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LVC Electric Hotwater Storage Heater

Design Advantages

The Richmond Model LVC Heaters are Commercial Volume Storage Water Heaters designed for industrial, commercial and institutional users who require large quantities of service water at preset temperatures. When the job calls for lots of hot water — when it is called for quickly — when a continuous supply that will not quit at a crucial moment is needed — when downtime or failure will cause you a problem — It is time to think Richmond. We offer a wide range of storage and recovery capacities to meet your job requirements. These complete, factory packaged, Electric Storage Water Heaters are available in vertical configurations, and are ASME constructed and National Board Registered for design pressures of your choice of 125 PSI or 150 PSI. They are constructed under ASME Code Section IV and stamped HLW. Storage capacities are from 300 Gallons to 1500 Gallons, and recoveries from 315 to 1825 Gallons per hour are cataloged with larger sizes available upon request. Input capacities: 80 KW to 440 KW are cataloged using Incoloy- Sheathed individually flanged elements in 20 KW ratings.

Standard Features and Accessories

- Constructed per NEC and UL Standards, and UL Labeled
- Pressure Vessel Built to ASME Code Section IV and National Board Registered (125 PSI or 150 PSI)
- Completely Assembled and Tested at the Factory
- Precision Seal Lining (NSF-61 Compliant)
- 22 Gauge Enameled Steel Jacket on Structural Steel Base Ring
- 4" Fiberglass Insulation
- Individually Flanged Incoloy-Sheathed Elements (75wsi)
- Integral Electric Control Panel with Key-Locked Door(s)
- ASMEPressureandTemperatureReliefValve(s)
- Pressure Gauge (w/Cock)
- Manual Limit Toggle Switches (One Per Step)
- Main Supply Circuit Lugs
- On/Off Control with time delay on units <200KW
- Automatic Temperature Control via: Proportional Solid State Step Control on units >200KW
- Magnetic Contactors
- Internal Protection Fusing
- 120 Volt Fused Control Transformer
- On/Off Control Power Switch w/Pilot Light
- High Limit Aquastat (1) Automatic Reset
- Probe-Type Low Water Cutoff
- Magnesium Anode(s)
- Drain Valve
- Manway (Lined)
- Lifting Lugs

Storage Heater Benefits

- Complete Factory package with insulation and 22 gauge enameled jacket, assembled and tested, ready for electrical and water service connections.
- Provides energy-efficient water heating where electricity is virtually 100% efficient; and where Factory insulation and steel jacket reduce radiant heat loss to less than 4 watts per square foot of tank surface.
- Meets or exceeds the ASHRAE 90.1B-1992 energy standard.
- Integrated cabinet design on structural steel base ring with lifting lugs.
- Built-in safety standards, features and controls such as heater UL labelled, ASME rated temperature and pressure relief valve to relieve pressure in the event of overheating or excess pressure, one high temperature cutout to limit the tank temperature if it exceeds Setpoint, low water cutoff to keep the heater from "dry firing", fused control circuits to interrupt power in the event of overload condition, and optional safety equipment such as safety door interlock to prevent the opening of control cabinet door(s) while the main power supply is energized.

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Storage Heater Engineering Features

- Preassembled and prewired, with all necessary controls to provide a reliable and automatic supply of hot water with proper control to obtain desired flow and temperature.
- Heaters which are dual fired with both electric elements and steam coil work well to supplement capacity during peak periods and to handle the loads for off season requirements, when a central steam plant might not be operational.
- Immersion heating elements are 2-1/2" square individually flanged for ease in field replacement. The elements are made of a highly corrosion- resistant Incoloy sheath and nickel-chromium resistance wire packed in magnesium oxide powder in a U-tube design. The tubes are not in direct contact with each other nor are they a part of a bundle of elements. This increases the space between the elements and eliminates pockets.
  where scale can collect and build, therefore minimizing the tendency of cascade failures. This design allows unrestricted water flow for optimum heat transfer.
- Elements are available in 20 KW at 75 watt density (50 watt density is available where lime deposits or hard water are a problem).
- All steel pressure vessels are ASME code stamped and National Board registered offering assurance of quality construction. A manway is furnished in all lined vessels for cleaning and inspection.
- A corrosive resistant lining of Precision Seal, a polym- erized epoxy, is the standard tank lining used by Richmond. This lining is NSF-61 approved for domestic water by EPA and USDA and is applied after complete fabrication. One other protective lining available is Cement also NSF-61 compliant.

How to select a model number

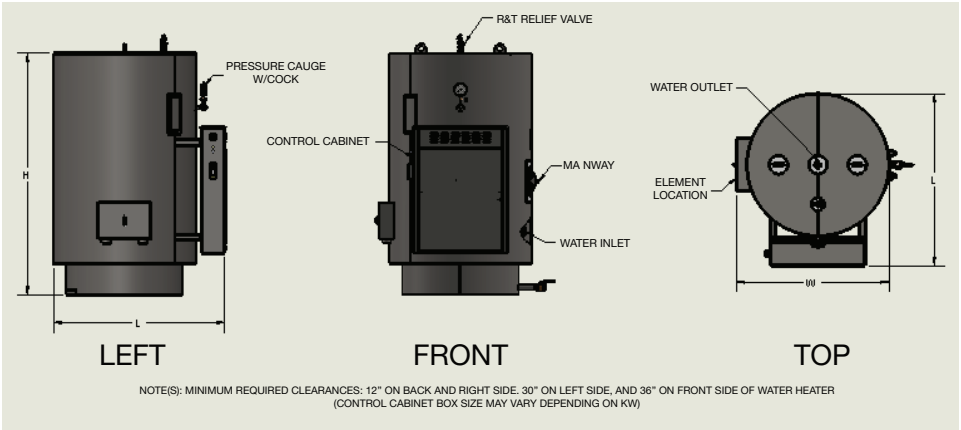
1. Choose the storage capacity and vessel dimensions for the job requirements, considering space or access limitations and whether vertical or horizontal construction would be suitable.
*Tall variations only available on 250 and 500 Gallon units.

Note: Total unit weight is the sum of the storage and recovery weights.

LVC - S - 36 - 74 - 80D - 380 - 125 - PS

- **LVC** — Hot Water Storage
- **S** — (S or T) Short or Tall Unit
- **36** — Tank Diameter (Inches)
- **74** — Tank Length (Inches)
- **80D** — KW Input; Element Designation (See Recovery Table)
- **380** — Voltage
- **125** — Design Pressure
- **PS** — Lining Type PS=PRECISION SEAL C=SEMENT

LVC Vertical Dimensional Data



NOTE(S): MINIMUM REQUIRED CLEARANCES: 12" ON BACK AND RIGHT SIDE. 30" ON LEFT SIDE, AND 36" ON FRONT SIDE OF WATER HEATER (CONTROL CABINET BOX SIZE MAY VARY DEPENDING ON KW)

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MODEL NUMBER*	ACTUAL GALLONS	DESIGN PRESSURE (PSI)		CONNECTIONS (IN/OUT)		DIMENSIONS (IN)			WEIGHT		CRATED DIMENSIONS (IN)		
		STANDARD	STRONG	IN / OUT	DRAIN	L	W	H	PS	CEMENT	L	W	H
LVC-S-200	200	150	-	11/4	1	48	44	78	1030	-	56	52	86
LVC-T-250	250	150	-	11/4	1	48	44	94	1180	-	56	52	102
LVC-S-250	250	125	150	11/4	11/4	54	50	70	1120	1400	62	58	78
LVC-S-300	300	125	150	11/4	11/4	54	50	82	1242	1552	62	58	90
LVC-S-400	400	125	150	11/4	11/4	60	50	106	1604	1964	68	58	114
LVC-S-500	500	125	150	11/2	11/2	66	62	80	1635	2145	74	70	88
LVC-T-500	500	125	150	2	11/2	60	56	98	1662	2092	68	64	106
LVC-S-600	600	125	150	2	11/2	66	62	92	1800	2350	74	70	100
LVC-S-800	800	125	150	2	11/2	72	68	98	2102	2742	80	76	106
LVC-S-1000	1000	125	150	2	11/2	84	74	100	2572	3292	92	82	108
LVC-S-1200	1200	125	150	2	11/2	84	74	116	2845	3635	92	82	124
LVC-S-1400	1400	125	150	2	11/2	90	80	113	3286	4286	98	88	121
LVC-S-1500	1500	125	150	2	11/2	90	80	120	3440	4480	98	88	128

Recovery Weights

MODEL NUMBER SUFFIX	(1) INPUT KW	MBTU's PER HOUR	GPH@ 100℉ RISE	(2) ELEMENTS		NUMBER OF CIRCUITS		(3) NUMBER & KW SIZE OF STEPS		AMPERAGE (3-PHASE)		(4) SHIP WEIGHT	
				QTY	KW	<250V	>250V	208/240V	380/415V	208V	380V	<250V	>250V
-10A	10	34	41	1	10	1	1	1@10	1@10	29	16	125	125
-20A	20	68	82	2	10	2	1	1@20	1@20	56	31	150	125
-30A	30	102	123	3	10	3	1	1@10, 1@20	1@30	84	46	175	125
-40A	40	136	164	4	10	4	2	2@20	1@40	112	61	200	150
-50A	50	171	205	5	10	5	2	1@20, 1@30	1@20, 1@30	140	76	225	150
-60A	60	205	246	6	10	6	2	2@30	2@30	167	92	250	150
-70A	70	239	287	7	10	7	3	2@20, 1@30	1@40, 1@30	195	107	275	175
-80A	80	273	328	8	10	8	3	1@20, 2@30	1@20, 2@30	223	122	300	175
-90A	90	307	369	9	10	9	3	3@30	3@30	251	137	325	175
-100A	100	341	410	10	10	10	4	2@20, 2@30	2@20, 2@30	279	152	350	200
-110A	110	375	451	11	10	11	4	1@20, 3@30	1@20, 3@30	306	168	375	200
-120A	120	409	492	12	10	12	4	4@30	4@30	334	183	400	200
-15B	15	51	62	1	15	1	1	1@15	1@15	43	23	125	125
-30B	30	102	123	2	15	2	1	1@30	1@30	84	46	150	125
-45B	45	154	185	3	15	3	2	1@15, 1@30	1@15, 1@30	126	69	175	150
-60B	60	205	246	4	15	4	2	2@30	2@30	167	92	200	150
-75B	75	256	308	5	15	5	3	1@15, 2@30	1@45, 1@30	209	114	225	175
-90B	90	307	369	6	15	6	3	3@30	3@30	251	137	250	175
-105B	105	358	431	7	15	7	4	1@15, 3@30	1@45, 2@30	292	160	275	200
-120B	120	409	492	8	15	8	4	4@30	4@30	334	183	300	200
-135B	135	461	554	9	15	9	5	1@15, 4@30	1@45, 3@30	376	206	375	225
-150B	150	512	615	10	15	10	5	5@30	5@30	417	228	400	275
-165B	165	563	677	11	15	11	6	1@15, 5@30	1@45, 4@30	459	251	425	300
-180B	180	614	738	12	15	12	6	6@30	6@30	501	274	450	300
-195B	195	665	800	13	15	13	7	1@15, 6@30	1@45, 5@30	542	297	475	325
-210B	210	717	861	14	15	14	7	7@30	7@30	584	319	500	325
-225B	225	768	923	15	15	15	8	1@15, 7@30	1@45, 6@30	626	342	525	350
-240B	240	819	984	16	15	16	8	8@30	8@30	667	365	550	350
-270B	270	921	1107	18	15	18	9	1@60, 7@30	1@60, 7@30	750	411	550	325
-300B	300	1024	1230	20	15	20	10	2@60, 6@30	2@60, 6@30	834	456	600	350
-330B	330	1126	1353	22	15	22	11	3@60, 5@30	3@60, 5@30	917	502	650	375
-360B	360	1228	1476	24	15	24	12	4@60, 4@30	4@60, 4@30	1000	547	700	400
-390B	390	1331	1599	26	15	26	13	5@60, 3@30	5@60, 3@30	1084	593	750	425
-420B	420	1433	1722	28	15	28	14	6@60, 2@30	6@60, 2@30	1167	639	800	450
-450B	450	1535	1845	30	15	30	15	7@60, 1@30	7@60, 1@30	1250	684	850	475
-480B	480	1638	1968	32	15	32	16	8@60	8@60	1333	730	900	500

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Recovery Weights

MODEL NUMBER SUFFIX	(1) INPUT KW	MBTU's PER HOUR	GPH@ 100℉ RISE	(2) ELEMENTS		NUMBER OF CIRCUITS		(3) NUMBER & KW SIZE OF STEPS		AMPERAGE (3-PHASE)		(4) SHIP WEIGHT	
				QTY	KW	<250V	>250V	208/240V	380/415V	208V	380V	<250V	>250V
-18C	18	61	74	1	18	N/A	1	N/A	N/A	–	–	–	125
-36C	36	123	148	2	18	N/A	1	N/A	N/A	–	–	–	125
-54C	54	184	221	3	18	N/A	2	N/A	N/A	–	–	–	150
-72C	72	246	295	4	18	N/A	2	N/A	N/A	–	–	–	150
-90C	90	307	369	5	18	N/A	3	N/A	N/A	–	–	–	175
-108C	108	368	443	6	18	N/A	3	N/A	N/A	–	–	–	175
-126C	126	430	517	7	18	N/A	4	N/A	N/A	–	–	–	200
-144C	144	491	590	8	18	N/A	4	N/A	N/A	–	–	–	200
-162C	162	553	664	9	18	N/A	5	N/A	N/A	–	–	–	225
-180C	180	614	738	10	18	N/A	5	N/A	N/A	–	–	–	275
-198C	198	676	812	11	18	N/A	6	N/A	N/A	–	–	–	300
-216C	216	737	886	12	18	N/A	6	N/A	N/A	–	–	–	300
-252C	252	860	1033	14	18	N/A	7	N/A	N/A	–	–	–	325
-288C	288	983	1181	16	18	N/A	8	N/A	N/A	–	–	–	350
-324C	324	1105	1328	18	18	N/A	9	N/A	N/A	–	–	–	375
-360C	360	1228	1476	20	18	N/A	10	N/A	N/A	–	–	–	400
-20D	20	68	82	1	20	N/A	1	N/A	N/A	–	–	–	125
-40D	40	136	164	2	20	N/A	1	N/A	N/A	–	–	–	125
-60D	60	205	246	3	20	N/A	2	N/A	N/A	–	–	–	150
-80D	80	273	328	4	20	N/A	2	N/A	N/A	–	–	–	150
-100D	100	341	410	5	20	N/A	3	N/A	N/A	–	–	–	175
-120D	120	409	492	6	20	N/A	3	N/A	N/A	–	–	–	175
-140D	140	478	574	7	20	N/A	4	N/A	N/A	–	–	–	200
-160D	160	546	656	8	20	N/A	4	N/A	N/A	–	–	–	200
-180D	180	614	738	9	20	N/A	5	N/A	N/A	–	–	–	225
-200D	200	682	820	10	20	N/A	5	N/A	N/A	–	–	–	275
-220D	220	751	902	11	20	N/A	6	N/A	N/A	–	–	–	300
-240D	240	819	984	12	20	N/A	6	N/A	N/A	–	–	–	300
-280D	280	955	1148	14	20	N/A	7	N/A	N/A	–	–	–	325
-320D	320	1092	1312	16	20	N/A	8	N/A	N/A	–	–	–	350
-360D	360	1228	1476	18	20	N/A	9	N/A	N/A	–	–	–	375
-400D	400	1365	1640	20	20	N/A	10	N/A	N/A	–	–	–	400
-440D	440	1501	1804	22	20	N/A	11	N/A	N/A	–	–	–	425
-480D	480	1638	1968	24	20	N/A	12	N/A	N/A	–	–	–	450

1) Recovery ratings should not exceed 1 KW per gallon of storage capacity.

(2) Element limitations for Vertical Tanks are as follows:

"A": No limitations on elements

"B" Element (15KW): Not to be used on vertical tanks <36" diameter "C" Element (18KW):

Not to be used on vertical tanks <42" diameter "D" Element (20KW):

Not to be used on vertical tanks <48" diameter

(3) Recovery ratings with 5 or more steps include a proportional step control

(4) Add recovery weight to storage tank weight to obtain total unit weight.

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Specifications

1. General

Furnish and install as shown on the plans a Richmond Storage Water Heater Model LVC-
which shall be a complete Factory tested, packaged unit consisting of an electrically-heated water storage vessel complete with all required operating and safety controls. The pressure vessel shall meet all the applicable requirements for ASME Section IV and stamped HLW and shall be National Board Inspected and designed for (125) (150) PSIG maximum working pressure. A copy of the Manufacturer's Data Report shall be provided to the owner.
The completed Hot Water Storage Heater shall be UL listed and be installed in accordance with all applicable state and local codes.

2. Recovery

Each Hot Water Storage Heater shall have an electrical heating capacity of KW for operation at a line voltage of , 3 phase, hertz. The control voltage shall be 120 volts derived from an integral control transformer.
Note for steam dual fired heater:
Heater shall also be provided with steam coil and controls rated to heat GPH of water from °F to °F temperature rise and to control the outlet within 5 degrees of the selected temperature when supplier with ___ PSIG saturated steam to the control valve.

3. Controls and safety devices

Load Sequencing:
Units of 4 or less steps – The Hot Water Heater shall be equipped with on/off thermostats to provide not less than stages. The limit circuit shall consist of a high limit thermostat (automatic reset), a high limit thermostat (manual reset), internal branch circuit fusing, magnetic contactors, a float-type low water cutoff, and pilot lights (one per stage).
Units of 5 or more steps – The Hot Water Heater shall be equipped with a proportional step control to provide not less than steps. The control circuit shall consist of a proportional temperature controller with adjust- able throttling range, a high limit thermostat (automatic reset), a high limit thermostat (manual reset), internal branch circuit fusing, magnetic contactors, an on/off switch with pilot light, a recycle feature, a float-type low water cutoff, and pilot lights (one per step).
Each Heater shall be equipped with an ASME pressure and temperature relief valve, a combination pressure and temperature gauge, and an integral electric control panel with key-locked door.

4. Construction

Heater shall be constructed of a (☐ vertical) (☐horizontal) steel tank " (inches) diameter x "(inches) (☐ long) (☐high) and shall have a storage capacity of gallons.
The immersion heating elements shall be Incoloy-sheathed individually flanged and sized for a maximum of 75 watts per square inch. The U-bend shall be heat treated and re-compressed after forming, to avoid failure due to stress cracks in the bend, and then brazed into a 2-1/2" square steel flange.
The pressure vessel shall be insulated with a minimum of 4 inches of 3/4 pound density fiberglass insulation (or equivalent) and shall be enclosed in an enameled sheet steel enclosure of at least 22 gauge thickness. The Heater shall be furnished with a 12" x 16" manway, _____" inlet, _____" outlet, drain pipe and valve, and lifting lugs.

5. Vessel Lining

Heater shall be completely lined After Fabrication with (☐ Precision Seal) (☐ Cement) lining as follows: (Insert one of the following paragraphs that applies to your selection of linings)
5.1 Precision Seal: (NSF 61 Compliant) The tank interior shall be lined with two separate coats of polymerized epoxy to a dry film thickness of 5-6 mils per coat. Each coat shall be baked and force- cured in an oven.
5.2 Cement Lined: (NSF 61 Compliant) The tank interior shall be completely lined with Hydreulic Calcium Oxide cement, good for service temperatures to 250°F with the same coefficient of expansion as medium steel. The cement is applied at a minimum thickness of 5/8" to form a hard one-piece lining.