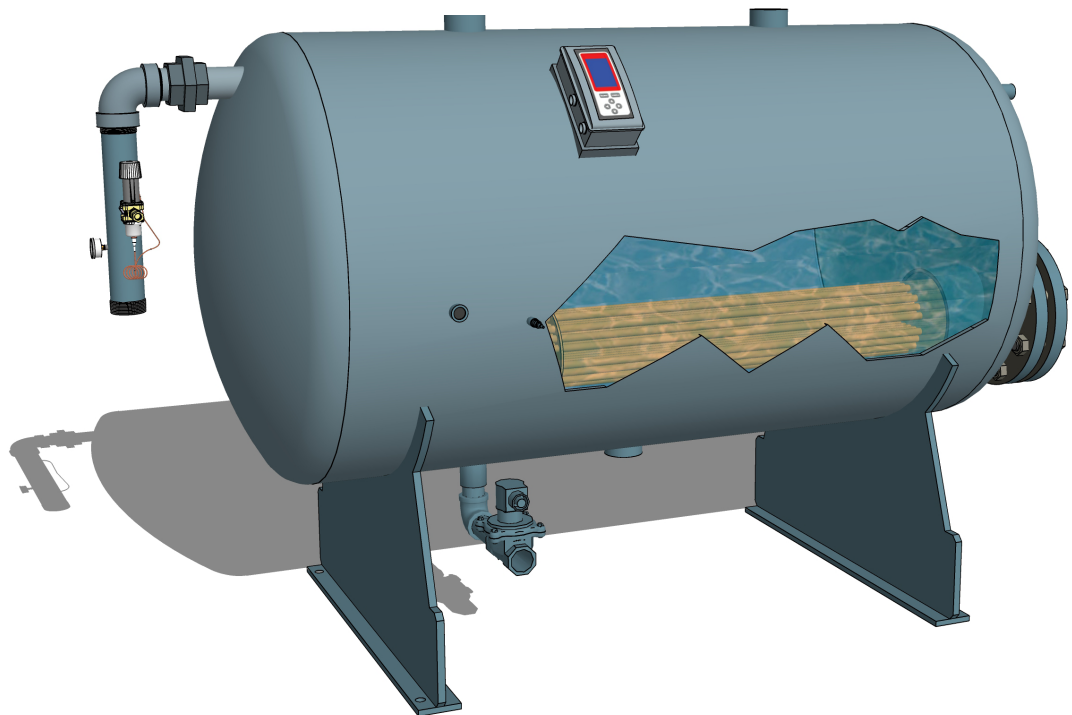
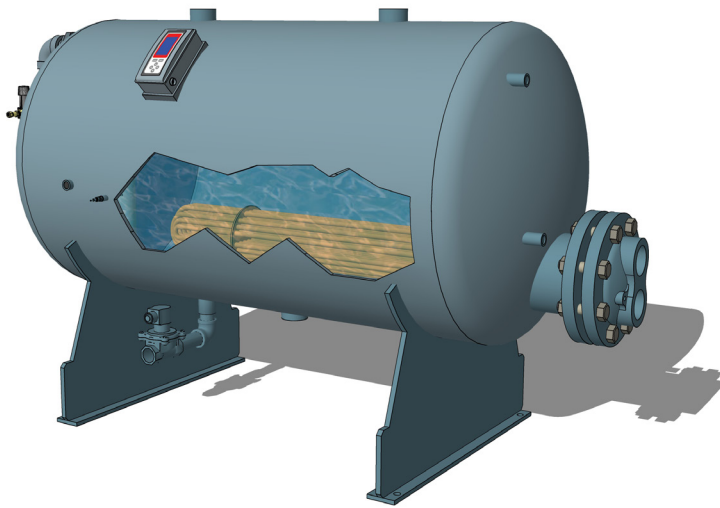


WHR Series



Waste Heat Recovery Package



CEMLINE CORPORATION

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www.cemline.com

Advantages of Cemline® Waste Heat Recovery (WHR)

Cemline® Waste Heat Recovery Package (WHR) is designed to recover waste heat from steam condensate before it is dumped down the drain. This is a perfect package for large municipal steam systems where the condensate is not returned to the boiler but sent down the drain. The waste condensate can be used to preheat domestic water or pre heat other applications. The advantage of the Cemline WHR over existing systems is existing systems are 1 pass with the condensate and domestic hot water passing by quickly. The Cemline WHR slows down the condensate recovery time

allowing for more heat recovery. Less additional cooling water is wasted tempering condensate before it goes down the drain. The domestic water can be heated to as high as 180°F while cooling the condensate to as low as 80°F. The waste BTU's are saved by preheating domestic water reducing additional BTU's to be inputted to heat the domestic water.

Package includes:

Steam condensate receiver, pre-heat heat exchanger (u-bend coil or brazed plate heat exchanger), electronic condensate control with dump valve,

float level switch, and over flow 2-way valve condensate cooler. Condensate is sent to the condensate receiver; the condensate can cool transferring heat to the pre-heat u-bend coil. Once the condensate temperature is below set point, condensate is drained from the bottom of the vessel. When condensate in the receiver becomes too high the 2 way control valve opens and condensate passes by the condensate cooler. The condensate will be cooled in the event it is greater than 140°F. The internal level controls maintain a level within the condensate vessel.

Standard Equipment

Features

TankA.S.M.E. (125 psi @ 400° F)

GussetsSteel Gussets for horizontal support

Heat ExchangerU-Bend heat exchanger coil or brazed plate heat exchanger. The U-bend is a double wall construction with 90:10 Copper Nickel Inner / 90:10 Copper Nickel Outer tubing. This tubing ensures a long life as it is resistant to condensate conditions. The brazed plate double wall heater exchangers are made from 316L plates. These compact heat exchangers are rated for 435 PSI @ 450°F suitable for condensate conditions. The heat exchanger pre-heats domestic water or other fluid while cooling condensate in the vessel.

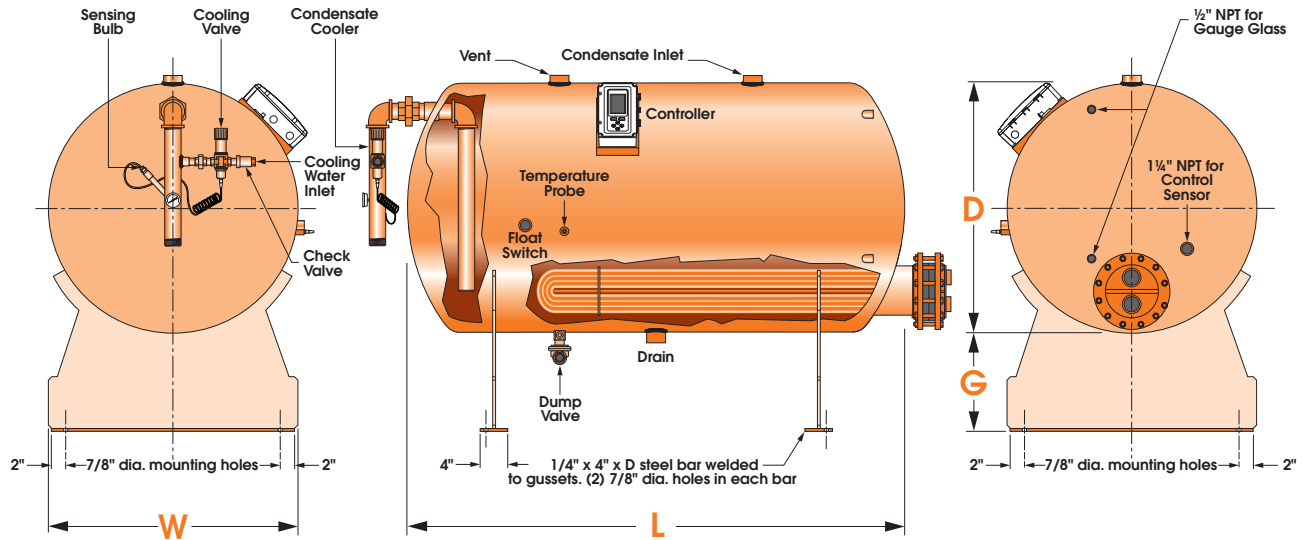
Electronic Temperature Controller.....The electronic temperature controller is designed to measure the temperature of the condensate in the tank. When the condensate temperature drops below set point the condensate temperature dump valve is opened to dump cooled condensate out of the vessel.

Float and Level SwitchThe float level switch prevents water from draining out below the level of the Heat Exchanger.

Condensate Cooler.....A condensate cooling leg is supplied to temper condensate from the tank if the level of the condensate was to become too high. This allows for condensate cooling by mixing cold water with higher temperature condensate to allow cooled water (below 140°F) to be dumped down the drain. The down pipe in the vessel allows for the drainage of the coolest water from the bottom of the vessel to be exhausted first.

Waste Heat Recovery (WHR) Horizontal Coil Dimensional Data

Waste Heat Recovery Package w/Coil



Dimensional Chart

Model	"D" Diameter	"L" Length	Condensate Inlet	Vent	Cooler Outlet	Cooling Water Inlet	Dump Valve Outlet	Drain	"G" Gusset Height	"W" Gusset Width
H60WHR	18"	61"	1-1/2"	2"	2"	1/2"	1"	1"	12 1/4"	20"
H120WHR	24"	60"	1-1/2"	2"	2"	1/2"	3/4"	1"	20 1/4"	26"
H200WHR	30"	72"	2"	2"	2"	1/2"	1"	2"	17 1/4"	32"
H300WHR	36"	72"	2"	2"	2"	1/2"	1"	2"	14 1/4"	38"
H500WHR	42"	90"	3"	3"	3"	3/4"	1-1/2"	2"	14 1/4"	44"

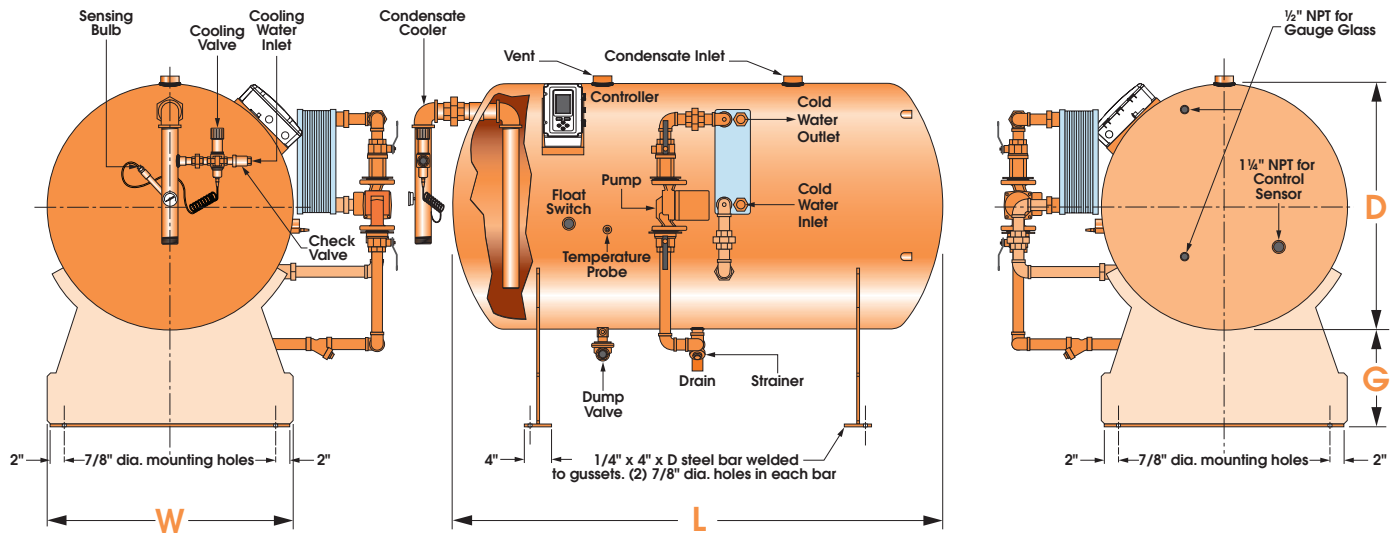
Sizing Data

Horizontal Coil MODEL	Condensate Temperature (°F)		Gallons Cooled per Hour	Pre-Heat Water		
	Condensate Temperature (°F)	Drain Temperature (°F)		Inlet Temp. (°F)	Outlet Temp. (°F)	Flow Rate (GPM)
448-DW	212	140	225	40	80	6.6
648-DW	212	140	500	40	80	14.7
848-DW	212	140	800	40	80	23.4
1048-DW	212	140	1550	40	80	45.4
660-DW	212	140	675	40	80	19.8
860-DW	212	140	1175	40	80	34.4
1060-DW	212	140	1875	40	80	54.9
1260-DW	212	140	2975	40	80	87.2

Waste Heat Recovery (WHR)

Horizontal Brazen Plate Dimensional Data

Waste Heat Recovery Package w/Brazen Plate



Dimensional Chart

Model	"D" Diameter	"L" Length	Condensate Inlet	Vent	Cooler Outlet	Cooling Water Inlet	Dump Valve Outlet	Drain	"G" Gusset Height	"W" Gusset Width
H60WHR	18"	61"	1-1/2"	2"	2"	1/2"	1"	1"	12 1/4"	20"
H120WHR	24"	60"	1-1/2"	2"	2"	1/2"	3/4"	1"	20 1/4"	26"
H200WHR	30"	72"	2"	2"	2"	1/2"	1"	2"	17 1/4"	32"
H300WHR	36"	72"	2"	2"	2"	1/2"	1"	2"	14 1/4"	38"
H500WHR	42"	90"	3"	3"	3"	3/4"	1-1/2"	2"	14 1/4"	44"

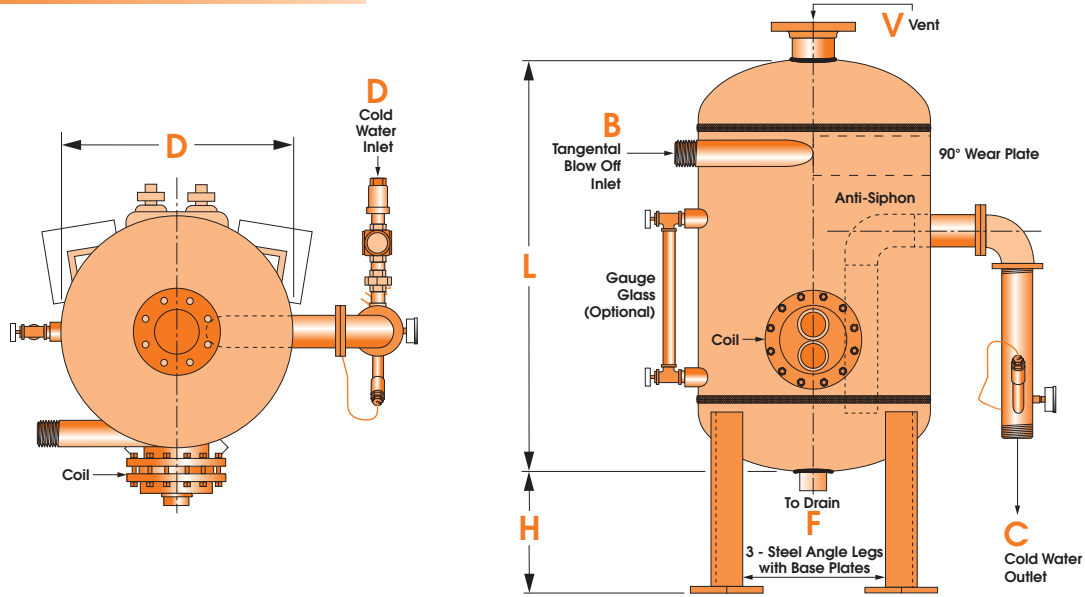
Sizing Data

Plate Heat Exchanger MODEL	Condensate Temperature (°F)			Pre-Heat Water		
	Condensate Temperature (°F)	Drain Temperature (°F)	Gallons Cooled per Hour	Inlet Temp. (°F)	Outlet Temp. (°F)	Flow Rate (GPM)
70-P-DW	212	140	120	40	80	3.5
125-P-DW	212	140	215	40	80	6.25
90-P-DW	212	140	156	40	80	4.6
165-P-DW	212	140	280	40	80	8.3
250-P-DW	212	140	426	40	80	12.5
110-P-DW	212	140	186	40	80	5.4
200-P-DW	212	140	340	40	80	10
335-P-DW	212	140	570	40	80	16.7
535-P-DW	212	140	912	40	80	26.7
135-P-DW	212	140	228	40	80	6.7
235-P-DW	212	140	400	40	80	11.7
465-P-DW	212	140	800	40	80	23.3
900-P-DW	212	140	1614	40	80	45
80-P-DW	212	140	144	40	80	4.1
160-P-DW	212	140	270	40	80	8
295-P-DW	212	140	500	40	80	14.7
700-P-DW	212	140	1190	40	80	35
365-P-DW	212	140	625	40	80	18.3
430-P-DW	212	140	738	40	80	21.7
750-P-DW	212	140	1278	40	80	37.5
1065-P-DW	212	140	1818	40	80	53.3

Waste Heat Recovery (WHR)

Vertical Coil Dimensional Data

Waste Heat Recovery w/Coil



Dimensional Chart

Model Number	Capacity Gallons	D	L	H	Vent V	Blow Off B	Outlet C	Drain F	Cold Water D
V30WHR	30	16"	36"	12"	2-1/2" NPT	3/4" NPT	2" NPT	1-1/2"	1/2" NPT
V50WHR	50	20"	42"	12"	2-1/2" NPT	3/4" NPT	2" NPT	1-1/2"	1/2" NPT
V87WHR	87	24"	48"	12"	3" NPT	1" NPT	2" NPT	1-1/2"	1/2" NPT
V140WHR	140	30"	48"	12"	3" NPT	1-1/4" NPT	2" NPT	1-1/2"	3/4" NPT
V215WHR	215	36"	54"	12"	5" FLG.	1-1/2" NPT	2-1/2" NPT	2" NPT	3/4" NPT
V320WHR	320	42"	60"	12"	5" FLG.	2" NPT	3" NPT	2" NPT	3/4" NPT
V455WHR	455	48"	66"	12"	6" FLG.	2-1/2" NPT	4" FLG.	2" NPT	1" NPT
V620WHR	620	54"	72"	12"	8" FLG.	3" NPT	4" FLG.	2" NPT	1" NPT
V815WHR	815	60"	78"	12"	10" FLG.	4" FLG.	4" FLG.	2" NPT	1" NPT

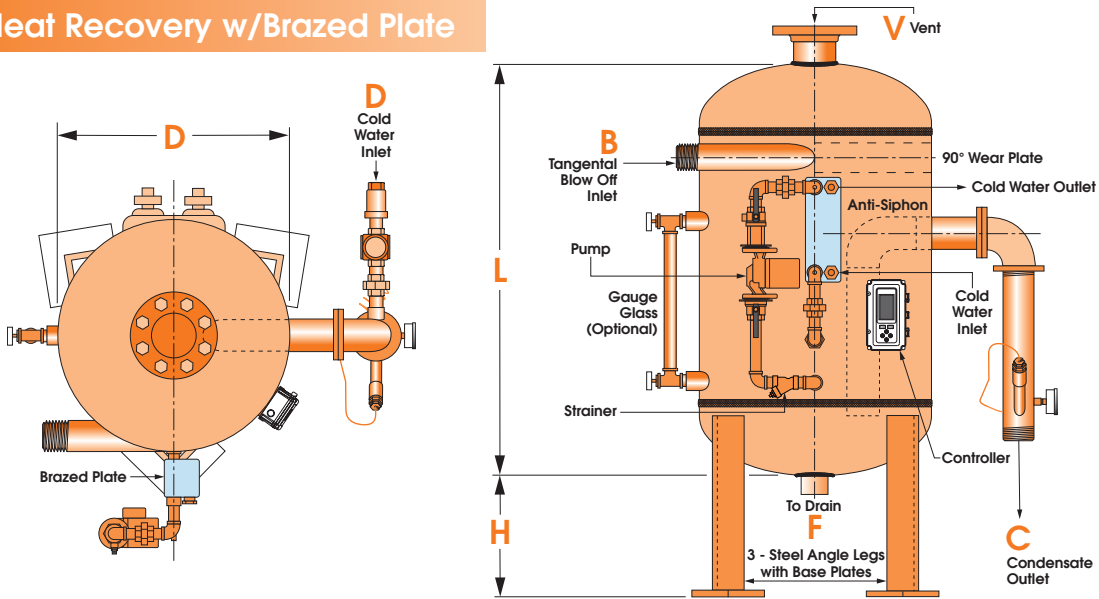
Sizing Data

Vertical Coil MODEL	Condensate Temperature (°F)			Pre-Heat Water		
	Condensate Temperature (°F)	Drain Temperature (°F)	Gallons Cooled per Hour	Inlet Temp. (°F)	Outlet Temp. (°F)	Flow Rate (GPM)
624-DW	212	140	120	40	80	3.5
824-DW	212	140	215	40	80	6.25
630-DW	212	140	156	40	80	4.6
830-DW	212	140	280	40	80	8.3
1030-DW	212	140	426	40	80	12.5
636-DW	212	140	186	40	80	5.4
836-DW	212	140	340	40	80	10
1036-DW	212	140	570	40	80	16.7
1236-DW	212	140	912	40	80	26.7
642-DW	212	140	228	40	80	6.7
842-DW	212	140	400	40	80	11.7
1042-DW	212	140	800	40	80	23.3
1242-DW	212	140	1614	40	80	45
448-DW	212	140	144	40	80	4.1
648-DW	212	140	270	40	80	8
848-DW	212	140	500	40	80	14.7
1048-DW	212	140	1190	40	80	35

Waste Heat Recovery (WHR)

Vertical Brazen Plate Dimensional Data

Waste Heat Recovery w/Brazen Plate



Dimensional Chart

Model Number	Capacity Gallons	D	L	H	Vent V	Blow Off B	Outlet C	Drain F	Cold Water D
V30WHR	30	16"	36"	12"	2-1/2" NPT	3/4" NPT	2" NPT	1-1/2"	1/2" NPT
V50WHR	50	20"	42"	12"	2-1/2" NPT	3/4" NPT	2" NPT	1-1/2"	1/2" NPT
V87WHR	87	24"	48"	12"	3" NPT	1" NPT	2" NPT	1-1/2"	1/2" NPT
V140WHR	140	30"	48"	12"	3" NPT	1-1/4" NPT	2" NPT	1-1/2"	3/4" NPT
V215WHR	215	36"	54"	12"	5" FLG.	1-1/2" NPT	2-1/2" NPT	2" NPT	3/4" NPT
V320WHR	320	42"	60"	12"	5" FLG.	2" NPT	3" NPT	2" NPT	3/4" NPT
V455WHR	455	48"	66"	12"	6" FLG.	2-1/2" NPT	4" FLG.	2" NPT	1" NPT
V620WHR	620	54"	72"	12"	8" FLG.	3" NPT	4" FLG.	2" NPT	1" NPT
V815WHR	815	60"	78"	12"	10" FLG.	4" FLG.	4" FLG.	2" NPT	1" NPT

Sizing Data

Plate Heat Exchanger MODEL	Condensate Temperature (°F)			Pre-Heat Water		
	Condensate Temperature (°F)	Drain Temperature (°F)	Gallons Cooled per Hour	Inlet Temp. (°F)	Outlet Temp. (°F)	Flow Rate (GPM)
70-P-DW	212	140	120	40	80	3.5
125-P-DW	212	140	215	40	80	6.25
90-P-DW	212	140	156	40	80	4.6
165-P-DW	212	140	280	40	80	8.3
250-P-DW	212	140	426	40	80	12.5
110-P-DW	212	140	186	40	80	5.4
200-P-DW	212	140	340	40	80	10
335-P-DW	212	140	570	40	80	16.7
535-P-DW	212	140	912	40	80	26.7
135-P-DW	212	140	228	40	80	6.7
235-P-DW	212	140	400	40	80	11.7
465-P-DW	212	140	800	40	80	23.3
900-P-DW	212	140	1614	40	80	45
80-P-DW	212	140	144	40	80	4.1
160-P-DW	212	140	270	40	80	8
295-P-DW	212	140	500	40	80	14.7
700-P-DW	212	140	1190	40	80	35
365-P-DW	212	140	625	40	80	18.3
430-P-DW	212	140	738	40	80	21.7
750-P-DW	212	140	1278	40	80	37.5
1065-P-DW	212	140	1818	40	80	53.3

Sample Specifications

For specifying Cemline Corporation Waste Heat Recovery (WHR) Series units, select model from charts and use specification below. Cemline has representation in most major cities or consult the factory.

Waste Heat Recovery (WHR)

Waste Heat Recovery shall be Cemline Series WHR; factory assembled and packaged. Waste Heat Recovery heater shall be constructed in accordance with A.S.M.E. Code for a working pressure of 125 psig. The Waste Heat Recovery shall be constructed with a horizontal or vertical steel tank. Waste Heat Recovery shall be mounted horizontally on a steel support gussets or vertically with angle legs with base plates.

Horizontal WHR shall have an opening for an inlet, vent, drain, outlet, overflow, and gauge glass. Horizontal WHR shall be supplied with an electronic temperature controller with field programmable set point and differential to drain cooled condensate through a 120 VAC solenoid valve. Horizontal WHR shall be supplied with a float switch to prevent unit from draining water below the heat exchanger. Horizontal WHR shall have an overflow outlet consisting of an internal elbow and pipe to drain water from the bottom of the tank in the event of a high-water condition. Internal pipe shall have a syphon breaker. Overflow outlet shall be supplied with an integral adjustable water-cooling control valve, check valve, and thermometer built into a factory fabricated drain leg which shall cool the condensate.

Horizontal WHR shall be provided with either a brazed plate heat exchanger or a submerged U-Bend 90:10 Copper-Nickel coil. Brazed plate heat exchanger unit shall be provided with intra tank piping, intra tank circulator, strainer, and electronic temperature controller. U-Bend heat exchanger Horizontal WHR shall be furnished with a submerged U-Bend 90:10 Copper-Nickel inner/outer double walled tubes, copper lined tube sheet, and stainless-steel coil head.

Vertical WHR shall have a tangential blow off inlet and a minimum 3/8" thick 90-degree wear plate, internal elbow and pipe to drain water from the bottom of the tank. Internal pipe shall have a syphon breaker. Vessel shall have openings for vent, outlet, gauge glass, and drain. Vertical WHR shall have an outlet with an integral adjustable water-cooling control valve, check valve, and thermometer built into a factory fabricated drain leg which shall cool the condensate.

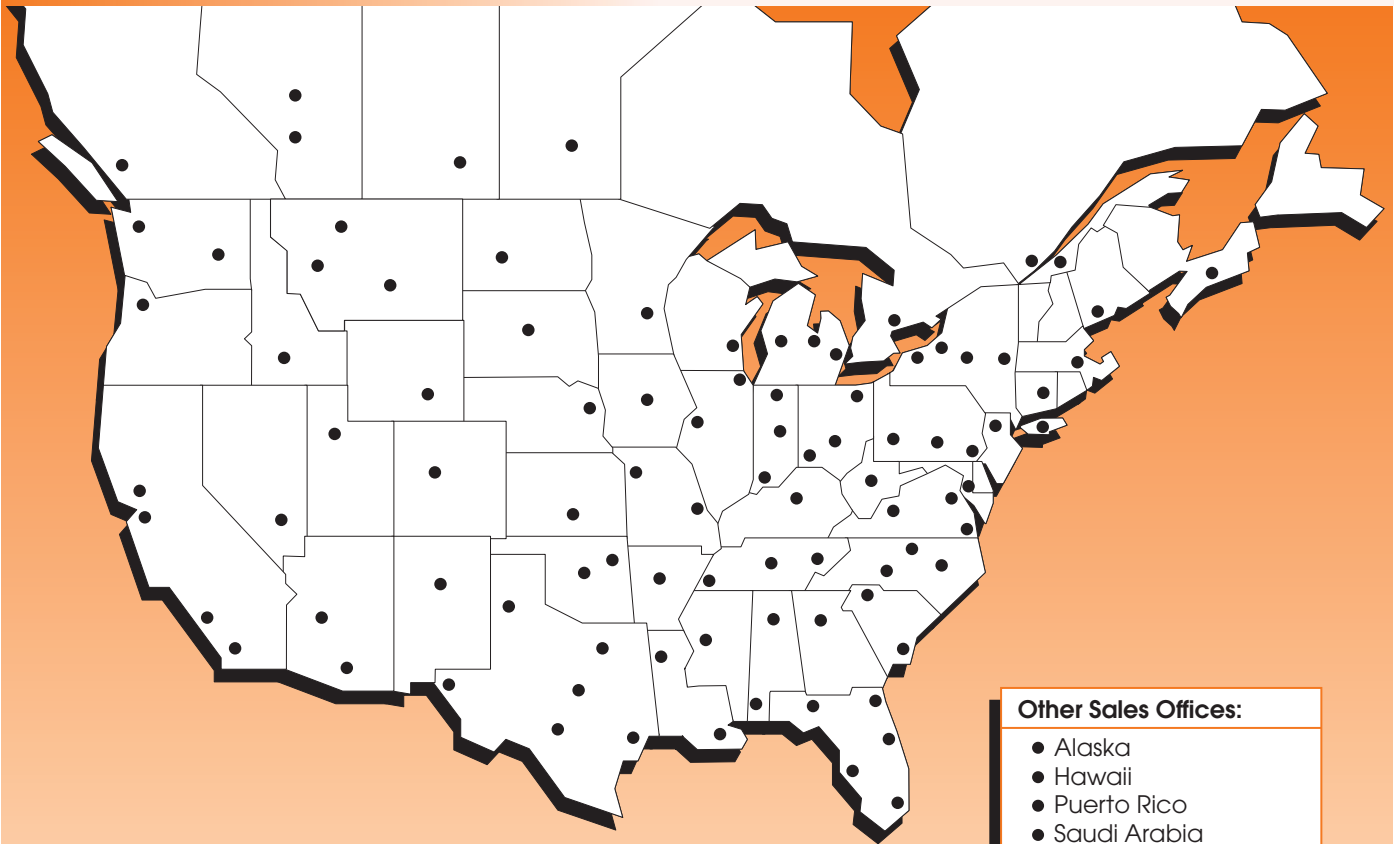
Vertical WHR shall be provided with either a brazed plate heat exchanger or a submerged U-Bend 90:10 Copper-Nickel coil. Brazed plate heat exchanger Vertical WHR shall be provided with intra tank piping, intra tank circulator, strainer, and electronic temperature controller. The electronic temperature controller with field programmable set point and differential to turn pump on/off to cool condensate as it run through the heat exchanger. U-Bend heat exchanger Vertical WHR shall be furnished with a submerged U-Bend 90:10 Copper-Nickel inner/outer double walled tubes, copper lined tube sheet, and stainless-steel coil head.

Vessels 42" in diameter and larger shall be furnished with a 12" x 16" manhole.

Manufacturer shall assume responsibility for correct sizing of components to assure performance designated in design criteria.

Heater shall be Cemline Corporation Model H or V _____ WHR _____.
Tank dimensions _____" diameter x _____" long.
Storage gallon capacity _____.
Heat exchanger to cool _____GPH from _____°F to _____°F
with _____ GPM of _____°F inlet - _____°F outlet Cold Water.

Sales Offices



Other Sales Offices:

- Alaska
- Hawaii
- Puerto Rico
- Saudi Arabia
- Taiwan
- U.A.E.

Available Cemline Brochures



- www.cemline.com
- Product Sizing Programs
 - Brochures
 - I.O.M. Manuals
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 - Plant Tour

- STONESTEEL®
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- Submerged Heating Coils
- Replacement Tube Bundles
- Steel Tanks
- Chilled Water Buffer Tanks
- System Efficiency Buffer Tanks
- Electric Boilers
- Stainless Compact Packaged Copper Coil Water Heaters - Semi-instantaneous, Instantaneous
- Unfired Steam Generators
- Condensed Catalog

Cemline is represented in all major cities.

Please contact your local representative or call Cemline Corporation.

