High Temp Heat Pumps for Space & DHW Applications

Moderator: Austin Crosby / *LaBella Associates*

Panel: Chris Ebener / *Nyle Water Heating Systems*

Gannon Dubay / *Trane*

Ian Motley / *Oilon/MPN*

Geoff Cullen / *G.A. Fleet Associates*

nyle water heating systems

Presented by:
Chris Ebener

Purpose Built Water Source Heat Pumps

HIGH TEMPERATURE WATER HEATING

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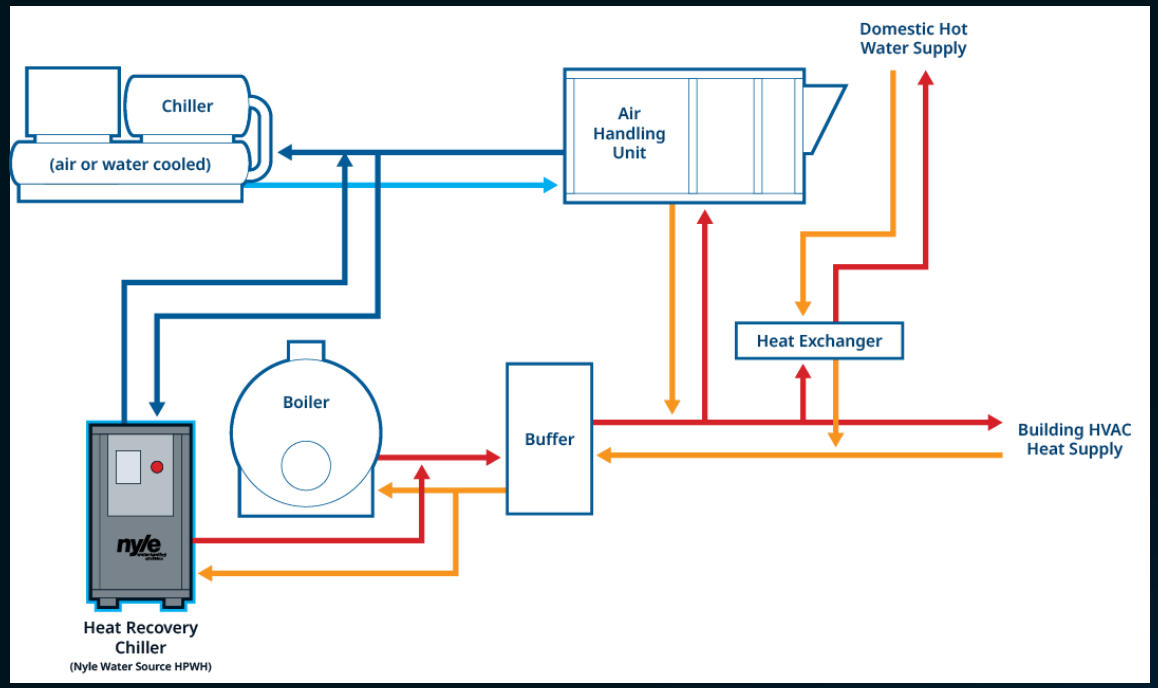
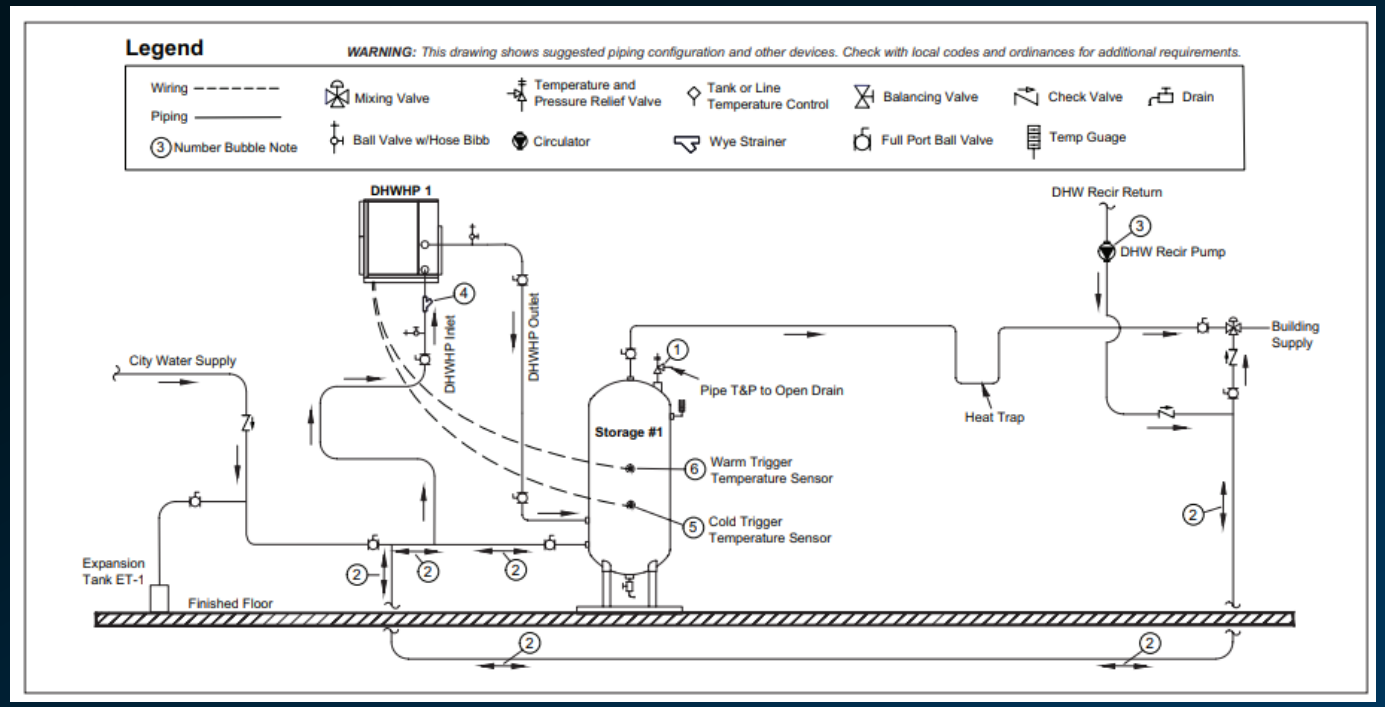
160F + Hydronic Heat Pumps



Space Heating

Domestic Water Heating



nyle water heating systems

| Made in Maine Since 1977

nyle water heating systems

Heat. Easy.

Plumbing

Self contained, modular design includes

- NSF61 on all DHW units
- Pumps
- Control Valves
- Check Valves
- Controls
- Internal Heat Traced plumbing and condensate standard
- Specialty tanks and fully packaged solutions available

Mechanical

All data publicly accessible for all products

- Spatial including Revit families and 3D files
- Access clearances, 24” for technician access 36” for NEC subject to local AHJ
- Center of mass, plumbing and electrical connection points
- Pump head at max flow
- Full capacity DHW load at lowest design source temp, 22 hour or less run time. Adjustments can be made based on hybrid, part load, or heat recovery calcs.
- Stackable or zero side clearance

Electrical

Fully accounted connected loads

- Pump power included
- Active Power Monitoring standard
- SCCR 100 Standard
- UL 60335-40 and UL-508

Controls

Dedicated Programming and Operations Manuals and unified software

- BACnet/MSTP support for individual units and centrally staged arrays
- Self contained control systems and cascade controls for arrays up to 50 units

LOW GWP REFRIGERANT

NON-FLAMMABLE GAS 2

SBA U.S. Small Business Administration

neea

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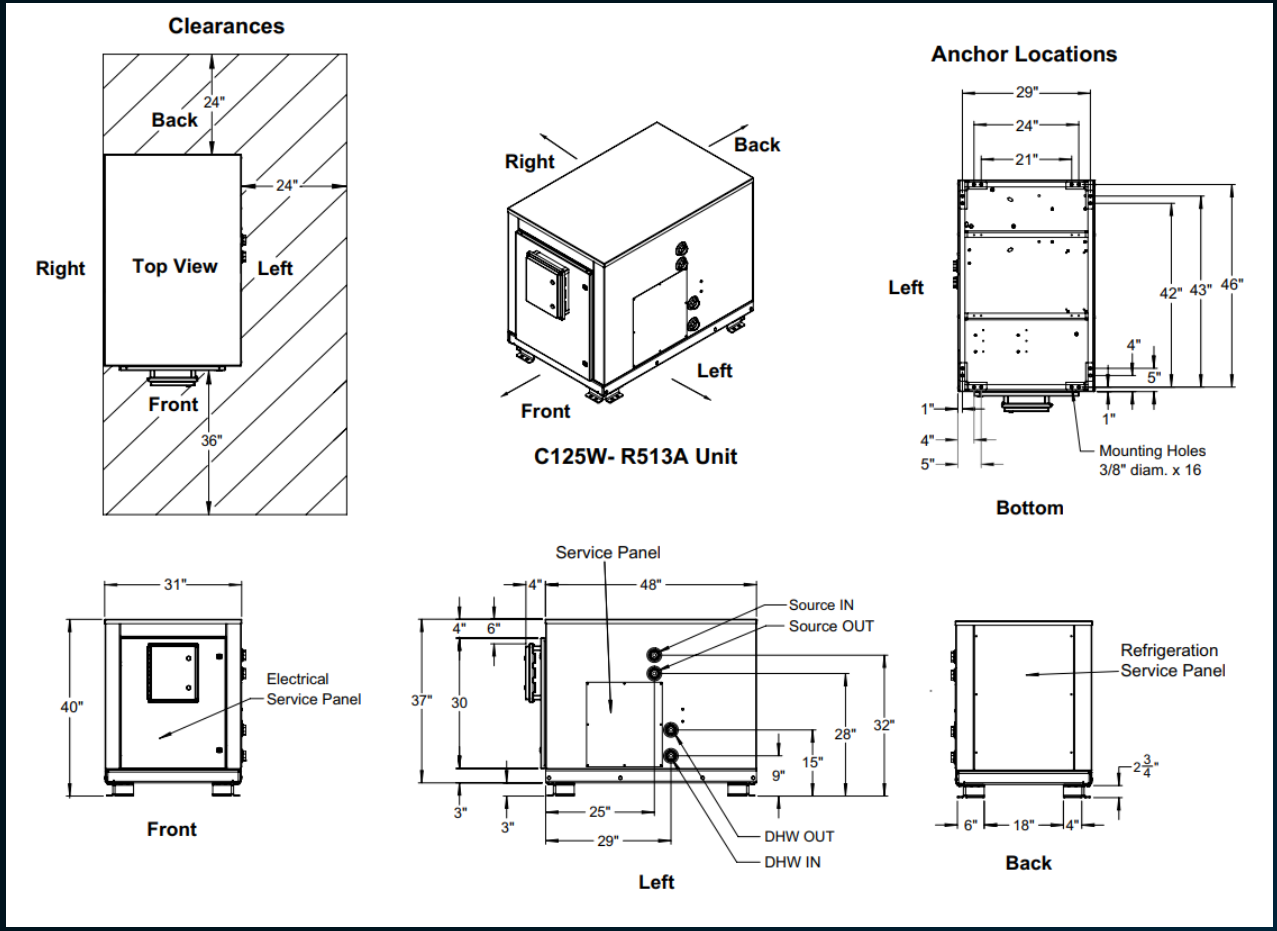
BABA BUILD AMERICA, BUY AMERICA ACT

C125W/C185W | Compact, Zero Top Clearance



Unit Specifications	Single Pass	Multi Pass
DHW Water Connections	1½" FPT Copper	
Source Water Connections	1¼" FPT Copper	
DHW Design Water Flow Rate	12.0 GPM	20.0 GPM
Source Water Flow Rate	23 GPM	
DHW Water Circuit Pressure Drop [1]	7.1 ft hd	8.4 ft hd
DHW Water Circuit Cv Value [1]	7.0	11.0
Source Water Circuit Pressure Drop	13.9 ft hd	
Source Water Circuit Cv Value	9.0	
DHW External Head Allowance [2]	9.7 ft hd	13.4 ft hd
Minimum Cold Cycle Volume [4]	61.0 Gal.	
Minimum Warm Cycle Volume [5]	N/A	171 Gal.
Minimum Tank Volume [6]	N/A	427 Gal.
Nominal DOE Capacity	137,160 BTUs/hr	
Nominal DOE Performance	4.4 COP	
Recovery Rate [3]	233 Gal/hr	
Compressor Type	Scroll	
Refrigerant	R513A	
Factory Charge	14 lbs.	
Max Water Temp	160°F	
Max Working Pressure DHW	150 psig	
Max Working Pressure Source	300 psig	
Source Water Operating Range	35° - 120°F	
Minimum Ambient Exposure	33°F	
Dimensions	52" L x 31" W x 40" H	
Sound Pressure [7]	Front: 63.9 dB, Left: 66.8 dB, Right: 65.9 dB, Rear: 65.7 dB	
Weight	Dry 649 lbs. / Operating 667 lbs.	
Salt Spray Resistance Cabinet/Evap	1000 hours	

Electrical Specifications		
Main Power Input	208-230/3/60	460/3/60
Minimum Circuit Ampacity (MCA)	64	30
Minimum Overcurrent Protection (MOCP)	110	50
Rated Load Amps (RLA)	52	25
Short Circuit Current Rating (SCCR)	100	
Internal Component Data		
Compressor Locked Rotor Amps (LRA)	300	150
Compressor Horsepower (HP)	10	

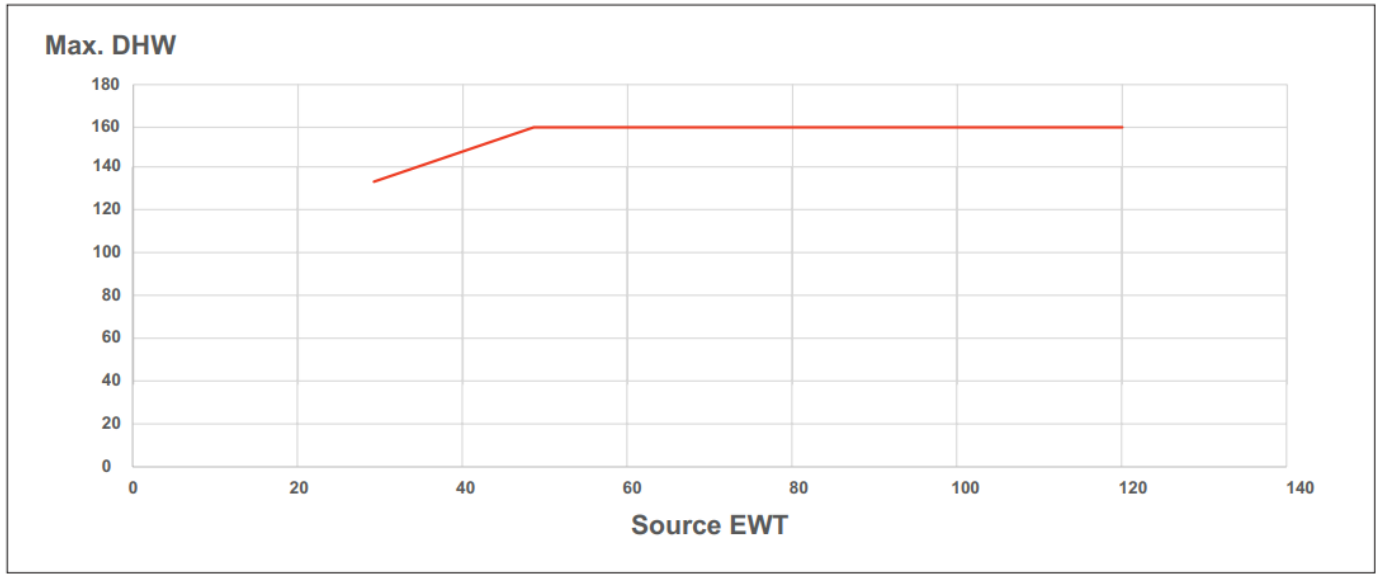
nyle water heating systems

C125W/C185W | Compact, Zero Top Clearance

Test Conditions: 50 EWT, 140 LWT, 100% Water Source Side

Entering Source Water	Supply Heating Capacity (Btu/hr)	Source Cooling Capacity (Btu/hr)	Power Input (KW)	Heating COP	Cooling COP	Combined COP
90°F	143,600	108,456	10.3	4.1	3.1	7.2
80°F	129,000	93,515	10.4	3.6	2.6	6.3
70°F	114,400	78,574	10.5	3.2	2.2	5.4
60°F	99,700	64,898	10.2	2.9	1.9	4.7
50°F	85,000	51,221	9.9	2.5	1.5	4.0
40°F	77,200	45,468	9.3	2.4	1.4	3.9

Diagram 1: Source EWT - Maximum DHW LWT



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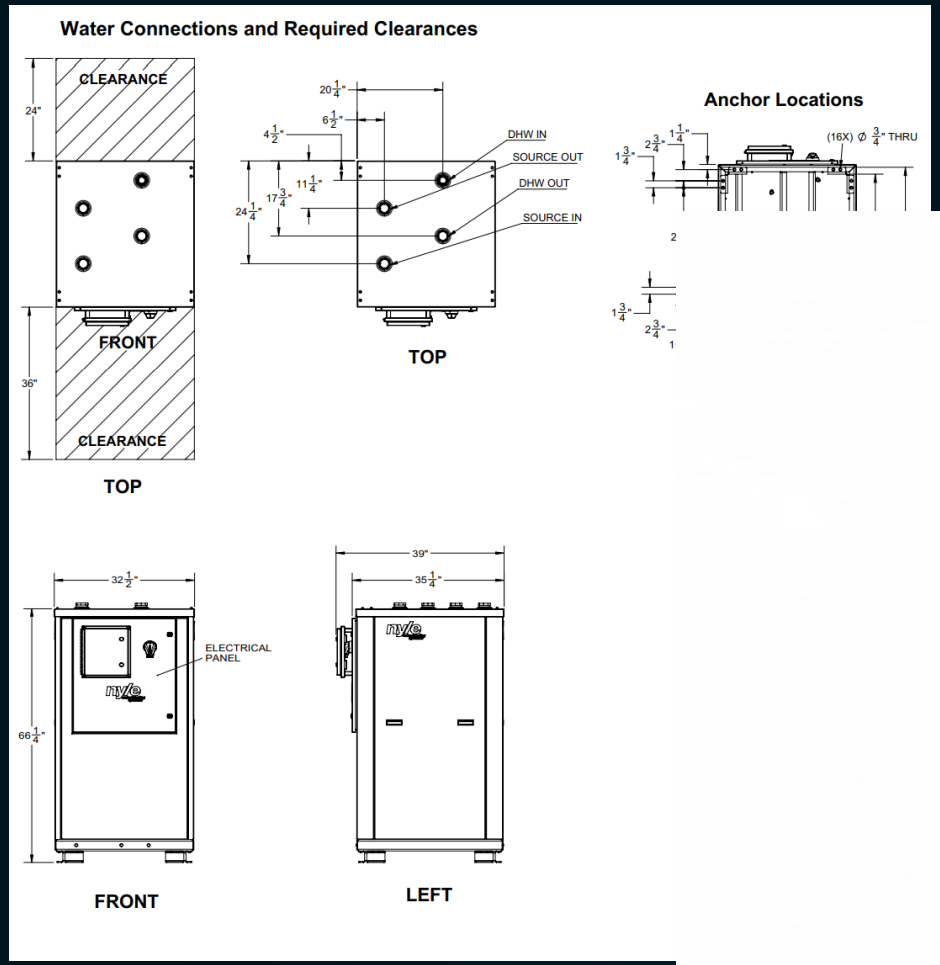
East End Lofts

Rochester, NY

An innovative and art-centered affordable housing property located in Newburgh's historic East End neighborhood. It offers 66 units, comprising 49 one-bedroom and 17 two-bedroom residences. Of these units, 40 are reserved for artists across all disciplines, reflecting a strong commitment to supporting Newburgh's creative community. The property uses 2 single pass C125W's paired with 960 gallons of storage and a swing tank.

C270WM | Zero Side Clearance, High Capacity



Unit Specifications	Single Pass	Multi Pass
DHW Water Connections	2" FPT Copper	
Source Water Connections	2" FPT Copper	
DHW Design Water Flow Rate	22.0 GPM	36.0 GPM
Source Water Flow Rate	48 GPM	
DHW Water Circuit Pressure Drop[1]	16.9 Ft. Hd.	7.4 Ft. Hd.
DHW Water Circuit Cv Value[1]	8	20
	11.1 Ft. Hd.	
	22	
	19.5 Ft. Hd.	18.7 Ft. Hd.
	119 Gal.	
	N/A	334 Gal.
	N/A	835 Gal.
	278,800	
	4.1	
	664 Gal./Hr.	
	Scroll	
	R513A	
	38.5 lbs.	
	175°F	
	150 psig	
	300 psig	
	35° - 120°F	
	33°F	
	32½" L x 39" D x 66¼" H	
	72.1 dB Front, 71.9 dB Left, 70.9 dB Right, 73.6 dB Rear	
	Dry 1074 lbs. / Operating 1113 lbs.	
	1000 hours	

	8-230/3/60	460/3/60	575/3/60
	108	55	38
	175	100	60
	88	45	30
Short Circuit Current Rating (SCCR)	100		
Internal Component Data			
Compressor Locked Rotor Amps (LRA)	605	272	238
Compressor Horsepower (HP)	25		

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C270WM | Zero Side Clearance, High Capacity

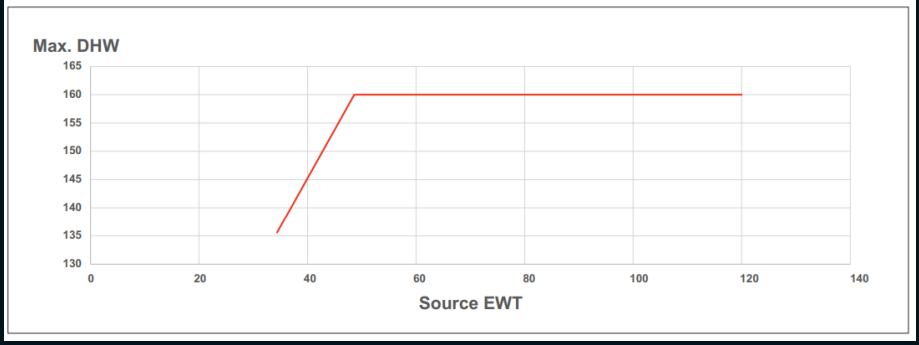

Table 4: C270WM High Temperature Performance Test Data: 160 EWT, 175 LWT, 100% Water Source Side

Unit Size	C270WM
Entering Source Water Range	90 – 100°F
Source Design GPM	60
Load Design GPM	39
Supply Heating Capacity (Btu/hr)	291,400
Source Cooing Capacity (Btu/hr)	178,122
Power Input (kW)	33.2
Heating COP	2.6
Cooling COP	1.6
Combined COP	4.1

Notes: Operation over 160 LWT requires the above adjustments to design flow rates, and restricts allowable source temperature ranges as shown. Requires Multi-pass HP. Source pressure drop increases to 17.2 Ft. Hd. Load side available head allowance drops to 17.4 Ft. Hd.

C270WM Single-pass Performance Test Data: 50 EWT, 140 LWT, 100% Water Source Side

Entering Source Water	Supply Heating Capacity (Btu/hr)	Source Cooling Capacity (Btu/hr)	Power Input (KW)	Heating COP	Cooling COP	Combined COP
90°F	280,400	203,630	22.5	3.7	2.7	6.3
80°F	253,600	178,536	22.0	3.4	2.4	5.8
70°F	226,900	153,542	21.5	3.1	2.1	5.2
60°F	200,600	129,460	20.9	2.8	1.8	4.6
50°F	174,400	105,478	20.2	2.5	1.5	4.1
40°F	152,200	87,031	19.1	2.3	1.3	3.7

C270WM Multi-pass Performance Test Data: 140 LWT, Design GPM, 100% Water Source Side

Entering Source Water	Supply Heating Capacity (Btu/hr)	Source Cooling Capacity (Btu/hr)	Power Input (KW)	Heating COP	Cooling COP	Combined COP
110°F	336,000	252,065	24.6	4.0	3.0	7.0
90°F	306,000	222,065	24.6	3.6	2.6	6.3
70°F	230,000	148,112	24.0	2.8	1.8	4.6
50°F	178,000	98,159	23.4	2.2	1.2	3.5
35°F	149,000	72,571	22.4	1.9	0.9	2.9

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Civic 66

Kitchener, ON

An 11-storey, mixed-use structure that brings 170 residential units to Kitchener's entertainment district. The building features a central courtyard, underground parking, fitness facilities and pet spa. As sustainability was a key consideration of the design, the structure is fixed with energy-efficient window glazing, electric vehicle charging stations and roof top solar panels that power the building and its geothermal heating and cooling system.

A multi-pass C1080 was paired with 950 gallons of storage to satisfy the primary domestic hot water demand AND the recirculation losses without a swing tank and has been operational since 2023.

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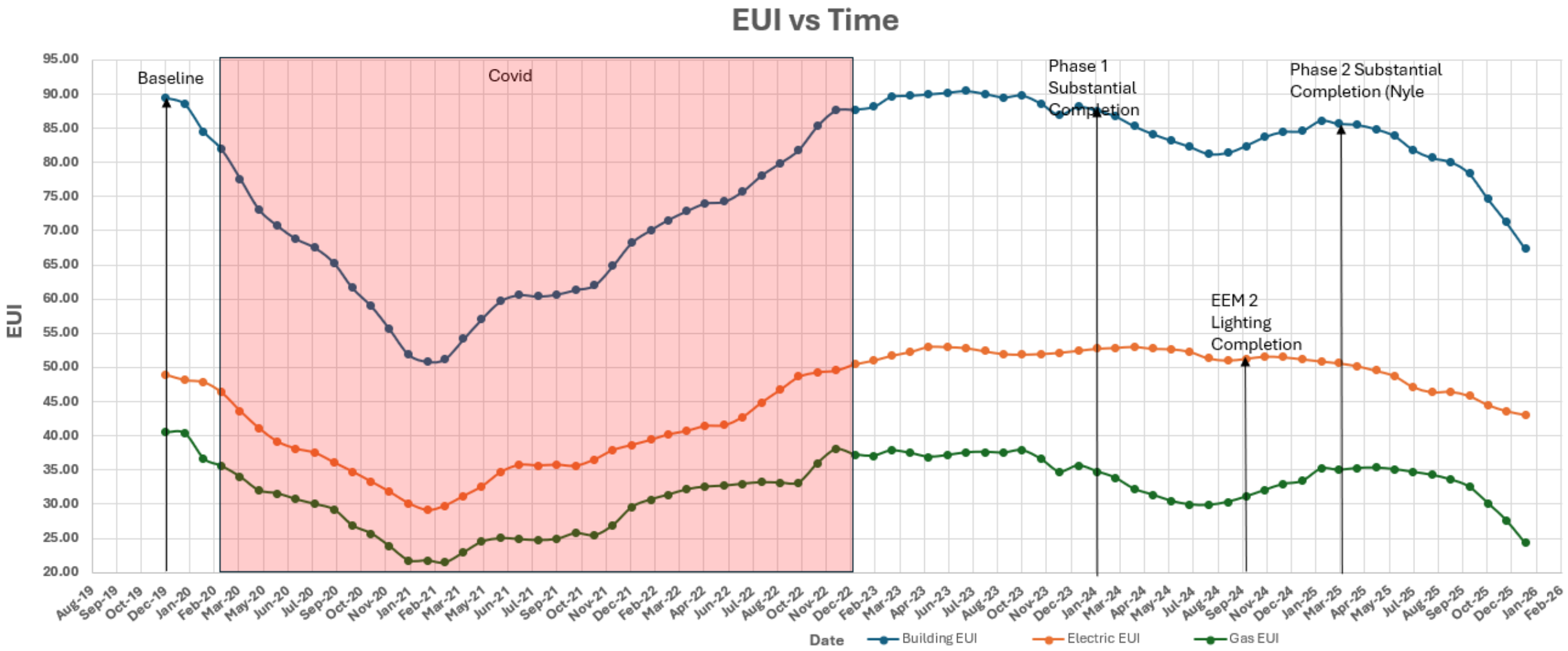
The Benefit of Return to Primary Heat Pumps



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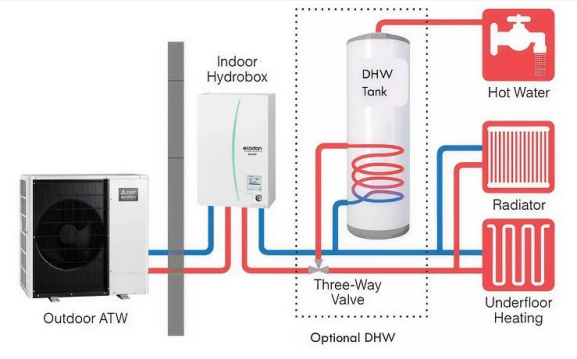
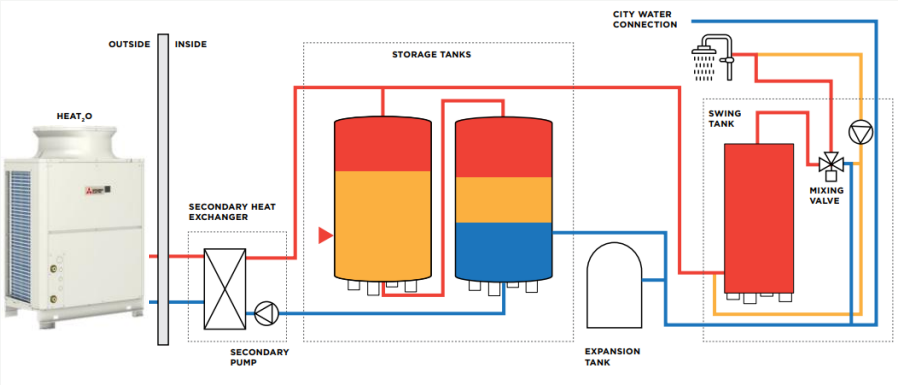
High Temp Solutions

Gannon Dubay, PE
Sustainable Systems Leader

1. Single High Lift Domestic
2. Single High Lift Space Heating
3. Dual Lift Cascade Systems

Domestic – Single High Lift





Air-Source Small – Ecodan DHW

- 158F LWT
- -22F ambient source
- R-32 refrigerant
- 4.74 COP

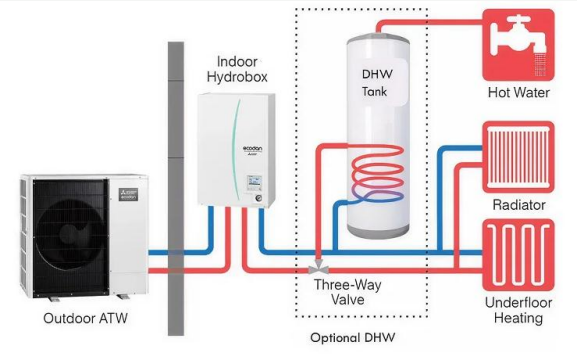
Air-Source Large – Heat2O

- 176F LWT
- -22F ambient source
- CO_2 refrigerant
- 4.52 COP

Water-Source – DHWHP

- 175F LWT
- 35F water source
- R-513A refrigerant
- 3.5-6.0 COP

Space Heating – Single High Lift



Air-Source Small – Ecodan Pro

- 158F LWT
- -22F ambient source
- R-32 refrigerant
- 4.74 COP

Air-Source Large – Ecodan CAHV

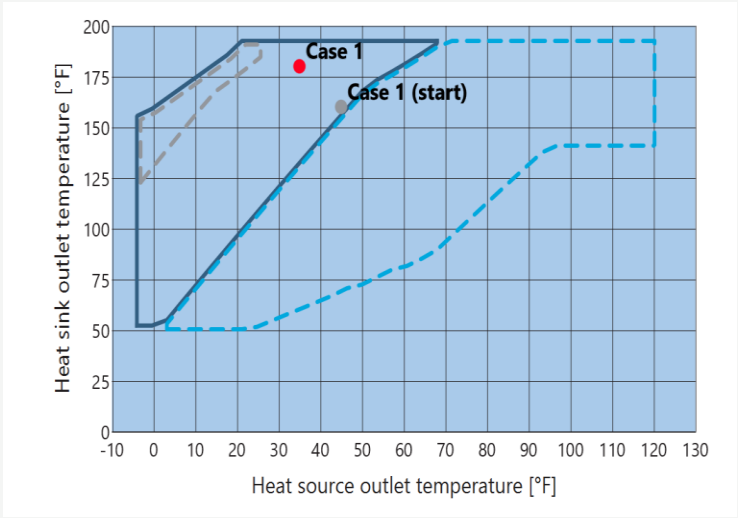
- 158F LWT
- -4F ambient source
- R-454C refrigerant
- 2.85 COP

Water-Source – Oilon P-Series

- Up to 248F LWT
- <30F water source
- Variety of refrigerants

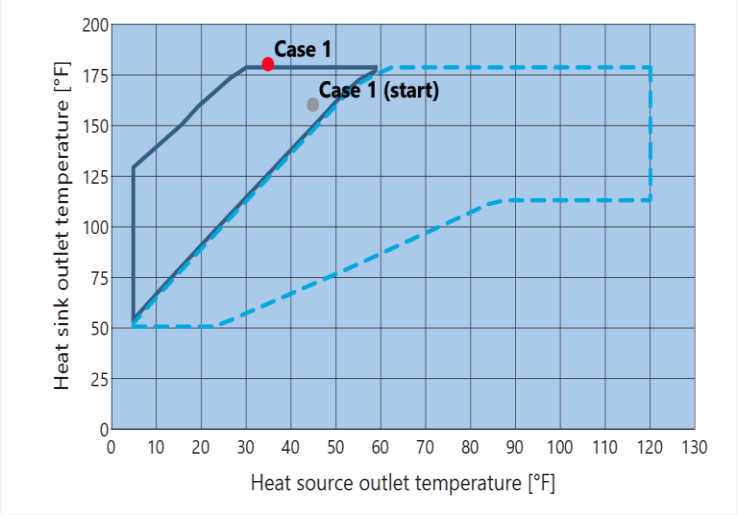
Refrigerant Choice

R450



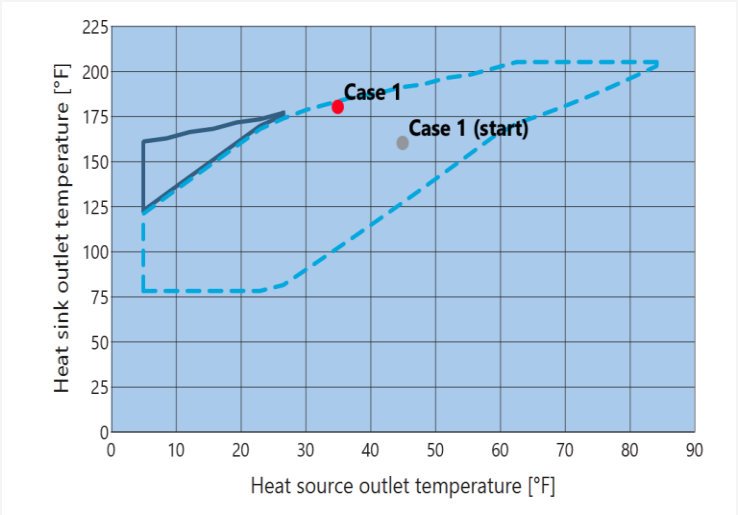
Lift: 175°F
Max: 195°F
Highest COP

R513A



Lift: 140°F
Max: 176°F
Highest Capacity

R-515B



Lift: 160°F
Max: 212°F
Highest LWT

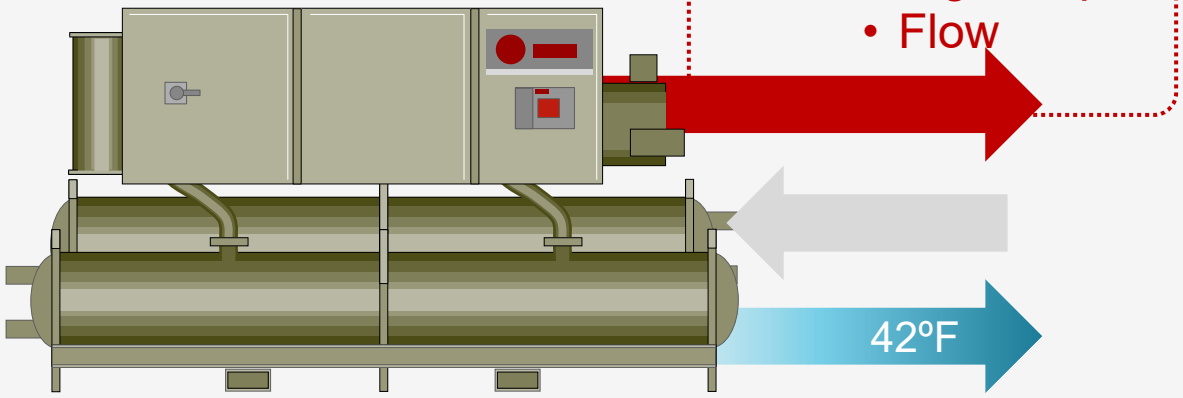
R-1234ze and R-1233-zd also available

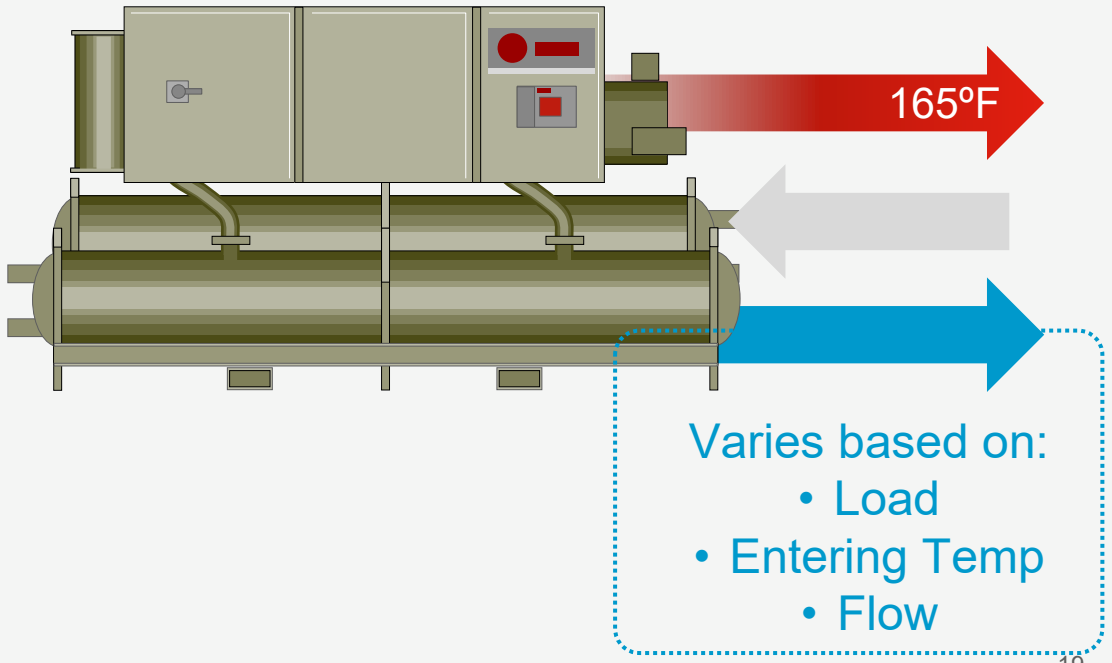
Chiller-Heater

(non-reversing HP)

Cooling Mode

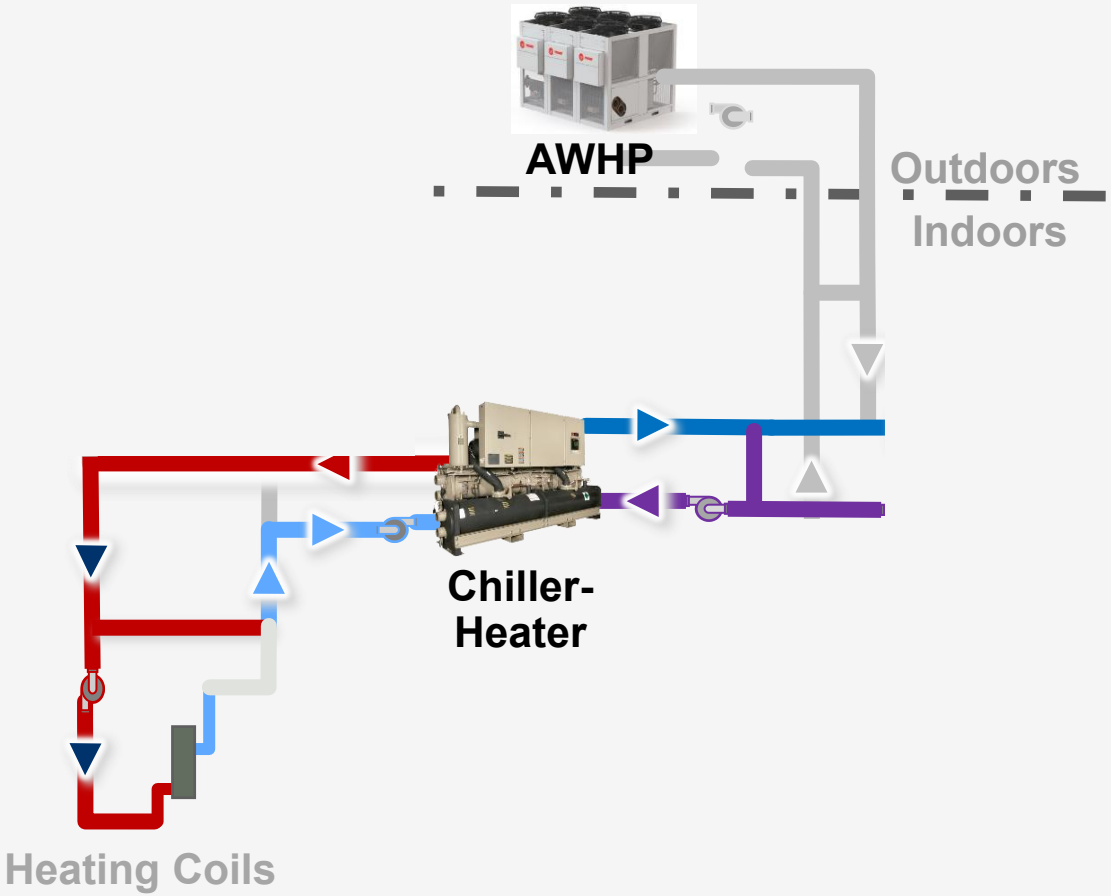
Heating Mode



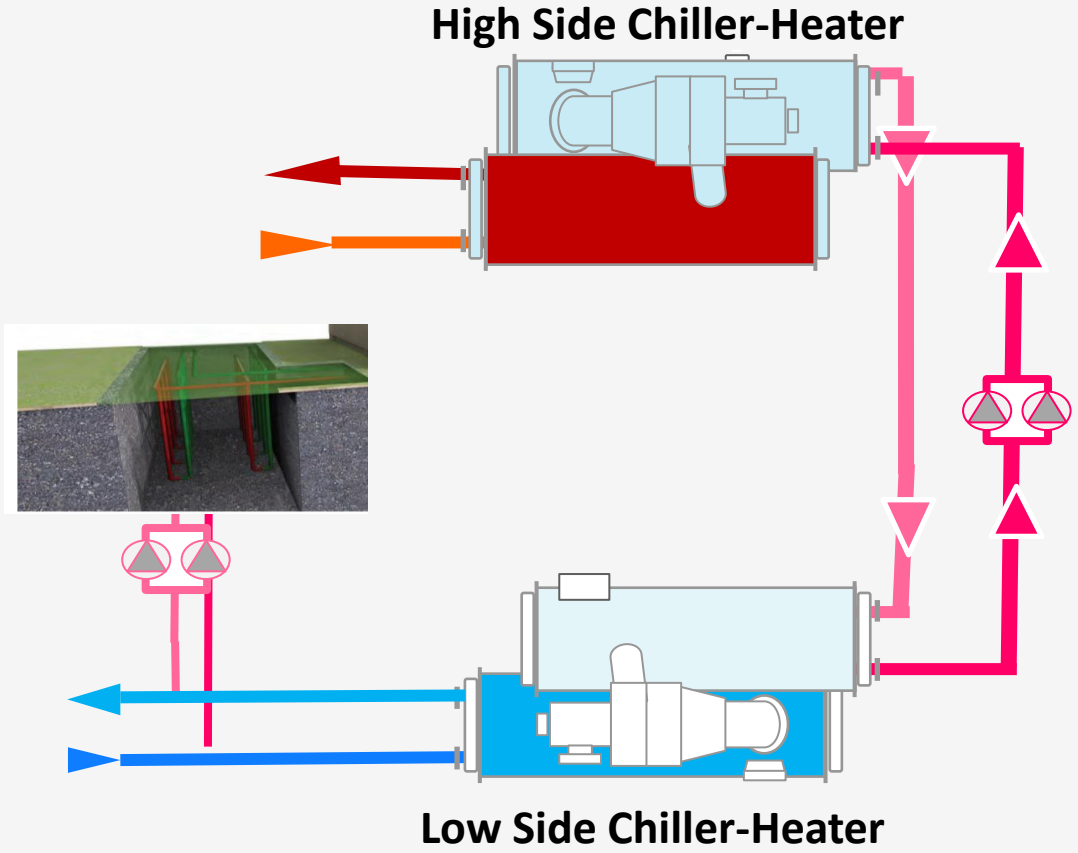


Cascaded Systems

low lift + low lift = high lift



Air-Source



Water-Source

High Temp Chiller-Heaters

Screw RTWD / RTZA

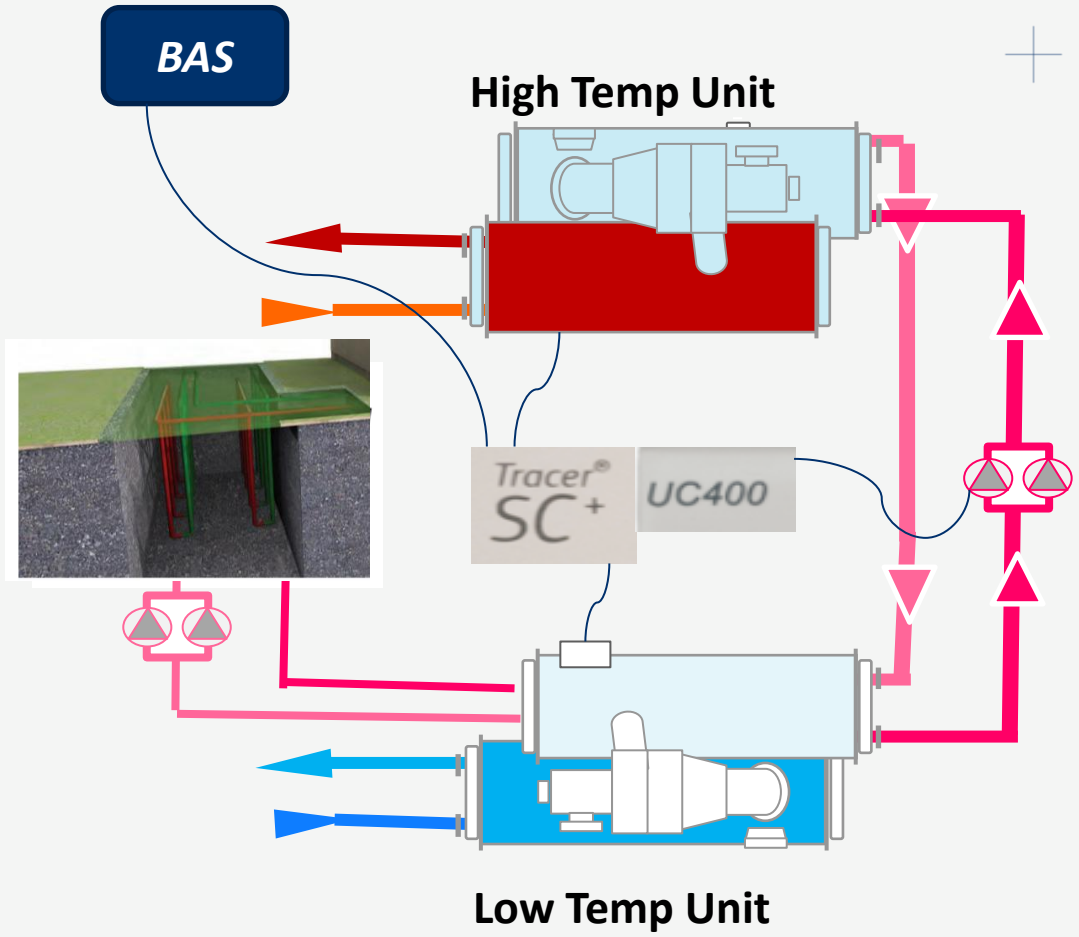
- <2.9 MMBH
- LWT up to 210°F
- 100F lift at 165F with R515b
- 80F lift at 210F with R1233zdE
- Turndown: 30% per machine

Centrifugal (CenTraVac) CVZA

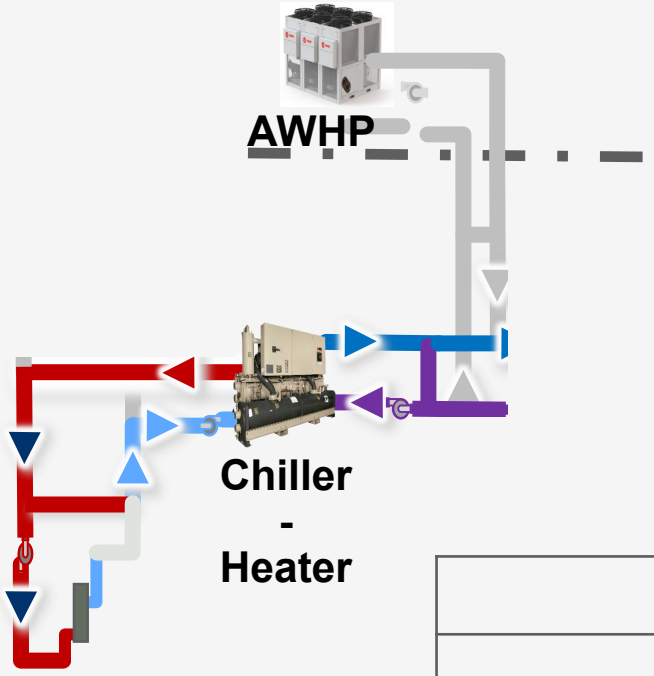
- 11-35 MMBH
- LWT up to 180°F
- 90F lift at 180F
- Turndown: 25% per machine

Cascaded System

- When to consider?
  - Large systems
  - Dual temp systems/campuses
  - (U)TEN
- Why?
  - Reduce first cost
  - Utilize more standard equipment/compressors
  - Allow for HR flexibility
  - Minimal capacity derate
  - High temp unit adds cooling redundancy
  - Utilize existing infrastructure for low temp side
  - Simultaneous COP of 7.1+



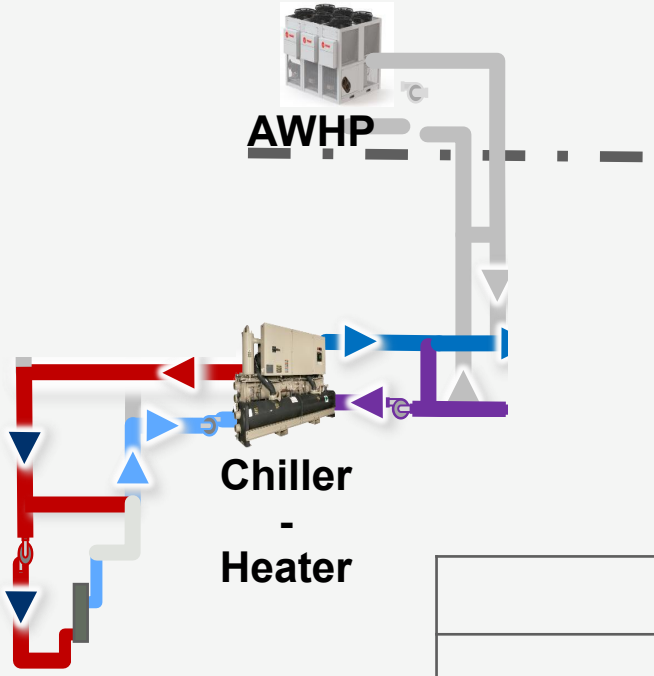
Cascaded Systems Example



- Design Ambient: 0F
- Heating load: 4,200,000 BTUs
- Design Temp: 160F
- Coincidental cooling load: 0 Tons
- 30% PG

	Modular AWHPs	Cascaded AWHPs
Equipment	(4) banks of (10) 30-ton high-lift modules	(5) 230-ton AWHPs (75F LWT) (6) 220-ton chiller/heaters (160F LWT)
Budget (HP's only)	+$5-7 MM	$2 - 3.5 MM

Cascaded Systems



- Design Ambient: 0F
- Heating load: 6,300,000 BTUs
- Design Temp: 120F
- Coincidental cooling load: 0 Tons
- 30% PG

	Modular AWHPs	Cascaded AWHPs
Equipment	(3) banks of (10) 30-ton modules	(4) 230-ton AWHPs (75F LWT) (2) 200-ton chiller/heaters (120F LWT)
Budget (HP's only)	~$3 MM	~$1.5 MM

Trane
High Temp Solutions

Questions?

Gannon Dubay, PE
Sustainable Systems Leader
Gannon.Dubay@Trane.com
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www.Trane.com

HUDSON CLEAN HEAT

High-Temperature Heat Pumps

for Space and DHW Application

NY GEO 2026

Presented By:

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PMP
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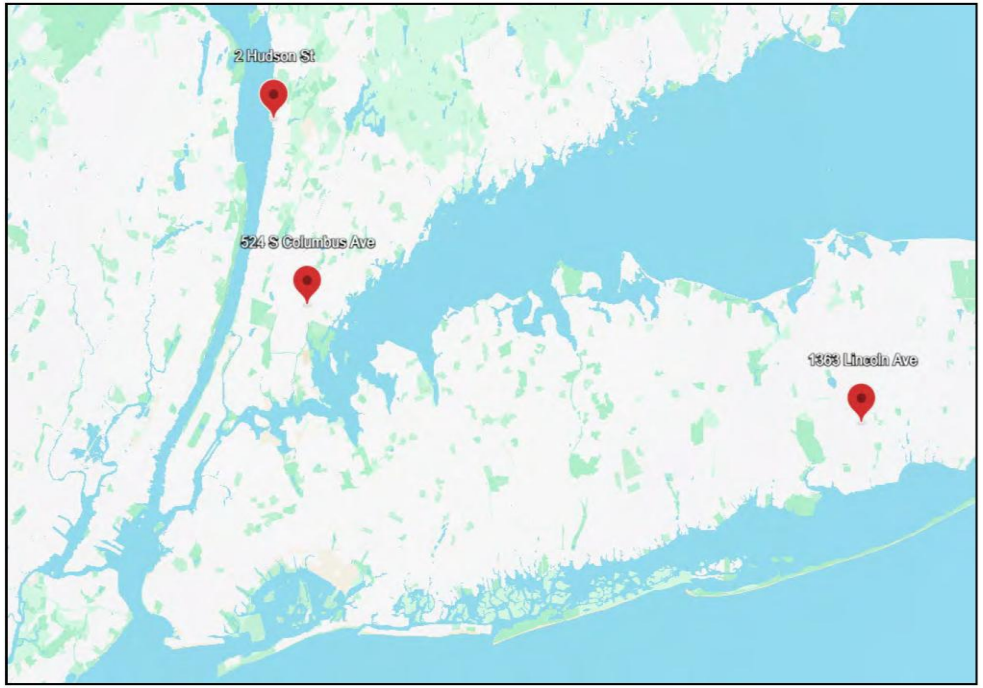

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- + **Low-Pressure Steam and Hydronic**
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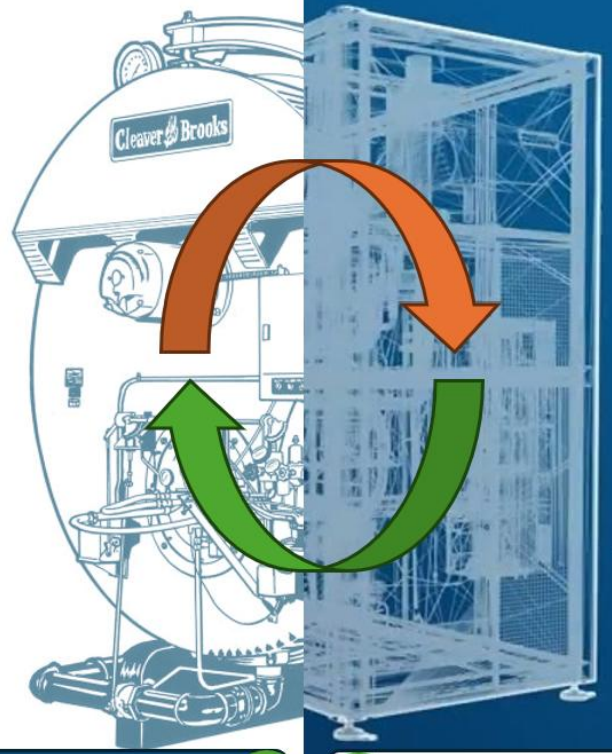
- + **System sizing and assessments**
- + **24/7 Service & Support**



Finland based company

Oilon specializes in improving energy efficiency, decreasing emission levels, and developing new solutions using renewable energy sources.

100% Employee Owned ✓

Founded in 1959 ✓

✓ 100% Family Owned

✓ Founded in 1961

OILON HIGH-TEMP HEAT PUMPS – “CHILLHEAT”

Oilon ChillHeat products and optional equipment

Oilon ChillHeat products are compact yet easy to service. They conform to the applicable European Union Directives and Regulations, such as the Pressure Equipment Directive, Low Voltage Directive, Electromagnetic Compatibility Directive, and Ecodesign Directive. Standard delivery includes a fixed control panel with ChillHeat automation and Modbus RTU bus interface.

We offer a range options that expand the capabilities of our heat pumps and allow them to be tailored to different applications.

On the right are some of the options that can be included in the delivery based on preliminary engineering at the quotation stage.

ChillHeat technical data

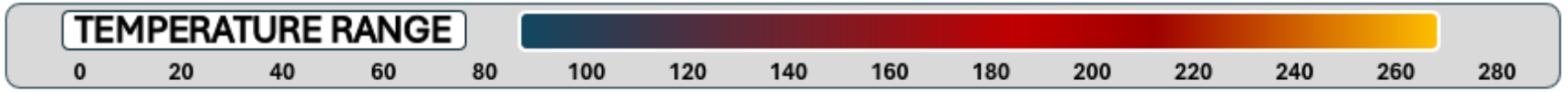
	P30 - P450	S180 - S2000	S600B - S1000B
Heating capacity B0/W35 R-134a	30 - 450 kW	180 - 2000 kW	600 - 1000 kW
Maximum temperature of heat produced *	120 °C	85 °C	90 °C
Minimum temperature of cooling produced *	−14 °C	−10 °C	−10 °C
ChillHeat product suitability for various applications			
Combined heating and cooling	Excellent	Good	Good
Heat recovery at refrigeration plants	Excellent	Excellent	Excellent
Heat recovery from waste water	Excellent	Excellent	Excellent
Ground source heating	Limited	Good	Good
Heat recovery from flue gases	Excellent	Excellent	Excellent
Heat extraction from outdoor air	Limited	Good	Good
Heat recovery from industrial processes	Excellent	Excellent	Excellent
Water chiller applications	Limited	Excellent	Excellent
Refrigeration applications	Limited	Good	Good

* The maximum temperature of heat produced or the minimum temperature of cooling produced depend on the dimensioning conditions.

Oilon Temperature Ranges – High & Medium Temp

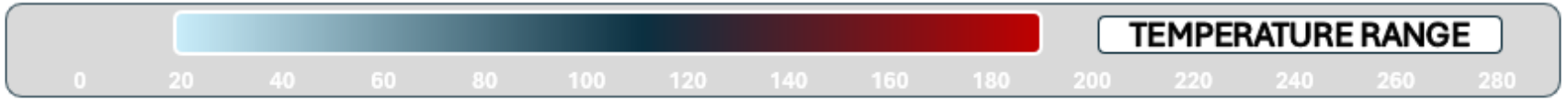
PISTON COMP SERIES

REFRIGERANT: R1233zd



PISTON COMP SERIES

REFRIGERANTS: R450A, R513A, R515B, R1234ZE



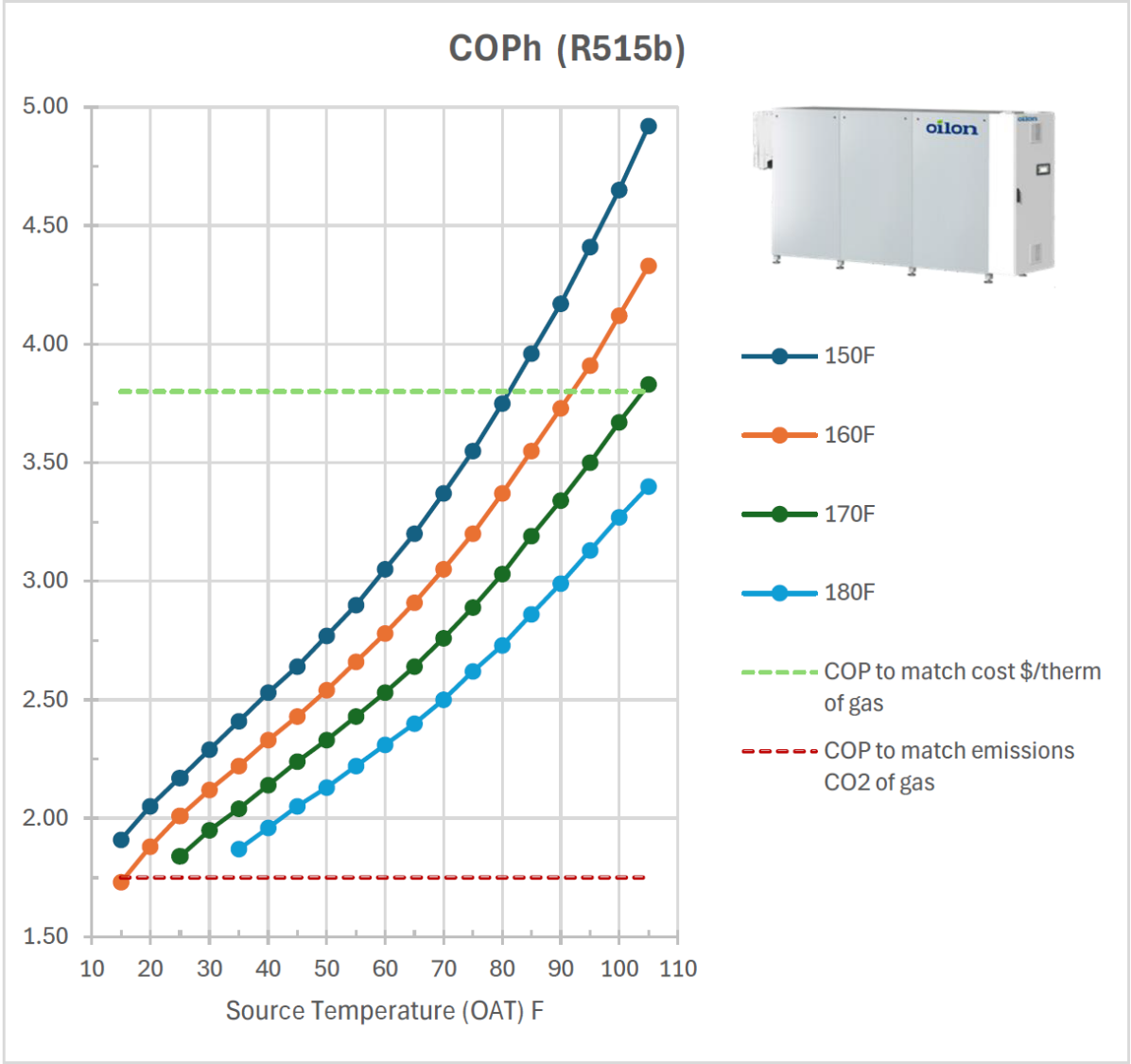
Heat Pumps – COPs (HYDRONIC)

Source Temp	COPh (R515b) 150F	160F	170F	180F
15	1.91	1.73		
20	2.05	1.88		
25	2.17	2.01	1.84	
30	2.29	2.12	1.95	
35	2.41	2.22	2.04	1.87
40	2.53	2.33	2.14	1.96
45	2.64	2.43	2.24	2.05
50	2.77	2.54	2.33	2.13
55	2.90	2.66	2.43	2.22
60	3.05	2.78	2.53	2.31
65	3.20	2.91	2.64	2.40
70	3.37	3.05	2.76	2.50
75	3.55	3.20	2.89	2.62
80	3.75	3.37	3.03	2.73
85	3.96	3.55	3.19	2.86
90	4.17	3.73	3.34	2.99
95	4.41	3.91	3.50	3.13
100	4.65	4.12	3.67	3.27
105	4.92	4.33	3.83	3.40

*Delta T at 15F for both loops

*this gives accurate results for both 10F and 20F delta-t

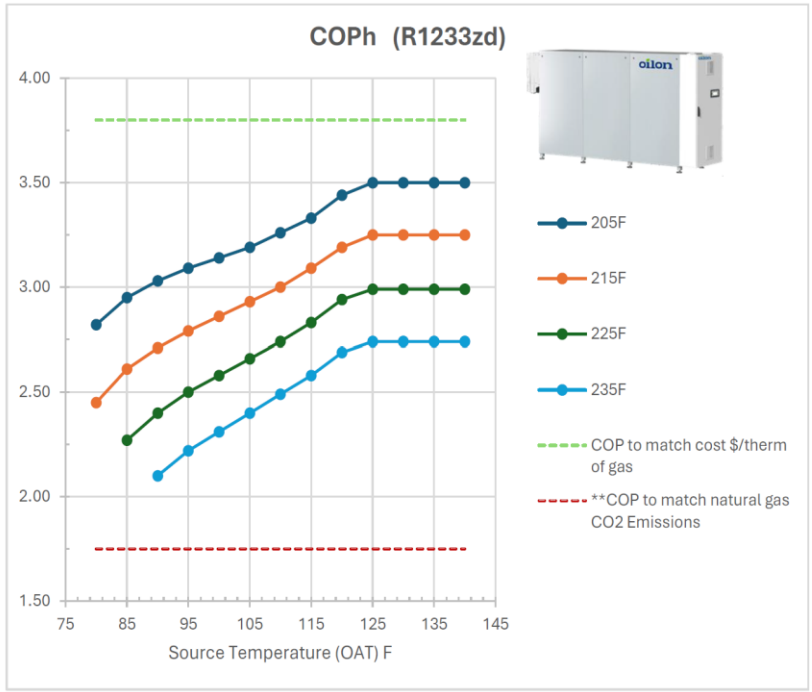
**COP to match based on US Grid and 90% hot water heater



COP's & how we measure/rate them

Source Temp	COPh (R1233zd) 205F	215F	225F	235F
80	2.82	2.45		
85	2.95	2.61	2.27	
90	3.03	2.71	2.40	2.10
95	3.09	2.79	2.50	2.22
100	3.14	2.86	2.58	2.31
105	3.19	2.93	2.66	2.40
110	3.26	3.00	2.74	2.49
115	3.33	3.09	2.83	2.58
120	3.44	3.19	2.94	2.69
125	3.50	3.25	2.99	2.74
130	3.50	3.25	2.99	2.74
135	3.50	3.25	2.99	2.74
140	3.50	3.25	2.99	2.74

*Delta T at 15F for both loops
*this gives accurate results for both 10F and 20F delta-t
**COP to match based on US Grid and 90% hot water heater



Source Temp	COPh (R515b) 150F	160F	170F	180F
15	1.91	1.73		
20	2.05	1.88		
25	2.17	2.01	1.84	
30	2.29	2.12	1.95	
35	2.41	2.22	2.04	1.87
40	2.53	2.33	2.14	1.96
45	2.64	2.43	2.24	2.05
50	2.77	2.54	2.33	2.13
55	2.90	2.66	2.43	2.22
60	3.05	2.78	2.53	2.31
65	3.20	2.91	2.64	2.40
70	3.37	3.05	2.76	2.50
75	3.55	3.20	2.89	2.62
80	3.75	3.37	3.03	2.73
85	3.96	3.55	3.19	2.86
90	4.17	3.73	3.34	2.99
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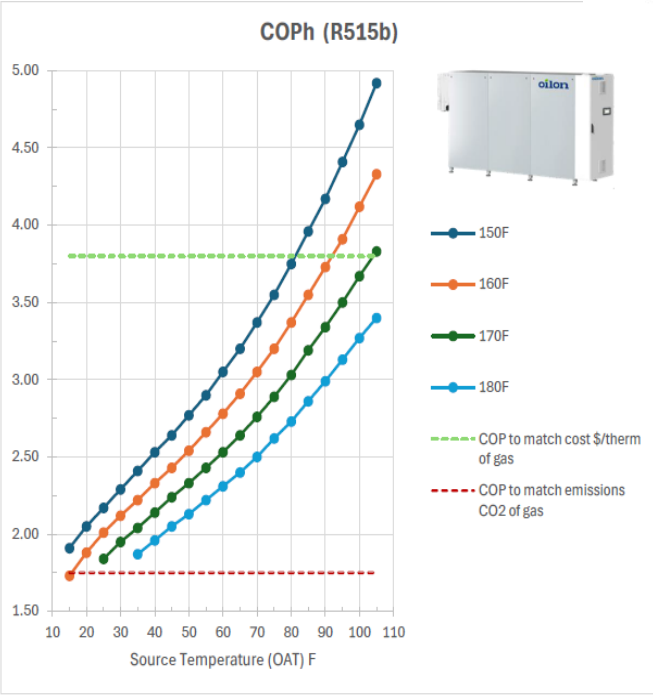


SCOP accounts for **seasonal variations**, providing a **weighted average efficiency over an entire heating season**.

- SCOP is better for **predicting real-world energy consumption**.

COP is measured under **specific test conditions**, representing an **instantaneous performance.**

- COP is useful for **comparing equipment specs**

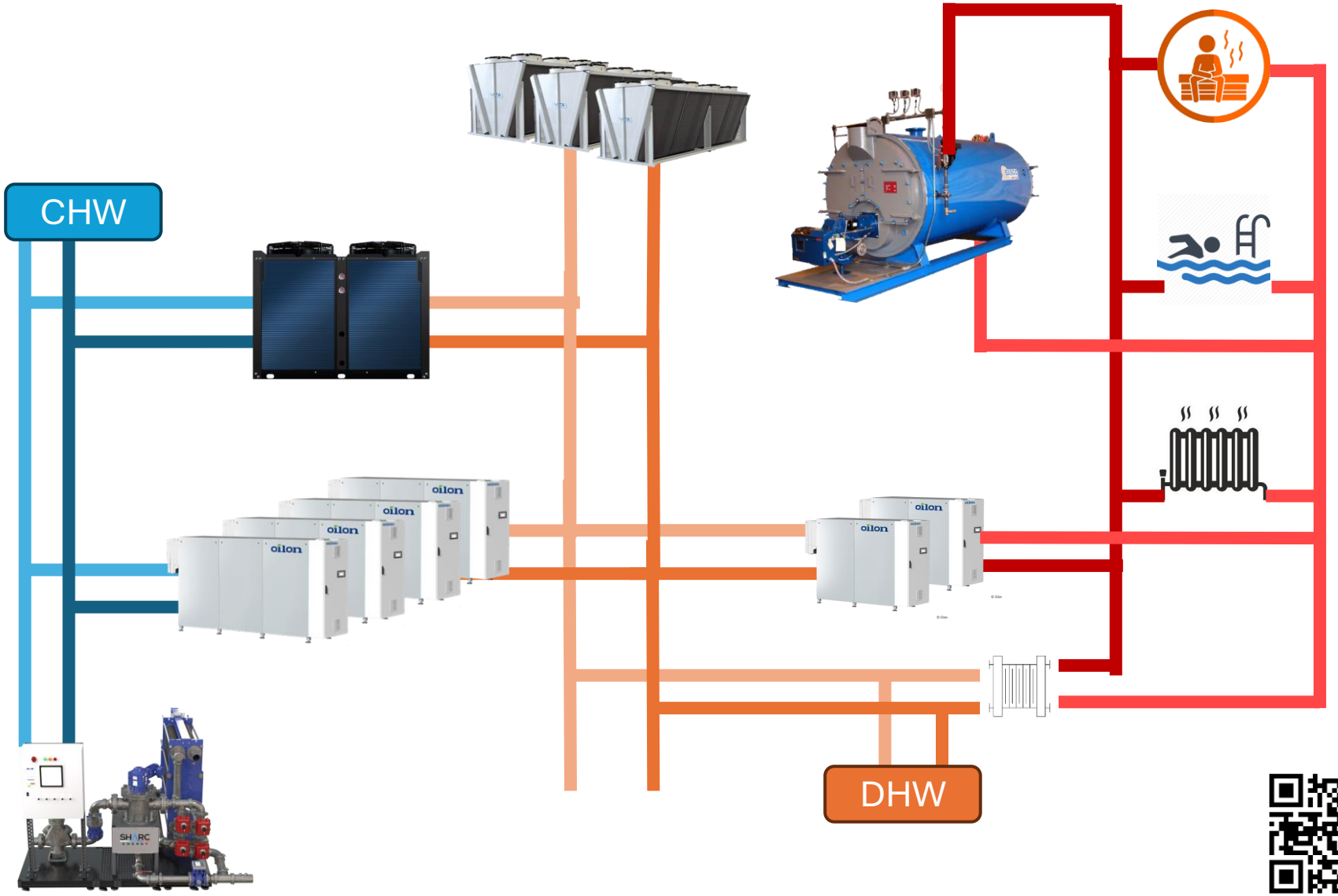
System Design:

System focus before equipment selection.

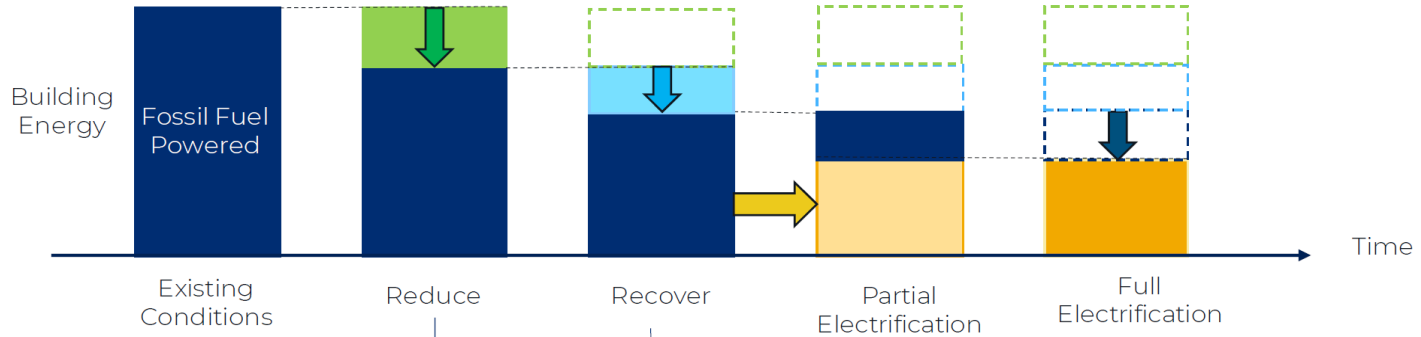
Offering many equipment manufacturers and solutions to allow flexible system design.

Beyond a single stage, cascade, or booster assembly, a multi-variant approach allows for an simultaneous benefit in three aspects:

1. Redundancy
2. Resiliency
3. Efficiency



A Focus on Retrofits...



Reduce Energy Load

- Building Envelope Improvements
- Control Optimization
- Ventilation Improvements
- Dedicated Outside Air System
- Hydronic Distribution
- Lower Heating Supply Temp.
- Terminal Units Replacement

runwise

Kelvin

Recover Wasted Heat

- Waterside Heat Recovery
- Airside Heat Recovery
- Wastewater Heat Recovery
- Thermal Energy Networks

SHARC ENERGY

Brightcore BUILDING ENERGY PERFORMANCE™

Partial Electrification

Replace fossil fuel inputs and prioritize the techno-economic portion of load

- Air Source Heat Pumps
- Water Source Heat Pumps
- Geothermal
- Thermal Layering

Full Electrification

In-time, replace or remove the remaining peak load equipment

- Heat Pumps
- Thermal Storage
- District Thermal Network
- Grid-interactivity

Demonstrations & Education

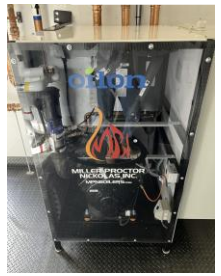
Demonstration Trailer is used as a marketing tool and a training center.

Brings working equipment and solutions to engineers, building owners, and market makers.

<u>Successful Demonstrations:</u>

- NY GEO, Saratoga, NY
- ASHRAE Long Island
- Empire State Building
- Empire Technology Prize, Penn Plaza
- Sustainable Solutions – Governors Island
- and more…





DOMESTIC HOT WATER DECOUPLING & ELECTRIFICATION

GEOTHERMAL
Highly stable year-round heat supply & rejection for maximum efficiency & reliability

SOLAR HOT WATER HEAT
Low-cost, renewable heat drastically reducing energy costs.

AIR-SOURCE HEAT PUMP
Uses ambient air to produce highly efficient low temps to heat pump

DRY-AIR COOLERS
Eliminates water use and treatment costs of cooling towers while being a heat sink and source.

ELECTRIFICATION OF STEAM SYSTEMS

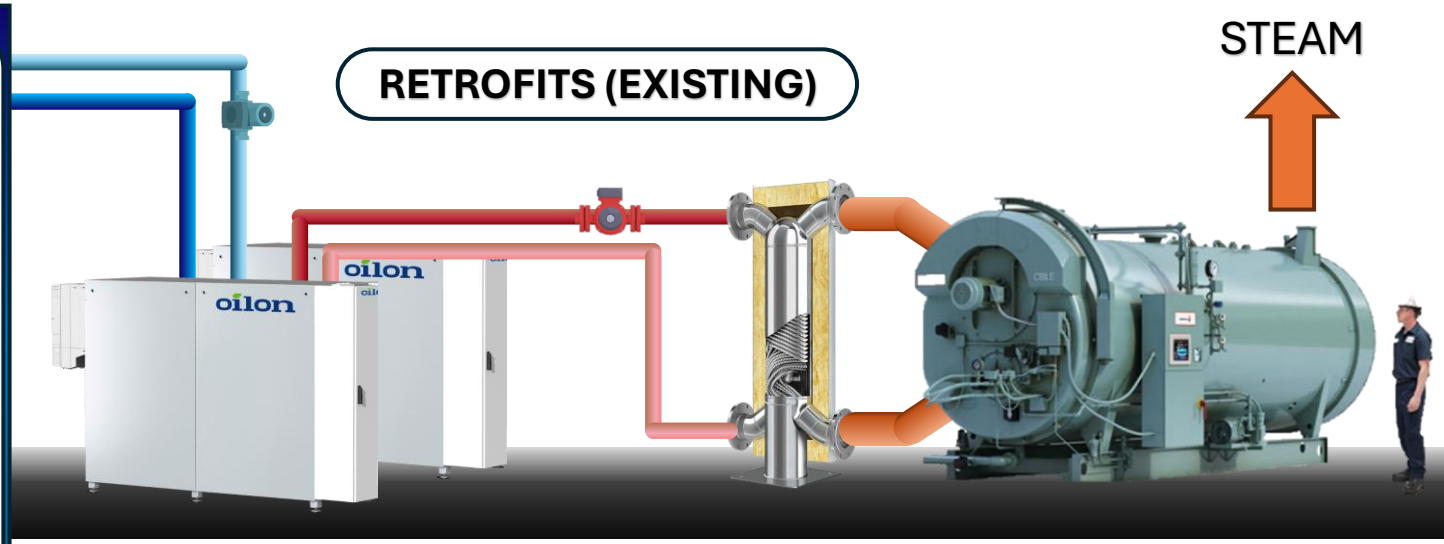
HEAT SOURCES

Provides up to 15psig low pressure steam from sources as low as 85F.

Compatible with:

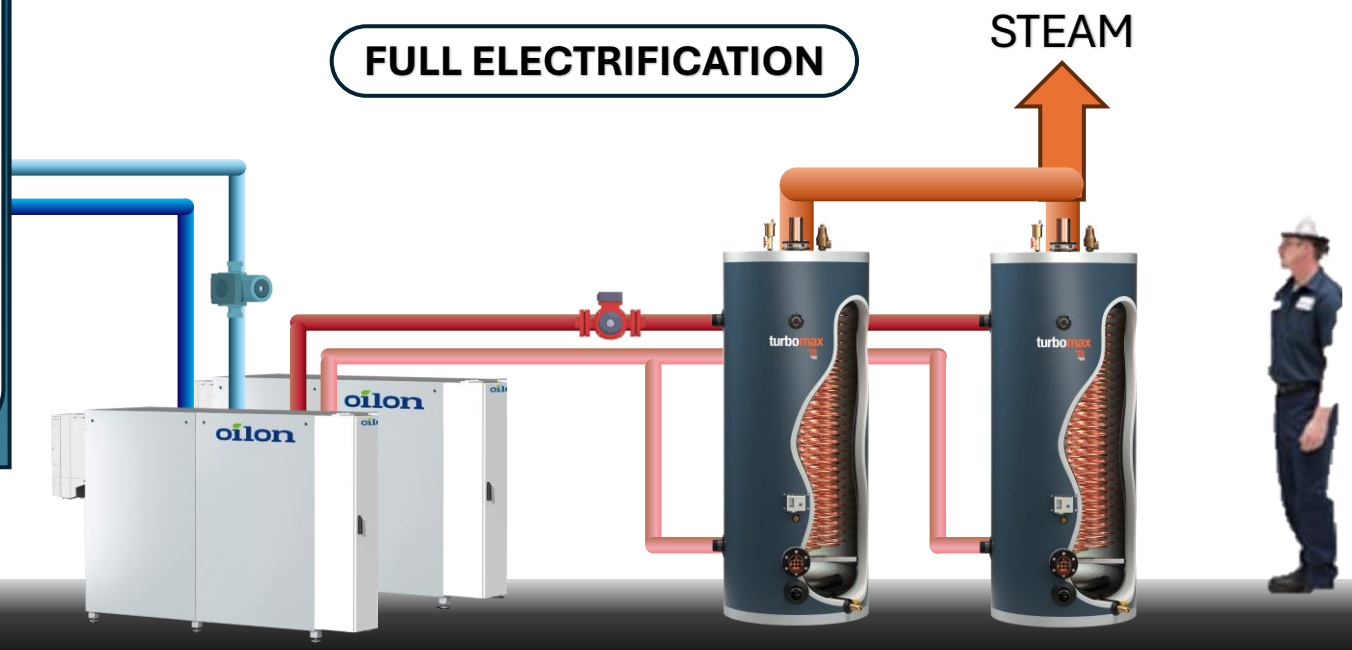
- **Air-source Heat Pumps**
- **Water-source heat pumps**
- **Condensing Boilers**
- **Geothermal**

RETROFITS (EXISTING)



Electrifying low-pressure steam is achievable with COPh's reaching 4.0 and above while working with existing equipment.

FULL ELECTRIFICATION



These options allow realistic electrification of systems at a fraction of the cost until the business case supports hydronic conversion or alternative heating means.

CO_2 (R-744) Domestic Hot Water Heat Pumps

March 24th 2026

Presented by:
Geoff Cullen, PE
GA Fleet Associates
gcullen@gafleet.com

Benefits of CO_2 (R-744)

Operating Conditions & Performance

Performance

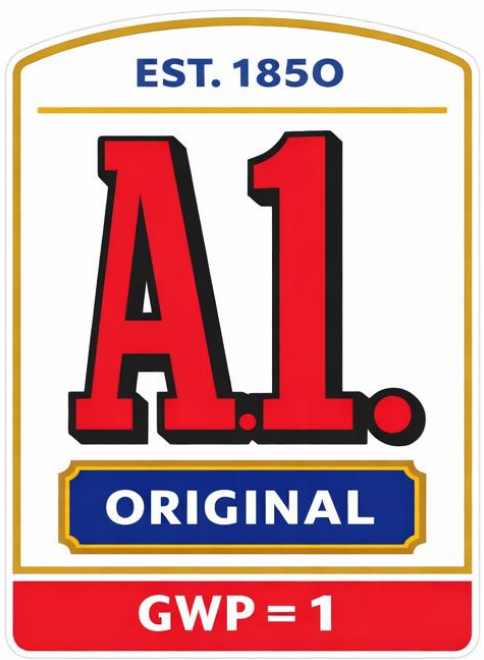
- **180°F** + outlet temperature
- **1.9–5.1** COP
- **18–130°F** source temp (water source)
- **-4–113°F** ambient temp (air source)

Design & Operation

- Stable outlet temperature
- 25% less storage volume
- Legionella mitigation
- No special training, monitoring or evacuation

Benefits of CO_2 (R-744)

Natural, Proven, Future-Proof, Safe



1850
1st Patent issued for using CO_2 as a Refrigerant

1893
CO_2 & Ammonia widely used in shipping replacing ice

1931
R-12 & R-22 "Freon" invented by DuPont & GM (CFC & HCFCs)

1987
Montreal Protocol banned CFCs & HCFCs, HFCs R134a & R410a become replacements

2016
Kigali Amendment bans HFCs

FLEET

Benefits of CO_2 (R-744)

Refrigerant Bans

Part 494 Factsheet

Reducing Hydrofluorocarbon Emissions

NEW YORK STATE | Department of Environmental Conservation

Refrigeration, Air-Conditioning, and Heat Pump Products		
Subsector	**EPA GWP100 Limit**	**NYS Prohibition Date**
Air-conditioning chillers	20	January 1, 2030
Heat pump chillers	20	January 1, 2034
Residential and light commercial air conditioning and heat pumps	10	January 1, 2034
Variable refrigerant flow (VRF/VRV)	10	January 1, 2030
All other commercial HVAC	10	January 1, 2034

Benefits of CO_2 (R-744)

NYC Fire Code – Operating Engineer Requirements

FC TABLE 606.1.1 REFRIGERATING SYSTEM OPERATING ENGINEER

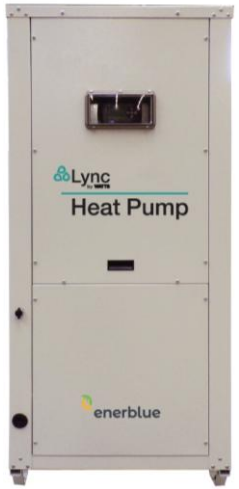
Installation Date	Refrigerant Group Or Name[a]	Occupancy Type[b]	Application	Pounds Of Refrigerant In System	System Horsepower	System Design[c]	Supervision Required
Prior to June 1, 1957	A1	Industrial	Human comfort	More than 50	NA	Not fully automatic	Personal
	A1	Industrial	Human comfort	More than 200	NA	Fully automatic	Personal
	A1	Industrial	Human comfort	More than 50 up to 200	NA	Fully automatic	General
	A1	All except Industrial	All	More than 50	NA	Not fully automatic	Personal
	A1	All except Industrial	All	More than 200	NA	Fully automatic	Personal
	A1	All except Industrial	All	More than 50 up to 200	NA	Fully automatic	General
On or after June 1, 1957	A1	Industrial	Human comfort	NA	More than 50 (or kilowatt equivalency)	NA	Personal
	A1	All except Industrial	All	NA	More than 50 (or kilowatt equivalency)	NA	Personal
Regardless of when installed	A2, A3, B1, B2, B3 and carbon dioxide	All	All	More than 50	NA	Not fully automatic	Personal
	A2, A3, B1, B2, B3 and carbon dioxide	All	All	More than 200	NA	Fully automatic	Personal
	A1	Industrial	All except human comfort	More than 50	NA	Not fully automatic	Personal
	A1	Industrial	All except human comfort	More than 200	NA	Fully automatic	Personal
	A1 and carbon dioxide	Industrial	All except human comfort	More than 50 up to 200	NA	Fully automatic	General
	A1	All	Human comfort	NA	Aggregate exceeds 100[d]	NA	Personal

a. For purposes of this table, refrigerant R-123 shall be treated as a group A1 refrigerant, and carbon dioxide shall not be treated as a group A1 refrigerant.
b. For purposes of this table, "industrial" occupancy refers to occupancy groups F, H and S. For installations constructed under the 1968 Building Code, "industrial" occupancy refers to occupancy groups A, B and D. For installations constructed prior to such 1968 code, "industrial" occupancy refers to that portion of a building used for manufacturing, processing, or storage of materials or products, including, among others, chemical, food, candy, and ice cream factories, ice making plants, meat packing plants, refineries, perishable food warehouses, and similar occupancies.
c. A fully automatic refrigerating system is one whose regulating and safety devices are automatically activated once the system is in operation.
d. This aggregate provision applies only to systems within a single building which are under the sole direct control of a single occupant, lessee or owner. Systems with a rating of 15 horsepower or less or the kilowatt equivalency thereof are excluded from the aggregate.

Lync Aegis Heat Pump – NY's DHW Solution

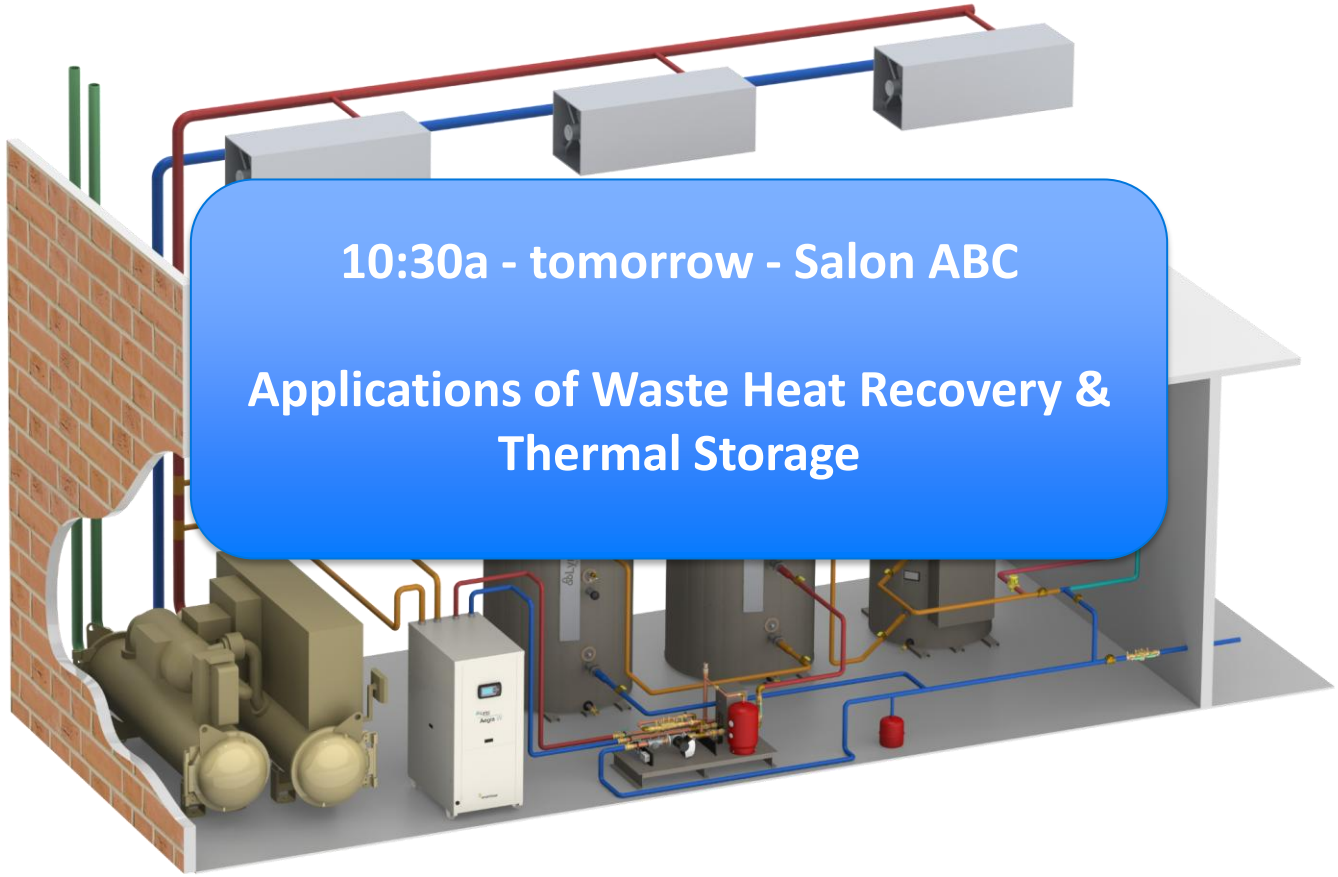
Overview

- Industry Leading Capacities
  - 250, 350, 500 MBH Nominal (14, 25, 35 HP)
- R744 (CO_2) heat pump water heater
  - Water source
  - Air source
  - Air source + Water source
- End-to-End DHW solution
  - Single point responsibility & accountability
  - Watts (1874), AERCO (1949) & PVI (1961)
    - Sizing & application experts



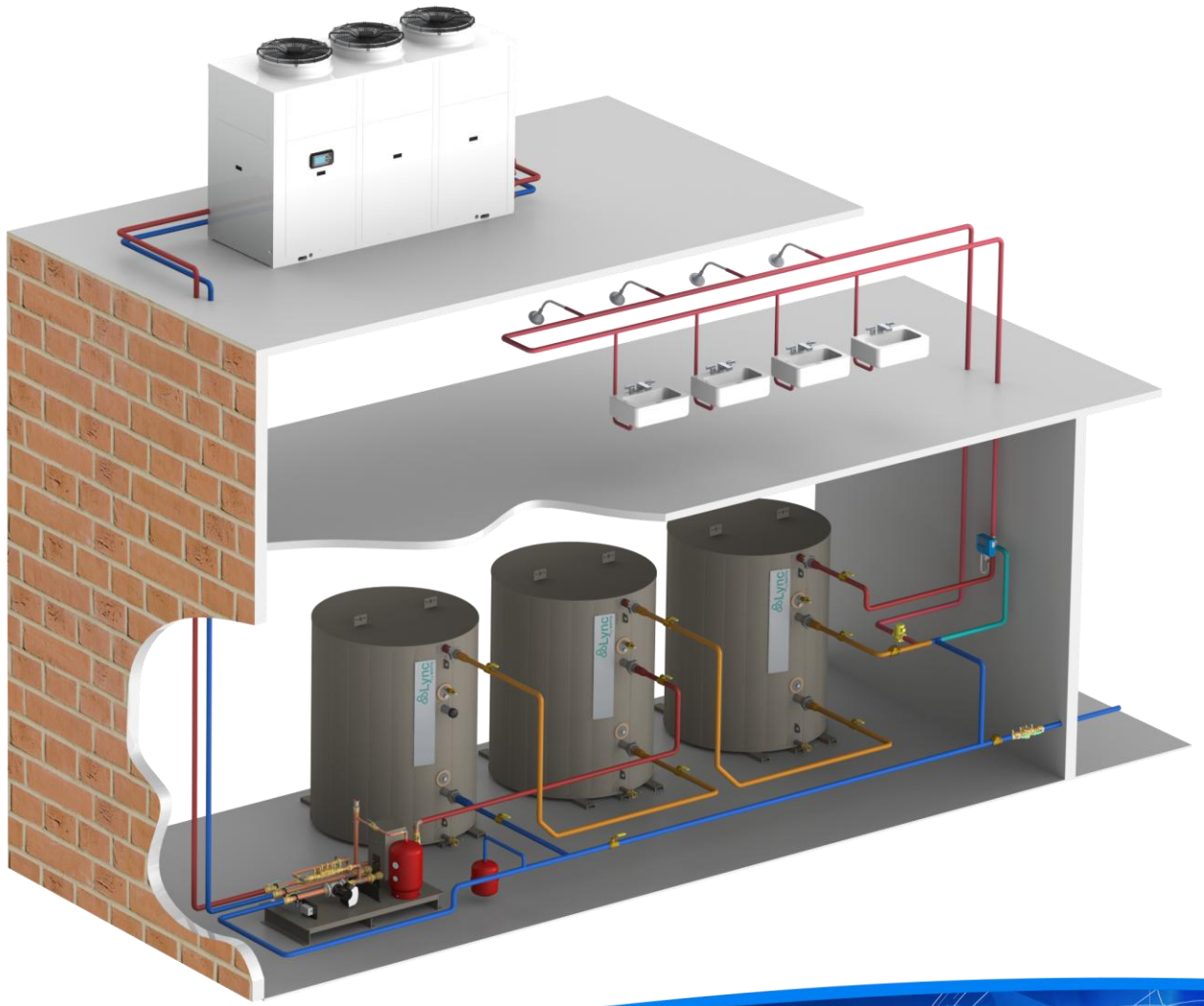
Application & Installation

Water Source



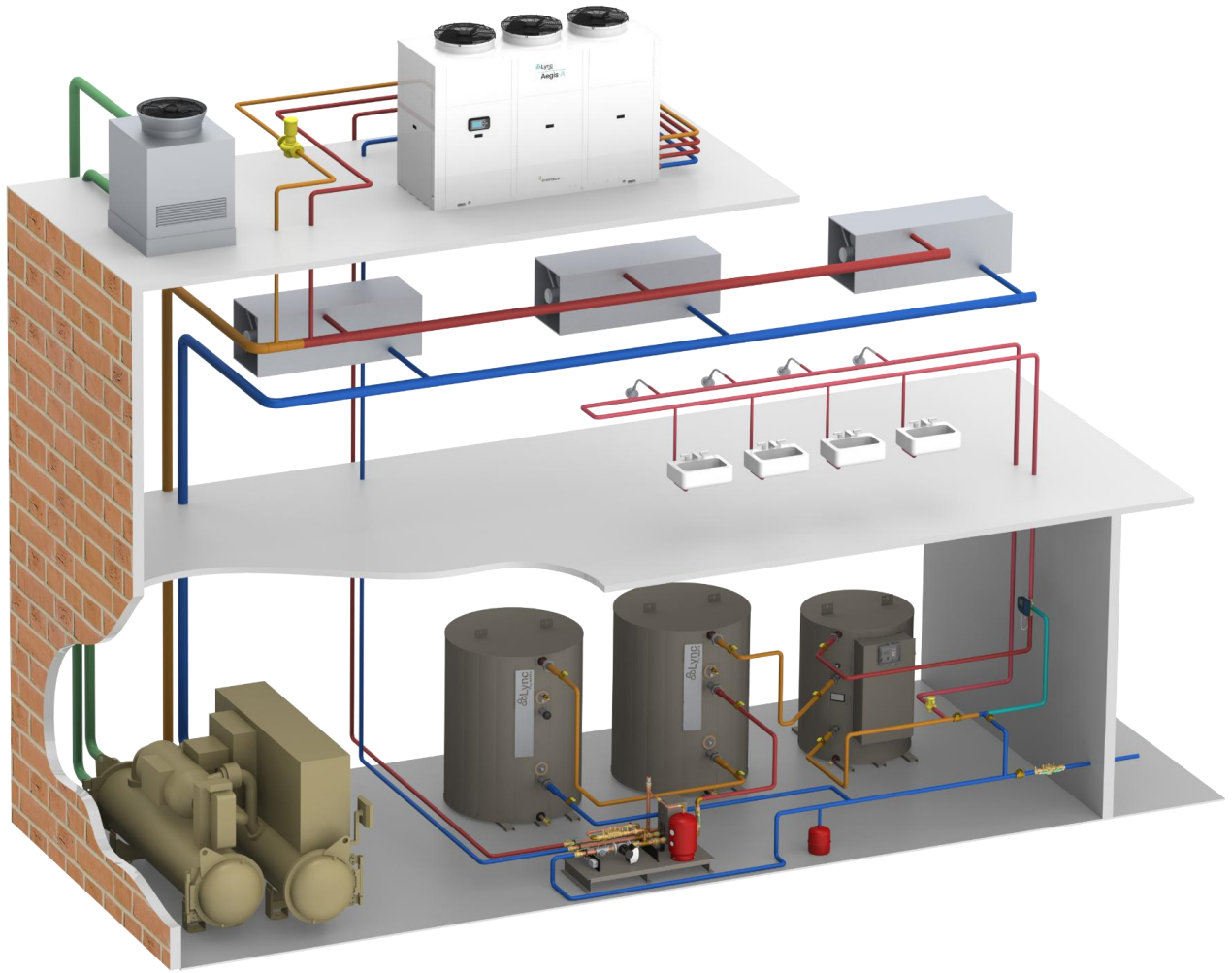
Application & Installation

Air Source



Application & Installation

Hybrid – Air + Water Source



Installation Reference

1515 Surf Ave – Coney Island, NY

- LCOR, Studio V, LRC, CDM Smith, MGE, EcoSave
- Two tower, 26-story, 463 apartment, Completed in 2024
- First & largest (2024) 100% geo multi-family project in NYC
- B1: (2) Lync Aegis W350 + (1) Lync Aegis W250
- B2: (3) Lync Aegis W250
  - Reduced original equipment count by ~50%
    - 11 → 6 Heat Pumps
    - 15 → 8 Storage Tanks
  - 20% Operational Savings
- 40 Sites & 97 Units Installed in NYC
- Case Studies: www.lyncbywatts.com/solutions/case-studies

Thank you for your time!

Geoff Cullen, PE gcullen@gafleet.com

High Temp Heat Pumps for Space & DHW Applications

Moderator: Austin Crosby / *LaBella Associates*

Panel: Chris Ebener / *Nyle Water Heating Systems*

Gannon Dubay / *Trane*

Ian Motley / *Oilon/MPN*

Geoff Cullen / *G.A. Fleet Associates*