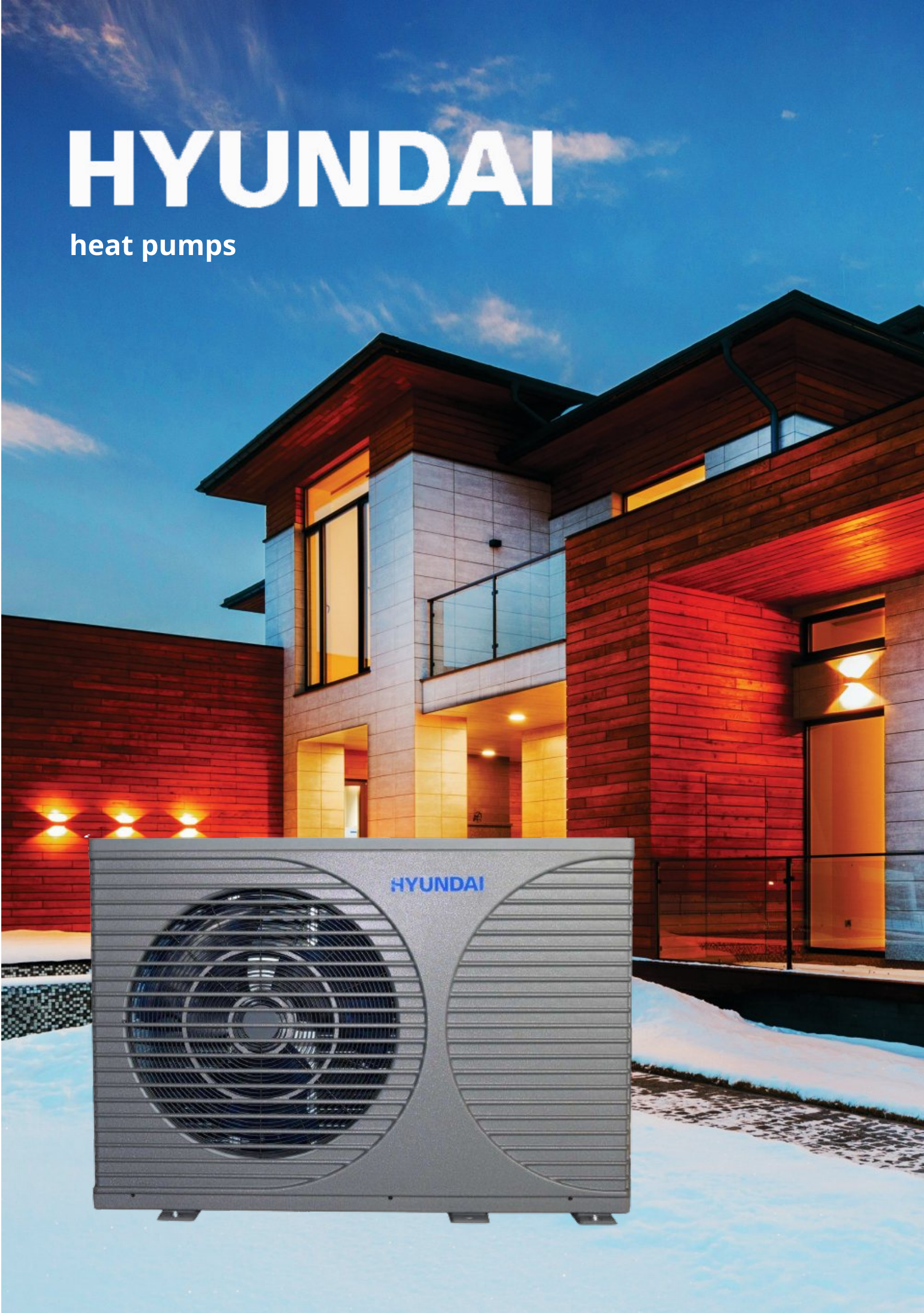
# HYUNDAI

## heat pumps

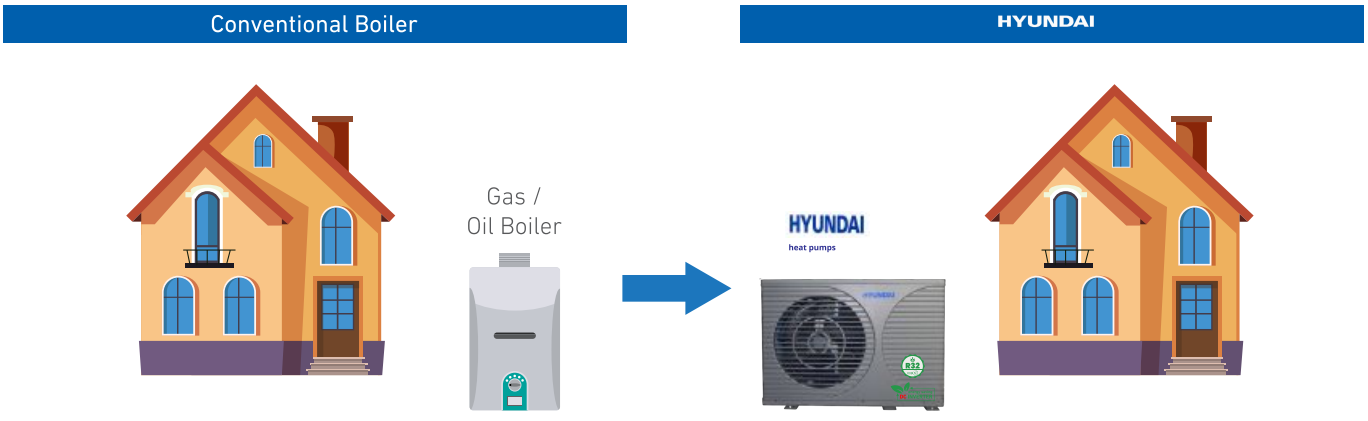


# HEAT PUMP TECHNOLOGY

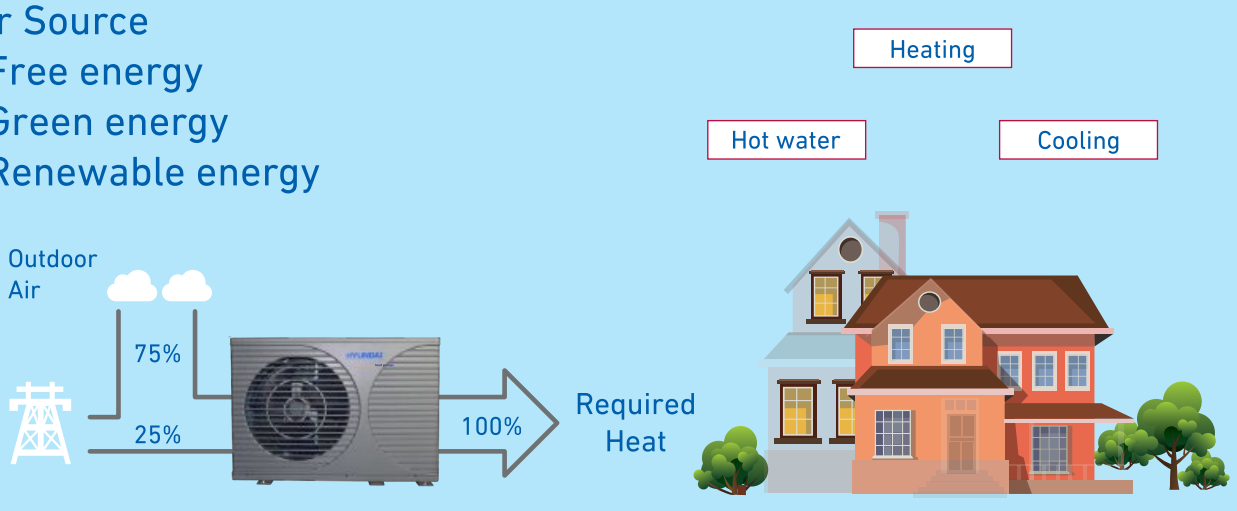
## What is A Heat Pump System?

### Modern Technology to Replace Conventional Boilers

Historically, conventional heating systems have used either oil or gas or have been direct electric heaters. In such conventional heating systems, environmental aspects such as fossil fuel use and environmental pollution have been overlooked. In recent years, interest in these environmentally friendly devices has been increasing and in order to meet these market demands, Hyundai has further developed the heat pump technology to produce the most efficient, environmentally friendly products in the industry.




Air Source
- Free energy
- Green energy
- Renewable energy



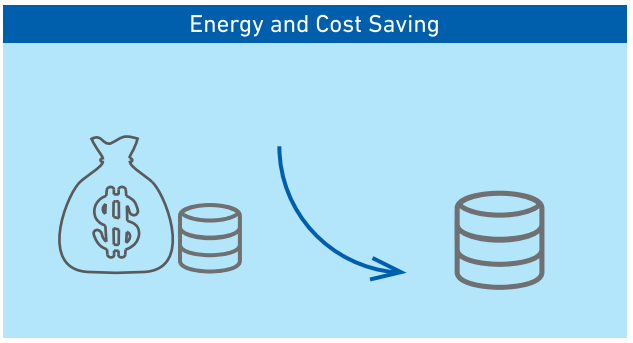
# Why Choose An Air to Water Heat Pump?

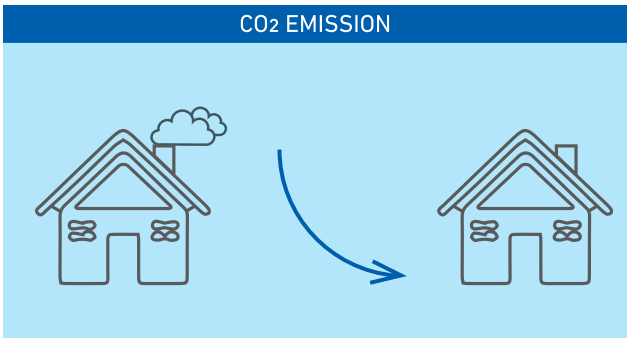
## Air to water heat pump is renewable.

Air to water heat pump uses less energy than furnaces, gas / electric water heater. The heat pump product absorbs energy from the surrounding air by the outdoor unit and transfers the energy into the refrigerant of the unit. The heat energy is upgraded using a refrigerant cycle and this renewable heat energy is transferred in the water by the heat-exchanger.

## Air to water heat pump has great financial benefits.

Air to water heat pump will most likely save a lot of money on your annual fuel bills due to the unit's high COP (Coefficient of performance).When the unit can achieve COP between 3-4 it means the unit can produce 3kW to 4kW of heat for every 1 kW power consummed.




## Air to water heat pump is more reliable.

| | | | |
|---|---|---|---|
| Safe to operate<br>Easy for installation<br>Cheap to operate | Risk of fire and explosion<br>Lifespan of several years<br>Expensive to operate | Risk of electric shocks<br>Expensive to install<br>Expensive to operate | Risk of fire and explosion<br>Lifespan of several years<br>Expensive to operate |

## Air to water heat pump will decrease your carbon footprint.

Compared with a gas water heater or a boiler, due to the fact that the heat pump does not use directly combustion to generate heat, won't cause as much pollution and will generate a smaller carbon foot-print. Air to water heat pump only need a small amount of electricity to run the compressor and fan motor.

Comparison of the power needed to heat 1 ton water from 15°C to 55°C under the same conditions:

| | Air to water HP | Gas water heater | Electric water heater | Boiler |
|---|---|---|---|---|
| Energy resource | Air & electricity | Gas | Electricity | Diesel oii |
| Calorific value | 860 kcal/kW·h | 24,000 kcal/$m^3$ | 860 kcal/kW·h | 10,200 kcal/kg |
| Average efficiency | 4.6 | 0.8 | 0.95 | 0.7 |
| Consumption | 10 kW-h | 2.08 $m^3$ | 48.9 kW·h | 5.6 kg |

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# R32 Monobloc

- Operation range down to -25°C
- Maximum LWT reach 65°C
- Single point maximum COP 5.01
- Energy efficiency level: A+++

## R32 Monobloc

Solutions for house heating/cooling and domestic hot water in one system.
R32 monobloc is an integrated system which provides house heating/cooling as well as domestic hot water, offering a complete and convenient solution which can replace the needs for traditional gas or oil boilers, or work together with them.

| Monobloc | | | | | | | |
|---|---|---|---|---|---|---|---|
| Model (kW) | 4kW | 6kW | 8kW | 10kW | 12kW | 14kW | 16kW |
| 220~240-1ph | √ | √ | √ | √ | √ | √ | √ |
| 380~415-3ph | | | | | √ | √ | √ |

### Excellent Performance & Efficiency

R32 refrigerant | Solar thermal | ERP A+++@35°C | LWT 65°C | @A7W35 for 10kW

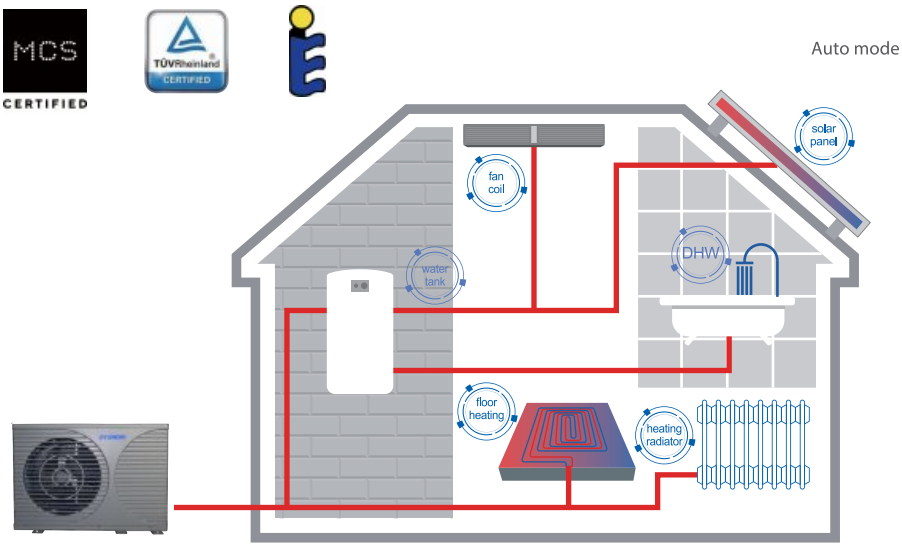
### User Convenience

Intuitive interface | WIFI | 2 zones control | gas boiler | DHW | Low noise mode | 3kW back up heater as standard | Auto mode

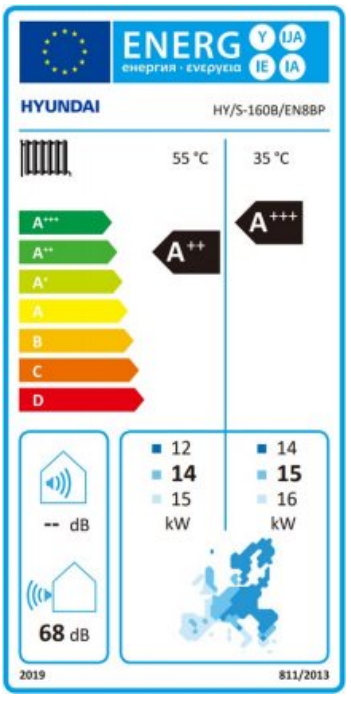
### Certificates

CERTIFIED

Auto mode




## Energy label




*35°CA+++
*55°CA++

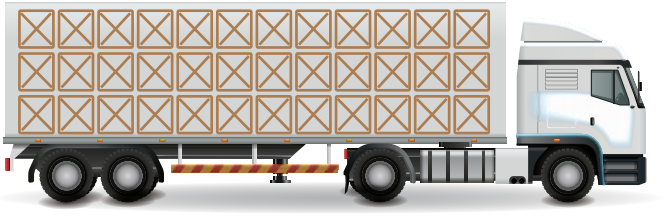
## Eco-Conscious with R32 Refrigerant

- R32 efficiently works even in small volume compared to existing R410A refrigerant, which decreases the potential hazard of global warming. Furthermore, R32 refrigerant is easy to recycle
- Lower GWP and carbon emission(GWP:Global Warming Potential) reduce up to 75% of $CO_2$ eg comparing with R41 0 A


## Structure innovation

- Single fan compact structure design for 4~16kW models with lower noise,and more loading quantity
- Three cabinets design which can ensure more compact and cost control
- Three layer loading can put 135 pcs for 4-6-8kw model în a 40HQ container

Single Fan structure
big noise reduction



3 layers loading
reduces fuel consumption

## Electric BackUp heater and leading brand components

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## Multi-function wired controller and APP control

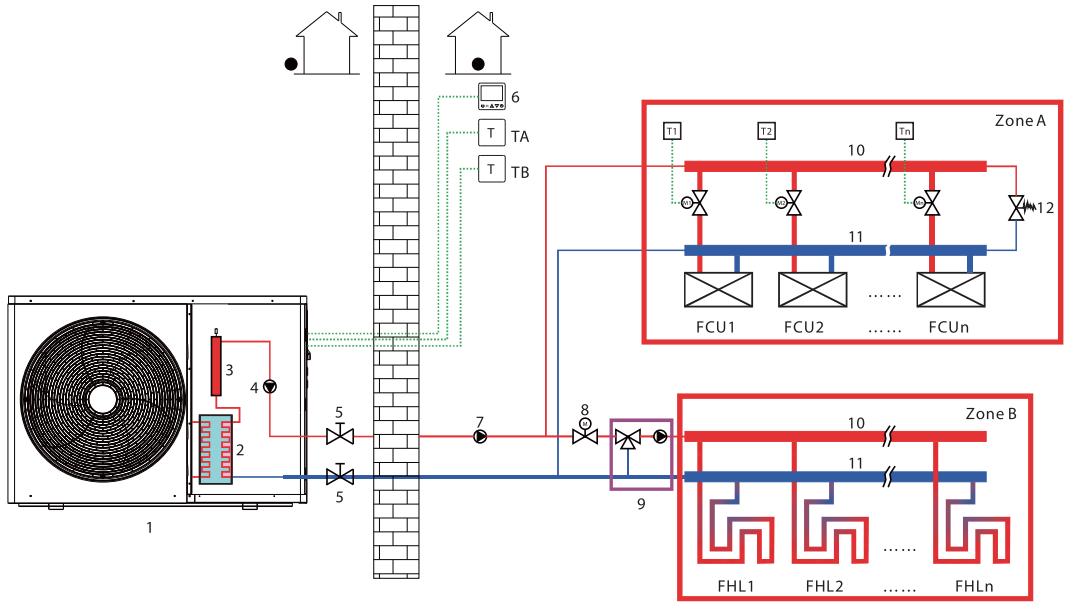

- Icon languages
- Mod bus protocol and network flexibility
- Built-in wifi module supports APP control
- Check the running state of heat pump, zone switch, operation mode and temperatu re

## Extremely silent

- Two level of silent mode provides more comfort
- Silent mode minimum sound power level 55dB

## Two zones control

For different indoor terminal units, the designed outlet water temperature is different. The two zones control function is used to ensure different indoor terminal units working at its designed temperature to enhance the comfort and save energy.



# Specifications

| Specification--monobloc | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model name | | | 4kW | 6kW | 8kW | 10kW | 12kW | 14kW | 16kW |
| Power supply | | V/Ph/H | 220-240 / 1 / 50 | | | | | | |
| Heating[1] | Capacity | kW | 3.96 | 6.01 | 7.93 | 10.21 | 12.06 | 14.47 | 15.91 |
| | Rated input | kW | 0.75 | 1.17 | 1.76 | 2.04 | 2.57 | 2.99 | 3.42 |
| | COP | | 5.25 | 5.13 | 4.50 | 5.01 | 4.7 | 4.84 | 4.65 |
| Heating[2] | Capacity | kW | 4.18 | 6.04 | 8.30 | 10.20 | 12.10 | 14.50 | 15.9 |
| | Rated input | kW | 1.11 | 1.63 | 2.61 | 2.79 | 3.36 | 3.89 | 4.63 |
| | COP | | 3.77 | 3.70 | 3.18 | 3.65 | 3.6 | 3.72 | 3.43 |
| Heating[3] | Capacity | kW | 4.41 | 6.09 | 7.70 | 9.60 | 12.30 | 13.80 | 15.80 |
| | Rated input | kW | 1.46 | 2.13 | 2.98 | 3.22 | 4.44 | 4.42 | 6.12 |
| | COP | | 2.84 | 2.86 | 2.58 | 2.98 | 2.77 | 3.12 | 2.58 |
| Cooling[4] | Capacity | kW | 3.98 | 6.18 | 8.16 | 10.01 | 11.85 | 14.14 | 15.72 |
| | Rated input | kW | 0.77 | 1.26 | 1.75 | 2.42 | 2.72 | 3.10 | 4.03 |
| | EER | | 5.19 | 4.91 | 4.65 | 4.14 | 4.36 | 4.56 | 3.90 |
| Cooling[5] | Capacity | kW | 4.29 | 6.27 | 7.58 | 8.78 | 11.58 | 14.30 | 15.98 |
| | Rated input | kW | 1.32 | 1.99 | 2.55 | 2.97 | 4.14 | 5.11 | 6.12 |
| | EER | | 3.24 | 3.14 | 2.97 | 2.96 | 2.80 | 2.80 | 2.61 |
| Seasonal space heating energy efficiency class | LWT at 35°C | | A+++ | A+++ | A+++ | A+++ | A+++ | A+++ | A+++ |
| | LWT at 55°C | | A++ | A++ | A++ | A++ | A++ | A++ | A++ |
| SCOP | LWT at 35°C | | 4.96 | 5.05 | 4.62 | 4.86 | 4.65 | 4.56 | 4.65 |
| | LWT at 55°C | | 3.47 | 3.52 | 3.32 | 3.51 | 3.37 | 3.45 | 3.57 |
| SEER | LWT at 7°C | | 5.15 | 5.27 | 5.17 | 4.66 | 5.02 | 4.76 | 4.63 |
| | LWT at 18°C | | 8.56 | 8.77 | 8.31 | 8.23 | 8.15 | 6.72 | 6.51 |
| MOP(Maximum overcurrent protection) | | A | 18 | 18 | 21 | 25 | 25 | 30 | 30 |
| MCA(minimum circuit amps) | | A | 12 | 14 | 16 | 1 9 | 23 | 26 | 27 |
| Water pressure drop | | kPa | 25 | 25 | 39 | 37 | 36 | 38 | 38 |
| Refrigerant system pressure (Max. / Min.) | | | 4.5MPa /1.5MPa | | | | | | |
| Refrigerant | Type | | R32 | R32 | R32 | R32 | R32 | R32 | R32 |
| | Charged | kg | 1.03 | 1.03 | 1.3 | 1.5 | 1.75 | 2.1 | 2.1 |
| GWP value | | | 675 | 675 | 675 | 675 | 675 | 675 | 675 |
| Equivalent $CO^2$ | | Ton | 0.695 | 0.695 | 0.878 | 1.013 | 1.181 | 1.417 | 1.417 |
| Compressor | Type | | Twin rotary DC inverter | | | | | | |
| | Brand | | Mitsubishi | | | | | | |
| | Model | | SVB172FNPMC | SVB172FNPMC | SVB220FLGMC-L | SVB220FLGMC-L | MVB33FBBMC | MVB42FCBMC-L | MVB42FCBMC-L |
| | Quantity | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Capacity | kW | 5.54 (@60rps) | 5.54 (@60rps) | 7.10 (@60rps) | 7.10 (@60rps) | 11.37 (@60rps) | 14.38 (@60rps) | 14.38 (@60rps) |
| | Input | kW | 1.73 (@60rps) | 1.73 (@60rps) | 2.23 (@60rps) | 2.23 (@60rps) | 3.57 (@60rps) | 4.4 (@60rps) | 4.4 (@60rps) |
| | Current | A | 5.1 (@60rps) | 5.1 (@60rps) | 6.6 (@60rps) | 6.6 (@60rps) | 11 (@60rps) | 13 (@60rps) | 13 (@60rps) |
| | Oil type / charged | | FW68S / 600ml | FW68S / 600ml | FW68S /460ml | FW68S / 460ml | FW68S / 1100ml | FW68S / 1250ml | FW68S / 1250ml |
| Outdoor fan | Motor type | | Brushless DC motor | | | | | | |
| | Number of fans | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Air side heat exchanger | Material | | Hydrophilic aluminum & Inner groove copper tube | | | | | | |
| | Rows | | 1.5 | 1.5 | 2 | 2.5 | 2.5 | 3 | 3 |
| | Tube size | mm | Φ7 | Φ7 | Φ7 | Φ7 | Φ7 | Φ7 | Φ7 |
| Fan motor | Fan type | | 3 blade | | | | | | |
| | Motor type | | BLDC | | | | | | |
| | Motor model | | EHTSO3BLQ | EHTSO3BLQ | EHTSO3BLQ | EHTSO3BLQ | EHTSO3BLQ | EHTSO1DLQ | EHTSO1DLQ |
| | Motor Brand | | Panasonic | | | | | | |
| | Quantity | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Speed | rpm | 850 | 850 | 850 | 850 | 850 | 825 | 825 |
| Throttle type | | | Electronic expansion valve | | | | | | |
| Water side heat-exchanger | | | Plate heat exchanger | | | | | | |
| Sound power level[6] | | dB | 56 | 58 | 59 | 60 | 64 | 65 | 68 |
| Controller (Standard: LCD) | | | GR-LC07 | | | | | | |
| Anti-UV cover | | | NO | | | | | | |
| Water resistance | | | IPX4 | | | | | | |
| Water pipe connection | Inlet | mm | Φ33 | Φ33 | Φ33 | Φ33 | Φ33 | Φ33 | Φ33 |
| | Outlet | mm | Φ33 | Φ33 | Φ33 | Φ33 | Φ33 | Φ33 | Φ33 |
| Net/Gross weight | Net/Gross | kg | 76/81 | 78/93 | 80/93.5 | 93/103 | 97/117 | 117/136 | 117/136 |
| Dimension (LxWxH) | Net | mm | 1125x370x680 | 1125x370x680 | 1125x370x680 | 1135x370x803 | 1135x370x803 | 1203x481x860 | 1203x481x860 |
| | Packing | mm | 1200x425x865 | 1200x425x865 | 1200x425x865 | 1260x488x982 | 1260x488x982 | 1305x495x1040 | 1305x495x1040 |
| | Loading quantity (20GP/40GP) | sets | 42/135 | 42/135 | 42/135 | 40/84 | 40/84 | 38/82 | 38/82 |
| Operating temperature | Cooling | °C | -5 to 43 | | | | | | |
| | Heating | °C | -25 to 35 | | | | | | |
| | DHW | °C | -25 to 43 | | | | | | |

Note:

1. Outdoor air temperature 7°C DB ,85% R.H ; EWT 30°C,LWT 35°C
2. Outdoor air temperature 7°C DB ,85% R.H ; EWT 40°C,LWT 45°C
3. Outdoor air temperature 7°C DB ,85% R.H ; EWT 47°C,LWT 55°C
4. Outdoor air temperature 35°C DB ,85% R.H ; EWT 23°C,LWT 18°C
5. Outdoor air temperature 35°C DB ,85% R.H ; EWT 12°C,LWT 7°C
6. Test standard:EN12102-1