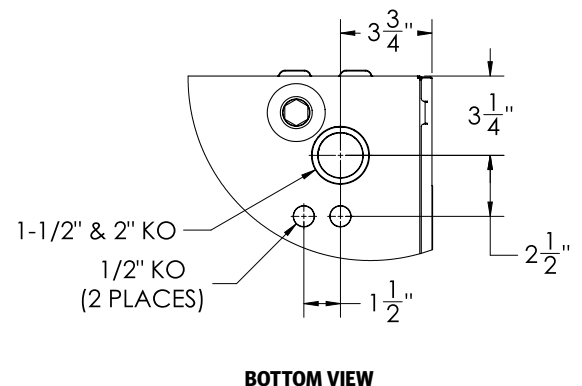
**UltraPure HD6 – (1.5 to 58.5kW)** Sample dimensions are for a HD69R

Shipping Weight: 110 lbs



### HD6 1.5 to 58.5kW Connections

<b>A</b>	Inlet	3/4" MNPT
<b>B</b>	Outlet	3/4" MNPT
<b>C</b>	Relief Valve	3/4" MNPT



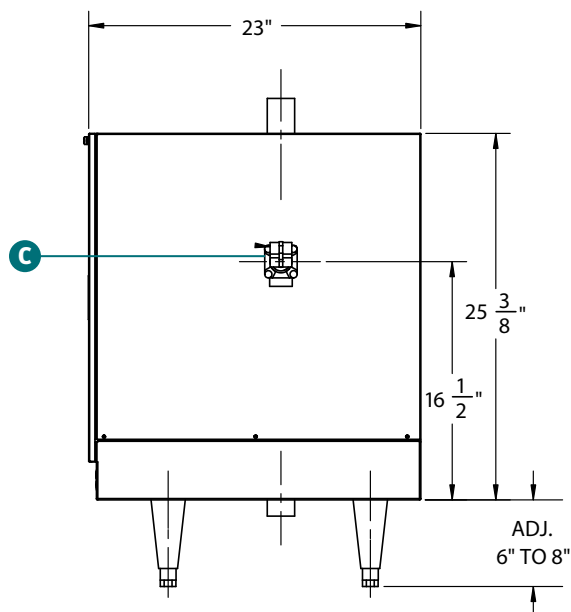
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## Dimensions

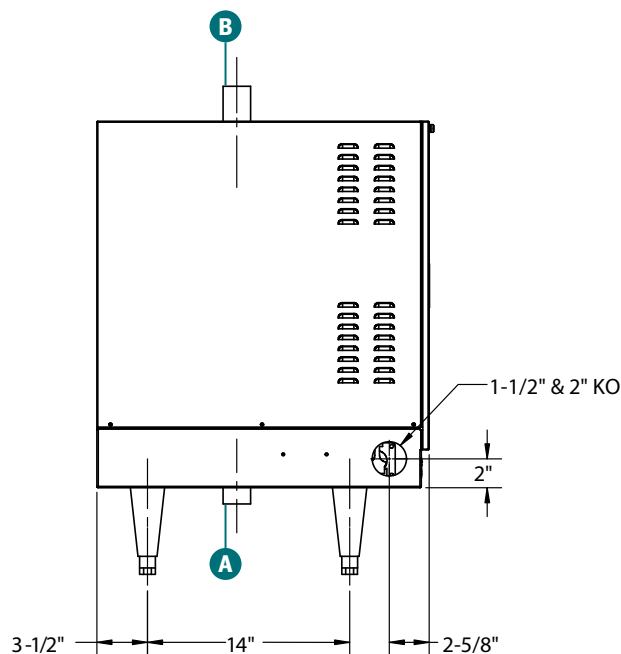
**UltraPure HD16 – (1.5 to 88kW)** Sample dimensions are for a HD1666T7

Shipping Weight 1.5 to 58.5kW: 160 lbs

Shipping Weight 64 to 88kW: 175 lbs



**RIGHT SIDE VIEW**



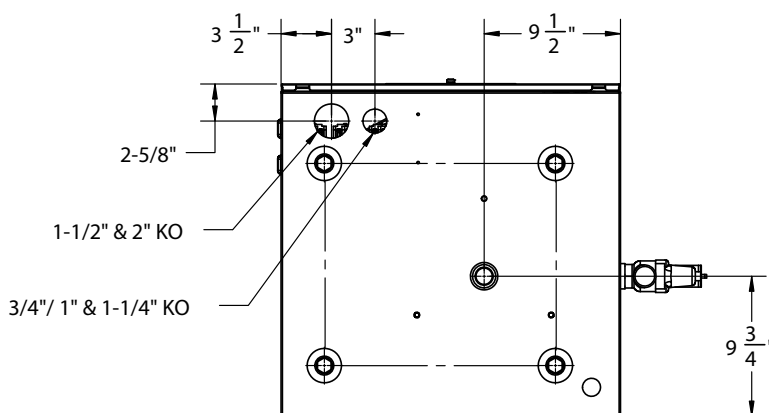
**LEFT SIDE VIEW**

### HD16 1.5 to 58.5kW Connections

<b>A</b>	Inlet	3/4" MNPT
<b>B</b>	Outlet	3/4" MNPT
<b>C</b>	Relief Valve	3/4" MNPT

### HD16 64 to 88kW Connections

<b>A</b>	Inlet	1-1/2" MNPT
<b>B</b>	Outlet	1-1/2" MNPT
<b>C</b>	Relief Valve	1" MNPT



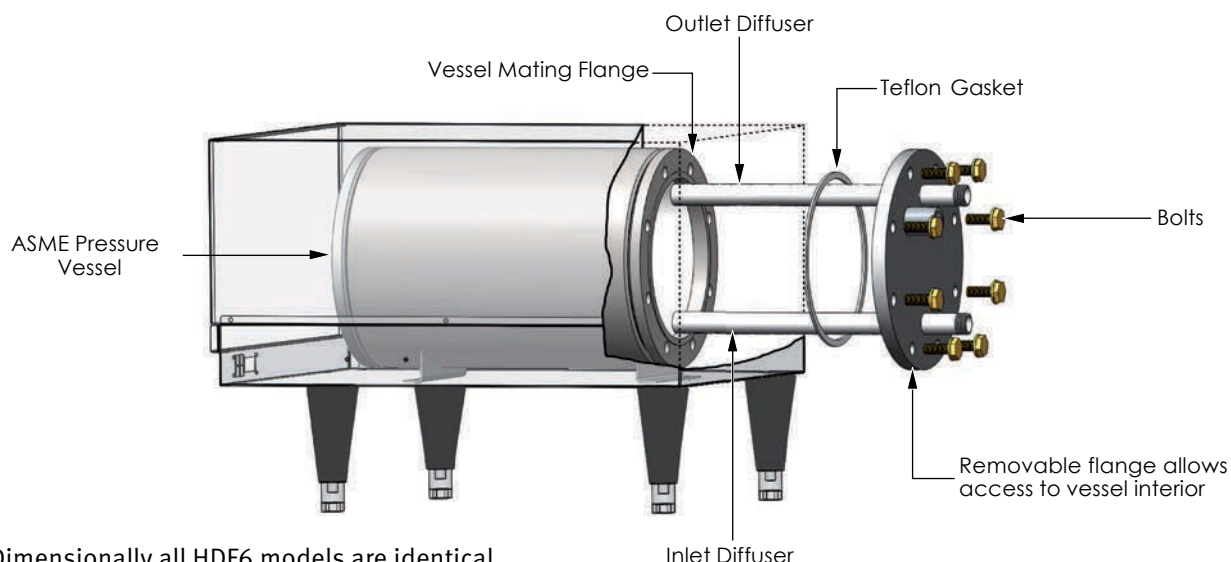
**BOTTOM VIEW**

All information is subject to change without notice. Consult factory for submittal drawings.

## The UltraPure HDF6 Optional Clean-in-Place Design

The ability for a piece of equipment to be CIP (Cleaned-In-Place) or SIP (Sterilized-In-Place) is a critical feature important to many industries including the food, dairy, beverage, biotechnology, pharmaceutical, cosmetic, and medical industries. In these industries there are hot water applications which require the water heating equipment to be designed and constructed for use in a hygienic environment. To meet this need, Hubbell offers, as an optional feature, an electro polished and

passivated vessel design which includes a removable rear flange to facilitate inspection, cleaning and sterilization of the interior of the water heater vessel with minimal disruption to the production process. This optional feature, designated as the Hubbell UltraPure HDF6 base model, is available in 6-gallon capacity and power ratings ranging from 1.5 to 58.5 KW. The drawing below depicts the removable flange feature, and the selection chart on page 4 provides details on available sizes.



**Note:** Dimensionally all HDF6 models are identical to model HD6, see page 6 for dimensional details.

## 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

*Photo shows a 58kW 480V 3Φ packaged system with dual hot water pumps and integrated SCR heater and pump control panel. Factory wired, piped, skid mounted and tested.*





## Recovery ratings in GPM

kW Rating	Recovery Rate in GPM for °F Temperature Rise Listed Below (°FΔT)									
	20°	30°	40°	60°	70°	80°	100°	110°	120°	140°
1.5	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
2.5	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
4	1.36	0.91	0.68	0.45	0.39	0.34	0.27	0.25	0.23	0.19
6	2.05	1.36	1.02	0.68	0.58	0.51	0.41	0.37	0.34	0.29
7	2.39	1.59	1.19	0.80	0.68	0.60	0.48	0.43	0.40	0.34
9	3.07	2.05	1.54	1.02	0.88	0.77	0.61	0.56	0.51	0.44
10	3.58	2.39	1.79	1.19	1.02	0.90	0.72	0.65	0.60	0.51
12	4.09	2.73	2.05	1.36	1.17	1.02	0.82	0.74	0.68	0.58
13.5	4.61	3.07	2.30	1.54	1.32	1.15	0.92	0.84	0.77	0.66
18	6.14	4.09	3.07	2.05	1.75	1.54	1.23	1.12	1.02	0.88
24	8.19	5.46	4.09	2.73	2.34	2.05	1.64	1.49	1.36	1.17
27	9.21	6.14	4.61	3.07	2.63	2.30	1.84	1.67	1.54	1.32
36	12.28	8.19	6.14	4.09	3.51	3.07	2.46	2.23	2.05	1.75
40.5	13.82	9.21	6.91	4.61	3.95	3.45	2.76	2.51	2.30	1.97
45	15.35	10.24	7.68	5.12	4.39	3.84	3.07	2.79	2.56	2.19
54	18.42	12.28	9.21	6.14	5.26	4.61	3.68	3.35	3.07	2.63
58.5	19.96	13.31	9.98	6.65	5.70	4.99	3.99	3.63	3.33	2.85
64	21.84	14.56	10.92	7.28	6.24	5.46	4.37	3.97	3.64	3.12
68	23.20	15.47	11.60	7.73	6.63	5.80	4.64	4.22	3.87	3.31
81	27.64	18.42	13.82	9.21	7.90	6.91	5.53	5.02	4.61	3.95
86	29.34	19.56	14.67	9.78	8.38	7.34	5.87	5.34	4.89	4.19
88	30.03	20.02	15.01	10.01	8.58	7.51	6.01	5.46	5.00	4.29

## 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.

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

All information is subject to change without notice. Consult factory for submittal drawings.

## UltraPure HD Sizing Information

### Versatile and Cost reducing design

#### In a continuous flow application...

with a constant flow of water the HD model 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 HD model 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 HD model 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 9 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 HD model

### Variables to Solve For:

**Step 1:** Determine the variables listed below.

Variables

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

**Step 2:** If variable #5 is between:

- 1–9 gallons then select HD6 model and Y=5
- 10–35 gallons then select HD16 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:**

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

$$\frac{\text{Time On} \times 0.80}{\text{(Variable 2)}}$$

**Step 4:**

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

(Variable 4)                      (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:

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

**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 HD16 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°FΔT 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 HD16 Model as determined in Step 2.

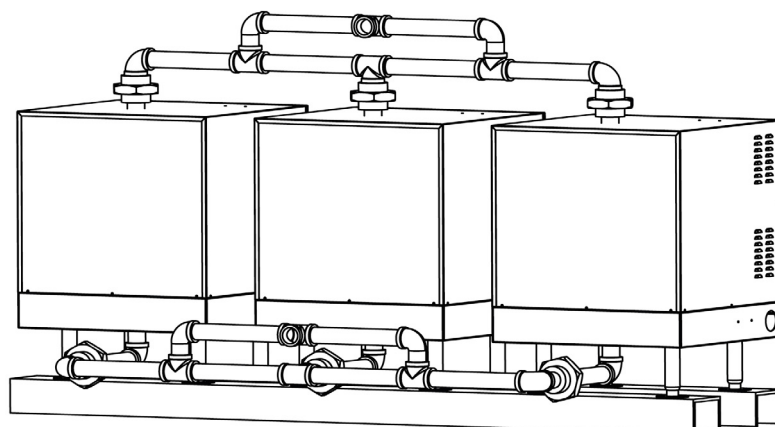
Specify Model HD1636T4

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



## Manifold Assembly Option:

- Single point connection
- High demand applications
- Multiple units for redundancy
- Contact Sales to specify



## UltraPure HD Model Number Designation

	See charts on pages 4 & 5			
MODEL	kW Rating	VOLTAGE / PHASE		OPTIONAL EQUIPMENT
HD6 HDF6 HD16	1–88	A = 120/1 RS = 208/1 S = 240/1 W = 277/1 T4S = 480/1	R = 208/3 T = 240/3 T3 = 380/3 T7 = 415/3 T5 = 440/3 T4 = 480/3 T6 = 600/3	Write/type optional equipment code in the gray box below in alphabetical order. For multiple options separate codes with a dash (–)

### Example: HD645T4-C55

A deionized water heater model HD with 6 gallons storage capacity, 45 kW rated at 480 volt 3 phase 60Hz power, with optional low temp alarm dry contact.

**Note:** For voltages not shown on pages 4 and 5, consult factory.

## Optional Equipment **Note:** Optional equipment must be called out using the codes below.

### Controller

- C21** Dry Contact for Remote Alarm Capability (Specify Condition)
- 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
- C55** Low Temp Alarm Dry Contact
- C56** High Temp Alarm Dry Contact
- C58** 24V Interlock Adapter

### General

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

### Vessel

- V7** Electropolished Heating Chamber
- V8** Passivated Heating Chamber
- V9** Electropolish and Passivation
- V10** 1-1/2" Inlet and Outlet (HD16 Only)
- V15** Additional 3/4" FNPT Tappings
- V16** Additional 1-1/2" FNPT Tappings (HD16 Only)
- V40** Flanged Inlet and Outlet Connections (ANSI Class 150, Please Specify Size)
- V41** Alternate Threaded Inlet/Outlet Connections Specify Size (HD16 Only)
- V42** Sanitary Connections (Specify Size)

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

## Available Accessories

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

**Slide Brackets:** For mounting the heater under a counter, specify part number "SLIDE BRACKETS"

**Protective Cover:** **HD6** specify part number "J6-6 SHROUD," **HD16** specify part number "J16-SHROUD"

Accessories Name

Part #

Accessories Name

Part #

Accessories Name

Part #