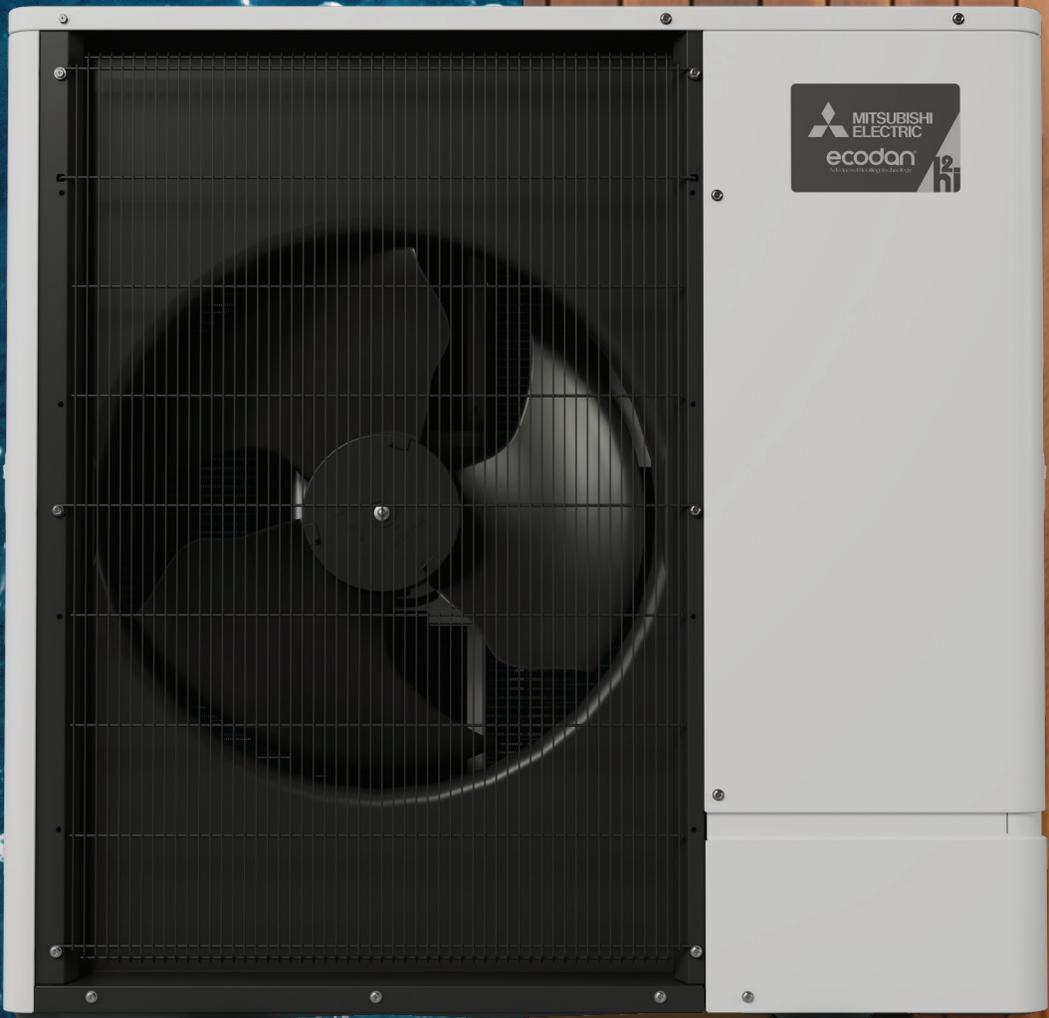




**ecodan<sup>®</sup>**

Air-to-water Heat Pump



Designed for life,



inside and out.

## Contents

1. Introduction .....	2
Mitsubishi Electric Quality	3
What is ecodan®?	4
Why use ecodan?	6
2. Product overview .....	11
System overview	13
How ecodan works	16
ecodan features	20
Key components	22
Control flexibility	24
3. Common applications .....	27
Installation and configuration examples	28
4. Technical specifications .....	31

A white Mitsubishi Electric ecodan outdoor HVAC unit is mounted on a brick wall. The unit features a large black fan grille and a logo with the text 'MITSUBISHI ELECTRIC ecodan'. The background is a blue-tinted image of a brick wall and some greenery.

# Leading all-electric HVAC innovation for more than 40 years.

Mitsubishi Electric offers innovative and evolving heating and cooling solutions for any application in any climate. Our ducted and ductless mini-split and Variable Refrigerant Flow (VRF) heat pump systems bring superior energy efficiency, comfort, and performance to any home or building. We are proud to provide not only cutting-edge products but also design and technical training and unmatched end-to-end support.

At Mitsubishi Electric, we strive to create better environments, inside and out. The adoption of all-electric heat pumps and sustainable building is more than a trend, it is the future. Discover the balance between enjoying the spaces where you live and work, while creating sustainability for the world around you.

We are renewable in all we do. This encompasses how our products function, leveraging both hybrid, water source, and all-electric heat pumps, and how they're assembled, with nearly 100% recyclable materials. We offer technology that contractors and customers don't have to think about after installation. In fact, Mitsubishi Electric has one of the industry's lowest incidence rates. Our industry leading warranty is even better when installed by a Diamond Contractor® or Ductless Pro.



## The INVERTER advantage

Mitsubishi Electric heat pumps use inverter-driven compressors, which use variable speed technology to control the speed of the motor. This allows for precise regulation of heating and cooling output according to demand, while minimizing the amount of energy required. Conventional compressors turn on and off to meet the set point, causing large temperature and energy swings. The inverter eliminates the wasteful stop and start cycle. Just as your heart always beats, and automatically beats faster when you exercise, our compressors are always active with the inverter enabling it to adjust conditioning as soon as temperature changes are detected.



We are exacting in how we build our technology, scrutinizing every component to ensure it functions in harmony with the system.



# Mitsubishi Electric quality

Our customers depend on our heat pump systems to maintain their comfort, even in harsh environments. Because of this, we've developed one of the industry's most rigorous inspection processes. We check for every possible point of failure in every step after the sale: delivery, installation and operation.

We perform advanced airflow testing during development, where we measure every corner of the room with more than 2,500 sensors to ensure even temperature distribution. An operation noise test is performed in an anechoic chamber with an extremely low 10 dB(A) of background noise.

This confirms that the heat pumps run ultra-quiet operations, with a minimum sound level of 19 dB(A).

Our products are also subjected to a wide range of safety tests, including combustion testing, to confirm safe operation under various conditions. Combustion testing is done by assuming accidental firing and replicating abnormal conditions that cause breakage of pressure components. With the transition to the low-Global Warming Potential refrigerants, we have built leak detection sensors into our units as an added safety measure. We also perform drop/strength tests, transport vibration tests, and many other product checks to ensure that quality and performance are maintained.

# What is ecodan®?

## Introducing ecodan

ecodan by Mitsubishi Electric is a compact air-to-water (ATW) heat pump designed for hydronic heating and cooling, as well as domestic hot water (DHW).



Hydronic heating/cooling + DHW



2, 3, 4 ton hyper heat ODU



Easy to install Hydrobox



158° F maximum flow temperature

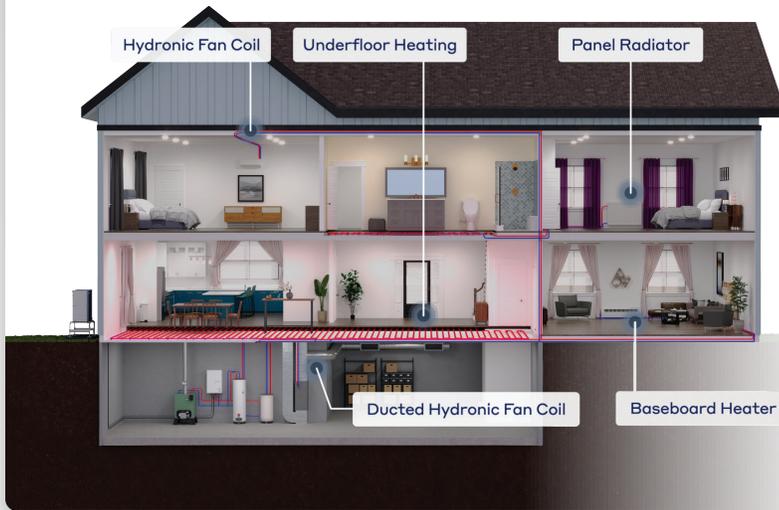


Boiler interlock with smart auxiliary/back-up control



ecodan represents the next generation of comfort technology, designed for the growing demand of all-electric, environmentally friendly solutions.

The system provides heating and cooling through the use of a heat pump that distributes heat evenly throughout the home or building through a series of fan coils, radiators, baseboard heaters or underfloor heating, and cool air through the hydronic fan coils.



Air-to-water systems are used in homes/buildings with hydronic distribution systems that heat and cool water, to deliver comfort to any space.

## The ATW outdoor unit uses inverter-driven technology to extract heat energy from the outside air, even in extremely low temperatures.

Unlike furnaces, hydronic systems heat and cool water instead of air to deliver comfort to any residential or commercial space. The ATW outdoor unit uses inverter-driven technology to extract heat energy from the outside air, even in extremely low temperatures down to -22 degrees Fahrenheit. The unit sends refrigerant to a device inside, where the heat is transferred between the refrigerant and water in a closed loop. The heated or cooled water is then distributed through pipes instead of air ducts for a quiet and comfortable experience. This same water loop can transfer its heat to a separate hot water tank, allowing the system to provide hot water for showers and taps.

ecodan® features an “all-in-one Hydrobox,” which has all of the key components built-in for streamlined installation and simple maintenance. Outdoor units have an elegant, compact design with a small footprint for greater installation flexibility. ecodan is also capable of interlocking with an existing boiler as a backup. The system can provide cooling along with heating and domestic hot water, which saves space and reduces the amount of systems that would require maintenance.

	Air-to-Air Heat Pump	Air-to-Water Heat Pump
<b>How heat is released from the refrigerant</b>	By blowing air across the refrigerant pipes within an air handling unit.	By passing the refrigerant tubes through a HEX/water tank.
<b>How the room/home is heated</b>	By blowing the air within the room(s).	By releasing heat from flowing water.
<b>Indoor requirements</b>	Individual air handling units or ductwork to distribute hot air to different rooms.	Radiators, underfloor heating, baseboard heat emitters, or fan coils.
<b>Additional features</b>	Can also be used to provide cooling by reversing the process and removing heat from a home.	Can provide domestic hot water. Can also be used to provide cooling by reversing the process and removing heat from a home.

# Why use ecodan®?



## A sustainable solution

ATW heat pump systems utilize all-electric heat pump technology, making them a preferred choice for homes and buildings in regions that are implementing fossil fuel usage reduction regulations.

All-electric solutions like air-to-water heat pump systems are preferred for homeowners who choose to invest in "net zero" homes<sup>1</sup>. These solutions appeal to customers considering not only environmental sustainability, but also grid resiliency.

Conventional HVAC systems may become more inconvenient to maintain as states move away from reliance on fossil fuels.

Since ATW heat pumps and other all-electric systems heat a space without the burning of fossil fuels, local, state and utility rebates and tax credits may be available for homeowners<sup>2</sup>. These incentives differ depending on the city and state of residence and local utilities may have differing requirements for eligibility for such incentives\*.



<sup>1</sup>"Net zero" homes are those which over the course of a year, generate energy onsite, using clean renewable resources, in a quantity equal to or greater than the total amount of energy consumed onsite. <https://worldgbc.org/climate-action/what-is-a-net-zero-carbon-building/>, <https://www.mass.gov/info-details/what-is-a-zero-net-energy-building>

<sup>2</sup> Rebates and credits not available in all areas and may vary depending on location; please contact your city, state and utility to determine any incentives and eligibility.

## Quiet, efficient, and future-ready

This ATW hydronic heating system is more energy efficient because it provides consistent, even comfort without generating harmful greenhouse gas emissions that traditional heating and cooling systems can produce. ecodan® provides cooling, along with heating, and domestic hot water all in one system. The whole-home solution makes its mark in the market through unbeatable comfort and reliability.



All-electric solution - reduces carbon emissions and utility costs



Incentives for ATW heat pumps available



Inverter technology - energy efficient with consistent comfort



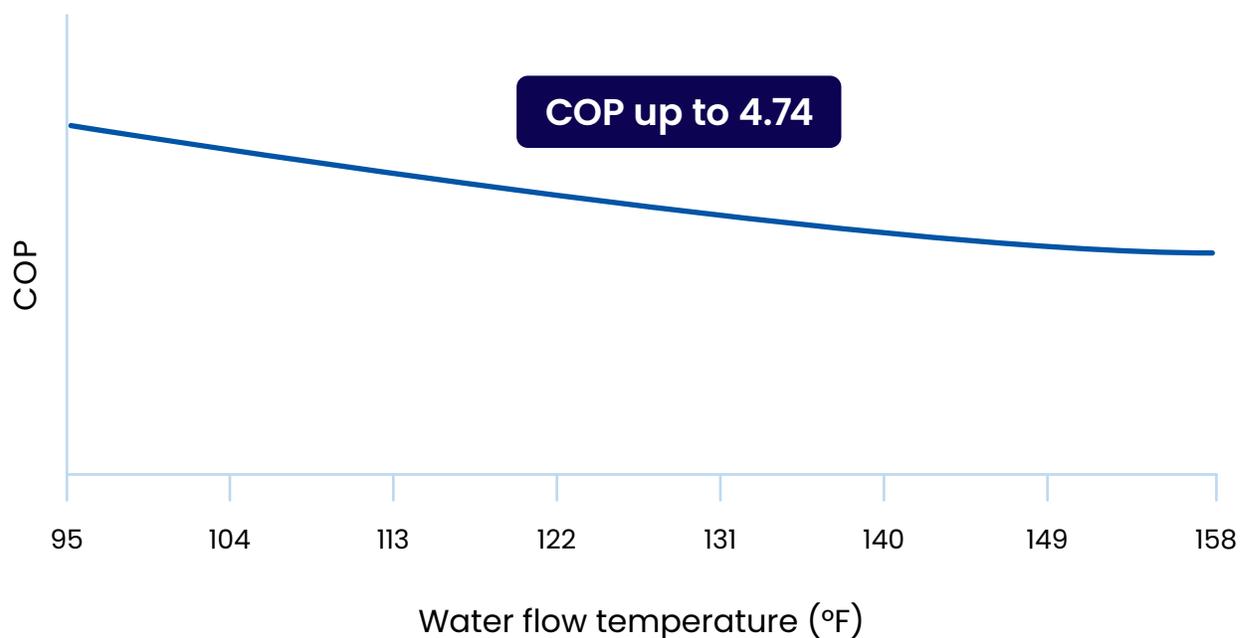
Comfortable with uniform radiant heat from around the feet up



Better indoor air quality

### COP

A heat pump's Coefficient of Performance (COP) rating measures how efficiently the system moves heat relative to the electrical energy it consumes. COP directly reflects energy efficiency, so ecodan's high COP value of up to 4.74 means reduced energy consumption compared to other systems with lower COP values.



# The benefits of air-to-water systems



## Air-to-water compared to boilers

### Consistent comfort at all loads

Traditional boilers often struggle with oversizing and have limited modulation, causing temperature swings and short cycling. ATW heat pumps use inverter driven compressors and variable-speed pumps to match demand, maintain steady comfort, and prevent inefficiencies.

### Simplified operating and maintenance costs

Boilers require continuous fuel purchases along with delivery and service expenses. ATW heat pumps eliminate fuel delivery needs and associated infrastructure, especially beneficial in new construction.

### High-efficiency, all-electric advantage

Heat pumps generate more heat energy than the electricity they consume, outperforming fossil fuel systems.



### **Built-in cooling capability**

Homes with boilers need a separate cooling system. ATW heat pumps provide both heating and cooling in one unit, reducing space, installation complexity, and long-term maintenance.

### **Year-round comfort with ecodan**

Reliable performance ensures comfort across seasons.

### **A versatile, low carbon solution**

With no onsite fossil fuel use, ATW heat pumps are well suited for both new builds and retrofit applications.





## Air-to-water compared to geothermal systems

Both geothermal and air-to-water heat pumps have their advantages. However, geothermal heat pumps may come with higher upfront costs for installation because the required horizontal or vertical ground loops require large areas of land. Air-to-water systems do not have the same larger space requirements because they do not require using a geothermal loop, therefore avoiding the costs associated with drilling for those loops.



## Air-to-water compared to forced air

Forced air heating systems provide heat that blows throughout ducts or grilles throughout the home. Through their inherent design and airflow distribution, using forced air systems may result in air temperature stratification, meaning that hot air remains concentrated in the upper portion of the room.

In contrast, air-to-water hydronic heating systems that utilize underfloor heating or radiator panels generate uniform radiant heat from the floor up, meaning no drafts and, less air stratification as well as quieter operation since no fans and motors are distributing the air.



Product

overview

02

# System overview

ecodan® is a modern hydronic system that can provide heating, cooling and domestic hot water

With hyper-heating capability available in 2, 3, and 4 ton capacities, ecodan can serve as the primary system for single- and multi-family homes.



Recommended indirect tanks are available in 60 and 85 gallon capacities with or without an integrated heater. Tanks will store domestic hot water which is indirectly heated by hot water supplied by ecodan.



### Outdoor unit

- |               |           |
|---------------|-----------|
| • WUZ-SA24NMZ | 24 kBtu/h |
| • WUZ-SA36NMZ | 36 kBtu/h |
| • WUZ-SA48NMZ | 48 kBtu/h |

### Capacity



### Hydrobox (indoor unit)

- ERSF-NM6E



### Domestic hot water tank

- |               |                      |
|---------------|----------------------|
| • ME-60-HO    | 60 gallons           |
| • ME-60-HO-H  | 60 gallons w/ heater |
| • ME-60-XHO   | 85 gallons           |
| • ME-60-XHO-H | 85 gallons w/ heater |



### Buffer tank

- Based on application needs
- Field supplied

# 3-in-1 system

## Space heating, cooling, and domestic hot water

The modern hydronic system can automatically change between heating, cooling, and DHW modes when the room temperature or DHW tank temperature deviates from the set temperature.

### Domestic hot water (DHW)

The ecodan®'s DHW capabilities allow it to serve as the primary source of hot water for a home. The system can ramp up the heating of water based on usage and demand. The system controller further allows for the programming and scheduling of hot water to the dedicated tank whenever it's needed.

### Cooling

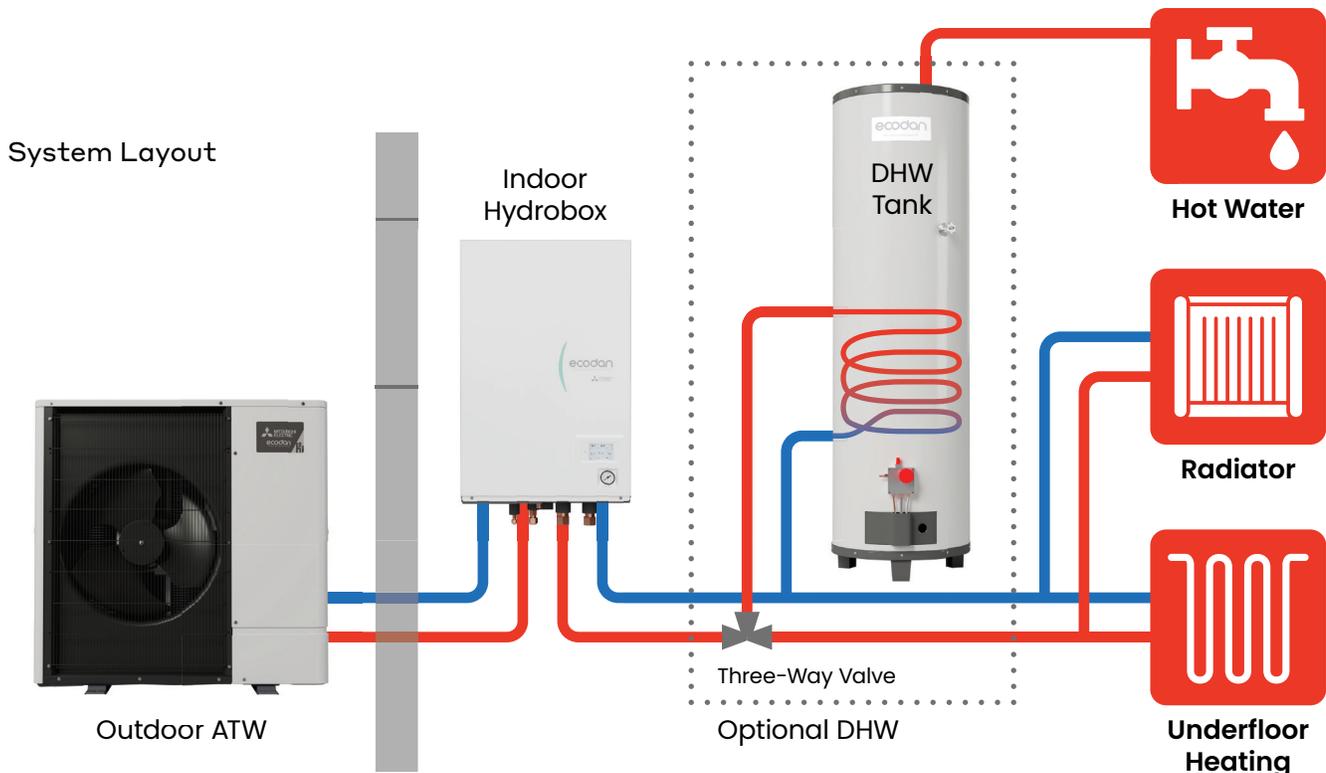
When connected to hydronic air handlers and modern radiator panels, the ecodan system provides cooling as well as heating. It's an all-in-one solution for the home.

### Heating:

The system is compatible with a wide range of heat emitter types thanks to its high water flow temperatures of up to 158° F while maintaining high heating capacity output.

### Low GWP refrigerant

ecodan uses R-32 refrigerant, which is environmentally friendly with a low Global Warming Potential (GWP) of 675.



# ecodan® operating ranges

## Hyper-heating:

100% heating capacity at 5° F, and guaranteed heating at temperatures as low as -22° F.

## Operating ranges:

Heating: as low as -22° F

Cooling: As high as 115° F

Domestic hot water: as low as -22° F

## Flow temperature ranges

The wide flow temperature range allowed by ecodan allows the system to work seamlessly with various heat emitter types, including underfloor radiant heating, panel radiators, baseboard heaters, and fan coils. This flexibility supports both retrofit and new installations, across diverse applications.

Heating flow temperature range:

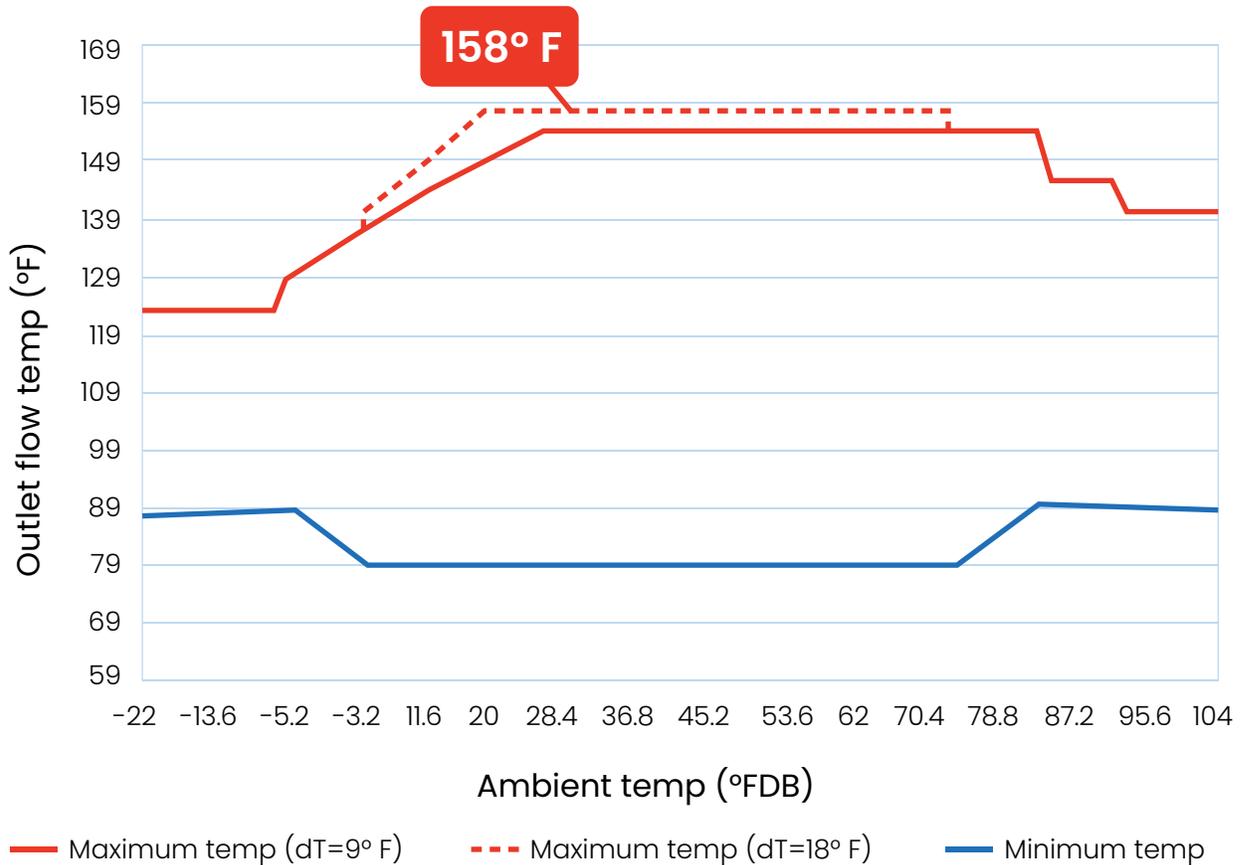
68° F to 158° F

Cooling flow temperature range:

41° F to 77° F

### Water outlet temperature

#### Heating/DHW Mode



\*WUZ-SA series can supply Max. 158° F

\*Water outlet temperature depends on ambient temperature and differential of water temperature between target and inlet water temperature.

# How ecodan® works



## The next generation of air-to-water heat pumps, ecodan uses a refrigerant split type system

This means the piping between the outdoor unit and Hydrobox uses low GWP refrigerant as the heat transfer fluid, compared to hydro-split and monobloc systems which use water or glycol as the heat transfer fluid between the outdoor unit and the indoor heat exchangers.



### Benefits of a refrigerant split type system

The refrigerant heats the water in the hydronic distribution system through the plate heat exchanger which then can be circulated around the home.

- No freeze risk: Uses refrigerant instead of water in piping between outdoor and indoor units.
- No glycol or heat trace needed: Eliminates added materials, complexity, maintenance and cost.
- Fewer auxiliary components: Hydro-split and monobloc systems may require extra pumps for longer piping.
- Long piping flexibility: Supports up to 164 ft.
- Vertical install capability: Handles up to 100 ft vertical piping; ideal for multi-family projects.

# Plug-and-play solution



The key benefit of the system's configuration is that the ecodan®'s Hydrobox is installed indoors, making it more convenient to service in a comfortable environment. This is in stark contrast to monobloc systems, which requires service to be completed outdoors in potentially harsh, cold climates.



ecodan serves as an all-in-one solution, with key water circuit components such as flow temperature controller, water circulator/pump, plate heat exchanger, and magnetic filter.

While other systems may require additional pumps in order to extend piping, ecodan is capable of long piping lengths of up to 164 feet and a vertical piping height of up to 100 feet. The design and installation flexibility are ideal for multi-family applications or if you want to have the outdoor unit hidden from view.



# Hydrobox

ecodan®'s all-in-one Hydrobox indoor unit is sleek and compact, with a modern design that blends well into the look and feel of nearby appliances.

The Hydrobox can fit into easily accessible interior areas for convenient access to settings. It features a back-lit touch screen controller for convenient control of both comfort and water heating settings.



**The heart of the ecodan system, the all-in-one Hydrobox, includes the key water circuit components.**

The Hydrobox is easy to install and comes with many of the necessary components for hydronic applications built-in. It's developed for easy set up and maintenance. Designed with front-access serviceability, the all-in-one Hydrobox includes the pumps, expansion vessel, magnetic filter, booster heater, plate heat exchanger, flow temperature controller and safety devices.

One of the key Hydrobox components is the magnetic filter. Providing system longevity and easier maintenance, the magnetic filter is specially designed to catch large debris, sediment, and iron particles before they can ever reach the plate heat exchanger, pump, or other associated piping.



# Flow Temperature Controller

## The Flow Temperature Controller (FTC) is the brain of the ecodan® system.

The circuit board located inside the Hydrobox, called the Flow Temperature Controller (FTC), enables optimized control of the outdoor unit, indoor unit, and water circuit based on ambient and flow temperatures. The FTC can manage the system through its various input and output options and determine the best source of heating for consistent comfort and energy efficient performance.



The Flow Temperature Controller can also easily integrate or interlock with an existing boiler or external controllers in the home, providing greater flexibility and adaptability for a wide range of applications.



# ecodan® features



## Optimum water flow temperatures

ecodan® is capable of delivering hot water up to 158° F outlet water even in low ambient temperatures. During cooling operation, ecodan can deliver a minimum water flow temperature of 41° F.



## Hyper-heating

Hyper-Heating INVERTER® ecodan models provide heating at low ambient outdoor temperatures with 100% heating capacity down to 5° F and guaranteed operation as low as -22° F. These units are certified to offer year-round comfort even in extreme climates.



## Flash injection

As temperatures drop outside, the compressor speeds up to maintain comfort inside. The flash injection process supplies a small amount of cooler refrigerant back to the compressor, reducing excess heat from increased speeds; allowing it to run faster and produce a high heating performance. This also enables the system to achieve set points faster, maintain efficiency, and recover quickly after a defrost cycle.



## Quiet operation

The outdoor unit features ultra-quiet operation as low as 41 - 45 dB(A) due to an anti-vibration design and 6-layer insulation around the compressor. The unit also offers a three-stage low-noise operation modes.



## All-in-one Hydrobox

Designed with a small footprint and front-access serviceability, the all-in-one Hydrobox incorporates all of the key water circuit components, including the pump, expansion vessel, magnetic filter, booster heater, and plate heat exchanger.



## Boiler integration

Boiler Integration enables the system to automatically switch from heat pump to boiler operation based on ambient temperature and operating load readings. The Flow Temperature Controller (FTC) determines the best source of heating for consistent comfort and energy-efficient performance.



### Multi-zone control

Connecting auxiliary valves and room thermostats to the Hydrobox enables dual-zone control, eliminating the need for additional zone controllers.



### Auto changeover function

The unit will automatically change between heating and cooling modes when the ambient temperature deviates from the set temperature. This maintains comfort without the need for manual adjustment to the system settings. Installers can set custom temperature thresholds and delay periods to minimize unnecessary mode changes and promote year-round comfort.



### Automatic air vent

Air builds up in a hydronic system over time and needs to be released to maintain optimal performance. The automatic air vent purges the excess air from the system piping, avoiding noise in the pump and providing steady circulation in the primary water circuit.



### Eco mode

Eco Mode allows the system to heat the water gradually to reduce power consumption.

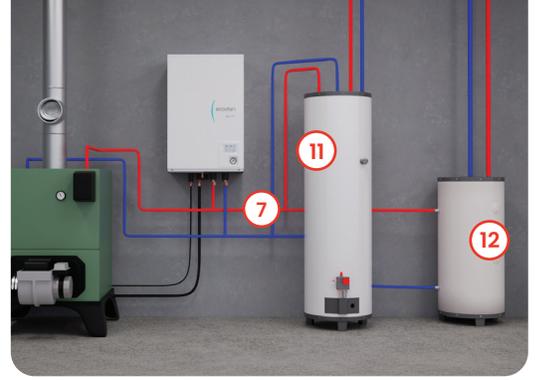


### Energy monitoring

Homeowners can monitor monthly and yearly Domestic Hot Water (DHW) and space heating and cooling energy consumption from the Hydrobox controller. This information can help manage home energy use.

# Key components

## Hydrobox indoor unit



- 1 Flow Temperature Controller (FTC)** - The Flow Temperature Controller is the control board inside the Hydrobox. It manages the system, including the indoor and outdoor units and the water circuit based on ambient and flow temperatures. It can be integrated or interlocked with external controllers for greater application flexibility.
- 2 Water pump/Circulator** - This component is built-in and equipped with sensors for energy efficient water circulation in a closed loop. The pump adjusts the speed of the water flow to maintain comfort.
- 3 Plate heat exchanger** - The plate heat exchanger is designed and optimized for the efficient transfer of heat between the refrigerant and water.
- 4 Magnetic filter** - The magnetic filter catches large debris, sediment, and iron particles before they can impact the plate heat exchanger, pump, or other piping, supporting system longevity and easier maintenance.
- 5 Booster heater** - When the set point deviates beyond a selected temperature for a specified amount of time, the electric booster heater provides additional heating to raise the water temperature.
- 6 Pressure relief valves** - The pressure relief valve is automatically activated when the water pressure is above 43.5 psi (3 bar).
- 7 Three-way valve** - The three-way valve diverts water to switch between space conditioning and DHW.
- 8 Expansion vessel** - The built-in expansion vessel absorbs the water volume expansion due to heating, protecting piping and its components.
- 9 Flow sensor** - The flow sensor maintains water pressure by monitoring the flow rate and automatically adjusting the inverter output for maximum efficiency.
- 10 MicroSD Card** - Installers can copy settings onto an included SD card to use for future installs. They can also easily save and refer to system operation data.
- 11 Indirect tank** - This tank stores domestic hot water indirectly heated using hot water supplied by ecodan. Available in 60 and 85 gallon capacities with and without an integrated heater.
- 12 Buffer tank** - The optional buffer tank serves as a thermal energy battery, storing hot or cold water and reducing short cycling.

# Outdoor unit

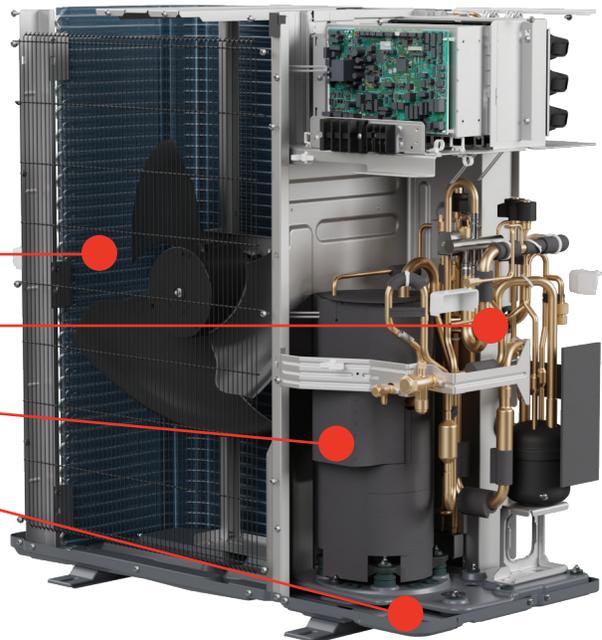


## Design and sound

The ecodan® heat pump outdoor unit features an elegant design which seamlessly blends in with the design and functionality of any outdoor space.

Outdoor units can be “tucked away” due to their small size and are adaptable to many spaces. The compact, attractive design is further emphasized by the rounded edges of the unit, which gives a softer look and feel.

- Aerodynamic design
- Flash injection technology
- 6-layer sound jacket
- Dual layer vibration isolators



## Designed for peace and quiet

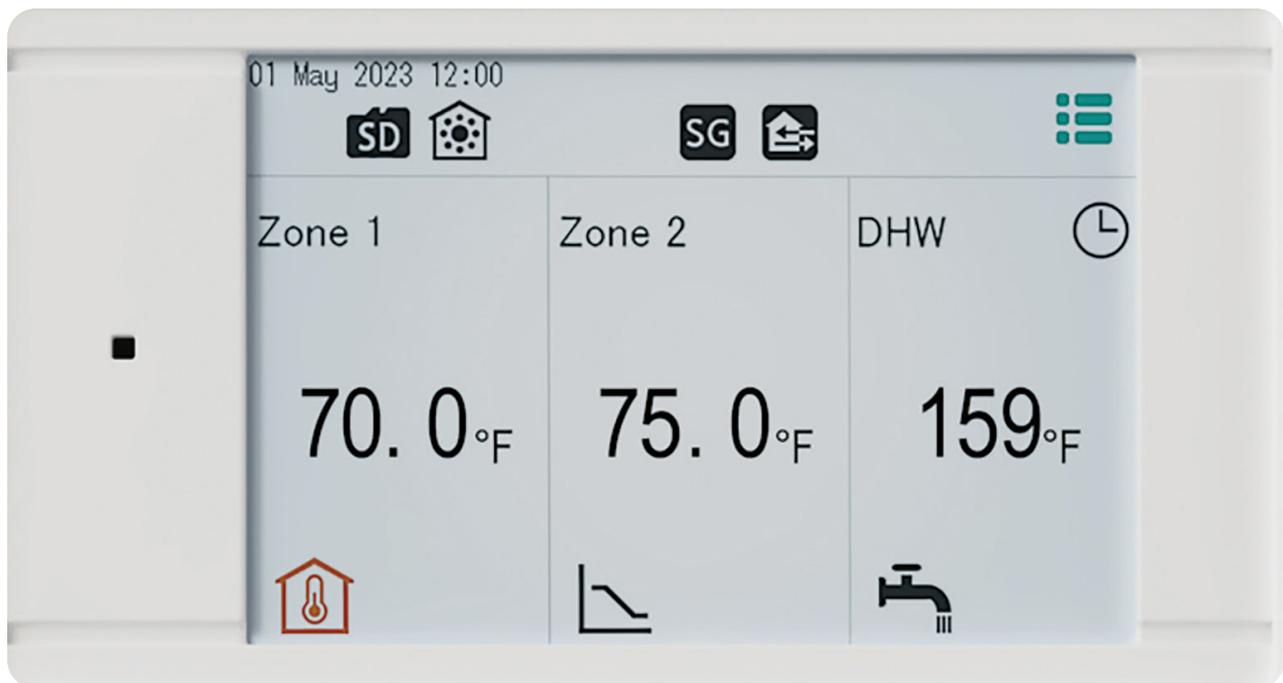
ecodan units feature a dual vibration isolation structure to reduce noise and vibrations as well as a six-layer sound insulation and a larger low-speed fan. These designs are incorporated to reduce noise and achieve quiet operation.

The outdoor unit features ultra-quiet operation as low as 41 - 45 dB(A) thanks to its reduced-vibration design. The unit also offers a three-stage low-noise mode that can lower the compressor frequency and fan speed to reduce noise levels if desired while house occupants are sleeping.

# Control flexibility

The ecodan® controller, located on the front panel of the Hydrobox, features a touch screen with a vibrant color display. Users can navigate to settings that allow them to adjust heating and cooling for multiple zones, set schedules, as well as control domestic hot water.

The DHW settings screen allows homeowners to choose to toggle Eco mode on or off, set water temperature, enable the boost function, and program the DHW prohibit schedule. The controller's expanded menu screen allows users to access even more features, including cooling mode, vacation mode, and detailed information on their system's energy consumption.



## Key settings

- Heating/cooling mode selection
- Target water flow temperature for heating/cooling  
Set the flow temperature manually to match the space heating/cooling system design and customize user's desired requirements.
- Set the desired temperature, priority and schedule for DHW
- Vacation mode  
Keeps the system running at lower flow temperatures and thus reduced power usage whilst the property is unoccupied.
- Eco mode  
Reduces the compressor power consumption when DHW demand is low.
- DHW boost mode
- Legionella prevention mode\*

\*This product may assist in maintaining water quality when properly installed and maintained. However, risk of Legionella cannot be entirely eliminated by any single device or method. Owners and operators are responsible for adhering to all prevailing health and safety regulations, and for implementing comprehensive Legionella prevention and water management protocols as required by law and/or as recommended under national or regional guidance, such as ASHRAE Guideline 12.

## DHW prioritization

The system can prioritize DHW and heating based on time and delta from set temperature

## Intermittent operation control and schedule

### DHW prohibition schedule

Prohibits DHW heating during the scheduled times

<Back
DHW
🏠

Max. temp. drop	— 50°F	+
Max. operation time	— 60min.	+
Interval	— 30min.	+

### Flexible DHW setting

#### Max temp. drop (9° F-72° F)

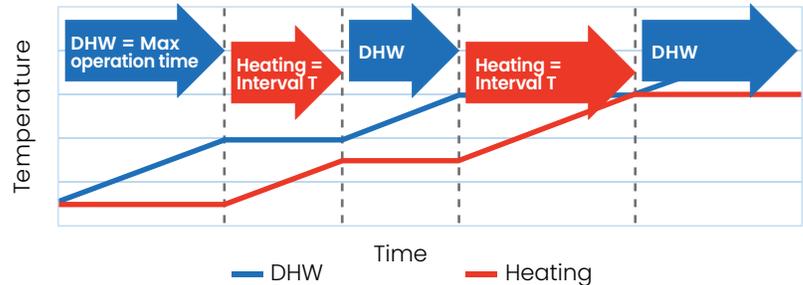
The temp difference between the maximum DHW temp at which DHW mode restarts

#### Max operation time (adjustable 30-120 min)

DHW maximum operation time during cyclic operation with heating (interval)

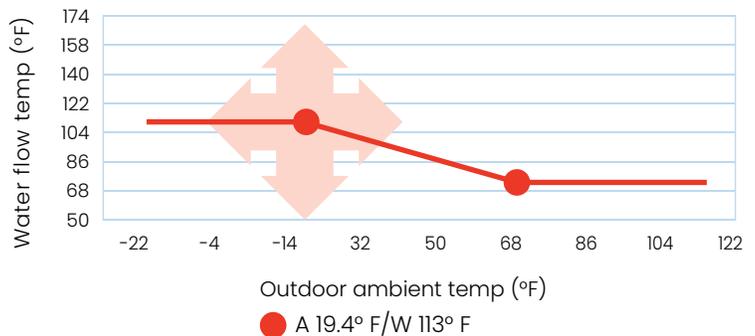
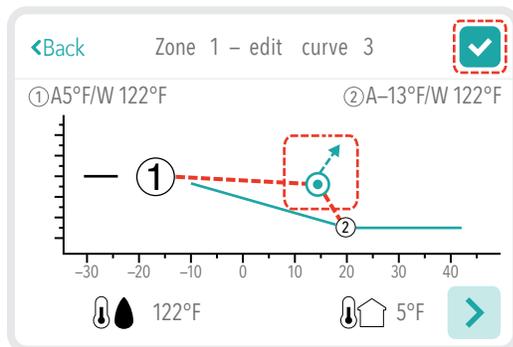
#### Interval (32-120 min)

Heating time



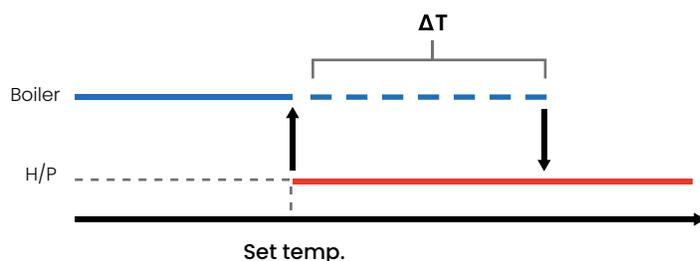
## Weather compensation curve

Optimizes flow temperatures to provide the highest COP using information from both an outdoor temperature sensor and a temperature sensor on the primary water circuit to ensure the heat pump is not producing excessive flow temperatures if the weather conditions do not require it.



## Boiler integration mode

Enables the system to automatically switch from electric heat pump to boiler operation for consistent comfort. The system can also be set to switch based on optimal energy efficiency or ambient temperature.



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🔑
Outdoor ambient temperature

Heat Pump
Boiler

🔌
➡
🔥

5°F

—
+

Boiler
Heat Pump

🔥
➡
🔌

5°F

—
+

## Water flow rate settings

Define the water flow rate required based on outdoor unit capacity and water circuit requirements.

Follow the Table 4.3.1 in the Installation Manual and set the flow range by outdoor unit.

<Back
Flow rare & pump speed
Next>

Min flow rate	1.4GPM <span style="color: green;">+</span>	} <b>Flow rate setting</b> Function: Define the error notification criteria when the water flow amount exceeds the setting
Max flow rate	26.4GPM <span style="color: green;">+</span>	
Pump speed	5 <span style="color: green;">+</span>	} <b>Pump speed per heating and DHW</b> Function: pump power setting (no need to change from Level 5)
Pump speed DHW	5 <span style="color: green;">+</span>	

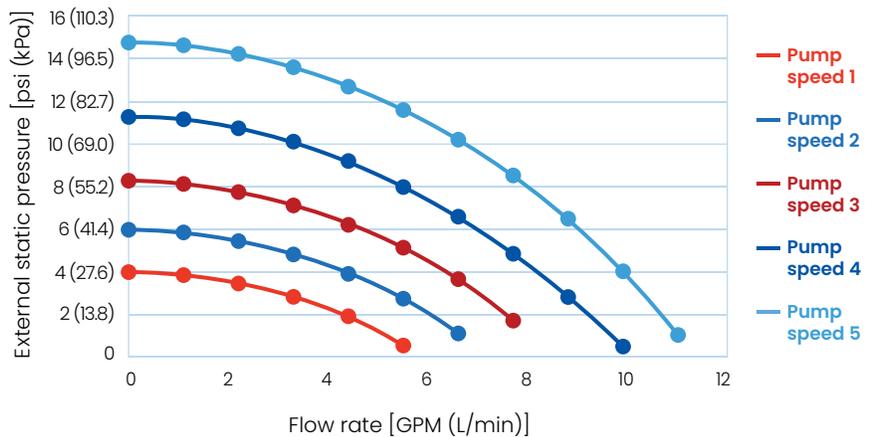
Outdoor heat pump	Water flow rate range		Recommended flow		
	L/min	gal/min	L/min	gal/min	
Split model WUZ series	WUZ-SA24NMZ	7.2 - 22.9	1.9 - 6.1	14.3	3.8
	WUZ-SA36NMZ	7.2 - 28.7	1.9 - 7.6	17.9	4.7
	WUZ-SA48NMZ	10.0 - 34.4	2.6 - 9.1	25.1	6.6

## Water circulation pump characteristics

Pump speed can be selected by main remote controller setting. Adjust the pump speed setting so that the flow rate in the primary circuit is approximate for the installed outdoor unit.

### Notes:

1. If the water flow rate is less than the minimum flow rate setting of the flow sensor (default 1.4 GPM [5.0 L/min]), the flow rate error will be activated.
2. If the water flow rate exceeds 9.7 GPM (36.9 L/min), the flow speed will be greater than 6.6 ft/s (2.0 m/s), which could erode the pipes.



## Booster heater operation

Change the booster heater's maximum capacity and operation logic.  
Booster heater capacity options: 2kW, 4kW, 6kW

## Low noise mode schedule and settings

Setting the low-noise mode reduces compressor frequency and fan speed.

## Service and Commissioning control and data

Access operational data during commissioning.



Common

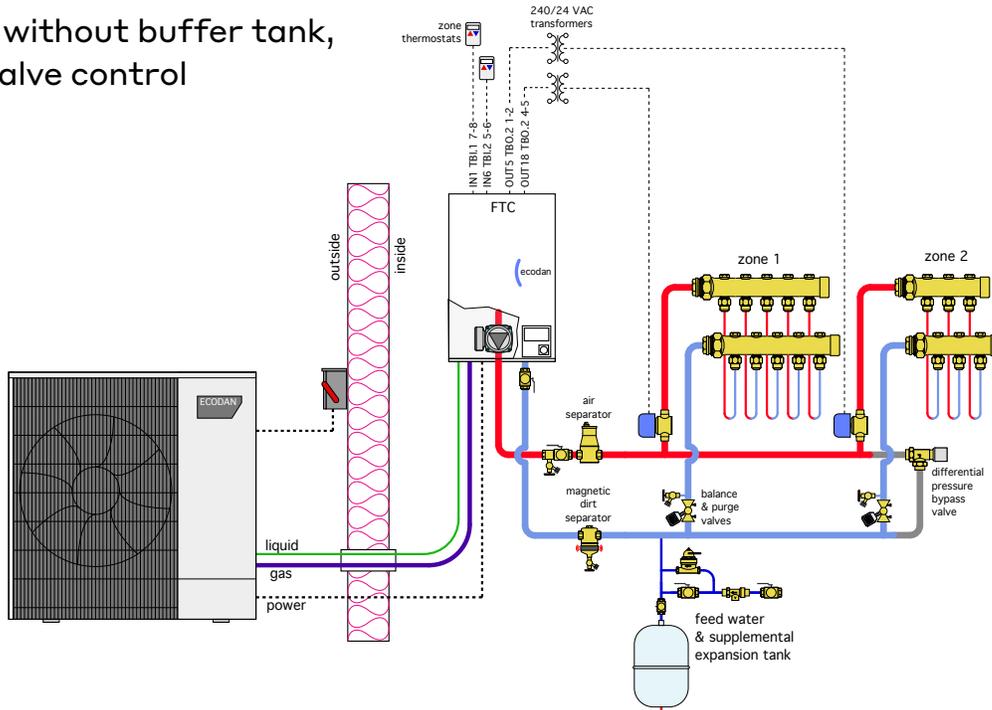
applications

03

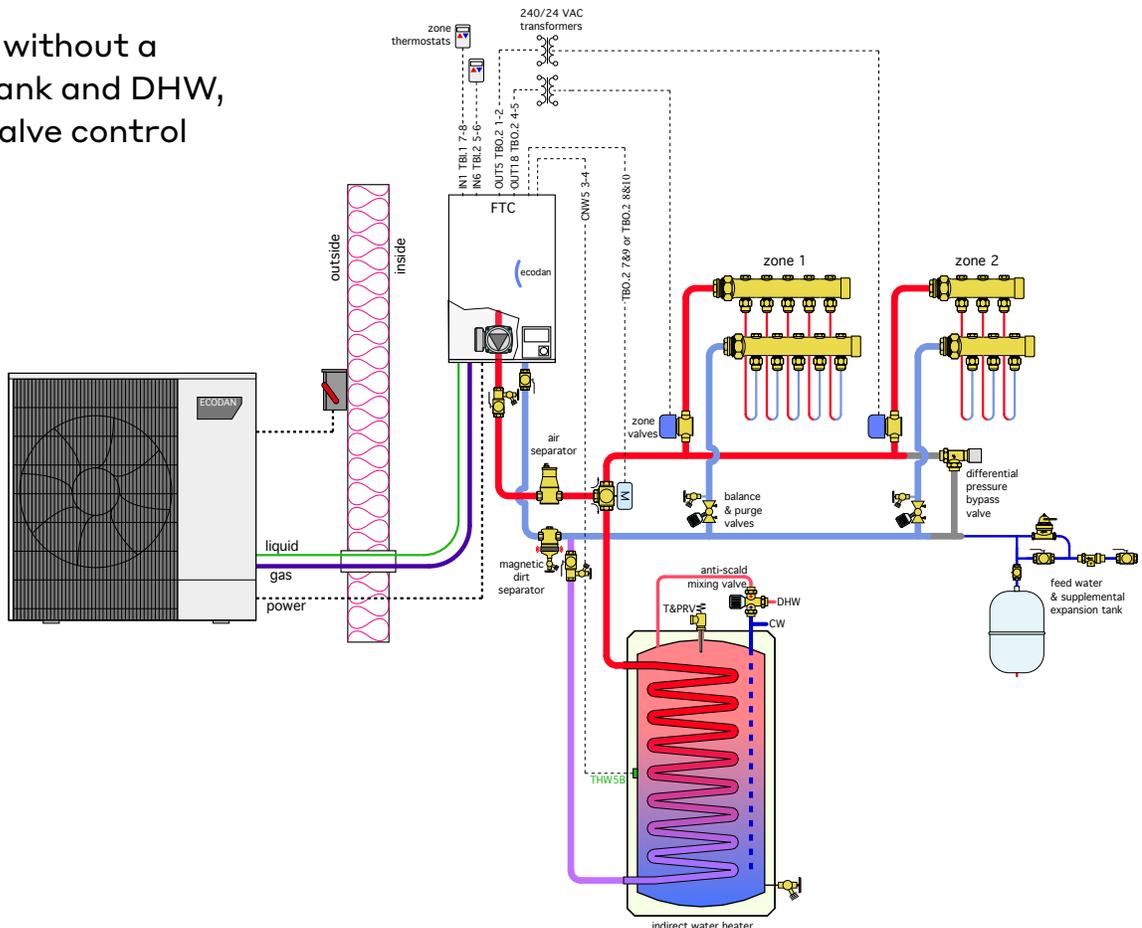
# Installation and configuration examples

Please refer to the ecodan® application guide for more configuration examples and design guidance.

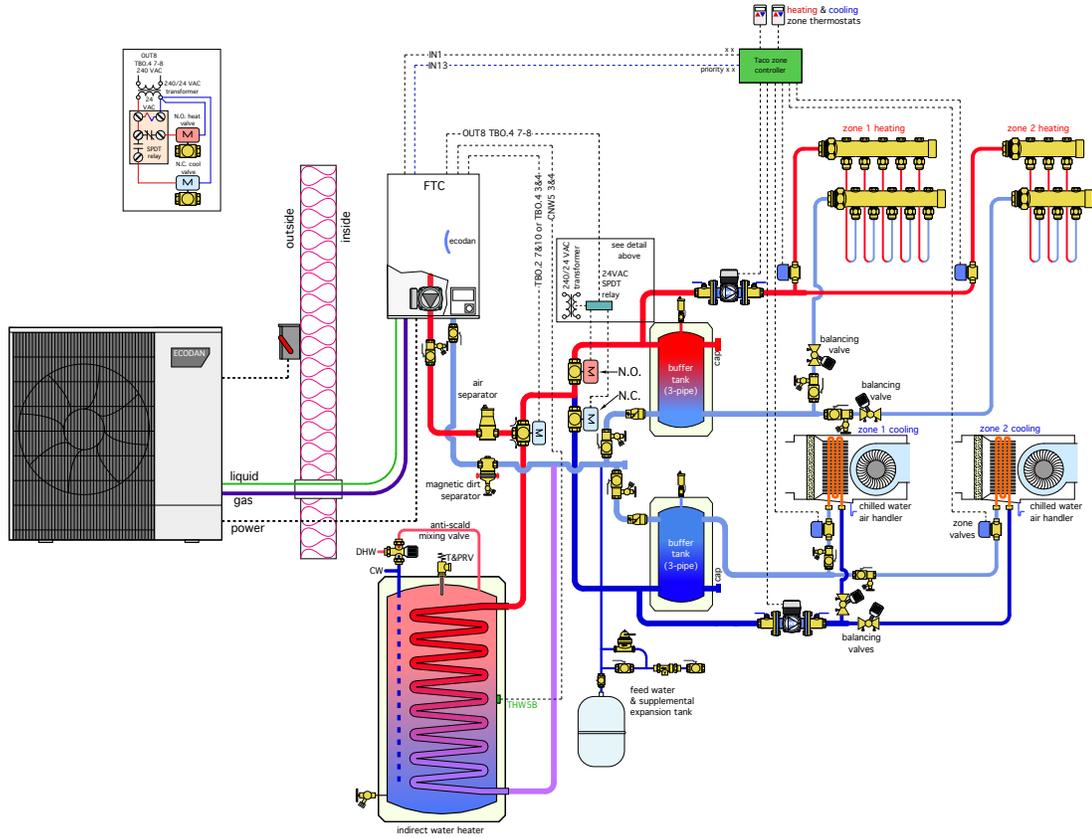
## Heating without buffer tank, 2-zone valve control



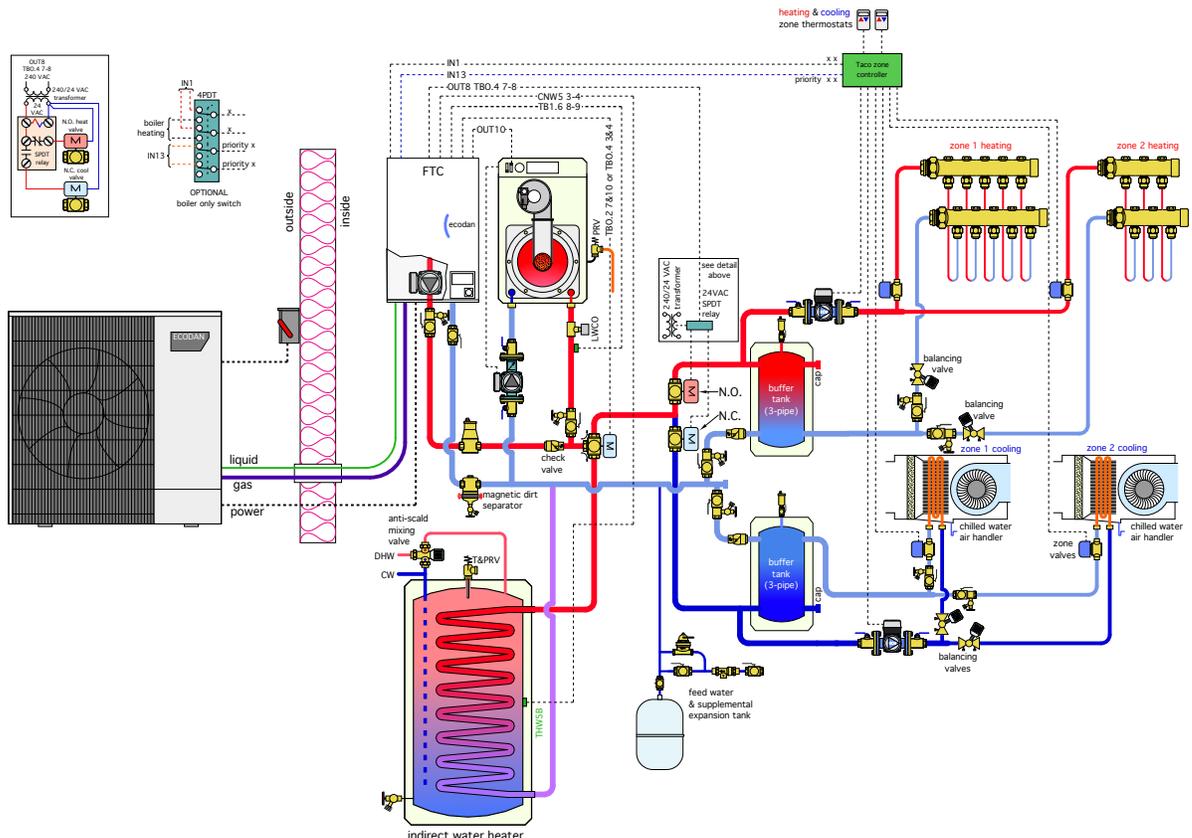
## Heating without a buffer tank and DHW, 2-zone valve control



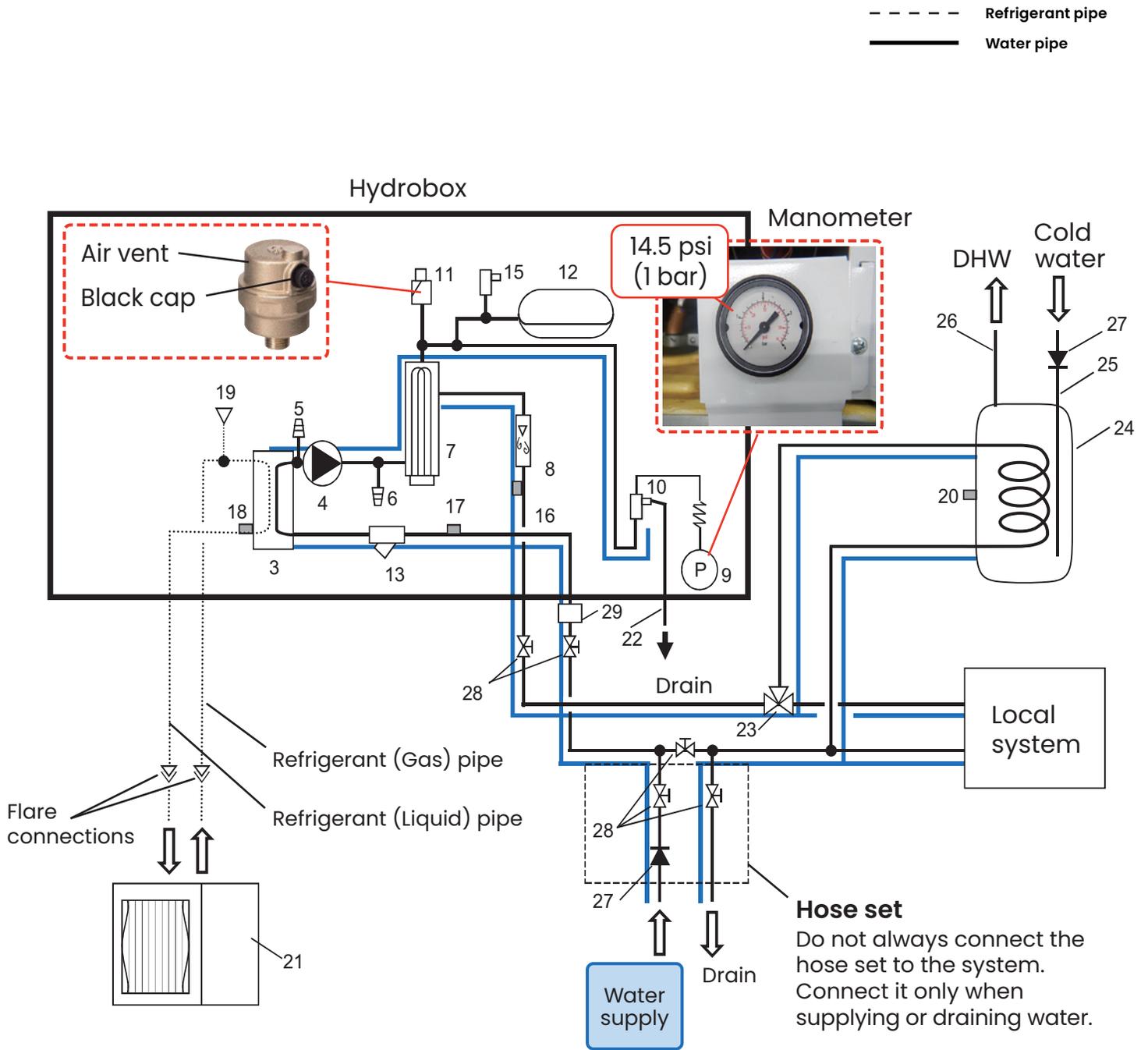
# Heating and cooling with 2 buffer tanks and DHW



# Heating and cooling with 2 buffer tanks, DHW, and a backup boiler



# Refrigerant and water circuit flow diagram



**Notes:**

- The blue lines indicate the water flow at air purge when supplying water.
- Refer to the installation manual for full water flow diagram and legend.
- Pressurize system indicated by the manometer is 14.5 psi (1 bar).
- When purging air, open the black cap of the air vent.



Technical

specifications

04

# ecodan® Air-to-Water Heat Pump specifications

Indoor Unit			ERSF-NM6E	ERSF-NM6E	ERSF-NM6E
Outdoor Unit			WUZ-SA24NMZ	WUZ-SA36NMZ	WUZ-SA48NMZ
Heating <sup>1</sup>	Heating Water Temperature Range [Minimum / Maximum] <sup>2</sup>	deg F	77 / 158	77 / 158	77 / 158
	Maximum Capacity at A45W95	Btu/h	30,370	37,190	49,130
	Maximum Power Input at A45W95	W	1,914	2,300	4,034
	COP at A45W95		4.65	4.74	3.57
	Maximum Capacity at A35W95	Btu/h	32,420	42,310	49,820
	Maximum Power Input at A35W95	W	2,819	3,839	4,899
	COP at A35W95		3.37	3.23	2.98
	Maximum Capacity at A5W95	Btu/h	30,030	36,510	48,450
	Maximum Power Input at A5W95	W	3,465	4,213	6,636
	COP at A5W95		2.54	2.54	2.14
	Maximum Capacity at A5W110	Btu/h	27,980	35,150	47,770
	Maximum Power Input at A5W110	W	4,141	5,337	7,035
	COP at A5W110		1.98	1.93	1.99
	Maximum Capacity at A-4W95	Btu/h	25,932	32,074	40,263
	Maximum Power Input at A-4W95	W	3,408	4,312	5,784
	COP at A-4W95		2.23	2.18	2.04
Maximum Capacity at A-22W95		19,107	27,297	33,438	
Maximum Power Input at A-22W95		3,146	3,941	5,052	
COP at A-22W95		1.78	2.03	1.94	
Cooling <sup>1</sup>	Cooling Water Temperature Range [Minimum / Maximum]	deg F	41 / 77	41 / 77	41 / 77
	Maximum Capacity at A95W45	Btu/h	27,297	31,392	42,650
	Maximum Power Input at A95W45	W	2,477	3,108	4,808
	EER at A95W45		11.02	10.1	8.87
	Maximum Capacity at A95W65	Btu/h	34,121	40,946	51,182
	Maximum Power Input at A95W65	W	2,141	2,885	4,249
EER at A95W65		15.94	14.19	12.05	
Electrical	Voltage, Phase, Frequency	V AC / V AC, ø, Hz	208 / 230, 1, 60	208 / 230, 1, 60	208 / 230, 1, 60
	Guaranteed Voltage Range	V AC	198 - 253	198 - 253	198 - 253
	Voltage: Indoor - Outdoor, S1-S2		208/230	208/230	208/230
	Voltage: Indoor - Outdoor, S2-S3	V DC	28	28	28
	Short-circuit Current Rating [SCCR]	kA	5	5	5
	Recommended Fuse/Breaker Size, ODU + hydrobox (without booster heater)	A	30	35	40
	Recommended Fuse/Breaker Size, booster heater (requires separate circuit)		35	35	35
	Recommended Wire Size [Indoor - Outdoor]	AWG	16	16	16
Minimum Wire Size (Outdoor power)		11	11	9	
Hydrobox	SPL (Sound Pressure Level)		34	34	34
	PWL (Sound Power Level)		48	48	48
	External Finish		Galvanized Steel, 6.2PB 9/0.9	Galvanized Steel, 6.2PB 9/0.9	Galvanized Steel, 6.2PB 9/0.9
	Unit Dimensions (W x D x H)	inch x inch x inch [mm x mm x mm]	20-55/64 x 14-11/64 x 31-1/2 [530 x 360 x 800]	20-55/64 x 14-11/64 x 31-1/2 [530 x 360 x 800]	20-55/64 x 14-11/64 x 31-1/2 [530 x 360 x 800]
	Package Dimensions (W x D x H)		23-5/8 x 39 x 22-1/16 [600 x 990 x 560]	23-5/8 x 39 x 22-1/16 [600 x 990 x 560]	23-5/8 x 39 x 22-1/16 [600 x 990 x 560]
	Unit Weight		93 [42]	93 [42]	93 [42]
	Unit Weight (Water full)	lbs [kg]	106 [48]	106 [48]	106 [48]
	Package Weight		124 [56]	124 [56]	124 [56]
	Hydrobox water circuit volume <sup>3</sup>	gal [L]	1.40 [5.30]	1.40 [5.30]	1.40 [5.30]
	Booster Heater Equipped		Yes	Yes	Yes
	Booster Heater Capacity [208V / 230V]	kW	4.90 / 6	4.90 / 6	4.90 / 6
	Water Flow Rate [Minimum / Maximum]	GPM / GPM [L/min / L/min]	1.90 / 6 [7.20 / 22.90]	2.60 / 7.50 [10 / 28.60]	2.60 / 9 [10 / 34.40]
	Plate-Plate Heat Exchanger Model Number		MWA1-54AP2	MWA1-54AP2	MWA1-54AP2
	Expansion Vessel Equipped		Yes	Yes	Yes
	Expansion Vessel Net Volume	gal [L]	3.20 [12]	3.20 [12]	3.20 [12]
	Expansion Vessel Charge Pressure	psi [MPa]	14.50 [0.10]	14.50 [0.10]	14.50 [0.10]
	Water Connection (Return from the water circuit)		NPT1 (Female)	NPT1 (Female)	NPT1 (Female)
	Water Connection (Supply to the water circuit)		NPT1 (Female)	NPT1 (Female)	NPT1 (Female)
	Pressure Relief Valve Pipe Connection		NPT1/2 (Female)	NPT1/2 (Female)	NPT1/2 (Female)
	Drain Pipe Size O.D.	inch [mm]	13/16 [20]	13/16 [20]	13/16 [20]
IP Rating		IPX0	IPX0	IPX0	
Maximum Pressure of Refrigerant		708 [4.88]	708 [4.88]	708 [4.88]	
Maximum Pressure of Water	psi [MPa]	43.50 [0.30]	43.50 [0.30]	43.50 [0.30]	
Set Pressure of Pressure Relief Valve		43.50 [0.30]	43.50 [0.30]	43.50 [0.30]	

Indoor Unit		ERSF-NM6E	ERSF-NM6E	ERSF-NM6E	
Outdoor Unit		WUZ-SA24NMZ	WUZ-SA36NMZ	WUZ-SA48NMZ	
IDU Operating Temp. Range	deg F	32 / 95	32 / 95	32 / 95	
	Guaranteed Maximum Relative Humidity	78%RH (at 81F) or less	78%RH (at 81F) or less	78%RH (at 81F) or less	
Outdoor Unit	MCA	A	27	32	
	MOCP		43	52	
	Fan Motor Output	HP	0.27	0.27	0.27
	Airflow Rate Cooling	CFM	1,483	1,836	1,907
	Airflow Rate Heating		2,048	2,189	2,119
	Defrost Method		Reverse Cycle	Reverse Cycle	Reverse Cycle
	Coating on Heat Exchanger (Bluefin, Sea Coast)		Yes, No	Yes, No	Yes, No
	Heat Exchanger Tube		Copper	Copper	Copper
	Sound Pressure Level at A7W55	dB (A)	41	45	45
	Compressor Type		Scroll	Scroll	Scroll
	Compressor Model		DVK28FEJMT	DVK28FEJMT	DVK36FEGMT
	Compressor Oil [Type // Charge]	// oz	FW68CA // 30	FW68CA // 30	FW68CA // 30
	Unit Dimensions (W x D x H)	inch x inch x inch [mm x mm x mm]	41-11/32 x 18-29/32 x 40-15/16 [1,050 x 480 x 1,040]	41-11/32 x 18-29/32 x 40-15/16 [1,050 x 480 x 1,040]	41-11/32 x 18-29/32 x 40-15/16 [1,050 x 480 x 1,040]
	Package Dimensions (W x D x H)	inch x inch x inch [mm x mm x mm]	44-7/8 x 23-15/64 x 47-41/64 [1,140 x 590 x 1,210]	44-7/8 x 23-15/64 x 47-41/64 [1,140 x 590 x 1,210]	44-7/8 x 23-15/64 x 47-41/64 [1,140 x 590 x 1,210]
	Unit Weight	lbs [kg]	236 [107]	236 [107]	252 [114]
Package Weight	lbs [kg]	276 [125]	276 [125]	292 [132]	
ODU Operating Temp. Range	deg F	-22 / 107	-22 / 107	-22 / 107	
Refrigerant	Type		R32	R32	
	Pre-Charged Refrigerant Amount	lbs, oz	3, 15.5	3, 15.5	3, 15.5
	Maximum Pre-charged Piping Length [Reversible System]	ft [m]	50 [15]	50 [15]	50 [15]
	Additional Refrigerant Charge Per Additional Liquid Piping Length [Reversible System]	oz/ft [g/m]	0.20 [18.40]	0.20 [18.40]	0.20 [18.40]
Piping	Gas Pipe Size O.D. [Flared]	inch [mm]	5/8 [15.88]	5/8 [15.88]	5/8 [15.88]
	Liquid Pipe Size O.D. [Flared]	inch [mm]	1/4 [6.35]	1/4 [6.35]	1/4 [6.35]
	Maximum Piping Length [Reversible System]	ft [m]	164 [50]	164 [50]	100 [30]
	Maximum Piping Length [Heating Only System]	ft [m]	164 [50]	164 [50]	164 [50]
	Maximum Height Difference	ft [m]	100 [30]	100 [30]	100 [30]
	Maximum Height Difference, ODU above IDU	ft [m]	100 [30]	100 [30]	100 [30]
	Maximum Height Difference, ODU below IDU	ft [m]	100 [30]	100 [30]	100 [30]
Maximum Number of Bends		10	10	10	

<sup>1</sup>A=Ambient temperature (°F) W= Leaving water temperature (°F) e.g. A45W95 = Ambient temperature 45 °F, Leaving water temperature 95° F.

<sup>2</sup>Refer to the Technical & Service Manual for the minimum/maximum leaving water temperature since those are dependent on the ambient temperature.

<sup>3</sup>Excluding the expansion vessel and piping to expansion vessel.

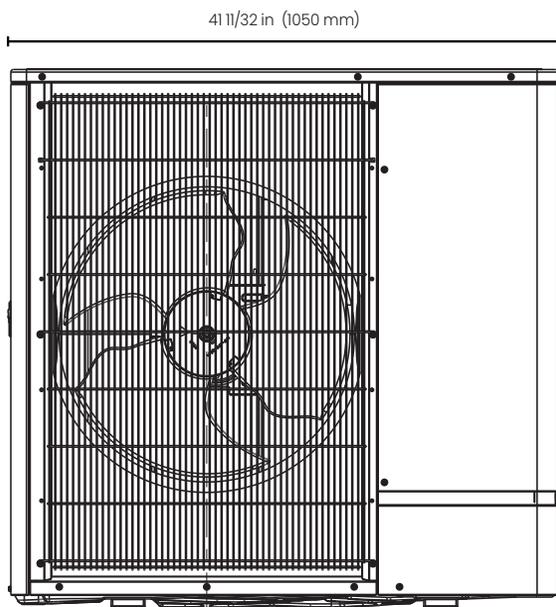
# Outdoor unit



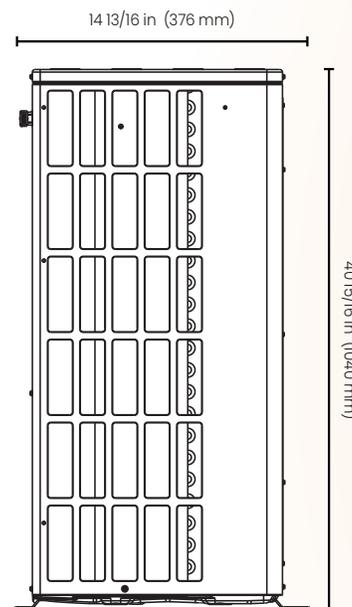
## Unit models

- WUZ-SA24NMZ
- WUZ-SA36NMZ
- WUZ-SA48NMZ

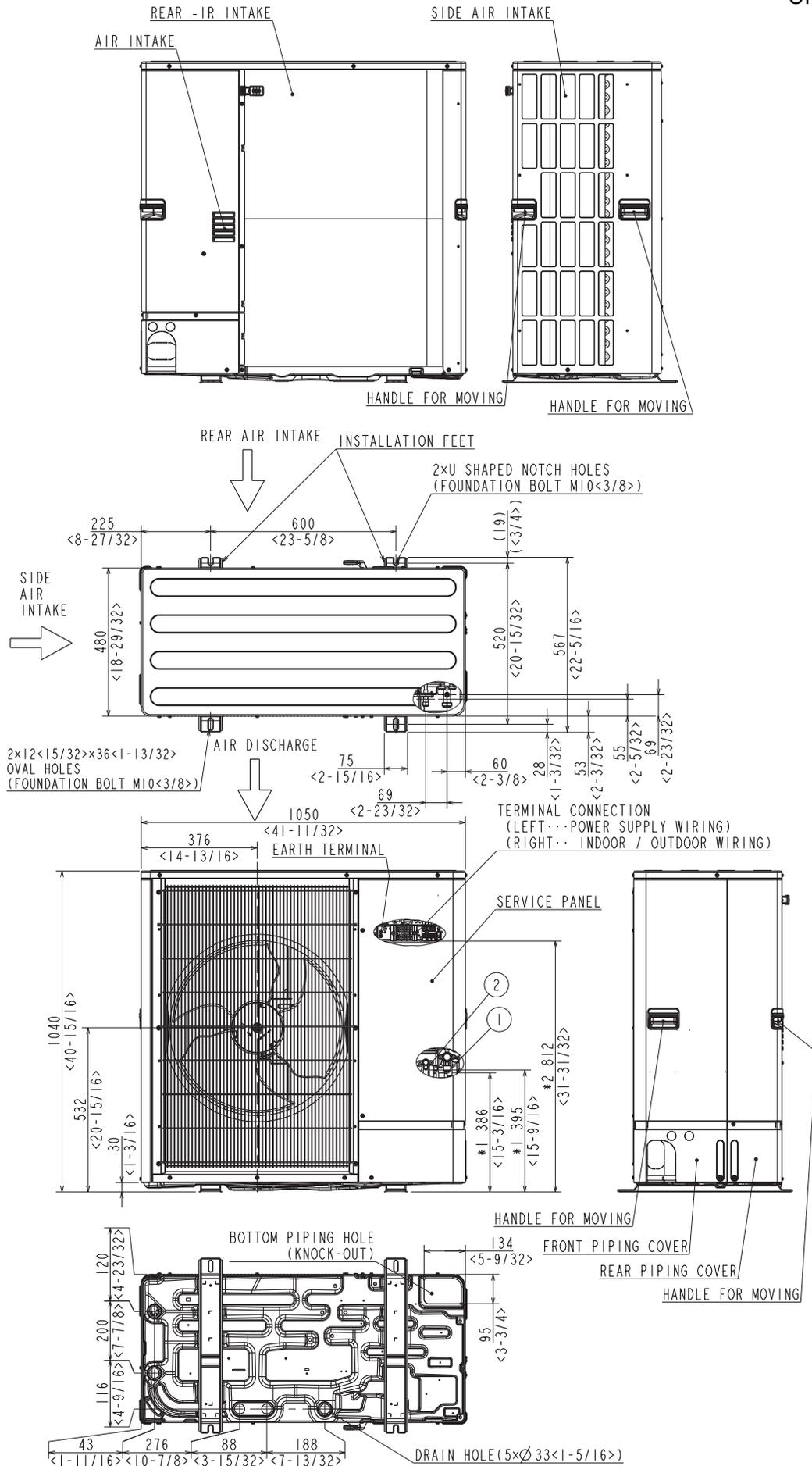
## Dimensions



Front



Side

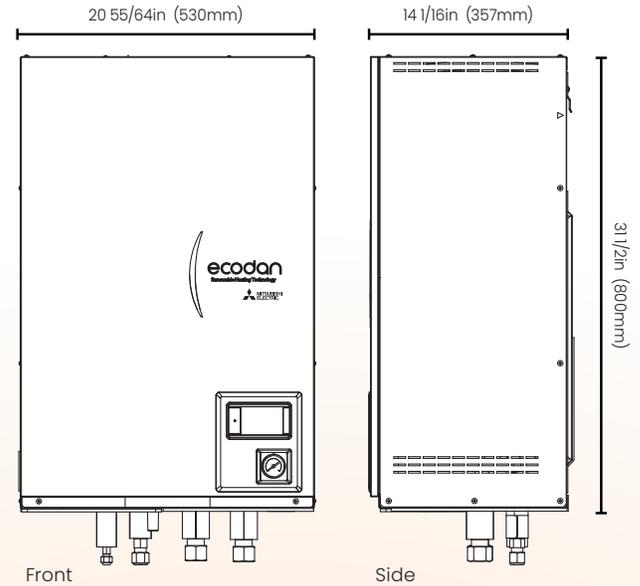


# Hydrobox

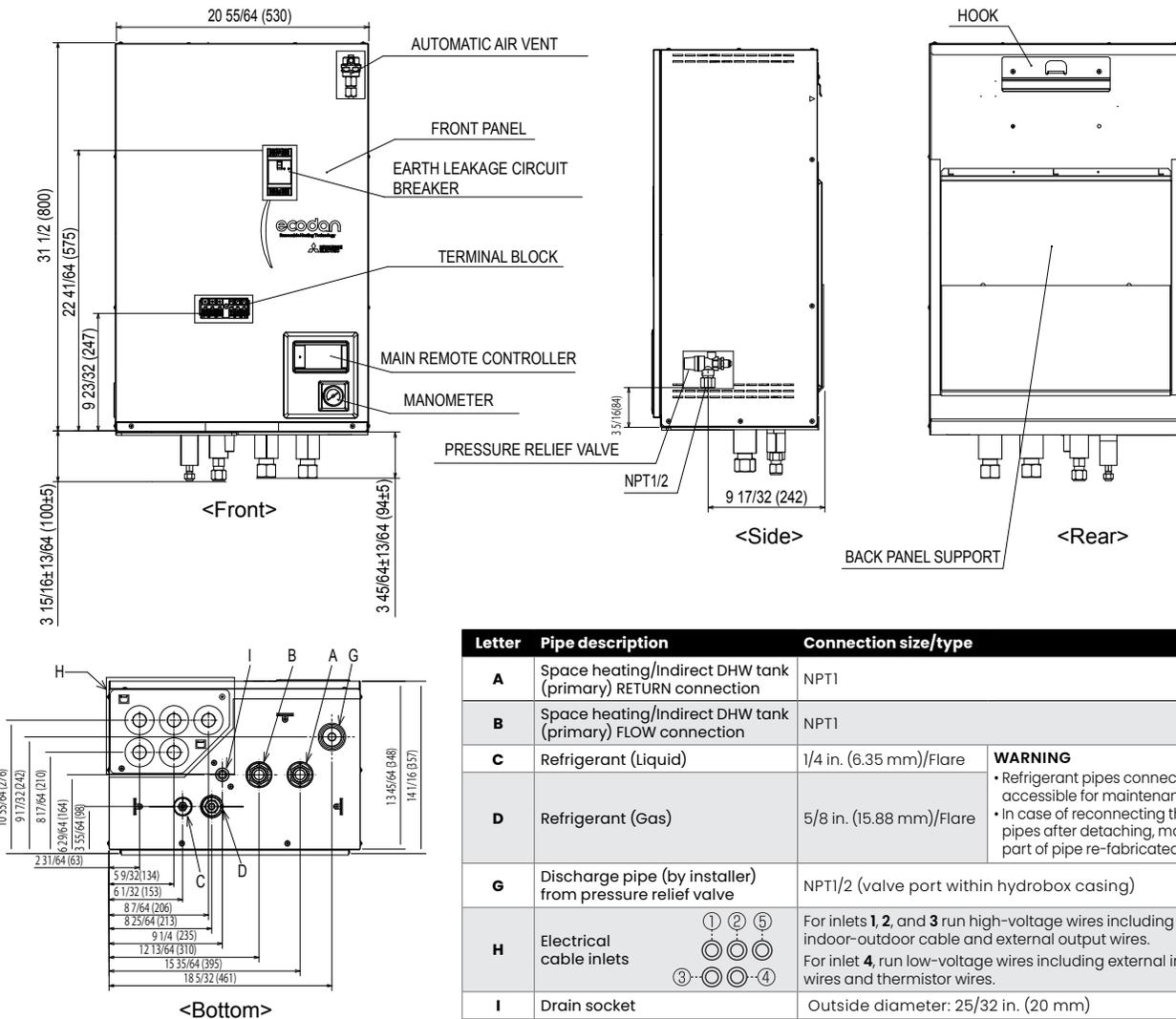
Indoor unit  
• ERSF-NM6E



## Dimensions



Unit: mm (in.)



Letter	Pipe description	Connection size/type
A	Space heating/Indirect DHW tank (primary) RETURN connection	NPT1
B	Space heating/Indirect DHW tank (primary) FLOW connection	NPT1
C	Refrigerant (Liquid)	1/4 in. (6.35 mm)/Flare
D	Refrigerant (Gas)	5/8 in. (15.88 mm)/Flare
G	Discharge pipe (by installer) from pressure relief valve	NPT1/2 (valve port within hydrobox casing)
H	Electrical cable inlets	For inlets 1, 2, and 3 run high-voltage wires including power cable, indoor-outdoor cable and external output wires. For inlet 4, run low-voltage wires including external input wires and thermistor wires.
I	Drain socket	Outside diameter: 25/32 in. (20 mm)

**WARNING**  
 • Refrigerant pipes connection shall be accessible for maintenance purposes.  
 • In case of reconnecting the refrigerant pipes after detaching, make the flared part of pipe re-fabricated.

# ecodan® accessories

	Part number	Description
Remote Sensor	PAC-SE41TS-E	Wall Mounted Remote Temperature Sensor
Thermistor	PAC-TH011TKL2-U	100 ft (30 m) THWSB for DHW tank
	PAC-TH012HTL-U	100 ft (30 m) THWB1 for boiler
Indirect DHW Tank	ME-60-HO	60 Gallon Indirect DHW tank
	ME-85-XHO	85 Gallon Indirect DHW tank
	ME-60-HO-H	60 Gallon Indirect DHW tank (with heater)
	ME-85-XHO-H	85 Gallon Indirect DHW tank (with heater)
Schneider 2-way/3-way Valve	AG13U020	230V Actuator
	VT3427	3-way valve body
	VT2427	2-way valve body
Belimo 3-way Valve	B325-LRB120-3	Actuator & 3-way valve
Lineset	MLS145812T-15	15 x 1/4 x 15 x 5/8 Lineset Twin-Tube Insulation
	MLS145812T-30	30 x 1/4 x 30 x 5/8 Lineset Twin-Tube Insulation
	MLS145812T-50	50 x 1/4 x 50 x 5/8 Lineset Twin-Tube Insulation
	MLS145812T-65	65 x 1/4 x 65 x 5/8 Lineset Twin-Tube Insulation
	MLS145812T-100	100 x 1/4 x 100 x 5/8 Lineset Twin-Tube Insulation
Air Outlet Guide	PAC-SH96SG-E	Air Outlet Guide 1 Piece
	PAC-SJ82AT-E	Attachment for Air Outlet Guide
Control/Service Tool	PAC-SK52ST	Control/Service Tool
Wind Baffle	WB-PA3	Front Wind Baffle
Mounting Pad	ULTRILITE2	Condensing Unit Mounting Pad 24 x 42 x 3
Mini-Split Wire	SW144-250	14 Gauge 4 wire Armored Mini Split Cable 250 ft roll
	SW144-50	14 Gauge 4 wire Armored Mini Split Cable 50 ft roll
	S144-250	14 Gauge 4 wire Mini Split Cable 250 ft roll
	S144-50	14 Gauge 4 wire Mini Split Cable 50 ft roll
Stand	QSMS1201M	Outdoor Unit Stand 12 High
	QSMS1801M	18 Single Fan Stand
	QSMS2401M	24 Single Fan Stand



For questions, call  
Customer Care  
at 1-800-433-4822.



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