Steam is More Efficient than Most People Think

Welcome to maxi therm beyond steam™

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A DISABLED VETERAN OWNED COMPANY

Agenda

- Steam Basics
  - Piping
  - Thermodynamic
- Vertical Flooding Design
- Building Heat Application
- Domestic Hot Water Application
- Clean Steam Generation
- Being 6 times less corrosive
- 100% Steam Condensate Close Loop
- Conclusion - Q & A

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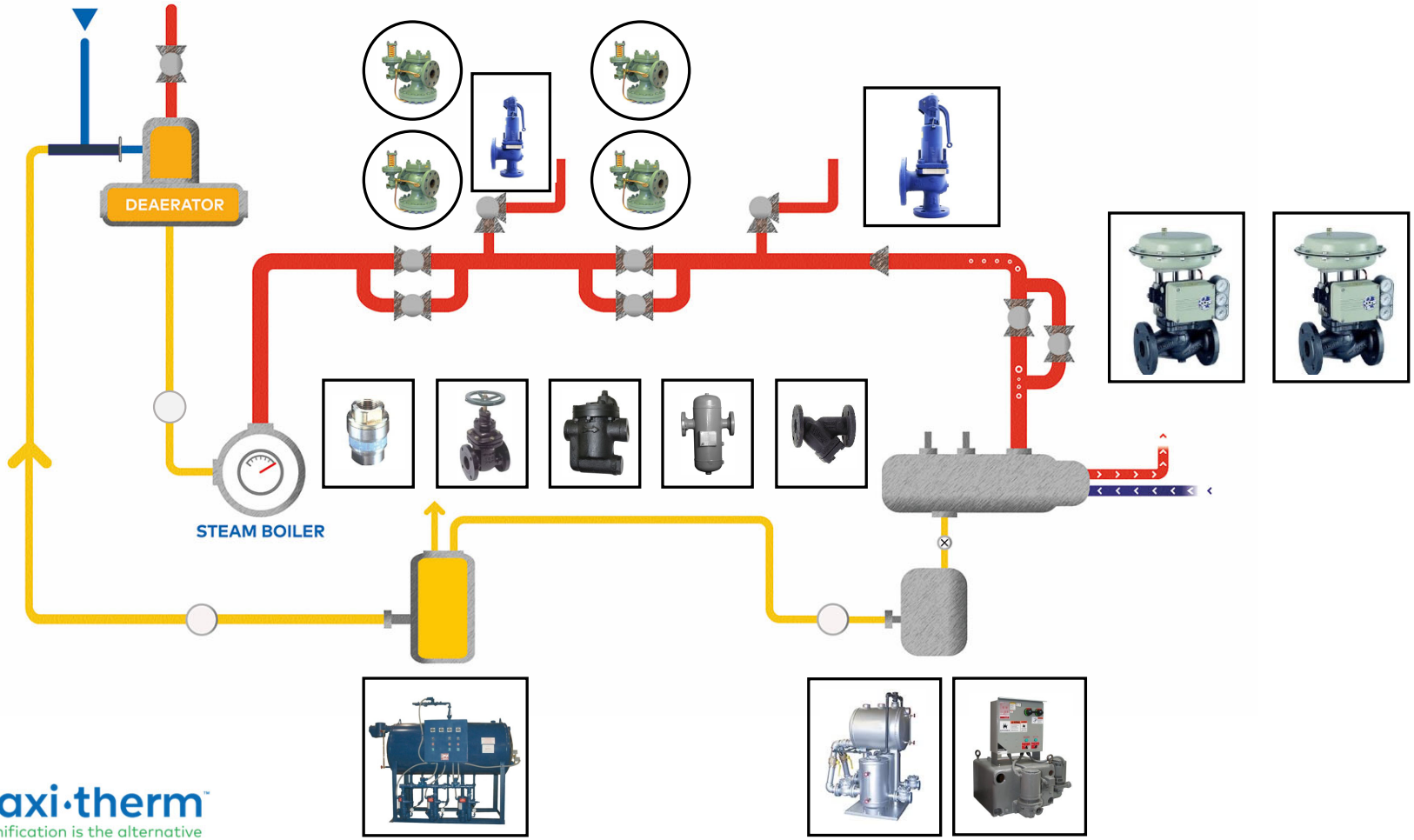
WESTERN WASHINGTON UNIVERSITY
1893
Duke
UNIVERSITY
VE RI TAS
HARVARD
UNIVERSITY
PENNSTATE
1855
THE UNIVERSITY OF
CHICAGO
COLORADO SCHOOL OF MINES
OFFICIAL SEAL
1874
TOWSON
UNIVERSITY
GRAND VALLEY
STATE UNIVERSITY
University of
Connecticut
MONTCLAIR STATE UNIVERSITY
University
of Colorado
Denver
Yale
UNIVERSITY
Penn
THE UNIVERSITY OF
TENNESSEE
KNOXVILLE
THE UNIVERSITY of
NEW MEXICO

conEdison, inc.


DUPONT
Schreiber
pepsi
MillerCoors
SINCE 1889
B&G
MERCK
H-E-B
Coca-Cola
MULLINS
EST. Cheese 1970
MOSINEE WISCONSIN

CURRENT STEAM TECHNOLOGY



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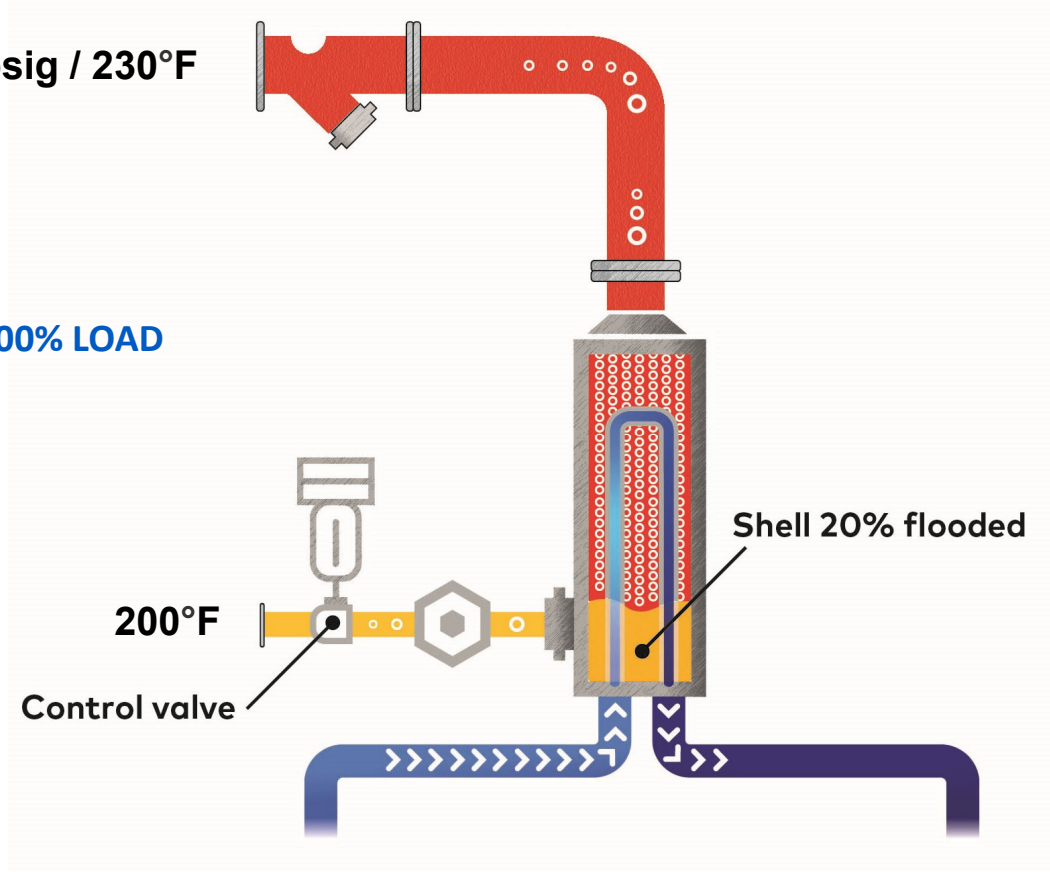
Properties of Saturated Steam

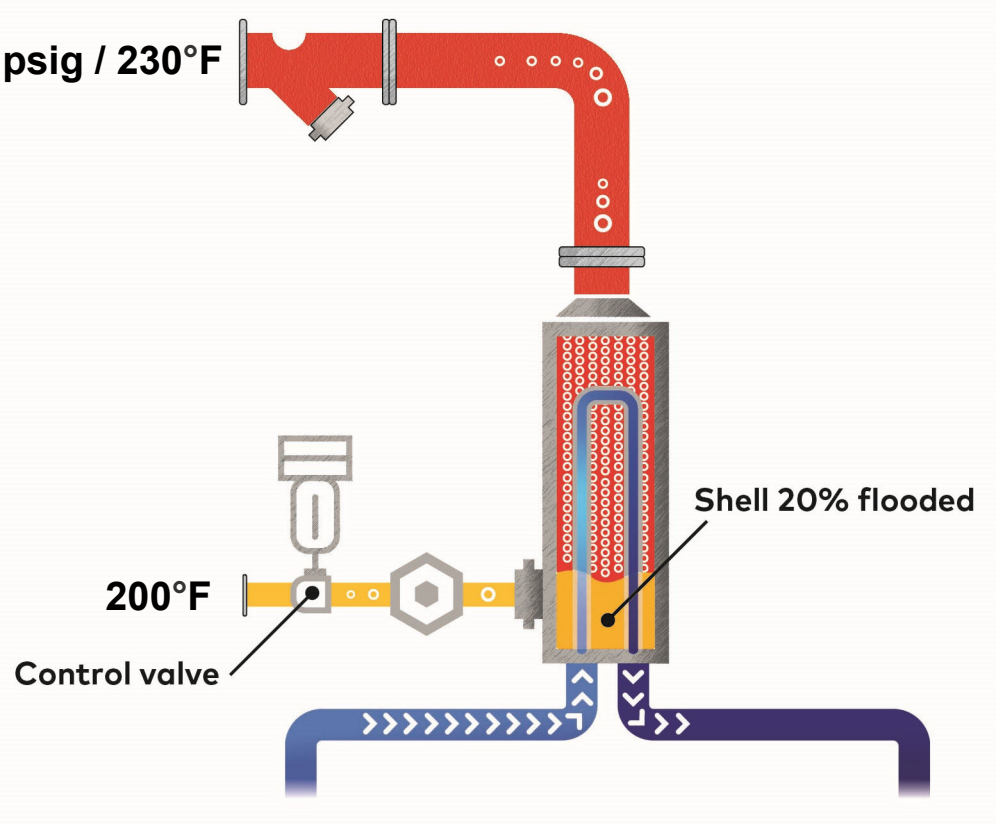
Pressure	Temp. (°F)	Heat (BTU/lb)			Volume (ft^3/lb)	
		Sensible	Latent	Total	Condensate	Steam
(PSIG)						
0	212	180	970	1151	0.01672	26.80
1	215	184	968	1152	0.01674	25.21
2	219	187	966	1153	0.01676	23.79
3	222	190	964	1154	0.01679	22.53
4	224	193	962	1155	0.01681	21.40
5	227	195	961	1156	0.01683	20.38
6	230	198	959	1157	0.01685	19.46
7	232	201	957	1158	0.01687	18.62
8	235	203	956	1159	0.01689	17.85
9	237	206	954	1160	0.01690	17.14
10	239	208	953	1160	0.01692	16.49
12	244	212	950	1162	0.01696	15.33
14	248	216	947	1163	0.01699	14.33
16	252	220	944	1165	0.01702	13.45
100	338	309	881	1190	0.01785	3.891
105	341	312	878	1190	0.01789	3.736
110	344	316	876	1191	0.01792	3.594
115	347	319	873	1192	0.01796	3.462
120	350	322	871	1192	0.01799	3.340
125	353	325	868	1193	0.01803	3.226

4,000,000 BTU/H process



4,000,000 BTU/H process

100% LOAD



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Heat Exchanger Specification Sheet

1	Company: Maxitherm									
2	Location:									
3	Service of Unit: Water Heater			Our Reference:96643						
4	Item No.:			Your Reference:						
5	Date:	Rev No.:	Job No.:							
6	Size	23 /	48 in	Type	BEU	Ver	Connected in	1	parallel	1 series
7	Surf/unit(eff.)	629.1	ft2	Shells/unit	1		Surf/shell (eff.)	629.1		ft2
8	**PERFORMANCE OF ONE UNIT**									
9	Fluid allocation			**Shell Side**			**Tube Side**			
10	Fluid name			STEAM			WATER			
11	Fluid quantity, Total		lb/h	32270			1099560			
12	Vapor (In/Out)		lb/h	32270	0		0	0		
13	Liquid		lb/h	0	32270		1099560	1099560		
14	Noncondensable		lb/h	0			0			
15										
16	Temperature (In/Out)		F	353.29	199.87		150	180		
17	Dew / Bubble point		F	353.29	353.29					
18	Density (Vap / Liq)		lb/ft3	0.301 /	/ 60.184		/ 61.339	/ 60.677		
19	Viscosity		cp	0.0153 /	/ 0.3005		/ 0.4378	/ 0.3443		
20	Molecular wt, Vap			18.01						
21	Molecular wt, NC									
22	Specific heat		BTU/(lb*F)	0.6277 /	/ 1.0012		/ 0.9997	/ 1.0003		
23	Thermal conductivity		BTU/(ft*h*F)	0.019 /	/ 0.389		/ 0.375	/ 0.384		
24	Latent heat		BTU/lb	866.9	867.3					
25	Pressure (abs)		psi	139.7	138.86		90	84.81		
26	Velocity		ft/s	143.93			10.38			
27	Pressure drop, allow./calc.		psi	1.5	0.84		7.25	5.19		
28	Fouling resist. (min)		ft2*h*F/BTU	0.0001			0.0001	0.0001	Ao based	
29	Heat exchanged	3298512	BTU/h				MTD corrected		161.5	F
30	Transfer rate, Service	324.67		Dirty	399.54		Clean	438.89		BTU/(h*ft2*F)

4,000,000 BTU/H process

Conventional

4,000,000 BTU/h / 959 BTU/lb = 4171 lbs/h

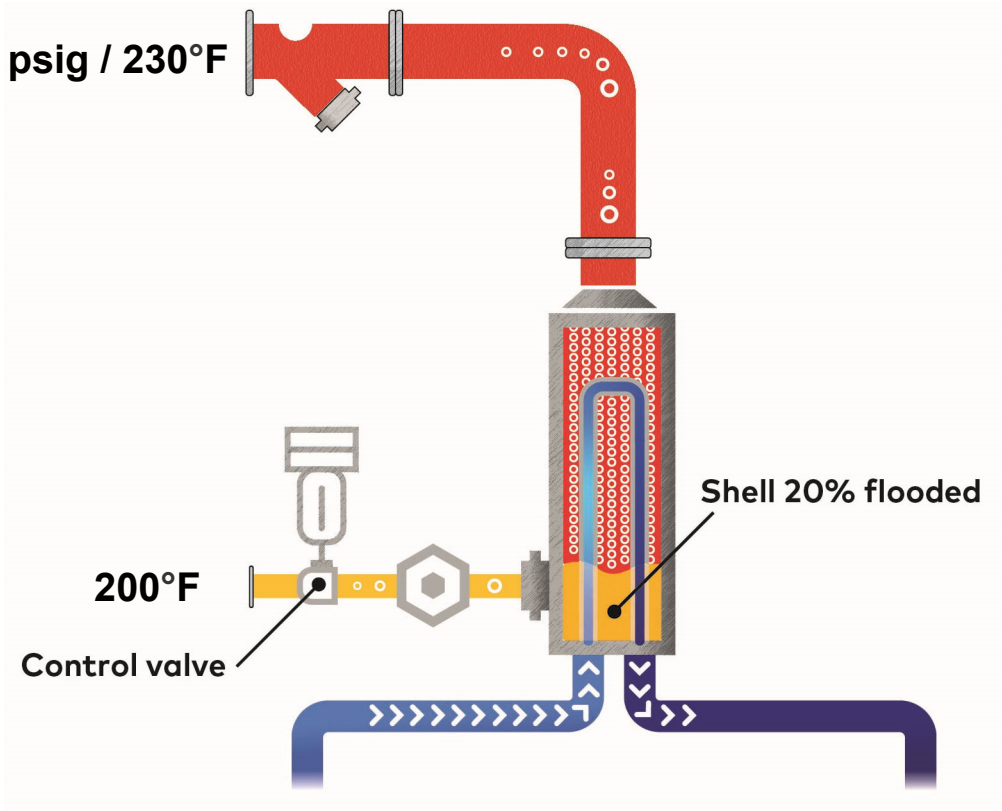
Flooded

959 BTU/lb (latent) +

30 BTU/lb (sensible) = 989 BTU/lb total heat

4,000,000 BTU/h / 989 BTU/lb = 4044 lbs/h

3.14% Savings



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4,000,000 BTU/H process

Conventional @ 6 psig

4,000,000 BTU/h / 959 BTU/lb = 4171 lbs/h

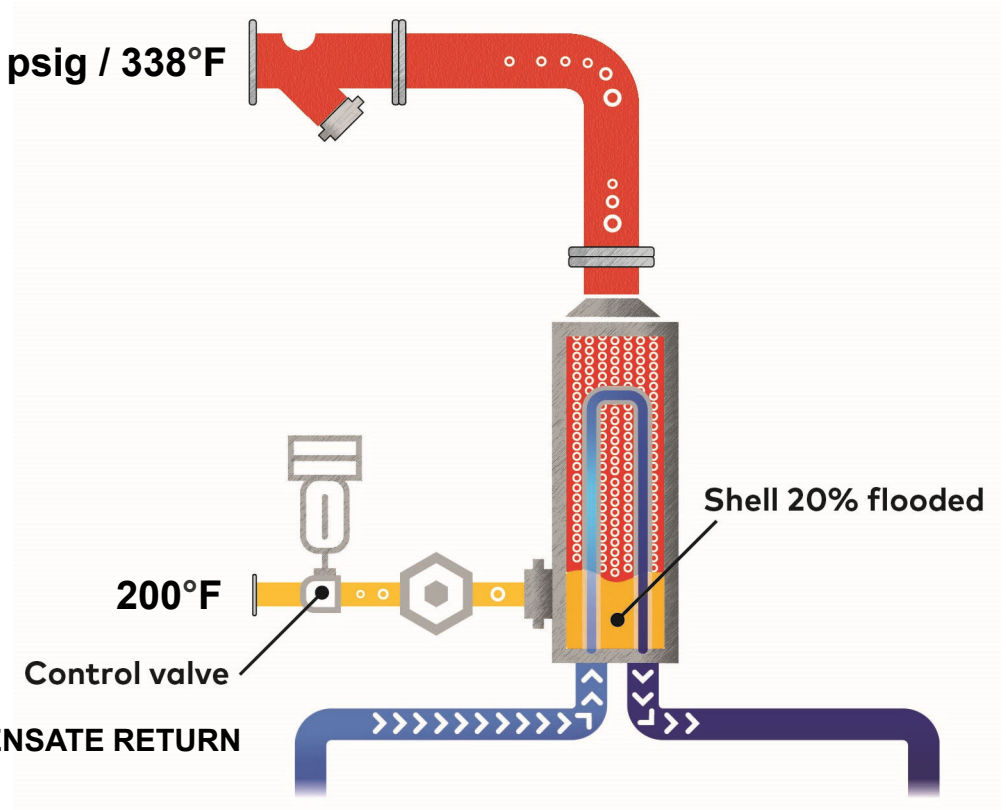
Flooded @ 100 psig

881 BTU/lb (latent) +

138 BTU/lb (sensible) = 1019 BTU/lb total heat

4,000,000 BTU/h / 1019 BTU/lb = 3925 lbs/h

6.26% Savings



0% FLASH STEAM IN CONDENSATE RETURN

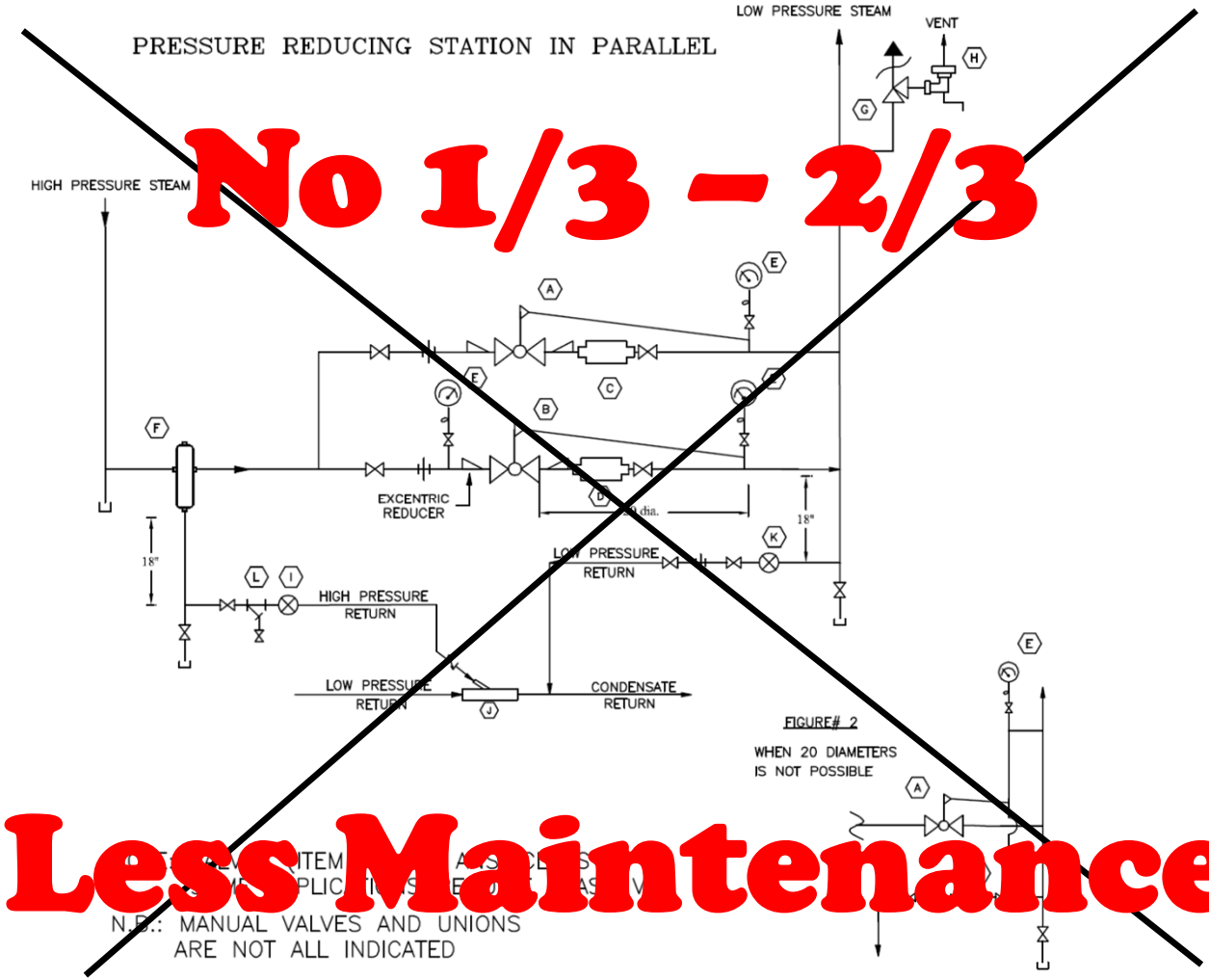
EVALUATION: COST COMPARAISON WITH EXCHANGER ON FULL LOAD

	CONVENTIONAL	MAXI-THERM	M = Million
Pressure	**15**	**100**	PSIG
Energy Transferred	6 877 248	6 877 248	Btu/h
Steam Flow	7274	6881	lbs/h
Flash Rate	4,0	0,0	%
Atmospheric Flash Loss	288,1	0,0	lbs/h
Energy to Heat Condensate	0,880	0,950	MBtu/h
Energy to Heat Make Up	0,077	0,000	MBtu/h
Energy to Vaporize	6,407	6,061	MBtu/h
Total:	7,365	7,010	**MBtu/h**

Difference = Savings	0,35	**MBtu/h**
	4,8	**%**
Boiler Efficiency	0,80	
Total Savings	0,44	**MBtu/h**
	5,5	**%**

Dollar Savings at		
$10,00	***per 1000 lbs of steam***	
2 000	***hrs / year***	***$8 864***
3 000	***hrs / year***	***$13 296***

Carbon Footprint Reduction (using natural gas):		
0,05843	*ton of CO_2 per Million BTU*	
2 000	*hrs / year*	*51,8* tons of CO_2 per year
3 000	*hrs / year*	*77,7* tons of CO_2 per year



No 1/3 – 2/3

Less Maintenance

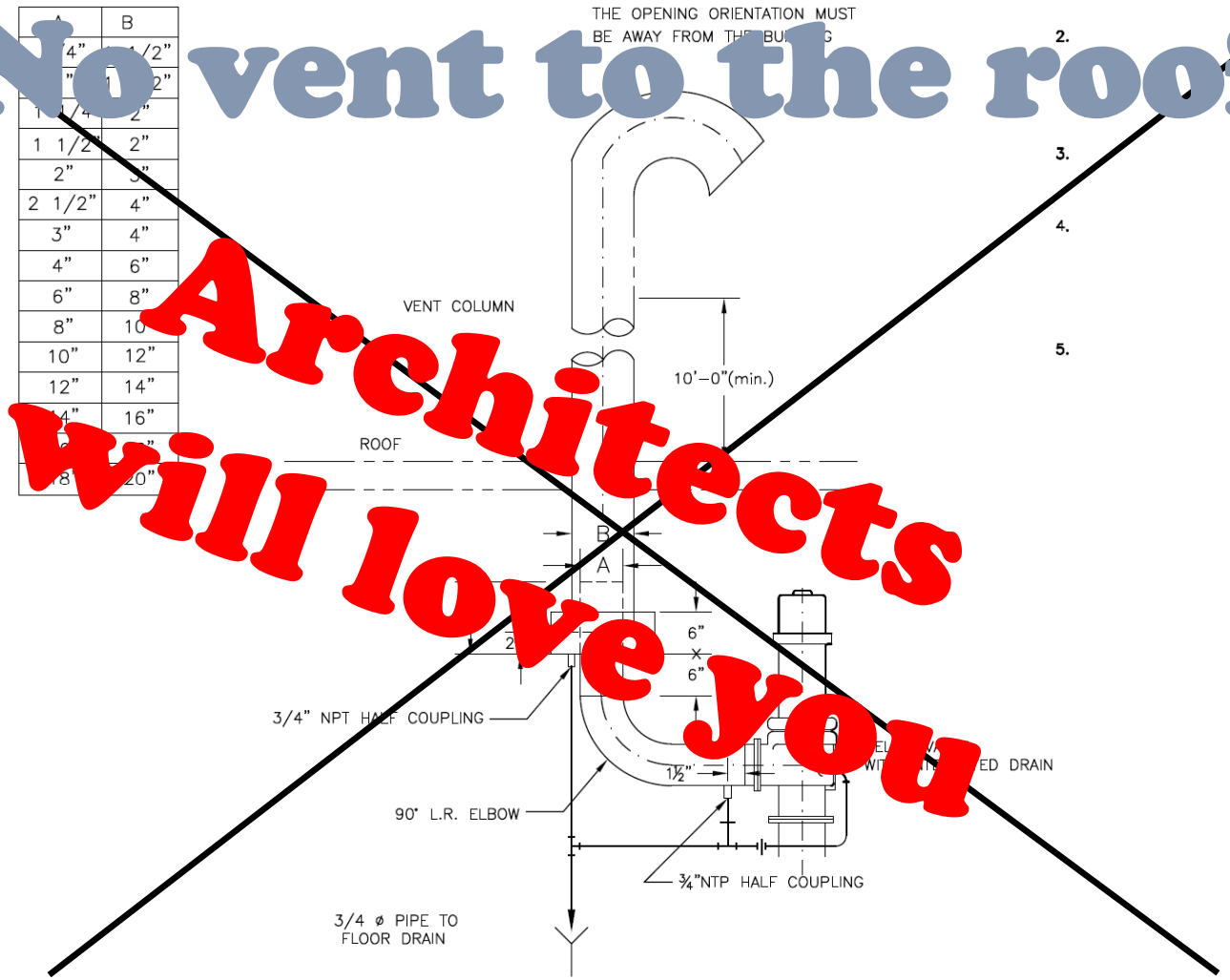

HI PRESS STEAM


MED PRESS STEAM

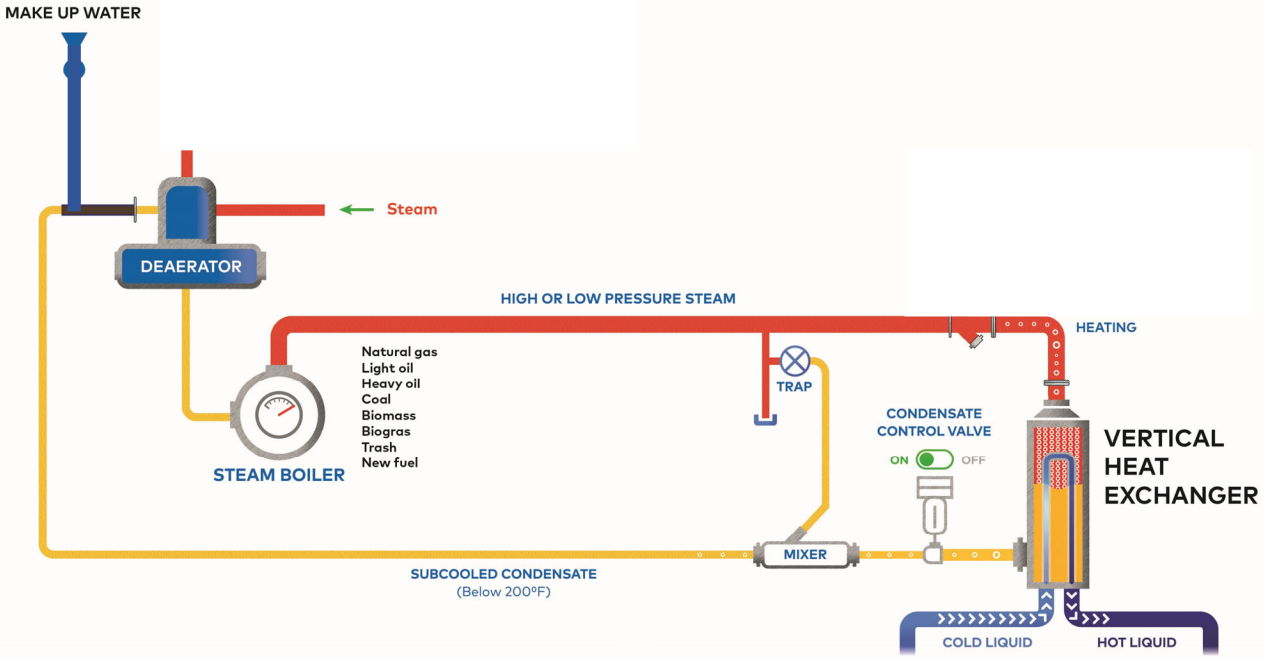
No vent to the roof

Architects will love you

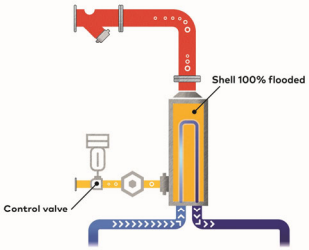
A	B
1 1/4”	1 1/2”
1 1/2”	2”
2”	3”
2 1/2”	4”
3”	4”
4”	6”
6”	8”
8”	10”
10”	12”
12”	14”
14”	16”
16”	18”
18”	20”



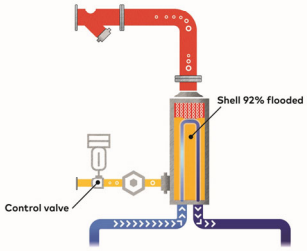
STEAM REINVENTED



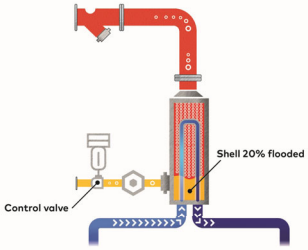
180 - 180° F with 100 psi steam – Zero Load



178 - 180° F with 100 psi steam – 10%Load



160 - 180° F with 100 psi steam – Full Load



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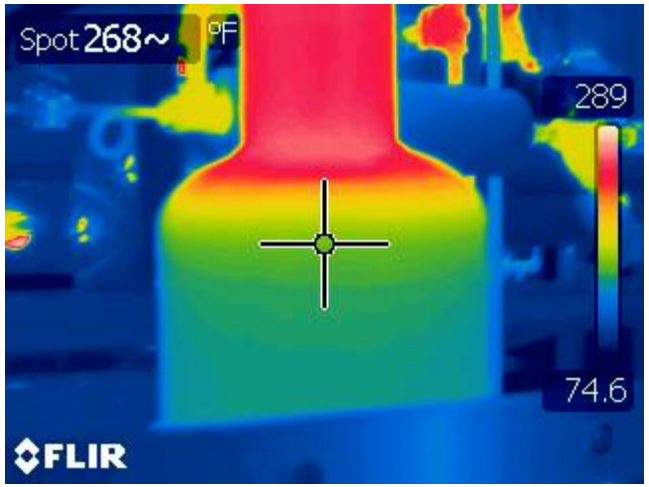
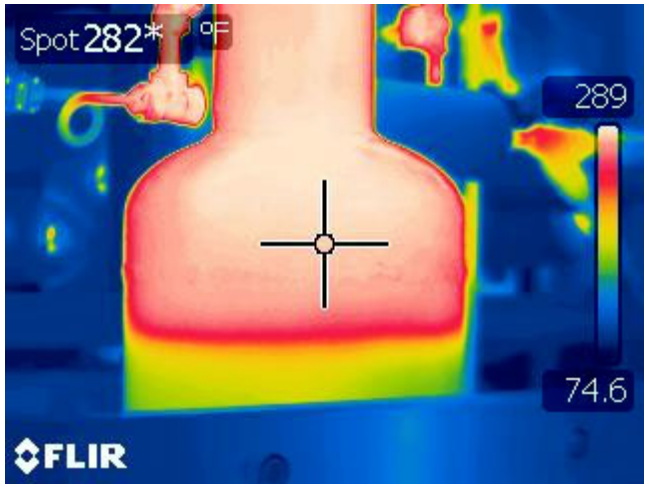
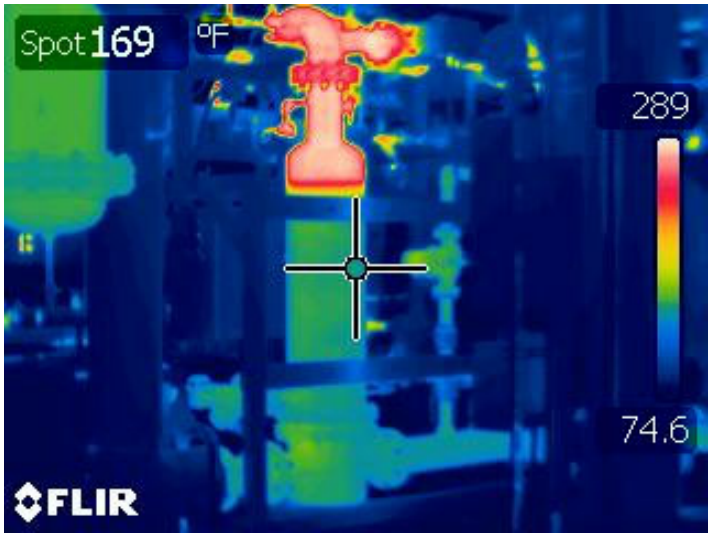
STEAM REINVENTED







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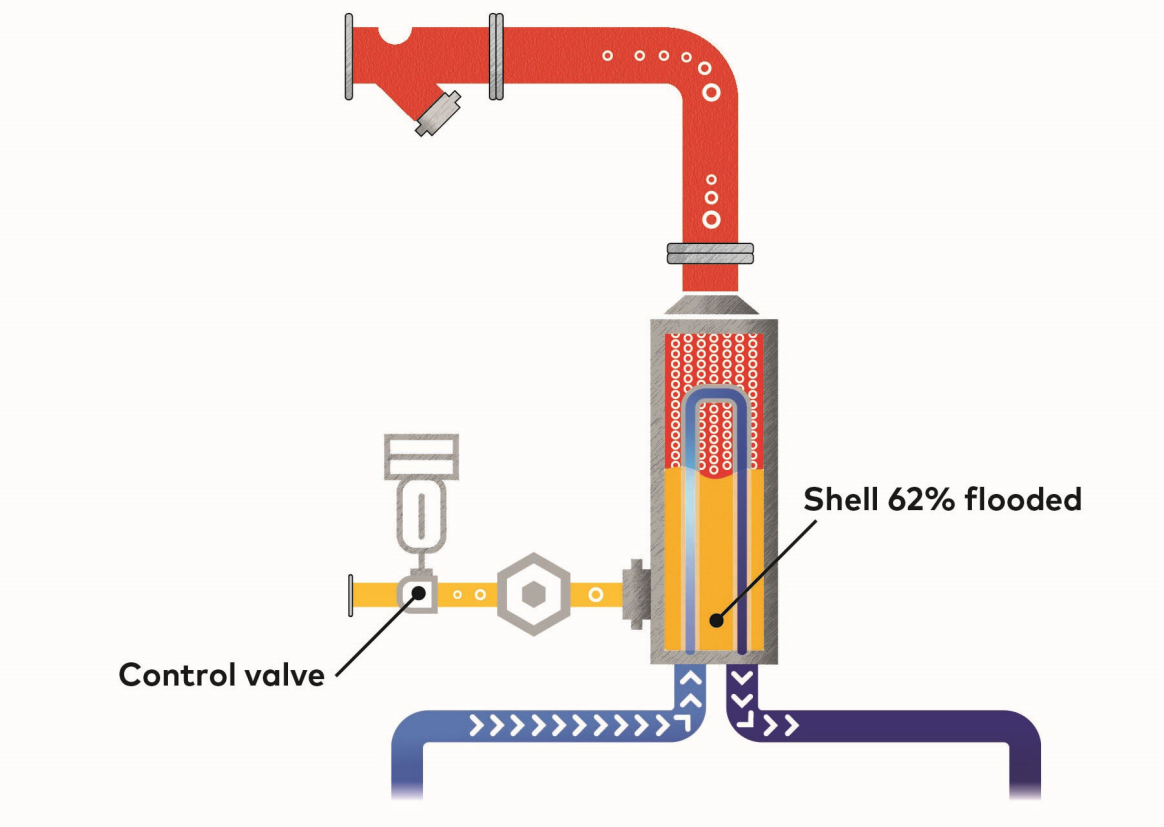
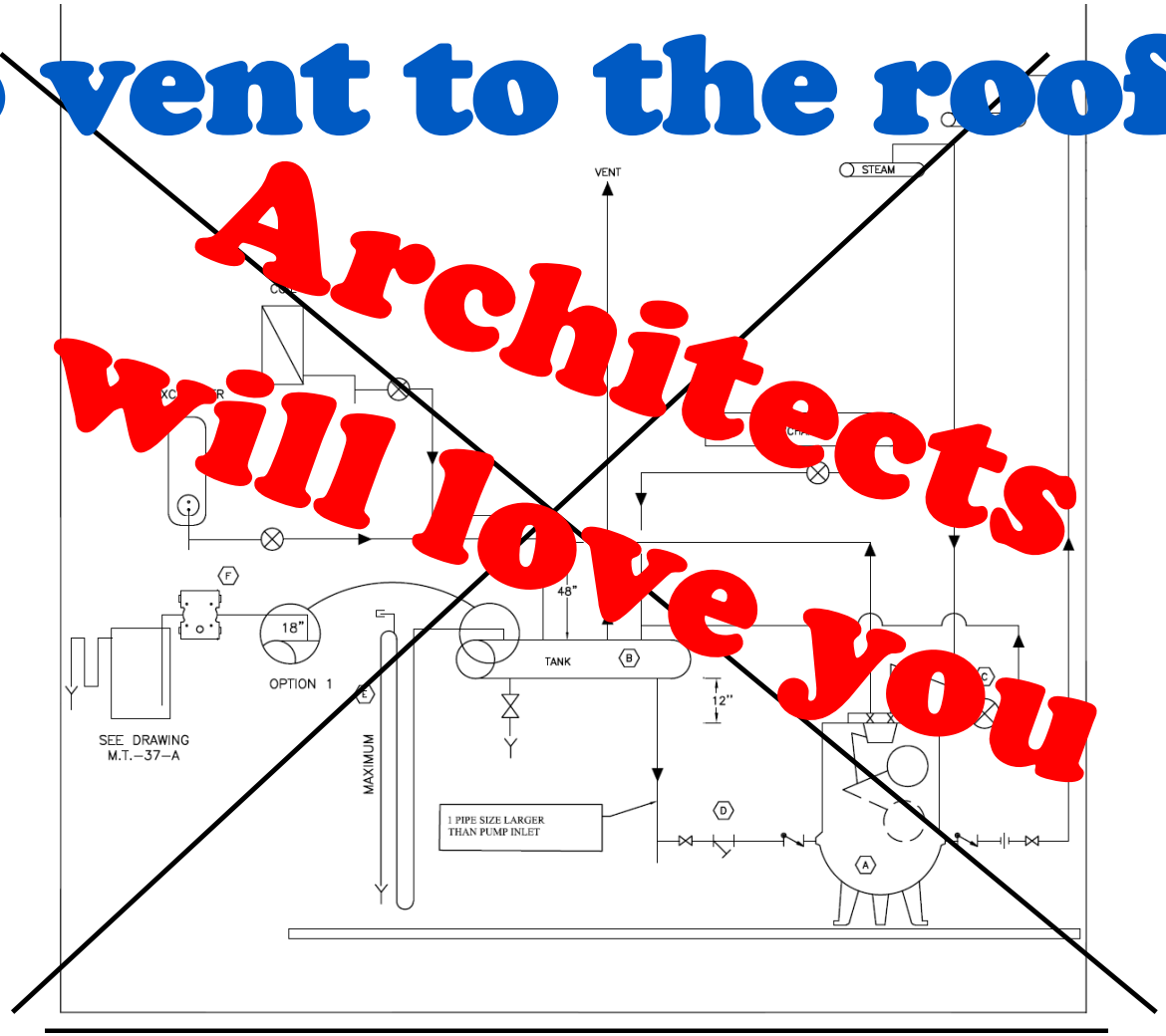
I have 2 questions



No vent to the roof



Architects will love you

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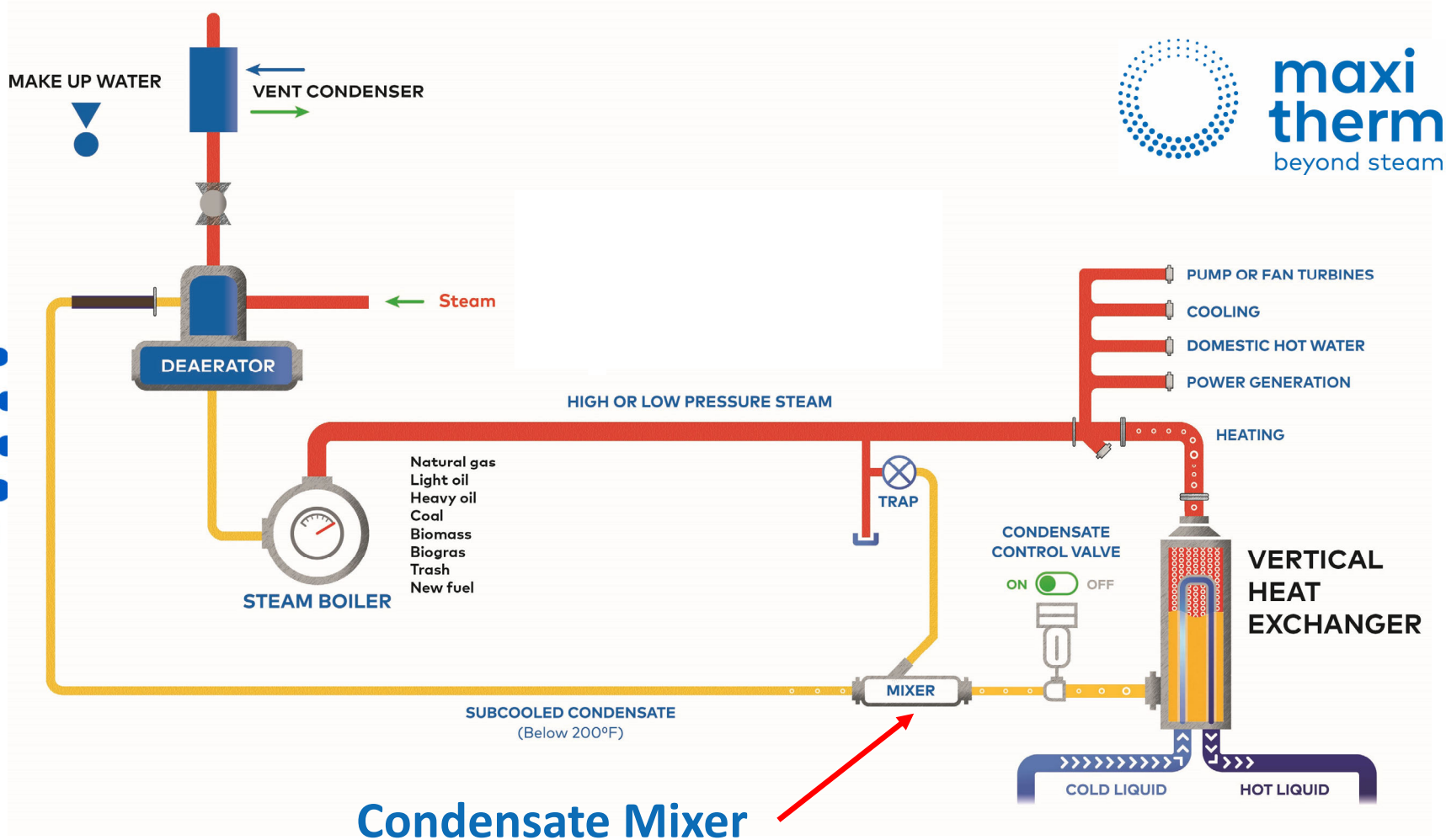

Condensate Mixer

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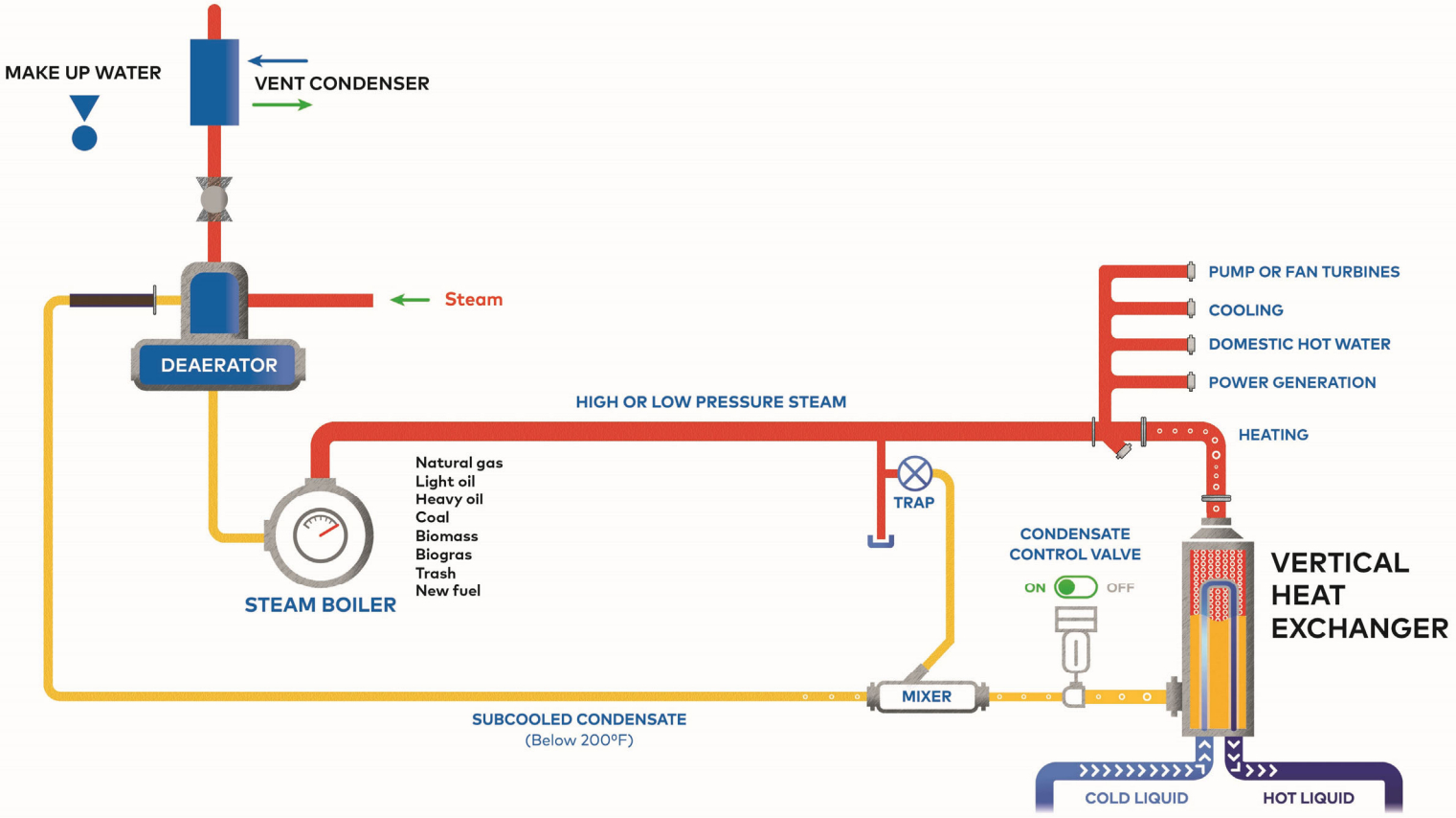

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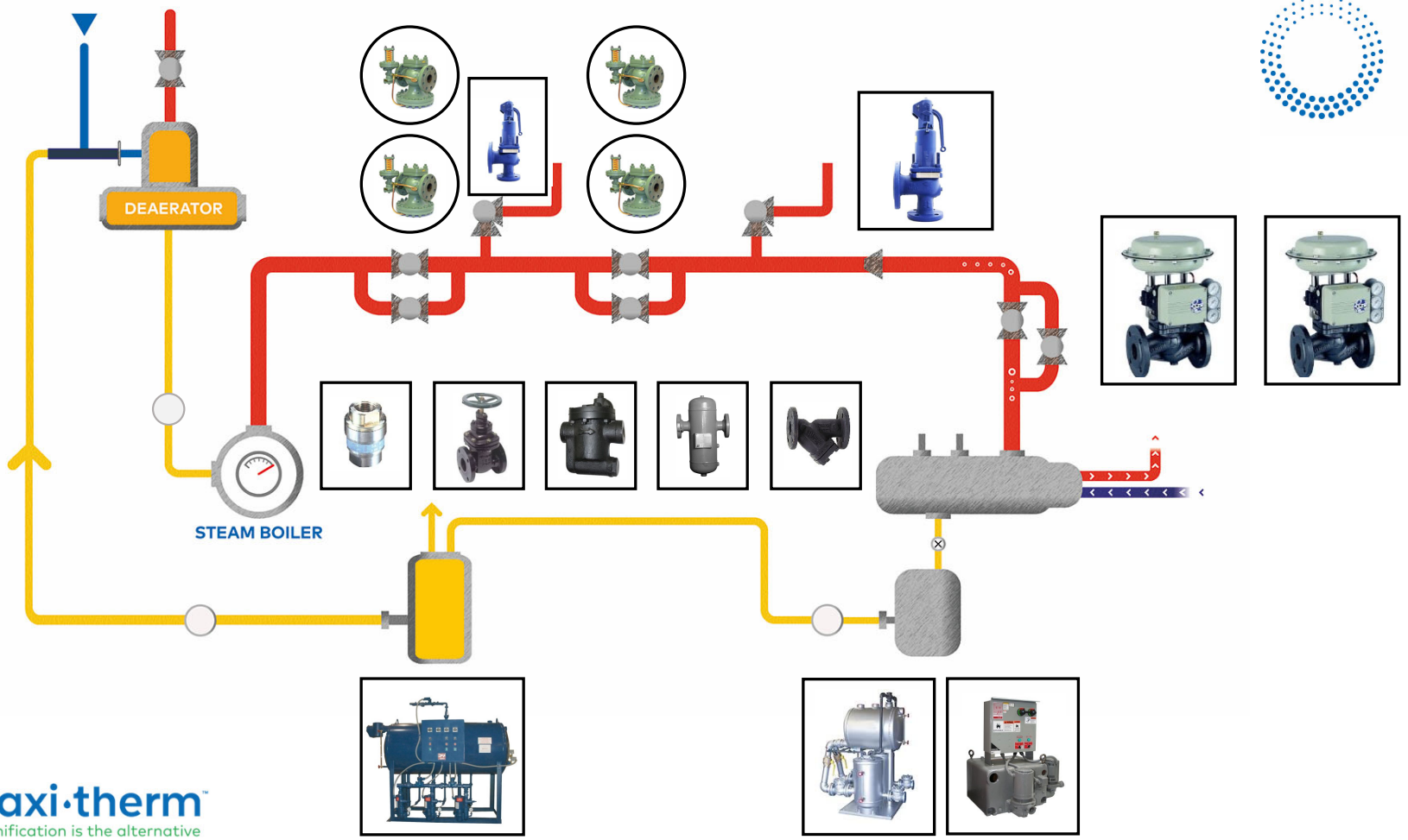
CURRENT STEAM TECHNOLOGY



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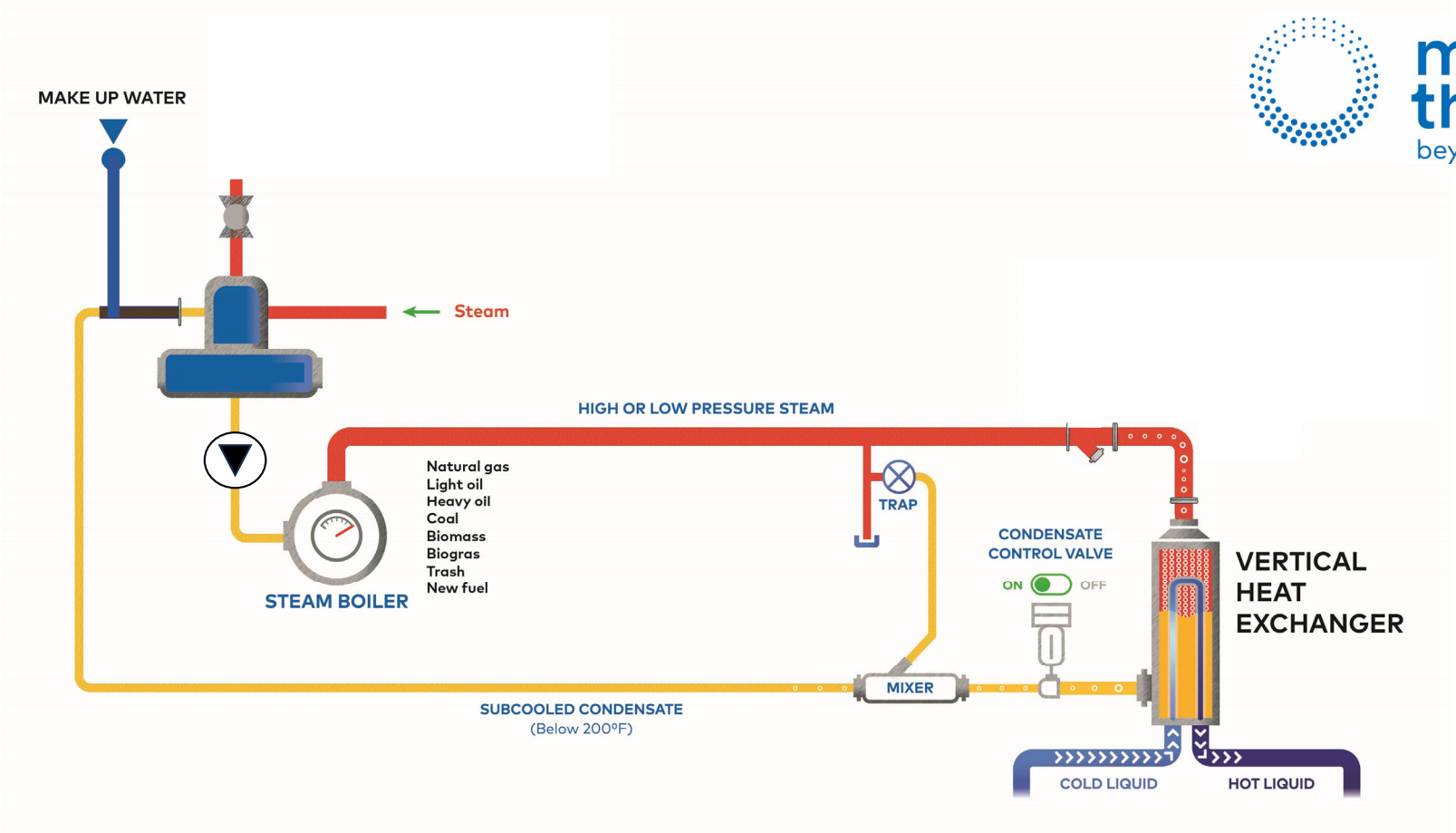
STEAM REINVENTED



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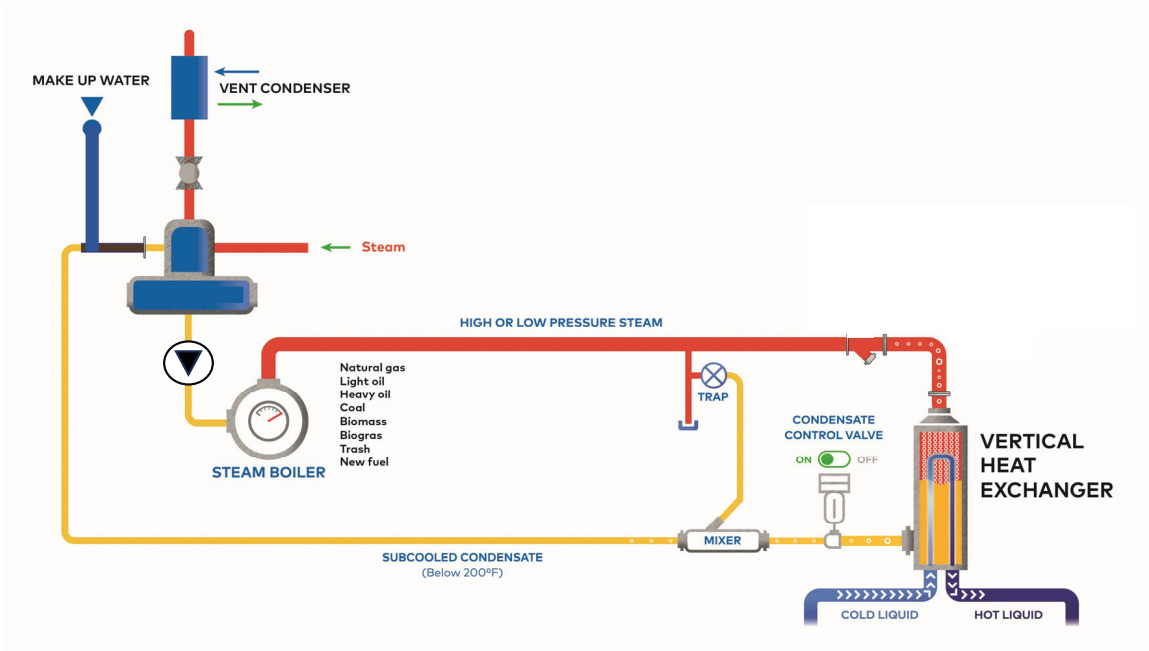


TEMA-C

1 = Less Make-Up

2 = 0% Flash

3 = No Steam PRV

4 = No Safety Relief to Roof

5 = No Condensate Receiver Pump

6 = Smaller Pipe Size

7 = Smaller Control Valve

8 = No Vacuum Breaker

9 = Energy Savings of Over 5.4% up to 20%

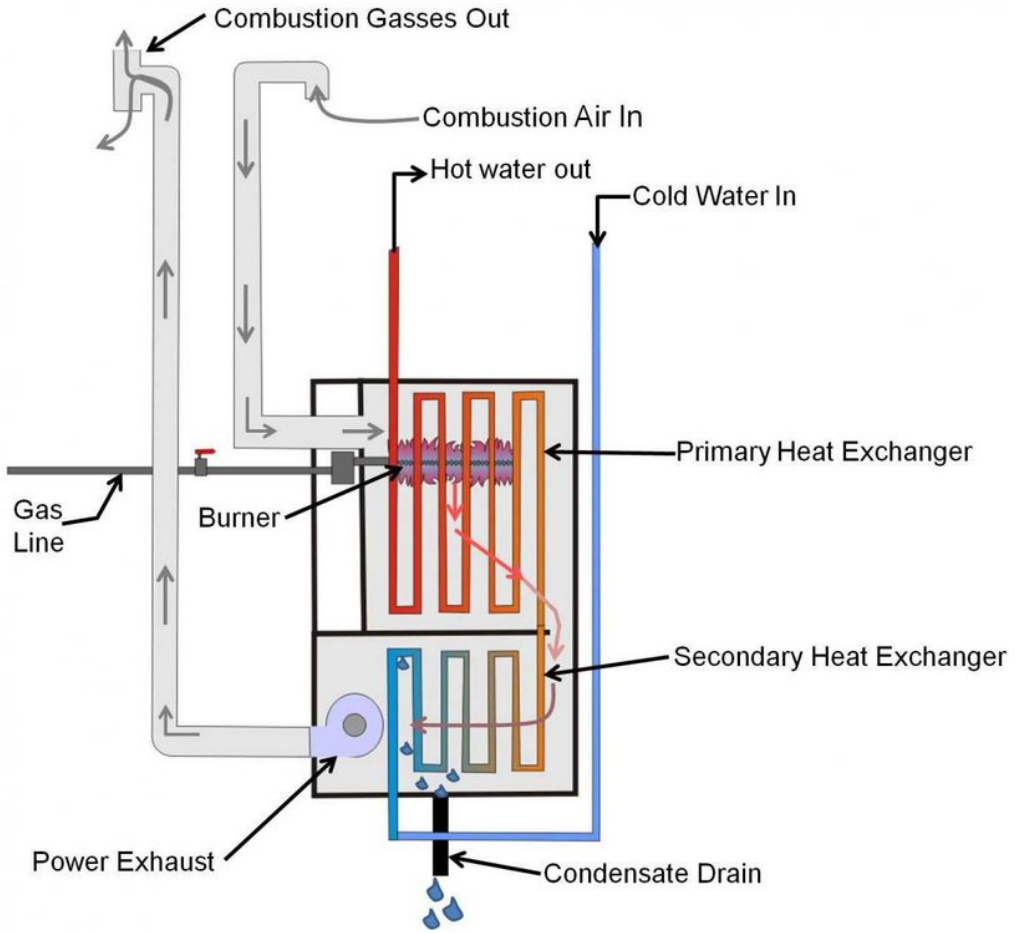
10 = Stability of Set Point 2°F

11 = Less Maintenance cost

12 = 50:1 turndown

13 = Less blowdown on boiler

14 = Less chemicals for the boiler & return lines


Combustion Gasses Out
Combustion Air In
Hot water out
Cold Water In
Primary Heat Exchanger
Gas Line
Burner
Secondary Heat Exchanger
Power Exhaust
Condensate Drain

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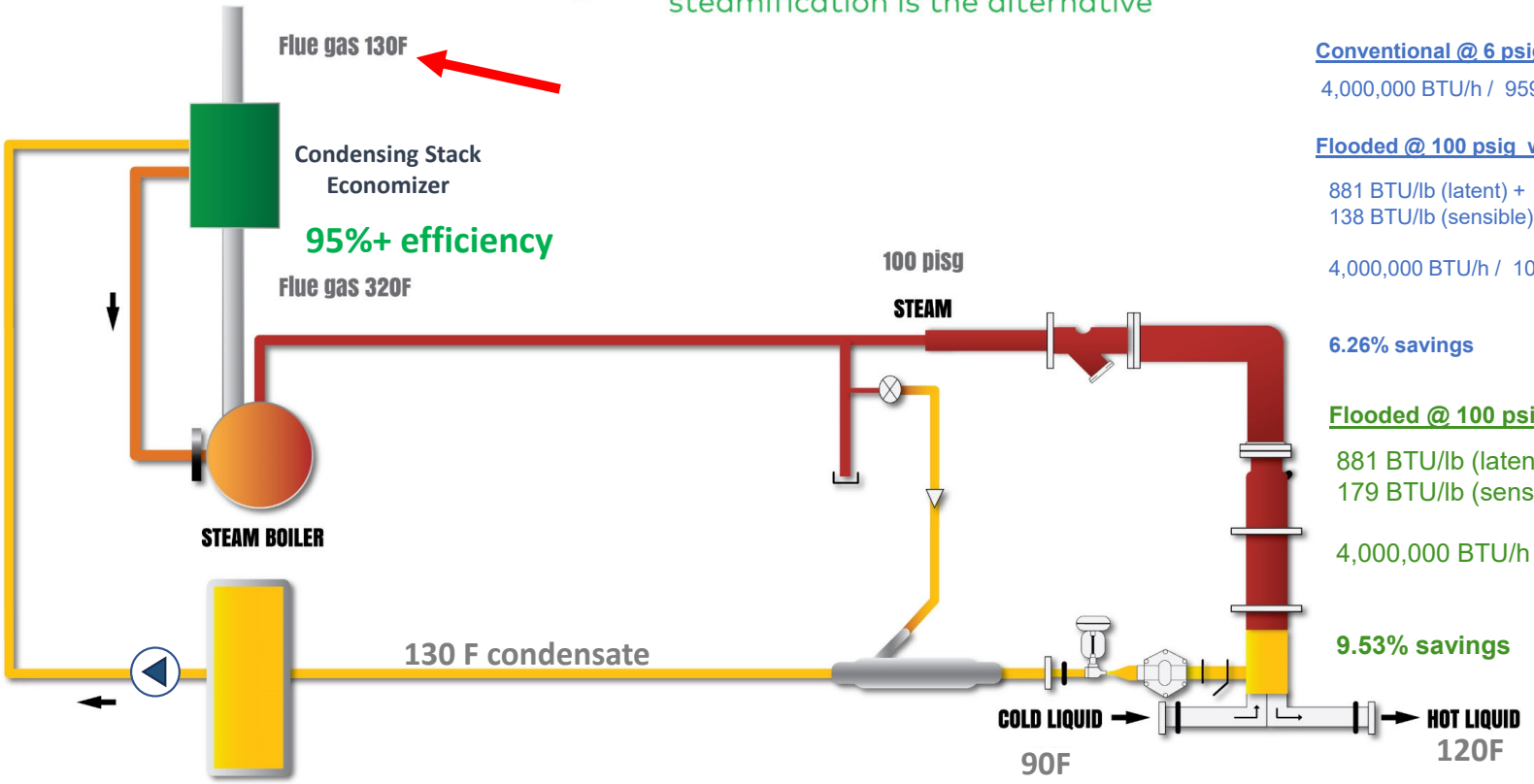


Conventional @ 6 psig

4,000,000 BTU/h / 959 BTU/lb = 4,171 lbs/h

Flooded @ 100 psig w/ 200F condensate outlet

881 BTU/lb (latent) +
138 BTU/lb (sensible) = 1019 BTU/lb total heat

4,000,000 BTU/h / 1019 BTU/lb = 3,925 lbs/h

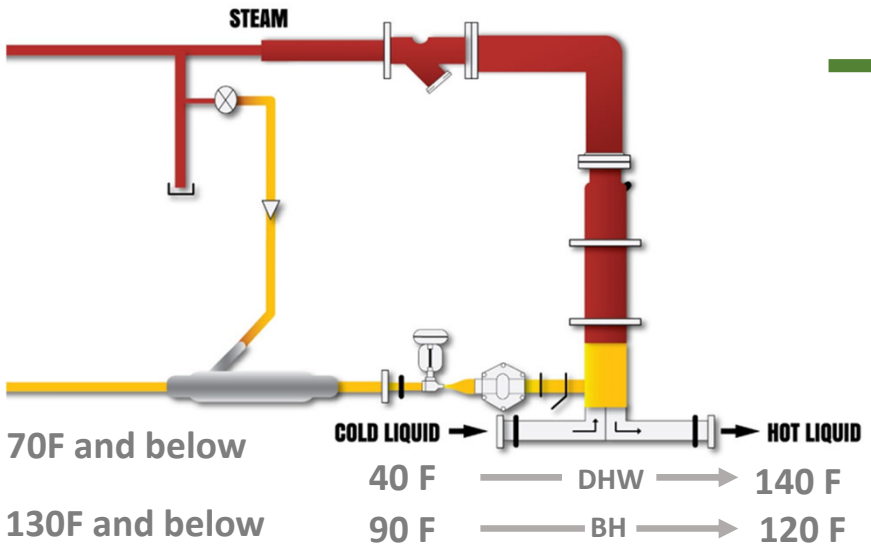
6.26% savings

Flooded @ 100 psig w/ 130F condensate outlet

881 BTU/lb (latent) +
179 BTU/lb (sensible) = 1060 BTU/lb total heat

4,000,000 BTU/h / 1,060 BTU/lb = 3,673 lbs/h

9.53% savings



Conventional @ 6 psig

4,000,000 BTU/h / 959 BTU/lb = 4,171 lbs/h

Flooded @ 100 psig w/ 200F condensate outlet

881 BTU/lb (latent) +
138 BTU/lb (sensible) = 1,019 BTU/lb total heat

4,000,000 BTU/h / 1,019 BTU/lb = 3,925 lbs/h

6.26% savings

Flooded @ 100 psig w/ 70F condensate outlet

881 BTU/lb (latent) +
299 BTU/lb (sensible) = 1,180 BTU/lb total heat

4,000,000 BTU/h / 1,180 BTU/lb = 3,389 lbs/h

18.75% savings

Flooded @ 175 psig w/ 130F condensate outlet

847 BTU/lb (latent) +
221 BTU/lb (sensible) = 1,068 BTU/lb total heat

4,000,000 BTU/h / 1,068 BTU/lb = 3,745 lbs/h

10.20% savings

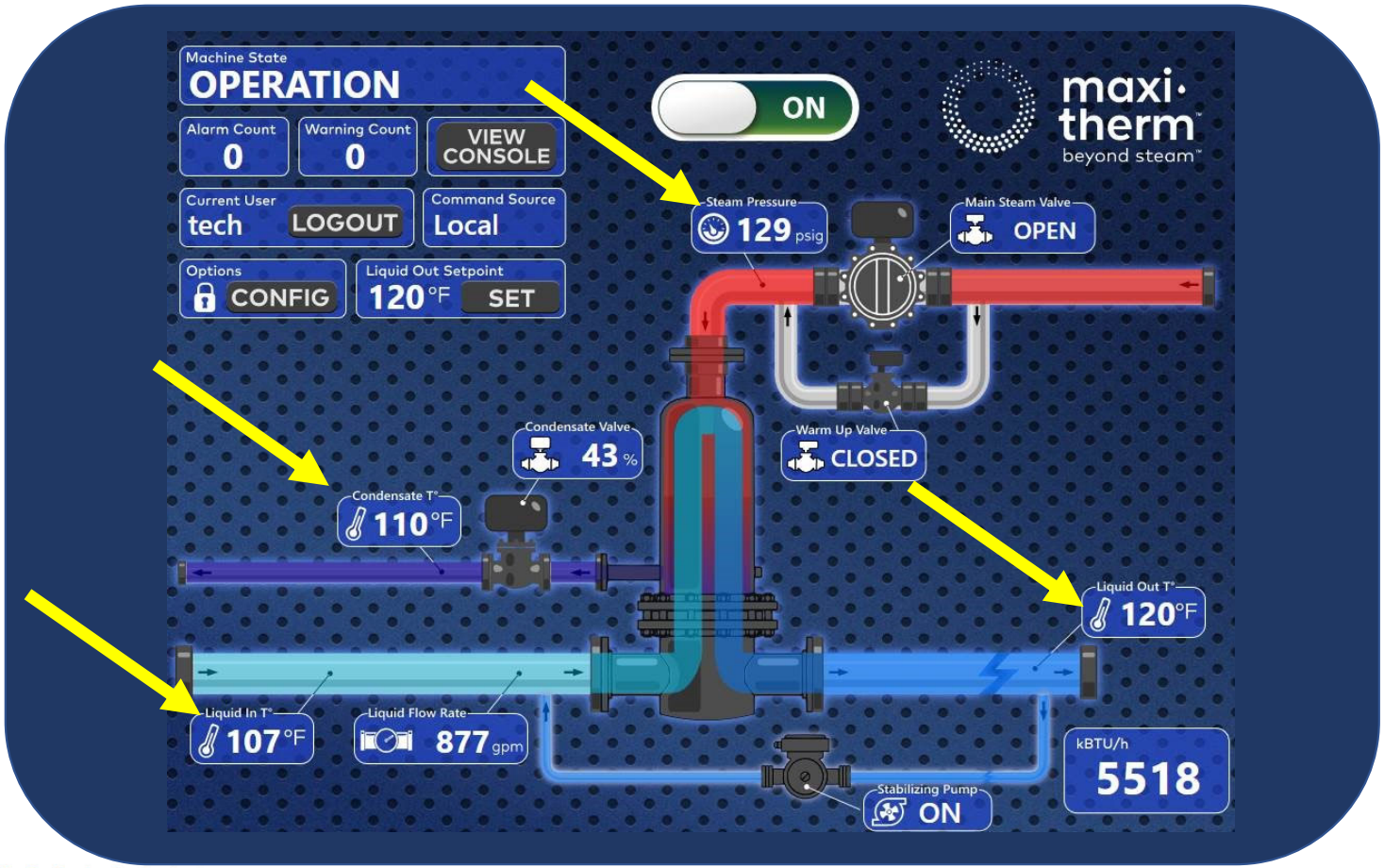
Flooded @ 12 psig w/ 70F condensate outlet

950 BTU/lb (latent) +
142 BTU/lb (sensible) = 1,092 BTU/lb total heat

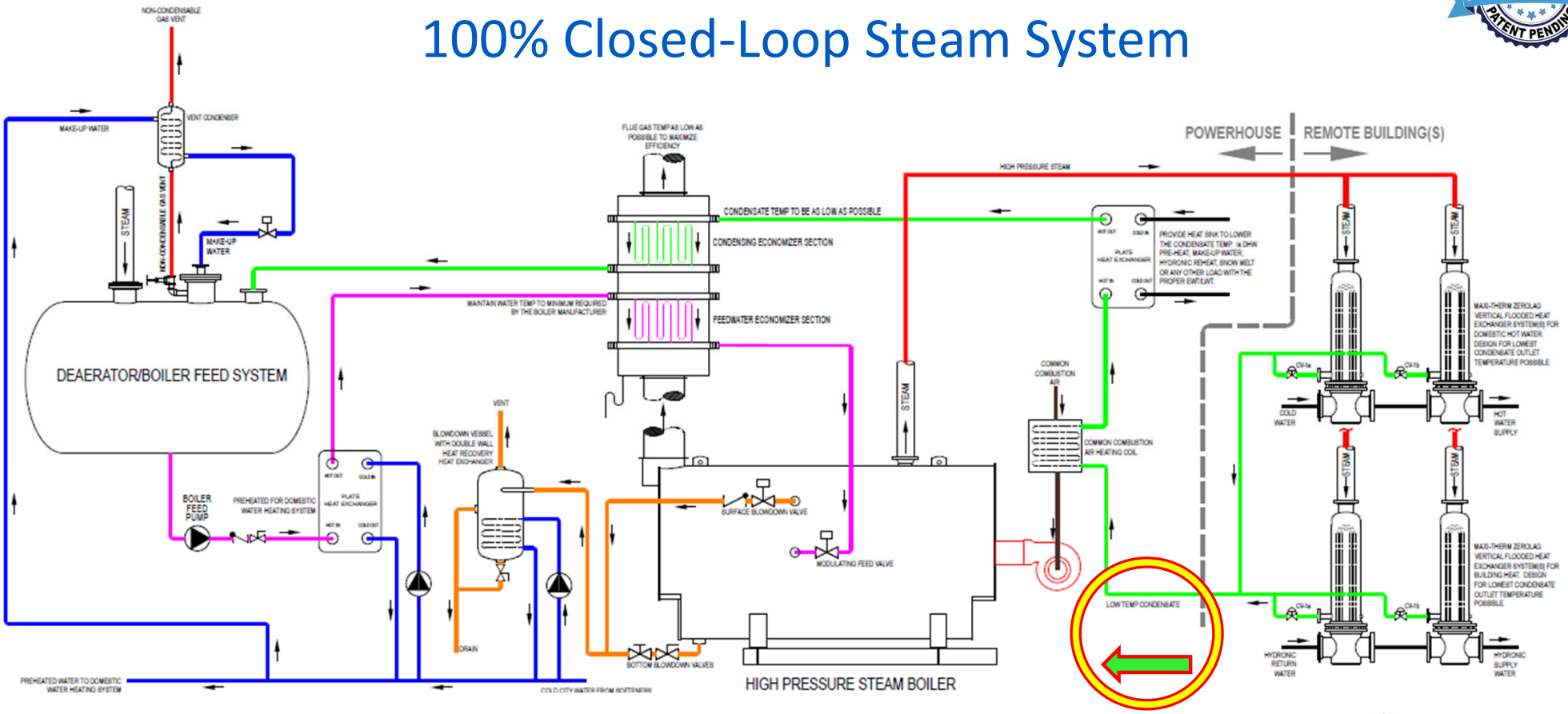
4,000,000 BTU/h / 1,092 BTU/lb = 3,663 lbs/h

12.18% savings

Real-World Example



High Efficiency
100% Closed-Loop Steam System



United States Application No: 63/286,132
Canadian Serial No: 3,183,035

LOW TEMP CONDENSATE FROM SYSTEM/CAMPUS

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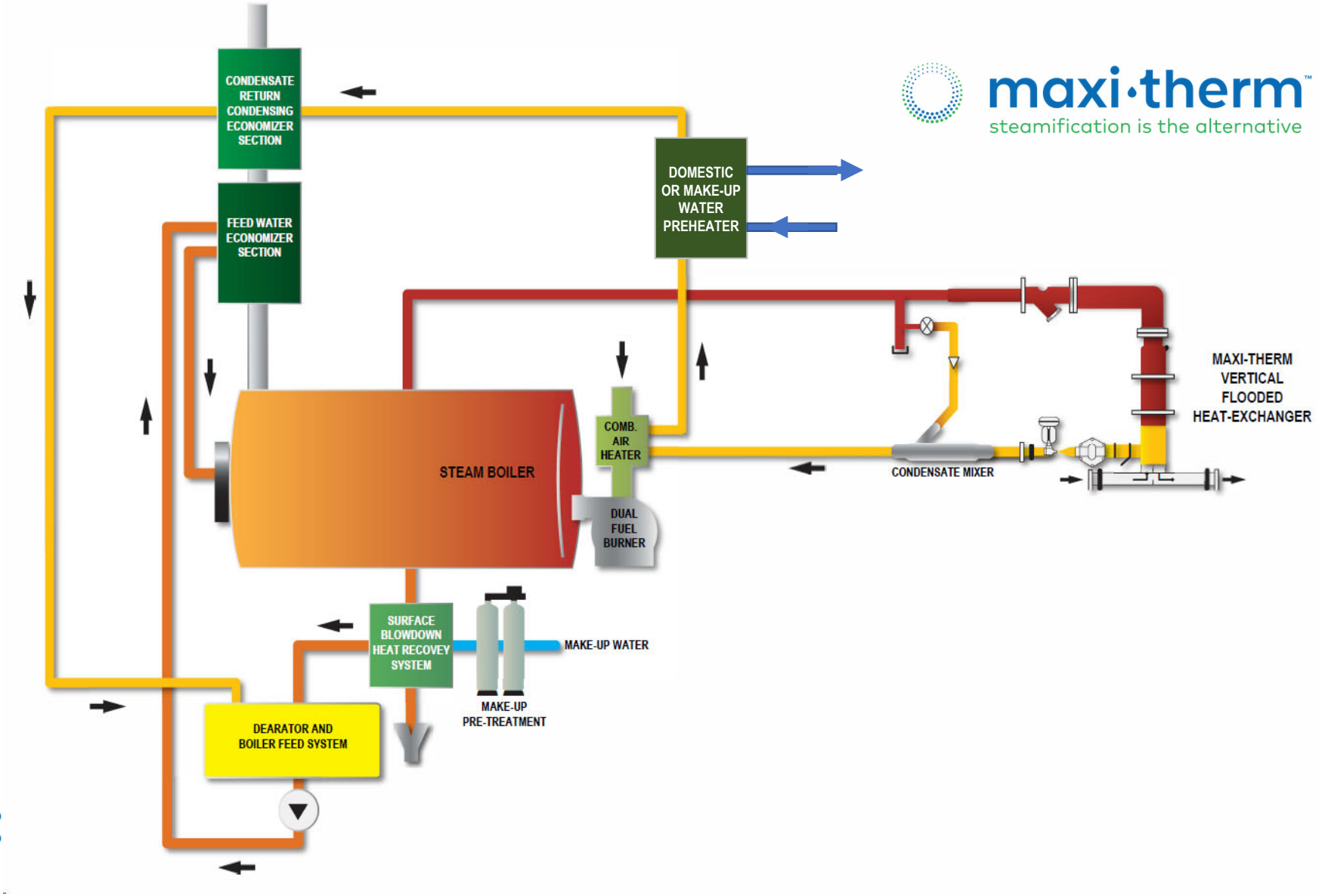

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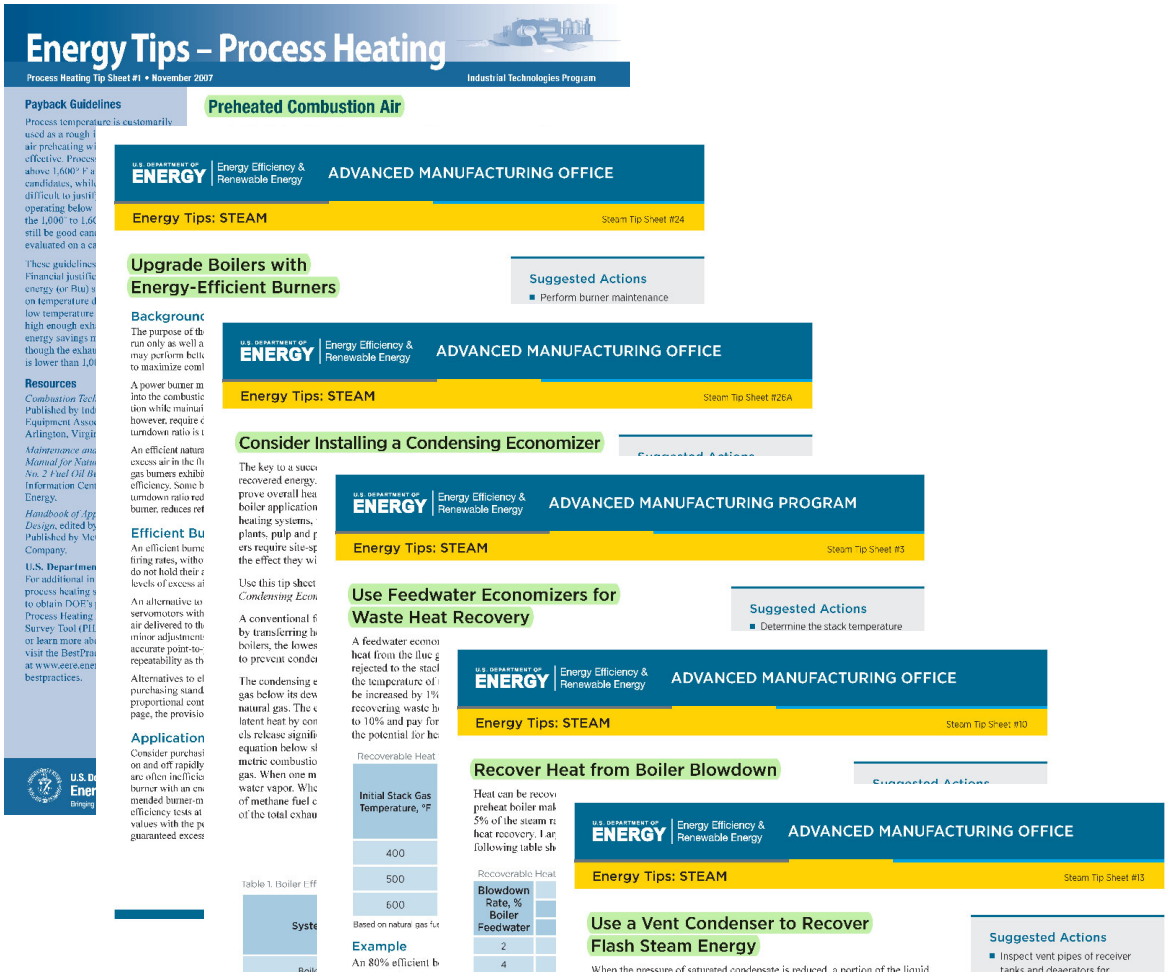
Energy Tips from the U.S. Department of Energy (energy.gov)



Energy Tips – Process Heating

Process Heating Tip Sheet #1 • November 2007 — Industrial Technologies Program

Payback Guidelines

Resources

Preheated Combustion Air

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy — ADVANCED MANUFACTURING OFFICE

Energy Tips: STEAM — Steam Tip Sheet #24

Upgrade Boilers with Energy-Efficient Burners

Suggested Actions
- Perform burner maintenance

Background

Efficient Bu

Application

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy — ADVANCED MANUFACTURING OFFICE

Energy Tips: STEAM — Steam Tip Sheet #26A

Consider Installing a Condensing Economizer

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy — ADVANCED MANUFACTURING PROGRAM

Energy Tips: STEAM — Steam Tip Sheet #3

Use Feedwater Economizers for Waste Heat Recovery

Suggested Actions
- Determine the stack temperature

Recoverable Heat

Initial Stack Gas Temperature, °F
400
500
600

Example

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy — ADVANCED MANUFACTURING OFFICE

Energy Tips: STEAM — Steam Tip Sheet #10

Recover Heat from Boiler Blowdown

Recoverable Heat

Blowdown Rate, % Boiler Feedwater	
2	
4	

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy — ADVANCED MANUFACTURING OFFICE

Energy Tips: STEAM — Steam Tip Sheet #13

Use a Vent Condenser to Recover Flash Steam Energy

Suggested Actions
- Inspect vent pipes of receiver tanks and deaerators for

Calculations

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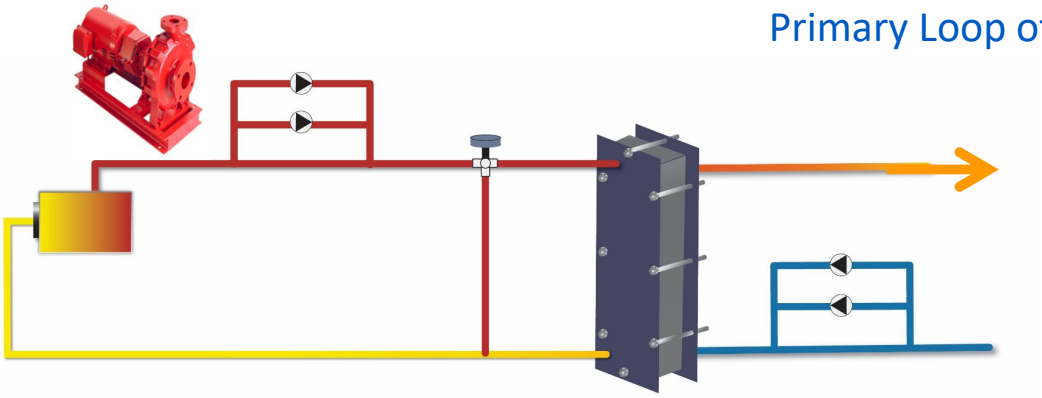
Combustion Efficiency Calculator

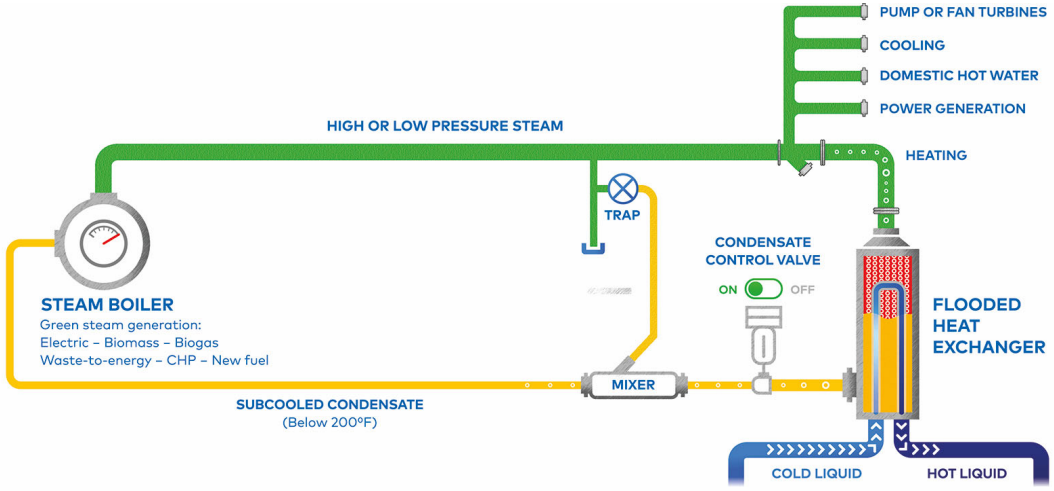
Boiler Size in PPH	20,700		Input:	24,415	MBH (based on 82.3% efficiency)
Measured % O_2 in flue	3.00		Calc. CO_2	10.4	% (CO_{2max} = 12.1% for nat gas)
Boiler Leaving Flue Gas Temp. Gross	450.0	°F T_i or T_f		5,481.0	CFM (Combustion Air Volume based on 95.06% efficiency)
Economizer Leaving Flue Gas Temp. Gross	135.0	°F T_i or T_f	Input:	21,728	MBH (based on 95.1% efficiency)
Ambient Air Temp.	70.0	°F EAT into combustion air preheat coil			
Combustion Air Temp. into Burner	120.0	°F LAT from combustion air preheat coil			
Water temp. into the Comb. Air Preheat Coil	130.0	°F EWT			
Water temp. out of the Comb. Air Preheat Coil	110.0	°F LWT to additional plate heat exchanger(s)			
Additional water temp reduction	20.0	°F This reduction is from the plate heat exchanger(s)			
Nominal Economizer flow PPH	20,700	PPH Flow will vary with firing rate			
Water temp. into the condensing economizer	90.0	°F EWT economizer			
Water temp. out of the condensing economizer	157.0	°F LWT economizer			
Latent heat recovered - economizer	518,660	BTUH Recovered			
Water temp. into the feed water economizer	180.0	°F EWT economizer			
Water temp. out of the feed water economizer	224.0	°F LWT economizer			
Sensible heat recovered - economizer	2,035,047	BTUH Recovered			
Total feed water & condensing economizer	2,553,707	BTUH Recovered - Total			

Combustion Efficiency Nat. Gas =	**82.3%**	**Before the Air Preheat Coil**
Combustion Efficiency Nat. Gas =	**84.6%**	**After the Air Preheat Coil but before the Water Economizer**
Combustion Efficiency Nat. Gas =	**95.1%**	**After the 2-Stage Economizer**

HYDRONIC HOT WATER VS STEAM

Primary / Secondary Loop System
Primary Loop of 35,140,000 BTU/HR





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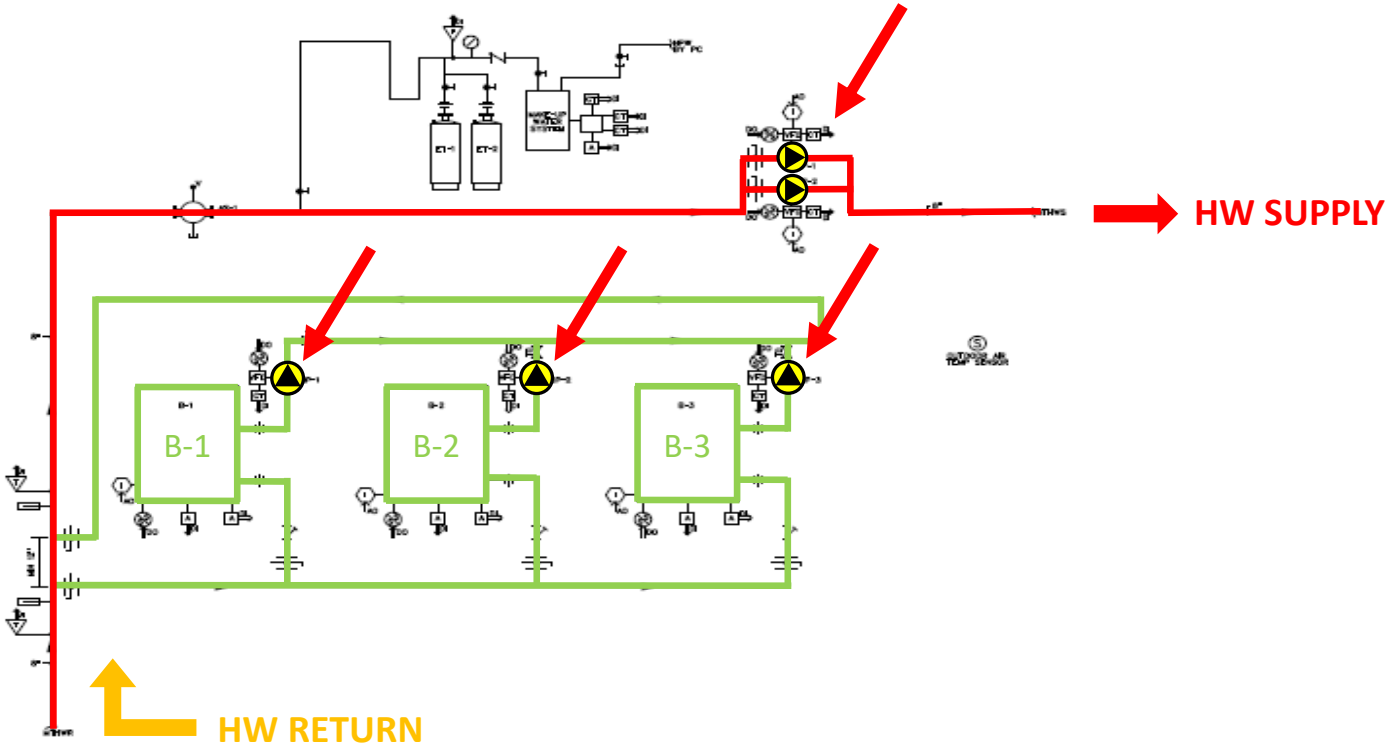
HYDRONIC vs STEAM

Typical layout of a **High Temperature Hot Water System (HTHW)**

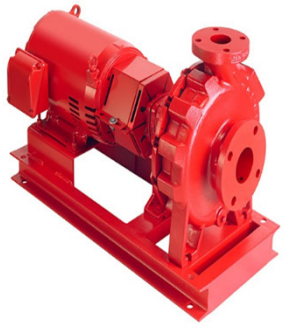


35,000,000 BTU Hydronic Central Plant VS
100 PSI Steam plant
937 GPM Hydronic VS 69 GPM Steam

Hydronic System
75 Degree DT

Total GPM Flow 937 GPM
Mass Flow 468,533 PPH

Pumping Power 90 HP
Primary Pump 60 HP
Boiler Pumps 30 HP



Steam System
100 PSI

Total GPM Flow 69 GPM
Mass Flow 34,485 PPH

Pumping Power 4 HP

Decarbonization opportunity by reducing pumping needs:

Carbon Footprint Reduction: 192.6 Tons

STEAM REINVENTED

HIGH EFFICIENCY & 100% CLOSED LOOP STEAM SYSTEM

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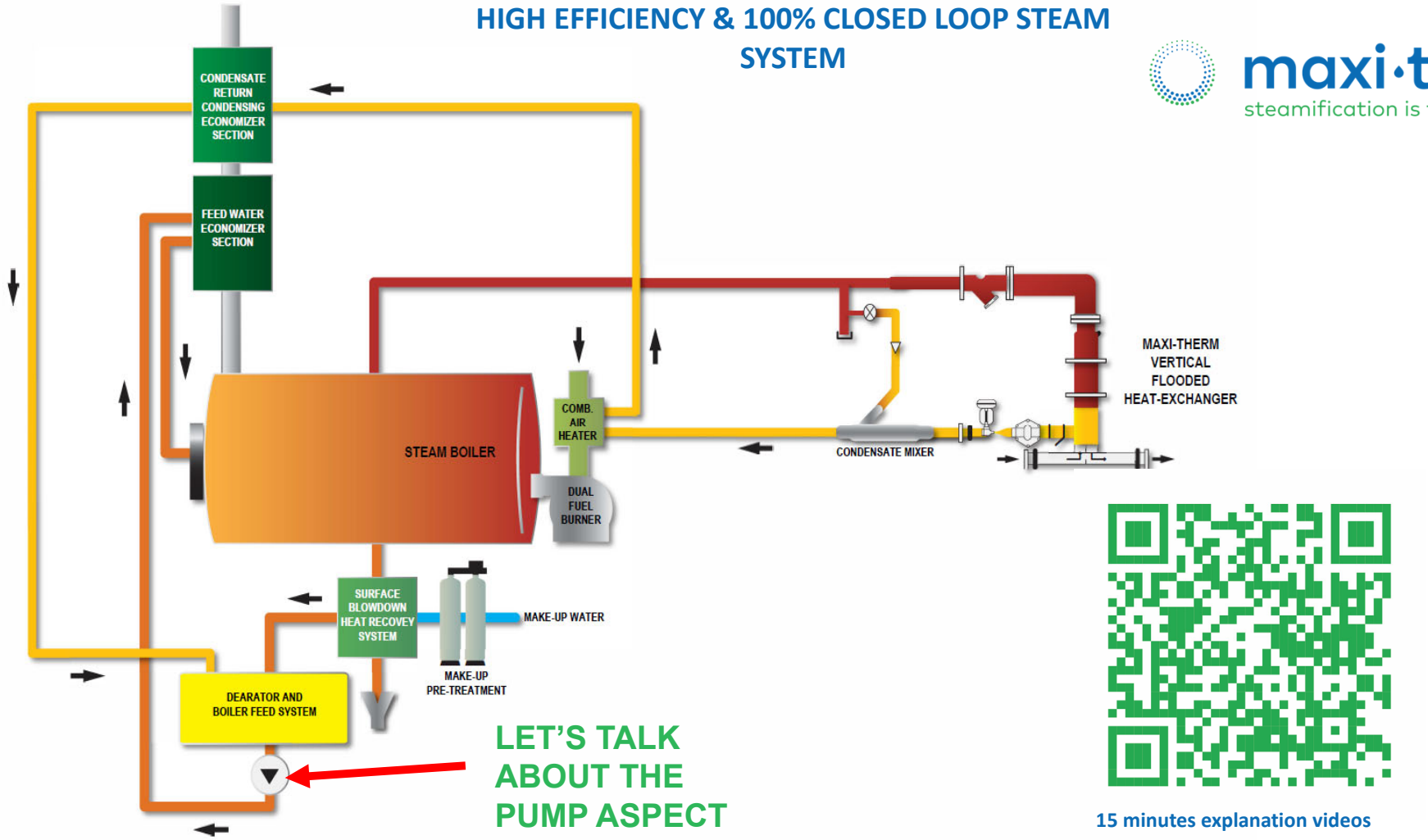

LET'S TALK ABOUT THE PUMP ASPECT

15 minutes explanation videos

STEAM VIDEOS EXPLANATION

https://maxi-therm.net/videos

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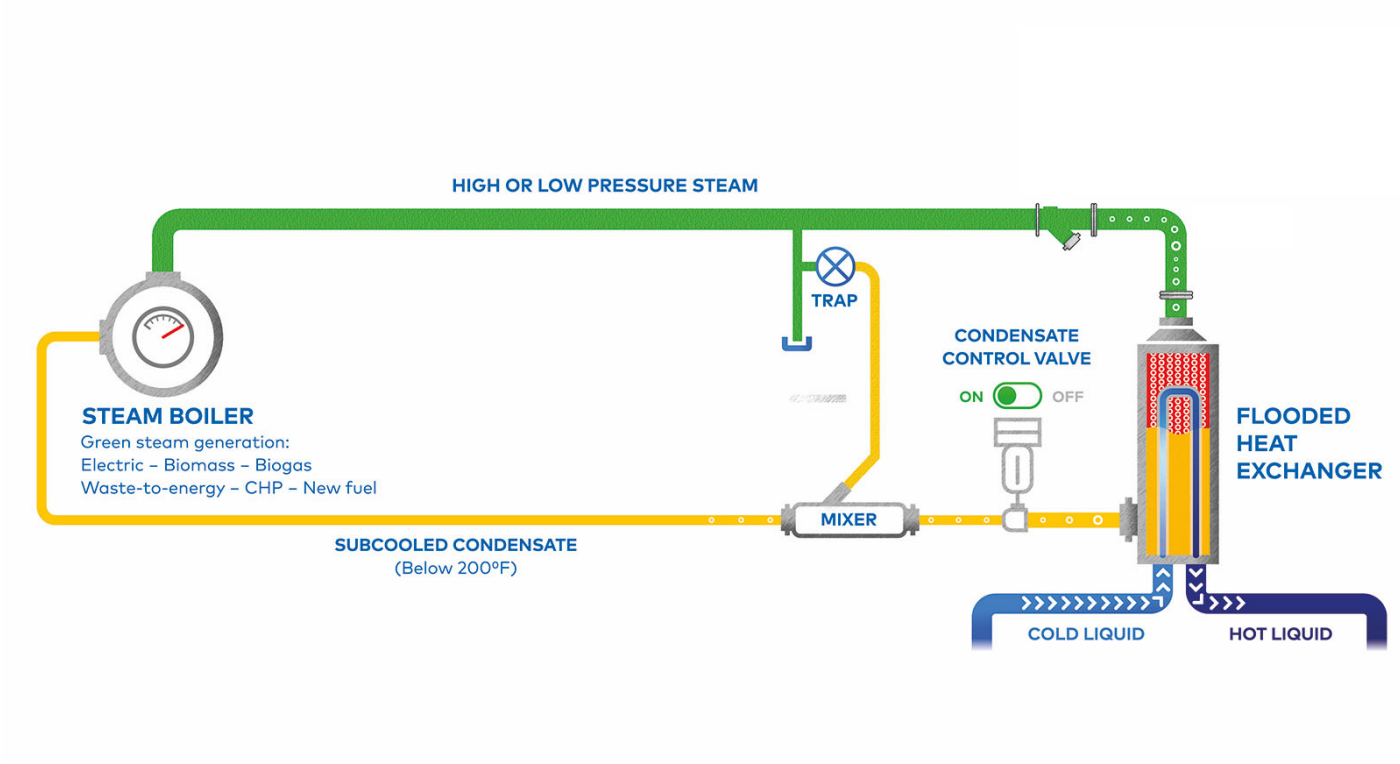
STEAMIFICATION IS THE ALTERNATIVE

"100% Steam & Condensate Closed Loop"

Potential Green source fuel:

- Biomass
- Biogas
- Biodiesel
- Solar *
- Nuclear
- Hydrogen
- Waste to Energy
- Carbon Capture *
- Cogeneration **
- Future green source fuel



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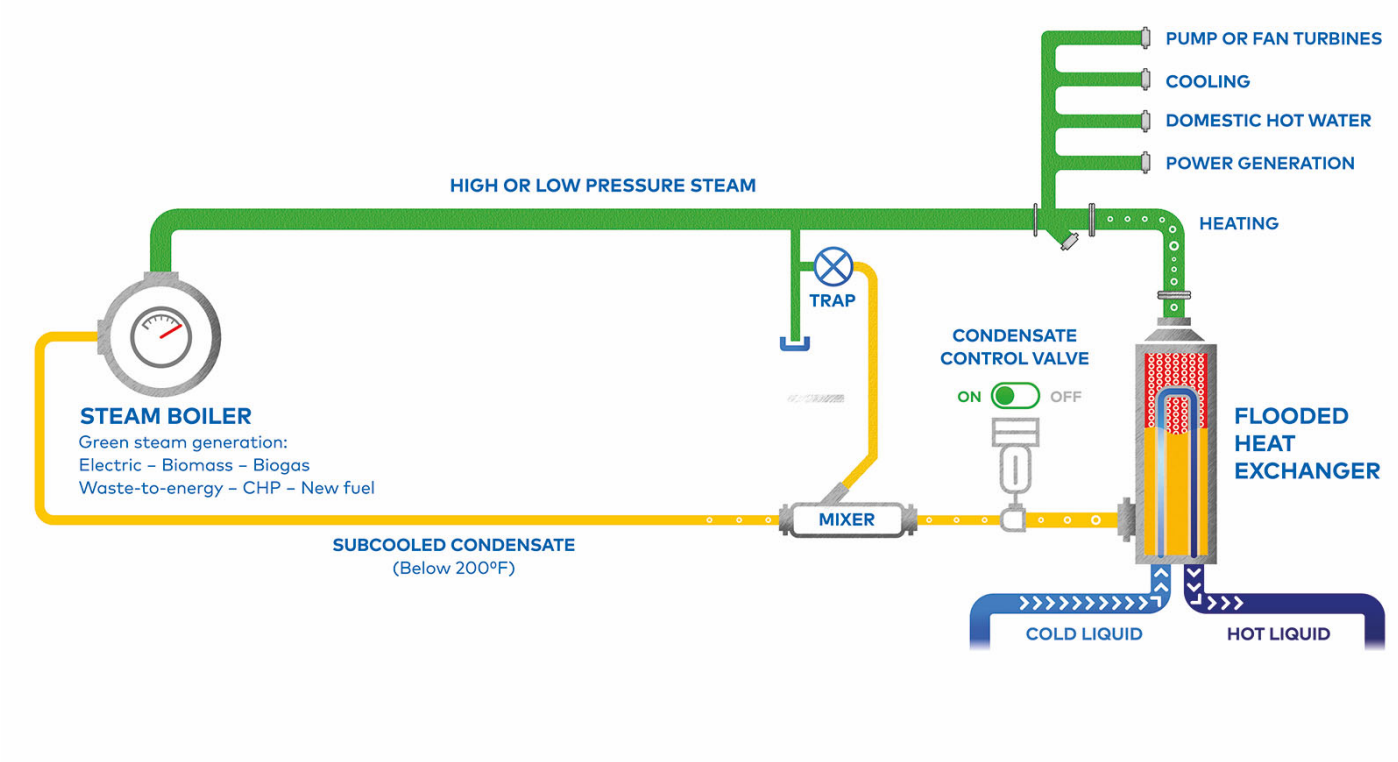
STEAMIFICATION IS THE ALTERNATIVE

*"**STEAMIFICATION** OFFERS A PATH TO ENERGY SECURITY BY ALLOWING FLEXIBLE FUTURE FUEL CHOICES"*

Potential Green source fuel:

- Biomass
- Biogas
- Biodiesel
- Solar *
- Nuclear
- Hydrogen
- Waste to Energy
- Carbon Capture *
- Cogeneration **
- Future green source fuel



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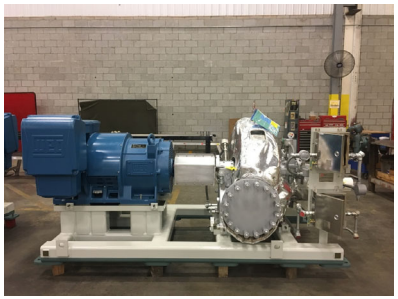
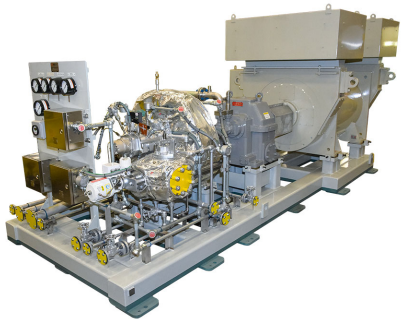
STEAMIFICATION IS THE ALTERNATIVE





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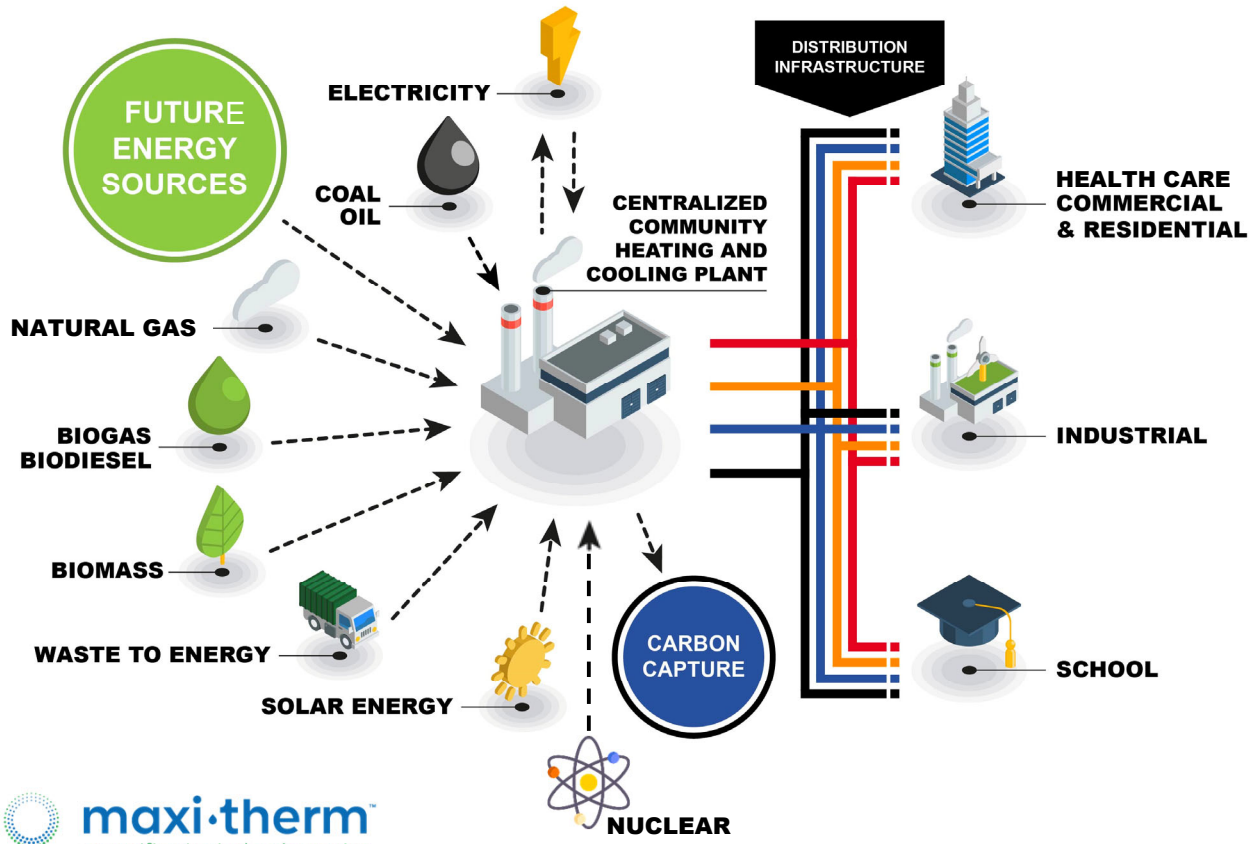
STEAM DISTRICT ENERGY ADVANTAGE

COMMUNITY ENERGY DIAGRAM



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beyond steam™

Central Steam Plant Benefits

1. Resiliency
2. Fuel Flexibility
3. Lower capital and operational cost for buildings
4. **ENERGY SECURITY**

Decarbonization Opportunities

4. Low Pumping Input
5. 95% Energy Conversion with Natural Gas
6. Onsite Electrical Generation
7. Provides Heating and Cooling
8. Electrical Grid Relief
9. Potential for Carbon Capture
10. Adaptable to future fuel sources

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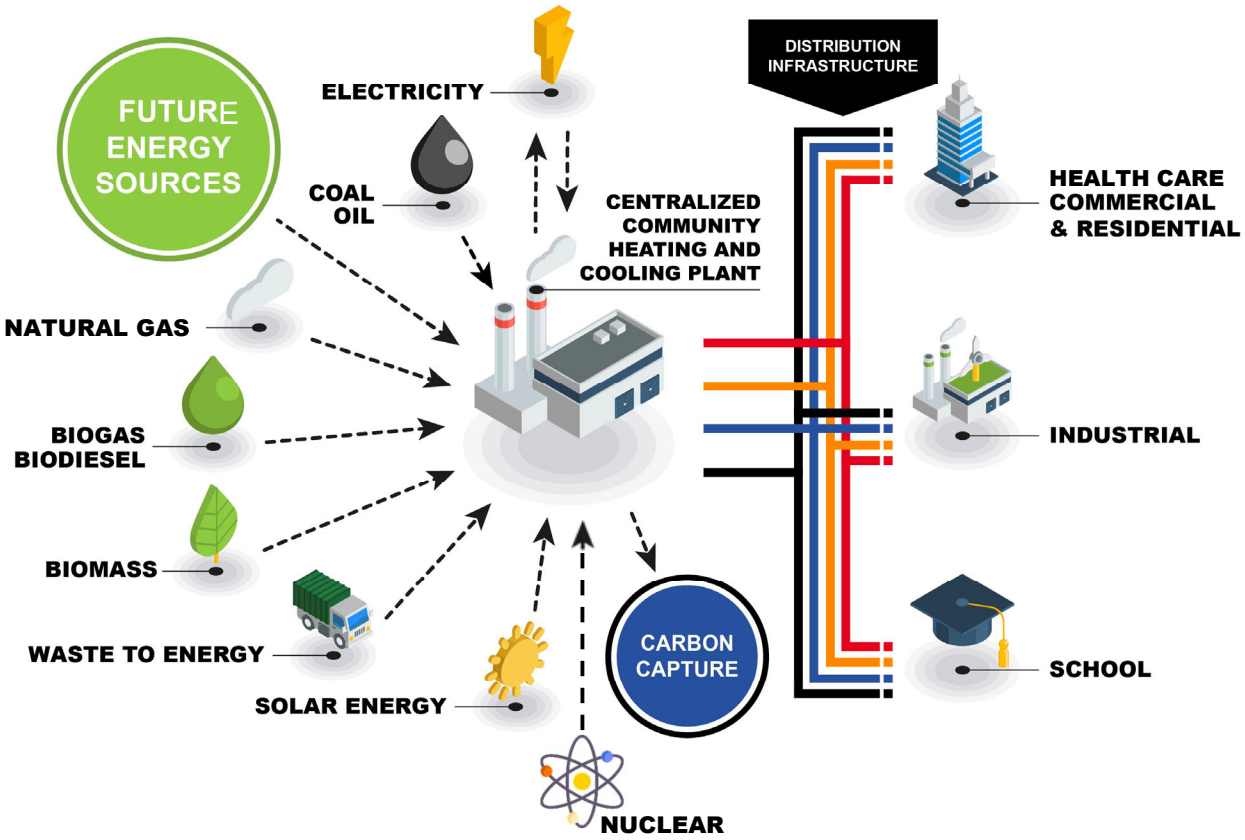
COMMUNITY STEAM ENERGY DIAGRAM



2 DISTRICT ENERGY VIDEOS EXPLANATION

IDEA
International District Energy Association
districtenergy.org

districtenergyinitiative.org

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30+ CITIES THAT HAVE CENTRAL STEAM

- New-York
- Seattle
- Philadelphia
- Boston
- Baltimore
- Washington D.C.
- Hartford
- Buffalo
- Rochester
- Minneapolis
- Milwaukee
- Denver since 1880
- Montreal
- Vancouver
- New Ulm
  Population of 14,120
- St. Louis
- Tulsa
- Kansas City
- San Francisco
- New Orleans
- Detroit
- Cambridge
- Los Angeles
- Houston
- Pittsburg
- Austin
- Richmond
- San Diego
- Grand Rapids
- Cleveland

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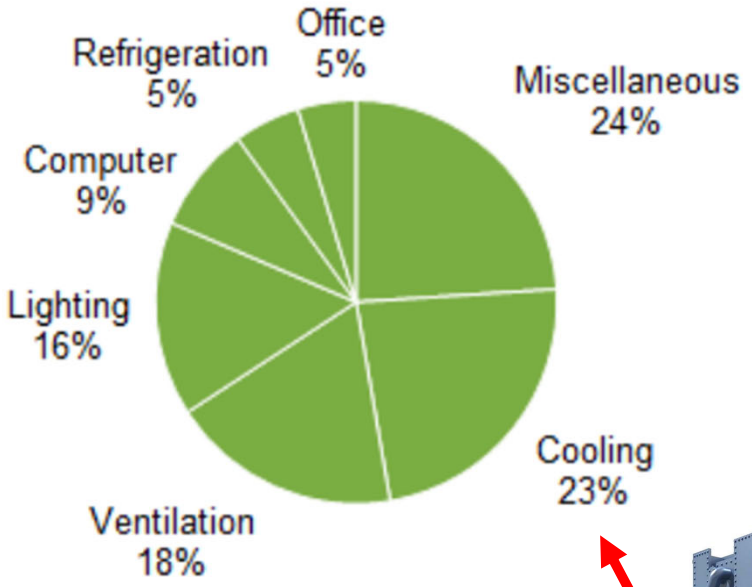
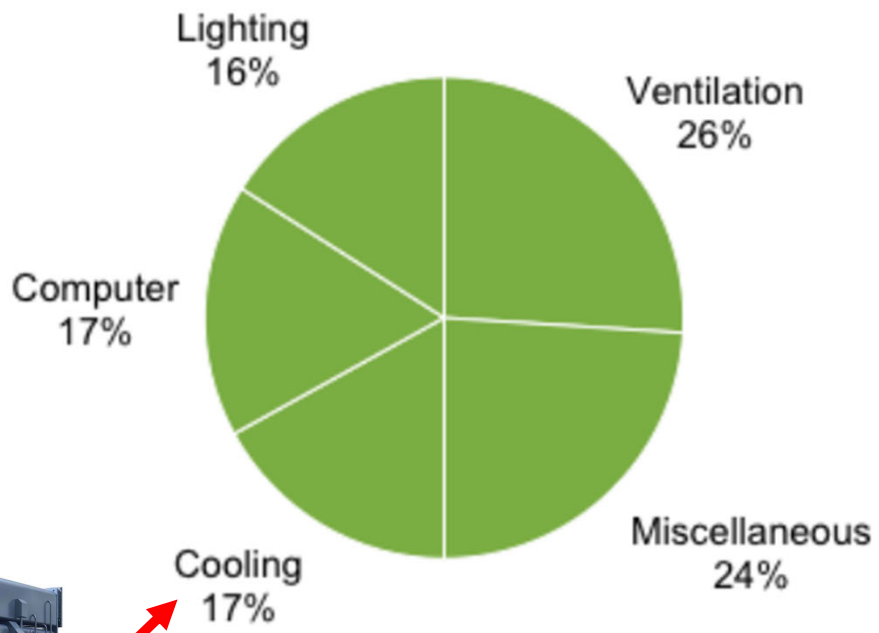
Electricity end uses in hospitals

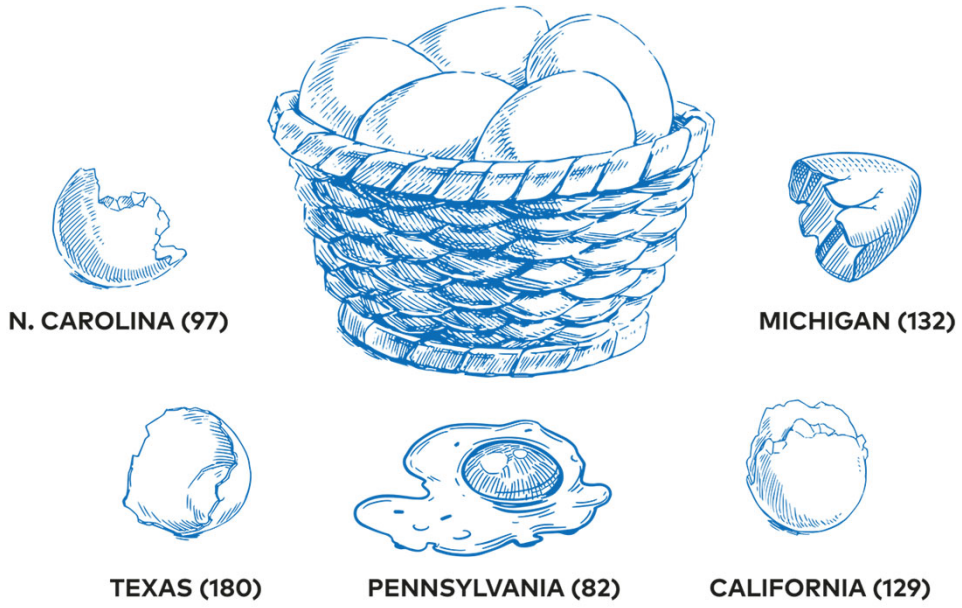


Electricity end uses in large offices



STEAMIFICATION IS THE ALTERNATIVE

Don’t put all your Energy Eggs in the Electric Grid Basket



THESE FIVE STATES REPRESENT 30.5% OF THE US POPULATION

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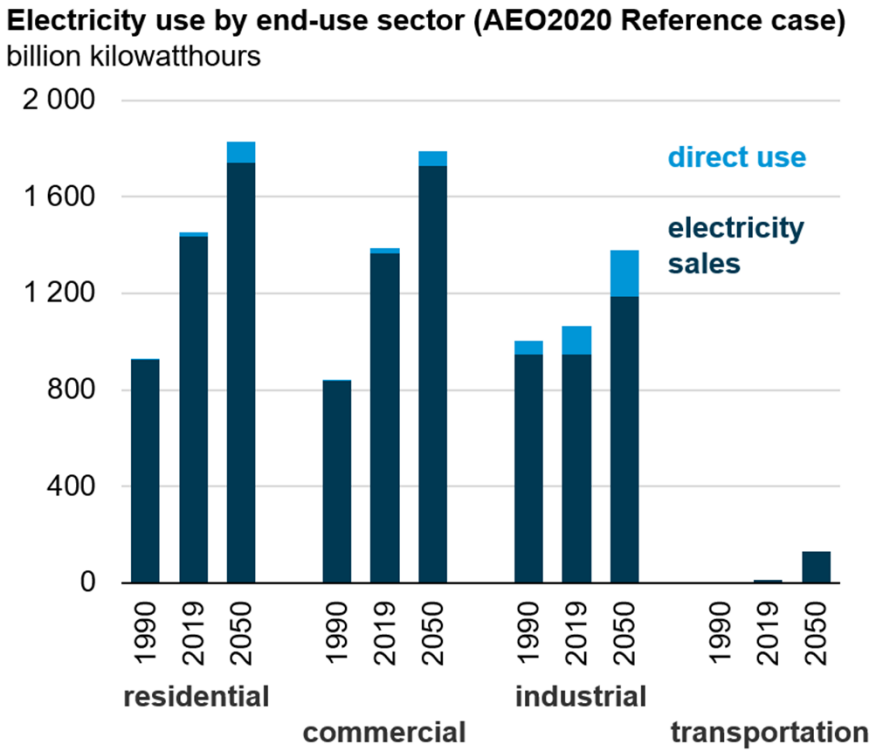
These are the states with the most reported weather-related power outages from 2000-2021. All of which are ranked among the top 10 most populous states.

U.S. Energy Information Administration's (EIA) Annual Energy Outlook 2020 (**AEO2020**) **Reference case**
https://www.eia.gov/outlooks/aeo/



Despite the fact that we invest in energy saving projects, electric demand is growing every year: more cloud servers, electric cars, an increase in electric process automation, robots, digital currencies & assets, etc.

I will be presenting Suzan Sun-Yuan of ESD Global

CampusEnergy2024

BRIDGE TO THE FUTURE

February 20 – 23, 2024

Hilton San Francisco Union Square | San Francisco , CA

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Re: Corrosion Question

Lately we have asked our customers if our flooded design is more or less corrosive on return lines?

Attached is a report of a corrosion test performed by an independent firm in 2007 at a hospital in Montreal.

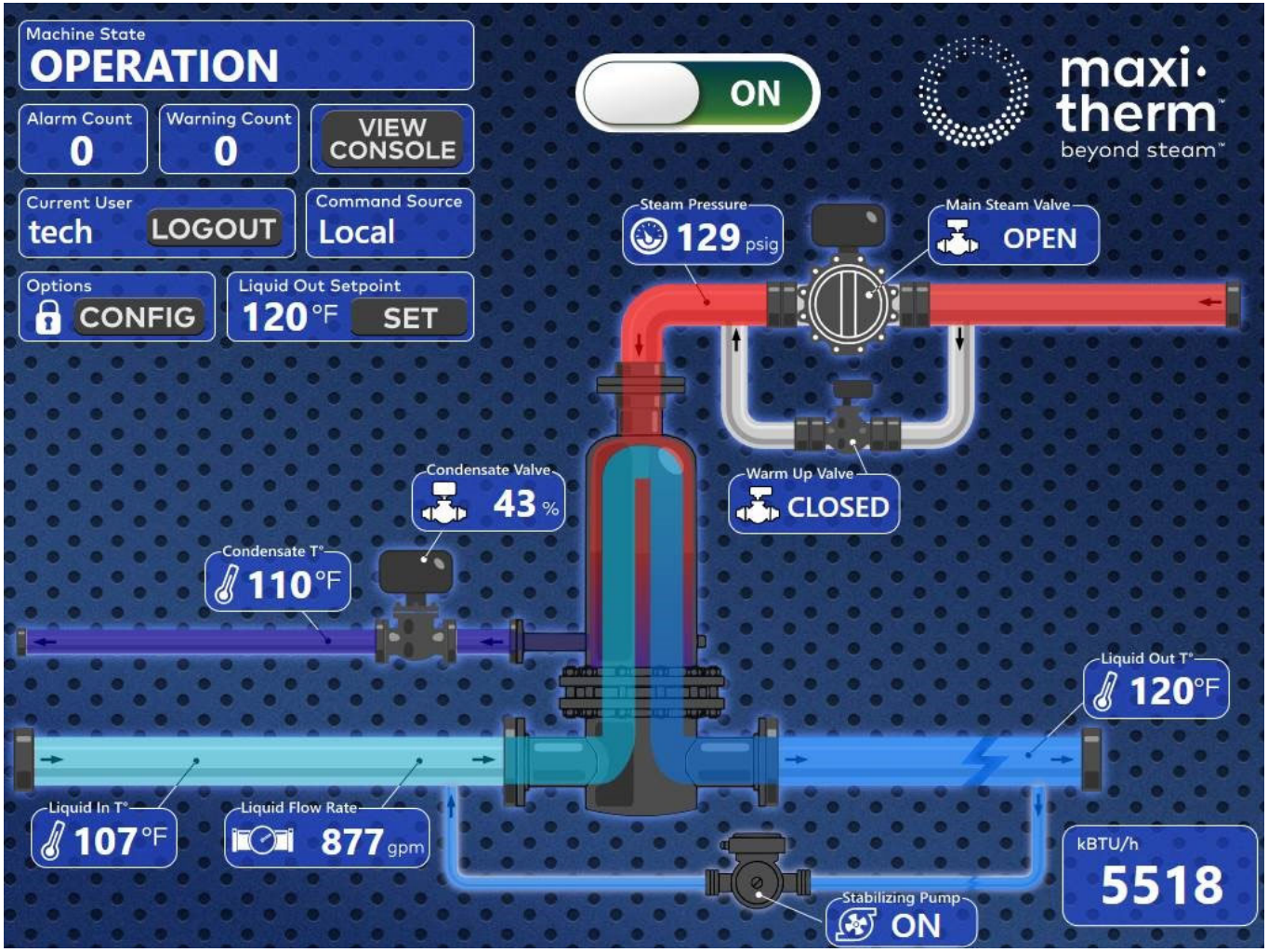
The test compared an existing conventional horizontal heat exchanger and a new Maxi-Therm vertical flooded heat exchanger installation.

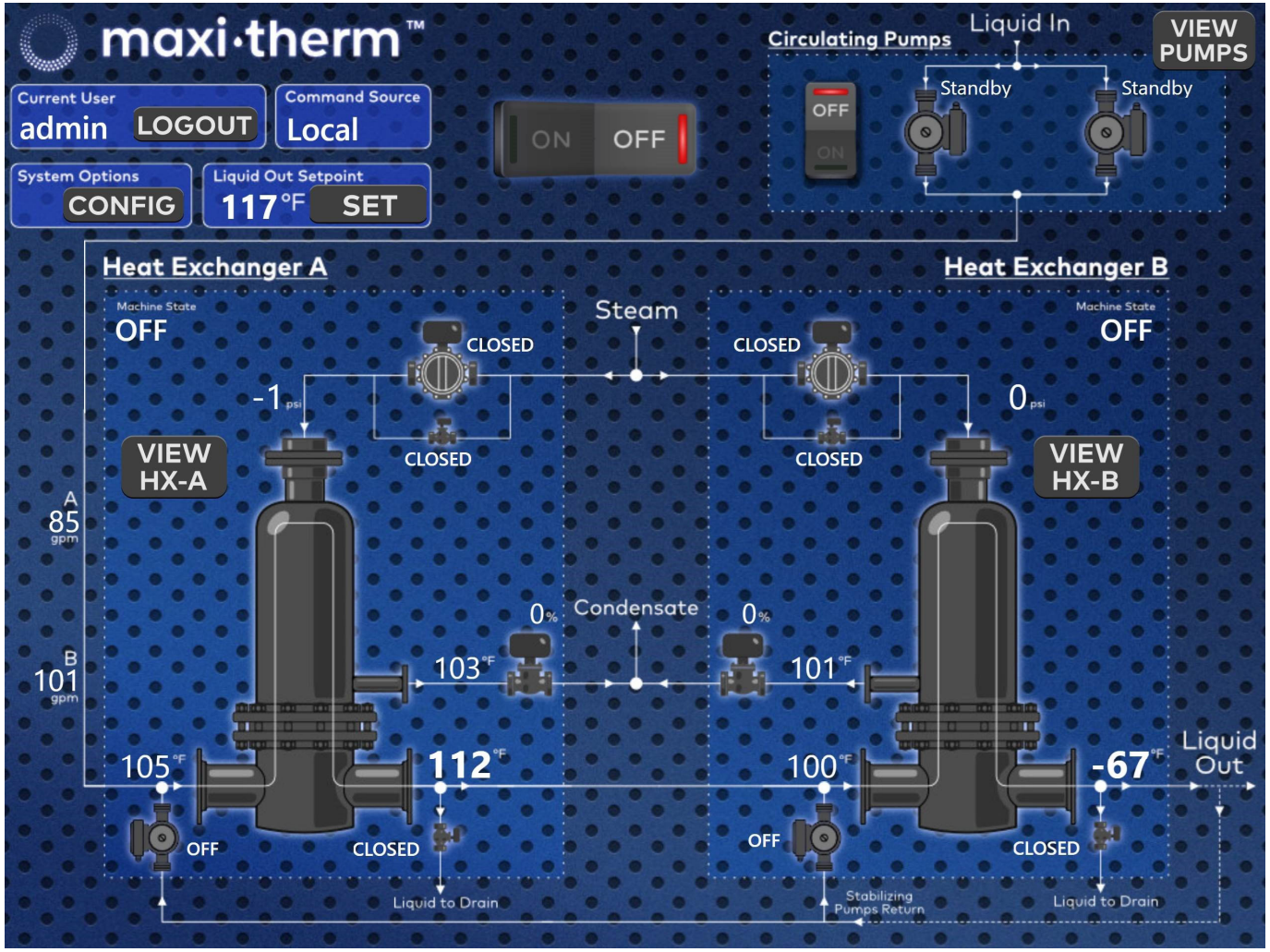
The test was conducted by a chemical consultant using black iron (alloy C1010) corrosion coupons. After 94 days of exposure the measured corrosion rated for the Maxi-Therm system was 2.36 mills per year while the conventional method system was 14.63 mills per year. The conventional system is 6.2 times more corrosive!

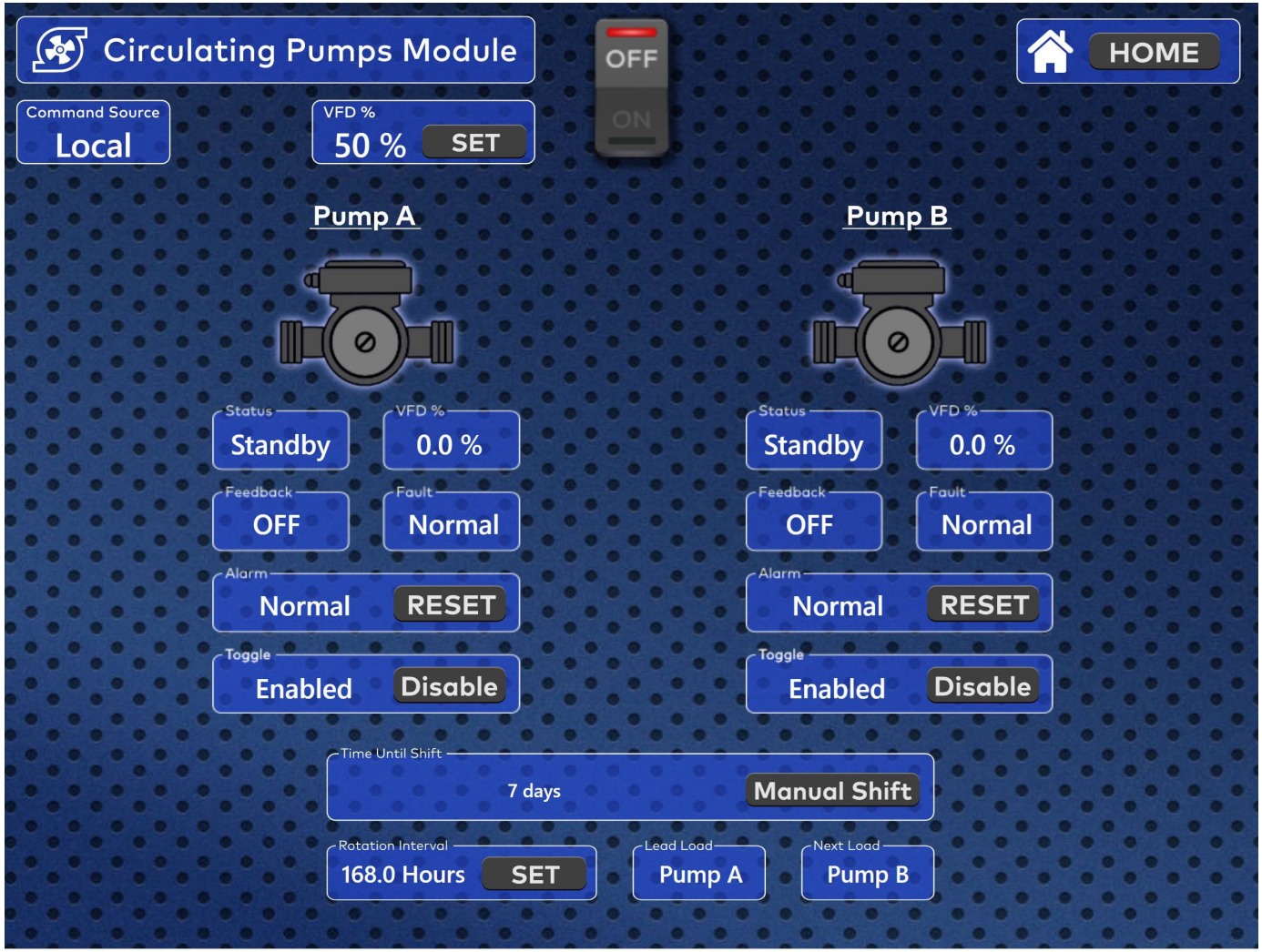
Per industry standards any result below 3 mills per year shows a good protection of the condensate system. Visual surface observation of the coupon did not denote any pitting corrosion mechanism, which is a positive point.

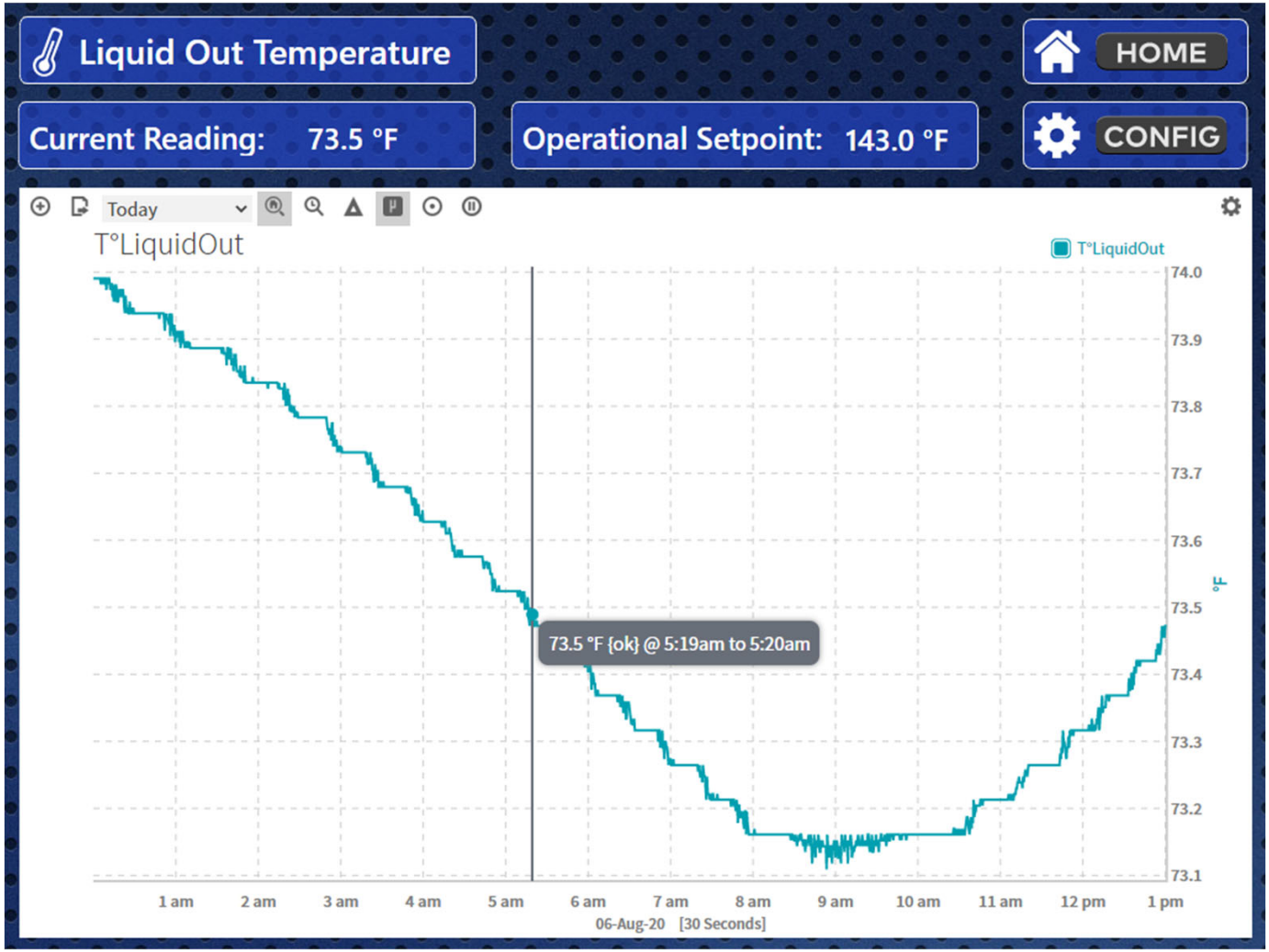
Maxi-Therm is a constant steam pressure design therefore no vacuum breakers are required. A conventional method system must use vacuum breakers which allows air in to break the vacuum, during low loads, cooler condensate absorbs the air which leads to return line corrosion.

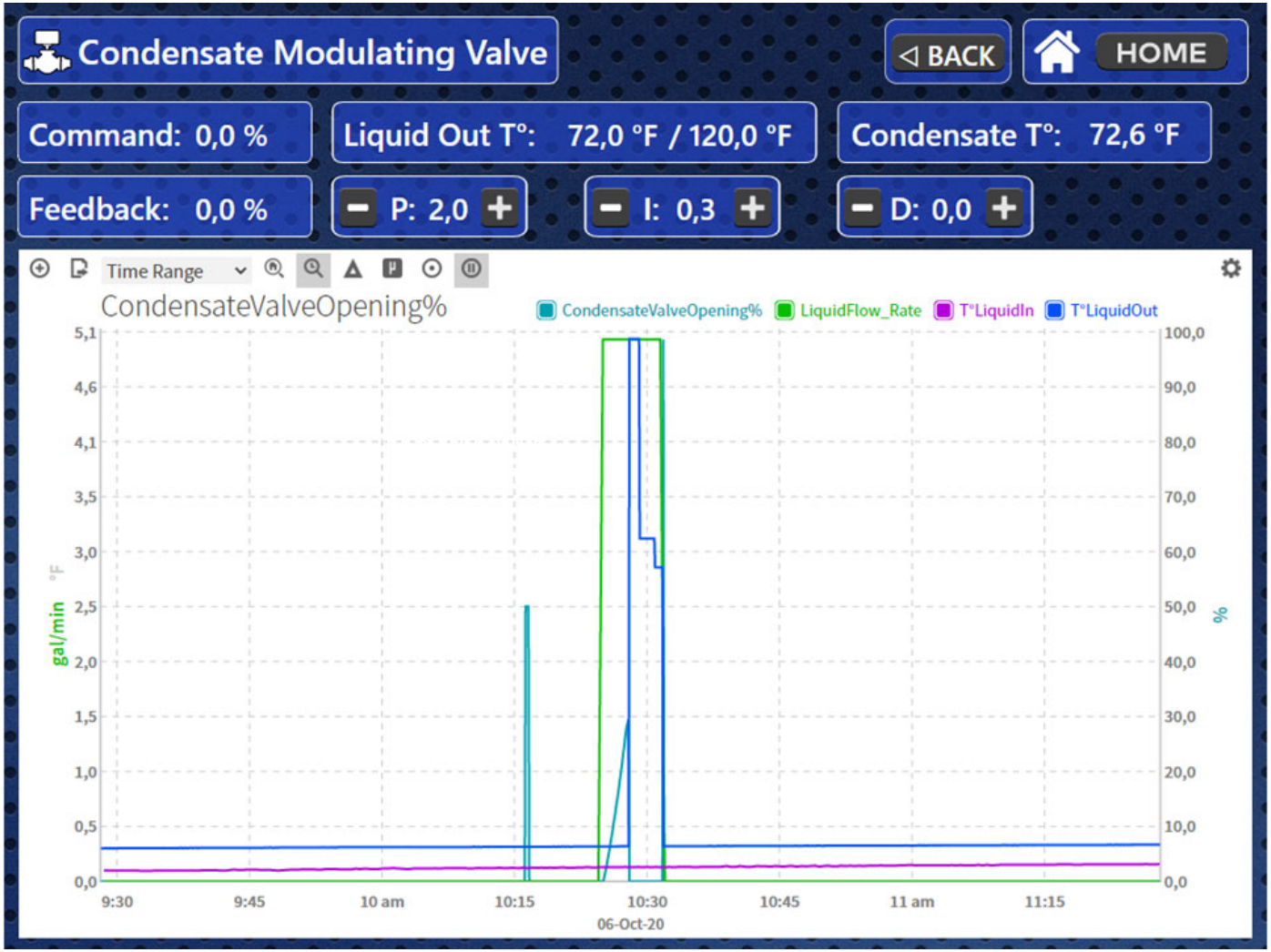
	Maxi-Therm	**Conventional**
Metallurgy	Black Iron	Black Iron
Days exposed	94	94
Corrosion MPA (Mills per year)	2.36	14.63


Machine State
OPERATION
ON
maxi·therm
beyond steam™
Alarm Count
0
Warning Count
0
VIEW CONSOLE
Current User
tech
LOGOUT
Command Source
Local
Options
CONFIG
Liquid Out Setpoint
120 °F
SET
Steam Pressure
129 psig
Main Steam Valve
OPEN
Condensate Valve
43 %
Warm Up Valve
CLOSED
Condensate T°
110 °F
Liquid Out T°
120 °F
Liquid In T°
107 °F
Liquid Flow Rate
877 gpm
kBTU/h
5518
Stabilizing Pump
ON


maxi·therm™
Current User
admin
LOGOUT
Command Source
Local
System Options
CONFIG
Liquid Out Setpoint
117 °F
SET
ON
OFF
Circulating Pumps
Liquid In
VIEW PUMPS
OFF
ON
Standby
Standby
Heat Exchanger A
Heat Exchanger B
Machine State
OFF
Steam
CLOSED
CLOSED
-1 psi
0 psi
VIEW HX-A
VIEW HX-B
A
85
gpm
B
101
gpm
0%
Condensate
0%
103 °F
101 °F
105 °F
112 °F
100 °F
-67 °F
Liquid Out
OFF
CLOSED
OFF
CLOSED
Liquid to Drain
Stabilizing Pumps Return
Liquid to Drain


Circulating Pumps Module
OFF
ON
HOME
Command Source
Local
VFD %
50 %
SET
Pump A
Pump B
Status
Standby
VFD %
0.0 %
Feedback
OFF
Fault
Normal
Alarm
Normal
RESET
Toggle
Enabled
Disable
Status
Standby
VFD %
0.0 %
Feedback
OFF
Fault
Normal
Alarm
Normal
RESET
Toggle
Enabled
Disable
Time Until Shift
7 days
Manual Shift
Rotation Interval
168.0 Hours
SET
Lead Load
Pump A
Next Load
Pump B

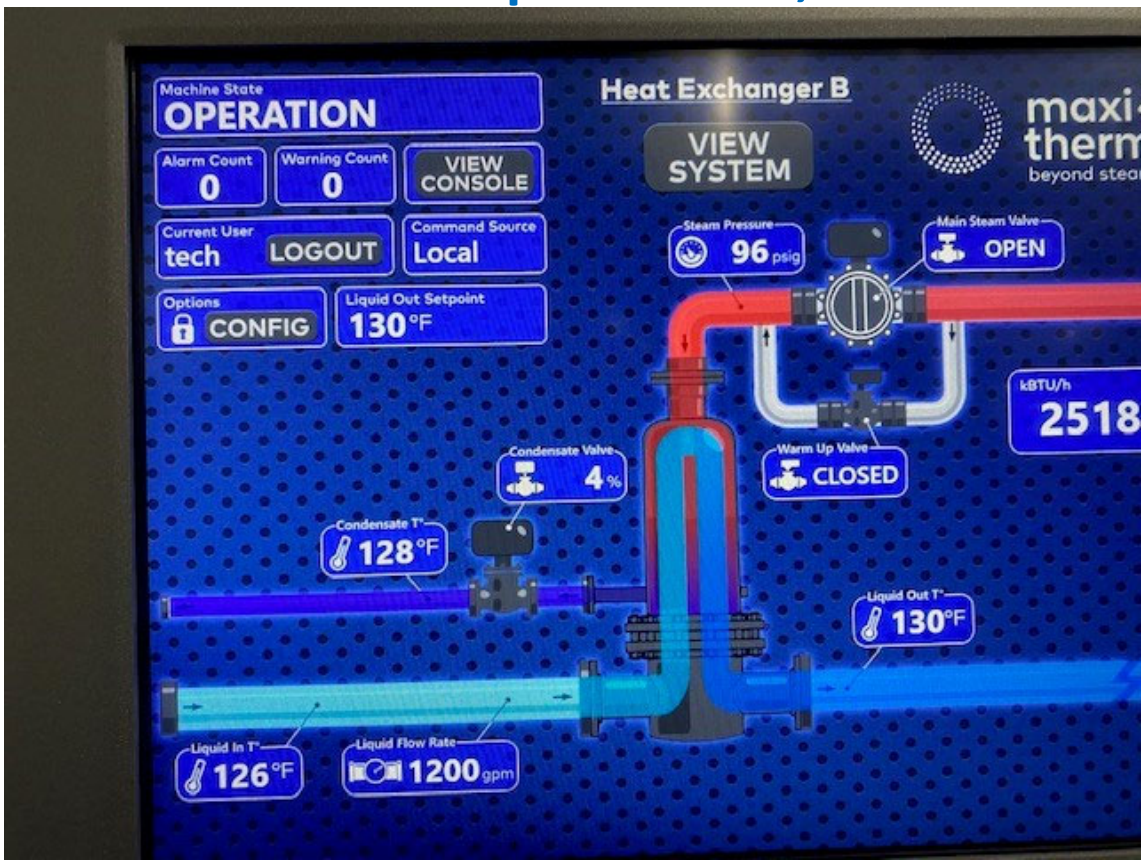

Liquid Out Temperature
HOME
Current Reading: 73.5 °F
Operational Setpoint: 143.0 °F
CONFIG
Today
T°LiquidOut
T°LiquidOut
74.0
73.9
73.8
73.7
73.6
73.5
73.4
73.3
73.2
73.1
°F
73.5 °F {ok} @ 5:19am to 5:20am
1 am
2 am
3 am
4 am
5 am
6 am
7 am
8 am
9 am
10 am
11 am
12 pm
1 pm
06-Aug-20 [30 Seconds]


Condensate Modulating Valve
BACK
HOME
Command: 0,0 %
Liquid Out T°: 72,0 °F / 120,0 °F
Condensate T°: 72,6 °F
Feedback: 0,0 %
P: 2,0
I: 0,3
D: 0,0
Time Range
CondensateValveOpening%
CondensateValveOpening%
LiquidFlow_Rate
T°LiquidIn
T°LiquidOut
gal/min
°F
%
5,1
4,6
4,1
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
100,0
90,0
80,0
70,0
60,0
50,0
40,0
30,0
20,0
10,0
0,0
9:30
9:45
10 am
10:15
10:30
10:45
11 am
11:15
06-Oct-20

Northshore hospital NY, 17 MMBTU

Northshore hospital NY, 17 MMBTU

Northshore hospital NY, 17 MMBTU




MADE in NORTH AMERICA
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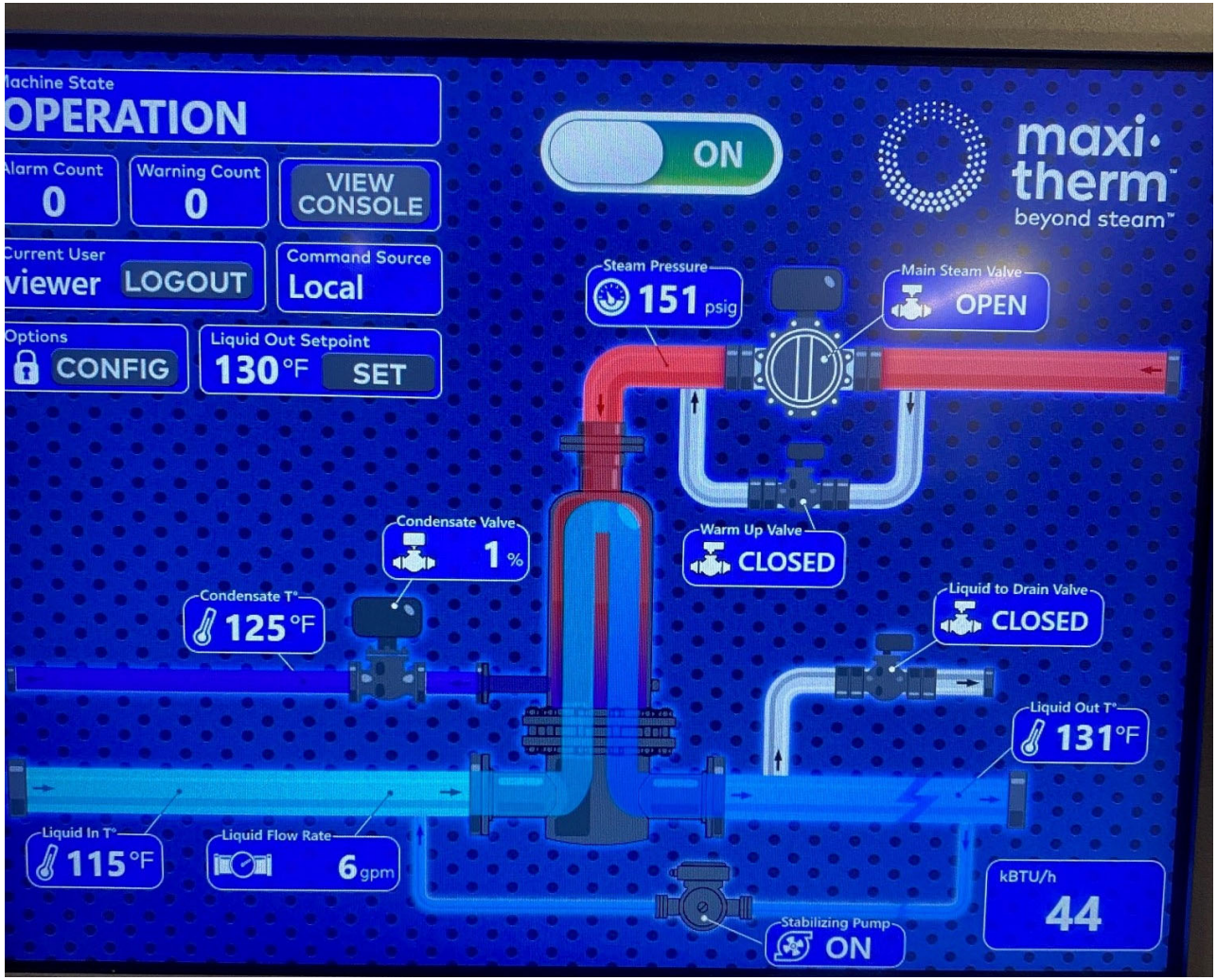
Machine State
OPERATION
Alarm Count
0
Warning Count
0
VIEW CONSOLE
Current User
viewer
LOGOUT
Command Source
Local
Options
CONFIG
Liquid Out Setpoint
130 °F
SET
ON
maxi-therm
beyond steam™
Steam Pressure
151 psig
Main Steam Valve
OPEN
Condensate Valve
1 %
Warm Up Valve
CLOSED
Condensate T°
125 °F
Liquid to Drain Valve
CLOSED
Liquid Out T°
131 °F
Liquid In T°
115 °F
Liquid Flow Rate
6 gpm
kBTU/h
44
Stabilizing Pump
ON

VPN Router: Remote Access

FIREWALL FRIENDLY OUTBOUND CONNECTION

Outbound Internet connection across the factory LAN using port 443 (HTTPS) or UDP 1194. Easy to set up with no firewall issues and only access to the machine LAN.

INTEGRATED WIFI, CELLULAR CONNECTIVITY

WiFi and cellular modems allow Internet connectivity where factory/corporate LAN network is not available. They offer free access, high bandwitdh, easy deployment (no cabling) and facilitates security network management.

SECURE VPN CONNECTIVITY

Fully secure SSL-based VPN tunnel. The information exchanged during the communication is encrypted (SSL - 2048-bit keys) and only authenticated users can connect to the eWON.


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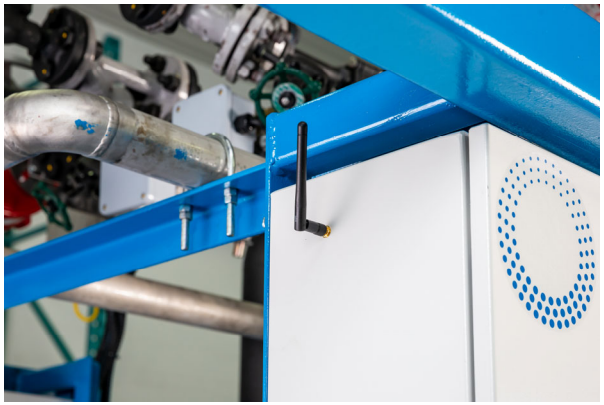
beyond steam
Designed & Built with & Products & Patented Technology




Heat Exchanger B
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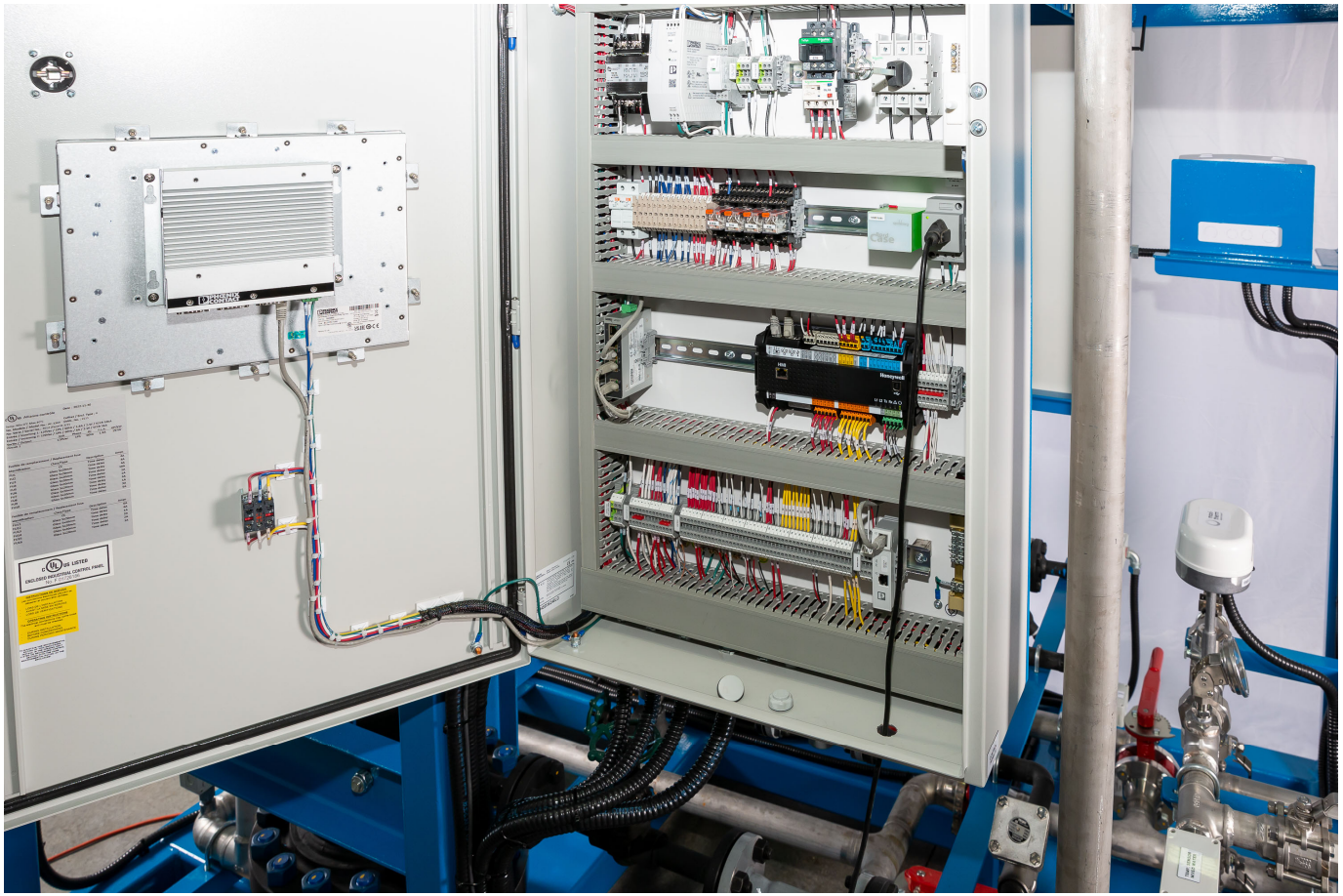
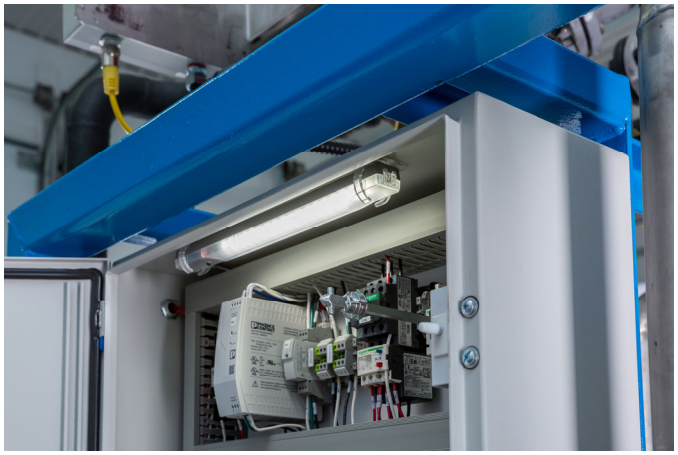
therm






Allen-Bradley

BUILDING HEAT BASE UNIT

Capacity : 550 usgpm of 40% propylene glycol from 146 to 180°F using 125 psig steam. Overall dimensions (L x W x H): 76” x 51” x 76”

BUILDING HEAT BASE UNIT

Capacity (each) : 2200 usgpm of water from 150 to 180°F using 125 psig steam.

Overall dimensions (L x W x H): 87’’ x 46’’ x 99’’

BUILDING HEAT BASE UNIT

Capacity : 720 usgpm of water from 165 to 190^{o}F using 40 psig steam.

Overall dimensions (L x W x H): 75” x 42” x 70”

BUILDING HEAT BASE UNIT

Capacity (each): 1900 usgpm of water from 93 to 120°F using 80 psig steam.

Overall dimensions (L x W x H): 89’’ x 52’’ x 86’’

BUILDING HEAT BASE UNIT

Capacity (each): 935 usgpm of water from 160 to 180^{o}F using 150 psig steam.

Overall dimensions (L x W x H): 83’’ x 36’’ x 101’’


MAXI
THERM
maxi-therm.ne

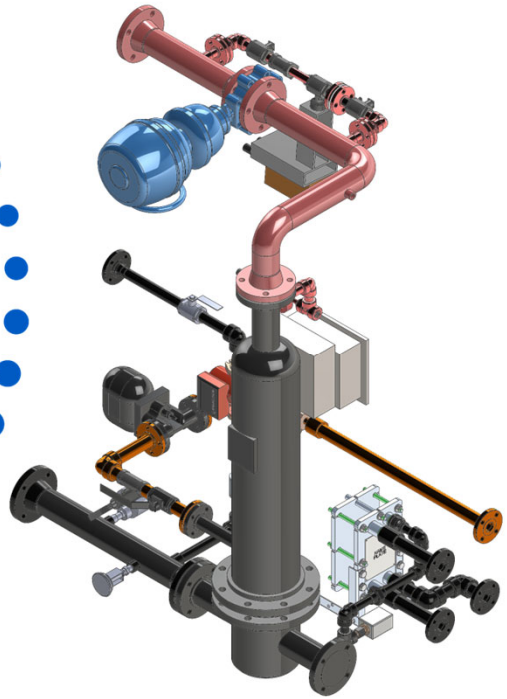
BUILDING HEAT UTLIMATE PACKAGE
Capacity : 900 usgpm of 40% propylene glycol, 220’ of head, from 120 to 185°F using 175 psig steam. Overall dimensions (L x W x H): 156’’ x 76’’ x 151’’

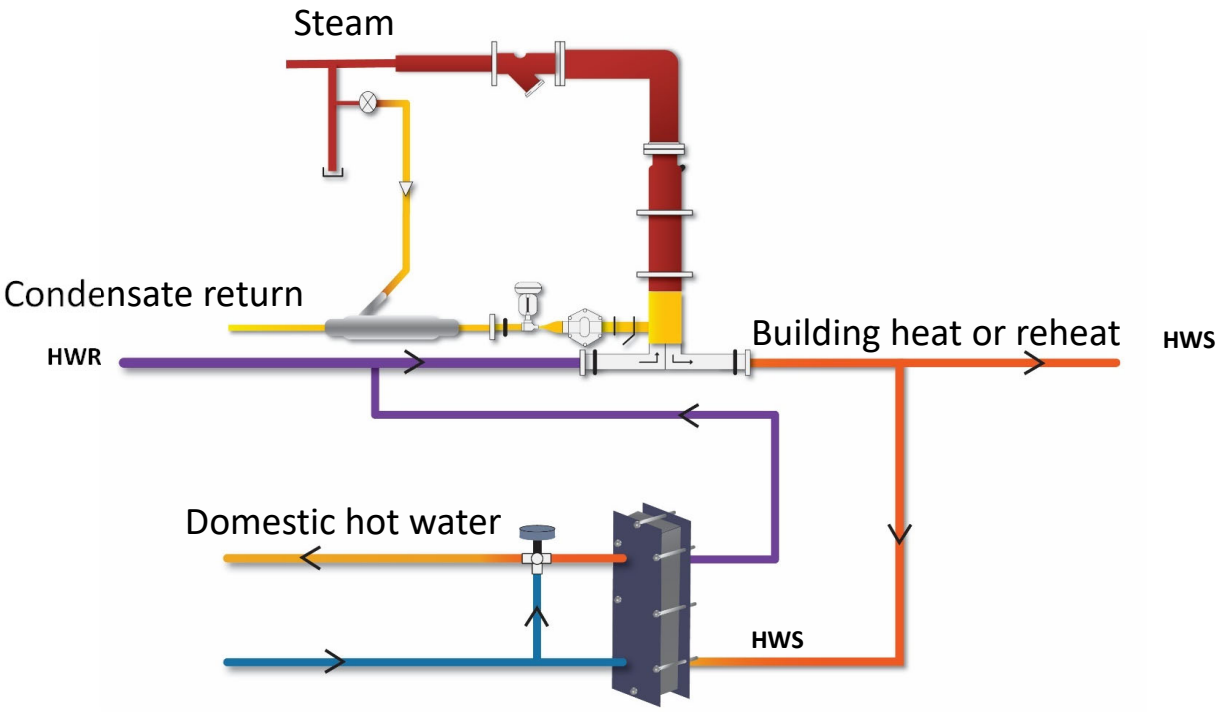

maxi-therm.net

When a building owner purchases a complete package, he should have access to 100% depreciation on his capital investment.

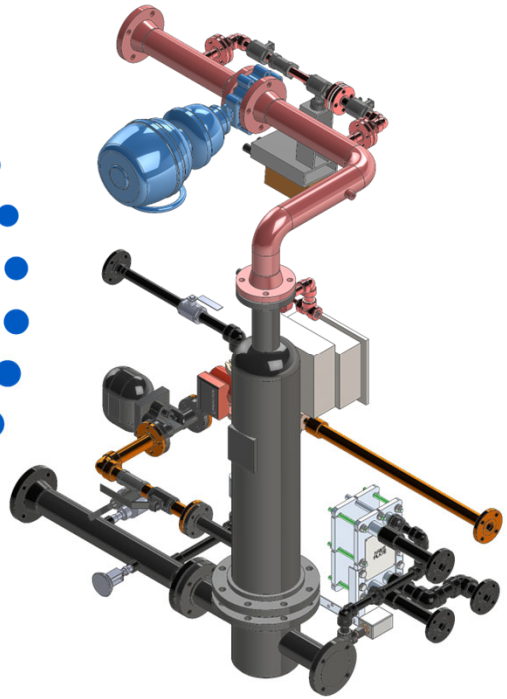
If he purchases the material, he will not have benefit of the offsite labor included in the skidded package.

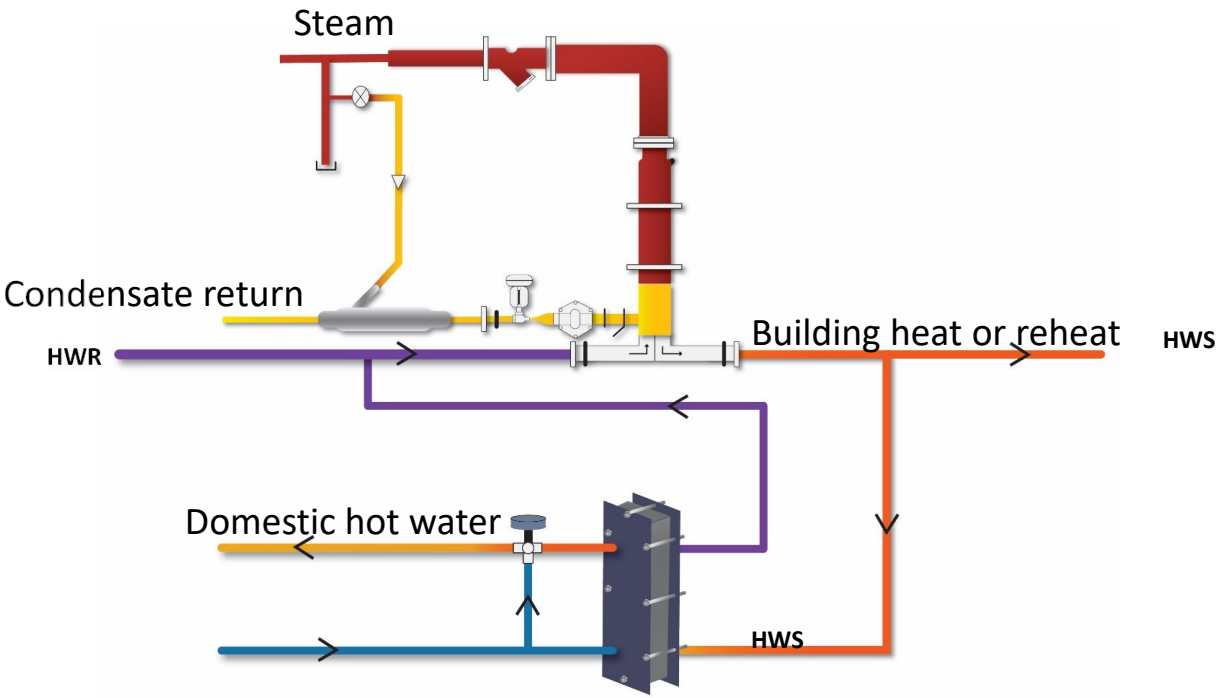
SideArm Series

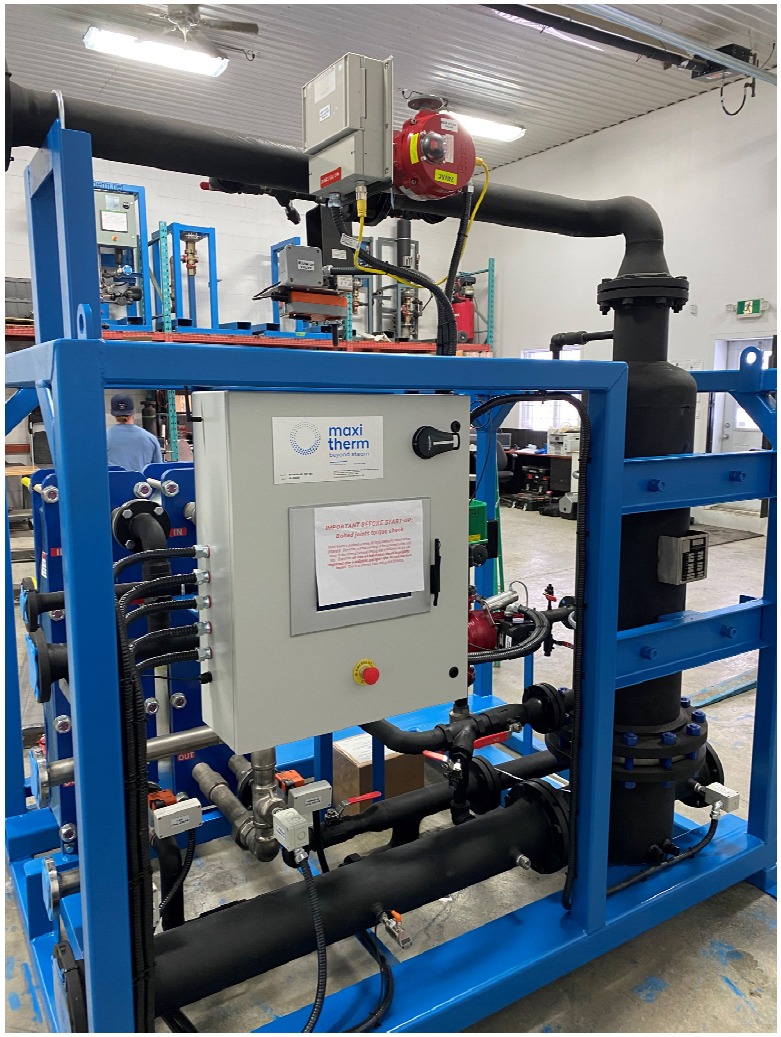


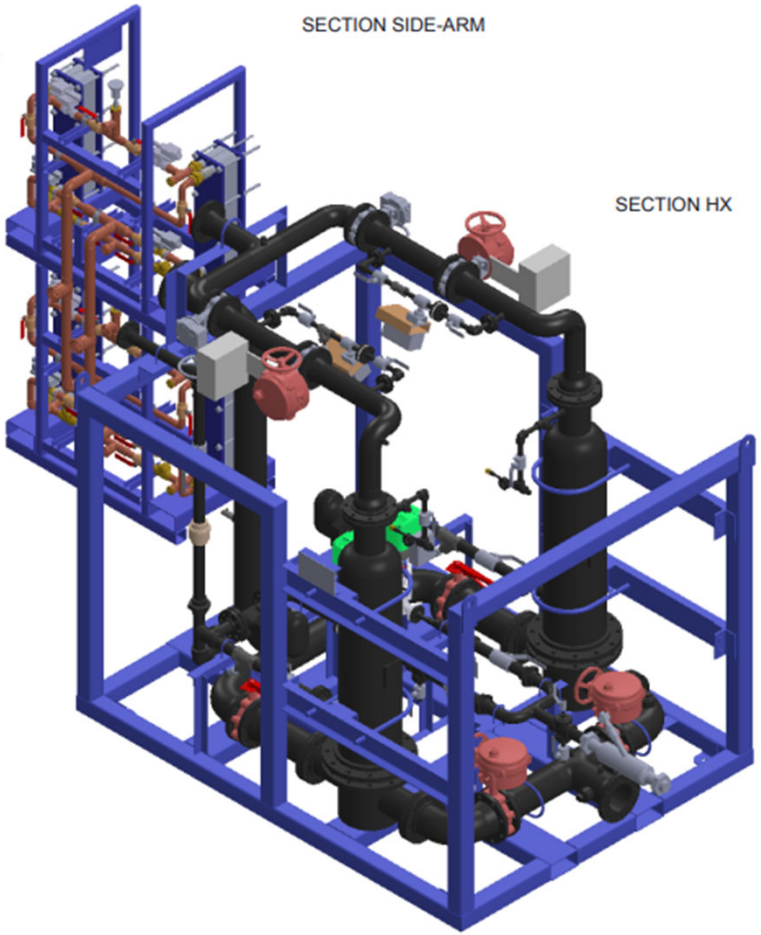


SideArm Series



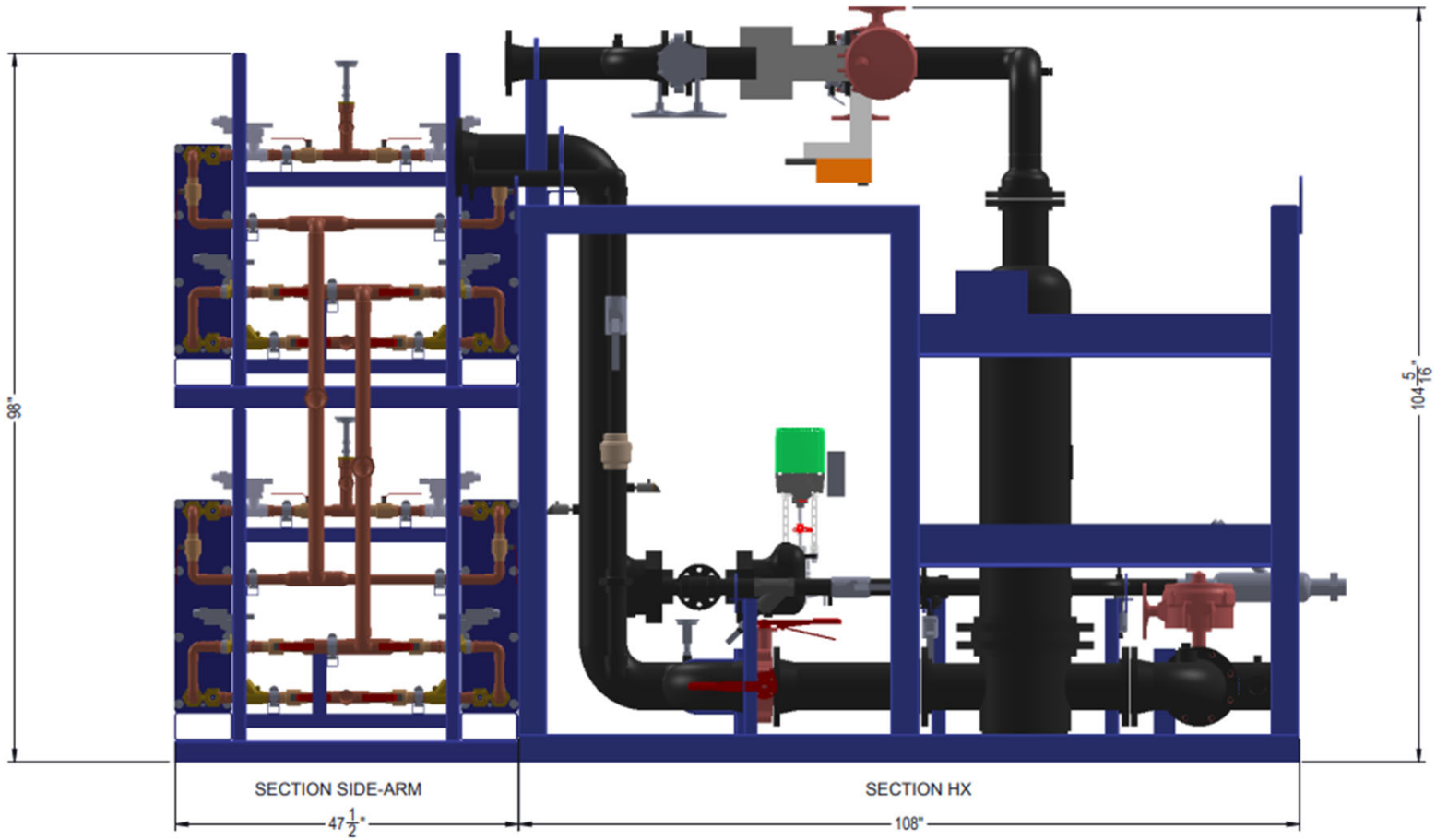


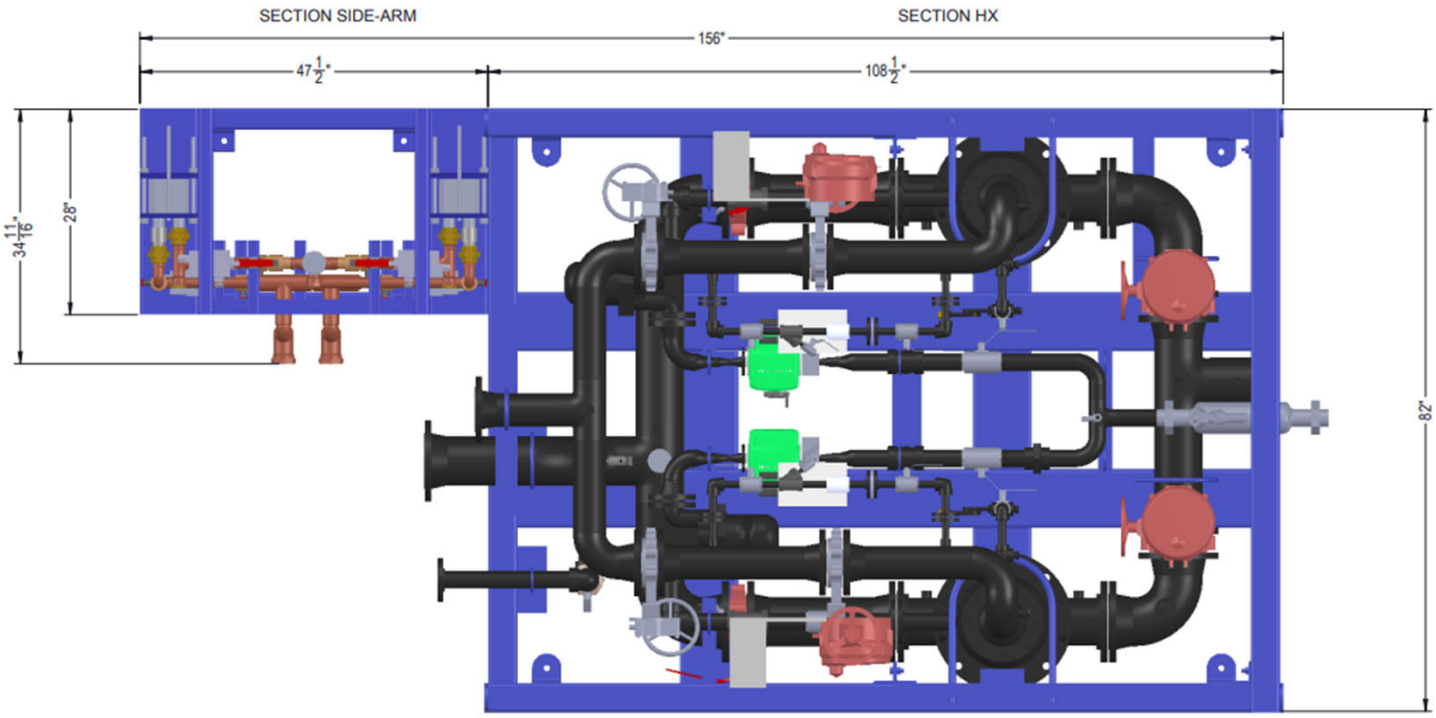

maxi
therm



6 MMBTU/HR, 180 HP Steam fired boiler.

Zerolag with redundant Sidearm to provide 48 GPM (2,4 MMBTU each) of domestic hot water for 2 different zones


98"
104 5/16"
SECTION SIDE-ARM
47 1/2"
SECTION HX
108"



TOP PLAN

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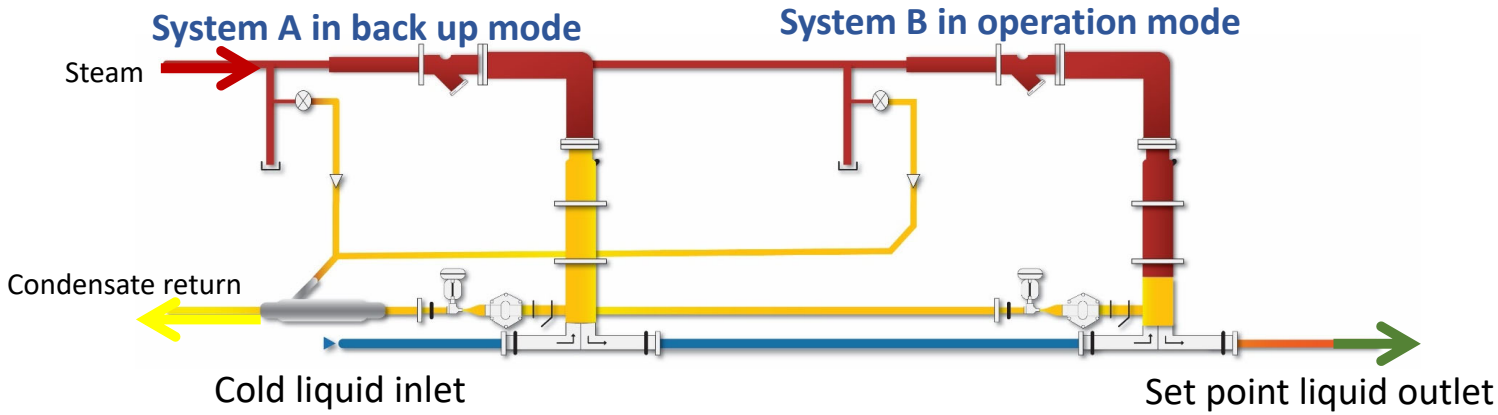
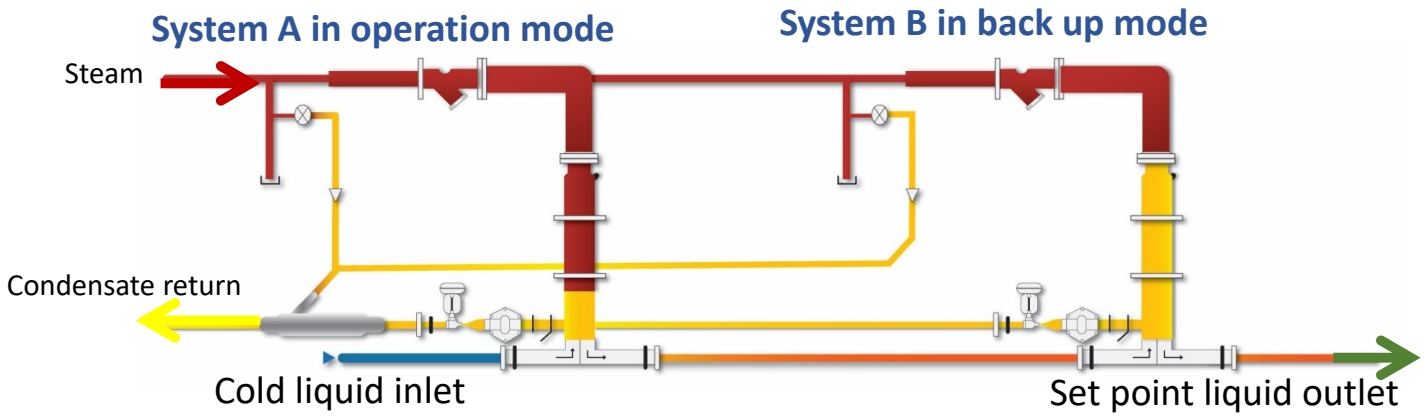
Zerolag Duplex Series

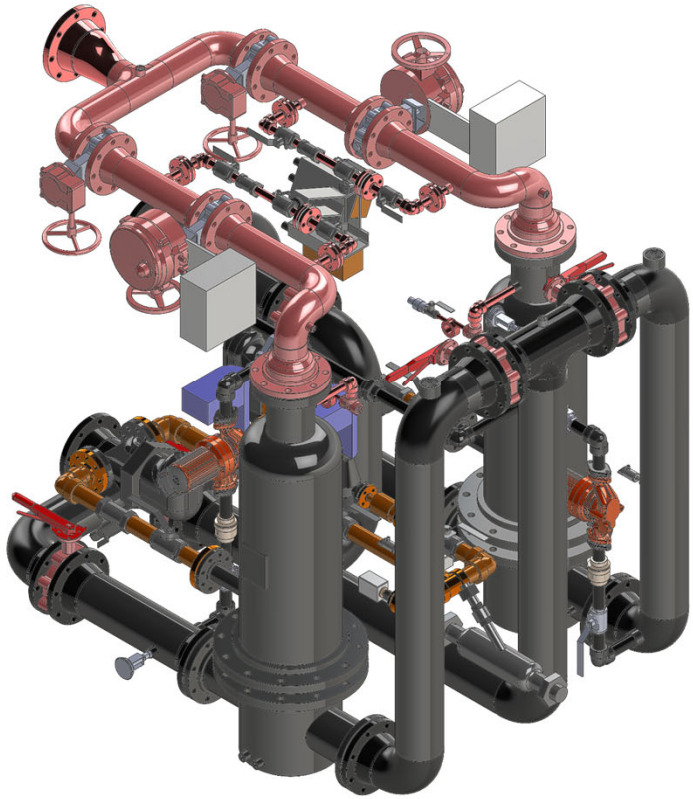
Steam is ON on Both System!



Zerolag Duplex Series



Zerolag Duplex Series



OPERATES IN SERIES

- Accurate Temperature Control
- ZERO Downtime on Alarm Shutdown
- No Thermal Stress due to Lead-Lag
- Second Unit is Always ON
- Less Potential Leaks on Gaskets
- Integrated Control BacNet-ModBus
- Very Smooth Operation. No Noise

Duplex ZeroLag™ Features:

Lifting Logs.

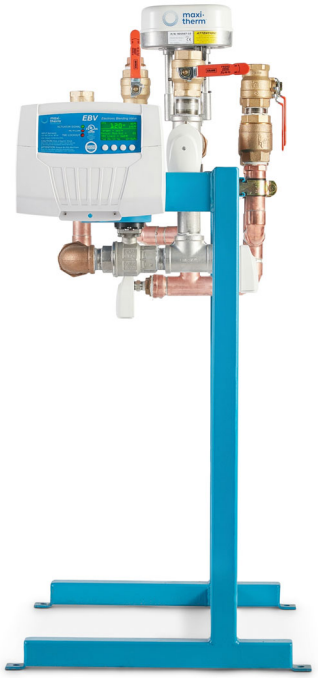
Removable brackets & beams.

Anchoring pads

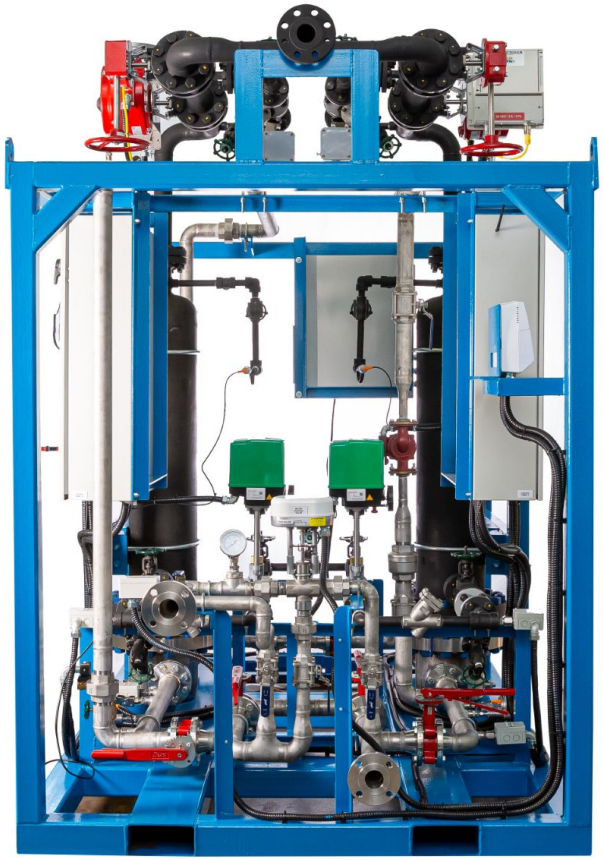
Forklift Channel

ZeroLag™ offers
peace of mind!

EBV Station



Zerolag double wall with EBV station for DHW



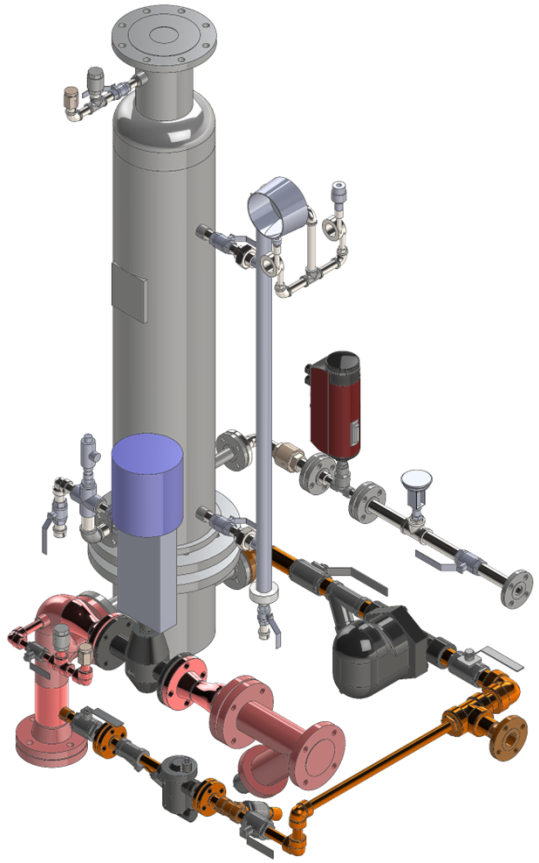
PFFF Series

Saving over $240,000 in install costs

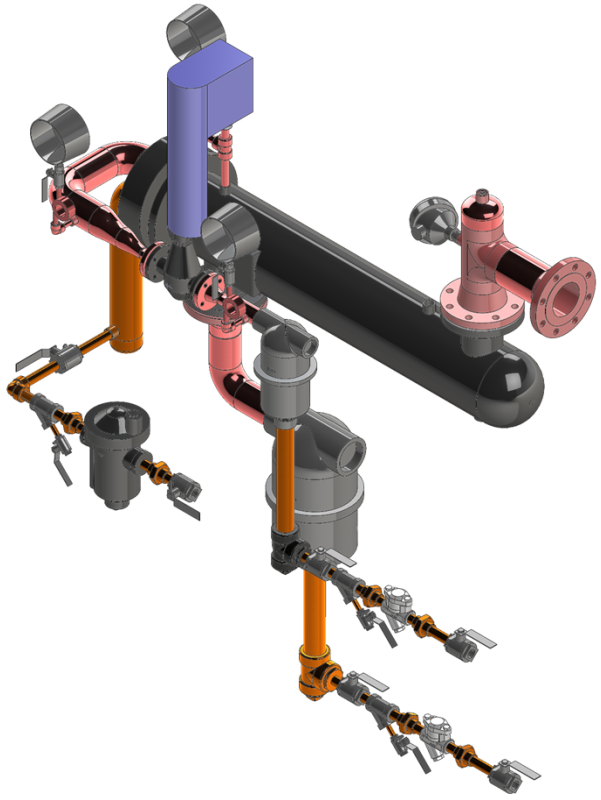
Whiting-Turner reviewed the original mechanical contractor proposal with the original scope, and compared it with the Maxi-Therm proposal, including the work of the local mechanical contractor. After review, Whiting-Turner showed a saving in total installation costs of over $240,000.

maxi therm
beyond steam™

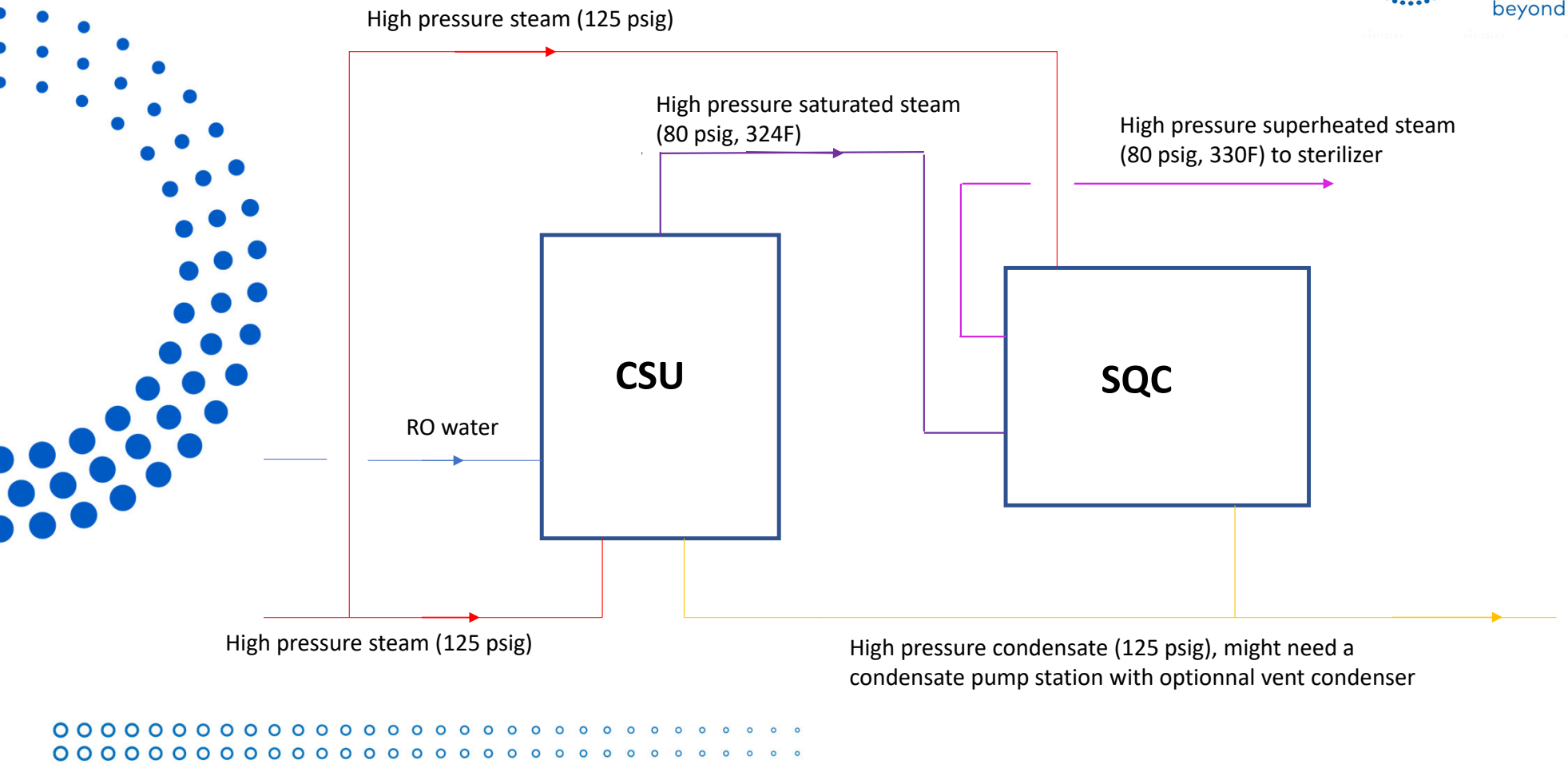
CSU
Clean Steam Generator



SQC
Steam Quality Controller



Clean Steam Generator Unit with Steam Quality Controller



BENEFITS OF USING STEAM ENERGY

Steam is visible, non-flammable, non-toxic, has no electric shock hazard.

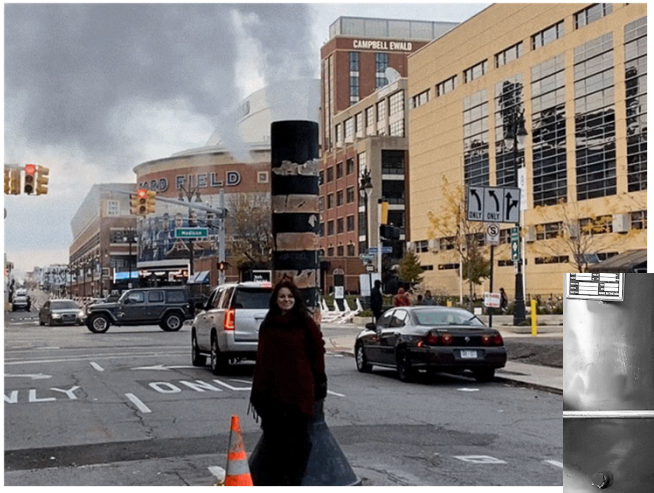
Steam is safe and reliable. When a steam leak happens, it's never an emergency.

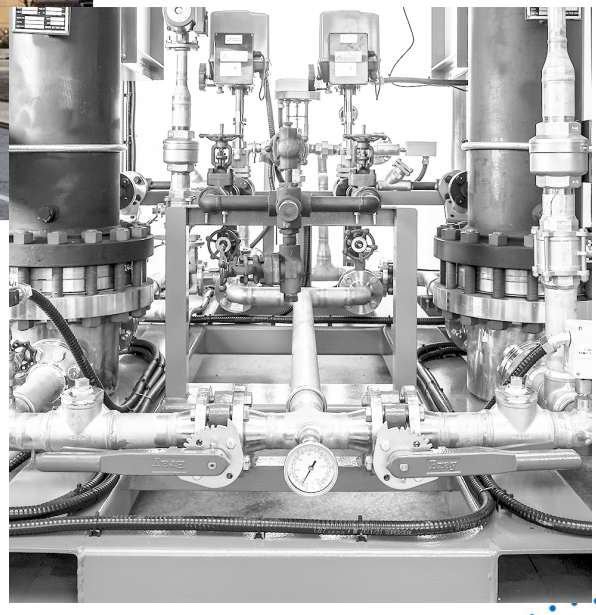
Steam is easy to transport with no pumps, up to 10,000 FPM vs 600 FPM for 1 pound of water.

Possibility to have a building with NO VENTS,
NO CHIMNEY using steam district energy for heating.

Steam can be used for heating and cooling using technologies proven for over 100 years.

High reliability with long lifespan which decreases total cost of ownership.





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BENEFITS OF USING STEAM ENERGY

Low condensate temperatures allow for the use of non-metallic (PEX) piping returning to the powerhouse and reduce radiant heat loss.

Possibility of having a condensing steam boiler with 95% steam generation efficiency.

One pound of steam contains 1,000+ BTUs. How much for the same pound of water?

Steam only needs a small pump for boiler feed, uses less than one-tenth the pumping energy of a comparable hot water loop.

When using heating and cooling district energy, buildings don't need boilers with chimneys and chillers with cooling towers. Only heat exchangers!

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BENEFITS OF USING STEAM ENERGY

Steam turbines can generate electric power, and can also run pumps and fans.

You can generate steam from multiple green source fuels such as biomass, biogas, solar, hydrogen, nuclear, waste-to-energy
or an unknown future fuel.

Carbon capture is easier to consider with a central steam plant, especially including cogeneration with a steam distribution system for heating and cooling.

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World class laboratory and seminars