

AARIA START

SERIES R32

EN INSTALLATION AND TECHNICAL SERVICE INSTRUCTIONS

RIELLO

Dear Technician,

We would like to congratulate you on having recommended a **RIELLO** unit: a modern product that is capable of ensuring maximum comfort at length, with a high degree of reliability, efficiency, quality and safety.

While your technical skills and knowledge will certainly be more than sufficient, this booklet contains all the information that we have deemed necessary for the device's correct and easy installation.

Thank you again, and keep up the good work.

RIELLO

COMPLIANCE

RIELLO AARIA START heat pumps are compliant with the following European Directives:

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility Directive 2014/30/EU
- RoHS Directive 2011/65/EU
- ErP Directive 2009/125/EC and Regulation 2012/206/EC
- WEEE Directive 2012/19/EU
- F-Gas Regulation 2014/517/EU



WARRANTY

RIELLO product has a **Conventional Warranty** (valid for Italy, Republic of San Marino, Vatican City), starting from the product's date of purchase.


WARNING

Keep the product purchase documents for tax purposes to be presented to the Authorised Technical Support upon request of a service call under warranty.

Find the nearest Authorised Technical Support by visiting the website

www.riello.it

Support // Authorized Support Centre

 The product must be used for its intended purpose, as stated by **RIELLO** for which it has been expressly manufactured. **RIELLO** shall bear no responsibility, whether of a contractual or non-contractual nature, for any damage caused to people, animals, or property due to incorrect installation, adjustments, or maintenance, or improper use.

RANGE

Model	Code
AARIA START 25	20139542
AARIA START 35	20139546
AARIA START 50	20139548
AARIA START 70	20139550


ACCESSORIES

For the complete list of accessories and the information relating to their usage combinations, please refer to the catalogue.

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The following symbols are used in this publication:


 **WARNING** = actions requiring special care and appropriate training.


 **DO NOT** = actions that **MUST ON NO ACCOUNT** be carried out.

1 GENERAL INFORMATION

1.1 General Notices










-  When you get the product, check immediately that the contents are all present and undamaged. Contact the dealer **RIELLO** if you notice any problems.
-  The product's installation must be carried out by an authorised company that will issue a declaration of the installation's conformity to the product's owner once the work has been completed, indicating that the work has been carried out in accordance with the standards of good practice, current National and Local regulations, and the indications provided by **RIELLO** in the instruction booklet accompanying the device.
-  The product must be used for its intended purpose, as stated by **RIELLO** for which it has been expressly manufactured. **RIELLO** shall bear no responsibility, whether of a contractual or non-contractual nature, for any damage caused to people, animals, or property due to incorrect installation, adjustments, or maintenance, or improper use.
-  Suitable clothing, instrumentation, and accident-prevention devices must be utilized during the installation and/or maintenance operations. **RIELLO** shall bear no responsibility for any failure to comply with current safety and accident-prevention regulations.
-  During installation and/or service operations, keep the area around the unit tidy and clean.
-  Comply with the legislation in force on the country of deployment with regard to the use and disposal of packaging, of cleaning and maintenance products and for the management of the unit's decommissioning.
-  Any repair and maintenance interventions must be carried out by **RIELLO** Technical Support Service, in accordance with the provisions contained in this publication. Do not modify or tamper with the unit as dangerous situations may arise and the unit manufacturer will not be liable for any damage caused.
-  In the event of any functional anomalies or fluid leaks, set the system's main switch to its "off" position. Promptly contact your local **RIELLO** Technical Support Service, and do not perform any interventions upon the device on your own.
-  The units contain refrigerant gas: operate carefully so as to avoid damaging the gas circuit and the fin bank.
-  Do not place any inflammable object (spray cans) within a 1 metre radius from the air expulsion.
-  According to EU Regulation no. 517/2014 regarding certain fluorinated greenhouse gases, the total amount of refrigerant contained within the installed system must be indicated. This information can be found on the unit technical data plate.
-  This unit contains fluorinated greenhouse gases covered by the Kyoto protocol. Maintenance and disposal activities must be carried out exclusively by skilled personnel.

 The R32 refrigerant gas is slightly inflammable and odourless. Carefully read the safety data sheet available from the dealer.

 This booklet is an integral part of the device, and must therefore be carefully preserved, and must ALWAYS accompany it, even in the event that it is sold to another Owner or User, or is transferred to another system. If it is damaged or lost, another copy can be requested to **RIELLO** Technical Support Service in your Area.

1.2 Safety precautions

It should be noted that the use of products that utilize electric energy requires certain essential safety regulations to be respected, including the following:

-  Do not allow children or unassisted disabled people to use the unit.
-  It is forbidden to touch the device while barefoot or with wet body parts.
-  Do not spray or throw water directly on the unit.
-  It is forbidden to place weights on the device.
-  It is strictly forbidden to touch the coil fins, the moving parts, to place any body parts between them, or to insert pointy objects into the grilles.
-  It is forbidden to perform any technical interventions or cleaning operations before having disconnected the device from its electrical power supply, by setting the system's main switch to its "OFF" position.
-  It is forbidden to modify the safety or adjustment devices without the manufacturer's authorisation.
-  Do not pull, detach or twist the electrical wires coming out of the unit, even when the unit is disconnected from the power grid.
-  The packing material must not be disposed of in the surrounding environment and must be kept out of children reach, as it can be dangerous. It must be disposed of according to the regulations in force.

1.3 Unit description

RIELLO AARIA START is a heat pump outdoor unit that can be coupled to indoor units of the same series for the air-conditioning of small/middle-sized rooms. Designed for outdoor installation, it is suitable for use in residential and small business premises. The rotary-type compressor is controlled via DC-Inverter control with continuous modulation from 20% to 110%, thus ensuring high energy standards. The fan DC motor improves performance and sound comfort. The expansion valve electronically optimises the flow of refrigerant within the circuit (excluding AARIA START 25).

1.4 Safety and adjustment devices

The device safety and setting are achieved thanks to

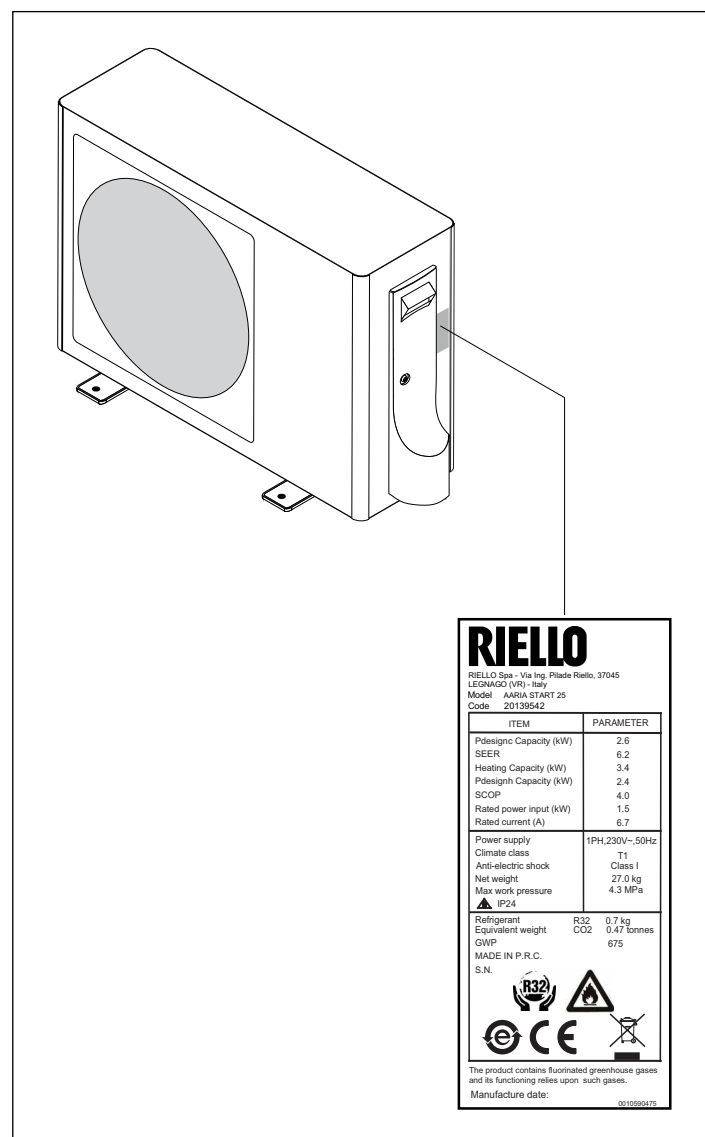
- compressor motor thermal protection, which is triggered in case the current consumed by the compressor is excessive
- gas delivery temperature sensor, which transmits the detected value to the electronic board that is triggered in case of overtemperature (110°C)
- anti-freeze sensor, which transmits the temperature value as detected by the heat exchanger to the electronic board that is triggered when the heat exchanger is clogged by frost formations
- suction temperature sensor, which transmits the detected value to the electronic board that is triggered in order to adjust the flow of refrigerant gas or to stop the unit in case of overtemperature (40°C)
- outdoor air temperature sensor, which transmits the detected value to the electronic board that is triggered in order to adjust the operation of the unit indoor components to the variation of weather conditions

⚠ Safety device replacement must be carried out by **RIELLO** Technical Support Service, using only original components. Please refer to the spare parts catalogue.

⊘ IT IS FORBIDDEN to operate the device with faulty safety systems.

1.5 Identification

The unit can be identified through the technical data plate:



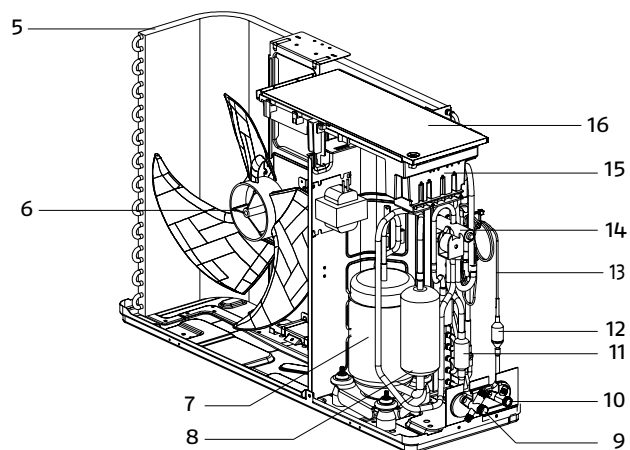
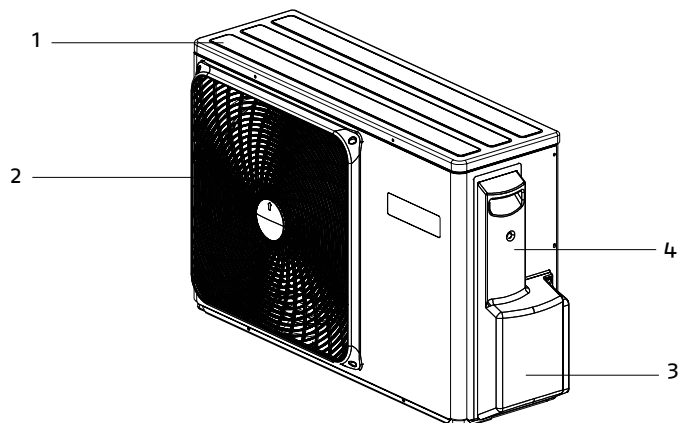
Technical data plate

Contains the device's technical and performance data.

⚠ The tampering, removal, or absence of the identification plates will not allow the product to be properly identified by its serial number.

1.6 Layout

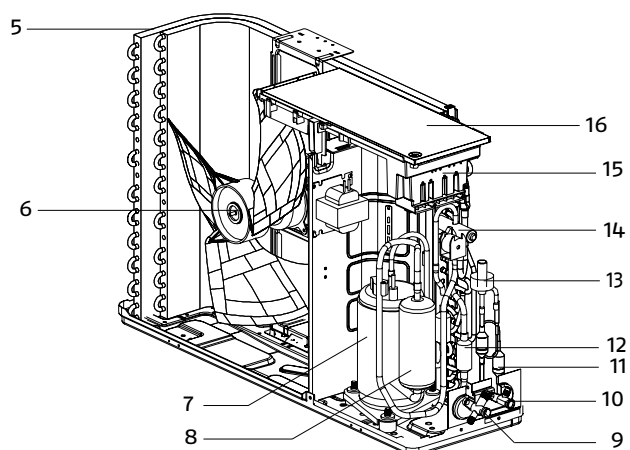
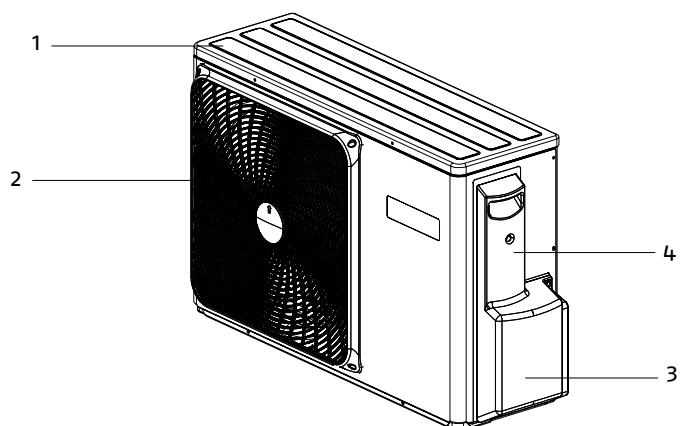
MODEL 25



- | | |
|-------------------------|---------------------------|
| 1 Upper panel | 7 Rotary compressor |
| 2 Fan protection grille | 8 Intake separator |
| 3 Connections cover | 9 Gas line connection |
| 4 Handle for handling | 10 Liquid line connection |
| 5 Heat exchanger | 11 Silencer |
| 6 Electric fan | 12 Filter |

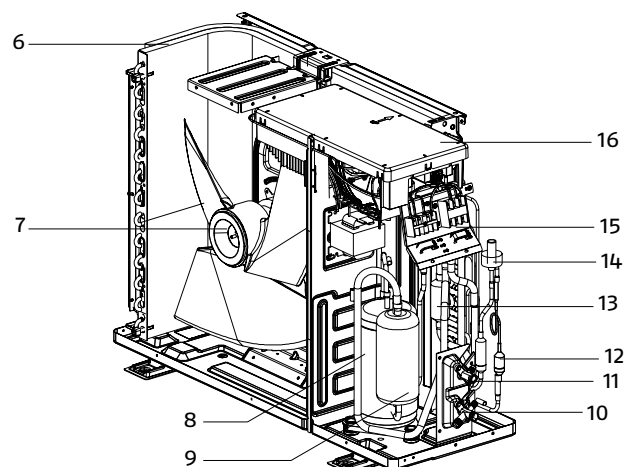
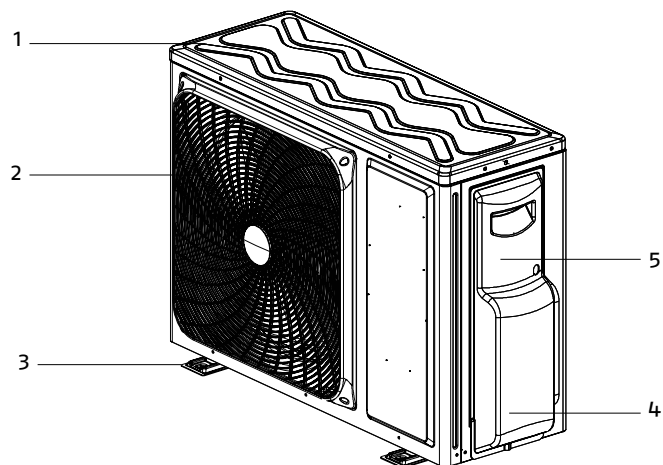
- | |
|--|
| 13 Capillary tube |
| 14 Cycle reversal valve |
| 15 Terminal board for electric connections |
| 16 Electric panel cover |

MODEL 35

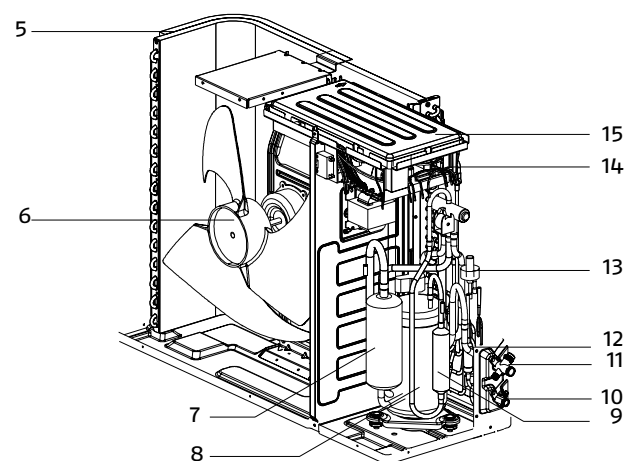
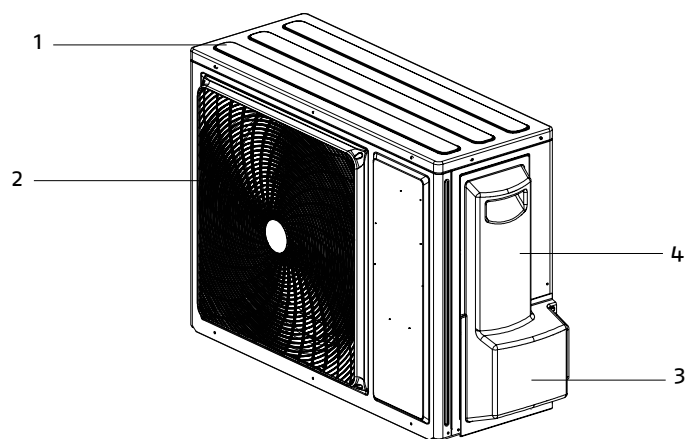


- | | |
|-------------------------|---------------------------|
| 1 Upper panel | 7 Rotary compressor |
| 2 Fan protection grille | 8 Intake separator |
| 3 Connections cover | 9 Gas line connection |
| 4 Handle for handling | 10 Liquid line connection |
| 5 Heat exchanger | 11 Silencer |
| 6 Electric fan | 12 Filter |

- | |
|--|
| 13 Electronic expansion valve |
| 14 Cycle reversal valve |
| 15 Terminal board for electric connections |
| 16 Electric panel cover |

MODEL 50

- | | | |
|-------------------------|---------------------------|--|
| 1 Upper panel | 7 Electric fan | 13 Silencer |
| 2 Fan protection grille | 8 Rotary compressor | 14 Electronic expansion valve |
| 3 Support bracket | 9 Intake separator | 15 Terminal board for electric connections |
| 4 Connections cover | 10 Gas line connection | 16 Electric panel cover |
| 5 Handle for handling | 11 Liquid line connection | |
| 6 Heat exchanger | 12 Filter | |

MODEL 70

- | | | |
|-------------------------|---------------------------|--|
| 1 Upper panel | 7 Intake separator | 13 Electronic expansion valve |
| 2 Fan protection grille | 8 Rotary compressor | 14 Terminal board for electric connections |
| 3 Connections cover | 9 Silencer | 15 Electric panel cover |
| 4 Handle for handling | 10 Liquid line connection | |
| 5 Heat exchanger | 11 Gas line connection | |
| 6 Electric fan | 12 Filter | |

1.7 Technical specifications

Prestazioni in abbinamento ad AMW ST

Model	AMW 25 ST	AMW 35 ST	AMW 50 ST	AMW 70 ST	
Cooling performance [A35 / A27] ⁽¹⁾					
Capacity at rated air flow	2,60	3,60	5,20	7,00	kW
Absorbed power at rated air flow	0,80	1,11	1,61	2,16	kW
EER		3,23			kW/kW
Capacity at maximum air flow	3,40	4,20	6,80	8,50	kW
Absorbed power at maximum air flow	1,20	1,60	2,00	2,90	kW
Capacity at minimum air flow	0,80	1,00	1,30	2,20	kW
Absorbed power at minimum air flow	0,30		0,40	0,70	kW
Energy data ⁽²⁾					
SEER	6,20	6,80		7,10	kW/kW
Energy class		A++			
Annual energy consumption	147	186	268	350	kWh/annum
Heating performance [A7 / A20] ⁽³⁾					
Capacity at rated air flow	3,40	4,20	6,00	8,10	kW
Absorbed power at rated air flow	0,91	1,13	1,61	2,18	kW
COP		3,71			kW/kW
Capacity at maximum air flow	4,60	5,40	6,90	10,00	kW
Absorbed power at maximum air flow	1,50	1,60	2,35	2,90	kW
Capacity at minimum air flow	1,00	1,10	1,40	2,40	kW
Absorbed power at minimum air flow	0,30	0,40	0,52	0,70	kW
Energy data for Average climatic profile ⁽⁴⁾					
Pdesign at -10 °C	2,40	3,20	5,20	5,60	kW
SCOP		4,00			kW/kW
Energy class		A+			
Annual energy consumption	839	1123	1819	1963	kWh/annum
Energy data for Warm climatic profile ⁽⁴⁾					
Pdesign at +2 °C	1,30	1,70	2,80	3,30	kW
SCOP	4,90	4,60	5,30		kW/kW
Energy class	A++		A+++		
Annual energy consumption	373	517	734	872	kWh/annum

(1) Outdoor air: 35 °C D.B., Indoor air: 27 °C D.B. / 19 ° W.B.

(2) In compliance with 626/2011 regulation

(3) Outdoor air: 7 °C D.B. / 6 °C W.B., Indoor air: 20 °C D.B.

(4) In compliance with EU 206/2012 regulation

Outdoor unit data

Model	25	35	50	70	
Cooling performance [A35 / A27] ⁽¹⁾					
Nominal capacity	2,60	3,60	5,20	7,00	kW
Nominal power input	0,80	1.11	1,61	2,16	kW
Rated frequency	47	63		61	Hz
Maximum frequency	65	85			Hz
Minimum frequency	24	25	20		Hz
Nominal current consumption	3,60	5,00	7,20	9,60	A
Max. current input	5,70	7,10	8,90	13,00	A
Minimum current consumption	1,40		1,80	3,20	A
Heating performance [A7 / A20] ⁽²⁾					
Nominal capacity	3,40	4,20	6,00	8,10	kW
Nominal power input	0,91	1,13	1,61	2,18	kW
Rated frequency	64				Hz
Maximum frequency	99		103	99	Hz
Minimum frequency	24	25	20		Hz
Nominal current consumption	4,10	5,10	7,20	9,70	A
Max. current input	6,70	7,10	10,60	13,00	A
Minimum current consumption	1,40	1,80	2,30	3,20	A
Electrical characteristics					
Power supply	230/1/50				V/Ph/Hz
Compressor					
Compressor	Rotary				Type
Oil	FW50S				Type
Oil charge	0,32	0,27	0,35	0,52	l
Refrigerant	R32				Type
Refrigerant charge	0,70	0,72	0,95	1,20	kg
Fan					
Fan	Axial				Type
Quantity	1				n.
Nominal air flow	1900		2500	2900	m³/h
Minimum speed	300				rpm
Maximum speed	800				rpm
Maximum power input	40		50		kW
Cooling sound levels					
Sound power level	60	61	63	65	dB(A)
Sound pressure level ⁽³⁾	46		51	52	dB(A)
Heating sound levels					
Sound pressure level ⁽³⁾	47		52	53	dB(A)
Sound power level	61	62	64	66	dB(A)

(1) Outdoor air: 35 °C D.B., Indoor air: 27 °C D.B. / 19 ° W.B.

(2) Outdoor air: 7 °C D.B. / 6 °C W.B., Indoor air: 20 °C D.B.

(3) Free field value at 1 meter unit face, in compliance with GB / T7725-2004

1.8 Operating limits

Operating mode	Temperature		Min	Max
Cooling	Indoor air (W.B.)	°C	21	35
	Outdoor air (D.B.)	°C	-15	46
Heating	Indoor air (D.B.)	°C	10	27
	Outdoor air (W.B.)	°C	-15	24

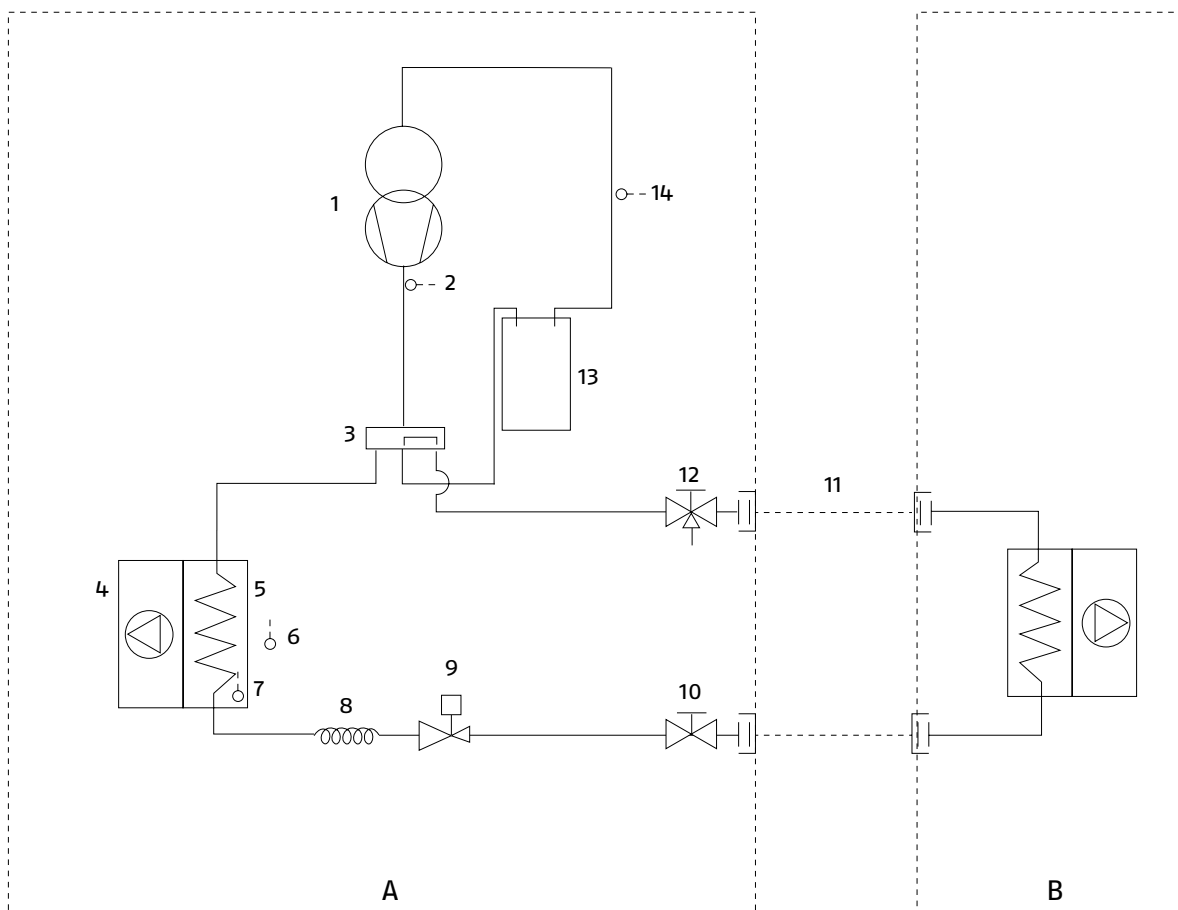
The values are based on the following condition:

- pipe length: 5 m
- difference in height: 0 m
- air flow: maximum

1.9 Cooling circuit

The cooling circuit is of the heat pump type with a refrigerant gas reversal cycle. The source fluid utilised is the outdoor air, while the utility-side fluid is the air inside the rooms. During the wintertime, the heat pump extracts the thermal en-

ergy from the outdoor air and delivers it to the room air, thereby heating it. During the summertime the cycle is reversed, and the thermal energy is extracted from the room air, which is cooled, and is delivered to the outdoor air.



A Outdoor unit

B Indoor unit

1 Compressor

2 Discharge temperature sensor

3 Cycle reversal valve

4 Electric fan

5 Heat exchanger

6 External air probe

7 Defrost temperature sensor

8 Capillary tube

9 Electronic expansion valve (excluding AARIA START 25)

10 Two-way shut-off valve

11 Connection pipes

12 Three-way shut-off valve

13 Intake separator

14 Intake sensor

2 INSTALLATION

- A** Ensure that the installation and operation sites are properly ventilated in order to disperse any gas leaks that could cause flames during activities with intense heat generation and high temperature.
- A** Avoid proximity to sources of ignition in continuous operation (open flames, gas household appliances, electric stoves, lit cigarettes, etc).
- A** Use equipment suitable for the system refrigerant.
- A** Use an electronic leak finder properly calibrated for the system refrigerant.
- ⊖** It is forbidden to use leak finders with halogen lamps.

2.1 Receiving the product

RIELLO AARIA START is supplied in a single pack, protected by a cardboard box and by polystyrene elements. The following material is placed inside the packaging, below the unit

Document envelope:

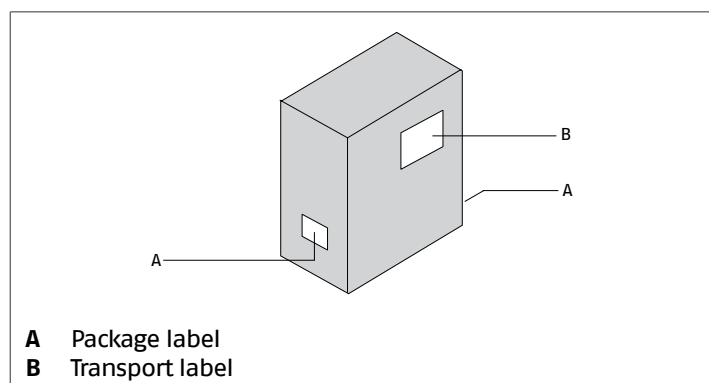
- Instruction's book for the installer and for the Technical Service in Italian
- Instruction's book for the installer and for the Technical Service in English
- Warranty/Spare parts labels.
- energy label
- etichetta gas refrigerante
- contact sheet

It is also supplied as kit:

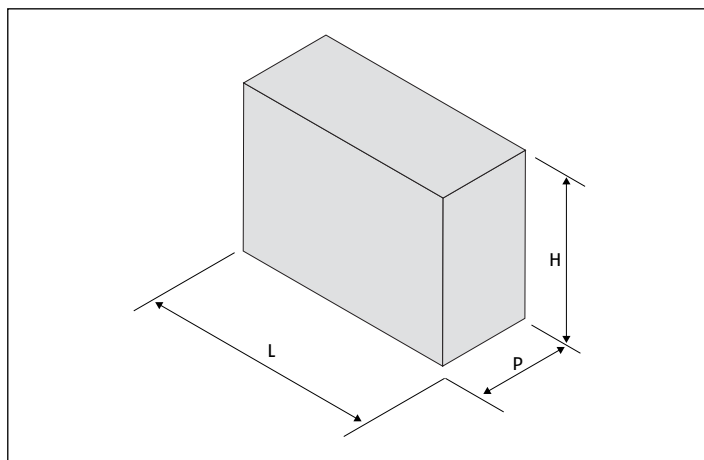
- Condensate outlet hose.
- 4 x vibration dampers
- screws to connect refrigerant connections cover

- A** The Instruction book comes with the equipment and it should be taken, read and kept carefully.
- A** The document envelope must be kept in a safe place. Any duplicate must be requested from Riello S.p.A. which reserves to charge the cost.

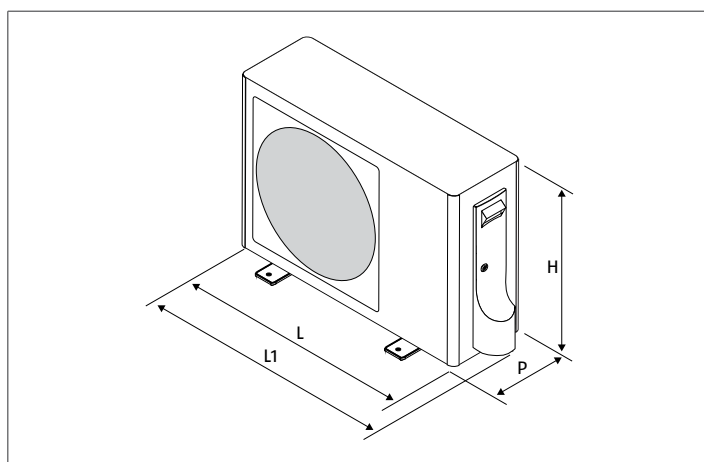
2.2 Labels positioning



2.3 Dimensions and weight



Model	25	35	50	70	
Packaging dimensions					
H	620	620	685	780	mm
L	920	920	963	1046	mm
P	351	351	413	460	mm
Weight	30,0	31,0	41,5	56,0	kg



Model	25	35	50	70	
Product dimensions					
H	540	540	614	697	mm
L	780	780	820	890	mm
L1	840	840	893	988	mm
P	245	245	338	353	mm
Weight	27,0	28,0	37,8	51,0	kg

2.4 Storage

If the product is stored in a room before installation check:

- there aren't continuously operating ignition sources (open flames, gas appliances, electric heaters,..) within a radius of 2.5 m.
- the floor area is larger than 3 m²
- there is adequate ventilation

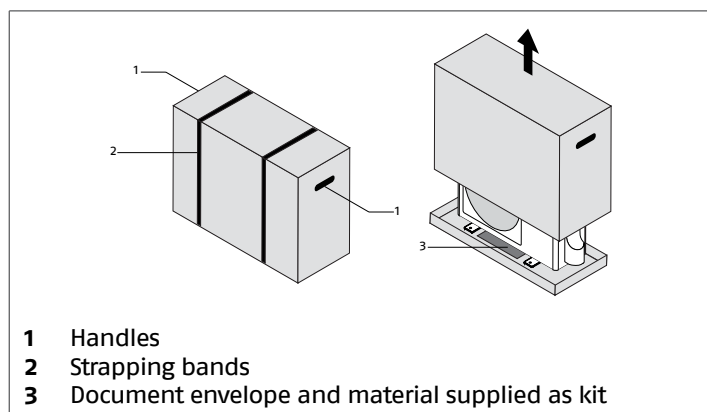
- ⚠** The product must be stored according to the regulations in force.

2.5 Handling and removal of the packing

- ⚠** Before unpacking, personal protective clothing should be worn and used transport means and tools suitable for the size and weight of the unit.

- ⚠** Check refrigerant leak inside the packaging with a leak detector suitable for the refrigerant used in the system. If a gas leak is detected, probably the refrigerant circuit is damaged and the product can't be installed; finally call Technical Service **RIELLO**.

Product handling can also be done manually by grasping the handles provided on the packaging.

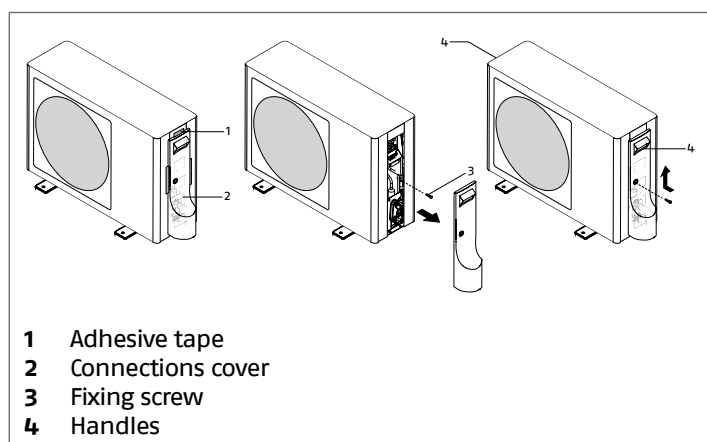


Follow the below instructions for packing removal and product handling:

- transport the equipment in the installation place
- cut strapping bands
- lift and remove the cardboard pack

The unit is supplied with the connections cover fixed to the unit with adhesive tape to avoid damage during transport and handling operations.

Before handling operations it is necessary to fix the connections cover to the unit:



- remove the adhesive tape
- unscrew the connections cover fixing screw from the unit
- position the connections cover
- Reassemble the fixing screws.
- handle the unit by grasping the handles provided.
- remove the document envelope

- ⚠** In manual operation it is compulsory to respect always the maximum weight per person provided for by the national laws and standards.

- ⚠** Handle with care

- ⚠** The equipment must always be handled vertically

- ⚠** Do not tilt the equipment over 15°

- ⚠** The unit's weight is concentrated on the compressors side (connection covering side).

- ⊖** The packing material must not be disposed of in the surrounding environment and must be kept out of children reach, as it can be dangerous. It must be disposed of according to the regulations in force.

2.6 Place of installation

The location of **RIELLO AARIA START** devices must be determined by the system's designer or by another competent person, and must take into account the technical requirements, as well as any current local regulations that require specific permits to be obtained. (e.g.: zoning, architectural, environmental protection, etc.).

It is therefore recommended to obtain all the necessary permits before installing the device.

RIELLO AARIA START is designed for outdoor installation.

Avoid:

- positioning the unit in air shafts and/or basement window wells
- any obstacles or barriers that will cause the expelled air to recirculate
- locations with aggressive or explosive atmospheres or with inflammable fluids
- confined locations in which the device's sound levels might be compounded by reverberations or resonances
- proximity to bedrooms and rooms for resting
- positioning in corners where dust, leaves, or any other materials typically accumulate, which could compromise the device efficiency by obstructing the airflow
- situations in which the air expelled from the device might enter the habitation through doors or windows, thus creating an inconvenience for the people inside
- situations in which the air expelled from the device will encounter resistance from opposing winds
- direct exposure to sunlight and proximity to heat sources

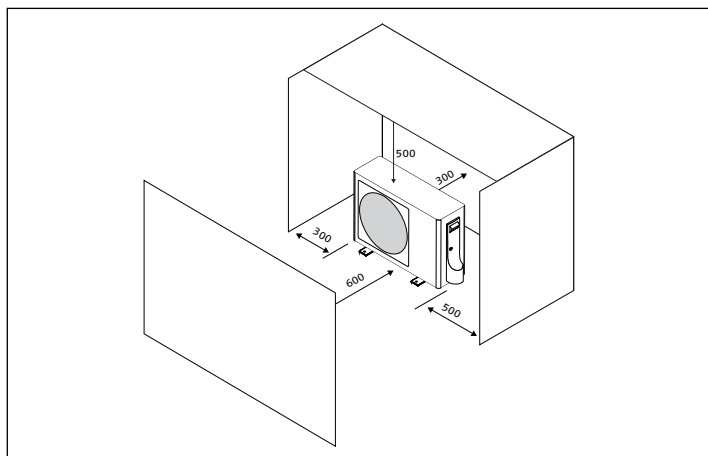
- ⚠** Avoid placing the unit less than 3 metres away from radio and video systems.

- ⚠** If the unit is installed in a windy location, fit an anti-wind grille to protect the fan and check the correct functioning of the unit.

- ⚠** Decide where to place the unit considering the length of cooling lines and the maximum difference of height allowed between the devices.

2.7 Recommended distances

The distances for the device installation and maintenance are shown in the figure. The indicated spaces are necessary in order to prevent the airflow from being blocked, as well as to allow normal cleaning and maintenance operations to be carried out.

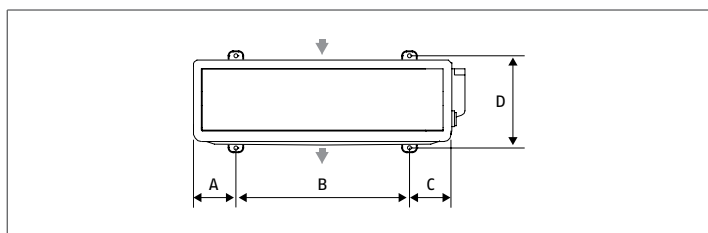


2.8 Positioning

RIELLO AARIA START devices must:

- be positioned on a level surface that is capable of supporting their weight
- be positioned on a sufficiently rigid surface that will not transmit any vibrations to the underlying or adjacent rooms

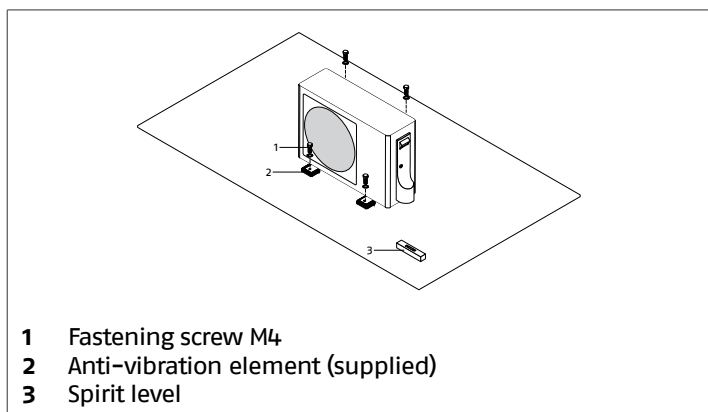
⚠ Use the anti-vibration supports supplied with the device.



Model	25	35	50	70	
Foot print dimensions					
A	140	140	114,2	130	mm
B	500	500	590	6,28	mm
C	140	140	114,2	130	mm
D	256	256	324	355,5	mm

They can be placed on the floor or suspended on supporting brackets.

Positioning on floor



- 1 Fastening screw M4
- 2 Anti-vibration element (supplied)
- 3 Spirit level

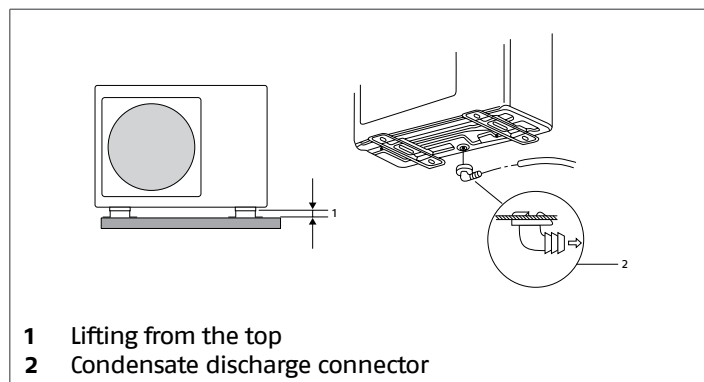
- screw the unit to the ground
- tighten using a torque wrench

- apply a tightening torque of 3.5 Nm
- Provide for lifting of the unit from the floor:
- 20 mm without conveying of the condensate outlet
 - 90 - 100 mm to allow for the condensate discharge

⚠ If the device is installed in an area that is subject to heavy snowfalls, place the unit in a raised position so as to prevent the air flow from being blocked or install a roofing to protect it.

⚠ Adequate anti-freeze systems should be used for installations in extremely cold areas, where there is a possibility of freezing.

⚠ While operating in heating mode, the unit generates condensate, which will deposit on the support surface if there is not discharge. This could freeze if the outdoor temperatures are below zero, thus creating a hazard. In this case, appropriate barriers should be installed in order to prevent people from approaching the unit.



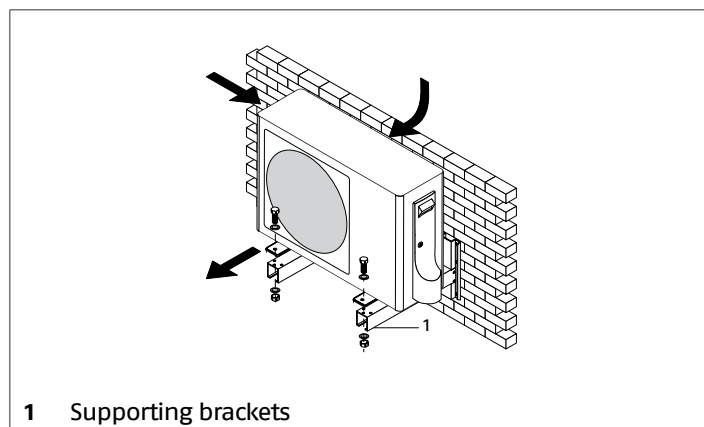
- 1 Lifting from the top
- 2 Condensate discharge connector

Model	25	35	50	70	
Connections					
Condensate discharge attachment Ø	16				mm

Hanging position

⚠ Properly sized supporting brackets must be used if the device is installed in suspension.

⚠ Ensure that the wall section does not include bearing elements, pipes or electric lines.



- 1 Supporting brackets

2.9 Installation on old systems or systems in need of upgrading

When **RIELLO AARIA START** is installed on old systems or systems in need of upgrading, it is recommended to ensure that:

- the electrical system is compliant with the applicable regulations and has been installed by qualified professionals

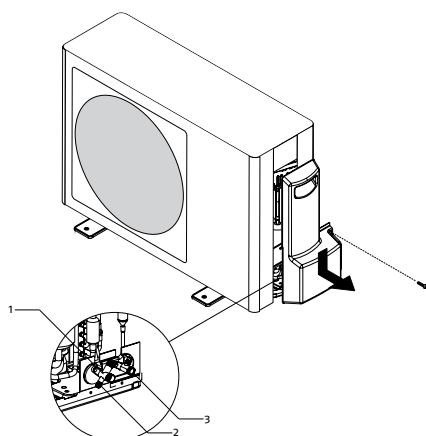
⚠ In the event of a replacement, the system must be inspected by the designer or by another competent person, and must be compliant with the technical requirements, as well as the current legislations and regulations.

⚠ The manufacturer shall bear no responsibility for any damages caused by incorrect system installation.

2.10 Refrigerating connection

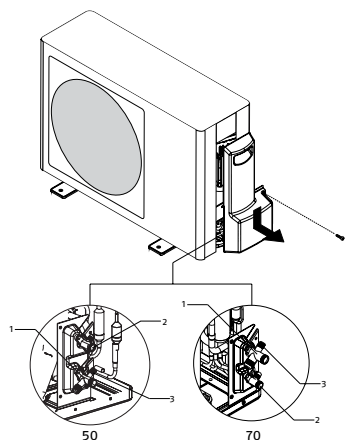
The dimensions and positions of **RIELLO AARIA START** cooling connections are shown hereunder.

MODEL 25 – 35



- 1 Gas line connection
- 2 Service connection
- 3 Liquid line connection

MODEL 50 – 70



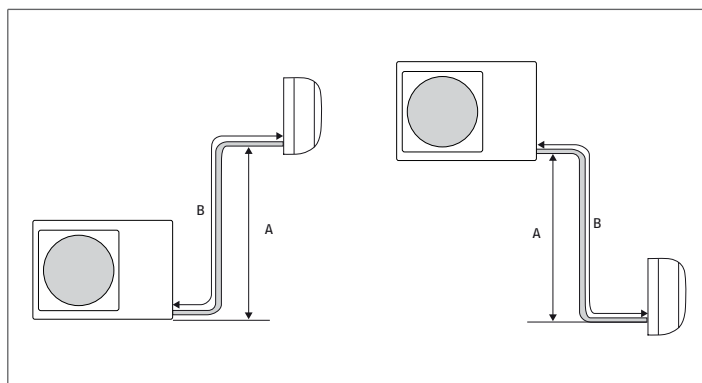
- 1 Gas line connection
- 2 Liquid line connection
- 3 Service connection

Model	25	35	50	70	
Connections					
Liquid line connection		1/4			Pollici
Gas line connection	3/8		1/2		Pollici
Charge connection		1/2			Pollici
Liquid line connection		6,35			mm
Gas line connection	9,52		12,7		mm
Charge connection		12,7			mm

To access the cooling connections:

- unscrew the fastening screw
- push down the connection covering panel
- remove the connection covering panel

The cooling pipes must respect the lengths and differences in height as indicated in the following table.



Model	25	35	50	70	
A	10		15		m
B	15		25		m
Maximum length with standard charge		7			m
Additional charge		20			g/m

Use pipes with the thickness indicated in the following table:

Pipe Ø		Thickness
mm	inches	mm
6,35	1/4	0,8
9,52	3/8	0,8
12,70	1/2	0,8
15,88	5/8	1,0

Maximum operating pressure 4.3 Mpa.

⚠ In case of a drop in excess of 5 m, a siphon must be installed every 5-7 metres.

⚠ The given measures are the maximum permitted values.

⚠ Cooling connections featuring shut-off valves are preconfigured for flare connections.

⚠ Cooling lines must be as straight as possible and any necessary bends must have a radius greater than 40 mm.

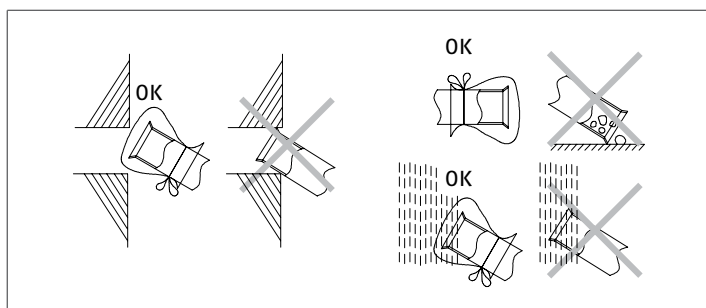
⚠ Use clean hoses. Make sure the inside is free of dust, residues, water.

⚠ Avoid the entry of uncondensable gases (air) in the circuit, otherwise, with the unit in operation, high pressures with the risk of damages might ensue.

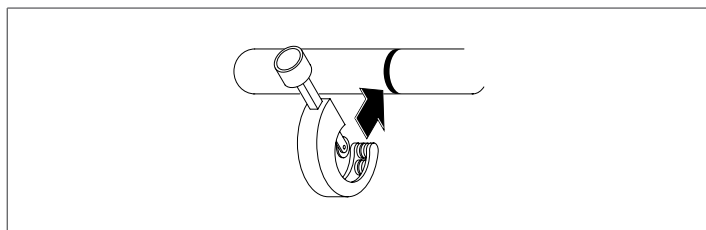
- ⚠** Use copper pipes for cooling systems.
- ⚠** Use connecting pipes and tools appropriate for the system's refrigerant.
- ⊖** It is forbidden to use second-hand cooling lines since their flare connection seal is not guaranteed.
- ⊖** It is forbidden to use pre-charged cooling lines.
- ⊖** It is forbidden to carry out welding operations with refrigerant inside the cooling circuit. If necessary, the refrigerant must be recovered and the circuit must be cleaned with nitrogen without oxygen.

Connections

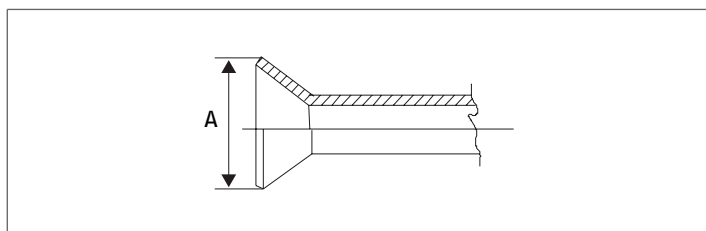
— position the connecting pipes



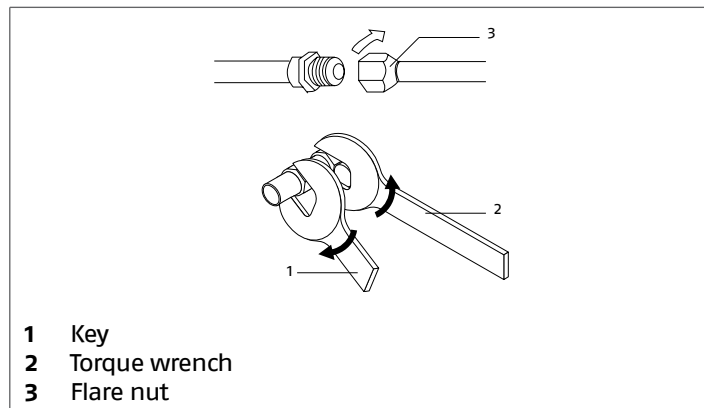
- ⚠** Plug the pipe ends in order to prevent water or debris from flowing in.
- ⚠** Before threading the lines through the hole in the wall, close the lines ends.



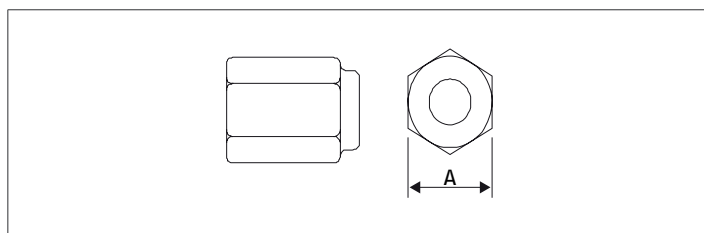
- cut the pipe end square using a pipe cutter
- remove burrs keeping the cut edge facing down
- remove the flare nut on the unit connection
- insert it into the connection pipe
- flare the tube



Pipe Ø		A
mm	inches	mm
6,35	1/4	9,1
9,52	3/8	13,2
12,70	1/2	16,6
15,88	5/8	19,7



Pipe Ø		Tightening torque
mm	inches	Nm
6,35	1/4	18
9,52	3/8	42
12,70	1/2	55
15,88	5/8	60



Pipe Ø		A
mm	inches	mm
6,35	1/4	17
9,52	3/8	22
12,70	1/2	26
15,88	5/8	29

- bring line ends with flare connection close to their coupling on the unit
- manually rotate the flare nuts by 3 - 4 turns
- tighten the connections using a spanner and a counter spanner

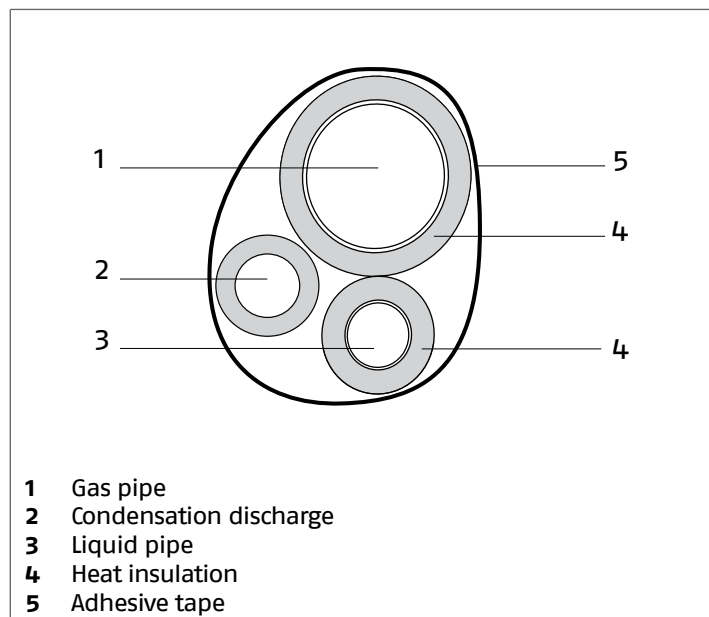
- ⚠** Use a torque wrench to tighten so as to prevent damage to flare nuts and gas leaks.
- ⚠** During the connection, keep the leak finder on and close to the unit so that it signals any refrigerant leak.
- ⚠** Avoid using the refrigerant oil on the external part of the flaring.

After connecting the cooling pipes:

- create a vacuum inside the pipes
- check for refrigerant leaks
- apply thermal insulating material on the joints

Pipe insulation

Connection pipes must be thermally insulated to prevent dispersions of heat or formation of condensate.



- insulate the liquid and gas pipes separately
- use insulating material that is thicker than 15 mm
- ensure that the insulating material adheres to the pipe without gaps
- fix using adhesive tape

⚠ Do not tighten the adhesive tape excessively to prevent damaging the insulation.

⚠ Avoid partial insulation of the pipes.

⚠ In case of use with outdoor temperature above 30 °C and relative humidity above 80%, increase wall thickness up to 20 mm.

For gas pipes:

- ensure that the material used resists to temperatures up to 120°C

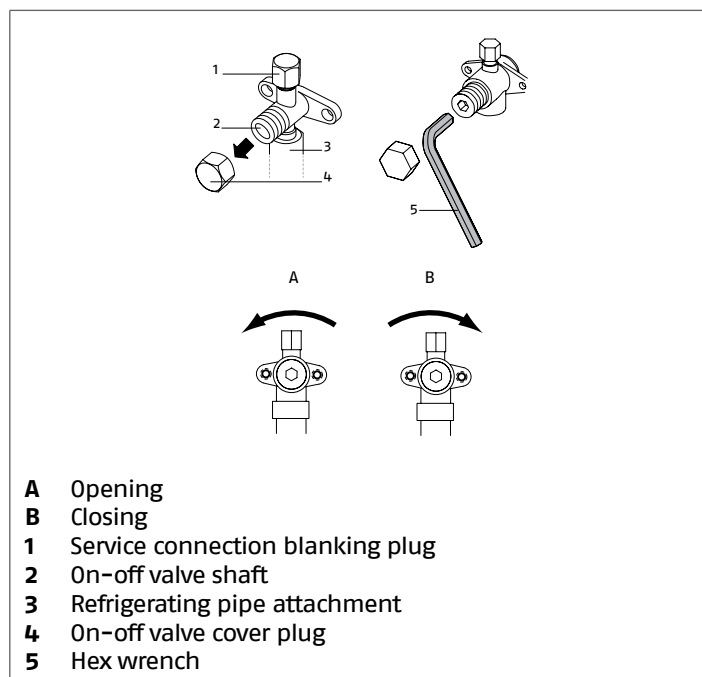
For liquid pipes:

- ensure that the material used resists to temperatures up to 70°C

Stop valves

Cooling connections feature shut-off valves.

During operations on the cooling circuit, start-up and service, it may be required to open and close the valves.



If required:

- remove the valve covering plug
- operate on the valve shaft with an hex wrench
- open or close according to what is needed
- immediately stop as soon as the valve shaft has reached the stop point
- use a torque wrench calibrated on the valve diameter

Pipe Ø		Hex wrench	Valve tightening torque	Plug tightening torque
mm	inches	mm	Nm	Nm
6,35	1/4	5	6	25
9,52	3/8	5	6	25
12,70	1/2	5	8	30
15,88	5/8	5	10	35

⚠ Do not force beyond the stop point to prevent damaging the shaft and causing leakage as a consequence.

At the end of the operations:

- refit the valve covering plug

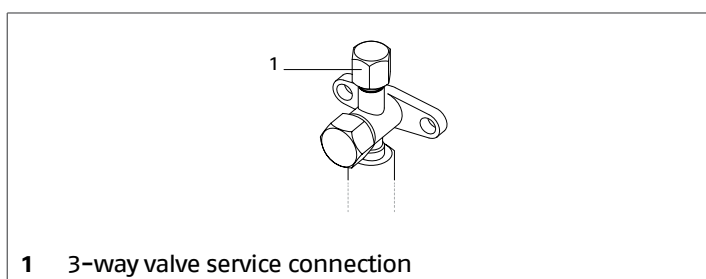
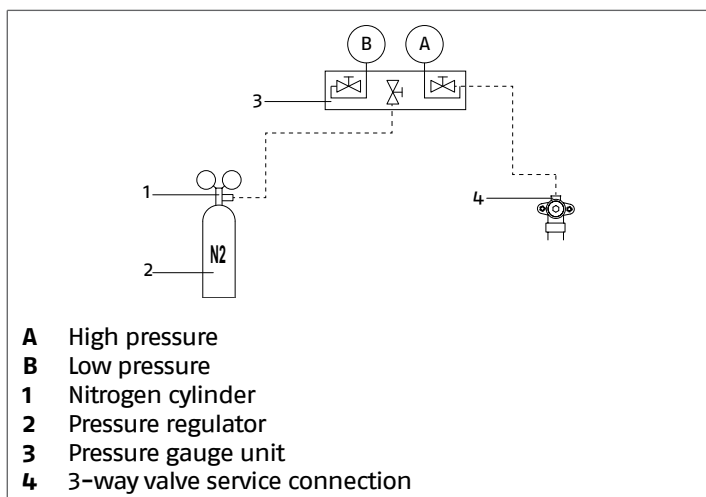
⚠ Carefully check for absence of leakages from the closing point of the plug.

Circuit tightness check

The appliance is tested at the factory and the indoor refrigerating circuit tightness does not usually need to be checked. The refrigerating circuit built on site needs to be checked instead.

To check tightness:

- keep the outdoor unit shut-off valves closed



- charge the circuit with nitrogen through the service connection on the 3-way shut-off valve

⚠ Do not use oxygen or acetylene or other flammable or poisonous gases in the refrigerating circuit, as they can cause explosions.

- reach a pressure equal to 0.3 Mpa
- wait 3 minutes.
- check that the pressure has not dropped
- reach a pressure equal to 1.5 Mpa
- wait 3 minutes.
- check that the pressure has not dropped
- reach a pressure equal to 3 Mpa
- adjust the reached pressure and room temperature
- leave the circuit pressurised for 1 day
- check that the pressure has not dropped

⚠ If the temperature has changed with respect to the noted value consider that the pressure varied by 0.01 Mpa for 1 °C.

⚠ If pressure has dropped, detect the leak, fix it and repeat the test.

⚠ To detect the leak, use a solution of water and soap and check all the joints and welds, if any.

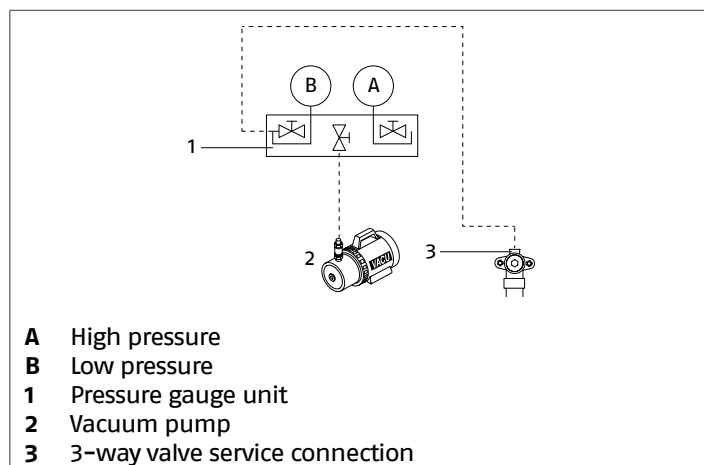
Having verified the absence of leakages:

- create a pneumatic vacuum inside the circuit

Pneumatic vacuum

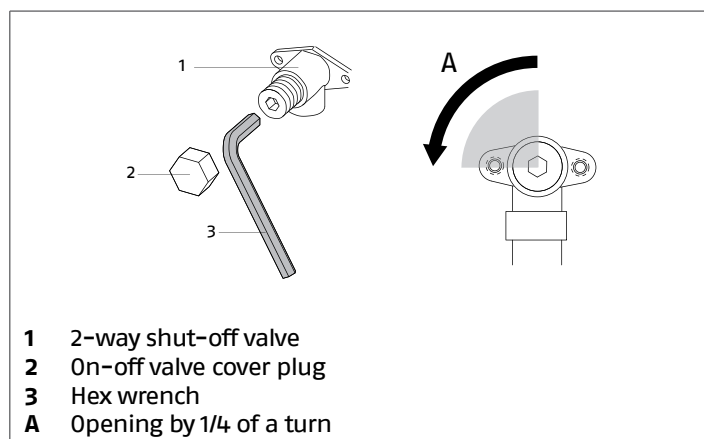
To create vacuum in the circuit:

- keep the outdoor unit shut-off valves closed



- connect the vacuum pump to the pressure gauge unit
- connect the pressure gauge unit to the service connection on the 3-way shut-off valve
- completely close the pressure reducing valve of the pressure gauge
- fully open the low pressure valve of the pressure gauge unit
- let the vacuum pump work for at least 15 minutes
- reach a pressure that is close to -0.1 Mpa
- close the low pressure valve of the pressure gauge unit
- switch off the vacuum pump
- wait 5 minutes
- check that the pressure has not risen again

If the pressure has risen again:



- open the 2-way shut-off valve by a quarter of a turn
- close it after 6 seconds so as to allow a small quantity of refrigerant into the circuit
- detect the leak using a solution of water and soap
- fix the leak
- recreate the pneumatic vacuum

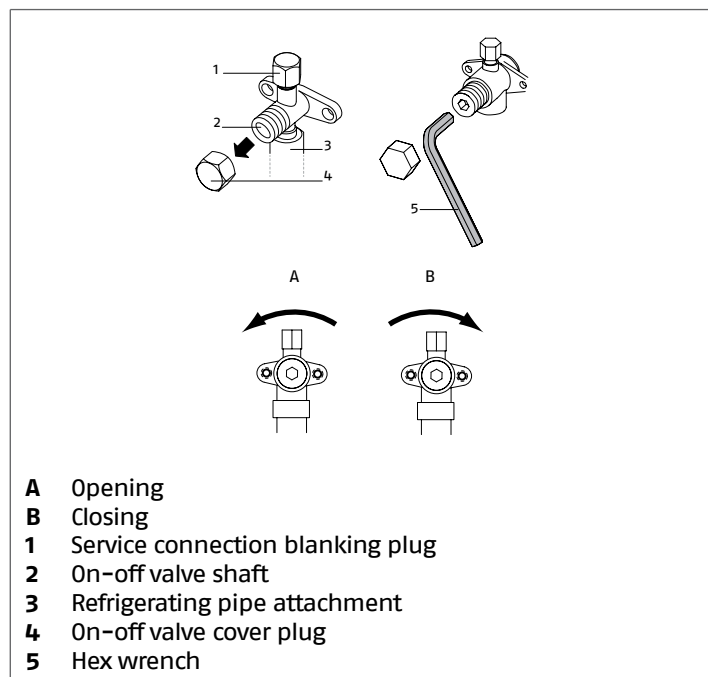
⚠ Take the necessary safety precautions for the system refrigerant.

⚠ It is forbidden to carry out welding operations with refrigerant inside the cooling circuit. If necessary, the refrigerant must be recovered and the circuit must be cleaned with nitrogen without oxygen.

⚠ It is forbidden to use detergents containing chlorine because it could react with the refrigerant and corrode the copper pipes.

If the pressure has not risen again:

- remove the tube of the pressure gauge unit from the service connection on the 3-way shut-off valve

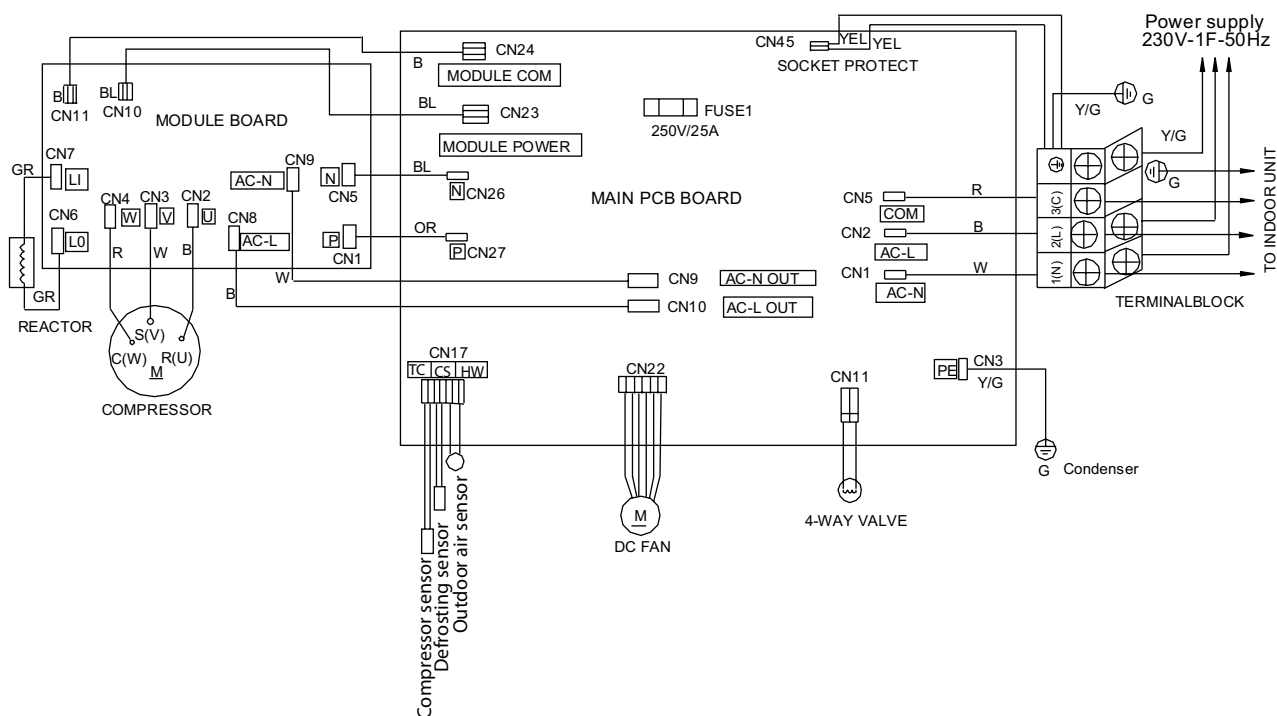


- fully open the unit shut-off valves
- refit the valve covering plug

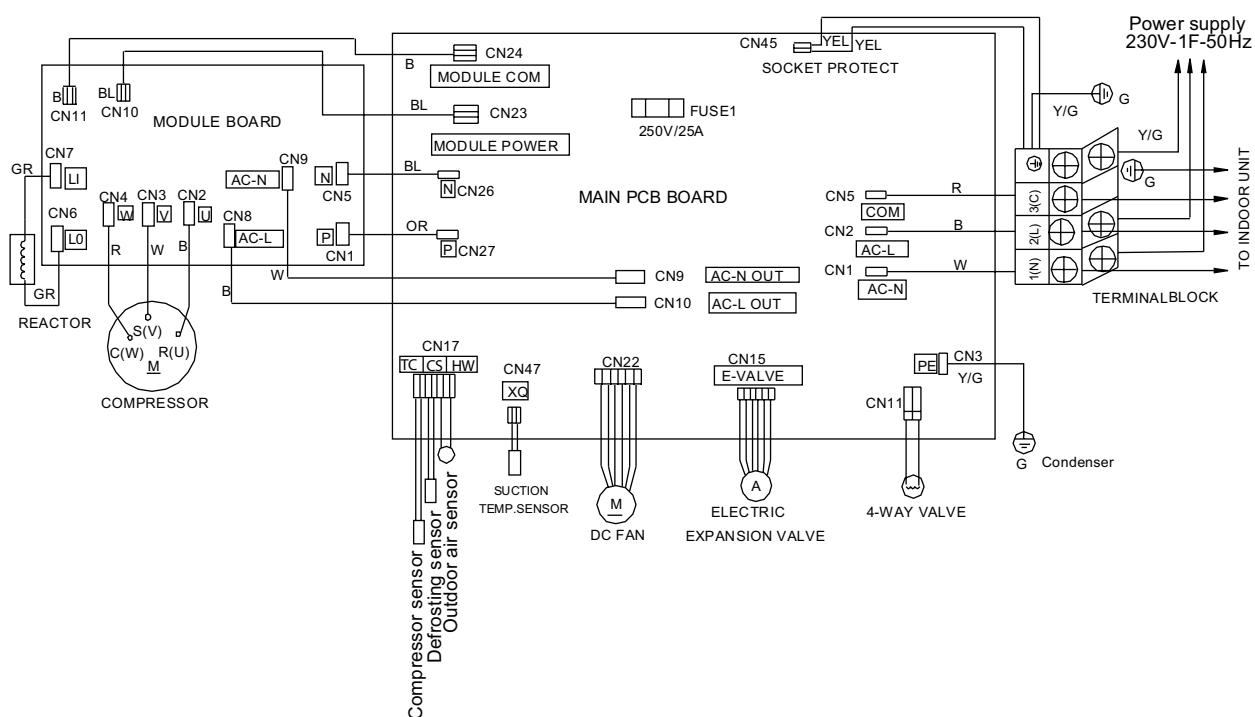
- ⚠** Carefully check for absence of leakages from the closing point of the plug.
- ⚠** Do not force beyond the stop point to prevent damaging the shaft and causing leakage as a consequence.
- ⚠** Once the check has been completed, remove any residues of the water-soap solution.
- ⚠** Do not use the same vacuum pump with different refrigerants.
- ⚠** The vacuum pump must be periodically serviced and oil purity must be checked.
- ⚠** After having created the vacuum and established the electric connections, proceed with the additional refrigerant charge (see chapter "Additional refrigerant charge" *p. 23*).

2.11 Wiring diagram

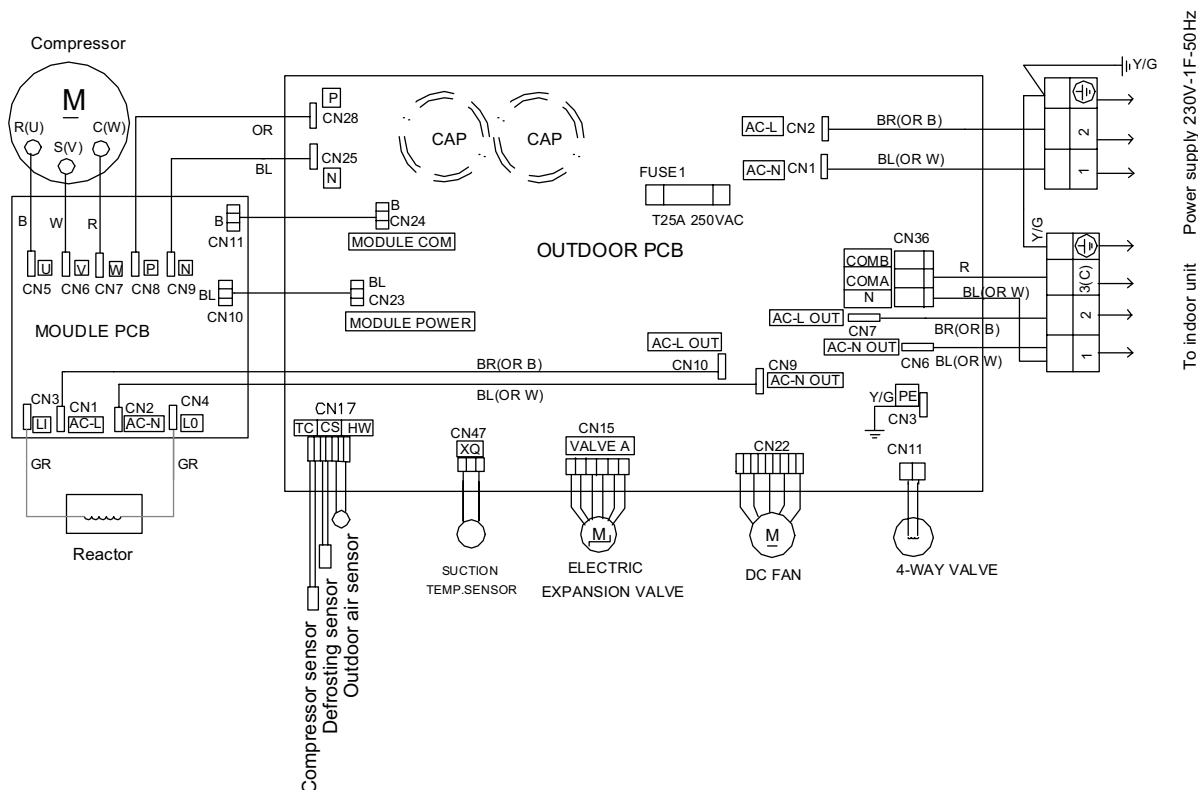
MODEL 25



MODEL 35



MODEL 50 - 70



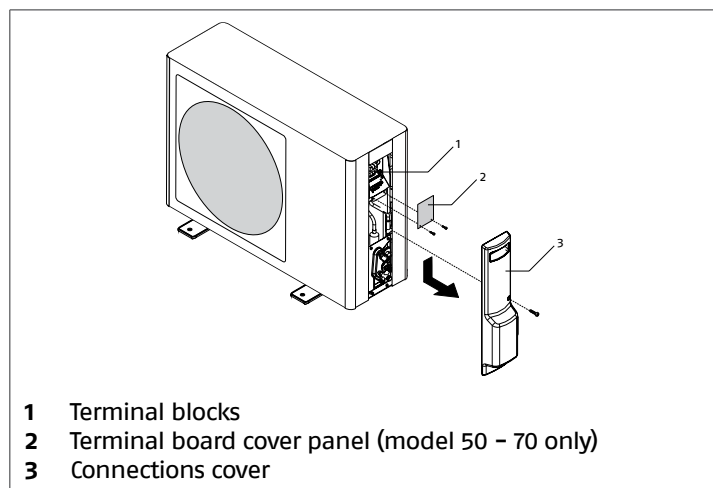
2.12 Electrical connection

AARIA START It leaves the factory completely wired, and only requires a connection to the electrical power grid, the installation of a padlockable disconnecting switch, and a connection to the indoor unit.

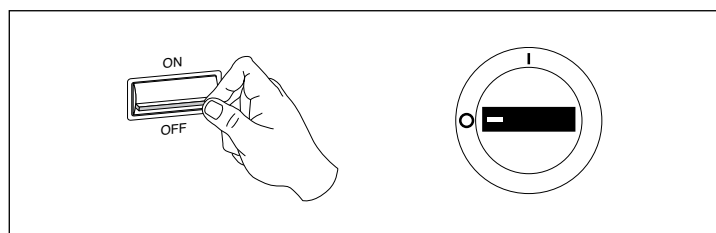
⚠ The unit must be powered with a separate electric circuit.

⚠ Wait 10 minutes before touching the device electric components.

To access the terminal board:

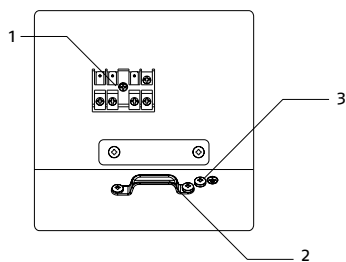


- unscrew the fastening screw
- push down the connection covering panel
- remove the connection covering panel
- unscrew the fastening screws
- remove the terminal board cover panel



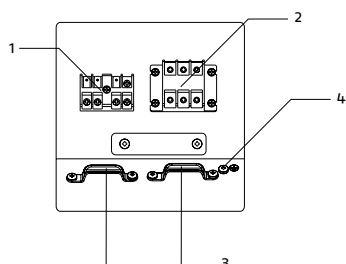
— set the system main switch to "OFF"

MODEL 25 - 35



- 1 Terminal blocks
- 2 Wire retainer
- 3 Earth screw

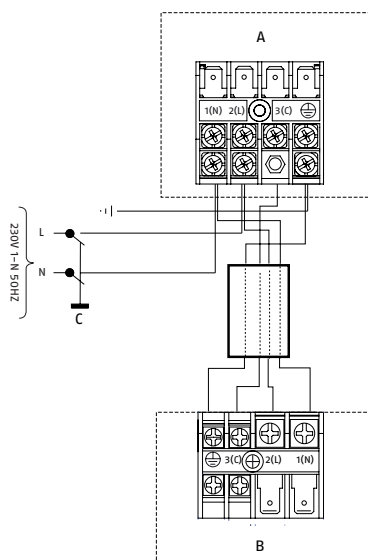
MODEL 50 - 70



- 1 Connection terminal board with indoor unit
- 2 Power supply connection terminal board
- 3 Wire retainer
- 4 Earth screw

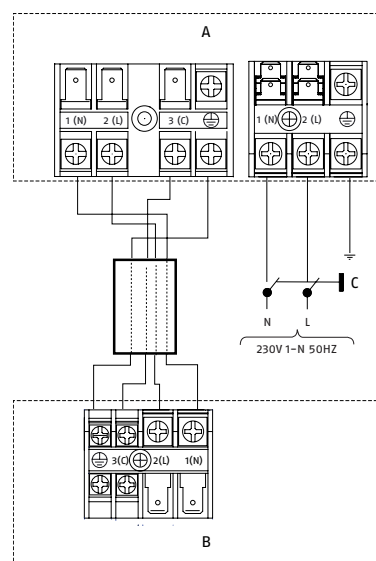
- remove the wire retainer
- make electrical connections according to the diagrams below

MODEL 25 - 35

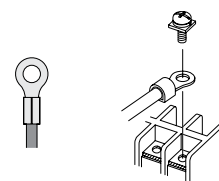


- A Outdoor unit
- B Indoor unit
- C System main switch

MODEL 50 - 70



- A Outdoor unit
- B Indoor unit
- C System main switch



! It is compulsory to use ring crimp terminals to connect to the terminal board.

For the sizing of the electrical power cables and safety devices, use the following table:

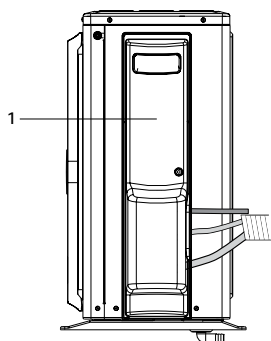
Model	25	35	50	70	
Electrical characteristics					
Power supply	230/1/50				V/Ph/ Hz
Protection factor	24				IP
Protection against short circuit	20		25		A
Protection against overcurrent	15		20		A
Ground protection	20		25		A
Residual current	30				mA
Starting current	1,00				A
Power cable	H07RN-F				Type
Power cable	3 x 1,5		3 x 2,5		n. x mm ²
Signal cable	1 x 1				n. x mm ²

! The cable sections specified in the table are minimum requirements. The correct size must be calculated taking into account the actual length, the type of routing and other conditions set by the existing regulations.

- fasten the wires with the wire retainer
- complete the electric connections and refit all components

by performing the described operations in reverse order

MODEL 25 - 35



1 Connections cover

⚠ Electric connections shall be made in compliance with national regulations.

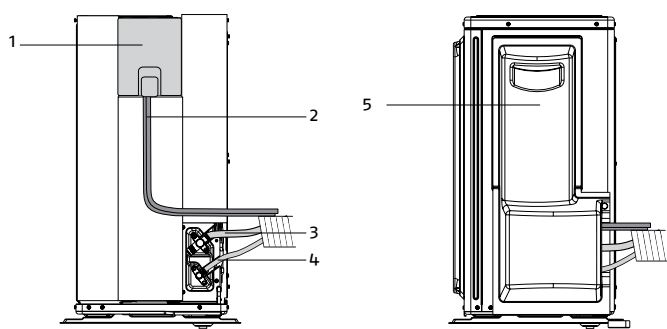
⚠ Avoid placing the connection cables less than 3 metres away from radio and video systems.

⚠ Avoid using mobile phones.

⊖ It is forbidden to earth the device together with pipes, lightning conductors or the earthing system of a telephone line. Using an improper earthing system can cause electric shocks.

⊖ It is forbidden to connect other devices in parallel to the unit.

MODEL 50 - 70



- 1 Terminal board cover panel
- 2 Connection power cables
- 3 Gas pipe
- 4 Liquid pipe
- 5 Connections cover

Check that:

- the characteristics of the power network are suitable for the device usage values
- the power supply voltage corresponds to the nominal value $\pm 10\%$, with a maximum phase imbalance of 3%
- all of the power network disconnect devices must be equipped with contact openings (3 mm) in order to allow for complete disconnection, in accordance with the conditions required

Mandatory items:

- have an omnipolar magneto-thermal circuit breaker and a padlockable disconnecting switch compliant with the IEC-EN Standards (contact opening of at least 3 mm), with adequate breaking power and differential protection, installed near the equipment
- connect the device to a properly functioning earthing system
- make sure that the electrical power supply system is compliant with the current national safety standards
- make sure that the power supply line impedance is consistent with the unit's power consumption, as indicated on the unit's data plate
- for any electrical intervention, always refer to the wiring diagrams contained within this booklet
- take anti-static precautions in case of weather conditions where humidity is less than 40%

3 COMMISSIONING AND MAINTENANCE

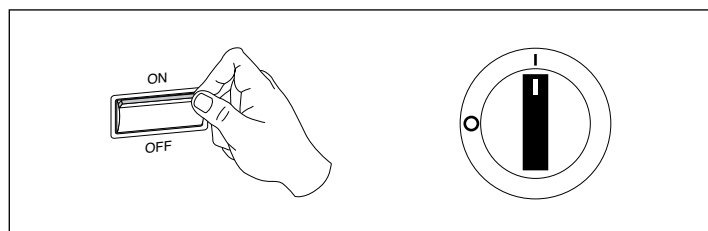
3.1 Preparation for first commissioning

Prior to commissioning, it is necessary to check that:

- all the safety conditions have been met
- the required distances have been respected
- the electrical connections have been properly completed
- the electrical power supply's values are correct
- the earthing has been carried out correctly
- all the connections have been properly tightened
- the shut-off valves are open

A The device must always be powered electrically in order to allow for the compressor's oil to be properly pre-heated.

If the device is installed in very cold areas, the device should be under voltage for at least 12 hours before starting it up for the first time.



- set the system main switch to "ON"

3.2 Putting into service

After having completed all the operations required to prepare for first commissioning, do the following to activate the device:

- follow the instructions given in the manual of the indoor unit that you are installing

A Keep the leak finder on and close to the unit so that it signals any refrigerant leak.

A Use an electronic leak finder properly calibrated for the system refrigerant.

⊖ It is forbidden to use leak finders with halogen lamps.

Checks during and after the first commissioning

After starting the device, check that:

- the current consumed by the compressor is less than the maximum permitted
- the device is operating under the recommended operating conditions
- the unit is able to stop and start up again

A Should any of the above-listed controls have problems: turn the device off and call the Technical Service immediately.

A Do not touch the device pipes to prevent potential burns.

A Take anti-static precautions in case of weather conditions where humidity is less than 40%.

A Avoid using mobile phones.

Additional refrigerant charge

The units are supplied with a sufficient amount of refrigerant gas for a pre-set length of the connection pipes.

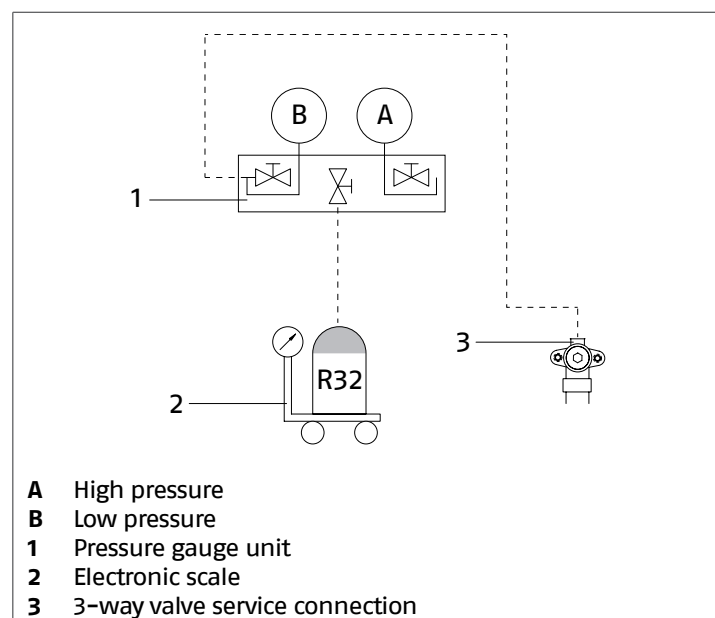
An additional refrigerant charge is needed if such length is exceeded.

The pre-set values are detailed in the following table:

Model	25	35	50	70	
Maximum length with standard charge	7	7	7	7	m
Additional charge	20	20	20	20	g/m

A The device must be earthed before performing the additional charge.

To perform the additional charge:



- connect the refrigerant cylinder to the pressure gauge unit
- connect the charging tube to the service connection on the 3-way shut-off valve
- remove the air from the charging tube
- charge the refrigerant with an electronic scale
- disconnect the charging tube from the service valve
- refit the three-way valve closing plug

A Carefully check for absence of leakages from the closing point of the plug.

A Do not force beyond the stop point to prevent damaging the shaft and causing leakage as a consequence.

A Use equipment suitable for the system refrigerant.

A Use only the system refrigerant.

A Any gas leaks indoors can generate toxic gases if they come into contact with naked flames or high temperature bodies, in case of leaks, please air the rooms thoroughly.

A Take anti-static precautions in case of weather conditions where humidity is less than 40%.

A Avoid using mobile phones.

3.2.1 Refrigerant label

According to EC Regulation No. 517/2014 regarding certain fluorinated greenhouse gases, the total amount of refrigerant contained within the installed system must be indicated. This information can be found on the outdoor unit technical data plate.

RIELLO

QUESTO APPARECCHIO CONTIENE GAS AD EFFETTO SERRA COPERTI DAL PROTOCOLLO DI KYOTO.

È VIETATO DISPERDERE IL GAS R32 DIRETTAMENTE IN ATMOSFERA

Istruzioni per compilare l'Etichetta "F-Gas Label":
1 - Annotare le quantità sull'etichetta con inchiostro indelebile
2 - Collocare l'etichetta sul pannello di protezione (sempre presente assieme al manuale)
3 - Peso equivalente CO2 del sistema in tonnellate = Carica totale in kg / 1000 x GWP

INFORMAZIONI SUL REFRIGERANTE	
Refrigerante	: R32
GWP	: 675
Carica di fabbrica	: <input type="text"/> kg
Carica aggiuntiva	: <input type="text"/> kg
Carica totale	: <input type="text"/> kg
Peso equivalente CO2	: <input type="text"/> t

A Standard charge

B Additional charge

C Total charge

D Equivalent total weight of CO2

To fill in the tag:

- note the quantity onto the label with indelible ink
- place the refrigerant gas label on the outdoor unit

A This unit contains fluorinated greenhouse gases covered by the Kyoto protocol. Maintenance and disposal activities must be carried out exclusively by skilled personnel.

A Global warming potential of the R32 refrigerant gas: GWP=675

A If necessary, the refrigerant must be recovered and not dispersed into the environment.

⊖ It is forbidden to disperse the refrigerant into the environment.

3.3 Ordinary maintenance

Periodical maintenance is fundamental to keep the device efficient, safe and reliable over time, and it can be carried out on a regular basis, depending on the type of intervention required, by our Technical Support Service, which is technically trained and licensed and can also provide original spare parts if necessary.

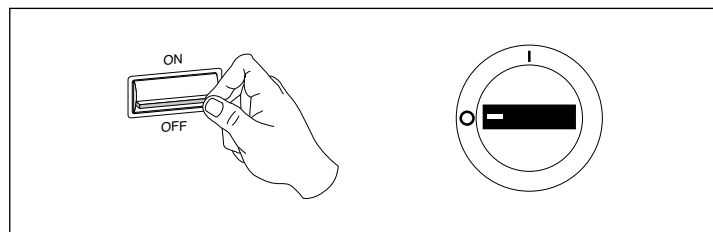
A For units installed in a seaside environment, the maintenance intervals shall be halved.

A Original conditions must be restored after performing the required maintenance operations.

A All described operations **MUST** be carried out under the following conditions:

- cold device
- device NOT supplied with electric power
- suitable personal protection equipment

⊖ It is forbidden to open the access doors and carry out any technical or cleaning operation before disconnecting the device from the power supply by positioning the system main switch to "OFF"



- set the system main switch to "OFF"

A Wait 10 minutes before touching the device electric components.

A Check with a tester that the voltage between connectors CN25 and CN 28 of the main electronic board is lower than 10 Vdc.

Yearly operations

The annual maintenance plan includes the following checks:

- power supply voltage
- electric connection tightening
- status of cooling and hydraulic joint
- finned coil cleaning
- electric absorption
- fan grille cleaning

Cleaning the heat exchanger fins

The thermal exchange bank must be cleaned with compressed air.

Cleaning must be performed at least once a year, depending on the location, because the dirt gathering in the rows narrows the passageway section and reduces the exchange capacity.

- check the alignment of the aluminium fins of the coil and, if necessary, straighten them with a suitable comb
- check that the condensate discharge pipe is clean

A Do not use any means to accelerate the defrosting.

A Do not use systems different from the ones indicated in this manual.

Emptying of the evaporator

This operation may be necessary to perform reparations on the low pressure side (evaporator), the device reallocation or the replacement of the indoor unit without losing the whole refrigerant charge.

Proceed as follows:

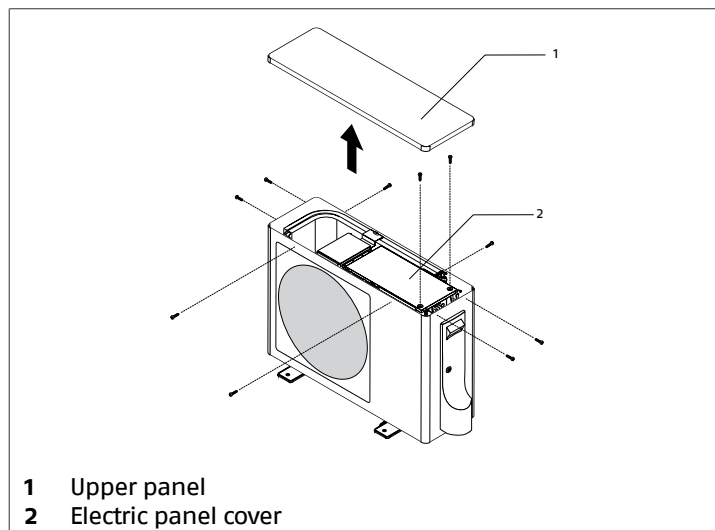
- remove the covering plug from the shut-off valve
- check that the three-way shut-off valve is fully open
- let the device operate in cooling mode for 10 - 15 minutes
- stop the device for about 3 minutes
- connect the charging tube of the pressure gauge unit to the three-way valve service connection on gas side
- vent the air from the charging tube
- close the two-way shut-off valve on liquid side
- operate the equipment in cooling mode until pressure gauge reads a suction pressure of approx. -1 MPa
- close the three-way shut-off valve on gas side
- stop the unit
- disconnect the pressure gauge unit
- refit the valve covering plug

A Carefully check for absence of leakages from the closing point of the plug.

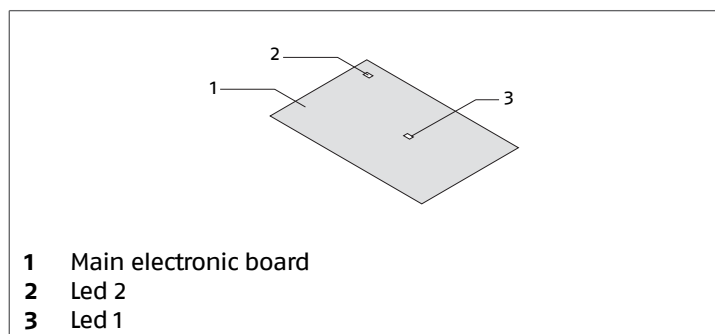
3.4 Operation signal and alarms

Signals are displayed by means of LEDs on the unit main electronic board.

Proceed as follows to access the filters:



- unscrew the fastening screws
- remove the top panel
- unscrew the fastening screws
- remove the electric panel cover



The unit operation is signalled with LED 2.

Led 2	Description
On	Indicates that the unit is supplied with electricity
Off	Indicates that the unit is not supplied with electricity

After the LED switches off:

A Wait 10 minutes before touching the device electric components.





Faults are signalled by means of LED 1 blinking.

Led 1	Description	Remarks
1	External unit microprocessor fault	The unit resets after problem resolution
2	Power module fault	After 3 consecutive interventions in 10 minutes, the unit resets after problem resolution

Led 1	Description	Remarks
3	Main electronic board protection against overcurrent	After 3 consecutive interventions in 30 minutes, the unit resets after problem resolution
4	Communication error between main board and power module	The alarm activates 4 minutes after the unit start The unit resets after problem resolution
6	Wrong power supply voltage	The unit resets after problem resolution
7	Compressor lockout	After 3 consecutive interventions in 10 minutes, the unit resets after problem resolution
8	Overheat protection for compressor discharge	The unit resets automatically when the temperature drops under 110°C After 3 consecutive interventions in 30 minutes, the unit resets after problem resolution
9	Fan motor malfunction	After 3 consecutive interventions in 30 minutes, the unit resets after problem resolution
10	Defrost temperature sensor failure	The unit resets after problem resolution
11	Suction probe fault or suction overtemperature	The unit resets automatically when the temperature drops under 40°C or after problem resolution
12	External air probe fault	The unit resets after problem resolution
13	Discharge temperature sensor failure	The alarm activates 4 minutes after the unit start After 3 consecutive interventions in 30 minutes, the unit resets after problem resolution
14	Compressor suction overtemperature	The alarm activates 10 minutes after the unit start The alarm activates if temperature exceeds 40°C for 5 consecutive minutes The alarm resets after problem resolution
15	Communication error between outdoor and indoor unit	The alarm activates 4 minutes after the unit start The unit resets after problem resolution
16	Lack of refrigerant	The alarm activates 5 minutes after the unit start After 2 consecutive interventions in 20 minutes, the unit resets after problem resolution
17	4-way valve malfunction	The alarm activates 5 minutes after the unit start The alarm activates when, in Heating mode, the temperature detected by the indoor unit heat exchanger probe is less than or equal to 15°C for 1 minute and for 3 times in an hour
18	Deviate from the normal for the compressor	The unit resets after problem resolution
19	Power module malfunction	After 3 consecutive interventions in 10 minutes, the unit resets after problem resolution

Led 1	Description	Remarks
20	Electronic board overtemperature protection sensor fault	After 3 consecutive interventions in 1 hour, the unit resets after problem resolution
21	Internal unit overload	The unit resets after problem resolution
22	Internal unit anti-freeze protection	The alarm activates when the indoor unit heat exchanger probe is lower than the setpoint for 2 minutes The unit resets after problem resolution
24	Compressor motor overcurrent	The unit resets automatically
25	Overcurrent protection for single- phase of the compressor	The unit resets after problem resolution

In the presence of operating abnormalities, the unit is secured and blocked.

-  Safety block can occur randomly.
-  Wait for at least 10 minutes before restarting the unit.
-  If the fault occurs again, an accurate check of the device components is required. Contact **RIELLO** Technical Support Service.
-  Indoor units with display signal faults with an alphanumeric code. Consult the matching outdoor unit instruction booklet for the installer.

4 DISPOSAL

Packaging materials shall be disposed of separately so as to recover and recycle them. Refrigerant and oil must be recovered and not dispersed into the environment. At the end of its service life, the device shall be disposed of according to the existing legislation.



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As the manufacturer is constantly improving its products, the aesthetic or dimensional features, the technical data, the equipment and accessories indicated could be subject to variations.