

EHS Mono R290

Safety Guide
for Installers.



Key information about the EHS Mono R290

The Samsung EHS Mono R290 is an exceptional heating system, known for its future-conscious design. This heat pump utilises R290, a type of propane refrigerant, which is less harmful to the climate, making it a more responsible choice. The R290 refrigerant offers excellent thermodynamic properties, enhancing the system's performance.

The EHS Mono R290 is a monobloc heat pump, which means that the heat pump houses all the essential components in the outdoor unit. All the refrigerant pipes are factory assembled and factory sealed. Unlike a split heat pump, it doesn't need to work on the refrigerant side.

Samsung Climate Solutions offer two different types of monobloc heat pumps: one with the pump, expansion and control components built into the outside unit which simplifies installation and requires less indoor space within the home. It's particularly well-suited for residential and light commercial applications, providing space, heating and hot water production. The second type is the standard EHS Mono R290 heat pump with the pump, expansion and controls components fitted separately inside the house.

Thanks to its inverter technology, the EHS Mono R290 can modulate its output to match the heating demand, resulting in energy reduction and consistent comfort. Additionally, the unit is compatible with smart control systems, allowing users to manage their heating remotely, further optimising energy consumption.



Important information related to refrigerants

Installers need to understand the significance of refrigerants, refrigerating systems and heat pumps. This is crucial for ensuring safety, environmental responsibility and efficiency. Guidance from key industry standards is essential. These standards include, EN378, IEC 60335, ISO 5149, ISO 22712 and ISO 817.





Transportation and Storage

Transporting EHS Mono R290 heat pumps, with a charge amount below 12kg, is exempt from the ADR (European Agreement concerning the International Carriage of Dangerous Goods by Road) regulations. Nevertheless, for safety considerations, the following requirements must be adhered to.

- Label packages containing heat pumps with R290 with specification of new transport category UN 3358, hazard label 2.1, directional arrows, and full documentation compliance
- Provide training for personnel involved in transporting dangerous goods, including carrying a two-kilogram powder fire extinguisher
- Prohibit smoking during transport
- Avoid opening packages and store loaded transport units in safe locations
- Carry an ATEX-compliant (explosion-protected) fire-setter on board for added safety

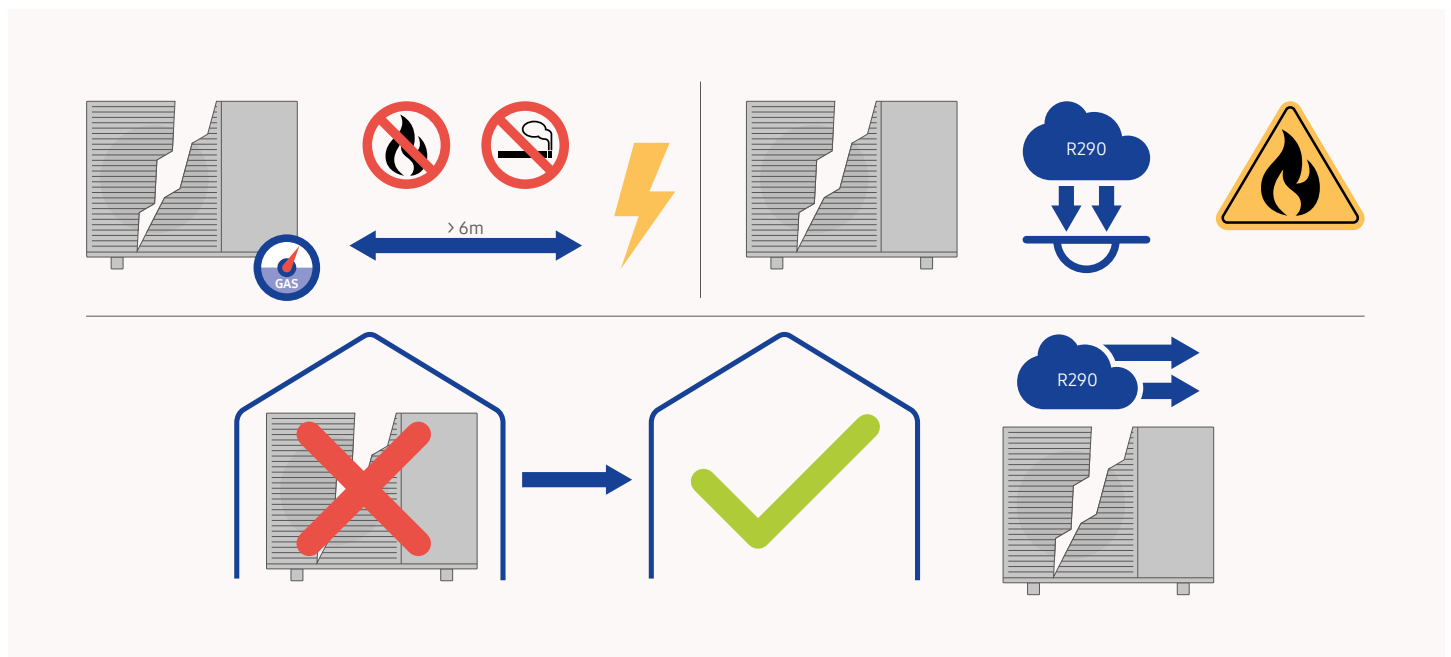
Other precautions include:

- Transport heat pumps upright to prevent equipment damage during transit
- Ensure adequate air supply during transportation to maintain safe conditions
- Use undamaged packaging for heat pump transportation
- Ideally, store heat pumps above ground level with natural ventilation to the environment
- Avoid potential ignition sources such as sparking and smoking
- If damage occurs during transportation, the hazardous materials must be taken immediately to a secure outdoor area. There must be no ignition sources within a six-metre radius. The unit must be positioned in a location where the refrigerant can either disperse safely or be expertly evacuated and disposed of by a qualified service technician
- If damage has been found on the product or packaging, and in case of suspicion of possible damage to the product, please remove the R290 refrigerant using the correct procedures before returning the heat pump
- It is advisable to equip each transport unit with a portable gas detector, particularly when regularly transporting a large volume of heat pumps contain flammable refrigerants

Safe storage of the EHS Mono R290 is essential to prevent accidents and ensure compliance with safety regulations. To reduce the potential risks associated with propane cylinders, please follow the guidance below:

- Store in dedicated areas or cages, in dry, well-ventilated spaces away from fire risks
- Limit access to authorised personnel only, with clear "No Smoking" and "No Naked Flames" signage
- Store on the ground level, avoiding cellars or basements
- Maintain easy access
- Never store in residential premises
- Keep upright during storage
- Adhere to specified quantity limits for storage
- Prevent static electricity build-up

EHS Mono R290 General precautions





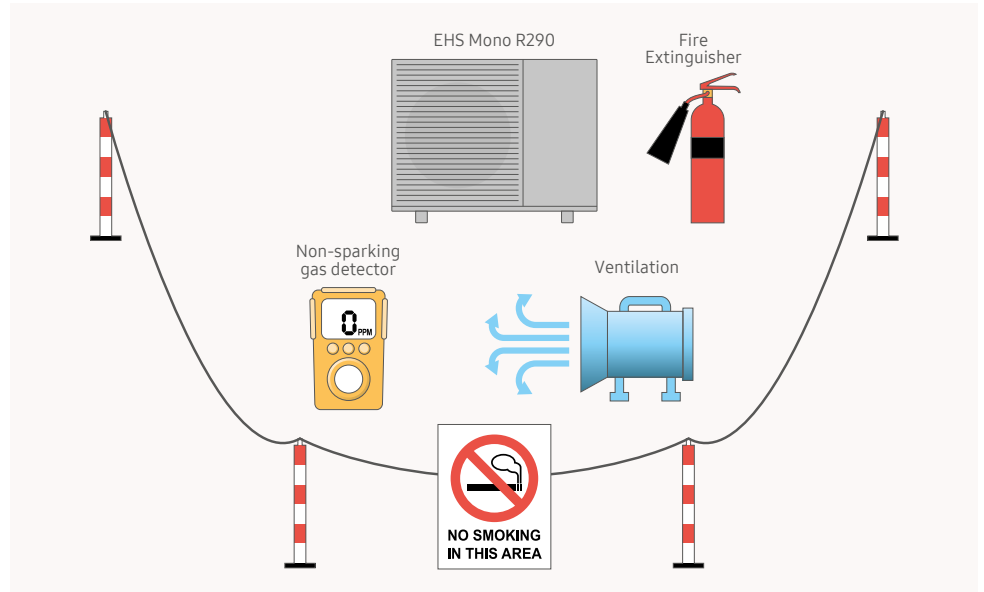
Installation, inspection and maintenance

Installation, inspection and maintenance of EHS Mono R290 require strict adherence to safety protocols to mitigate the potential hazards associated with flammable refrigerants like R290. These precautions are critical and align with safety guidelines and industry standards.

Safety considerations revolve around three fundamental preconditions that must not occur simultaneously: refrigerant release, the presence of a flammable mixture of R290 and air, and an active ignition source. To prevent these occurrences, installers must follow specific safety measures.

Before working in temporary flammable zones, precautions include ensuring proper ventilation, not using a mobile phone, using non-sparking gas detectors, instructing staff, displaying no-smoking signs, and having appropriate tools and equipment.

Safety protocols





Recommended checks ahead of installation and maintenance

Follow below recommended checks ahead of installation and maintenance.

Point	Service check prerequisites	Compliance Y/N
1	Awareness Familiar with the information provided by other sources, such as the system equipment manufacturers, component manufacturers, refrigerant suppliers, and Material Safety Datasheets (MSDSs). Occupants should be aware of manufacturer operating instructions, procedures, guidelines and safety issues regarding the equipment. Be made aware of evacuating the space following the accidental release of a flammable refrigerant.	
2	Safety distance Safety distance to building openings with regard to the movement of refrigerant required. For outdoor installations refrigerating system sited in the open air shall be positioned to avoid leaked refrigerant following into a building or otherwise endangering people and property.	
3	No ignition Sources No smoking, including displaying 'No Smoking' signs. Survey the area around the equipment before servicing to establish any flammability or ignition risks. Remove all sources of ignition. Be aware that a cell phone or similar electronic devices could be the source of ignition.	
4	Labels R290 is classified as a highly flammable category A3 gas and must be labeled accordingly.	
5	General Work Area Instruct anyone in the temporary flammable zones as to the nature of the work.	
6	Personal Protective Equipment Technicians should wear appropriate protective equipment, including chemical goggles, protective gloves, grounding probes, and anti-static bands.	
7	Free Air Movement Ensure that free air movement around all refrigerant-containing parts of the systems can be achieved. Depending on the size of the room, especially in a confined space, mechanical ventilation may need to be considered. The ventilation should displace any released refrigerant and preferably expel it externally.	
8	Base Emptiness R290 is heavier than air. Precautions should be made against refrigerant collecting in troughs and low points of the structure.	
9	Electrical Devices An initial safety check of components to see if a fault exists that could compromise safety. Capacitors should be discharged with bleed resistors (minimum 2 Watt/10,000) or multimeter's. Do not work on 'live' electrical components. Maintain and enforce proper usage of ground equipment to prevent accidents and ensure safety.	
10	Certified Equipment - Gas Leak Detectors and Monitors, Electrical Test meters, Portable Lighting, non-sparking tool, and etc.	
11	Work Space Guidelines - Good ventilation - Dry powder fire extinguishers	



Refrigerant removal and recovery procedure

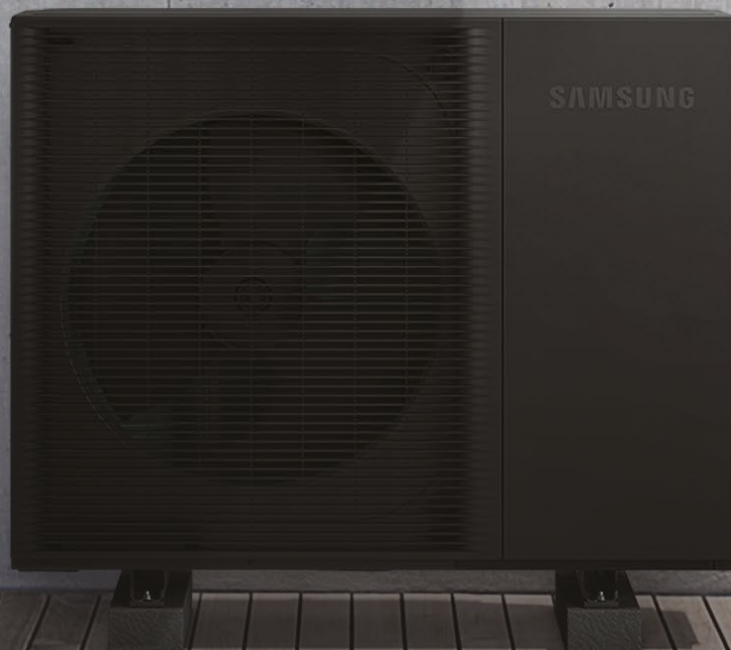
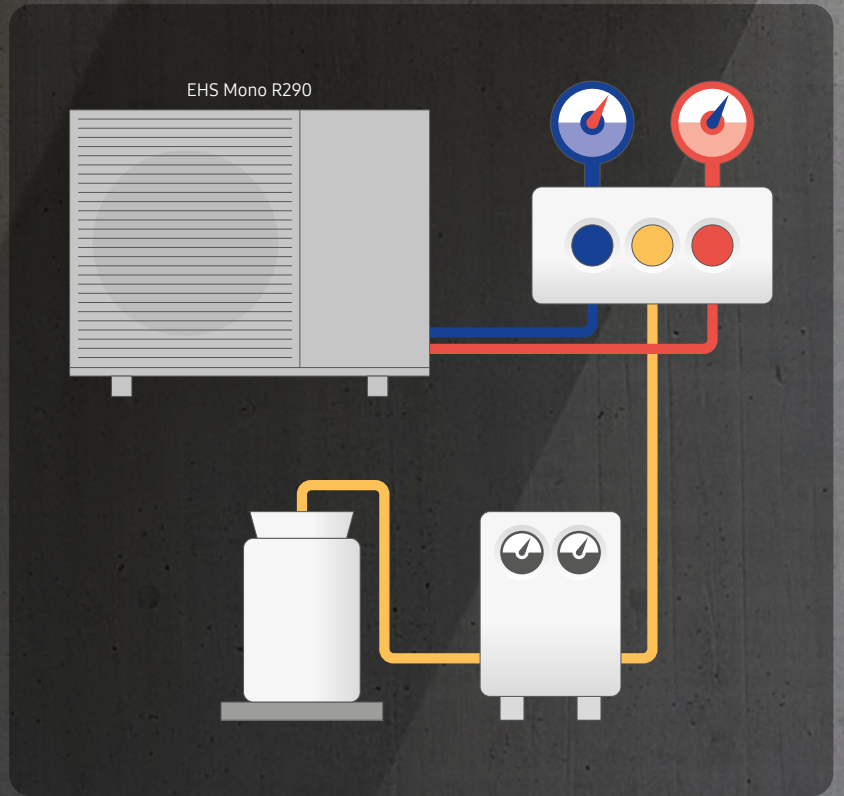
Refrigerant removal and recovery involve the careful extraction of refrigerant gases from cooling systems and air conditioners, using specialised equipment to ensure these gases are safely contained and recycled. Preventing environmental harm and complying with regulatory standards.

Always use a refrigerant explicitly labelled as 'R290' and avoid using Propane alone.

Owing to the minimal amount of the R290 charge, precise weighing of the R290 introduced into the system is imperative to guarantee optimal performance.

Prior to commencing work on electrical components, the corresponding power supply must be disconnected before opening any sealed parts.

These comprehensive procedures ensure the safe and efficient installation, inspection, and maintenance of R290 systems.



Building safety, fire department, outdoor safety



Flammable



Poisonous



Danger



Electricity

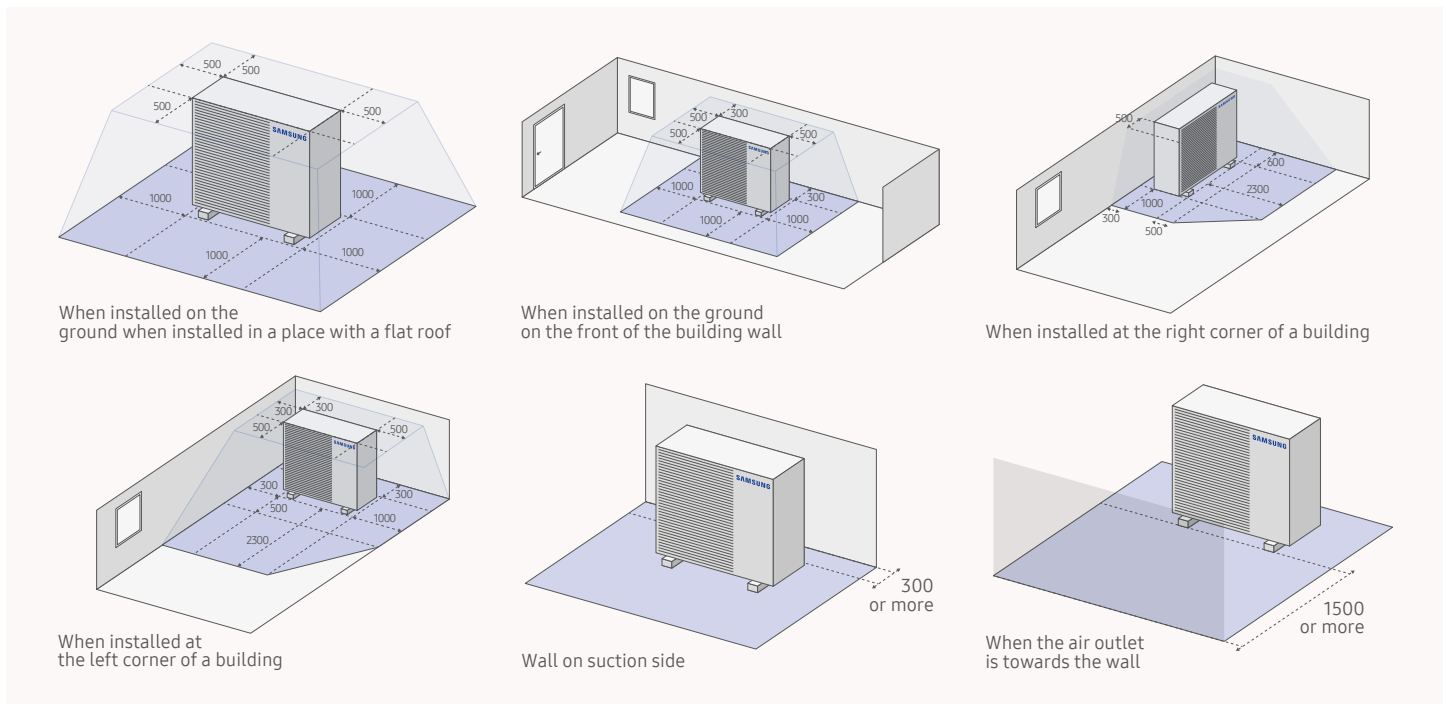


No smoking

Building safety, outdoor safety, and the involvement of the fire department are crucial when working with refrigeration systems. Safety distances are essential to prevent refrigerant leaks from endangering people and property.

- The Safety Zone shall not have any building openings such as: Windows, Doors, Light wells, Flat roof windows, Air inlet/Outlet of ventilation systems, etc
- R290 refrigerant is heavier than air and can be collected on the ground. There should be no sinking or deepening of the ground in the safety zone
- The safety zone should not extend to intact buildings or public spaces
- The safety zone cannot be modified later to violate the protection rules

EHS Mono R290 safety zone measurements



The designated safety zone must be free from any structural openings such as windows, doors, light wells, skylights, and air inlets or outlets of ventilation systems. R290 refrigerant, being denser than air, tends to sink and accumulate at ground level. Therefore, there must be no depressions or excavations within the safety zone. Furthermore, this zone should not encroach upon intact buildings or public areas. Once established, the safety zone must not be altered in any way that contravenes established safety regulations.

Refrigerating equipment in the open air must be positioned to prevent refrigerant from flowing into building openings or ventilation systems. Sheltered equipment should have natural or forced ventilation to maintain safety.

The work area should be adequately ventilated before working on the refrigerant circuit, brazing, or dealing with electrical components.



Protection gear and certification needed

When working with EHS Mono R290 systems, protection equipment and certification (if needed) are of paramount importance. The requirements for protective gear and equipment are in line with those for existing R32 products. Installers should wear appropriate protective equipment, including chemical goggles, protective gloves, grounding probes, and anti-static bands to minimise risks associated with flammable refrigerants.



Product scrapping and recycling

Product scrapping and recycling at the end of a system's life is a crucial phase that applies to refrigeration systems irrespective of the refrigerant used. Standard procedures include:

- Removal of refrigerant
- Removal of oil
- Dismantling the refrigeration system and related equipment
- Transporting refrigerant, oil, and hardware to designated collection stations
- Transporting system construction materials (metals, plastics, etc.) to appropriate recycling centres

These actions ensure responsible and environmentally-friendly disposal of refrigeration systems.



In case of an emergency

For installers working with EHS Mono R290, your safety is our priority and we are here to support you. In case of emergencies, please keep the designated contact number readily available.

Emergency contact details: Please contact your local Samsung customer service team.

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