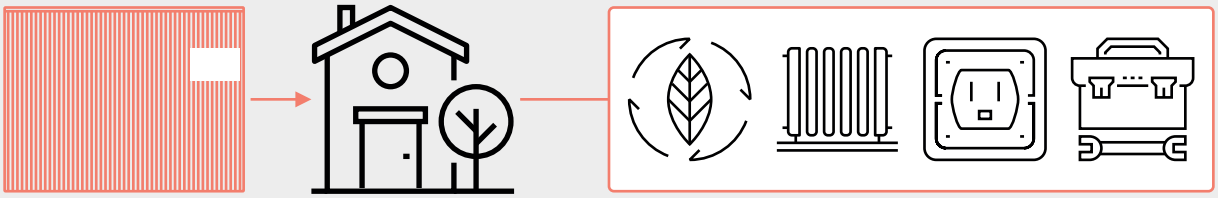
ALARKO

R290
HEAT PUMP

ENERGY EFFICIENCY

A+ energy efficiency with smart grid support, save money and be eco-friendly.

High Potential Heating System Heat Pump



What is a heat pump?

A heat pump is an eco-friendly heating system that can provide heating, hot water, and even cooling for your home all year round. It works by extracting heat from the enviroment and transferring it indoors.

Do heat pump refrigerant harm the enviroment?

Alarko heat pump uses R290 eco- friendly refrigerant, known for itslow enviromental impact and high effiency, making it a sustainable choice for enviromentally conscious consumers.

Is the heat pump noisy during operation?

No, it isn't. Alarko R290 heat pump operates at a noise level of only 30dB(A) at a distance of 3 meters when running at full load, which is equivalent to the sound of a whisper. This creates a quiet enviroment, making it ideal for residential areas.

Will using a heat pump result in high electricity bills?

Alarko R290 heat pump series complies with European Union regulations, achieving an A+++ rating at 55°C/35°C water temperature in space heating. This is the highest possible rating for energy-efficient products in the European market, ensuring our customers benefit from high performance at an economical cost.

Can the heat pump operate effectivly in cold winters?

Yes, it can. Alarko R290 heat pump can operate efficiently even in extreme cold conditions as low as -25°C. Additionally, it maintains its heating capacity without attenuation at 7°C ambient temperature with 35°C water outlet, ensuring comfort and warmth during the harshest winters.

Is the heat pump suitable for old houses and radiators?

Absolutely. Alarko R290 heat pump can provide water temperatures up to 80 °C even at -10°C ambient temperature. It covers more than 98% of European heating scenarios, making it ideal for old building heating and boiler replacement, saving on water system renovation work.

How long can a heat pump typically last?

The lifespan of a heat pump is usually between 15 to 25 years. The specific lifespan depends on factors such as the quality of the equipment, the quality of the installation, the frequency of maintenance, and the operating enviroment.

Why Heat Pump

Low Carbon Background

To achieve carbon peaking and carbon neutrality, cope with the energy crisis, achieve energy independence, and promote the transformation of buildings from carbon consumption to carbon neutrality, residents can install heat pumps to contribute. The government has also introduced various policies to support residents to install heat pumps.

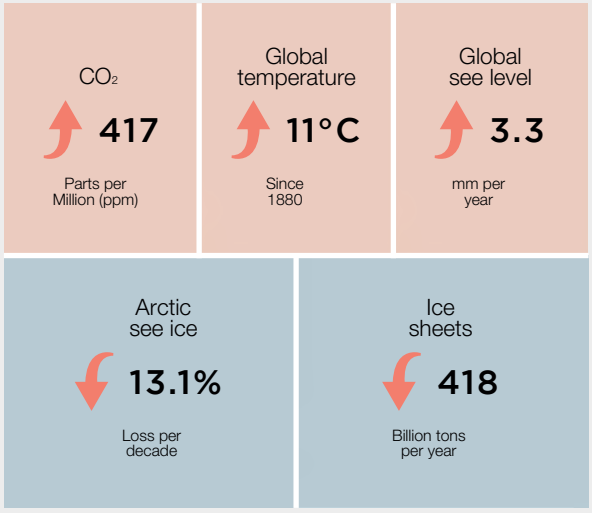
In Germany, for example, the German Federal Ministry for Economic Affairs and Energy (BMWi) subsidizes heat pump installations to a lesser extent, with the amount of subsidy varying according to the type and specifications of the heat pump. German states and regions may also provide additional heat pump subsidies and preferential policies, the specific situation needs to be understood according to local policies and regulations. The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) offers low interest loans to households buying heat pumps to help them pay for the purchase and installation of heat pumps in installments.

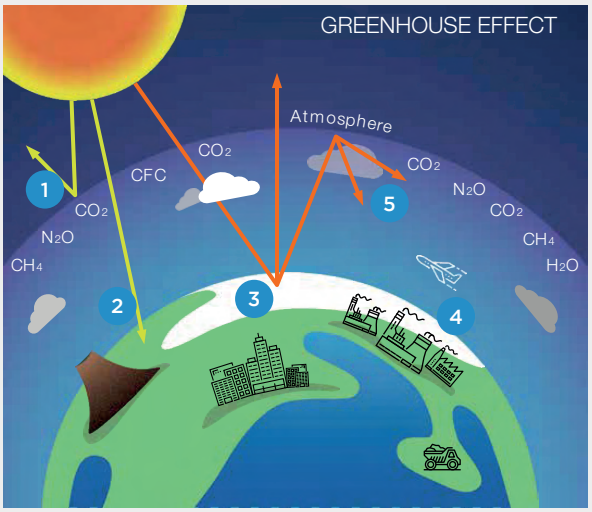
The German Federal Ministry of Finance (BMF) has granted tax incentives to households buying and installing heat pumps to reduce the cost of buying and installing heat pumps. For German consumers, the purchase and installation of heat pumps is an important way to save energy and reduce emissions, which can enjoy government subsidies and preferential policies, but also reduce household energy consumption and carbon emissions.

Climate Change, Nature Disasters Caused By CO_2 Emissions

Phenomenon

Global warming has been an ongoing phenomenon in recent decades.





Cause

In recent years, greenhouse gas emissions have increased significantly due to human activity, intensifying the greenhouse effect.

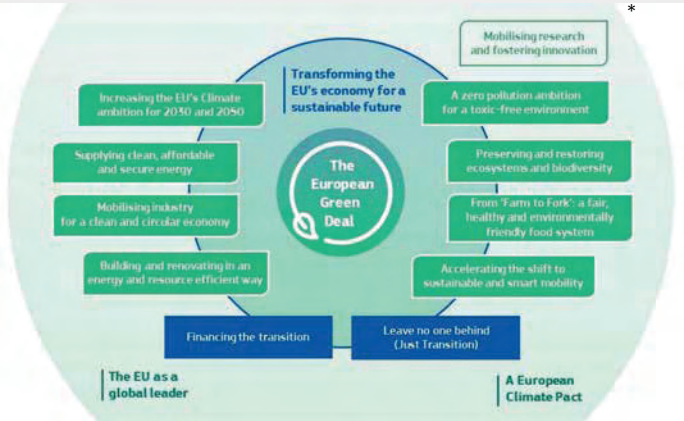
1. Sunlight Reflected back to space by the atmosphere
2. Sunlight Absorbed at surface
3. Sunlight reflected by the surface
4. Human activities release Greenhouse gases
5. Greenhouse gases trap the heat from the sun

Impact

Frequent occurrence of localized droughts, floods, and extreme weather.

Solution

The European Commission officially issued the European Green Deal in December 2019, aiming to make Europe the world's first climate-neutral continent by 2050 and reduce greenhouse gas emissions to tackle climate change.

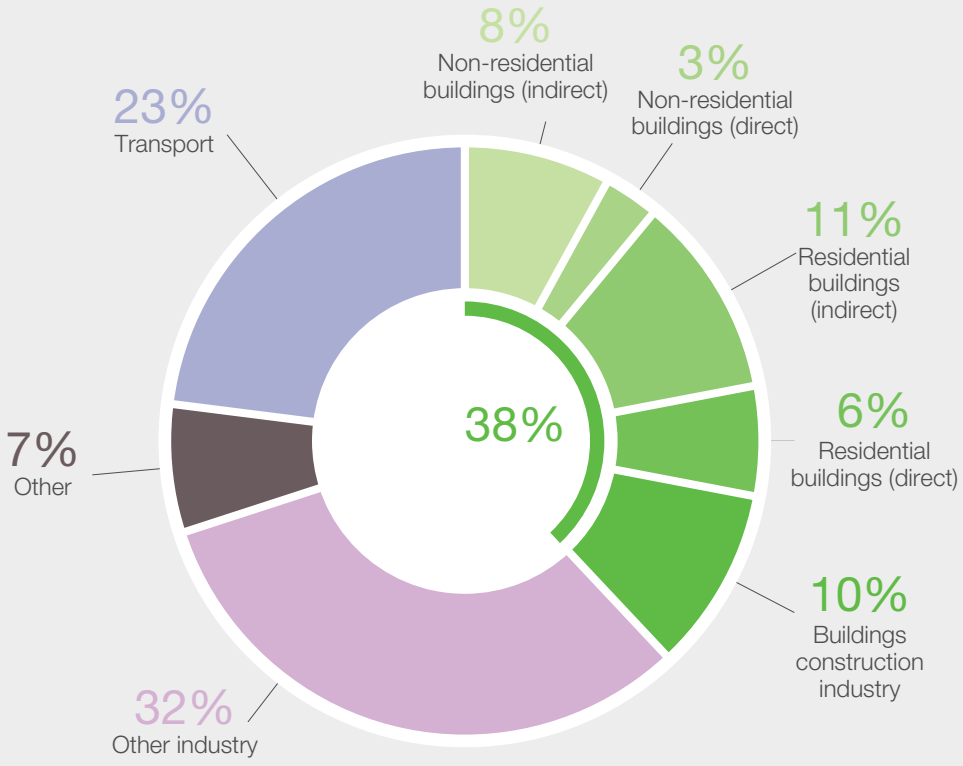


*The elements of European Green Deal (source: COM (2019) 640 final, 11 December 2019, p. 3)

Reducing CO_2 Through The Use Of Heat Pumps

Reducing carbon dioxide emissions is a critical goal in combating climate change, and heat pumps offer an effective solution in this effort. By shifting from traditional heating methods to heat pumps, we can significantly cut down fossil fuel usage, which directly leads to lower CO_2 emissions. This transition not only supports sustainability but also moves us closer to achieving climate goals, as depicted in the data illustrating reduced emissions and increased energy efficiency.

Greenhouse gas emissions from building heating and domestic hot water supply account for 30% of the world's total emissions.



EMISSIONS

Reducing energy consumption for your household's heating and hot water supply can lower your bills and contribute to a greener planet.

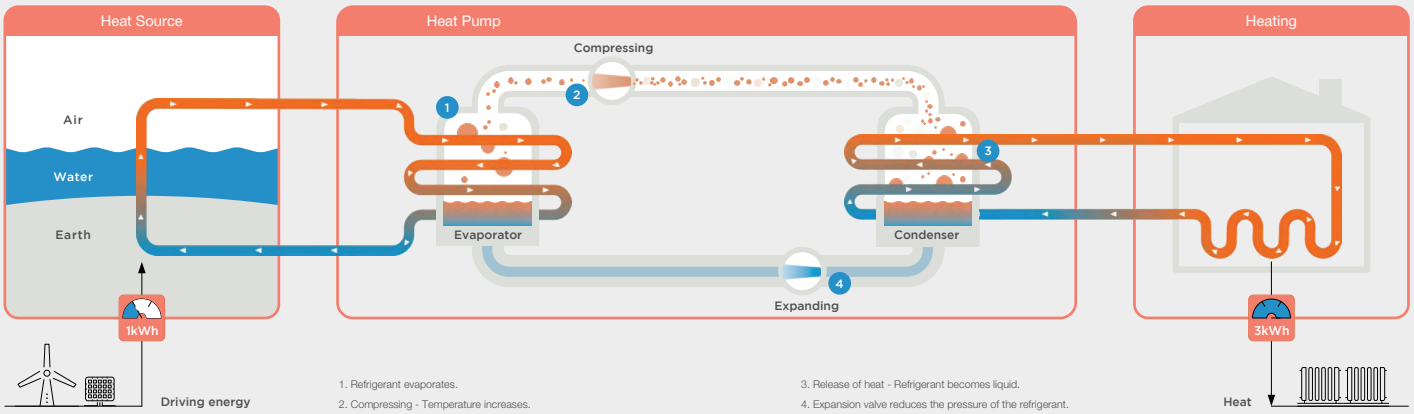
With today’s refrigerants, heat pumps still reduce greenhouse gas emissions by at least 20% compared with gas boilers, even when running on emissions-intensive electricity.
This reduction can be as large as 80% in countries with cleaner electricity *.

What Is A Heat Pump?

A heat pump efficiently transfers natural and free heat energy to indoor spaces by means of a compressor and heat exchanger. Thanks to their environmentally-friendly features and high efficiency, heat pumps are widely promoted and funded by governments for energy conservation in old house renovations, and have gradually become popular around the world in the energy transformation and carbon reduction process for new buildings.

With one kilowatt-hour of electricity, heat pumps can generate around three kilowatt-hours of heat.

Facts: As of 2022, a total of 17 million heat pumps were in use in European residential/commercial buildings, with an increase of over 10%. Also, more than 50% of new buildings were equipped with heat pump systems.



What Are The Benefits Of Using Heat Pumps?

Advantages Over Other Heat Sources

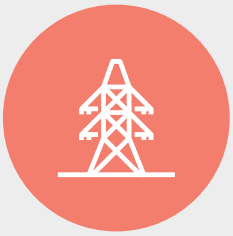
- Lower energy cost
- Stable energy supply
- Available cooling features
- Safety with no CO poisoning risk
- Small footprint
- Zoned heating
- Intelligent control
- Remote fault viewing
- Works with a PV electricity generation and storage system to reduce electricity consumption

Government Subsidies

The European Union launched the REPowerEU Plan in May 2022, with plans to invest 56 billion euros in highefficiency products such as heat pumps to promote European energy security.
Purchasers of heat pump systems can obtain financial assistance such as lowinterest loans and price subsidies. Please contact your local energy consultant or installer for further details.
The REPowerEU Plan will rapidly reduce our dependence on Russian fossil fuels by fast-forwarding the clean energy transition and adapting our industry and infrastructure to different energy sources and suppliers.
Additional investments of € 210 billion are needed between now and 2027 to phase out Russian fossil fuel imports, which are currently costing European taxpayers nearly 100 billion euros per year.

These investments include:

€210 billion by 2027



€29 billion in the power grid by 2030 to enable greater electricity use

€37 billion to increase biomethane production by 2030

€10 billion investments to import sufficient LNG and pipeline gas by 2030

€41 billion for adapting industry to use less fossil fuels by 2030

€1.5-2 billion for security of oil supply

€56 billion for energy efficiency and heat pumps by 2030

€113 billion for renewables (€86bn) and key hydrogen infrastructure (€27bn) by 2030

Lifetime Costs

This cost is estimated for reference only, the actual cost needs to be based on the user's actual choice of the machine and the use and maintenance of the situation.

Heating Equipment Type	Minimum Equipment Cost (Euros)	Maximum Equipment Cost (Euros)	Minimum Installation Cost (Euros)	Maximum Installation Cost (Euros)	Minimum Operating Cost (Euros/Year)	Maximum Operating Cost (Euros/Year)	Minimum Maintenance Cost (Euros/Year)	Maximum Maintenance Cost (Euros/Year)	Minimum Total Cost over 15 Years (Euros)	Maximum Total Cost over 15 Years (Euros)
Gas Boiler	1000	5000	500	3000	1500	2500	100	300	25500	50000
Oil Boiler	1500	5500	1000	4000	1760	2940	150	400	31150	59600
Heat Pump	3000	10000	1500	5000	1500	2500	200	500	30000	60000

Note:

The table lists equipment costs ranging from basic models to mid-high-end models available in the market. Installation costs cover basic to complex installations. Repair costs mainly refer to minor repairs, such as replacing igniters and sensors in gas boilers, nozzles and filters in oil boilers, and sensors and fans in heat pumps.
The data is sourced from various channels, including market research reports like the "European Heating Market Report," official websites of well-known manufacturers, retailers, and installation companies, online retail platforms, and online quotation platforms. The final price ranges are derived through AI analysis and integration.
The operating costs of the equipment are calculated using energy prices published by the German Federal Statistical Office and the German Energy Agency, equipment efficiency standards from manufacturers and industry standards, and heating demand data from market research reports and academic studies such as the "German Heating Market Report" and the "German Energy Consumption Report."

Calculation Logic for Operating Costs:

For a medium-sized household in Germany (approximately 150m2), the annual average heating demand is estimated to be between 15,000 kWh and 25,000 kWh.

Energy Price:

Electricity Price: €0.25/kWh - €0.35/kWh, calculated at €0.30/kWh
Heating Oil: €0.08/kWh - €0.12/kWh, calculated at €0.10/kWh
Natural Gas: €0.06/kWh - €0.12/kWh, calculated at €0.09/kWh

Equipment Efficiency:

Heat Pump: Average COP (Coefficient of Performance) of approximately 3.0 (i.e., 1 kWh of electricity produces 3kWh of heat)
Oil Boiler: Efficiency of approximately 85% (i.e., 1 kWh of heating oil produces 0.85 kWh of heat)
Gas Boiler: Efficiency of approximately 90% (i.e., 1 kWh of natural gas produces 0.90 kWh of heat)
By using these parameters, the specific cost ranges for operating the equipment can be calculated.

* This cost is estimated for reference only, the actual cost needs to be based on the user's actual choice of the machine and the use and maintenance of the situation.

Why Choose Us

- Enhanced Heating Performance
- Cost Efficiency
- User-Centric Design
- Practical Function
- Easy Scalability
- Seamless Service
- Application Scenario Solution

Environmentally Friendly

R32 vs R410A

67.67% LESS GWP VALUE
87.43% LESS CO_2 EMISSION

The R32 refrigerant has a low global warming potential (GWP=675) and zero ozone depletion potential (ODP), a high energy efficiency ratio, a low charge and working pressure, and is suitable for scenarios requiring efficient cooling and high safety.

R290 vs R410A

99.86% LESS GWP VALUE
99.96% LESS CO_2 EMISSION

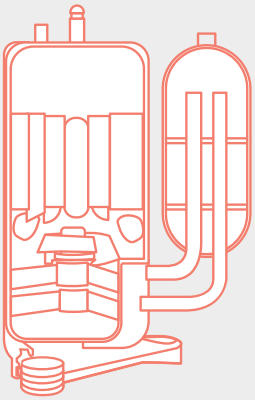
The R290 refrigerant has a very low global warming potential (GWP=3) and zero ozone depletion potential (ODP), which is highly energy efficient and suitable for scenarios with high environmental requirements.


R290 vs R410A
99.86% LESS GWP VALUE
99.96% LESS CO_2 EMISSION
R32 vs R410A
67.67% LESS GWP VALUE
87.43% LESS CO_2 EMISSION

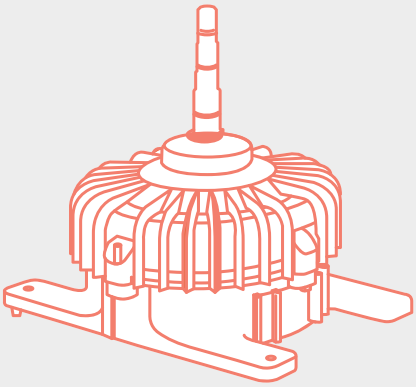
Cost Efficiency

All DC Inverter System

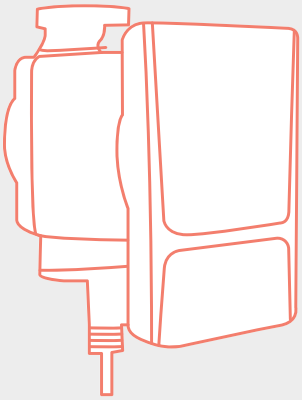
All DC Inverter systems enable greater energy efficiency, more precise temperature control, lower noise and longer equipment life, providing a more comfortable and energy efficient use experience.



DC Inverter compressors can adjust the cooling capacity according to the actual demand, improving energy efficiency and reducing energy consumption.



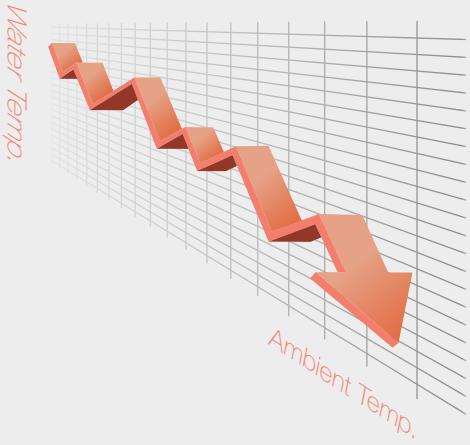
DC Inverter fans can automatically adjust the wind speed according to changes in indoor temperature, providing a more comfortable environment and reducing noise.



DC Inverter pumps can adjust water flow according to system load changes, improve system efficiency and extend equipment life.

Climate Curves

Water temperature automatically adjusts in response to ambient temperature to save energy.

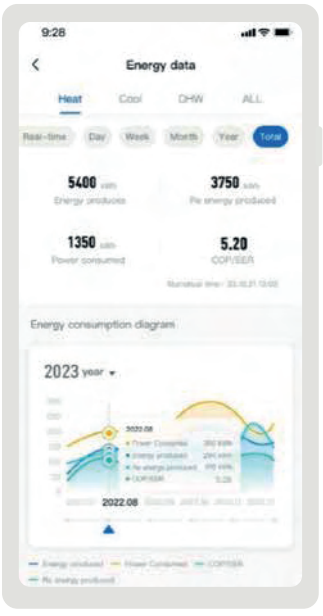


- Three types of temperature types: Standard, Custom, and ECO
- 32 standard weather temperature curves
- “Temperature offset” function to control precisely
- Customized curves in different zones and different modes

Smart Grid Function

Heat pump adjusts the operation according to different electrical signals. Power consumption of the system can be automatically adjusted according to the peak and valley power to reduce the power consumption to the greatest extent.

Controller



Energy Metering Function

Users have the option to receive a customized energy analysis through the user interface, APP and portal, enabling intuitive, visual energy management which helps guide user behavior to achieve a more energy efficient heat pump system.

Complies with EU Regulations 2018/2001/EU and (EU) 2022/759 for the purpose of receiving subsidies.

User-Centric Design

Color Screen Display

- Color screen displayIntegral tempered glass panel, metallic texture border
- 3.5 inch color screen display, immersive interface after screen-off
- 2-core non-polar cable, Homebus communication protocol
- Modbus protocol
- OTA function, enables wired controller updates remotely
- APP control (Bluetooth connection for network setup)
- FAQ function
- Error code display
- Operation parameter checking
- Point check function
- Multiple languages
- Child lock function
- Buzzer alarm
- Built-in temperature sensor and wifi module

reddot

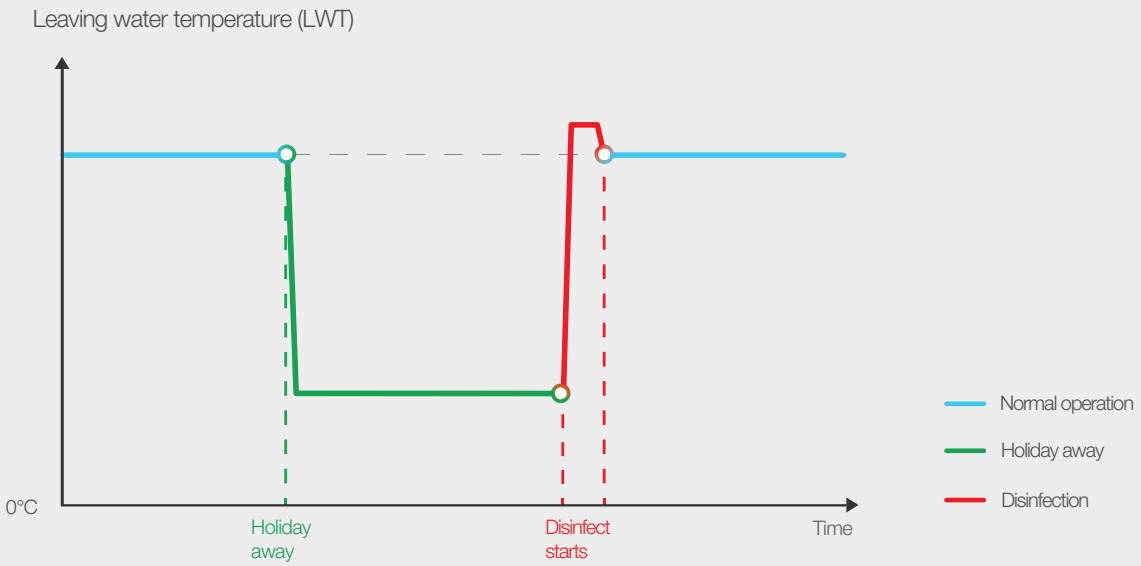
Practical Function

Preheating And Drying Up

Drying up mode is used to dry the floor after installation. Preheating mode is designed for the first heating during seasonal heating. The water temperature of floor heating loops would be increased gradually in order to protect the floor from warped or even rupture.

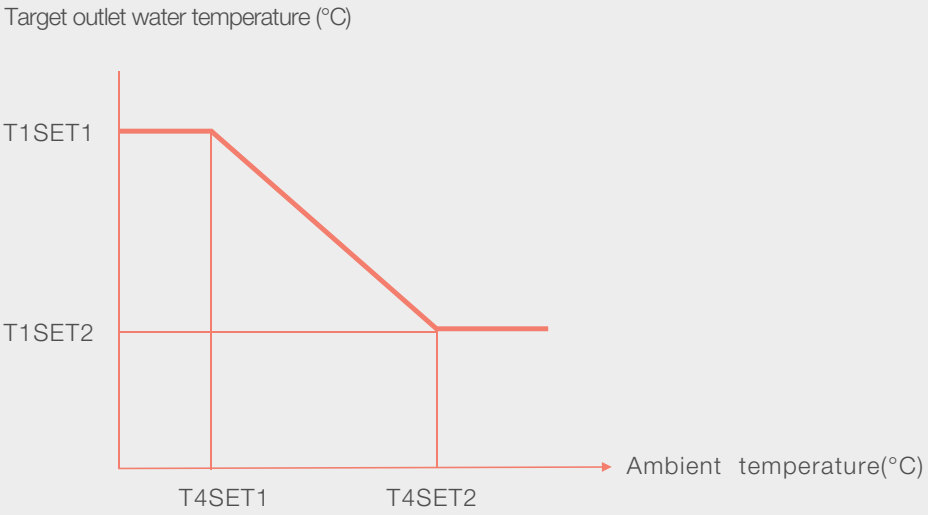
Holiday Away

If user leaves, heat pump runs in heating mode and/or DHW mode with lower water temperature to prevent water system from freezing. Disinfection is available before user returns home to ensure the water security.



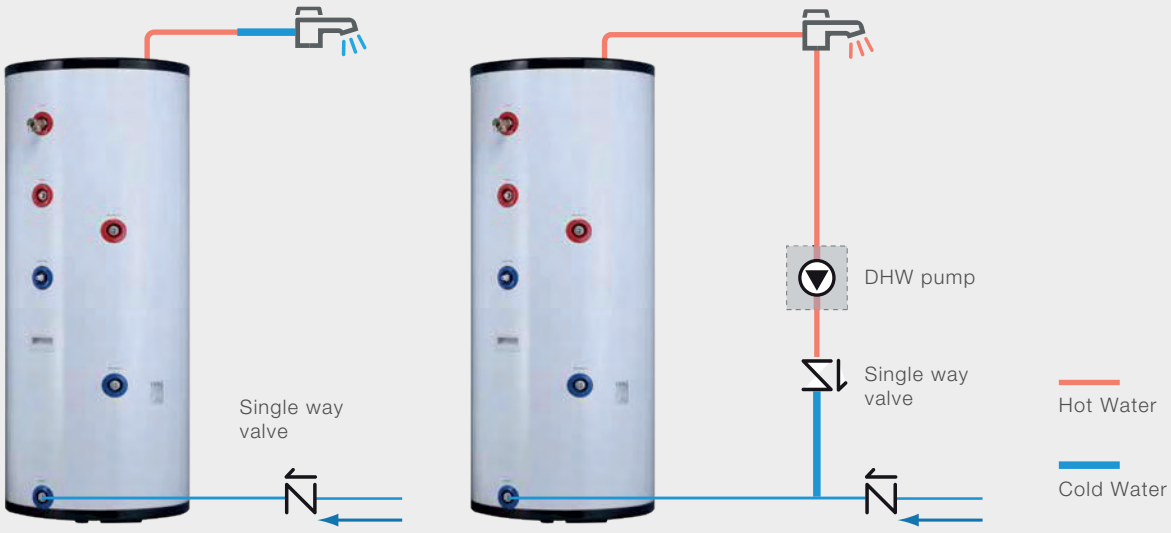
Climate Curve

Water temperature automatically changes as ambient temperature changes. It is convenient and energy-saving for end users. 32 fixed climate curves and 1 customized curve are available, which meets the diversified requirement.



DHW Pump Function

The DHW pump function is used to return water in the water pipe net to the tank. Total 12 timers for one day can be set, which allows users to set the DHW pump operation schedule according to using habit to guarantee using hot water without waiting for a long time.

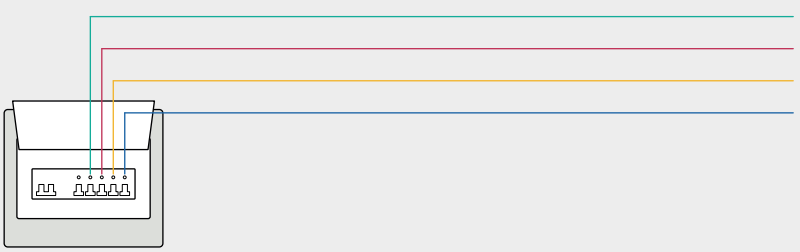


Easy Scalability

Power Input Limitation

During the installation of the unit, the appropriate current usage is set in the Power Input Limitation function of the controller based on the user's power supply conditions. This ensures that the unit can operate safely and stably even when the power supply is limited.

- Easy setting on wired controller
- 8 configurations for unit current limitation adjustment
- Flexible to adapt to different usage scenario



Air conditioning and heating	10-30A
Kitchen appliance	5-30A
Lighting	1-5A
Socket	10-20A

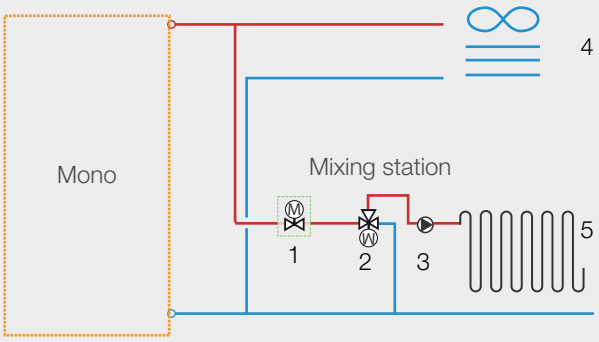
Note: Data above for reference.

Typical Application

Practical applications are various, including but not limited to the following applications. The application examples given below are for illustration only.

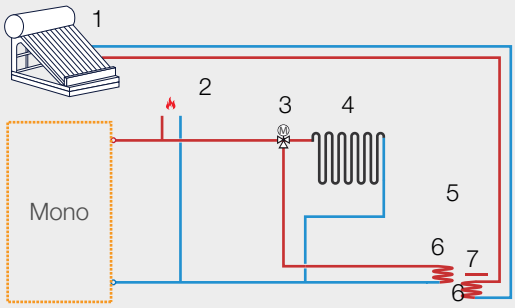
Heating And Cooling

Floor heating loops is used for space heating and fan coil unit is used for both space heating and cooling. For heating mode, floor heating loops and fan coil unit require different operating water temperature. Mixing station is used to adjust appropriate water temperature for floor heating loops using. 2-way valve is used to prevent water from entering floor heating loops then result in condensation during cooling.



Notes:
1. 2-way valve (field supplied)
2. 3-way valve (field supplied)
3. Water pump (field supplied)
4. Fan coil unit (Alarko can supply)
5. Floor heating loop (field supplied)

Heating, DHW And Hybrid Heat Source



Backup electric heater(optional) and AHS provide additional heating to raise the leaving water temperature. TBH and solar system provide additional heating to raise the domestic hot water temperature. 3-way valve is used to switch between heating mode and DHW mode.

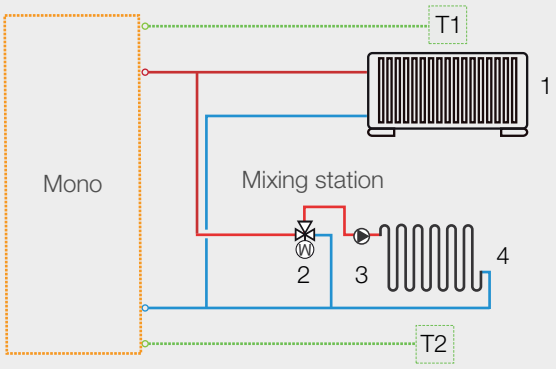
Notes:
1. Solar panel (field supplied)
2. AHS: Additional heating source (field supplied)
3. 3-way valve (field supplied)
4. Floor heating loop (field supplied)
5. Water tank (field supplied)
6. Heat exchanger coil (field supplied)
7. TBH: Tank booster heater (field supplied)

Double Zones Control

Double zones control is only available for heating mode. It can control different areas to reach different temperature to meet various needs.

1. Using wired controller only
Wired controller sets the mode, temperature and on/off. Zone 1 is controlled based on the leaving water temperature. Zone 2 is controlled based on the leaving water temperature or built-in sensor integrated in the wired controller.

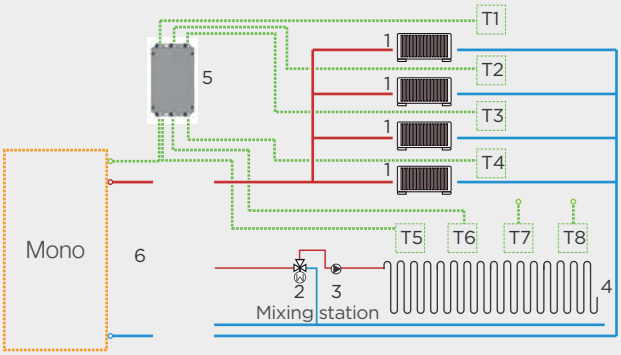
2. Using wired controller and thermostat
Wired controller sets the mode and water temperature. Both Zone 1 and Zone 2 are controlled by thermostat.



Notes:
1. Radiator (field supplied)
2. 3-way valve (field supplied)
3. Water pump (field supplied)
4. Floor heating loop (field supplied)

Abbreviation
T: Room thermostat (field supplied)

Multiple Rooms Control



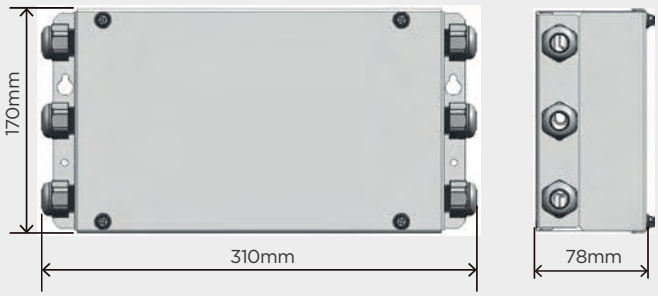
Maximum 6 room thermostats are available to be connected with M-kit and 2 thermostats are connected to heat pump, which realizes maximum 8 rooms can be controlled.

Notes:
1. Radiator (field supplied)
2. 3-way valve (field supplied)
3. Water pump (field supplied)
4. Floor heating loop
5. M-kit (optional)
6. Balance tank (field supplied)

Abbreviation
T: Room thermostat (field supplied)

M-Kit

The M-kit is wall-mounted with a simple structure, mini size, flexible installation, and can connect up to a maximum of 6 thermostats.

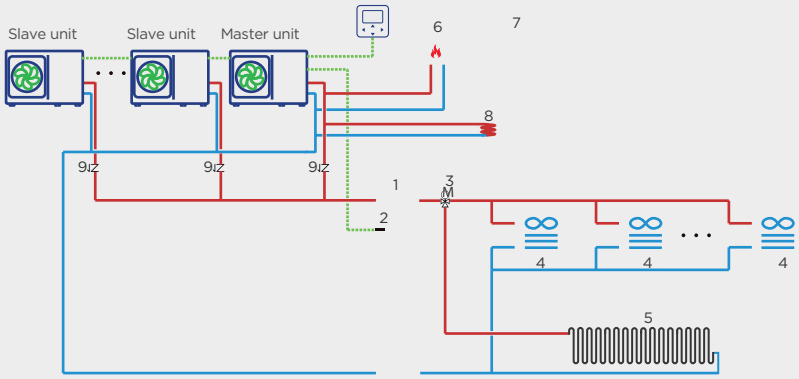


Monobloc Structure

The Monobloc structure units can be connected in parallel with up to 6 machines to meet the heating needs of different capabilities.

Monobloc Cascade System

Cascade system design is perfect when an extension of capacity becomes required as the building demand evolves. Maximum 6 units can be controlled in group with one controller. Balance tank temperature control makes water temperature more accurate.



Notes:
1. Balance tank (field supplied)
2. Balance tank temperature sensor (Alarko can supply)
3. 3-way valve (field supplied)
4. Fan coil unit (Alarko can supply)
5. Floor heating loop (field supplied)
6.AHS: Additional heating source (field supplied)
7.Water tank (field supplied)
8.Heat exchanger coil (field supplied)
9.Single way valve (field supplied)

Product Lineup

Structure Type		4	6	8	10	12	14	16
Power supply	220-240V~50Hz	√	√	√	√	√	√	√
	380-415V~3N-50Hz					√	√	√
Appearance		 4/6kw				 8-16kw		
Internal electric heating	(optional)	3kW				3/6/9kW		

Wide Application Range

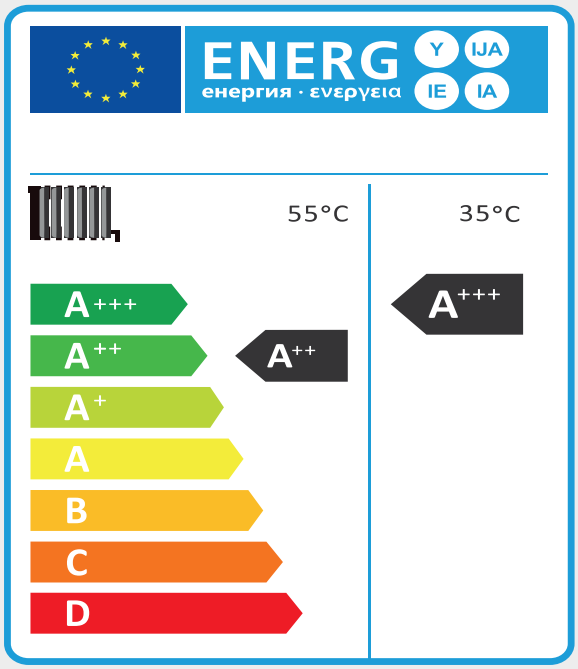
Ambient temperature range	-30	-20	-10	0	10	20	30	40	50	60	70
Cooling -5°C to 46°C			-5°C						46°C		
Heating -25°C to 35°C		-25°C						35°C			
DHW -25°C to 46°C		-25°C							46°C		

Leaving Water Setting Temperature range	-20	-10	0	10	20	30	40	50	60	70	80
Cooling 5°C to 25°C				5°C	25°C						
Heating 25°C to 75°C						25°C				75°C	
DHW 20°C to 70°C					20°C					70°C	

High Energy Level

ERP Directive*
ns. Seasonal space heating
energy efficiency
ns average up to A+++ at 35°C
ns average up to A++ at 55°C

*This is high rating for energy-efficient products in the European market, ensuring our customers benefit from high performance at an economical cost.



Authoritative Certification

Alarko R290 Heat Pump
have received numerous certifications, demonstrating its superior quality, safety, energy efficiency, and environmental compliance.

Specifications

Model			FLR-HPM04B104	FLR-HPM06B104	FLR-HPM08B104
Power supply		V/Ph/Hz	220- 240/1/50		
Heating A7W35	Capacity	W	4500	6200	8400
	Rated input	W	874	1265	1680
	COP		5.15	4.90	5.00
Heating A7W45	Capacity	W	4500	6400	8200
	Rated input	W	1111	1684	2130
	COP		4.05	3.80	3.85
Heating A7W55	Capacity	W	4600	6200	7800
	Rated input	W	1438	2000	2438
	COP		3.20	3.10	3.20
Heating A2W35	Capacity	W	4400	5600	7100
	Rated input	W	1073	1436	1844
	COP		4.10	3.90	3.85
Heating A-7W35	Capacity	W	4500	5900	7000
	Rated input	W	1452	2000	2333
	COP		3.10	2.95	3.00
Cooling A35W18	Capacity	W	4500	6500	8300
	Rated input	W	818	1275	1612
	COP		5.50	5.10	5.15
Cooling A35W7	Capacity	W	4700	6800	7500
	Rated input	W	1288	2194	2174
	COP		3.65	3.10	3.45
SCOP	Average climate, W35°C		A+++		
	Average climate, W55°C		A++		
Erp sound power level		dB	56	58	60
Refrigerant	Type (GWP)		R290 (3)		
	Charged volume	g	700		1100
Unit dimensions (H*W×D)		mm	1299×717×426		1385×865×523
Packing dimensions (H×W*D)		mm	1375×885×475		1375×885×475
Net/Gross weight		kg	90		117
Water side connection			G1"BSP		G11/4''BSP
Outdoor air temperature range	Cooling	°C	-5 - 46		
	Heating	°C	-25 - 35		
	DHW	°C	-25 - 46		
Water setting temperature range	Cooling	°C	5 - 25		
	Heating	°C	25 -80		
	DHW	°C	20 - 70		

Note: data above based on test reference standard EN14511; EN14825; EN50564: EN12102; (EU) No: 811

Specifications

Model			FLR-HPM10B104	FLR-HPM12B104	FLR-HPM14B104	FLR-HPM16B104	FLR-HPM12B109	FLR-HPM14B109	FLR-HPM16B109
Power supply		V/Ph/Hz	220- 240/1/50			380- 415/3/50			
Heating A7W35	Capacity	W	10000	12000	14000	15000	12000	14000	15000
	Rated input	W	2128	2500	3111	3409	2500	3111	3409
	COP		4.70	4.80	4.50	4.40	4.80	4.50	4.40
Heating A7W45	Capacity	W	10000	12000	14000	15000	12000	14000	15000
	Rated input	W	2740	3243	4000	4478	3243	4000	4478
	COP		3.65	3.70	3.50	3.35	3.70	3.50	3.35
Heating A7W55	Capacity	W	9500	12000	14000	15000	12000	14000	15000
	Rated input	W	3115	3871	4667	5263	3871	4667	5263
	COP		3.05	3.10	3.00	2.85	3.10	3.00	2.85
Heating A2W35	Capacity	W	8200	9100	10800	12800	9100	10800	12800
	Rated input	W	2247	2395	3086	4000	2395	3086	4000
	COP		3.65	3.80	3.50	3.20	3.80	3.50	3.20
Heating A-7W35	Capacity	W	8000	10000	11500	12700	10000	11500	12700
	Rated input	W	2807	3571	4259	5080	3571	4259	5080
	COP		2.85	2.80	2.70	2.50	2.80	2.70	2.50
Cooling A35W18	Capacity	W	10000	12000	14000	16000	12000	14000	16000
	Rated input	W	2105	2667	3333	4103	2667	3333	4103
	COP		4.75	4.50	4.20	3.90	4.50	4.20	3.90
Cooling A35W7	Capacity	W	8900	11500	12700	14000	11500	12700	14000
	Rated input	W	2738	3770	4379	5091	3770	4379	5091
	COP		3.25	3.05	2.90	2.75	3.05	2.90	2.75
SCOP	Average climate, W35°C		A+++						
	Average climate, W55°C		A++						
Erp sound power level		dB	61	65		69	65		69
Refrigerant	Type (GWP)		R290 (3)						
	Charged volume	g	1100	1250					
Unit dimensions (H*W×D)		mm	1051 X 1330 X 475						
Packing dimensions (H×W*D)		mm	1235 X 1390 X 570						
Net/Gross weight		kg	117	135			137		
Water side connection			G11/4''BSP						
Outdoor air temperature range	Cooling	°C	-5 - 46						
	Heating	°C	-25 -35						
	DHW	°C	-25 - 46						
Water setting temperature range	Cooling	°C	5 - 25						
	Heating	°C	25 -80						
	DHW	°C	20 -70						

Note: data above based on test reference standard EN14511; EN14825; EN50564: EN12102; (EU) No: 811

Note: Manufacturer reserves the right to change any product specifications without notice.

ALARKO CARRIER
SANAYİ VE TİCARET A.Ş.

GOSB - Gebze Organize Sanayi Bölgesi, Şahabettin Bilgisu Cad.

No:1604 Gebze 41480 KOCAELİ - TÜRKİYE

Phone: +90 262 648 60 00

Fax: +90262 648 60 08

www.alarko-carrier.com.tr

info@alarko-carrier.com.tr