










SELECTION Choose the series that best matches the building layout.




Excellent ecodan's heating performance, even at low outdoor temperature!

R32		INDOOR UNIT	OUTDOOR UNIT		
		<p>Hydro box, cylinder unit</p> 	Packaged type	Small capacity (Under 5kW)*  PUZ-WM50	Medium capacity (6.0kW–11.2kW)*  PUZ-WM60/85/112
			Split type	Small capacity (Under 5kW)* 	Medium capacity (6.0kW–14kW)*  PUD-SHWM60/80/100/120/140
					 PUD-SWM60/80/100/120
			Eco Inverter	 SUZ-SWM40/60	 SUZ-SWM80

*Rated capacity is at conditions A2W35. (according to EN14511)

R410A		INDOOR UNIT	OUTDOOR UNIT				
		<p>Hydro box, cylinder unit</p> 	Split type	Medium capacity (7.5kW–14kW)* 	Large capacity (≥16kW)*  PUHZ-SHW80/112	 PUHZ-SHW140	 PUHZ-SHW230
					 PUHZ-SW75/100	 PUHZ-SW120	 PUHZ-SW160/200

*Rated capacity is at conditions A2W35. (according to EN14511)

Other ATW-related system	Mr.SLIM+	PUMY + ecodan	ecodan geodan
	R410A  PUHZ-FRP71	R410A  PUMY-P112/125/140	R32  EHGT17D-YM9ED

New Eco-design Directive

What is the ErP Directive?

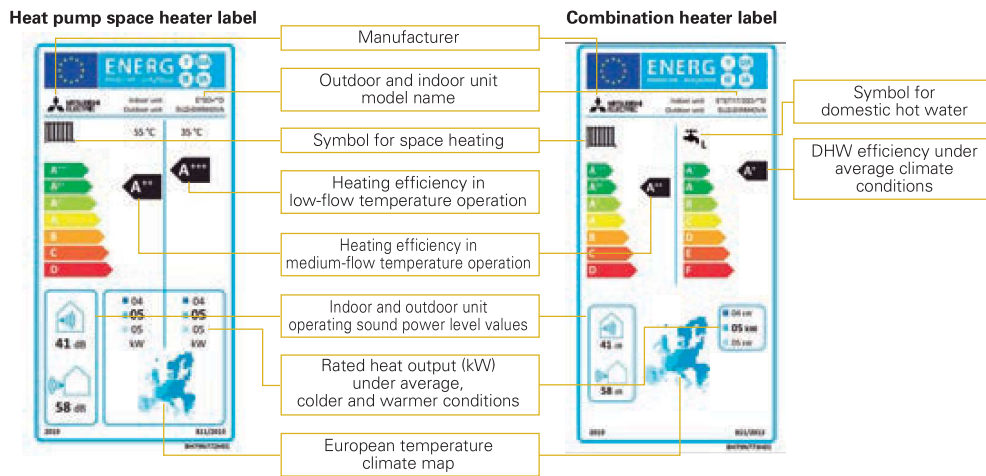
The Eco-design Directive for Energy-related Products (ErP Directive) established a framework to set mandatory standards for ErPs sold in the European Union (EU). The ErP Directive introduces new energy efficiency ratings across various product categories. It affects how products such as computers, vacuum cleaners, boilers and even windows are classified in terms of environmental performance. Labelling regulations that apply to our ATW heat pumps came into effect from September 26, 2015, and then revised from September 26, 2019.

New energy label and measurements

Under directive 2009/125/EC, ATW heat pumps of up to 70kW are required to show their heating efficiency on the energy label. The purpose of the energy label is to inform customers about the energy efficiency of a heating unit. The efficiency for space heating is ranked from A+++ to D (from September 2019). In the case of domestic hot water, it is from A+ to F (from September 2019).

Product label

This label is for individual heating units, such as an ecodan heat pump. Typically, the space heater label is used for ecodan systems with a hydro box, and the combination heater label is used for ecodan systems with a cylinder unit.



These labels are delivered with all ecodan outdoor units.

What is the package label?

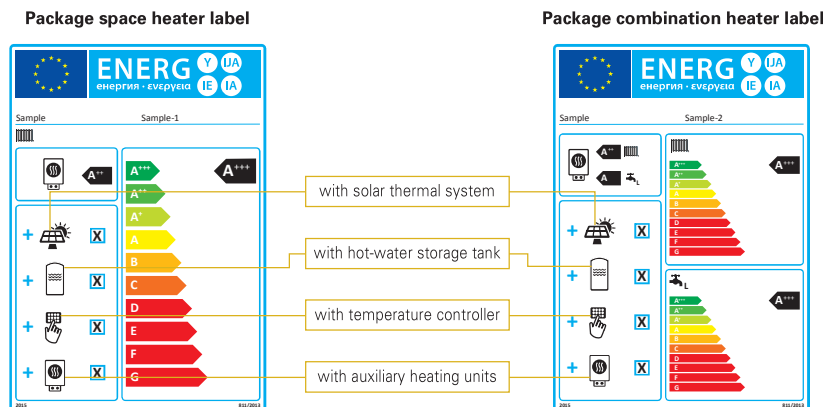
A heating system can use several energy-related products, such as a controller or solar thermal system. Therefore, a label showing the efficiency of the total heating system is required. The category range is defined from A+++ to G.

Creating the package label is the responsibility of the installers and distributors. A useful tool on the Mitsubishi Electric website is available to easily create the labels for ecodan products and controllers.

<http://erp.mitsubishielectric.eu/erp/options>

Package label

This label is for heating systems that use several energy-related products, such as a controller or a solar thermal system.



Customised package labels including ecodan heat pumps and the FTC6 controller can be created on the Mitsubishi Electric website.

New R32 Eco Inverter Line-up

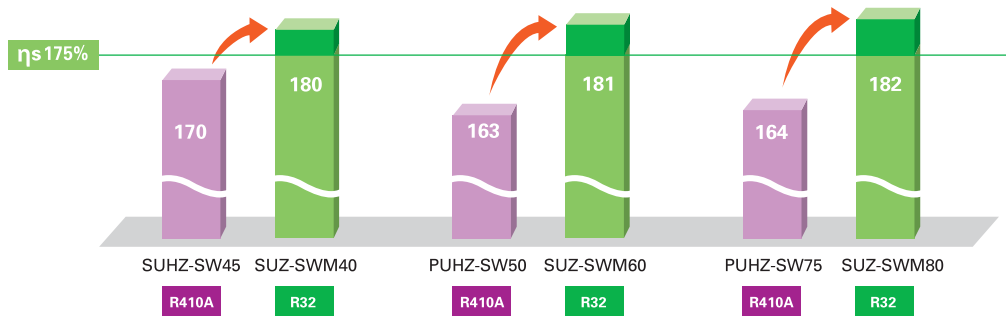
Energy Efficient and Environmentally Friendly Heating

- Wide variety of product line with R32 refrigerant
- More energy efficient than conventional eco inverter models



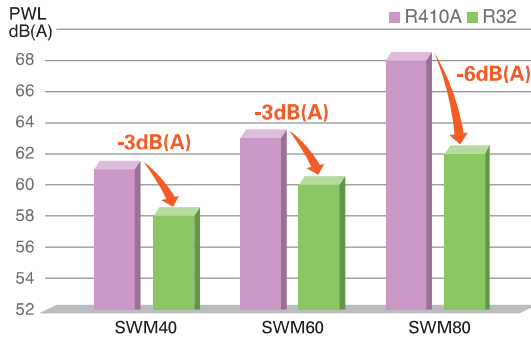
High Performance

All models have achieved the "RANK A+++" for SCOP at low temperature.



Low Noise

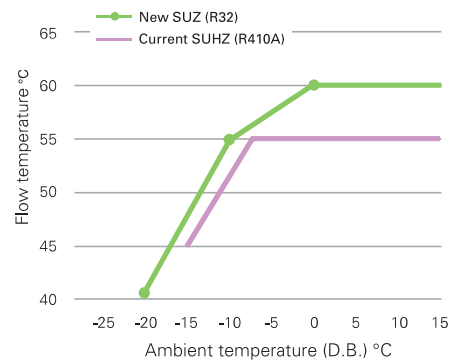
Compared with conventional outdoor unit, New R32 eco inverter achieved lower noise level, assuring the flexibility of installation in dense residential areas.



*Compared SUZ-SWM40/60/80VA with SUHZ-SW45VA/PUHZ-SW50VKA/PUHZ-SW75VHA
*Rated condition (According to EN12102)

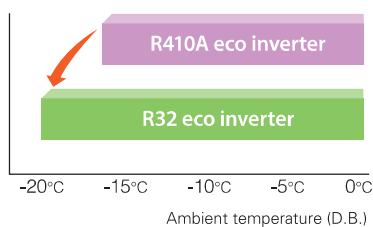
60°C Flow Temperature

Along with its increased lower operating range the New R32 range is capable of delivering a higher flow rate of 60°C, 5°C higher than the conventional model.



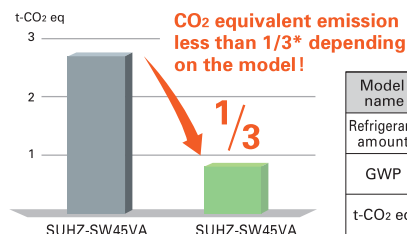
Guaranteed Operating Range Expansion

Guaranteed heating operating range is extended to -20°C.



Reducing Refrigerant Amount

<R410A vs 32> CO₂ equivalent emission



*Source: IPCC 4th Assessment Report, global warming potential (GWP) 100-year value. Comparison of 2088 (R410A) and 675 (R32).

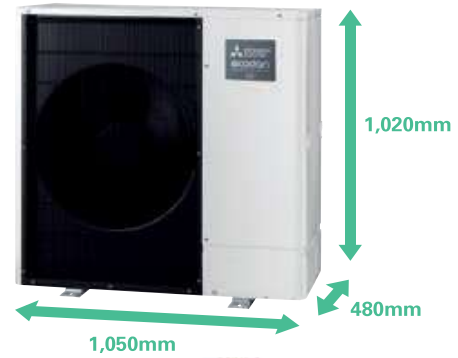
Dedicated Heat Pump for Residence



Stylish and Compact

The Stylish Design and Compact Size Harmonises Residential Application

- Simple and elegant design by rounding left and right corners of the unit.
- Concealing the fan by matching the panel and the grille in dark colour.
- Unified shape and safety by setting the fan whole backwards and matching the grille on the same level of the front panel.
- Wider lineup with environmental-friendly R32 refrigerant.

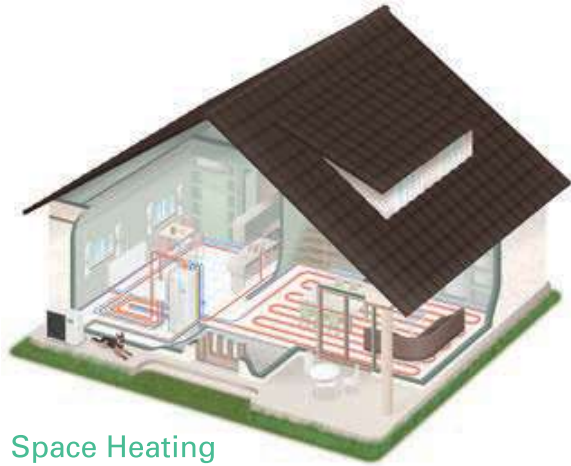


High Performance

New Compressor



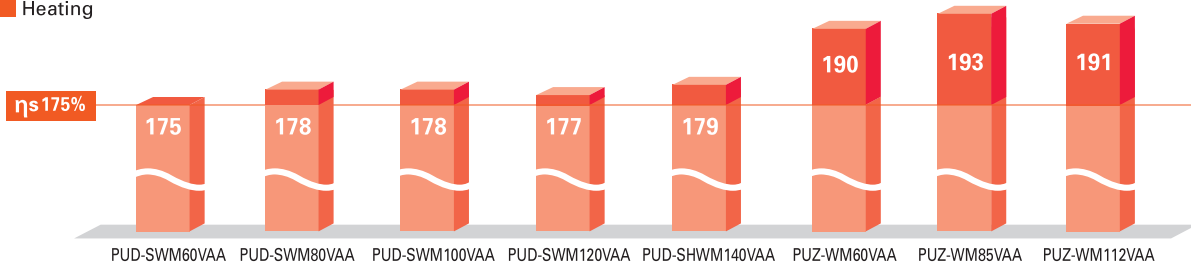
- Compact
 - High performance
 - Flash injection*
- *ZUBADAN (SHWM) only



ErP Lot 1 Compliant with Highest Seasonal Space Heating Energy Efficiency Class A+++

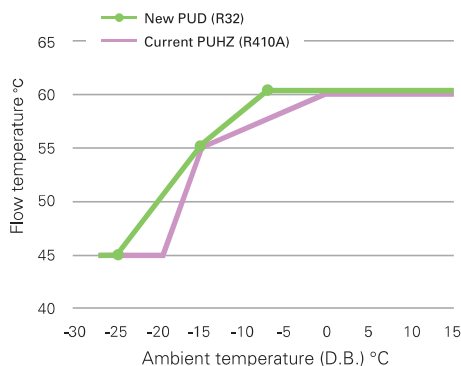
All models have achieved the "RANK A+++" for SCOP at low temperature.

Heating



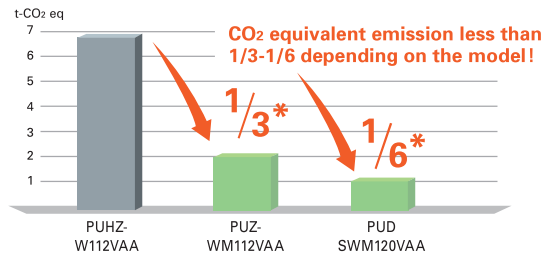
60°C Flow Temperature at Low Ambient Temperature

60°C max flow temperature can be maintained up to Ambient -7°C. (For PUD-S(H)WM models)



Reducing Refrigerant Amount

<R410A vs 32> CO₂ equivalent emission



Model name	PUHZ-W112VAA	PUZ-WM112VAA	PUD-SWM120VAA
Refrigerant amount	3.3kg	3.0kg	1.6kg
GWP	2088 (R410A)	675 (R32)	675 (R32)
t-CO ₂ eq	6.890	2.025	1.080

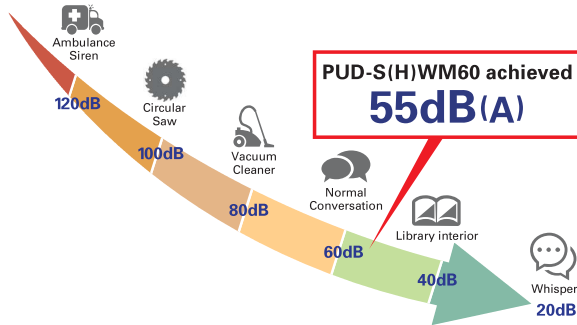
*Source: IPCC 4th Assessment Report, global warming potential (GWP) 100-year value. Comparison of 2088(R410A) and 675 (R32).

Compact with Silence

Noise Reduction-10dB(A)

Mitsubishi Electric heat pumps are designed to give you highly efficient and eco-friendly heating with 10dB(A) less in PWL. Compared with conventional models.

* Rated condition (According to EN12102)



Enclosing Noise

Shutting Out Noise from Compressor

- The structure of double enclosing

Primary: enclosing a compressor (the structure is patented.)

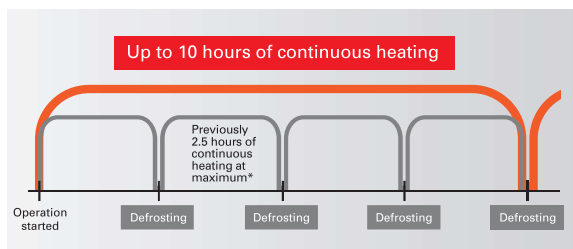
Secondary: enclosing machine room.



New Control for Eco-friendly Heating

Defrost Improvement

Conventional models often switch to defrost operation even when there is not much frost on outdoor units. By defecting frost more precisely, it is possible to prevent frequent on/off for defrosting and to give you more comfort.

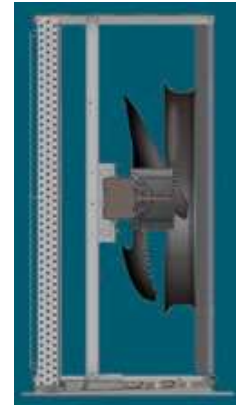


* Comparison between prior PUHZ-SHW-AA model and new PUD-S(H)WM-AA model. Maximum number of operational hours at our Company's laboratory (external temperature -15°C). Hours of continuous operation may differ depending on external temperature conditions.

Blowing Air

To Reduce Fan Noise

- Optimising fan position
- Optimising bell mouth shape
- Bigger fan diameter



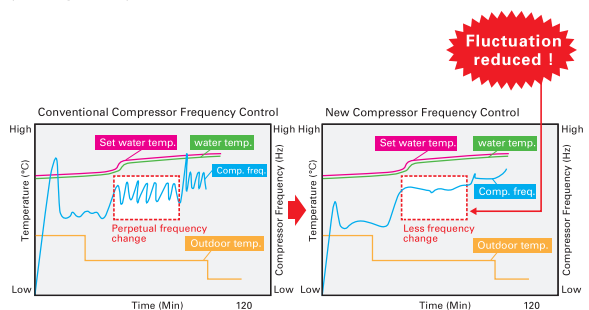
Avoiding Vibration and Resonance

- Dedicated soft rubber mount for the compressor to avoid vibration.
- Optimising piping structure to avoid vibration and resonance.



New Compressor Frequency Control

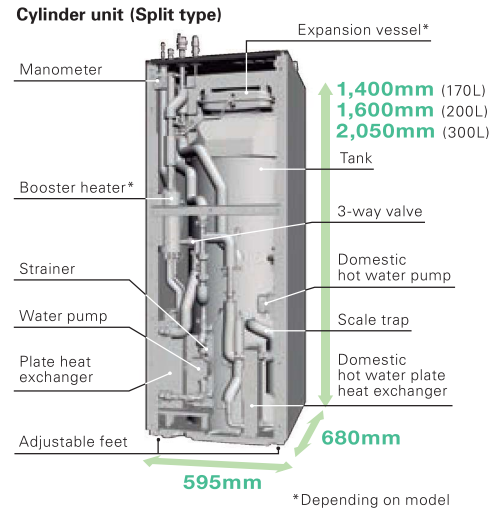
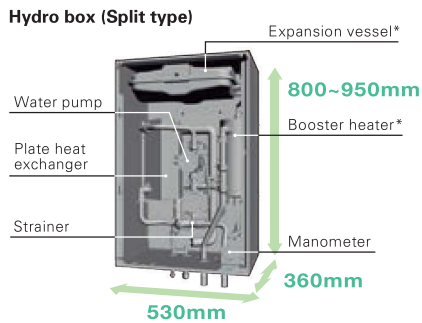
By reducing frequency changes (from 17 to 4 times per hour), hunting is prevented. Reducing fluctuation improves efficiency and prolongs compressor life.



New D generation Indoor Unit

New All-in-one Compact Indoor Unit

- All-in-one: Key functional components are incorporated
- Compact cylinder unit: 1,400~2,050mm in height
- Compact hydro box: Only 530×360mm footprint
- Easy installation: Factory fitted pressure relief valve
- Easy service: Relevant parts are located at the front of the unit for easy maintenance
- Easy transport: Handles attached on front and back (cylinder unit)



New Line-up

ecodan's line-up has many types of indoor units to satisfy diverse customers' needs, requests and local regulations. It includes various capacity units, with/without booster heater, with/without an expansion vessel, etc. In addition, a reversible hydro box and a reversible cylinder unit are available.



Available options

- Packaged or Split type
- With/without booster heater
- With/without expansion vessel
- Cylinder unit has an integrated 170L/200L/300L stainless steel tank
- Hydro box is control ready for domestic hot water with a stand-alone tank (locally supplied)

New Reversible Models

(for heating/cooling)

Perfect Comfort in Winter and Summer Time, Thanks to Our Reversible Models.

Reversible models are now available for both hydro box and cylinder units (Both for split type and cylinder unit for packaged type). The new reversible cylinder is now able to produce cold water for cooling use and can alternatively produce domestic hot water in summer time.



Easy Installation and Low Maintenance

Simple Piping Arrangement

All water piping is aligned at the rear side of the unit for easy connection and neat finish.



Easy Adjustment

Adjust bolt capable of 50mm expansion for easy installation on uneven surfaces.



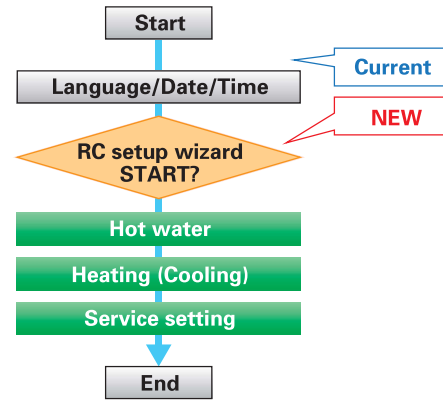
Built-in Drain Pan for Reversible Cylinder Models

Reversible models now include a built-in space saving drain pan and the drain socket is positioned at the back of the unit. With use of the adjuster bolt, the outlet height can be higher than 50mm, allowing 5m drainage.



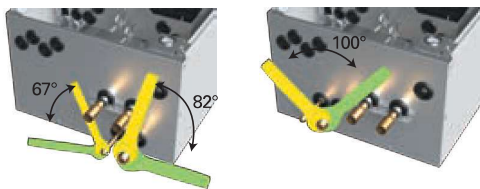
Initial Setting Wizard

In addition to language, date and time, you can set up hot water and heating/cooling operation, pump speed, flow rate range initial setting much simpler than previous models.



Hydro Box Piping Arrangement Improvement

Through structural innovation related to the space around the pipes, the area where the spanner can be moved has been increased, thus improving pipe work and enabling it to be completed smoothly.



Operation Data Monitoring

Time, operation mode, flow/return/tank temperature, can be displayed on main remote controller.

Sample display of monitoring setting

26 Feb 2019 10:00				
	THW1	THW2	THW5	Flow
10:00 ☀	41°C	38°C	54°C	20L
9:55 ☀	38°C	38°C	54°C	20L
9:50 ☀	48°C	48°C	54°C	20L
9:45 🌧	60°C	56°C	54°C	15L
9:40 🌧	59°C	55°C	52°C	15L

Navigation icons: i, left arrow, right arrow, (1/5)

Minimum Additional Water Required

In average/warmer conditions, minimum additional water is required for outdoor unit. If there is enough water amount inside water pipe, radiator, or underfloor heating no buffer tank is required.

*Refer to the indoor unit installation manual for specific outdoor unit models.

New 2 Zone Kit

You can select from 3 types of pump operations, 1. Fixed speed mode, 2. Fixed pressure mode, 3. Energy saving mode, depending on your preference.

- All-in-one kit: Key functional components are incorporated in 2 zone kit.
- Easy installation: G1 screw type flexi-piping to avoid brazing.
- Compact size: Just to fit on the top of cylinder unit, also wall mountable.



High Performance

Improved Efficiency

With additional thermistor (THW5A), η_{wh} [%] rating is improved by more than 40% compared to previous C generation 200L models allowing 170L and 200L to achieve A+, the highest possible domestic hot water efficiency rank.

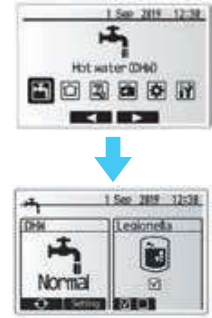
Excellent DHW efficiency



	170L	200L	300L
	η_{wh} [%]	η_{wh} [%]	η_{wh} [%]
Conventional	-	96~104	-
New	120~148	135~159	118~128
Load Profile	L	L	XL
DHW Rank	A+	A+	A/A+

Thermistor Position of Cylinder

The thermistor position is now selectable allowing the unit to accommodate for different water demands in order to maximise the efficiency of the unit for any size of household or application. Using two thermistors equipped with all sizes of tanks, you can now select the DHW recharge amount from two options (Standard/Large). It helps accommodate for different water demands in order to maximise the efficiency of the unit for any size of household or application. This mode can be selected from main remote controller.



Unique Technology of ecodan

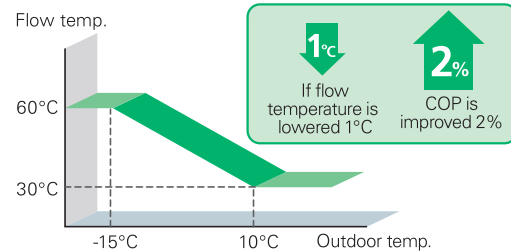
Auto Adaptation

Maximise Energy Savings While Retaining Comfort at All Times

Regarding the relation of flow temperature and unit performance, a 1°C drop in the flow temperature improves the coefficient of performance (COP) of the ATW system by 2%. This means that energy savings are dramatically affected by controlling the flow temperature in the system.

In a conventional system controller, the flow temperature is determined based on the pre-set heat curve depending on the actual outdoor temperature. However, this requires a complicated setting to achieve the optimal heat curve.

■ Heat curve setting (Example)



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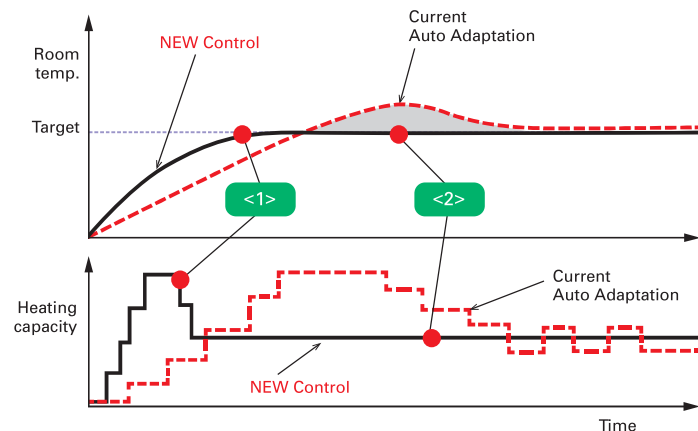
Auto Adaptation Improvement

Mitsubishi Electric's Auto Adaptation Function Automatically Tracks Changes in the Actual Room Temperature and Outdoor Temperature and Adjusts the Flow Temperatures Accordingly.

Aiming to realise further comfort and energy savings, Mitsubishi Electric has already introduced a revolutionary new controller. Auto Adaptation function measures the room temperature and outdoor temperature, and then calculates the required heating capacity for the room. Simply stated, the flow temperature is automatically controlled according to the required heating capacity, while optimal room temperature is maintained at all times, ensuring the appropriate heating capacity and preventing energy from being wasted.

Furthermore, by estimating future changes in room temperature, the system works to prevent unnecessary increases and decreases in the flow temperature. Accordingly, Auto Adaptation maximises both comfort and energy savings without the need for complicated settings.

For Mitsubishi Electric ecodan, by introducing improved control logic, we achieved faster heating and more energy saving.

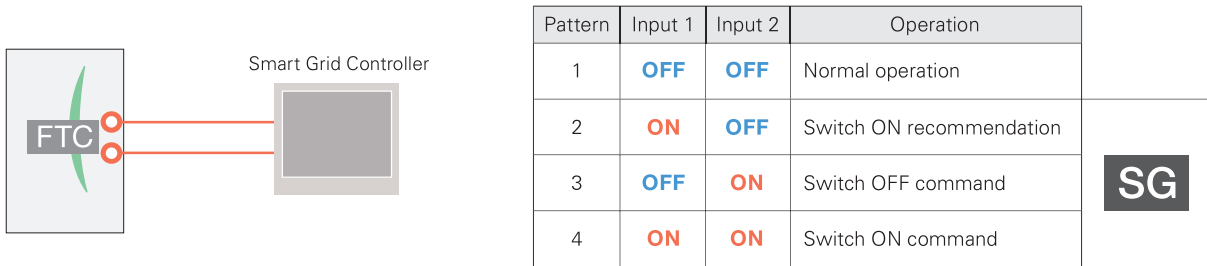


- <1> Fast heating with improved accuracy in learning building heat load
- <2> Energy saving by avoiding over heating and capacity fluctuation with better control response, i.e. control interval and resolution

Smart Grid Ready Function

In recent years renewable energy generation has become popular. However, this rapid growing causes the problem of supply and demand gap of electricity. The aim of "SG Ready" is to make the electricity demand response more flexible by creating a uniform interface for the smart grid integration of heat pumps. Air-to-Water units need to be able to change the operation pattern when the signal is received from the Smart Grid Controller.

New ecodan Cylinder, Hydro box and FTC have been modified to communicate with Smart Grid Controller. The communication protocol is based on "SG Ready" label regulation. (Version 1.1; gültig ab 01.01.2013)



Pattern 1: Normal operation

When there is no signal from the Smart Grid Controller, DHW and Heating operate according to user settings.

Pattern 2: Switch ON recommendation

When set to the "Switch ON" recommendation, the target temperature of DHW is increased a specified amount and the heating "Thermo ON" condition range is extended.

Pattern 3: Switch OFF command

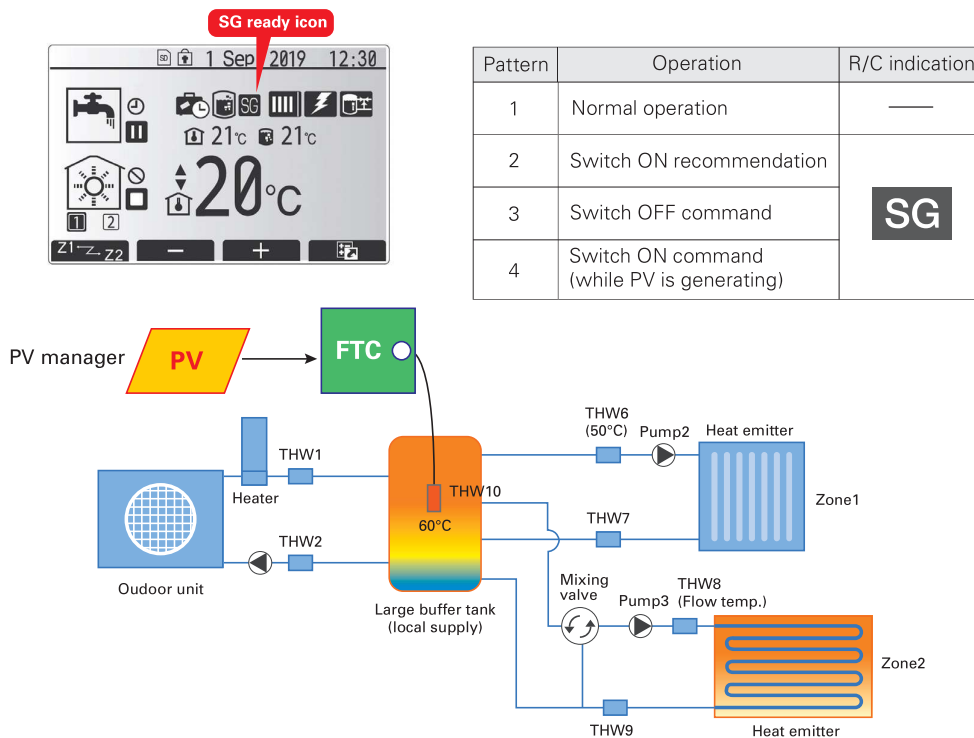
When the "Switch OFF" command is received, both DHW and Heating are turned off.

Pattern 4: Switch ON command

When the "Switch ON" command is received, the target temperature of DHW is increased to the maximum target temperature and Heating continues.

Improved Smart Grid Ready

SG ready icon on main remote controller indicates that SG ready is active and its setting can be easily operated with main remote controller. Improved SG ready function enables you to choose the target temperature in unit of 1°C. Also, when PV manager is interlocked with ecodan and ecodan receives its signal, heat is stored as much as possible while heat pump and/or electric heater running. Heat storage in large buffer tank will be made available for zone2 as well when peak cut signal is on. As long as a mixing valve keeps its control, zone2 flow temperature is maintained.





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Intelligent Hybrid Control (boiler interlock)

An Existing Boiler Can Be Used for Extra Heating Capacity in an Efficient Way

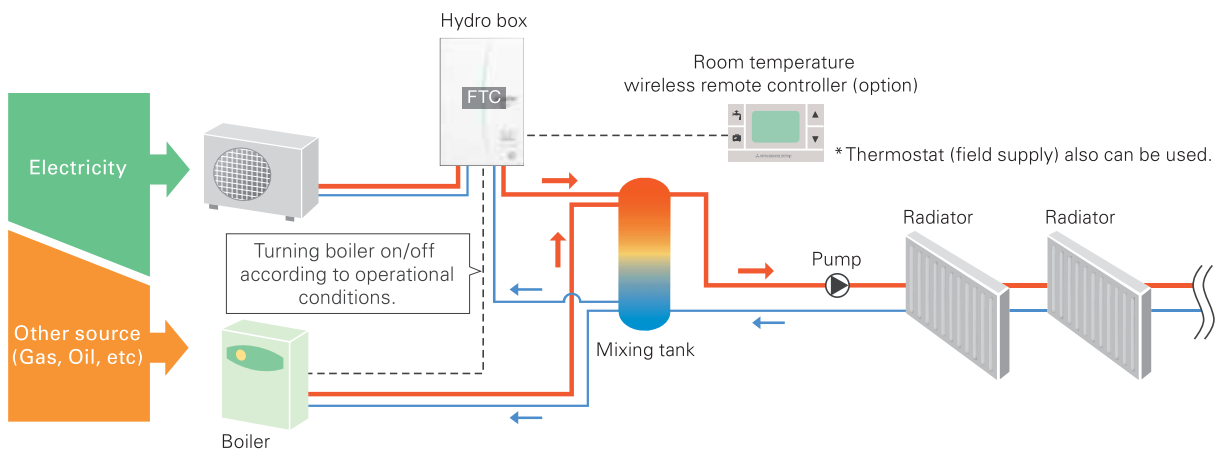
The flexibility of ecodan's intelligent control allows the system to be combined with the boiler currently in use. Additionally, this control can judge which heating source to use either ecodan or the existing boiler, based on various conditions*.

In the event of one heating unit not working due to some unforeseen problem, the other heating system can be used as a back-up, thereby preventing the heating system operation from stopping completely.

*Please see below "Heat source switchover".

Intelligent system combining a boiler with ecodan

■ Intelligent boiler interlock system



* Items such as a mixing tank, and pump are not included and need to be purchased locally.

Heat source switchover - Choose appropriate system based on needs

4 types of heat source switchover logic

- ① Switchover based on actual outdoor temperature
 - Heat source switchover occurs when the outdoor temperature drops below a pre-set temperature.
- ② Switchover based on running cost
 - Heat source switchover occurs by judging optimal operation based on running cost.
 - *Pre-registration of the energy price of electricity, and gas or oil per 1kWh is necessary.
- ③ Switchover based on CO₂ emission level
 - Heat source switchover occurs to minimise CO₂ emission.
 - *Pre-registration of CO₂ emission amount from electricity and gas or oil is necessary.
- ④ Switchover can also be activated via external input
 - For example, the peak cut signal from electric power company.



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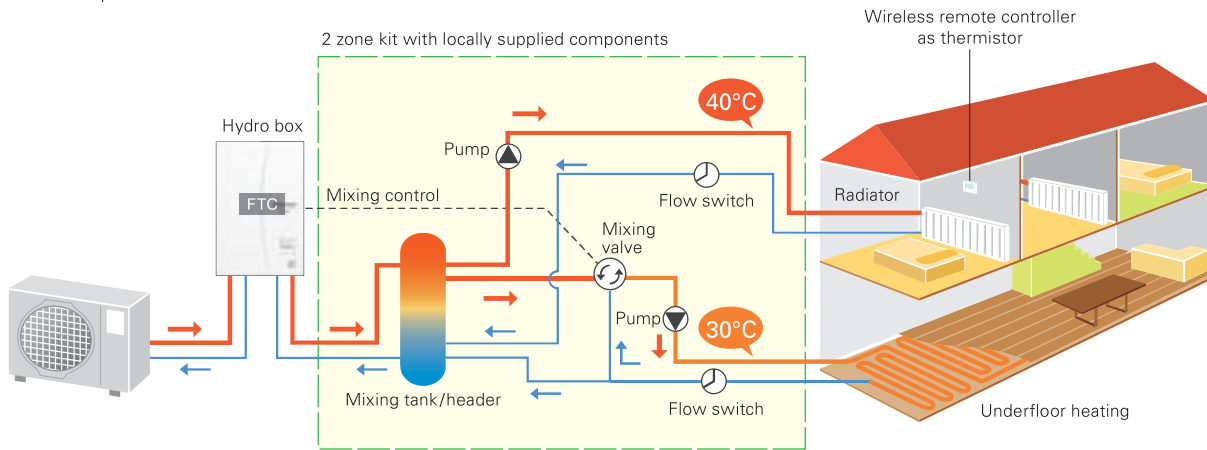
2 Zone Control (for heating/cooling)

Improved Simultaneous Control of Two Different Zones

Using ecodan, it is possible to control two different flow temperatures, thereby managing two different heating load requirements. The system can adjust and maintain two flow temperatures when different temperatures are required for different rooms; for example, controlling a flow temperature of 40°C for the bedroom radiators and another flow temperature of 30°C for the living room floor heating.

Moreover, mixing valve control is advanced for improving zone 2 comfort by using heat storage in buffer tank. Also, new controller monitors the temperature inside buffer tank and prioritizes using the heat inside the tank to avoid frequent on/off operation when using 2 zone control.

Two temperature zones



*Items such as a mixing tank, mixing valve flow switch and pumps are not included and need to be purchased locally.

Multiple Unit Control

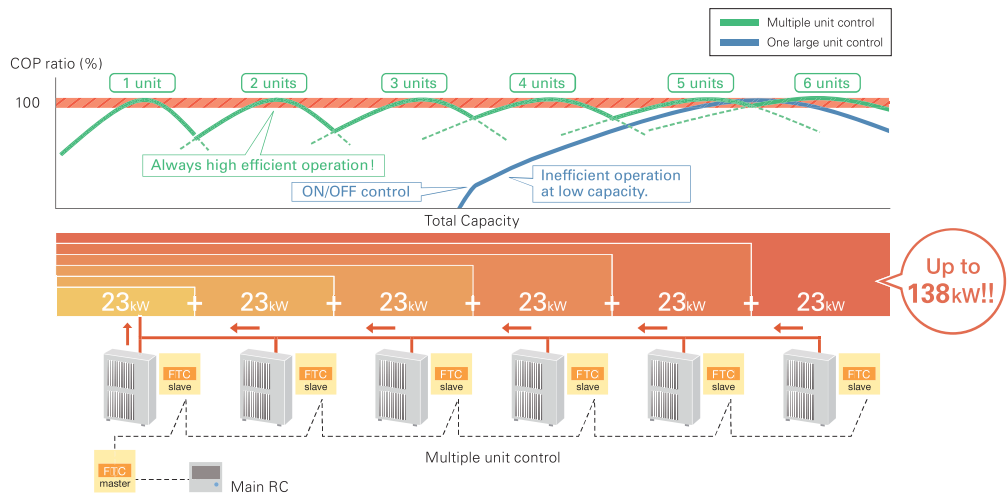
Connect up to 6 Units – Automatic Control of Multiple Units for Bigger Capacity and Better Efficiency

A maximum of 6 units* can be configured according to the heating/cooling load of the building. The most efficient number of operating units is determined automatically based on heating/cooling load. This enables ecodan to provide optimal room temperature control, and thus superior comfort for room occupants. Also incorporated is a rotation function that enables each unit to run for an equal time period.

If one of the units malfunctions when using the Multiple Unit Control, another unit can be automatically operated for back-up, thereby preventing the system operation from stopping completely.

*Only same models (same capacity) can be used.

Multiple unit control



Remote Controllers

Smart User-friendly Controller with Stylish Design

Main remote controller

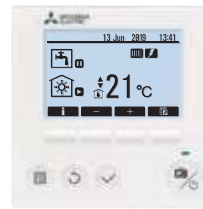
- Large screen and backlight for excellent visibility, even in dark environment
- Multi-language support (supports 15 languages)
- Can be removed from main unit and installed in a remote location (up to 500m)
- Quick reading of operation data (7.5 times faster than previous model)
- Wide range of convenient functions in response to user demand

Function settings

- Energy monitoring
- Two-zone control (cooling and heating)
- Two separate schedules
- Summer time setting
- Built-in room temperature sensors
- Hybrid control (boiler interlock)
- Floor drying mode
- Weekly timer
- Holiday mode
- Legionella prevention
- Error codes

Wireless remote controller (optional)

- Built-in room temperature sensor; easy to place in the best position to detect room temperature
- Wiring work eliminated
- Simple design that is easy to operate
- Remote control from any room without needing to choose an installation location
- Backlight and big buttons that are easy to operate
- Domestic hot water boost and cancellation
- Simplified holiday mode



Main controller



PAR-WR51R-E (Option)
Receiver



PAR-WT50R-E (Option)
Wireless remote controller



*SD logo is a trademark of SD-3C, LLC

Energy Monitoring

View Electricity Consumption and Heat Output on the Remote Controller

Every end user can now easily check the energy data of the ecodan heat pump.

Other features

- Daily, monthly and yearly data are stored and can be displayed using the main remote controller.
- External power meter and heat meter can be connected for accurate measurement.
- SD card is also available for storing data.

*Using pre-set values on the main remote controller, estimated energy consumption/output can be shown without external power and a heat meter.

Depending on operating condition and system configuration, there is some possibility to show different data from the reality.

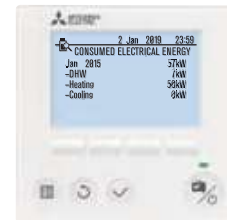
*This function is available depending on the version of the outdoor unit model.



Heating capacity produced



Electric energy used

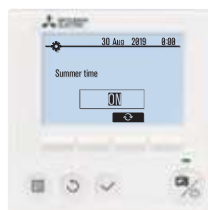
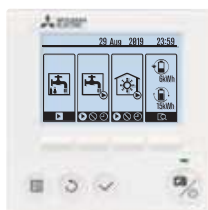


Summer Time Setting

Easy Adjustment for Summer Time

Just switch the summer time mode 'on' using the main remote controller and the clock in the main remote controller is adjusted to summer time hours.

This function can release the end user from clock setting tasks.

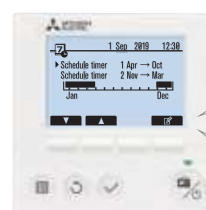


Two Separate Schedules

Pre-setting Two Different Schedules for Winter and Summer Seasons

Two different schedule settings are available for use via the main remote controller.

These schedules can be pre-set and changed depending on the season. For example, from November to March, space heating and domestic hot water are used; however, during warm months such as from April to October, only domestic hot water is used.



<Example>

Schedule 1 Winter time

Space heating **daytime**

Domestic hot water **early morning**

Schedule 2 Summer time

Domestic hot water **any time**



*SD logo is a trademark of SD-3C, LLC

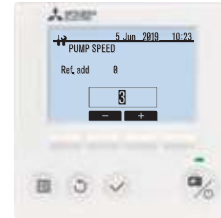
Easy Commissioning

Pump for Primary Water Circuit* Speed Setting Possible Using ecodan's Main Remote Controller

Even when the system is running, pump output can be set to one of five different settings using the main remote controller.

The person commissioning the system can adjust this speed much more easily.

*Speed setting of pump for domestic hot water is not available through the main remote controller when the system is running.



Flow sensor newly incorporated

The flow sensor is key for monitoring energy output and can also be used to detect flow error as well.

- Flow rate can be checked on the main remote controller.
- Flow rate can also be shown as graphs using the SD card tool.

Run indoor unit* without outdoor unit

During installation or situations such as an outdoor unit malfunction, the indoor unit can be operated using a heater.

While using this mode, flow and tank temperature are selectable.

Fixing and maintenance of the outdoor unit can be done without stopping heating and domestic hot water operation*.

*Models with electric heater only.

*When the indoor unit operation stops, please check all settings after the outdoor unit is connected.



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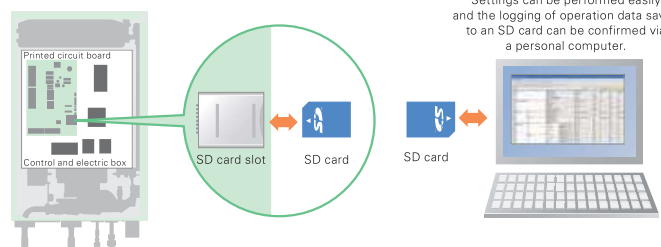
SD* Card

For Easier Settings and Data Logging

The initial setting for ecodan is now simpler than ever before. The special software enables the required initial settings to be saved to an SD card using a personal computer. The system set-up is as easy as moving the SD card from the computer to the SD card slot in the indoor unit. Compared to the previous procedure of inputting settings using the main controller at the installation site, a remarkable reduction in set-up time has been achieved. Thus, it is ideal for busy installers.

*SD card function is only used at the time of installation.

Hydro box operation panel



Settings can be performed easily and the logging of operation data saved to an SD card can be confirmed via a personal computer.

Items that can be pre-set

Simply copying pre-set data to an SD card, the same settings can input into another unit using the SD card.

- Initial settings (time display, contact number, etc.)
- Heating settings
 - Auto adaptation
 - Heat curve
 - Two different temperature zones (heating and cooling)
- Interlocked boiler operation settings
- Holiday mode settings
- Schedule timer settings (two separate schedules)
- Domestic hot water settings
- Legionella prevention settings

All items that are set by the main controller can be set via a personal computer.

Data that can be stored

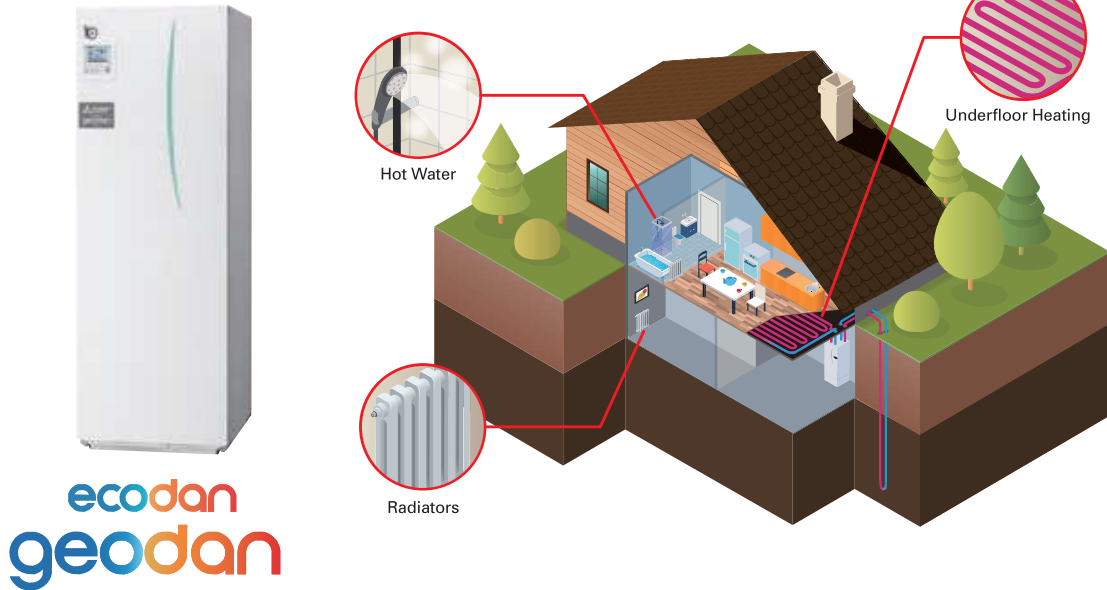
Operation data up to a month long can be stored on a single SD card

- Consumed electrical energy
- Delivered energy
- Flow rate
- Operation time
- Defrost time
- Actual temperature
 - Room temperature
 - Flow temperature
 - Return temperature
 - Domestic hot water temperature
 - Outdoor temperature
- Error record
- Input signal
- Etc.

ecodan geodan

Excellent Performance with Mitsubishi Electric First Residential Ground Source Heat Pump

Ground source heat pump works best especially in replacement from old ground source heat pump.



Performance / Function

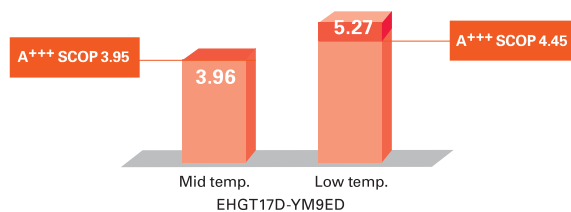
High Performance

ErP Lot 1 Compliant with highest seasonal space heating energy efficiency class A+++.

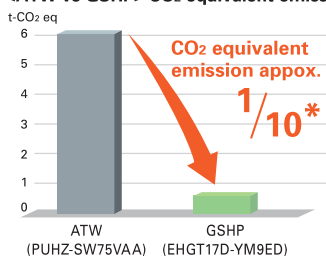


Low GWP refrigerant R32 contributes the reduction of CO₂ emission compared with conventional R410A refrigerant.

A+++ Class Energy Efficiency



<ATW vs GSHP> CO₂ equivalent emission

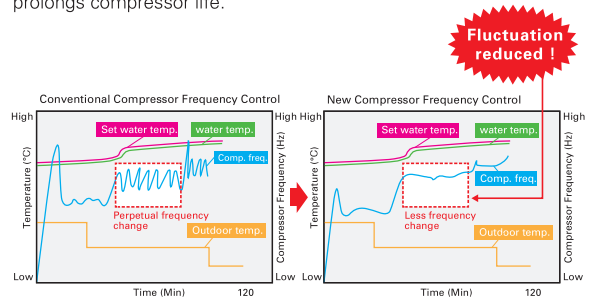


Model name	PUHZ-SW75VAA	EHGT17D-YM9ED
Refrigerant amount	3.0kg	0.9kg
GWP	2088 (R410A)	675 (R32)
t-CO ₂ eq	6.264	0.608

*Source: IPCC 4th Assessment Report, global warming potential (GWP) 100-year value. Comparison of 2088(R410A) and 675 (R32).

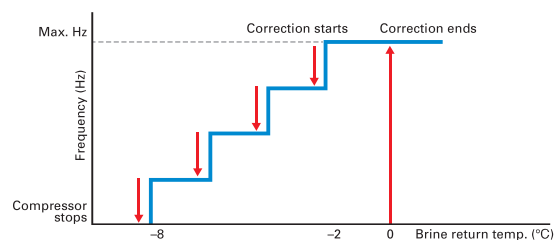
New Compressor Frequency Control

By reducing frequency changes (from 17 to 4 times per hour), hunting is prevented. Reducing fluctuation improves efficiency and prolongs compressor life.



Borehole Protection Control

When the unit detects low underground temperature, it automatically reduces the capacity by decreasing heat source collection in order to protect the borehole.



When the brine return temperature is below -8°C and brine outlet temperature is below -12°C, the unit operates only by booster heater. The correction temperature can be changed by dip SW.