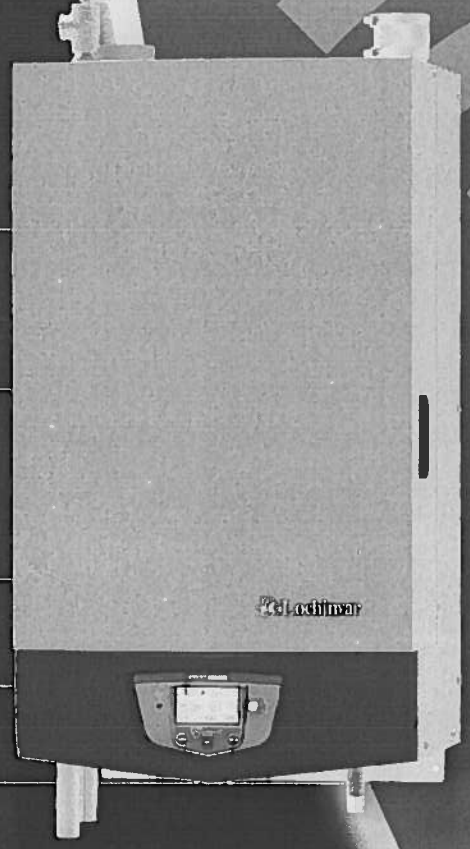
HIGH EFFICIENCY CONDENSING BOILER

RESURGAM CITY OF PORTLAND, MAINE

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 03/28/16

KNIGHT™
WALL MOUNT BOILER



CON·X·US™
REMOTE CONNECT CAPABLE

SMART SYSTEM
OPERATING CONTROL FEATURING
A BUILT-IN CASCADING SEQUENCER

7 MODELS: 55,000 – 399,999 BTU/HR

5:1 TURNDOWN RATIO

LESS THAN 20 ppm NOx

DIRECT VENT FLEXIBILITY TO 100 FEET

95% AFUE EFFICIENCY

Most Efficient 2015
ENERGY STAR
www.energystar.gov

LOW NOx Certified

Lochinvar®
HIGH EFFICIENCY BOILERS & WATER HEATERS

Lochinvar.com

KNIGHT™ WALL MOUNT BOILER

THE SMARTEST CHOICE F
CONDENSING BOILER PE

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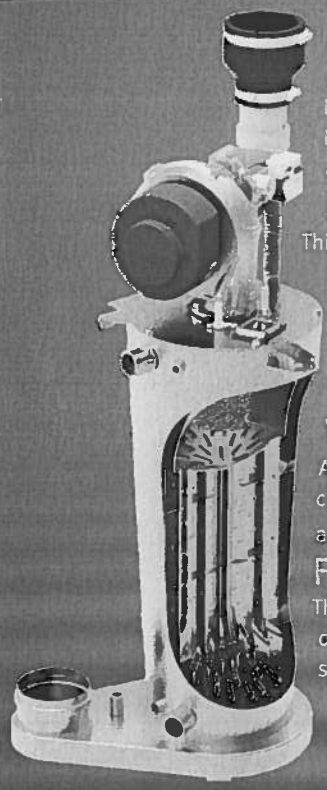
The KNIGHT™ Wall Mount, engineered with Lochinvar's exclusive SMART SYSTEM™ cont
innovative features is far ahead of any heating boiler in its class. It promises and delivers ulti
and maintenance. With up to 99% efficiency, low-NOx emissions and a fully modulating burner, it is the best "g
environmentally focused market.

Seven modulating/condensing stainless steel KNIGHT Wall Mount boilers are available with 55,000–399,999 Btu/hr inputs in a space-saving wall-mounted design. All are equipped for direct-vent installation with air intake and exhaust runs up to 100 feet using PVC, CPVC, Polypropylene or AL29-4C vent materials. This range of choices is ideal for residential or light-duty applications such as small hotels, schools and office buildings. For higher-demand applications, up to eight KNIGHT Wall Mount units can be installed utilizing the built-in cascading sequencer to deliver up to 3.2 million Btu/hr heating capacity.

The KNIGHT Wall Mount Boiler reflects Lochinvar's constant commitment to providing all the options you need to serve every application.



ADVANCED NEGATIVE REGULATION TECHNOLOGY

KNIGHT safely and reliably operates with supply gas pressure as low as 4 inches water column. Negative Regulation (Neg/Reg) technology automatically adjusts fan speed to ensure the correct volume and mix of fuel and air throughout the firing range.

FIRE TUBE DESIGN

This fully welded ASME Certified stainless steel heat exchanger uses oval shaped tubes to pass heat from the products of combustion into the water stored in the vessel. To facilitate heat transfer the tubes are manufactured with dimples to slow the flue products and extract available latent energy. With a fire tube design the flue products are inside tapered passage ways and the water is passed through the vessel. Since the flue products pass through tubes and the water is circulated through a larger diameter vessel a fire tube design allows for minimal head pressure loss through the boiler which allows the boiler to be installed easily into various hydronic applications.

WATER-BACKED COMBUSTION CHAMBER

An outstanding feature of the fire tube design is a water backed combustion chamber. By having the combustion chamber surrounded by water the Knight Wall Mount has more heating surface area. This larger heating surface area allows for efficiencies up to 99%.

FULLY MODULATING BURNER

The SMART SYSTEM allows fully modulating combustion with 5:1 turndown. The burner can fire as low as 20% of maximum input and modulates the firing rate up to 100% as demand increases. The burner is a single stainless steel assembly covered with woven steel mesh and fires in a 360° pattern along the entire length of the burner. This allows the compact KNIGHT to exceed the modulation capacities of units with larger multiple burners.

DIRECT VENTING UP TO 100 FEET

KNIGHT offers 5 venting options and tremendous flexibility for placement of units within the building, because it permits direct-vent air intake and exhaust runs up to 100 equivalent feet using either PVC, CPVC, Polypropylene or AL29-4C stainless steel vent pipe.

5 FLEXIBLE VENTING OPTIONS

Direct Vent Sidewall

Direct Vent Vertical

Vertical w/Sidewall Air

Concentric Direct Vent Vertical*

Concentric Direct Vent Sidewall*

*Optional Vent Kit Sold Separately

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SMART SYSTEM™

Refined Design Puts More Control and Information at your Fingertips

Advanced features include:

- MULTI-COLOR GRAPHIC LCD DISPLAY
- NAVIGATION DIAL
- USB PORT
- ABILITY TO CONTROL UP TO THREE DIFFERENT SETPOINT TEMPERATURES
- COMPATIBILITY WITH COPPER-FIN II NON-CONDENSING BOILER TO CREATE A FRONT-END LOADING SYSTEM
- BOILERS WITH DIFFERENT INPUTS CAN BE CASCADED TOGETHER TO MAXIMIZE BOILER PLANT TURNDOWN
- MODBUS CAPABILITY (OPTIONAL)
- DHW MODULATION LIMITING
- DHW NIGHT SETBACK*
- 0-10 V BOILER RATE OUTPUT
- 0-10 V SIGNAL TO CONTROL VARIABLE SPEED BOILER PUMP*
- 0-10 V SYSTEM PUMP SIGNAL INPUT*
- HEAT DEMAND FROM 0-10V INPUT
- INSTALLER CAN PROGRAM NAME AND NUMBER INTO THE BOILER
- INSTALLER ADJUSTABLE FREEZE PROTECTION PARAMETERS
- SEPARATELY ADJUSTABLE SH/DHW SWITCHING TIMES*
- INSTALLER ACCESS TO BMS AND RAMP DELAY SETTINGS

*Exclusive to Lochinvar Smart System

At-a-Glance Color Coding

BLUE SCREEN
Normal system operation.

YELLOW SCREEN
Maintenance due - shows the installer's name and number on the display.

RED SCREEN
Lockout mode.

CON-X-US™

The CON-X-US mobile communication platform allows SMART SYSTEM to go where no other boiler has gone before.[1]

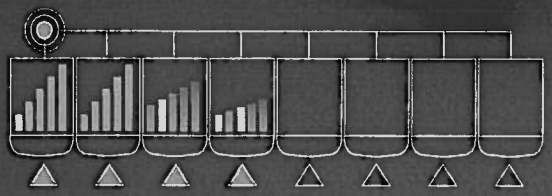
CON-X-US provides the ability to monitor and manage multiple Knight heating boilers without ever stepping into the mechanical rooms. CON-X-US will send alerts via text or e-mail notifying of changes in system status, and anytime, from anywhere, a user can check system status and re-program any boiler function. Once downloaded, the free CON-X-US mobile application allows for remote access to all SMART SYSTEM functions using an Internet-capable device.

[1]CON-X-US control board sold separately.

New Selectable Cascade Options

When multiple KNIGHT boilers are installed together, the SMART SYSTEM built-in sequencer can be set for "Lead-Lag" cascade or "Efficiency Optimized" cascade operation.

Lead-Lag Cascade



The "lead" boiler modulates with demand to capacity. As demand increases, additional boilers fire and modulate to capacity. This continues, with additional boilers firing and modulating to capacity until all units are operating. Every 24 hours, the SMART SYSTEM automatically shifts the lead boiler role to the next in the sequence, distributing lead-lag runtimes equally.

Efficiency Optimized Cascade

This feature optimizes the modulation capabilities of the Boiler Plant while evenly distributing run time across all cascaded boilers. Every 24 hours the SMART SYSTEM automatically shifts the 1st boiler on role to the next in the sequence, distributing run time equally.

SMART SYSTEM Cascade allows 2 - 8 boilers to be sequenced.

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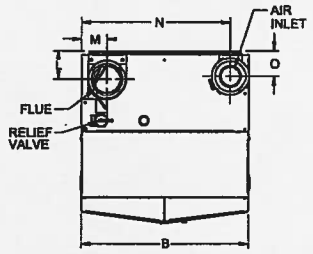
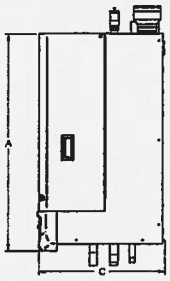
Knight- Wall-Mount Boiler Dimensions and Specifications



Top



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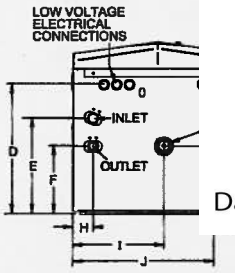

Bottom

Knight Heating Boiler — Dimensions and Specifications

Model Number	Input Max. MBH	Input Min. MBH	*AFUE %	Heating Capacity MBH	Net MBH	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Gas Conn.	Water Conn.	Air Inlet	Vent Size	Shipping Wt. (lbs.)
WHN055	55	11	95.0	51	44	33-1/4"	18-1/2"	16"	11-3/4"	10-1/2"	6-1/2"	4"	1-1/2"	3"	14-1/2"	5-3/4"	4"	3"	16-1/4"	5"	1/2"	1"	2"	2"	139
WHN085	85	17	95.0	79	69	33-1/4"	18-1/2"	16"	11-3/4"	10-1/2"	6-1/2"	4"	1-1/2"	3"	14-1/2"	5-3/4"	4"	3"	16-1/4"	5"	1/2"	1"	2"	2"	142
WHN110	110	22	95.0	102	89	33-1/4"	18-1/2"	19"	14-1/2"	10-3/4"	7-3/4"	7-3/4"	2-1/4"	10"	15-1/2"	5"	3-1/4"	3"	16-1/2"	2-3/4"	1/2"	1"	3"	3"	159
WHN155	155	31	95.0	144	125	33-1/4"	18-1/2"	19"	14-1/2"	10-3/4"	7-3/4"	7-3/4"	2-1/4"	10"	15-1/2"	5"	3-1/4"	3"	16-1/2"	2-3/4"	1/2"	1"	3"	3"	166
WHN199	199.9	40	95.0	185	161	33-1/4"	18-1/2"	19"	14-1/2"	11-3/4"	8"	8"	1-1/4"	10"	16-3/4"	4-3/4"	3-1/4"	2-3/4"	16-1/2"	3"	1/2"	1-1/4"	3"	3"	175
WHN285	285	57	95.0	264	229	33-1/4"	18-1/2"	19"	14-1/2"	11-3/4"	8"	8"	1-1/4"	10"	16-3/4"	4-3/4"	3-1/4"	2-3/4"	16-1/2"	3"	1/2"	1-1/4"	3"	3"	184
WHN399	399	80	94.4	377	328	35-1/2"	25"	21-3/4"	17-1/2"	12-1/2"	9-1/4"	9-1/2"	2-1/4"	13-1/4"	21-1/2"	9"	4-3/4"	4"	22-1/2"	3-3/4"	3/4"	1-1/2"	4"	4"	213

*Notes: Indoor installation only. All information subject to change. Change "N" to "L" for LP gas models. *WHN399 value is Thermal Efficiency*

Smart System™ Features

- **SMART SYSTEM Digital Operating Control**
  - Multi-Color Graphic LCD Display with Navigation Dial and Soft Keys
- **Three Boiler Setpoint Temperature Inputs**
  - Plus Domestic Hot Water Prioritization
- **Built-in Cascading Sequencer for up to 8 Boilers**
  - Multiple Size Boiler Cascade
  - Lead Lag
  - Efficiency Optimization
  - Front End Loading Capability with Copper Fin II
- **Outdoor Reset Control with Outdoor Air Sensor**
  - Programmable for Three Reset Temperature Inputs
- **Programmable System Efficiency Optimizers**
  - Night Setback
  - DHW Night Setback*
  - Anti-Cycling
  - Outdoor Air Reset Curve
  - Ramp Delay
  - Boost Temperature & Time
- **Three Pump Control**
  - System Pump with Parameter for Continuous Operation
  - Boiler Pump with Variable Speed Pump Control*
  - Domestic Hot Water Pump
- **Domestic Hot Water Prioritization**
  - DHW tank piped with priority in the boiler loop
  - DHW tank piped as a zone in the system with the pumps controlled by the Smart System
  - DHW Modulation Limiting
  - Separately Adjustable Space Heat/DHW Switching Times*
- **Building Management System Integration**
  - 0-10 VDC Input to Control Modulation or Set Point
  - 0-10 VDC Modulation Rate Output
  - 0-10 VDC Input to Enable/Disable call for heat
- **Access to BMS Settings through Graphic LCD Display**
- **High-Voltage Terminal Strip**
  - 120 VAC / 60 Hertz / 1 Phase Power Supply
  - Three Sets of Pump Contacts
- **Low Voltage Terminal Strip**
  - 24 VAC Device Relay
  - Proving Switch Contacts
  - Flow Switch Contacts
  - Alarm on Any Failure Contacts
  - Runtime Contacts
  - DHW Thermostat Contacts
  - 3 Space Heat Thermostat Contacts
  - System Sensor Contacts
  - DHW Tank Sensor Contacts
  - Outdoor Air Sensor Contacts
  - Cascade Contacts
  - 0-10 VDC BMS External Control Contact
  - 0-10 VDC Boiler Rate Output Contacts
  - 0-10 VDC Variable Speed System Pump Signal Input*
  - 0-10 VDC Signal to Control Variable Speed Boiler Pump*
  - Modbus Contacts
- **Time Clock**
- **Data Logging**
  - Hours Running, Space Heating
  - Hours Running, Domestic Hot Water
  - Ignition Attempts
  - Last 10 Lockouts
- **Maintenance Reminder**
  - Custom Maintenance Reminder with Contractor Contact Information
  - Installer Ability to De-activate Service Reminder
- **Low-Water Flow Safety Control & Indication**
- **Password Security**
- **Customizable Freeze Protection Parameters**

Standard Features

- **ENERGY STAR Most Efficient Recognition§**
- **95% DOE AFUE Efficiency§**
- **Modulating Burner with 5:1 Turndown**
  - Direct-Spark Ignition
  - Low-NOx Operation
  - Field Convertible from Natural to LP Gas
- **ASME Stainless Steel Heat Exchanger**
  - 30 psi ASME Relief Valve
- **Vertical & Horizontal Direct-Vent**
  - PVC, CPVC, Polypropylene or SS Venting up to 100 feet
- **Smart System Control**
- **Condensate Trap**
- **Other Features**
  - Automatic Reset High Limit
  - Adjustable High Limit w/Manual Reset
  - Boiler Circulating Pump
  - Wall-Mount Bracket
  - Zero Clearances to Combustible Materials
  - 12-Year Limited Warranty (See Warranty for Details)
  - 2-Year Parts Warranty

Optional Equipment

- CON-X-US Remote Connectivity
- Modbus Communication
- Flow Switch
- Low-Water Cutoff w/Manual Reset & Test
- Alarm Bell
- Concentric Vent Kit
- SMART SYSTEM PC Software
- Condensate Neutralization Kit
- BMS Gateway to LON or BacNet
- Multi-Temperature Loop Control
- Sidewall Vent Termination
- Floor Stand
- Wireless Outdoor Sensor

Firing Codes

- M9 Standard Construction
- M7 California Code

** Exclusive feature, available only from Lochinvar*

§ WHN 55-285 only

Patent Pending

Lochinvar
HIGH EFFICIENCY BOILERS & WATER HEATERS

Lochinvar, LLC
300 Maddox Simpson Parkway
Lebanon, Tennessee 37090
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Lochinvar.com

Lochinvar®
High Efficiency Water Heaters, Boilers and Pool Heaters

KNIGHT® WALL MOUNT BOILER PRODUC
(WH) 55,000 - 399,999 BTU/H

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	WH-055	WH-085	WH-110	WH-155	WH-199		
WATER							
GALLON CAPACITY	2.5	2.5	3.5	3.5	5.0		
HEATING SURFACE (SQ. FT.)	5.92	8.33	10.00	14.07	15.66		
WATER CONNECTIONS	1"	1"	1"	1"	1-1/4"	1-1/4"	1-1/2"
20°F ΔT WATER FLOW (GPM)	5	8	10	15	19	27	38
HEAD LOSS (FT. OF HD.)	0.27	0.94	1.53	3.50	1.13	2.42	1.42
35°F ΔT WATER FLOW (GPM)	3	5	6	9	11	16	22
HEAD LOSS (FT. OF HD.)	0.10	0.37	0.55	1.45	0.38	0.85	0.48
MAX. WORKING PRESSURE (PSI)	80	80	80	80	80	80	80
# OF RELIEF VALVES	1	1	1	1	1	1	1
RELIEF VALVE SIZE	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
RELIEF VALVE RATING (MBH)	535	535	535	535	535	535	535
RELIEF VALVE PRESSURE RATING (PSI)	30	30	30	30	30	30	30
GAS							
INLET CONNECTION	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"
MAX. INLET PRESSURE, NAT	14.0" w.c.	14.0" w.c.	14.0" w.c.	14.0" w.c.	14.0" w.c.	14.0" w.c.	14.0" w.c.
MIN. INLET PRESSURE, NAT	4.0" w.c.	4.0" w.c.	4.0" w.c.	4.0" w.c.	4.0" w.c.	4.0" w.c.	4.0" w.c.
MAX. INLET PRESSURE, LP	14.0" w.c.	14.0" w.c.	14.0" w.c.	14.0" w.c.	14.0" w.c.	14.0" w.c.	14.0" w.c.
MIN. INLET PRESSURE, LP	8.0" w.c.	8.0" w.c.	8.0" w.c.	8.0" w.c.	8.0" w.c.	8.0" w.c.	8.0" w.c.
BTU/HR INPUT	55,000	85,000	110,000	155,000	199,999	285,000	399,999
BTU/HR OUTPUT (HIGH FIRE)	52,250	80,750	104,500	147,250	189,999	270,750	379,999
BTU/HR OUTPUT (LOW FIRE)	10,450	16,150	20,900	29,450	38,000	54,150	76,000
ELECTRICAL							
VOLTAGE/HEATER	120	120	120	120	120	120	120
VOLTAGE/CONTROL	24	24	24	24	24	24	24
TOTAL AMPS	0.5	0.5	0.5	0.5	1.5	1.5	2.0
# OF ELECTRICAL CONNECTIONS	1	1	1	1	1	1	1
DIMENSIONS							
HEIGHT	33-1/4"	33-1/4"	33-1/4"	33-1/4"	33-1/4"	33-1/4"	35-1/2"
WIDTH	18-1/2"	18-1/2"	18-1/2"	18-1/2"	18-1/2"	18-1/2"	25"
DEPTH	16"	16"	19"	19"	19"	19"	21-3/4"
SERVICE CLEARANCES							
FRONT	24"	24"	24"	24"	24"	24"	24"
BOTTOM	24"	24"	24"	24"	24"	24"	24"
RIGHT SIDE	0"	0"	0"	0"	0"	0"	0"
LEFT SIDE	24"	24"	24"	24"	24"	24"	24"
TOP	6"	6"	6"	6"	6"	6"	6"
DIRECT VENTING							
SIZE	2"	2"	3"	3"	3"	3"	4"
VENT CATEGORY	IV	IV	IV	IV	IV	IV	IV
VENT MATERIAL	PVC/CPVC/SS	PVC/CPVC/SS	PVC/CPVC/SS	PVC/CPVC/SS	PVC/CPVC/SS	PVC/CPVC/SS	PVC/CPVC/SS

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TAG:B-1

Lochinvar®
High Efficiency Water Heaters, Boilers and Pool Heaters

KNIGHT W
HEATING
Submitta
WHN-S

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Approved with Conditions
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KNIGHT® WALL MOUNT HEATING BOILERS

JOB NAME Riverton Boiler Replacement
LOCATION Portland ME
ENGINEER
WHOLESALER
MECH. CONTRACTOR
MODEL NO. WHN199
TYPE GAS NG
Btu/hr INPUT
Btu/hr OUTPUT
NOTES

SMART SYSTEM™ FEATURES

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  - Zero Clearances to Combustible Materials
  - 12-Year Limited Warranty (See Warranty for Details)

OPTIONAL EQUIPMENT

- ☐ Modbus Communication
- ☑ Flow Switch
- ☐ Low-Water Cutoff w/Manual Reset & Test
- ☐ Alarm Bell
- ☑ Concentric Vent Kit
- ☐ SMART SYSTEM PC Software
- ☐ BMS Gateway to LON or BacNet
- ☐ Multi-Temperature Loop Contro
- ☐ Sidewall Vent Termination

FIRING CODES

- ☐ M9 Standard Construction
- ☐ M7 California Code

** Exclusive feature, available only from Lochinvar*
§ WHN 55-285 only

TAG:B-1

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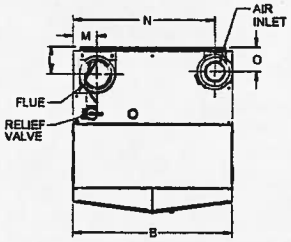
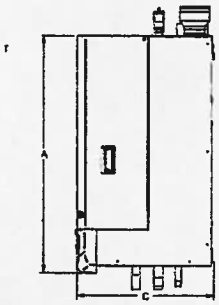
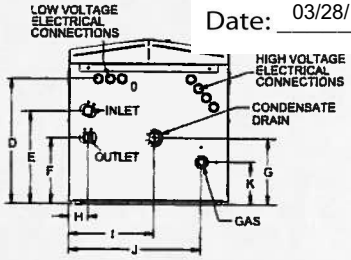
KNIGHT Wall Mount Dimensions & Specifications







KNIGHT HEATING BOILER

Model Number	Input Max. MBH	Input Min. MBH	*AFUE %	Heating Capacity MBH	NET I=B=R MBH
WHN055	55	11	95.0	51	44
WHN085	85	17	95.0	79	69
WHN110	110	22	95.0	102	89
WHN155	155	31	95.0	144	125
WHN199	199.9	40	95.0	185	161
WHN285	285	57	95.0	264	229
WHN399	400	80	94.4	380	323

DIMENSIONS AND SPECIFICATIONS

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Gas Conn.	Water Conn.	Air Inlet	Vent Size	Shipping Wt. (lbs.)
33-1/4"	18-1/2"	16"	11-3/4"	10-1/2"	6-1/2"	4"	1-1/2"	3"	14-1/2"	5-3/4"	4"	3"	16-1/4"	5"	1/2"	1"	2"	2"	139
33-1/4"	18-1/2"	16"	11-3/4"	10-1/2"	6-1/2"	4"	1-1/2"	3"	14-1/2"	5-3/4"	4"	3"	16-1/4"	5"	1/2"	1"	2"	2"	142
33-1/4"	18-1/2"	19"	14-1/2"	10-3/4"	7-3/4"	7-3/4"	2-1/4"	10"	15-1/2"	5"	3-1/4"	3"	16-1/2"	2-3/4"	1/2"	1"	3"	3"	159
33-1/4"	18-1/2"	19"	14-1/2"	10-3/4"	7-3/4"	7-3/4"	2-1/4"	10"	15-1/2"	5"	3-1/4"	3"	16-1/2"	2-3/4"	1/2"	1"	3"	3"	166
33-1/4"	18-1/2"	19"	14-1/2"	11-3/4"	8"	8"	1-1/4"	10"	16-3/4"	4-3/4"	3-1/4"	2-3/4"	16-1/2"	3"	1/2"	1-1/4"	3"	3"	175
33-1/4"	18-1/2"	19"	14-1/2"	11-3/4"	8"	8"	1-1/4"	10"	16-3/4"	4-3/4"	3-1/4"	2-3/4"	16-1/2"	3"	1/2"	1-1/4"	3"	3"	184
35-1/2"	25"	21-3/4"	17-1/2"	12-1/2"	9-1/4"	9-1/2"	2-1/4"	13-1/4"	21-1/2"	9"	4-3/4"	4"	22-1/2"	3-3/4"	3/4"	1-1/2"	4"	4"	213

*Notes: Indoor installation only. All information subject to change. Change "N" to "L" for LP gas models. *WHN399 value is Thermal Efficiency*

Lochinvar
High Efficiency Water Heaters, Boilers and Pool Heaters

Lochinvar, LLC • 300 Maddox Simpson Pkwy • Lebanon, TN 37090 • 615-889-8900 / Fax: 615-547-1000
www.Lochinvar.com

(Web Update 1/13) 11/12—Printed in U.S.A.

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CONCENTRIC VENT SIDEWALL & VERTICAL TERMIN
#CVK3003, #CVK3008 AND #CVK3007

Safety considerations

Installing and servicing heating equipment can be hazardous due to gas and electrical components. Only tr install or service heating equipment.

Recognize safety information. This is the safety alert symbol ⚠. When you see this symbol on the heating equipment and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTICE. These words are used with the safety alert symbol. DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies a hazard that could result in personal injury or death. CAUTION is used to identify unsafe practices which would result in minor personal injury or product and property damage. NOTICE is used to highlight suggestions that will result in enhanced installation, reliability, or operation.

Untrained personnel can perform basic maintenance functions such as cleaning and replacing filters. All other operations should be performed by trained service personnel. When working on heating equipment, observe precautions in the literature, on tags, and on labels attached to the unit.

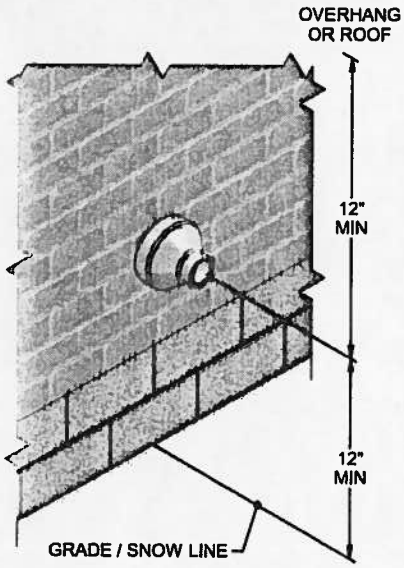
Follow all safety codes. Wear safety glasses and work gloves. Have a fire extinguisher available.

Description and usage

Lochinvar offers optional concentric combustion air and vent pipe termination kits (Factory Kit #CVK3003, #CVK3008 and #CVK3007). Both combustion air and vent pipes must attach to the termination kit. The termination kits must terminate outside the structure and must be installed as shown in FIG. 1 (this page) and FIG. 10 on page 5 of this instruction sheet.

The required combustion air and vent pipe fittings are listed in Table 1 below.

Figure 1 Concentric Sidewall Termination



Requirements for installation in Canada

1. Installations must be made with a vent pipe system certified to ULC-S636.

   IPEX is an approved vent manufacturer in Canada supplying vent material listed to ULC-S636.

2. The first three (3) feet of plastic vent pipe from the appliance flue outlet must be readily accessible for visual inspection.
3. The components of the certified vent system must not be interchanged with other vent systems or unlisted pipe/fittings. The inner vent tube must be replaced with field supplied certified vent material to comply with this requirement.
4. The 2" and 3" Concentric Vent Kits available from Lochinvar are approved and listed to the ULC-S636 standard for use in Canada.

Table 1 Vent, Air Pipe, and Fittings

All combustion air and vent pipe materials and fittings must comply with the following:			
Item	Material	Standards for installation in:	
		United States	Canada
Vent or air pipe and fittings	PVC schedule 40	ANSI/ASTM D1785	CPVC and PVC venting must be ULC-S636 Certified. IPEX is an approved vent manufacturer in Canada supplying vent material listed to ULC-S636.
	PVC-DWV	ANSI/ASTM D2665	
	CPVC schedule 40/80	ANSI/ASTM F441	
Pipe cement/primer	PVC	ANSI/ASTM D2564	IPEX System 636 Cements & Primers
	CPVC	ANSI/ASTM F493	
NOTICE: DO NOT USE CELLULAR (FOAM) CORE PIPE			

SUPERstor ULT

Stainless Steel, Indirect Water Heaters

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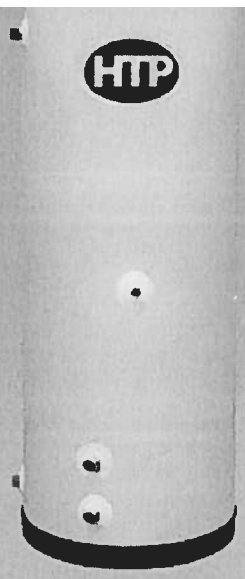
Approved with Conditions
Date: 03/28/16

- Low energy costs: when used in conjunction with an HTP high efficiency boiler, operating costs decrease even further
- Ultra high performance, can generate over 50% more hot water than many water heaters of similar size (offered in 7 sizes: 20 to 119 gallons)
- Minimal heat loss, thanks to thick water blown foam insulation
- Virtually maintenance free operation
- Extremely durable cupronickel heat exchanger boasts excellent heat transfer properties and resists corrosion
- Robust 316L stainless steel tank eliminates the need for anode rods
- Limited lifetime residential warranty: the industry's strongest protection plan
- Number one selling indirect water heater in the country

Market Leadership For Over **30 Years**

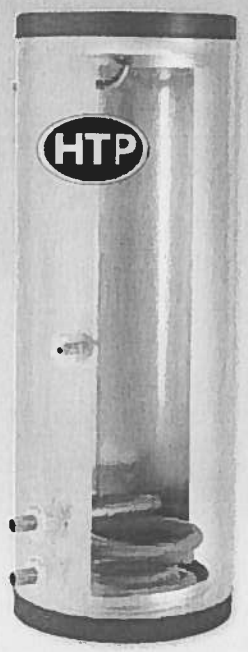
Ultra Indirect Model	180 F Boiler Water 1st Hr Rating		Height / Diameter	Pressure Drop (Ft.)	Shipping Weight
	140 F	115°F			
SSU-20	121 GPH	168 GPH	27"/19.25"	6.0	51 lbs.
SSU-30	154 GPH	212 GPH	39.5"/19.25"	6.0	62 lbs.
SSU-30LB	169 GPH	234 GPH	28.5"/23.25"	6.0	71 lbs.
SSU-45	212 GPH	292 GPH	52.5"/19.25"	7.9	72 lbs.
SSU-60	266 GPH	370 GPH	52.5"/23.25"	7.9	109 lbs.
SSU-80	330 GPH	440 GPH	72"/23.25"	9.1	143 lbs.
SSU-119	423 GPH	564 GPH	74"/27"	11.3	212 lbs.



Ultra Storage Tank	Height / Diameter	Floor to Drain	Floor to Inlet	Floor to Outlet	Water Connection Sizes	Shipping Weight
SSU-30CB	39.5"/19.25"	4.5"	4.5"	33.75"	.75" NPT	40 lbs.
SSU-45CB	52.5"/19.25"	4.5"	4.5"	45.75"	.75" NPT	64 lbs.
SSU-60CB	52.5"/23.25"	4.5"	4.5"	45.75"	1" NPT	90 lbs.
SSU-80CB	72"/23.25"	6"	16"	64.75"	1.5" NPT	129 lbs.
SSU-119CB	73.25"/27"	7.25"	17.25"	66"	1.5" NPT	178 lbs.

SuperStor Ultra Storage Tanks

- Low standby heat loss
- 10 year limited warranty on SSU storage tanks
- Robust 316L stainless steel tank eliminates the need for anode rods and resists corrosion



Commercial Indirect with 2 Heat Exchangers

SuperStor Ultra Commercial Indirect

- The commercial SuperStor Ultra contains two heat exchangers to accommodate high volume needs
- 7 year limited warranty

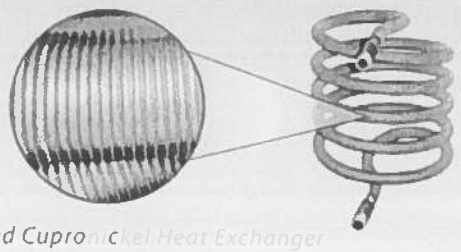
Indirect Commercial Model	180°F Boiler Water 1st Hr Rating		Height / Diameter	Pressure Drop (Ft)	Shipping Weight
	140°F	115°F			
SSU-45C	314 GPH	414 GPH	42"/23.25"	6.8	106 lbs.
SSU-60C	354 GPH	467 GPH	52.5"/23.25"	9.2	126 lbs.
SSU-80C	490 GPH	647 GPH	72"/23.25"	10.0	175 lbs.
SSU-119C	637 GPH	841 GPH	74"/27"	12.7	242 lbs.

Solar options available

SuperStor Ultra Double Wall Indirects

- Provides additional protection against cross contamination
- Limited lifetime warranty

Double Wall Indirect Model	180°F Boiler Water 1st Hr Rating		Height / Diameter	Pressure Drop (Ft)	Circulator GPM
	140°F	115°F			
SSU-45DW	70 GPH	108 GPH	42"/23.25"	8.2	6
SSU-60DW	90 GPH	144 GPH	52.5"/23.25"	12.8	7
SSU-80DW	138 GPH	215 GPH	72"/23.25"	13.6	10
SSU-119DW	210 GPH	326 GPH	74"/27"	15.9	12



Finned Cupronickel Heat Exchanger Provides Maximum Efficiency - 11 Fins per inch

Advanced Heating and Hot Water Systems

272 Duchaine Blvd · New Bedford, MA 02745 · 508-763-8071· Fax: 508-763-3769

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SuperStor Ultra Water Heaters

JOB NAME:

LOCATION:

ARCH./ENGR.:

WHOLESALER:

MECH. CONTRACTOR:

MODEL NUMBER: SSU-80

NOTES:

Stainless Steel Tank

- **Tank constructed of type 316L stainless steel for tolerance of high temperatures and superior corrosion resistance**
- **Insulated with approximately 2" of environmentally safe, CFC free, water-blown, extra thick foam insulation**
- **Allows less than ½ degree Fahrenheit per hour heat loss**
- **Outer shell constructed of silver finished durable plastic for rust and impact resistance**
- **NPT stainless steel inlet and outlet domestic connections for all models – side tappings**
- **Temperature and pressure relief valve port**
- **Stainless steel control well for accurate current temperature measurement inside vessel**
- **Internal bent hot water outlet tube extracts 5 – 7% more hot water off the top of the tank dome**

High Efficiency Heat Exchanger

- **High output finned 90/10 cupronickel heat exchanger provides corrosion resistance and maximum heat transfer of solar energy to domestic water**
- **Gasketless heat exchanger design**
- **1" NPT heat exchanger inlet/outlet size – all models**

Additional Features

- **Limited warranty – Lifetime residential and 7 years commercial coverage**
- **ETL Listed**
- **NSF Listed Components**
- **Lead Free Compliant, as required by the Safe Drinking Water Act, Section 1417**

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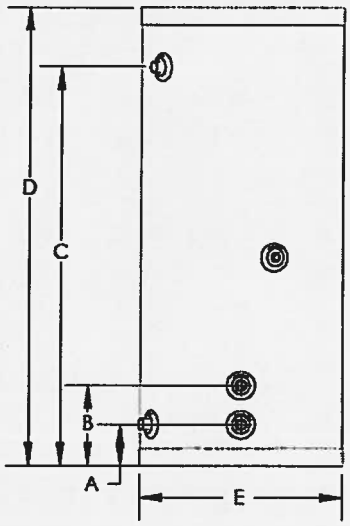
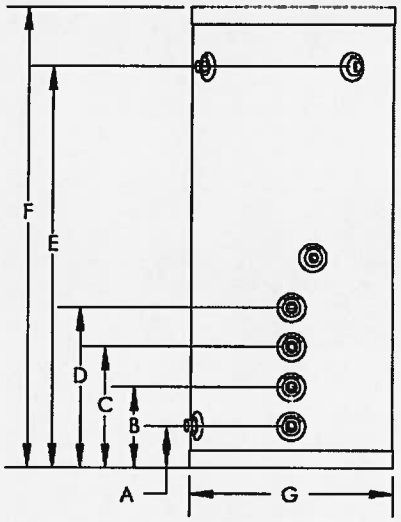


SUPERSTOR ULTRA

MODEL	A	B	C	D	E	CAPACITY U.S. GAL.	D CO	
SSU-20	5-1/4"	9-3/4"	22"	27"	19-1/4"	20 GAL.		
SSU-30			34"	39-1/2"		30 GAL.		
SSU-30LB			22"	28-1/2"	23-1/4"			
SSU-45			46"	52-1/2"	19-1/4"	45 GAL.		72 LBS
SSU-60					23-1/4"	60 GAL.	1" NPTM	109 LBS
SSU-80	6"	29"	64-3/4"	72"		80 GAL.	1-1/2" NPTM	143 LBS
SSU-119	7-1/4"	30-1/4"	66"	74"	27"	119 GAL.		212 LBS

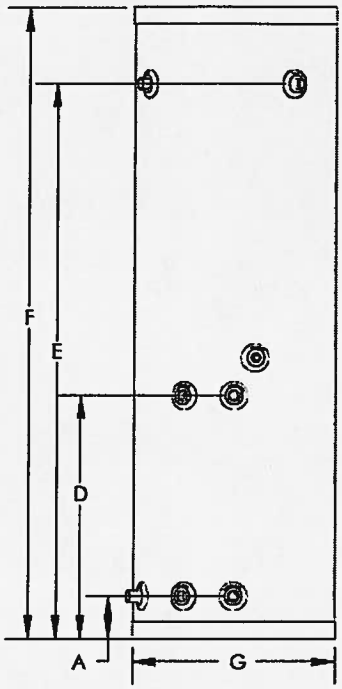


45/60 GAL.

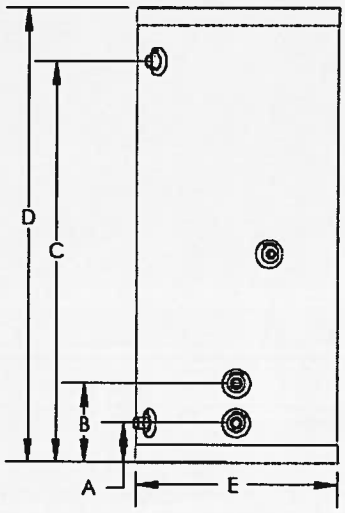
SUPERSTOR ULTRA COMMERCIAL

MODEL	A	B	C	D	E	F	G
SSU-45C	5-1/4"	9-3/4"	14"	18.75"	35"	42"	23-1/4"
SSU-60C					46"	52-1/2"	
SSU-80C	6"	N/A	N/A	29"	64-3/4"	72"	
SSU-119C	7-1/4"	N/A	N/A	30-1/4"	66"	74"	27"

MODEL	CAPACITY U.S. GAL.	DOMESTIC CONNECTION	SHIPPING WEIGHT
SSU-45C	45 GAL.	3/4" NPTM	106 LBS
SSU-60C	60 GAL.	1" NPTM	126 LBS
SSU-80C	80 GAL.	1-1/2" NPTM	175 LBS
SSU-119C	119 GAL.		242 LBS



80/119 GAL



SUPERSTOR ULTRA DOUBLE WALL

MODEL	A	B	C	D	E	CAPACITY U.S. GAL.	DOMESTIC CONNECTION	SHIPPING WEIGHT
SSU-45DW	5-1/4"	9-3/4"	46"	52-1/2"	19-1/4"	45	3/4" NPTM	81 LBS.
SSU-60DW					23-1/4"	60	1" NPTM	112 LBS.
SSU-80DW	6"	21"	64-3/4"	72"		80	1-1/2" NPTM	139 LBS.
SSU-119DW	7-1/4"	22-1/2"	66"	74"	27"	119		210 LBS.

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SUPERSTOR ULTRA SPECIFICATIONS

SUPERSTOR ULTRA

MODEL	HEAT EXCHANGER SURFACE/VOLUME	PRESSURE DROP (FT.)	TEST PRESSURE	WORKING PRESSURE	180° BOILER WATER FIRST HOUR RATINGS (GAL) *		200° BOILER WATER FIRST HOUR RATINGS (GAL) *		180° F BOILER BTU/SIZE	200° F BOILER BTU/SIZE	RECOMMENDED FLOW RATE
					140° F	115° F	140° F	115° F			
SSU-20	15 SQ. FT./1.5 GAL.	6.0	300 PSI	150 PSI	121	168	136	185	84,000	87,000	8
SSU-30					154	212	172	234	102,000	117,000	
SSU-30LB					169	234	189	257	114,000	131,000	
SSU-45	20 SQ. FT./2.0 GAL.	7.9			212	292	237	322	141,000	161,000	10
SSU-60					266	370	298	405	174,000	198,000	
SSU-80	34 SQ. FT./3.0 GAL.	9.1			330	440	370	503	212,000	241,000	12
SSU-119		11.3			423	564	474	645	269,000	301,000	14

*DOE TEST METHOD BASED ON 90° F TEMPERATURE RISE, 50° /140° W/BOILER WATER AT 180° F

NOTE: TANK RECOVERY FROM COLD START WILL BE BETWEEN 10-13 MINUTES WHEN SIZED WITH CORRECT FLOW RATE, BOILER SIZE AND PRESSURE DROP RATINGS FROM LIST IN ABOVE CHART.

SUPERSTOR ULTRA COMMERCIAL

MODEL	HEAT EXCHANGER SURFACE/VOLUME	PRESSURE DROP (FT.)	TEST PRESSURE	WORKING PRESSURE	180° BOILER WATER FIRST HOUR RATINGS (GAL) *		200° BOILER WATER FIRST HOUR RATINGS (GAL) *		180° F BOILER BTU/SIZE	200° F BOILER BTU/SIZE	RECOMMENDED FLOW RATE
					140° F	115° F	140° F	115° F			
SSU-45C	40 SQ. FT./4.0 GAL.	6.8	300 PSI	150 PSI	314	414	351	477	215,000	246,000	20
SSU-60C		9.2			354	467	396	539	245,000	270,000	22
SSU-80C	68 SQ. FT./6.0 GAL.	10.0			490	647	548	745	331,000	374,000	24
SSU-119C		12.7			637	841	713	970	425,000	490,000	28

*DOE TEST METHOD BASED ON 90° F TEMPERATURE RISE, 50° /140° W/BOILER WATER AT 180° F

NOTE: TANK RECOVERY FROM COLD START WILL BE BETWEEN 10-13 MINUTES WHEN SIZED WITH CORRECT FLOW RATE, BOILER SIZE AND PRESSURE DROP RATINGS FROM LIST IN ABOVE CHART.

SUPERSTOR ULTRA DOUBLEWALL

MODEL	HEAT EXCHANGER SURFACE/VOLUME	RECOMMENDED FLOW RATE (GPM)	PRESSURE DROP (FT.)	TEST PRESSURE	WORKING PRESSURE	180° BOILER WATER FIRST HOUR RATINGS (GAL) *		200° BOILER WATER FIRST HOUR RATINGS (GAL) *		180° F BOILER BTU/SIZE
						140° F	115° F	140° F	115° F	
SSU-45DW	15 SQ.FT/1.5 GAL	6	8.2	300 PSI	150 PSI	70	108	40	63	107,000
SSU-60DW		7	12.8			90	144	50	76	176,000
SSU-80DW		10	13.6			138	215	72	113	208,000
SSU-119DW		12	15.9			210	326	110	171	231,000

*DOE TEST METHOD BASED ON 90° F TEMPERATURE RISE, 50° /140° W/BOILER WATER AT 180° F

NOTE: TANK RECOVERY FROM COLD START WILL BE BETWEEN 10-13 MINUTES WHEN SIZED WITH CORRECT FLOW RATE, BOILER SIZE AND PRESSURE DROP RATINGS FROM LIST IN ABOVE CHART.

LP-83-BB
08/05/11

CONTINUOUS FLOW PERFORMANCE CALCULATION

FIRST HOUR RATING – (.75 X TANK CAPACITY) = CONTINUOUS FLOW

EXAMPLE: SSU-45C = 314 – (.75 X 45) = 280.25

TAG:DWH-1

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HTP

Advanced Hea
and Hot Water Sy

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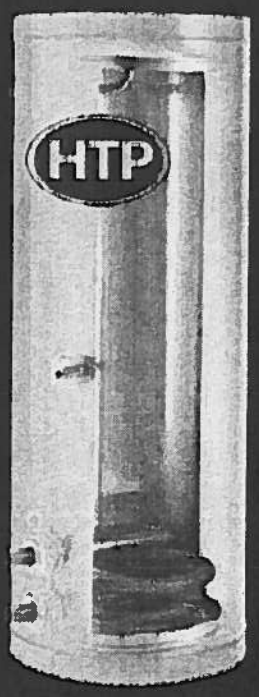
Residential Indirect

The SuperStor Ultra has been Recognized as the Market Leader for Over 25 Years.



HTP Stands By This Product

- 7 Model Sizes Available
- High Output Heat Exchanger
- May Be Eligible for Utility Rebates
- Made in America
- Industry Best: Limited Lifetime Warranty on SSU Indirect Tanks

We Take Pride In Our Products and Services!

HTP's Specially Designed Finned Cupronickel Heat Exchanger

This heat exchanger provides a higher BTU output per foot than any other heat exchanger in the market.

MODEL	130 DEG F BOILER WATER FIRST HOUR RATING		CIRCULATOR GPM	PRESSURE DROP (FEET)
	140 DEG F	115 DEG F		
SSU-20	121 GPH	168 GPH	8	6.0
SSU-30	154 GPH	212 GPH	8	6.0
SSU-30LB	169 GPH	234 GPH	8	6.0
SSU-45	212 GPH	292 GPH	10	7.9
SSU-60	266 GPH	370 GPH	10	7.9
SSU-80	330 GPH	440 GPH	12	9.1
SSU-119	423 GPH	564 GPH	14	11.3

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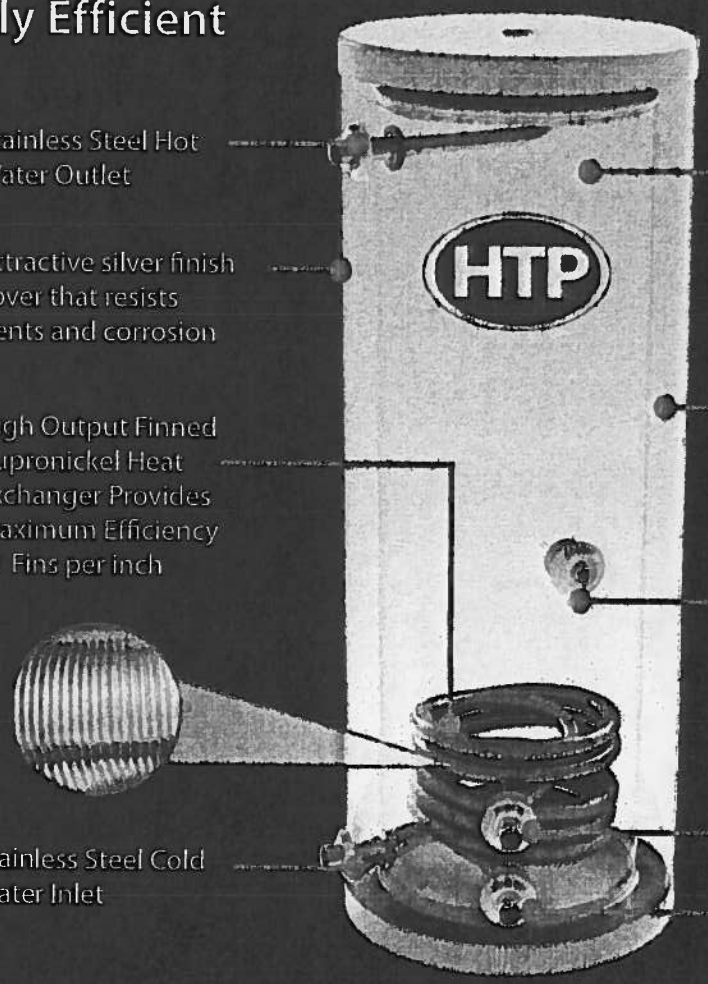
A Closer Look At HTP's SuperStor Ultra

Highly Efficient



Stainless Steel Hot Water Outlet

316L Stainless Steel Tank for High Temperatures and Superior Corrosion Resistance

Attractive silver finish cover that resists dents and corrosion

Environmentally Safe, CFC Free Water Blown, 2" Thick Foam Insulation allows less than 1/2 Degree F heat loss per hour

High Output Finned Cupronickel Heat Exchanger Provides Maximum Efficiency 11 Fins per inch

Immersion Type Stainless Steel Control Well

1" Boiler Supply Connection

Stainless Steel Cold Water Inlet

1" Boiler Return Connection

4 Versions Available:

Residential
Residential Double Wall
Commercial
Storage Tanks

4 Designs to Choose From:

Single Coil Indirect
Dual Coil for Solar Backup
Solar w/ Electric Backup
Storage Tank w/o Coil

TAG:DWH-1

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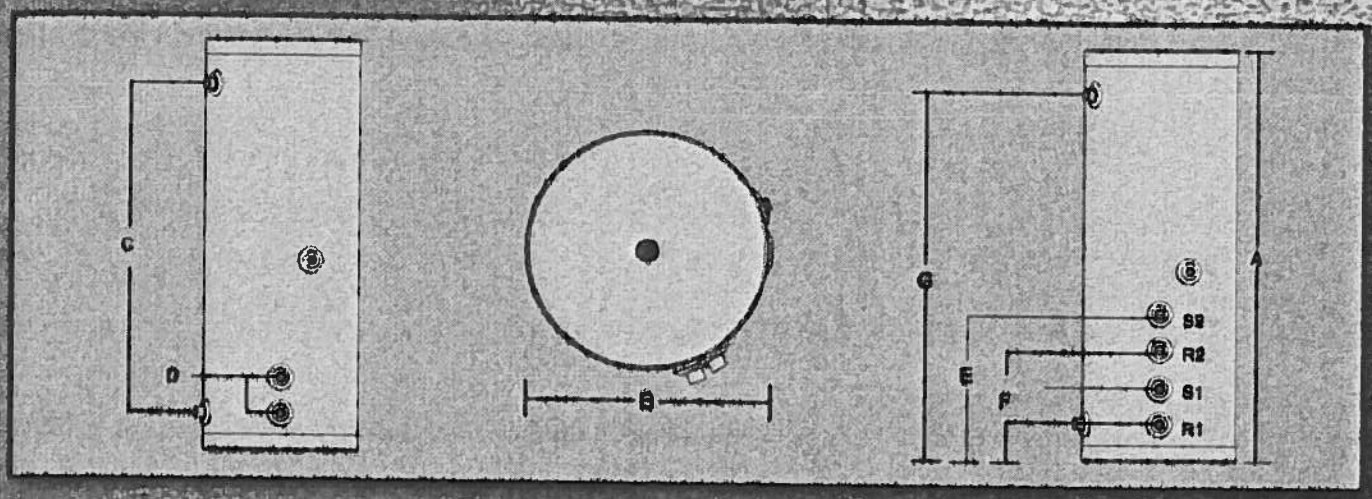
SuperStor Ultra
Dimensions and Specificat



Model	A Dimensions Ht	B Diameter	C Domestic Connections	D Boiler Connections	E Floor to Boiler Supply	F Floor to Boiler Return	G Floor to Domestic Out	Capacity	Heat Exchanger Surface	Shipping Weight
SSU-20	27"	19 1/4"	3/4"	1" NPT	S1- 9"	R1- 4 1/2"	22"	20	15 SQ FT	60 LBS
SSU-30	39 1/2"	19 1/4"	3/4"	1" NPT	S1- 9"	R1- 4 1/2"	34"	30	15 SQ FT	72 LBS
SSU-30LB	28 1/2"	23 1/4"	3/4"	1" NPT	S1- 9"	R1- 4 1/2"	22"	30	15 SQ FT	79 LBS
SSU-45**	52 1/2"	19 1/4"	3/4"	1" NPT	S1- 9"	R1- 4 1/2"	46"	45	20 SQ FT	88 LBS
SSU-60**	52 1/2"	23 1/4"	1"	1" NPT	S1- 9"	R1- 4 1/2"	46"	60	20 SQ FT	110 LBS
SSU-80**	72"	23 1/4"	1 1/2"	1" NPT	S1- 29"	R1- 6"	64 3/4"	80	34 SQ FT	141 LBS
SSU-119**	73 1/4"	27"	1 1/2"	1" NPT	S1- 30 1/4"	R1- 7 1/4"	66"	119	34 SQ FT	210 LBS
SSU-45C	42	23 1/4"	1 3/4"	1" NPT	S1- 6 1/2" / S2- 15 1/2"	R1- 2" / R2- 11"	32"	45	40 SQ FT	99 LBS
SSU-60C	52 1/2"	23 1/4"	1"	1" NPT	S1- 6 1/2" / S2- 19 1/2"	R1- 2" / R2- 11"	43 1/4"	60	40 SQ FT	115 LBS
SSU-80C	72"	23 1/4"	1 1/2"	1" NPT	S2- 25 5/8"	R2- 2 5/8"	61 3/8"	80	68 SQ FT	141 LBS
SSU-119C	74"	27"	1 1/2"	1" NPT	S2- 25 5/8"	R2- 2 5/8"	61 3/8"	119	68 SQ FT	210 LBS

*DOE test method based on 90°F. Temperature rise, 50°/140° w/boiler water at 180°/200°F
** Residential Double Wall Indirect available. Stainless steel tank w/ high efficiency cupronickel double wall heat exchanger.
NOTE: TANK RECOVERY FROM COLD START WILL BE BETWEEN 10-13 MINUTES WHEN SIZED WITH CORRECT FLOW RATE, BOILER SIZE, AND PRESSURE DROP RATINGS FROM INSTALLATION INSTRUCTIONS. THE MASS OF THE BOILER WILL AFFECT RECOVERY TIME, MORE BOILER MASS EQUALS LONGER RECOVERY TIME.

HTP

STANDARD FEATURES

- 316L Stainless Steel
- Finned 90/10 Cupronickel Heat Exchanger
- Aquastat Control

OPTIONAL EQUIPMENT

- Stainless Steel Aquastat Well
- Thermostatic Mixing Valve
- Bronze Pump