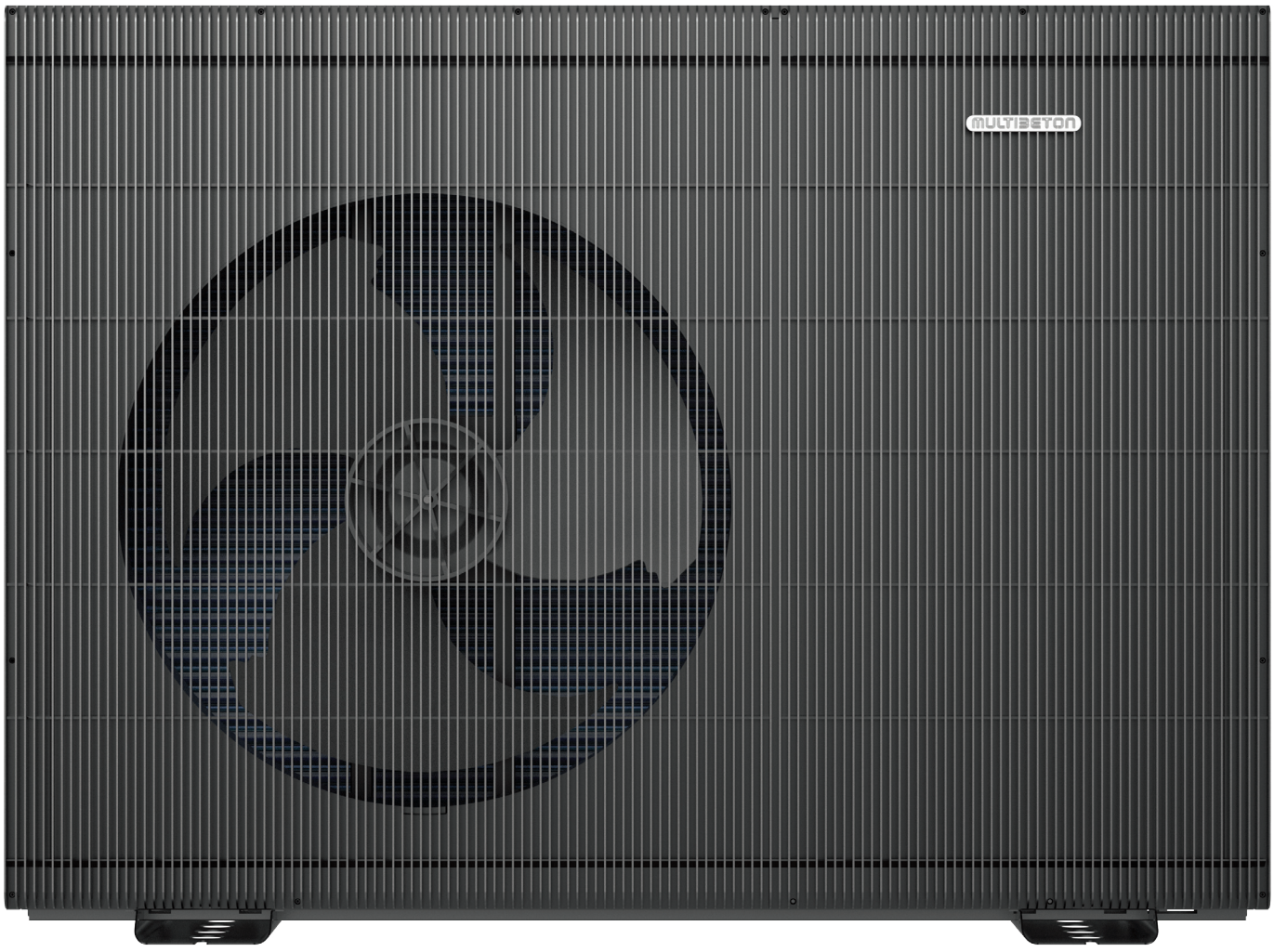
warmondo **Heat pumps**
User and installation manual



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1. Preface

Please read the relevant sections of the installation manual carefully before beginning installation work and observe all basic safety regulations during installation. The qualified personnel responsible for the operation and installation of the refrigerant system must possess the necessary qualifications and certifications.

The Warmondo air-source heat pump using R290 refrigerant has specific safety characteristics. Since propane (R290) is classified as a flammable refrigerant, installation must be carried out strictly in accordance with the instructions in this user manual. MULTIBETON assumes no liability for safety incidents or personal injury resulting from improper or non-compliant installation work.

The following safety symbols are used in this operating manual: Danger, Warning, Caution, Note.

Danger
This symbol indicates an imminent danger which will result in serious or fatal injury if not avoided.

Warning
This symbol indicates a potentially dangerous situation may result in serious injury.

Caution
This symbol indicates a situation that may result in minor or moderate injury.

Note
This symbol indicates important information regarding safe operation or the prevention of damage to the device.

1.1. Key to Symbols

The safety and warning labels attached to the indoor and outdoor units contain important safety information. Please read them carefully and strictly follow the instructions provided.

Warning
This symbol indicates that the unit uses a flammable refrigerant. In the event of a leak and contact with an ignition source, there is an immediate risk of fire or ignition.

Warning
This symbol indicates components or areas where highly flammable substances are used. All ignition sources must be strictly avoided.

Attention
This symbol indicates that the user manual must be read carefully before use. It contains important information on the safe and proper use of the device.

Attention
This symbol indicates that installation and service work must be performed exclusively in accordance with the instructions in the installation manual. It is intended specifically for qualified technical personnel.

Attention
This symbol indicates that additional documents, such as operating or installation instructions, are available. For detailed technical information and safety instructions, please consult these documents.

1.2. Safety Instructions

A. Requirements for authorised and qualified personnel
These instructions are intended exclusively for authorised and appropriately qualified specialised companies, as well as for trained and certified installers.

Danger

Installation of the Warmondo with R290 refrigerant
Installation work on Warmondo heat pumps using the flammable refrigerant R290 (hazard class A3) may only be performed by authorized and qualified refrigeration, air conditioning, and heat pump specialists, as well as by appropriately certified installers. These specialists must have completed recognized training in accordance with EN 378 Part 4 or IEC 60335-2-40, Section HH. Operating and service personnel must possess industry-recognized qualifications and certifications.

Brazing and welding
Brazing or welding work on the refrigerant circuit of R290 Warmondo heat pumps may only be performed by persons certified in accordance with ISO 13585 and AD 2000, Technical Note HP 100R. Such work must be carried out exclusively by qualified and certified refrigeration and air conditioning specialists.

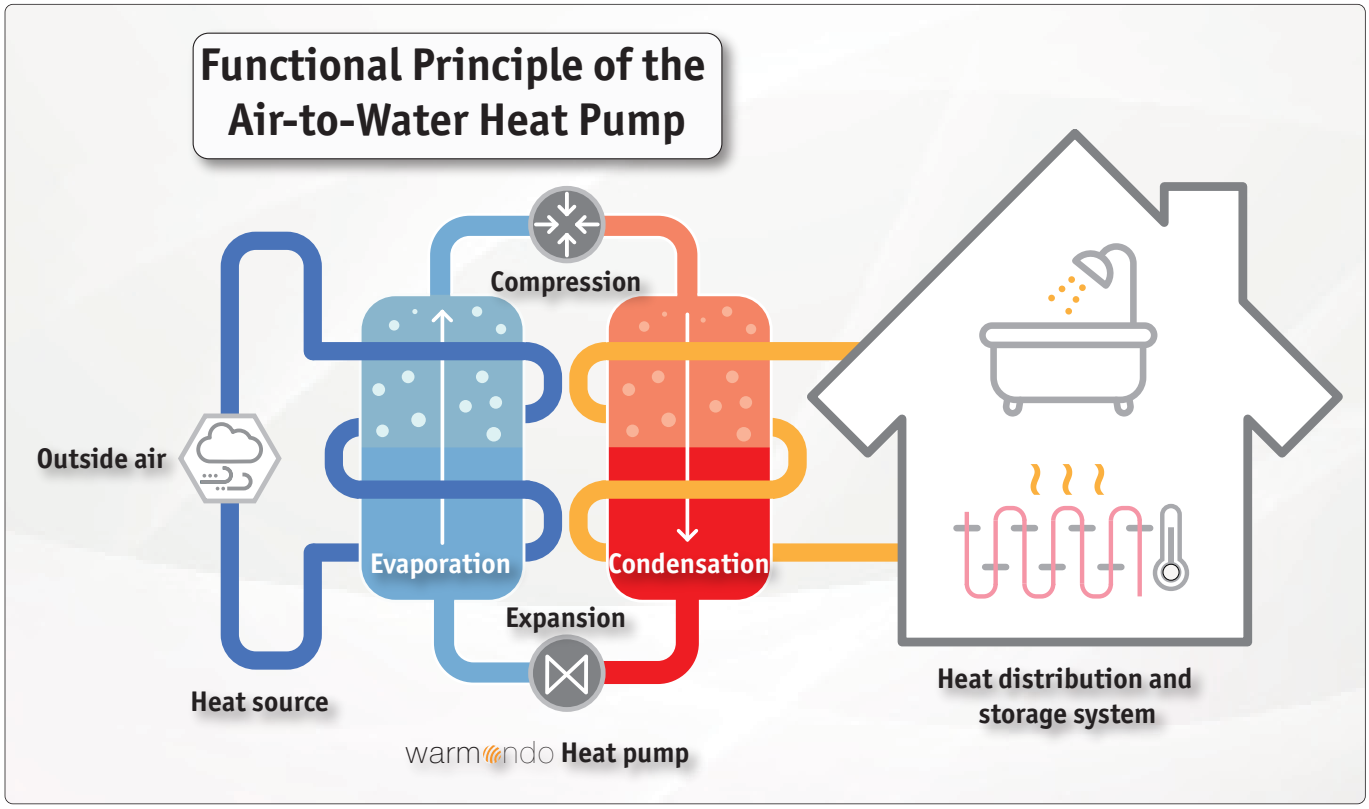
Work on pressure-bearing connections in accordance with the Pressure Equipment Directive (2014/68/EU)
All work must be performed within the scope of the intended applications and in accordance with the prescribed procedures. The requirements of the Pressure Equipment Directive 2014/68/EU apply to welding or brazing work on pressure-bearing connections of the heat pump. The qualified personnel involved and the procedures used must be certified for this purpose by a notified body.

Electrical installation work
The electrical installation - including the mains connection, internal wiring, and other electrical connections - must be performed exclusively by qualified electricians. All work must comply with applicable standards and national regulations.

Testing of safety-related functions and commissioning
Before final commissioning, all safety-related components, connections, and procedures must be inspected by a certified and qualified refrigeration and air conditioning specialist. The fully installed heat pump system may only be commissioned by the installer or by a qualified specialist authorised by the installer.

B. Intended use

Warmondo heat pumps are based on the principle of the reverse Carnot cycle. Through the phase change of the refrigerant, heat is absorbed from the ambient air and used for building heating and domestic hot water supply. The unit is a heat pump integrated as an outdoor unit and is operated in combination with the hydraulic station. This design simplifies installation and reduces the system's maintenance costs. Improper or unintended use can result in serious or fatal injuries as well as significant property damage.



C. Permitted Installation Locations

Warmondo heat pumps are intended exclusively for outdoor installation and may only be used in residential settings.
Installation in the following locations is not permitted:

- Areas with mineral oil mist, oil mist, or oil-containing vapor: This can damage plastic components, which may lead to leaks.
- Environments with corrosive gases (e.g., sulfur-containing gases): Corrosion on copper pipes or weld seams can cause refrigerant leaks.
- Near devices that emit strong electromagnetic waves: Strong electromagnetic interference can impair system control and cause malfunctions.
- Areas where flammable gases may escape or where flammable dust, carbon fibers, or volatile flammable substances (e.g., thinners, petrol) are present: There is an increased risk of fire or explosion.
- Locations with high salt concentrations in the ambient air, e.g., coastal regions.
- Areas with significant voltage fluctuations, as frequently occur in industrial environments.
- In vehicles, means of transport, or ships.
- Areas where acidic or alkaline vapors are present.

D. Guidelines for Intended Use

For proper use, the following guidelines must be strictly followed:

- **Follow the documentation**
  Be sure to carefully follow the device's user manual as well as the manuals for any system components that may be installed.
- **Inspection and Maintenance Requirements**
  All inspection, maintenance, and servicing intervals specified in the manuals, as well as the procedures described therein, must be followed.
- **Installation and Approval**
  Installation, connection, and commissioning must be performed in accordance with the applicable product and system approvals, as well as the specifications described in the documentation.
- **Qualified Personnel**
  Installation, commissioning, testing, maintenance, and troubleshooting must be performed exclusively by authorized, qualified specialists or licensed installers.

⚠ Attention

Prohibited Acts
The following actions are strictly prohibited, as they may result in personal injury or property damage:

- The unit must not be rinsed or sprayed with water or any other liquids.
- No objects or equipment may be placed on the unit (top cover).
- It is prohibited to step on, sit on, or climb on the unit.

E. Applicable Laws and Regulatory Requirements

The following legal and regulatory requirements must be observed during installation, operation, and maintenance:

- National installation regulations and technical codes.
- Legal accident prevention regulations.
- Environmental protection laws and regulations.
- Legal requirements for pressure equipment, in particular the Pressure Equipment Directive 2014/68/EU.
- Recognized rules of technology and industry standards of the relevant professional associations.
- State-specific safety and installation regulations.
- Regulations and guidelines for the operation, service, maintenance, repair, and safety of refrigeration, air conditioning, and heat pump systems using flammable refrigerants.
- Requirements of the respective energy supply company

F. Safety Precautions (R290)

Warmondo heat pumps contain the flammable refrigerant R290 (propane).

- In the event of a leak, escaping refrigerant may accumulate near the ground due to its higher density.
- The refrigerant must not enter building openings, shafts, floor cracks, or sewage pipes.
- Under no circumstances should such accumulation lead to a flammable, suffocating, or otherwise hazardous atmosphere.

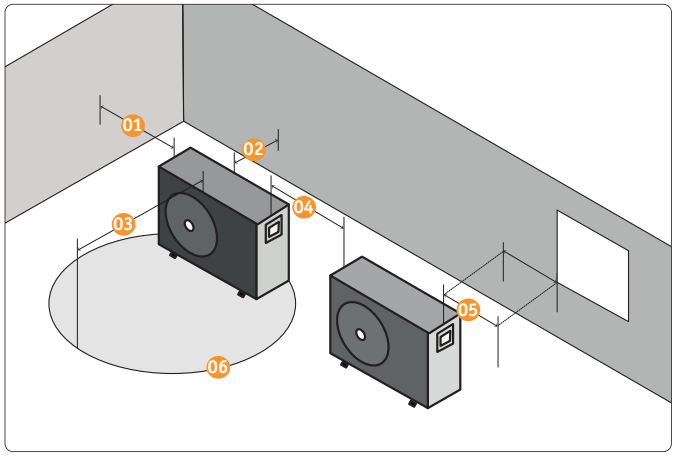
A safety zone is defined in the immediate vicinity of the outdoor unit. When working on the unit, the specific regulations for this zone must be strictly observed (see section "Safety Zone").

G. Safety Zone/Requirements for the Safe Work Area

Danger

To prevent fire and explosion hazards, the following requirements must be observed in the safety zone:

- The zone must be free of ignition sources, including open flames, hot surfaces, electrical switches, outlets, lamps, and portable devices with rechargeable batteries (e.g., smartphones, smartwatches).
- No sprays, aerosols, or other flammable gases may be used in the safety zone.
- No building openings (windows, doors, light wells, ventilation openings, basement entrances, drainage pipes) may be located within the safety zone.
- The safety zone must not extend into public traffic areas or adjacent buildings.
- All potential ignition sources in the area must be consistently removed or deactivated.



The minimum distances are:

01 ≥ 600 mm
02 ≥ 300 mm
03 ≥ 1,000 mm
04 ≥ 600 mm
05 ≥ 1,000 mm
06 Safety zone

H. Work on the R290 refrigerant system

Warning

- All work that requires opening the refrigerant circuit must be performed exclusively by qualified technicians who have demonstrated knowledge of the specific properties and risks of R290.
- Before beginning any work on R290 systems, appropriate safety checks must be performed to minimize fire risks.

J. Safety precautions prior to repair and maintenance work

Work Planning

- Work must be performed in accordance with controlled, standardized procedures to minimize the risk of flammable vapors or gases.
- All personnel involved must be informed of the nature and scope of the work.
- Work in confined or poorly ventilated areas must be avoided. The work area must be cordoned off and secured.
- Flammable materials must be removed from the work area or kept under control.

Leak Detection and Atmospheric Monitoring

- Before and during work, the area must be monitored using appropriate refrigerant leak detectors.
- For R290, the detector does not need to be spark-proof, explosion-proof (ATEX), or intrinsically safe.
- The device must be calibrated to ≤ 25 % of the lower explosive limit (LEL).
- Before working on open systems, ensure that there are no leaks.

Control of ignition sources

- All ignition sources must be avoided, including open flames, hot surfaces > 360 °C, sparks, static discharges, and unsuitable power tools.
- “No Smoking” signs must be posted.
- During installation, repair, disassembly, or transport, ensure that no ignition sources are present in the vicinity.

Ventilation

- Before work begins, the area must be opened up or adequately ventilated.
- Continuous ventilation must be maintained throughout the work to safely vent any escaping refrigerant.

Electrical components

- Use only components that are suitable for the intended application and comply with the manufacturer’s specifications.
- The housings of electrical components must not be damaged or modified.
- Cables and wires must be inspected for wear, corrosion, vibration, or sharp edges.
- Only intrinsically safe equipment may be used when performing repairs on live circuits.
- No inductive or capacitive loads that exceed the permissible voltage or current may be applied to electrical circuits.

Permitted tools and equipment for work on R290 Warmondo heat pumps

⚠ **Attention**
Permitted tools and equipment

Only tools and equipment that comply with applicable standards and regulations and are suitable for use in potentially explosive atmospheres may be used when working in the safe working area.

This includes, in particular:
· Brushless tools (e.g., cordless screwdrivers and assembly tools)
· Extraction systems and vacuum pumps approved for flammable refrigerants
· Conductive or dissipative hoses
· Spark-free or non-sparking tools

The equipment used must be suitable for refrigerants in safety classes A2L/A3 and must be inspected regularly for operating pressure and condition.

⚠ **Attention**
Operating Conditions and Additional Precautions

· Electrical equipment must comply with the requirements for use in potentially explosive atmospheres.
· No flammable substances (e.g., sprays, aerosols, solvents) may be used in the work area.
· It must be ensured that static electricity is safely dissipated from personnel and equipment before and during all work.

⚠ **Attention**

· Safety devices must not be removed, blocked, or bypassed.
· Do not make any changes to the outdoor unit or its surroundings:
  a. Do not modify the intake or exhaust ducts
  b. Do not alter electrical wiring or connections
  c. Do not remove any components, housings, or seals

Leak detection in systems using flammable refrigerants (R290)
The following guidelines apply to leak detection for Warmondo heat pumps using R290:
· Electronic leak detectors must be used that are approved for flammable refrigerants (A2L/A3) and do not pose a potential ignition source.
· The detection device must be calibrated in a refrigerant-free area and set to ≤ 25 % of the lower explosive limit (LEL).
· Chlorinated leak detection agents must not be used, as they react with the refrigerant and can cause corrosion.
· If a leak is suspected, remove or extinguish any open flames or other ignition sources.
· If soldering is required for a repair, the entire refrigerant system or the affected section of the circuit must be completely evacuated and isolated.
· Oxygen-free nitrogen (OFN) must be used for purging during all soldering work.

K. Inspection of systems using flammable refrigerants

The following points must be checked:
· Refrigerant charge must meet system or room size requirements.
· Ventilation systems must function properly and must not be blocked.
· In indirect systems, the secondary circuit must be checked for refrigerant.
· Labels and nameplates must be clearly visible and legible.· Refrigerant lines and components must be installed in such a way that there is no risk of corrosion.
· Electrical components must undergo an initial inspection/safety check; if safety-related defects are found, the unit must not be energised.
· Temporary measures are only permitted if the operator has been informed.

L. Initial inspection before work begins

The initial inspection must include at least the following:
· Safely discharging capacitors to prevent sparks.
· No exposed, moving electrical parts during filling, cleaning, or recovery.
· All components must be continuously grounded.
· All electrical connections must be disconnected before removing covers.
· If the device must remain energized: continuous leakage monitoring at critical points.
· Seals, cable glands, and housing bushings must be inspected for integrity.
· Only manufacturer-specified spare parts may be used.

M. Opening the refrigerant circuit

· When opening the circuit, standard industry procedures must be followed.
· Proper installation practices must be strictly adhered to, especially when using R290.

N. Procedures related to the flammability of the refrigerant (R290)

Removing the refrigerant

The refrigerant must be transferred to suitable, approved recovery cylinders.

Flushing the System

If the Warmondo heat pump's compressor is defective or there is a leak in the system, moisture or metal particles can accumulate in the piping and various components of the cooling system. To ensure the system operates smoothly, it is necessary to flush the system. Flushing a line with nitrogen is the most cost-effective and simplest method, unlike flushing with refrigerant or chemical cleaners.

Additional Precautions

- The vacuum pump outlet must not be located near any ignition source.
- Mixing different refrigerants must be strictly avoided.
- Hoses should be kept as short as possible to minimize residual quantities.

Pressure Test

Before refilling the system, a pressure test must be performed in accordance with applicable regulations.

P. Decommissioning and Recovery of R290 from Warmondo Heat Pumps

Preparation

Warning

- The Warmondo heat pump must be disconnected from the power supply and secured against accidental reconnection.
- Mechanical handling equipment (e.g., lifting devices for cylinders, etc.) must be available.
- Personal protective equipment must be used.
- Recovery equipment and cylinders must comply with relevant standards and be approved for flammable refrigerants (A3).

Recovery of the refrigerant

- The system must be evacuated as completely as possible. If this is not possible, multi-point extraction must be performed from various areas of the system.
- The recovery cylinder must be placed on a calibrated scale before starting.
- Cylinders must not exceed 80% capacity.
- The permissible operating pressures of the cylinder must not be exceeded.
- After proper filling, cylinders and recovery equipment must be removed from the work site, and all shut-off valves on the equipment must be closed.
- Recovered refrigerant must not be introduced into other systems without cleaning and analysis.

Care of the Compressor and Oil

- When removing compressors or compressor oil, the component must first be evacuated as much as possible to remove any R290 residue.
- The compressor may only be warmed using an electric heater (no open flames).
- Oil must be disposed of safely and in accordance with regulations.

Labeling and Status

- The unit must be marked as "Out of Service."
- A clearly visible label must be affixed stating: "Contains flammable refrigerant (R290)"
- The date and name of the responsible technician must be documented.

Disposal of equipment containing flammable refrigerants

- Warmondo heat pumps containing R290 must be disposed of properly in accordance with local disposal and waste regulations.
- Electrical appliances must not be disposed of with unsorted household waste.
- Appropriate collection points or take-back systems must be used.
- Improper disposal can lead to the release of hazardous substances that harm the environment and human health.· Recovered refrigerant must be returned to the refrigerant supplier in approved recovery cylinders.
- Cylinders must not be mixed with different refrigerants.

1.3. Declaration of Conformity

MULTIBETON hereby declares, under its sole responsibility, that the Warmondo WM-S, WM-M, WM-L, and WM-XL products comply with European and national requirements in terms of design and performance.

CE The CE marking certifies that the product complies with all applicable EU legislation that requires the affixing of this marking.

Warmondo heat pumps continue to comply with the provisions of the following EU directives:

- 2006/42/EC, Machinery Directive on safety
- 2009/125/EC, Ecodesign Directive on the eco-design of energy-related products
- 2014/35/EU, Low Voltage Directive (electrical equipment)
- 2014/30/EU, EMC Directive (Electromagnetic Compatibility)
- 2011/65/EU, RoHS Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment

The following harmonized standards were applied:

- EN 60335-1: Safety of household and similar electrical appliances – Part 1: General requirements
- EN 60335-2-40: Safety of household and similar electrical appliances – Part 2-40: Particular requirements for electrically operated heat pumps, air conditioners, and room dehumidifiers
- EN 62233: Methods for measuring electromagnetic fields from household appliances and similar electrical equipment with regard to the safety of persons in electromagnetic fields
- EN IEC 55014-1: Electromagnetic compatibility – Requirements for household appliances, power tools, and similar electrical appliances – Part 1: Emission
- EN IEC 55014-2: Electromagnetic compatibility – Requirements for household appliances, power tools, and similar electrical appliances – Part 2: Immunity – Product family standard
- EN IEC 61000-3-2: Electromagnetic compatibility – Part 3-2: Limits – Limits for harmonic currents (equipment input current ≤ 16 A per conductor)
- EN 61000-3-3: Electromagnetic compatibility – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations, and flicker in public low-voltage supply systems for equipment with a rated current ≤ 16 A per conductor not subject to special connection conditions
- EN IEC 61000-3-11: Electromagnetic compatibility – Part 3-11: Limits – Limitation of voltage changes, voltage fluctuations, and flicker in public low-voltage supply systems for equipment with a rated current ≤ 75 A per conductor subject to special connection conditions
- EN 61000-3-12: Electromagnetic compatibility – Part 3-12: Limits – Limits for harmonic currents caused by equipment and installations with an input current > 16 A and ≤ 75 A per conductor intended for connection to public low-voltage networks
- EN ISO 12100: Safety of machinery – General principles for design – Risk assessment and risk reduction
- EN 60204-1: Safety of machinery – Electrical equipment of machines — Part 1: General requirements
- EN 378-2: Refrigerating systems and heat pumps — Safety and environmental requirements — Part 2: Design, manufacture, testing, marking, and documentation
- EN 300328 V2.2.2: Broadband transmission systems – Data transmission equipment for operation in the 2.4 GHz band – Harmonized standard for the use of radio frequencies
- EN 301489-1 V2.2.3: Electromagnetic compatibility – Standard for radio equipment and services – Part 1: Common technical requirements – Harmonized standard for electromagnetic compatibility

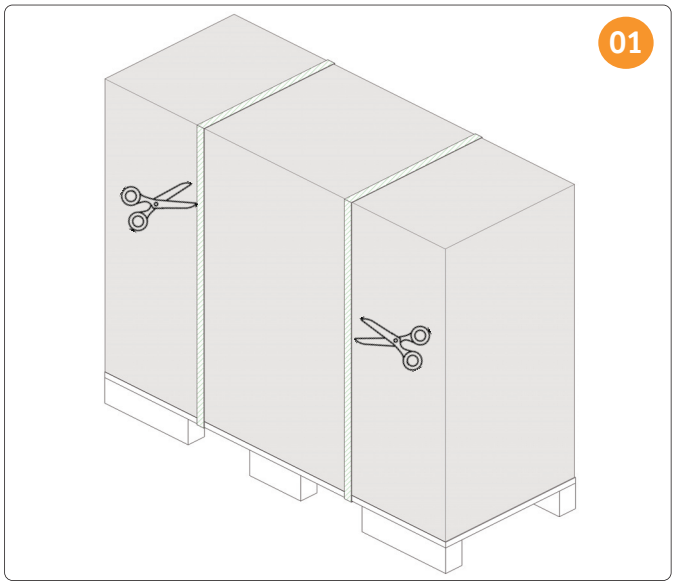
- EN 301489-17 V3.2.4: Electromagnetic compatibility – Standard for radio equipment and services – Part 17: Specific conditions for broadband data transmission systems – Harmonized standard for electromagnetic compatibility
- EN IEC 62311: Evaluation of electrical and electronic equipment with respect to limits for human exposure to electromagnetic fields (0 Hz to 300 GHz)

The following other technical standards and test specifications were applied:

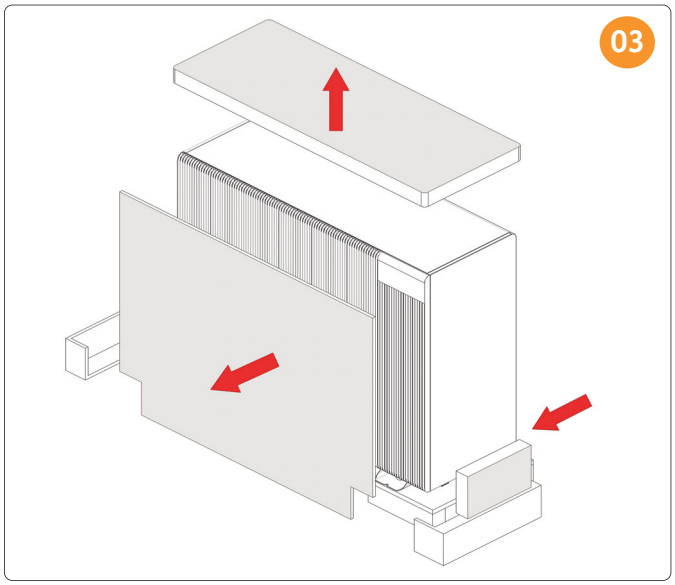
- EN 14825: Air conditioners, chillers, and heat pumps with electrically driven compressors for space heating and cooling, commercial refrigeration, and process cooling—Testing and performance evaluation under part-load conditions and calculation of the seasonal performance factor
- EN 14511-3: Air conditioners, liquid chillers, and heat pumps for space heating and cooling, and process chillers with electrically driven compressors – Part 3: Test methods
- EN 12102-1: Air conditioners, liquid chillers, heat pumps, process chillers, and dehumidifiers with electrically driven compressors – Determination of sound power level – Part 1: Air conditioners, liquid chillers, heat pumps for space heating and cooling, dehumidifiers, and process chillers
- EN 14511-4: Air conditioners, liquid chillers, and heat pumps for space heating and cooling, and process chillers with electrically driven compressors — Part 4: Requirements
- EUV 813/2013: Commission Regulation (EU) No. 813/2013 of August 2, 2013, implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to the establishment of ecodesign requirements for space heaters and combination heaters
- EUV 2016/2282: Commission Regulation (EU) 2016/2282 of November 30, 2016, amending Regulations (EC) No 1275/2008, (EC) No 107/2009, (EC) No 278/2009, (EC) No 640/2009, (EC) No 641/2009, (EC) No 642/2009, (EC) No 643/2009, (EU) No 1015/2010, (EU) No. 1016/2010, (EU) No. 327/2011, (EU) No. 206/2012, (EU) No. 547/2012, (EU) No. 932/2012, (EU) No. 617/2013, (EU) No. 666/2013, (EU) No. 813/2013, (EU) No. 814/2013, (EU) No. 66/2014, (EU) No. 548/2014, (EU) No. 1253/2014, (EU) 2015/1095, (EU) 2015/1185, (EU) 2015/1188, (EU) 2015/1189, and (EU) 2016/2281 regarding the application of tolerances in testing procedures

2. General Information

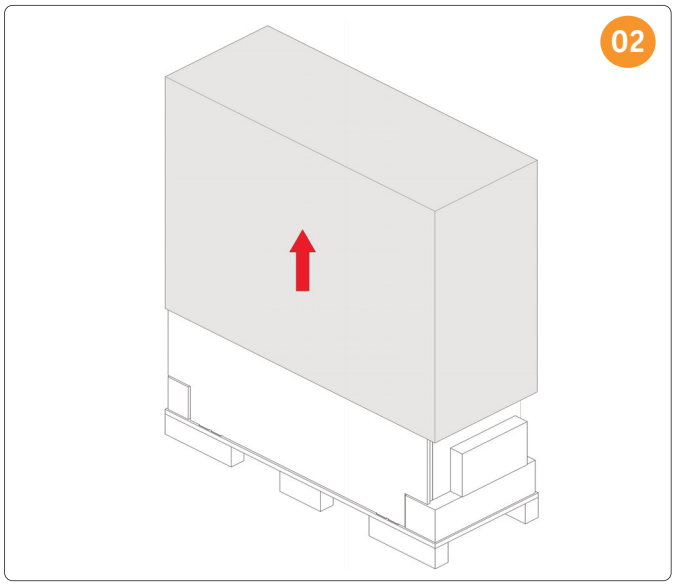
2.1. Unpacking



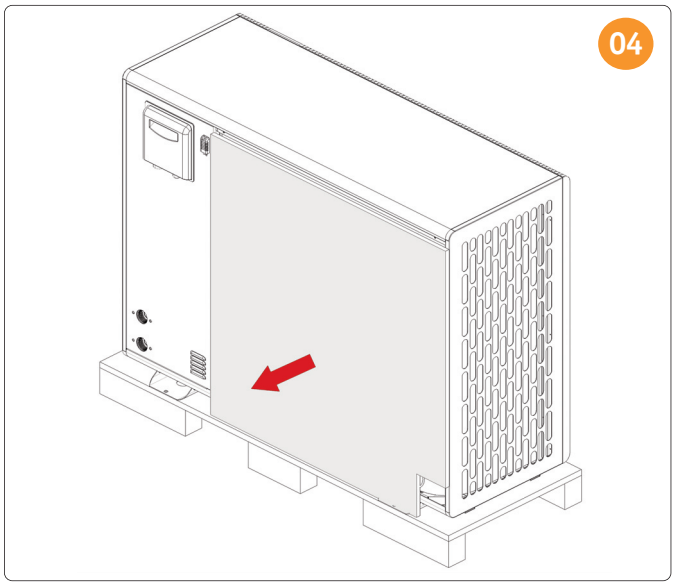
Check the packaging for any external damage. Then use a suitable tool to loosen the straps.



Remove the protective cardboard from the top and front of the device.



Lift the outer carton straight up using the handles on the sides.



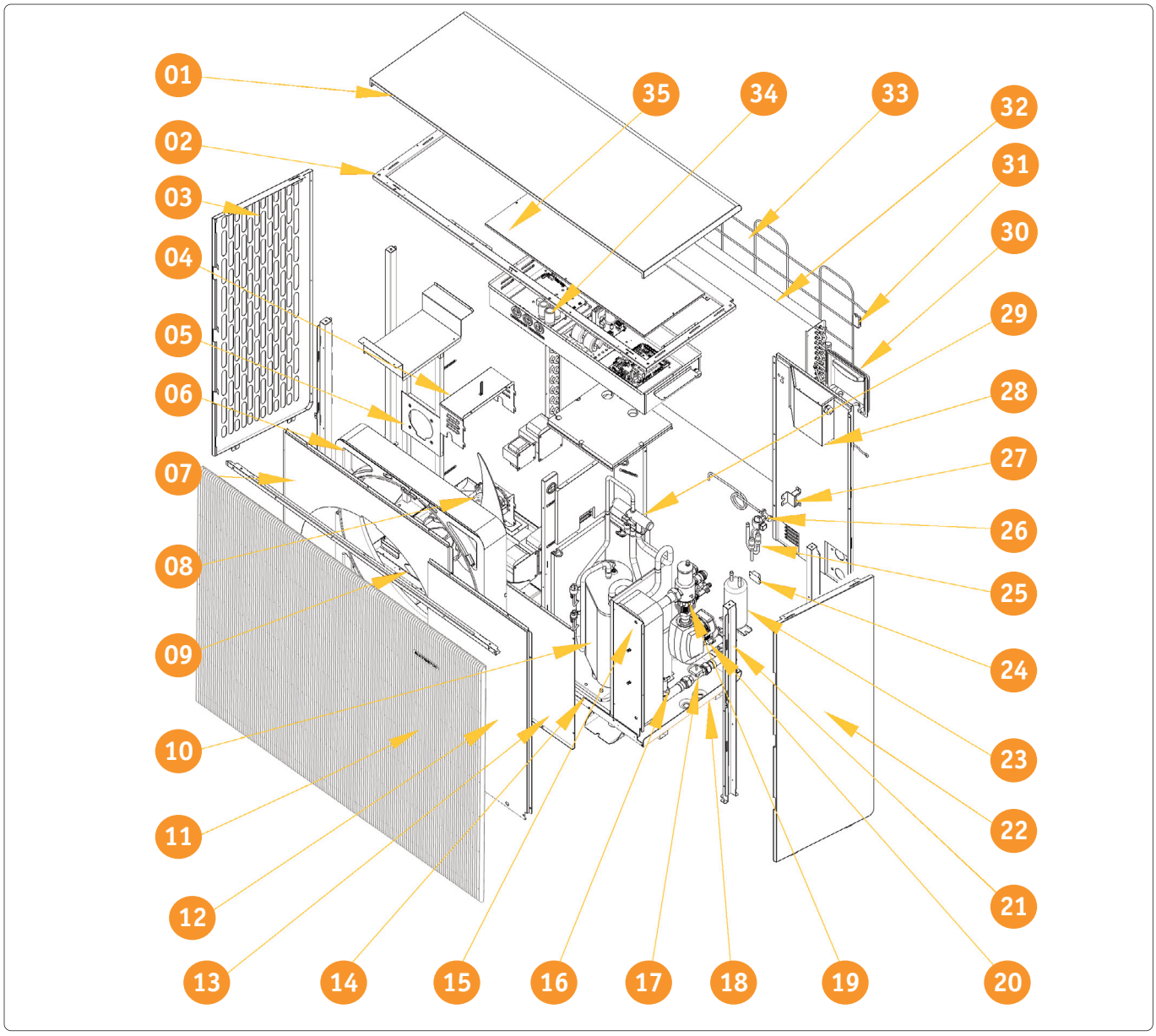
Next, remove the remaining protective cardboard from the back.

Note:
Applies to the entire Warmondo series.

2.2. Scope of Delivery

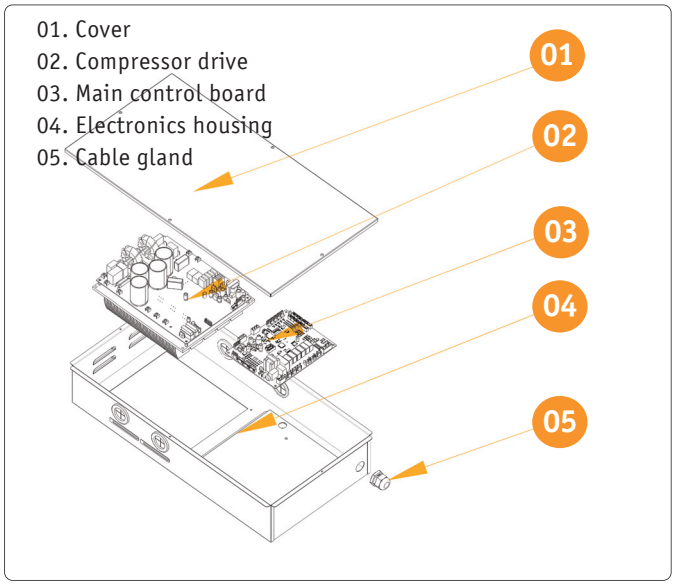
Installation manual, energy label, vibration dampers, drain flange, carrying strap;

2.3. Components of the outdoor unit

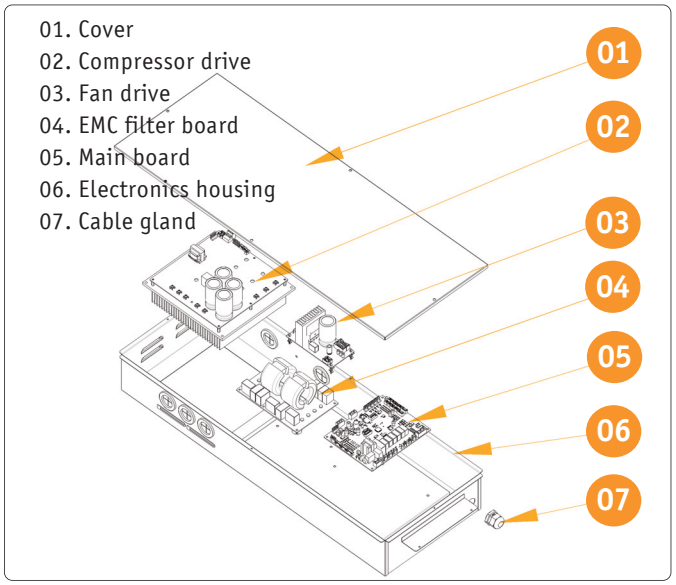


01 Top cover
02 Top of the frame
03 Left side panel
04 Protection
05 Fan bracket
06 Air deflector
07 Front cover
08 Fan motor
09 Fan rotor
10 Compressor
11 Safety gate
12 Front cover
13 Frame
14 Compressor base
15 Heat exchanger
16 Flow switch
17 Flow meter
18 Frame
19 Filter separator
20 Circulation pump
21 Side rail
22 Right cover
23 Vessel
24 Refrigerant leak sensor
25 Throttle valve
26 Shut-off valve
27 Mounting bracket
28 Electrical junction box
29 4-way valve
30 Handle
31 Outdoor sensor
32 Evaporator
33 Protective grille
34 Power electronics module
35 Cover

2.4. Power Electronics Components

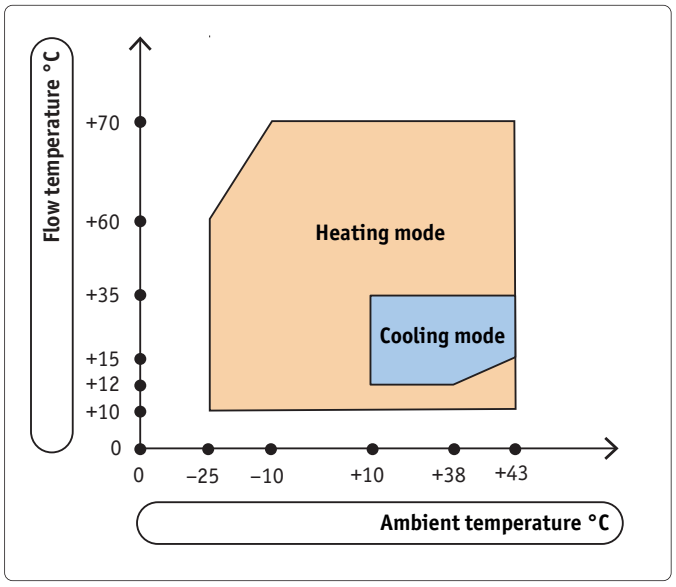


Single-phase (WM-S, WM-M)

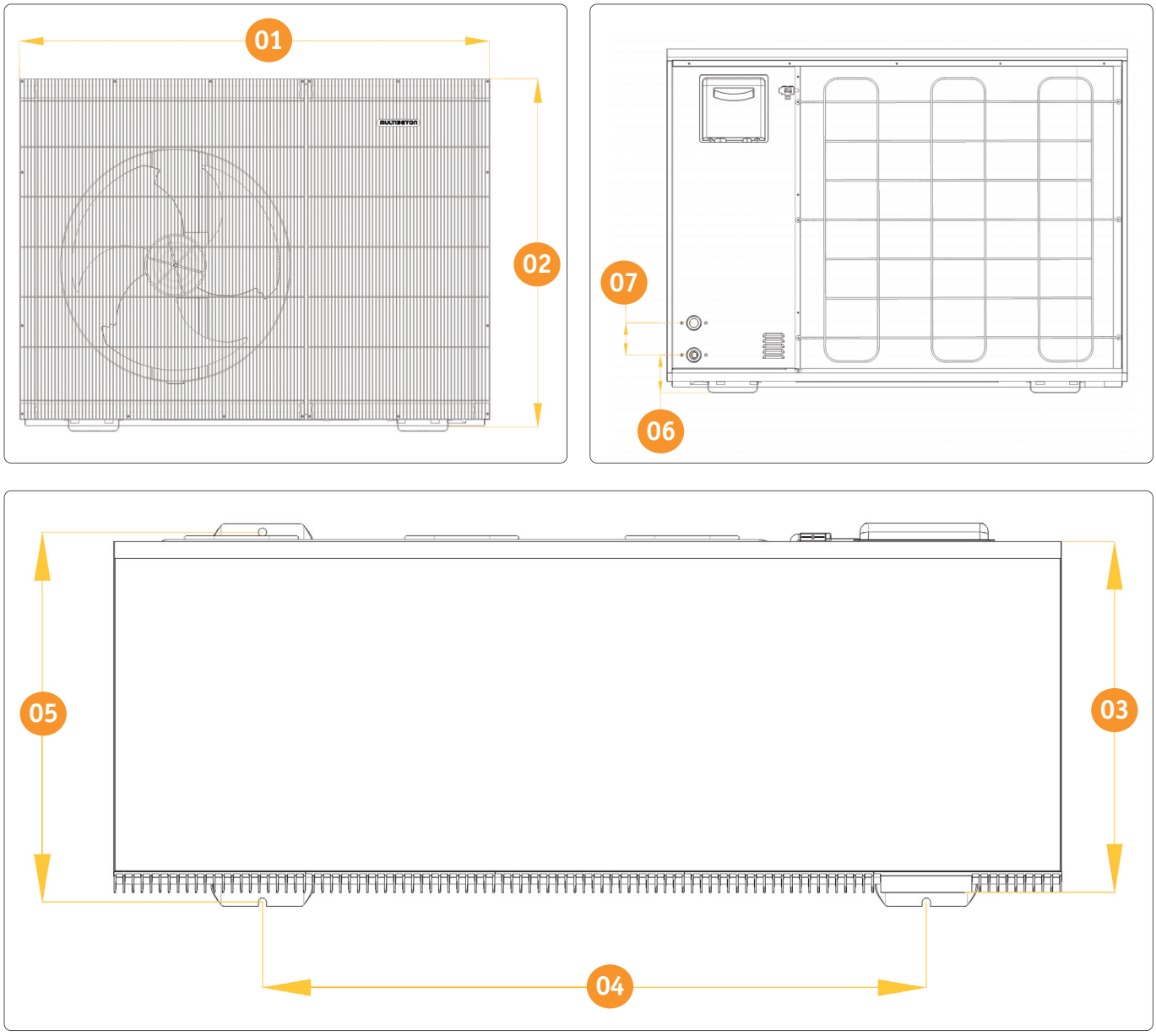


Three-phase (WM-L, WM-XL)

2.5. Operating Areas



2.6. Transport



2.6.1. Dimensions

Model	01	02	03	04	05	06	07
WM-S	1,102 mm	1,021 mm	557 mm	706 mm	537 mm	112 mm	95 mm
WM-M	1,102 mm	1,021 mm	557 mm	706 mm	537 mm	112 mm	95 mm
WM-L	1,377 mm	1,021 mm	557 mm	964 mm	537 mm	112 mm	95 mm
WM-XL	1,377 mm	1,021 mm	557 mm	964 mm	537 mm	112 mm	95 mm

2.6.2. Transport

Warning

Warmondo heat pumps are heavy. When handling them, it is essential to observe the weight specifications and to perform the work in accordance with your own physical capacity and in compliance with safety regulations.

For manual transport, it is recommended that 2 to 4 people be involved and that suitable transport aids (e.g., lifting straps of sufficient strength) be used.

- The heat pump must only be transported in an upright position. Transport in a sideways or inverted position is strictly prohibited.
- Before transport, check the weight distribution of the unit. The compressor is located on the right side of the unit, making this side heavier. Selecting the appropriate center of gravity contributes significantly to transport safety.
- During transport, the unit's tilt angle must not exceed 30°.
- After transport is complete, all securing and transport straps must be completely removed.

2.6.3. Lifting the Outdoor Unit

1. A detailed lifting and transport plan must be prepared in advance for the unit. This plan must include, among other things, the expected delivery date, the dimensions and weight of the unit, the planned transport route, any required access openings, and the lifting and transport equipment to be used.
2. Special care must be taken when lifting and transporting the unit. A sufficient safety distance must be maintained at all times to prevent injury to persons.
3. The unit's own weight must be taken into account during all lifting operations. To prevent damage to the housing or panels, suitable lifting straps with load distributors (e.g., spreader bars) must be used. The unit must be kept as stable as possible both horizontally and vertically. Tilting the unit beyond an angle of 30° is not permitted.
4. During lifting and transport, the unit must be protected against scratches, deformation, and localized stress. Suitable protective pads or edge protectors must be used at all contact points between the lifting strap and the unit.

Warning

During the lifting operation, no one is allowed to stand under the lifted load or work underneath it.

2.7. Indoor Units

Warmondo heat pumps are designed as split hydraulic modules and require connection to the external WM-HDS hydraulic station for proper operation. The heat pump is responsible solely for providing thermodynamic power; all control and hydraulic functions are handled by the connected indoor units.

The following compatible indoor unit is available for the Warmondo heat pump: WM-HDS. The hydraulic station is equipped with a touch controller, additional flow control components, a 3-way valve and sensors.
The hydraulic station allows for direct connection to the heating system and optimizes the hydraulic balancing of the entire system. Its modular design enables high installation flexibility, reduced installation effort, and system-optimized flow control.

Note

For more details on the hydraulic station, refer to the "Hydraulic Station Operating Instructions."

2.8. Installation Site Requirements

The outdoor unit's refrigerant circuit contains the flammable refrigerant R290 and is classified as Safety Group A3 in accordance with ISO 817 and ANSI/ASHRAE 34. Therefore, a safety zone is defined in the immediate vicinity of the outdoor unit, within which special requirements apply. Since the refrigerant is heavier than air, it may accumulate near ground level in the event of a leak. None of the following items or equipment may be located within the safety zone:

a. Openings and fixtures near the building
   - Windows, doors, light wells, skylights, or other building openings
   - Inlet and exhaust vents for ventilation or air conditioners
   - Pump chambers, floor drains, sewer inlets, drainage pipes or sewer manholes
   - Depressions, ditches, channels, or similar land subsidence

b. Boundaries and public areas
   - Property boundaries and adjacent properties
   - Sidewalks, driveways, and public traffic areas

c. Electrical installations/potential ignition sources
- Electrical systems, outlets, lights, lighting fixtures, switches
- Electrical outlets in the utility or equipment room
- Tools or devices that can produce sparks
- Electrical equipment for which a source of ignition cannot be ruled out
- Mobile devices with built-in batteries (e.g., cell phones, smartwatches, etc.)
- Hot surfaces with temperatures exceeding 360 °C

d. Open flames and other sources of ignition
- Open flames, burners, heating units
- Cooking facilities or other heat sources
- All other potential ignition sources within the safety zones

3. Installation Instructions

3.1. Requirements

The following equipment and materials are required for installing the heat pump:

- A power supply cable suitable for the unit's power consumption, installed in accordance with applicable electrical installation regulations.
- Use appropriate and approved power tools.
- Suitable anchors and screws to securely fasten the unit to the designated mounting bracket or foundation plate.
- It is recommended to decouple the unit from the piping system to prevent the transmission of vibrations.
- Suitable lifting equipment may be used to lift and position the heat pump.

3.2. System Design

The following technical requirements must be observed for the hydraulic integration of the heat pump:

a. Hydraulic Integration
The heat pump must be integrated into the primary circuit in accordance with the heating system specifications. Piping must be installed without tension and in accordance with standard installation codes.

b. Vibration Isolation
A flexible connection must be provided between the unit and the circulating water line to minimize the transmission of vibrations to the piping network.

c. Shut-off Valves
Shut-off valves must be installed at the water inlet and outlet of the heat pump. These must be closed during the pressure test of the heating circuit and then reopened afterward.

d. Filter and protection components
- A Y-strainer (60 mesh) must be installed at the heat pump inlet.
- It is recommended to also install a sludge separator and a microbubble separator to prevent long-term system malfunctions.
- The filter must be cleaned after installation; further cleanings are to be performed as part of routine maintenance.

e. Pressure testing
A leak and pressure test in accordance with EN 14336 must be performed prior to commissioning. All connections must be checked for leaks and corrected if necessary.

f. Flushing and Initial Filling
The piping system must be thoroughly flushed before filling to remove dirt and installation debris. The system must then be properly filled and completely vented.

g. Water Quality
The water quality must comply with the requirements of VDI 2035. Hardness, conductivity, and pH must be checked regularly to prevent corrosion and scale buildup.

h. Frost protection
In regions where there is a risk of frost, a suitable antifreeze agent (glycol) must be used. The concentration must be set according to the manufacturer's instructions and checked regularly.

i. Safety Group
A suitable safety valve and expansion tank must be installed in the system in accordance with EN 12828. The safety valve should be located outside near the outdoor unit; if it is located indoors, a discharge line must be routed to the outside.

j. Hydraulic balancing
To ensure efficient and trouble-free operation, the heating system must be hydraulically balanced.

k. Functional test
Once installation is complete, all components must be tested to ensure they are functioning properly. The heat pump may only be put into operation after a successful test.

3.3. Installation Site

When selecting a location for the heat pump, the following requirements must be taken into account:

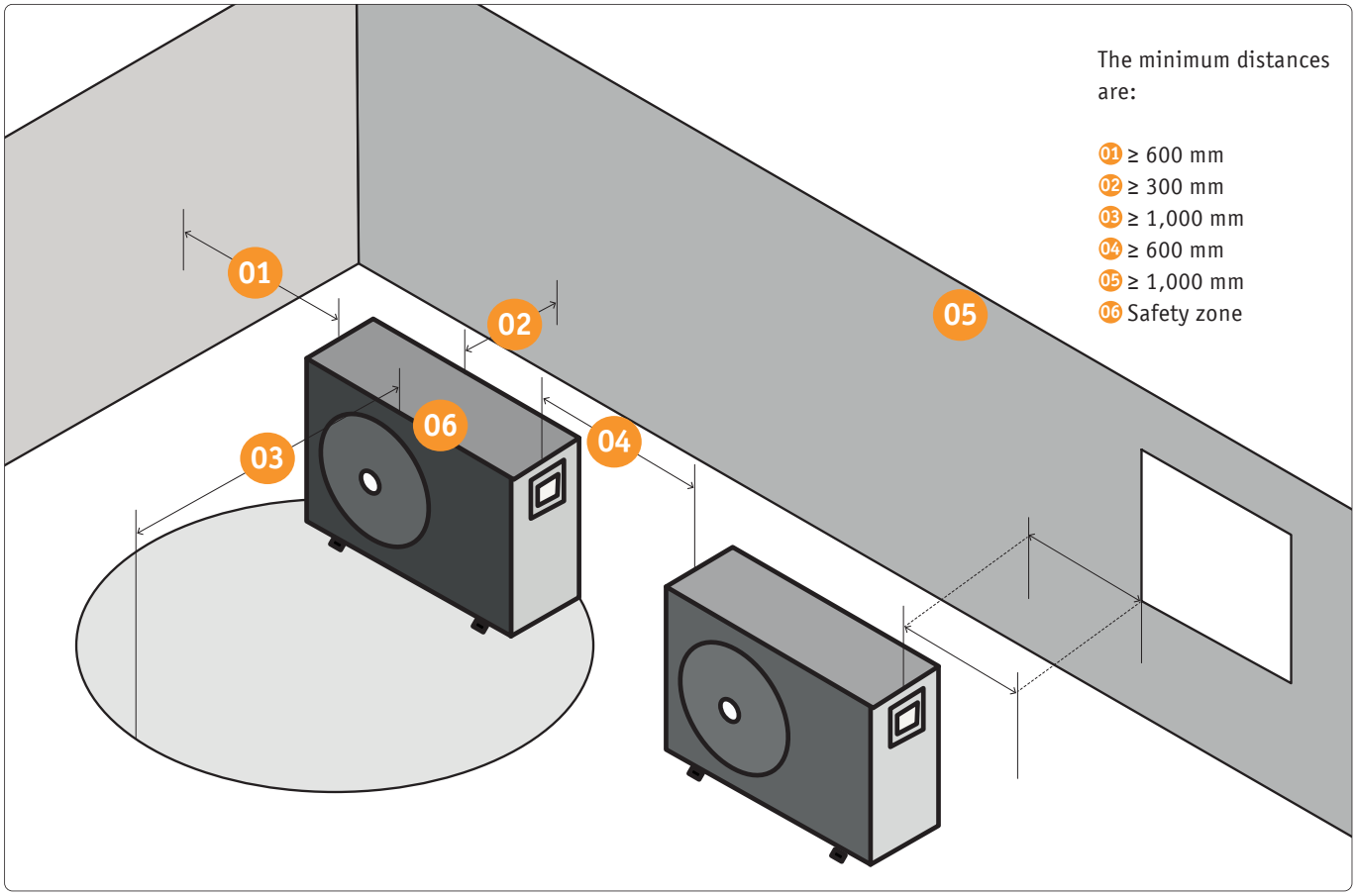
- The installation site must be easily accessible to ensure safe operation, maintenance, and service work.
- The heat pump must be installed on the ground, preferably on a level concrete foundation slab. The ground must be sufficiently load-bearing and capable of supporting the weight of the unit permanently.
- A suitable drainage system must be available in the immediate vicinity of the unit to ensure that condensate can be safely drained away.
- If necessary, the unit can be raised to the required level using suitable mounting or anti-vibration pads.
- Ensure that adequate air circulation is maintained, that the air outlet is not directed toward adjacent windows or doors, and that there is no risk of recirculation of exhaust air. In addition, sufficient space must be provided for maintenance and servicing.
- The unit must not be installed in areas with oil vapors, flammable gases, corrosive substances, sulfur compounds, or near equipment that generates magnetic fields.
- To prevent contamination of the unit, installation should not take place immediately adjacent to roads or heavily trafficked paths.
- To reduce potential noise pollution, the heat pump should be installed in a location that is not sensitive to noise and ensures sufficient distance from neighboring buildings.
- The heat pump should be installed out of the reach of children.
- The heat pump should be installed in accordance with the clearance distances specified in applicable building codes.

Installation spacing requirements

The heat pump must be installed in a location with adequate air circulation, away from heat radiation or other heat sources. The air outlet of one unit must not be directed toward or against the air inlet of another outdoor unit.

Installing two units one above the other is not permitted. Condensate from the upper unit drains through the chassis and may drip onto the unit installed below, which can lead to ice formation and malfunctions, particularly at low temperatures.

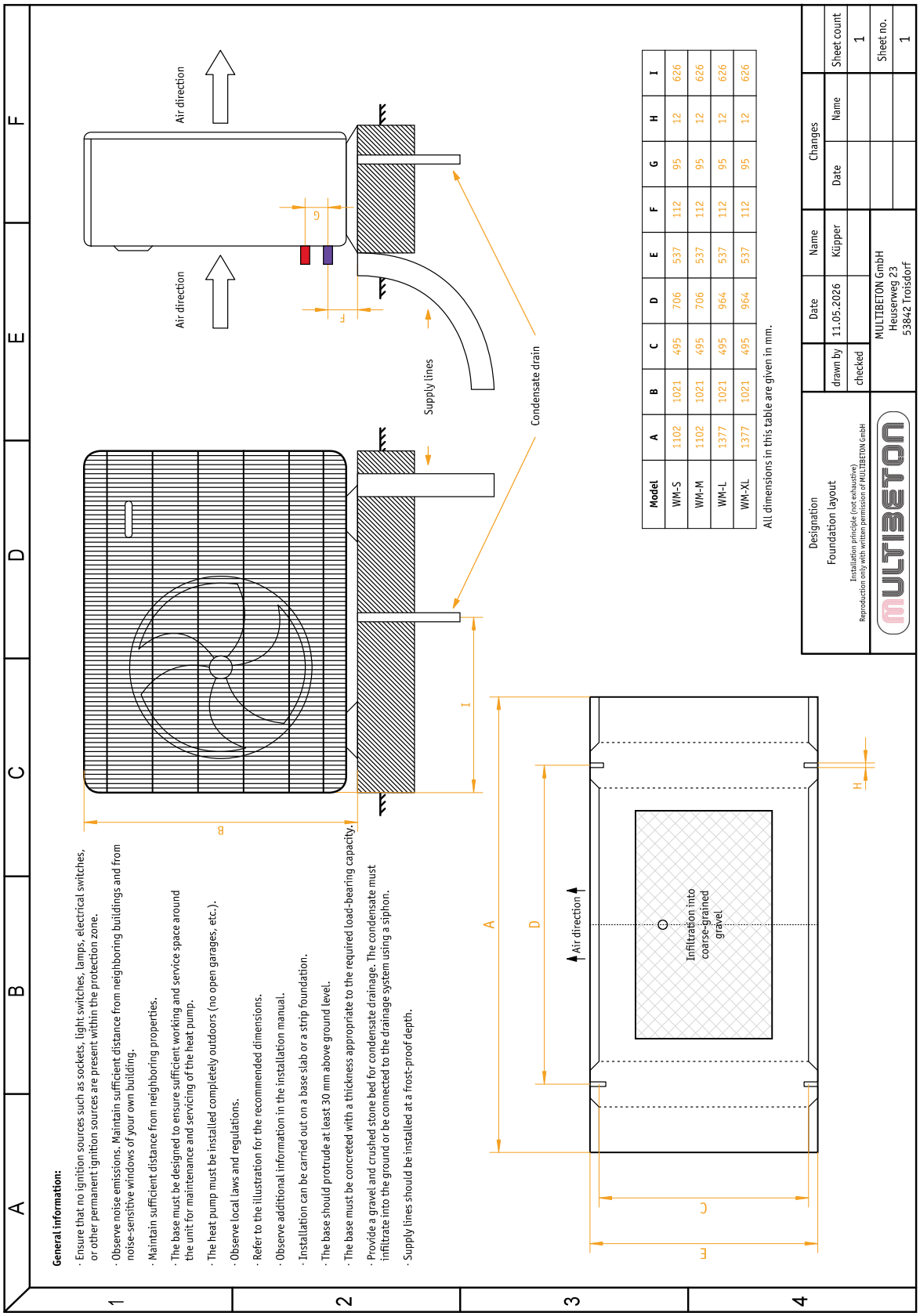
Suitable snow protection devices must be installed in regions with heavy snowfall. To prevent snow-related impairments, the unit must be installed on a raised platform and additionally equipped with snow guards at both the air inlet and air outlet.



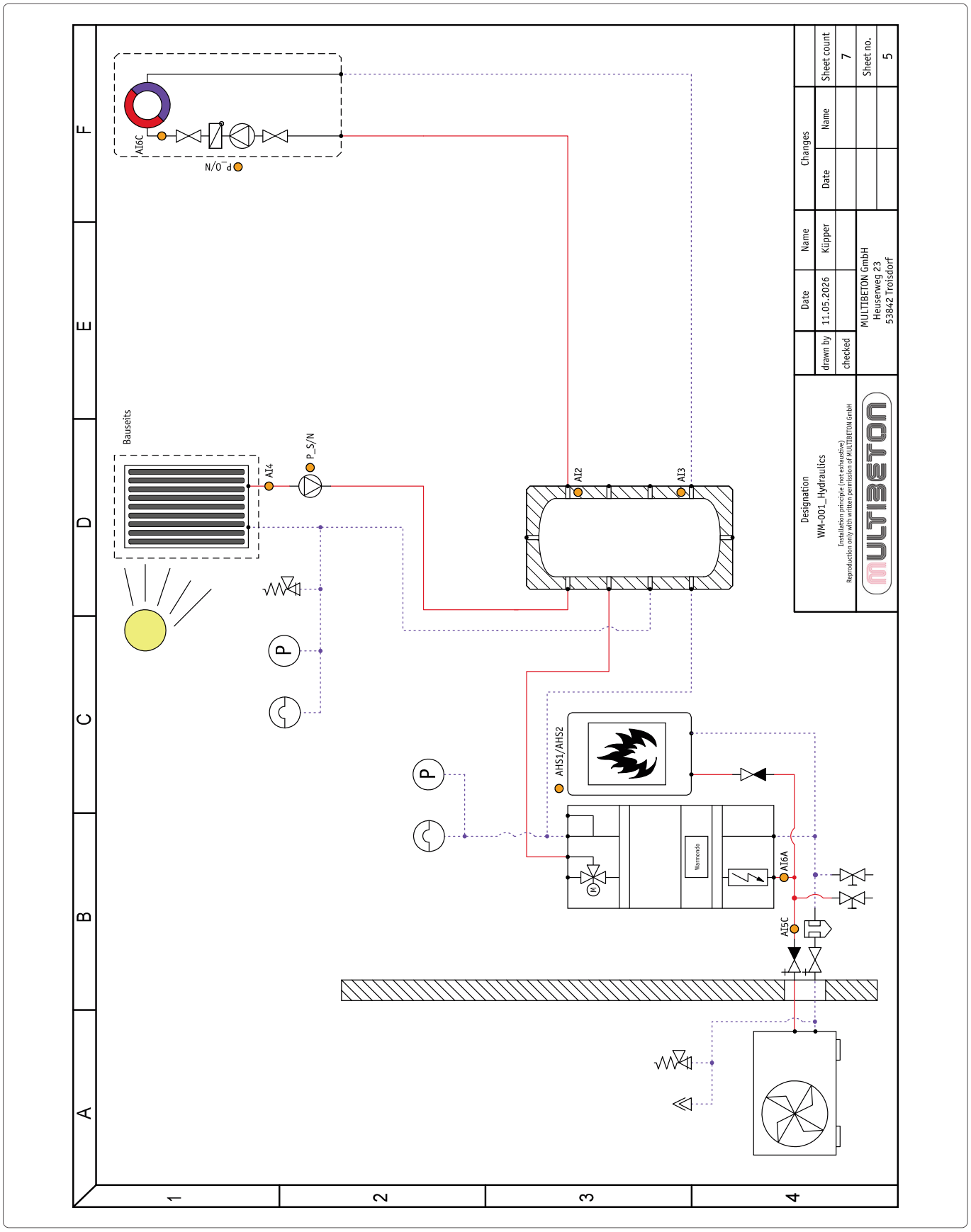
The minimum distances are:

01 ≥ 600 mm
02 ≥ 300 mm
03 ≥ 1,000 mm
04 ≥ 600 mm
05 ≥ 1,000 mm
06 Safety zone

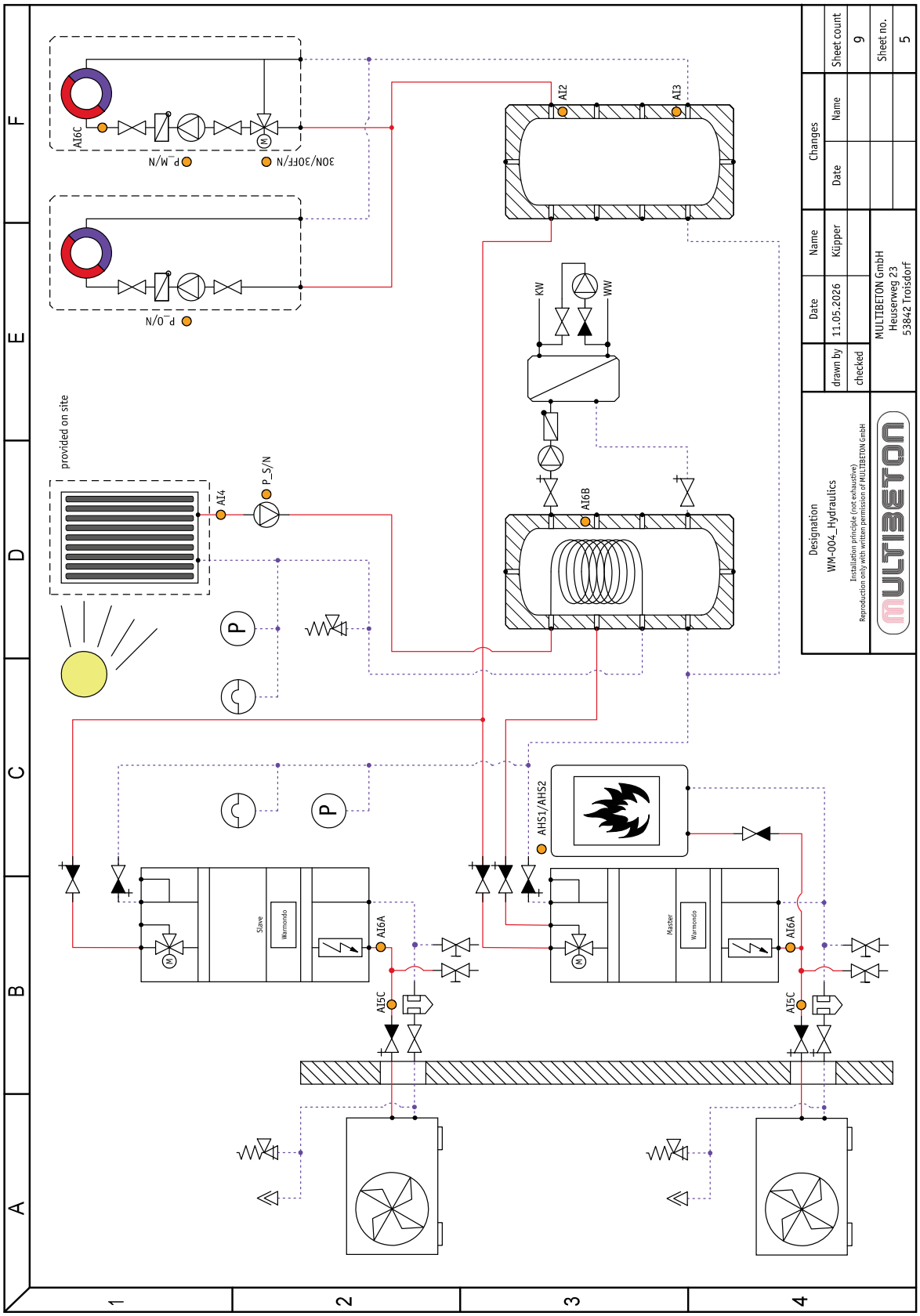
3.4. Foundation layout



3.5. Hydraulic system diagram of a single unit:



3.6. Hydraulic system diagram of a cascade system:



3.7. Electrical Connection

The electrical connections for the heat pump must be made in accordance with the relevant standards and legal requirements (including VDE 0100, EN 60335, EN 378, and R290-specific safety requirements). All work must be performed exclusively by licensed electricians.

A. Power Supply

- **Dedicated circuit and mains isolation**
  The heat pump must be connected to a dedicated electrical circuit. Sharing a power supply with other appliances is not permitted. An all-pole mains disconnect device must be installed to ensure complete disconnection from the power supply (e.g., a main switch or circuit breaker).
- **Power cord**
  The power supply cable must be selected based on the rated power, fuse rating, and cable length. For three-phase equipment, the correct phase sequence (L1–L2–L3) must be strictly observed. An incorrect phase sequence will prevent the compressor from operating properly. The electrical supply must comply with the specifications of the relevant utility provider.
- **Protective grounding**
  The device must be properly grounded using a dedicated protective conductor (PE). Grounding via water, gas, or telecommunications lines is not permitted. The protective conductor must be permanently installed, have low resistance, and be mechanically secure.
- **Emergency stop device**
  In publicly accessible or commercial areas, a local emergency stop switch must be provided in the immediate vicinity of the heat pump. The emergency stop switch must de-energize all active conductors.

Model	Capacity/Heating Circuits	Supply/Heat Pump	Power supply cable	
WM-S	6 kW/2	230 V/230 V	230 V/3 x 2.5 mm²	(AWG 14)
WM-M	9 kW/2	230 V/230 V	230 V/3 x 4.0 mm²	(AWG 12)
WM-L	13 kW/2	230 V/400 V	230 V/5 x 4.0 mm²	(AWG 12)
WM-XL	16 kW/2	230 V/400 V	230 V/5 x 4.0 mm²	(AWG 12)

B. Requirements for Electrical Connections

- **External loads and control outputs**
  External live loads must be properly grounded if they are mounted on metal or conductive surfaces. The maximum permissible load current for individual control outputs is 0.2 A. For load currents exceeding 0.2 A, the load must be controlled via an external contactor or relay.
- **Cable Requirements**
  For all power and high-voltage cables, use H07RN-F or an equivalent cable type suitable for outdoor use. The number of conductors must correspond to the respective terminal block. Extensions must be installed properly, with strain relief, and in accordance with standards.
  The current-carrying capacity depends on:
  · Maximum conductor operating temperature
  · Ambient temperature
  · Installation method
  · Conductor material

An overview of cable sizing is included in the appendix to this manual.

- **Terminal connections**
  Before starting any work, all electrical circuits must be de-energised and secured against accidental re-energisation. Only copper conductors may be used. Cables must not be crushed, routed over sharp edges, or subjected to mechanical stress.

C. Cable Installation and Safety Instructions

- **Access to the junction box**
  The electrical connection compartment is located behind the right-hand service panel and must be opened in accordance with the installation instructions. Cables must be routed so that they do not come into contact with refrigerant lines, particularly high-pressure lines. Cables must be secured with suitable fasteners and must not exert any tension or pressure on the connection terminals.
- **EMC Requirements**
  Ensure that the wiring complies with EMC requirements, especially when operating with an inverter.

Note

The unit is equipped with a capacity-controlled compressor. The installation of a phase-advance capacitor is strictly prohibited, as it does not improve the power factor, can lead to overheating due to high-frequency resonance effects, and may cause safety-related damage to the unit.

· **Additional requirements specific to R290**

Electrical work may only be performed in an area free of ignition sources. Opening electrical covers is prohibited if a refrigerant leak is suspected. Spark-generating or non-explosion-proof tools are prohibited. All work must be performed in compliance with applicable explosion protection and safety regulations.

D. Wiring Diagram (Terminal function)

Note

· **A. Types of cables**

For all control voltage and power cables, use cable type H07RN-F or an equivalent cable type approved for outdoor use.

Exceptions to this are:

· Thermistor cables

· Cables for user interfaces and communication signals. These must be selected based on their respective functions and the device-specific requirements.

B. Signal outputs (dry contacts)

The following connections are designed exclusively as potential-free switching contacts and are intended solely for signal output:

· AHS1/AHS2

· DFR1/DFR2

· ERR1/ERR2

Direct power supply to external devices via these contacts is not permitted.

C. Signal inputs

The following connections are used to receive external control signals, e.g., to activate a utility load control or external enable signals:

· DI2/G

· SG/EVU/G

The electrical specifications of the input signals must comply with the limits specified in the technical data.

D. External loads

· Maximum permissible load current per connection: 0.2 A

· For load currents > 0.2 A, control must be provided via an external contactor or relay. The external switching devices must be designed in accordance with applicable electrical standards.

E. Terminal positions

The exact location and designation of the terminal blocks can be found in the corresponding connection diagram in this operating manual. Before performing any connection work, ensure that the terminal blocks have been clearly identified and are de-energised.

Note

Wire cross-sectional area and current-carrying capacity

Max. Current (A)	Wire Gauge (AWG)
≤ 3.0	≥ 24
≤ 4.6	≥ 22
≤ 6.5	≥ 20
≤ 8.5	≥ 18
≤ 11	≥ 16
≤ 15	≥ 14
≤ 21	≥ 12
≤ 28	≥ 10
≤ 40	≥ 8
≤ 55	≥ 6

4. Test run

Warning

Before turning on the heat pump, the entire electrical and hydraulic system must be thoroughly inspected. Improper wiring or incomplete filling can result in serious damage to the unit or electric shock.

4.1. Preliminary inspection before the test run

Before starting the test run, the following points must be checked and confirmed. The results must be documented in the commissioning report (√ = OK):

Checkpoints	Result
Device properly installed	◯
Mains connection with its own power supply	◯
Electrical and hydraulic connections have been properly installed	◯
Air intake and outlet free of obstructions	◯
Condensate drain and drainage cleari	◯
No leaks detected	◯
Residual current device (RCD) is operational	◯
Piping and insulation properly installed	◯
Protective conductor (PE) properly connected	◯

4.2. Test operation Procedure

Step 1 – Preparation
· Ensure that all electrical connections are securely tightened and all piping is correctly connected.
· The buffer tank or water tank must be completely filled before the power supply is turned on.

Step 2 – Venting
· Bleed the entire hydraulic system, including the heat exchanger, piping, and storage tank.
· Then check the system pressure (see section “Water-side installation”).

Step 3 – Turn on
· Turn on the power.
· Press the “ON/OFF” button on the control panel to start the unit.
· Set the desired operating temperature.

Step 4 – Functional testing during the test run
· During initial operation, check the following items:

Checkpoints	**OK**
Current consumption is within the rated range	◯
Control panel buttons respond properly	◯
Display shows all operating states correctly	◯
No leaks in the heating and water systems	◯
Condensate drain is working properly	◯
No unusual noises or vibrations	◯

· If any irregularities occur (e.g., excessive current, leakage, vibration, error messages), the test run must be stopped immediately and the cause corrected before resuming operation.

4.3. Completion of commissioning
After a successful test run:
· Document all parameters and test results in the commissioning report.
· Verify that the antifreeze and safety functions are properly activated.
· Approve the unit for continuous operation.

5. Maintenance and winter Preparation

5.1. General Safety Instructions

⚠ Warning

Before beginning any maintenance, cleaning, or inspection work, the power supply to the unit must be completely disconnected. Work on the refrigerant circuit may only be performed by certified refrigeration and air conditioning specialists (in accordance with EN 378-4, ISO 13585, and AD 2000-HP 100R).

5.2. Regular maintenance

To ensure safe and efficient operation, the following tasks must be performed regularly:

Checkpoints	**Interval**	**OK**
Visual inspection for external damage check the housing, connections, and piping for visible damage.	monthly	◯
Cleaning the evaporator Remove dust and dirt with a vacuum cleaner and a soft brush. Do not use sharp tools.	every six months	◯
Cleaning the housing Clean with a damp cloth. Do not use chemical cleaners or solvents.	as needed	◯
Inspection of water connections Check for leaks, corrosion, and insulation.	every six months	◯
Checking the condensate drain Ensure that condensate can drain freely.	every six months	◯

5.3. Annual Inspection

Annual maintenance and leak testing in accordance with applicable standards are mandatory. This work must be performed and documented by a qualified specialist company.

a. Functional test

- Heat pump operation in heating and cooling modes
- Function of auxiliary and safety heaters
- Checking the control panel, error log, operating hours, and compressor start cycles

b. Leak test

- Check the heating circuit, domestic hot water circuit, and hydraulic separation circuit for leaks
- Check the refrigerant level and pressure gauge
- Visually inspect the pipe connections and solder joints

c. Inspection of safety devices

- Check that the safety valve and expansion tank are functioning properly
- Record the test pressure

d. Electrical inspection

- Inspection of all electrical connections, insulation, screws, and plug connections
- Functional test of the residual current device (RCD)
- Inspection of the protective conductor connection

5.4 Cleaning

- Clean the heat pump's housing only with a damp, soft cloth. Do not use household chemicals, cleaning agents, solvents, etc., as these can damage the surface coating.
- Clean the evaporator on the back with a vacuum cleaner equipped with a soft brush attachment. Do not use sharp objects or high-pressure washers.

5.5. Shutdown and Winter Preparation

If the heat pump is taken out of service for an extended period or shut down for the winter, the following steps must be taken:

a. Disconnect the power

- Disconnect the power supply via the main switch or circuit breaker.

b. System pressure and water volume

- Check the heating circuit pressure and, if necessary, drain the system to prevent frost damage.
- Completely drain the water from the heat exchanger, pipes, and storage tank.

c. Frost protection measures

- If the system is not expected to be in operation during freezing weather, it should be filled with antifreeze or completely drained.
- All open connections and pipe ends must be sealed.

d. Equipment protection

- Cover the heat pump with a waterproof, breathable protective cover to protect it from the elements.
- Make sure the cover does not block air circulation.

e. Restart

- Before restarting the system after a prolonged shutdown, all leak, functional, and safety tests must be performed again.
- The system may only be started up after a complete inspection by an authorised specialist company.

Note

To completely drain the water, unscrew the fill and drain valve (inlet) and drain the system through its lowest point.

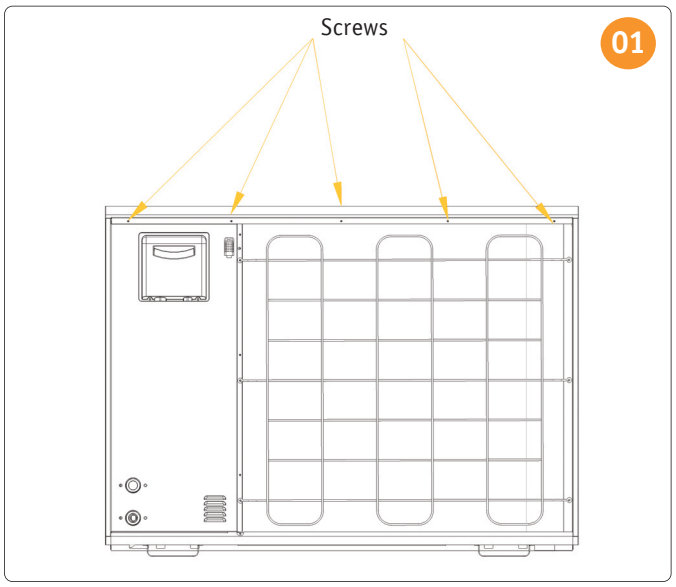
6. Disassembly process

Preparation and Safety Instructions

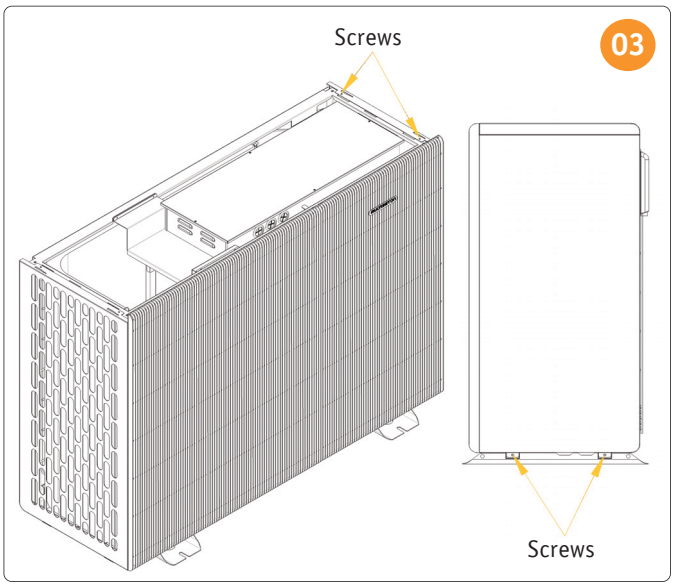
Note

Before beginning disassembly work, the power supply must be completely disconnected.

1. Remove the top cover



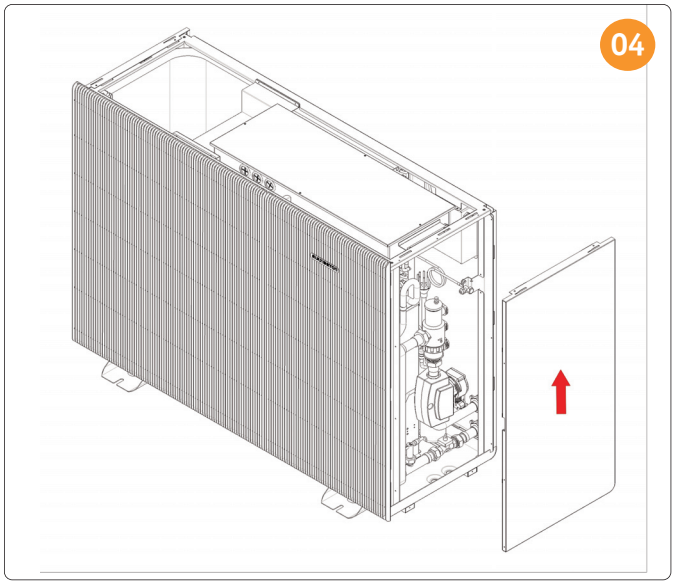
Loosen the mounting screws on the top cover.



Carefully slide the cover slightly backward, then lift it upward and remove it.

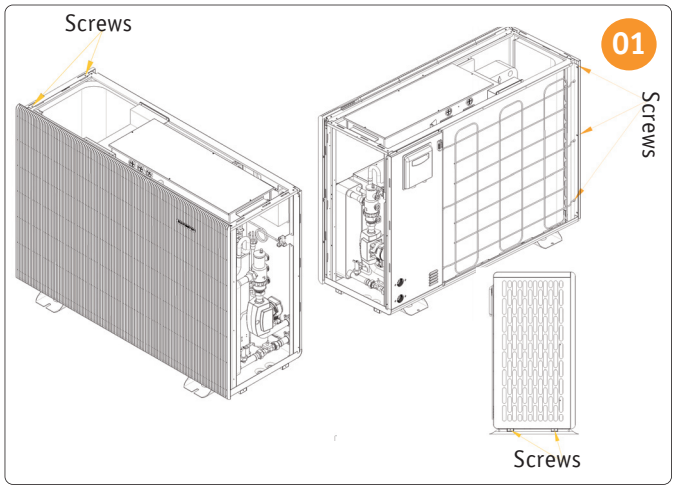
2. Remove the front service panel

Loosen the screws on the front service panel indicated in the illustration.

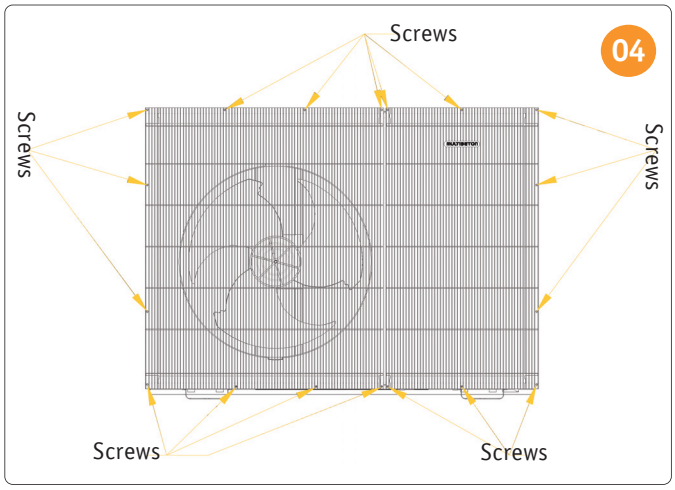


Carefully push the panel upward and remove it.

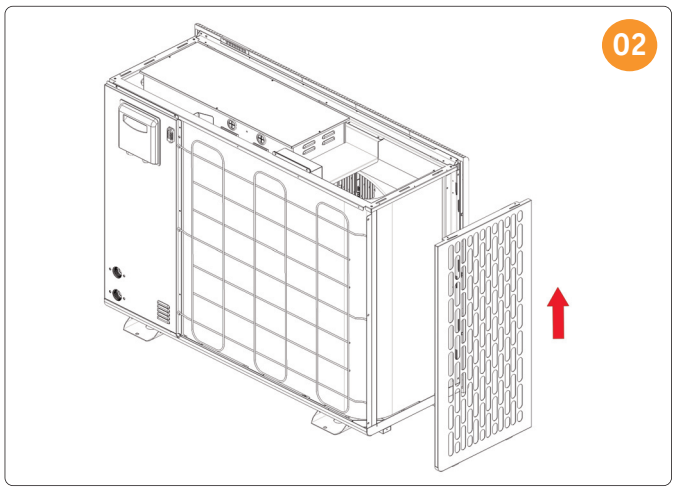
3. Remove the left sidebar



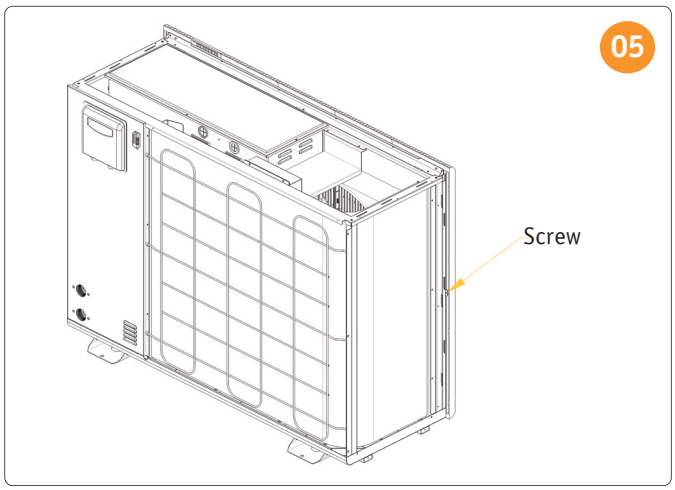
Loosen the mounting screws.



Loosen the mounting screws.

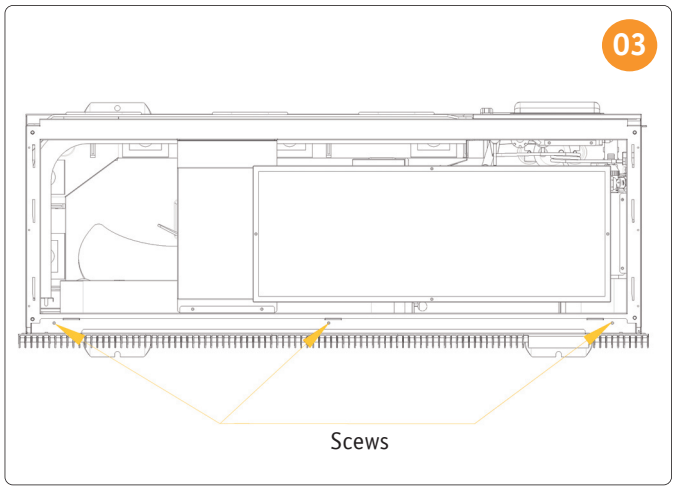


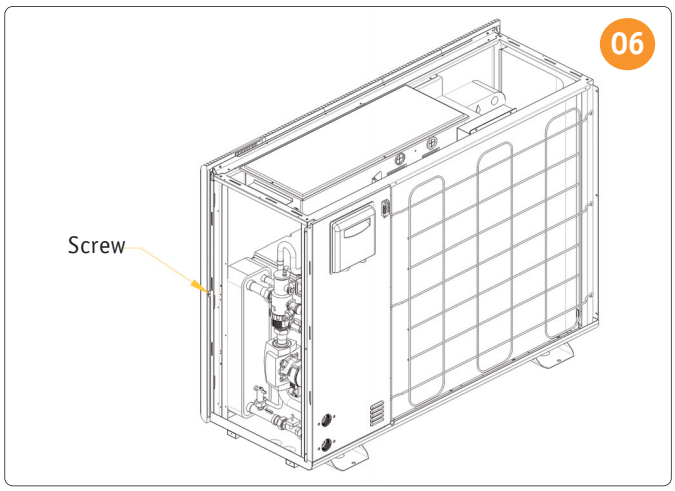
Lift the left side panel upward and set it aside.



Loosen the mounting screw.

4. Remove the air grille





Loosen the mounting screw.

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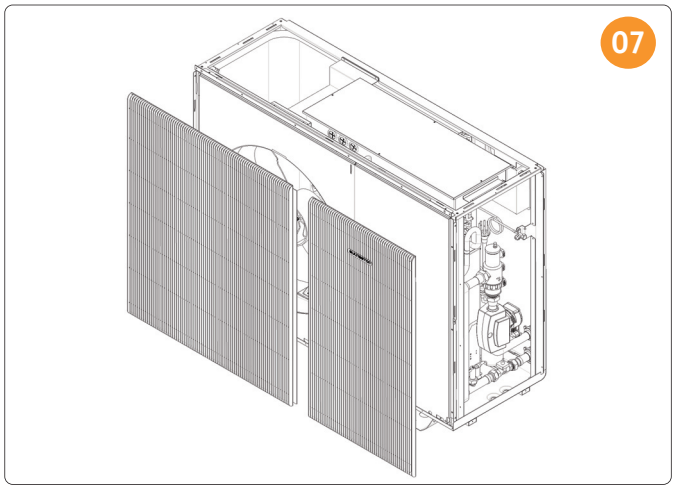
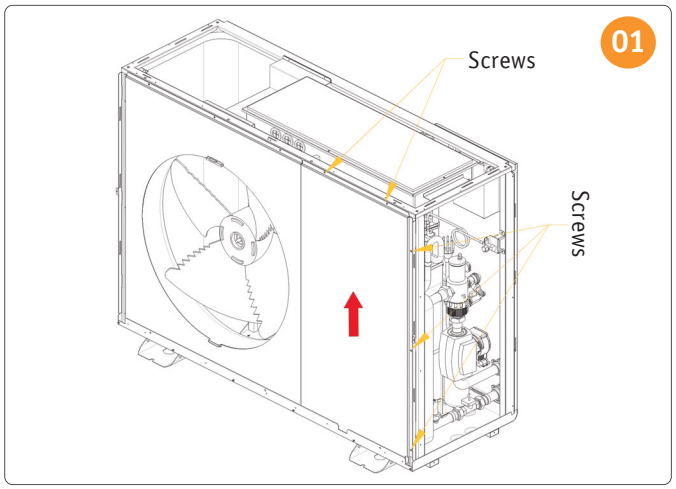
E-Mail info@multibeton.com, **Internet** www.multibeton.com

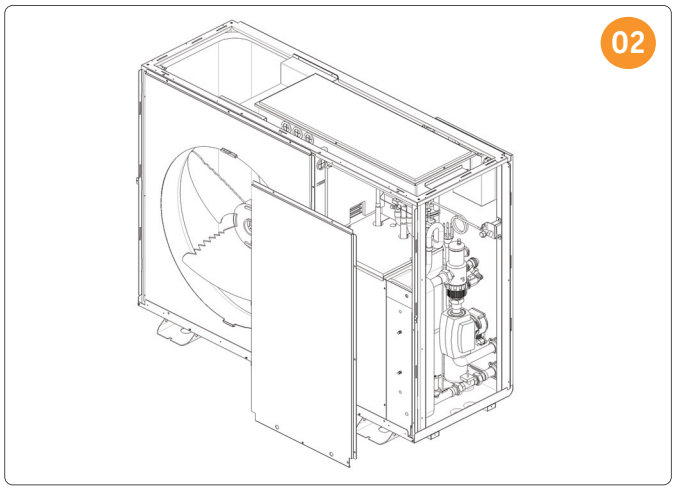


Remove the air grille.

5. Remove the right front panel

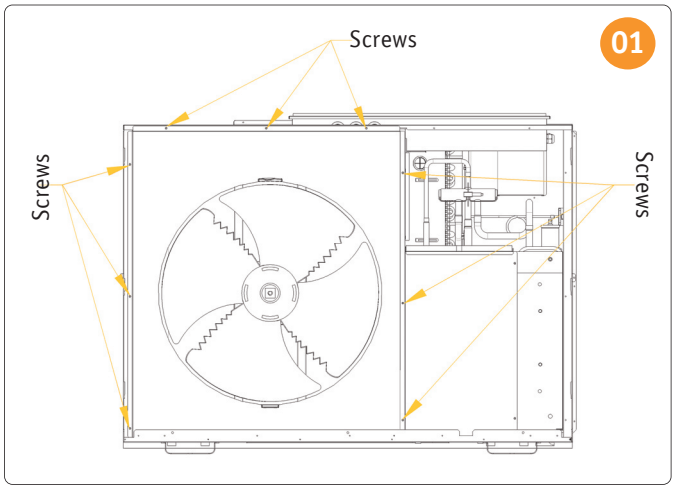


Loosen the mounting screws on the right front panel.

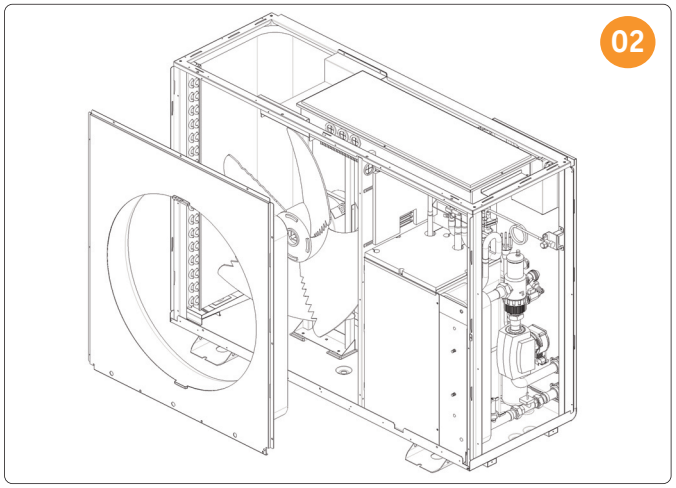


Carefully remove the right front panel.

6. Remove the fan guide plate

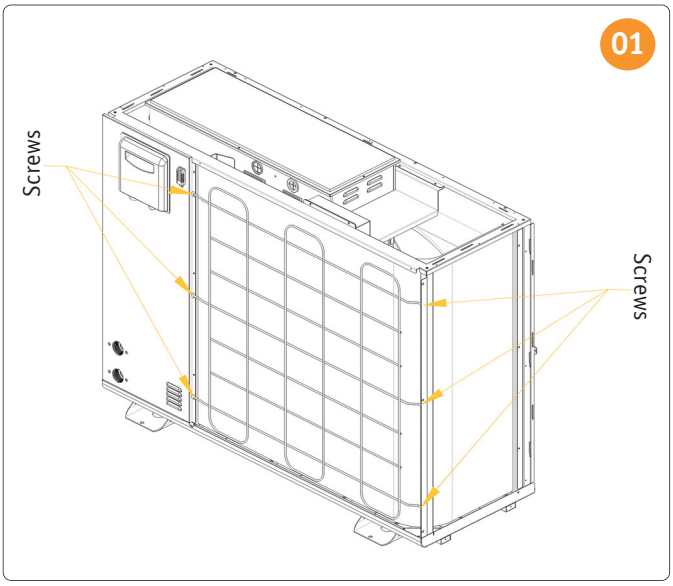


Loosen the screws on the rear fan guide plate.

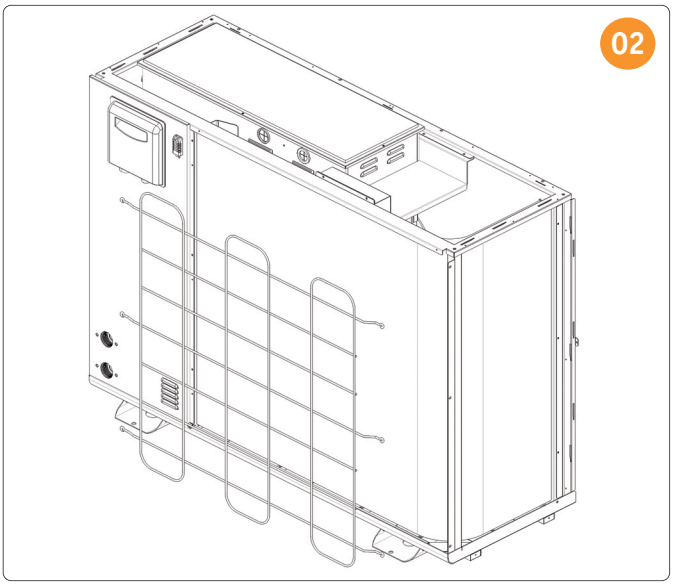


Lift the guide plate upward and remove it.

7. Remove the left side panel

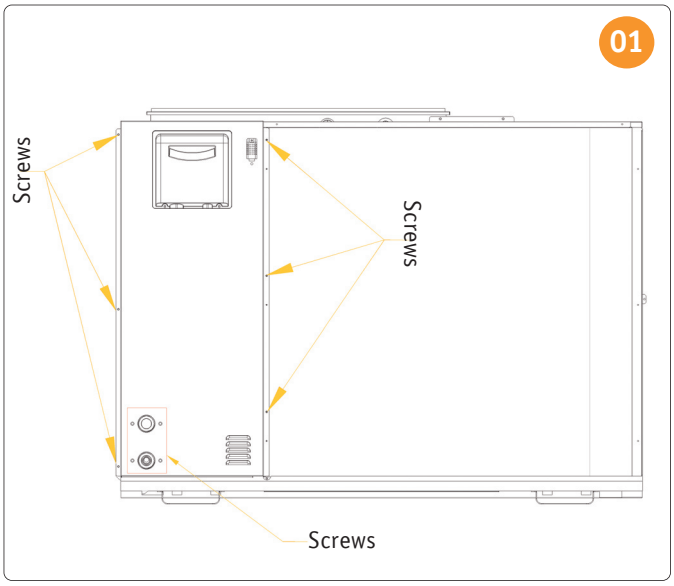


Remove the screws from the rear air grille.

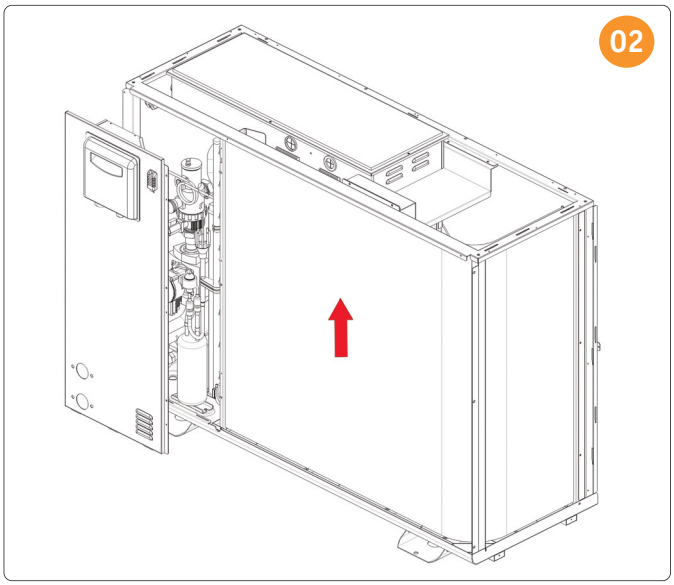


Lift the grille backward.

8. Remove the right hydraulic panel



Loosen the screws on the right rear panel.



Remove the rear right panel by lifting it up or pulling it back.

Note

All removed screws, covers, and panels must be carefully stored and reinstalled in the reverse order during reassembly. When reassembling, use the original fasteners to ensure a tight seal and stability.

Appropriate protective gloves must be worn to prevent injury from sharp edges.

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