stefani®
SMART THINKING

USE, MAINTENANCE AND INSTALLATION MANUAL

OSTRO / OSTRO-L / OSTRO-XL

CONDENSERS (H) AND LIQUID COOLERS (W)
WITH AXIAL FANS

CODE: DMOSTEN00001
DATE: 01/04/2025
REVISION: REV.00

EN Version in English language
Read carefully before use

CE

Index

1 General information: purpose of the manual

This manual is released as a tool and a guide to the installation and use of the partly completed machinery referred to here below as equipment.
It contains information regarding machine installation, use, maintenance and fault finding.
It provides indications regarding the most suitable behaviour to adopt for the correct use and operation of the equipment.
This manual is specifically reserved for use by the installer.

DANGER
To function correctly without being damaged, the equipment described in this manual must be integrated in a refrigeration/air conditioning system with suitable characteristics.
All starting, stopping and use procedures for this equipment must be described in the system manual.

Read this manual before using the equipment or servicing it in any way.

STEFANI S.p.A. declines any responsibility relating to not recommended uses of the equipment. Observe the specifications in this manual.

The manual constitutes an essential safety requirement and must accompany the equipment throughout its life cycle.

It is essential to keep and make this manual available to all people involved in the installation, use and maintenance of the equipment.

This manual and its contents may not be reproduced or transmitted to third parties without prior authorisation from STEFANI S.p.A.

1.1 How to consult the manual

- This manual is divided into chapters, paragraphs and subparagraphs listed in the index: an easy way to find your way to any topic of interest.
- The symbol used provides an immediate indication of the nature of the message. For example, the following symbol indicates an obligation.

Mandatory sign.

1.1.1 Description of the symbols found in the manual

Below are the different symbols used in the manual to highlight particularly important information.

DANGER
Indicates a HIGH LEVEL hazard which, if not avoided, could result in serious injury or death.

WARNING
Indicates a MEDIUM LEVEL hazard which, if not avoided, could result in serious injury or death.

CAUTION
Indicates a LOW LEVEL hazard which, if not avoided, could result in minor or moderate injury.

PROHIBITION SIGN
Indicates prohibited operations, failure to comply with which may damage the operator and/or the equipment.

MANDATORY SIGN
Indicates operations to be carried out; failure to comply with this sign may damage or affect the equipment.

NOTICE
Indicates critically important information or insights.

REFERENCE
Refers to an attached document which should be viewed.

1.2 Professional figures involved

Below is a description of the professionals who can operate the equipment, depending on the type of task to be carried out.

Operator
The professional responsible for checking and cleaning the equipment.

Refrigeration system technician
Specialised skilled technician capable of independently carrying out the work necessary for the assembly, installation and maintenance/repair of refrigeration systems and equipment and meeting the currently applicable legal requirements.

Manufacturer's technician
Qualified technician made available by the manufacturer to carry out complex operations in specific situations or in any case as agreed with the user.

It is up to the owner of the equipment to identify the personnel to be appointed as Operator and Refrigeration System Technician.

1.3 Use and storage of the manual

WARNING
Read this manual carefully before installing and operating the equipment, or servicing it in any way.
Failure to read the manual may prevent dangerous situations from being acknowledged - which may result in the operator or other persons becoming fatally or seriously injured.

This manual aims to provide all the information necessary for the correct installation and use of the equipment.

In case of doubts about the correct interpretation of the information included in the documentation provided, contact the manufacturer for the necessary clarifications.

All users and professionals concerned must carefully read the instructions contained in this manual and any attachments before carrying out any operation on the equipment.

The study and optimisation of the manufacturing process for which the equipment was purchased is the responsibility of and should be carried out by the end user.

CAUTION
Keep this manual and all attached literature in good condition, legible and complete in all its parts. Keep the machinery literature near the equipment, in an accessible place known to the user and all the professionals concerned.

WARNING
Keep the manual in its original condition. It is forbidden to rewrite, alter or delete any pages of the manual and their content. The manufacturer declines all responsibility for any damage to people, animals or property caused by failure to comply with the warnings and operating instructions contained in this manual.

This manual makes an integral part of the equipment and should be kept for future reference.

CAUTION
This manual must be handed over with the equipment if the equipment is transferred/sold to another user.

CAUTION
In case of loss or deterioration, another copy of this manual can be requested from the manufacturer specifying the document identification data and the model/item code of the equipment.

1.4 Manufacturer ID

STEFANI S.p.A.
Via del Lavoro 9
36020 - Castegnero (VI) - Italia
Tel. +39 0444 639999
E-mail: info@stefani-online.it
Web: www.stefaniexchangers.com

1.5 Proprietary information

This manual and/or any of its parts may not be reproduced or transmitted to third parties without prior authorisation from the manufacturer STEFANI S.p.A.

1.6 Declaration of Incorporation

The declaration of incorporation can be downloaded from the portal via the link provided to the customer.
To download the Declaration of Incorporation the transport document number must be known.

STEFANI S.p.A.
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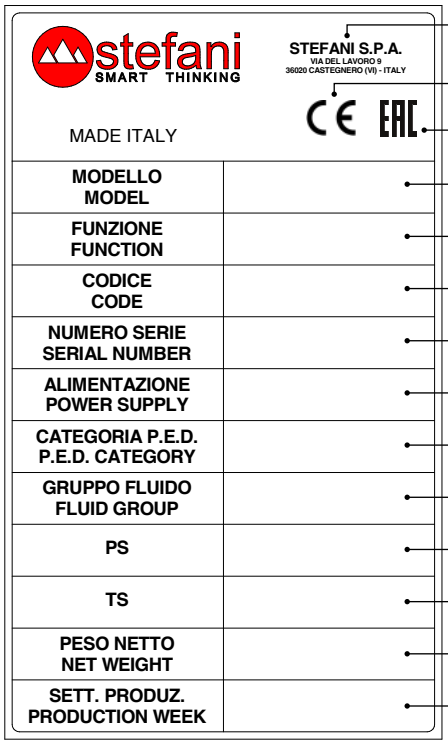
DICHIARAZIONE DI INCORPORAZIONE DI QUASI MACCHINA	DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINE
ai sensi della Direttiva 2006/42/CE, Allegato IIB	as specified in the Directive 2006/42/EC, Annex IIB
STEFANI S.p.A. dichiara che il seguente prodotto / quasi-macchina:	STEFANI S.p.A. declares that the following product / partly completed machine:

Modello	***Model***	**OSTRO-L H 90-9.2 C2,1 V EC 06D**
Funzione	***Function***	**CONDENSATORE INDUSTRIALE**
Codice	***Code***	
Serial number		Serial Scambiatore/Exchanger
Ordine	***Order***	**O.C.**
Data	***Date***	**DDT**

è stato costruito in conformità alle direttive: • 2006/42/CE (Direttiva Macchine) • 2014/30/EU (Direttiva Compatibilità elettromagnetica) • 2014/35/EU (Dir. Bassa Tensione) Dichiara altresì che la quasi-macchina è conforme ai seguenti requisiti essenziali della Direttiva 2006/42/CE :	have been manufactured in conformity to the directives: • 2006/42/EC (Machinery Directive) • 2014/30/EU (Electromagnetic Compatibility Directive) • 2014/35/EU (Low Voltage Directive) The partly completed machine is in accordance to the following essential requirements of the Directive 2006/42/EC :
1.1.2 - 1.1.5 - 1.2.2 - 1.2.6 - 1.3.1 - 1.3.2 - 1.3.4 - 1.3.7 - 1.3.8 - 1.3.8.1 - 1.3.8.2 - 1.3.9 - 1.4.1 - 1.4.2.1 1.5.1 - 1.5.2 - 1.5.4 - 1.5.5 - 1.5.7 - 1.5.8 - 1.6.1 - 1.6.2 - 1.7.1 - 1.7.2 - 1.7.4.1	
La documentazione tecnica pertinente è conforme all' Allegato VII B della stessa direttiva. È inoltre conforme alle altre Direttive sopra indicate. **La persona autorizzata a costituire la documentazione tecnica pertinente stabilita nella Comunità è:**	The pertinent technical documentation is in accordance to the Annex VII B of the same Directive and to the above mentioned Directives. **The person authorised to compile the relevant technical documentation, established in the EC, is:**
in qualità di Direttore Generale della Stefani S.p.A Via del Lavoro 9 - 36020 Castegnero (VI) - ITALIA	as General Manager of Stefani S.p.A. Via del Lavoro 9 - 36020 Castegnero (VI) - ITALIA
Il fabbricante si impegna a trasmettere, a seguito di una richiesta adeguatamente motivata delle autorità nazionali, informazioni pertinenti sulla quasi-macchina. L'impegno comprende le modalità di trasmissione e lascia impregiudicati i diritti di proprietà intellettuale del fabbricante della quasi-macchina.	The Manufacturer undertakes to transmit, in response to a reasoned request by the national authorities, relevant information on the partly completed machinery. This shall include the method of transmission and shall be without prejudice to the intellectual property rights of the manufacturer of the partly completed machinery.
Il prodotto / quasi-macchina non deve essere messo in servizio finché la macchina finale in cui deve essere incorporato non è dichiarata conforme,se del caso, alle disposizioni della Direttiva 2006/42/CE.	**The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the Directive 2006/42/EC, where appropriate.**

RAPPORTO DI COLLAUDO	TEST REPORT
La STEFANI S.p.A. dichiara che lo scambiatore e parti elettriche dell'unità ventilata sono state collaudate con esito positivo.	STEFANI S.p.A. declares that the heat exchanger and the electrical parts have passed test.

1.7 CE marking data plate



- **A** A. Manufacturer name and logo
- **B** B. CE Mark
- **C** C. EAC Mark (EurAseC Conformity)
- **D** D. Equipment model
- **E** E. Equipment function (condenser or cooler)
- **F** F. Code
- **G** G. Serial number
- **H** H. Supply voltage
- **I** I. PED Category
- **J** J. Fluid unit
- **K** K. Rated pressure (PED)
- **L** L. Rated ambient temperature (PED) for equipment operation
- **M** M. Unladen mass (without accessories)
- **N** N. Week of construction

CAUTION
The technical data labels must be replaced if worn or illegible.

1.7.1 How to read the product code

Example of code in use since January 2021

1M	02	005	00001
FIELD 1	FIELD 2	FIELD 3	FIELD 4

FIELD 1	**1M**	Ventilated finished product.
FIELD 2	**01**	Standard catalogue product, software-selected fans.
	02	Catalogue product configured with accessories selected by software, software-selected ventilation.
	03	Catalogue product configured with special accessories not selected by software, special ventilation.
	04	Special product not included in catalogue.
	05	Special customised product.
FIELD 3	**003**	Commercial condenser.
	004	Industrial liquid condenser/cooler.
	005	Commercial liquid cooler.
	100	Industrial liquid cooler.
FIELD 4	**00001**	Equipment progressive number.

1.7.2 Product description

Description of an example product code in use since January 2021

OSTRO	W	90	3.2	D	2,1	V	AC 04D
Model	Type of fluid	Fan diameter Ø	Number of fans	Coil size	Fin spacing	Air flow	Motor drive

1.8 Reference directives and standards

The equipment is designed and built to be incorporated in a more complex system enabling its use and operation.

Directives

- 1999/92/EC laying down the minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres (fifteenth individual directive pursuant to Article 16(1) of Directive 89/391/EEC).EC
- 2006/42/EC Machinery directive.
- 2014/35/EU Low Voltage directive.
- 2014/30/EU EMC (Electromagnetic Compatibility) directive.
- 2014/68/EU (PED Pressure Equipment Directive).
- 2009/125/EC (Energy Related Products) directive establishing a framework for the development of specifications for the eco-design of energy-related products.

Harmonised standards

- UNI EN ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction.
- UNI ISO/TR 14121-2:2013 Safety of machinery - Risk assessment - Part 2: Practical guidance and examples of methods.
- EN 60204 - 1 - Safety of machinery.
- CEI EN 60335 -1 (safety of household and similar electrical appliances).
- UNI EN 378-2:2017 Refrigeration systems and heat pumps - Environmental safety requirements - Part -2: Design, construction, testing, marking and documentation.

1.9 Glossary

Term	Description
Equipment	Term used to define the partly completed machinery covered by this manual.
Manufacturer	Natural or legal person who designed and built the equipment covered by this manual.
Icon	Small image that symbolically represents a command, a function or even a document or an operating software, which is displayed on a computer screen. When selected by the user, it starts the function or program that it symbolises.
Partly completed machine	Partly completed machines are only intended to be integrated in or assembled with other machines or other partly completed machinery or equipment to constitute a machine according to the Machinery Directive.

1.10 Warranty

The equipment warranty lasts 3 years and applies only to the heat exchanger. Fans and components are covered by the 1-year warranty prescribed by law.

The warranty terms can be found on the manufacturer's website. For the website details please refer to par. 1.11

1.11 Support

For any need relating to equipment use, maintenance or orders of spare parts, the user or other professionals concerned must contact the equipment installer/seller directly and then the manufacturer (or a service centre if available), quoting the identification data of the equipment shown on the CE marking plate.
The purchaser can rely on technical and sales support from local agents or importers, who are in direct contact with the manufacturer STEFANI S.p.A.
In the event of any fault or failure that cannot be fixed, the purchaser should contact the manufacturer directly.

Manufacturer contact details
Tel: +39 0444 639999
E-mail: info@stefani-online.it
Address: Via del Lavoro 9, 36020 - Castegnero (VI) - Italy
Web: www.stefaniexchangers.com

In the event of a change of ownership or of the owners moving the equipment elsewhere, the manufacturer or the after-sales service centre concerned should always be notified - even after the end of the warranty period.

2 Equipment overview

The equipment described in this manual is a heat sink equipped with axial fans. It is used to perform liquid cooling (Dry cooler) or gas condensation (condenser/gas cooler) in refrigeration, HVAC or process systems.

CAUTION
The equipment covered by this manual is a “partly completed machine”: to be able to operate, it must be installed within a system specifically designed for the application.

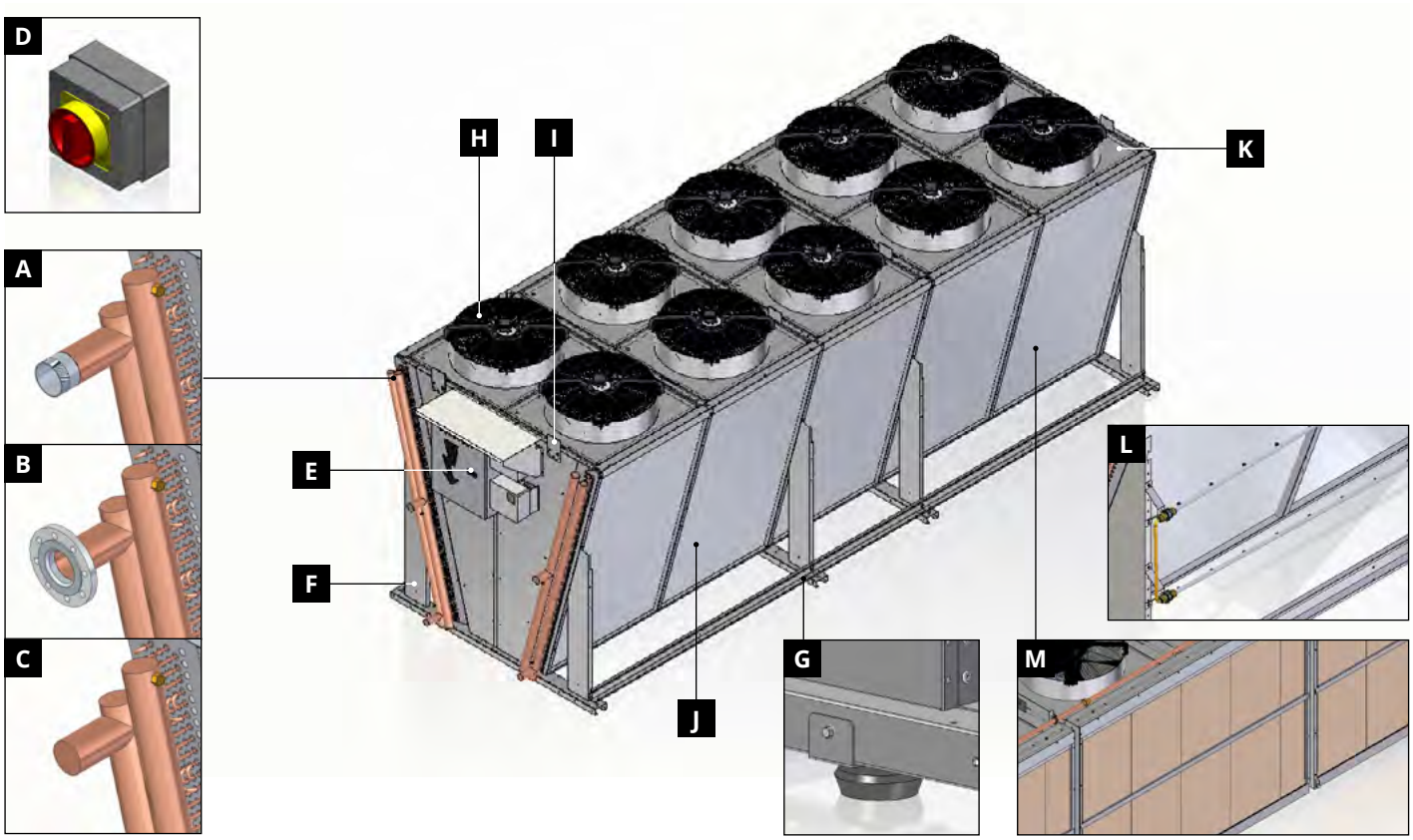
Commissioning should be ensured by whoever is responsible for the system in which the equipment is to be integrated.

The equipment is customisable and can be produced in various models and in various sizes based on use requirements. The main differences between models are:

- The type of refrigerant, gas or liquid mix.
- The number and type of fans.
- The number, type and position of the manifolds and inputs/outputs.
- The footprint.
- Accessories and equipment on request (systems and electrical connections methods and types).

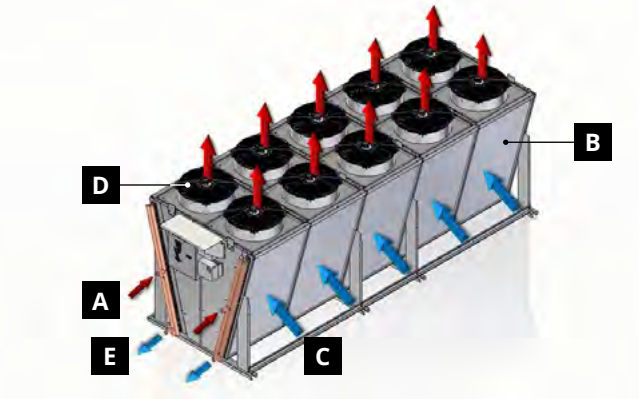
2.1 Parts making up the equipment

The parts that make up the equipment vary according to customer requirements. Find the right solution for you by checking the CE marking plate. See par. 1.7.



A. Liquid fluid manifolds, for operation as a liquid cooler (W). Threaded connector (available up to 3”). Beyond 3” flanged connections are used.
B. Liquid fluid manifolds, for operation as a liquid cooler (W). Flanged connection.
C. Gaseous fluid manifolds, for operation as a condenser (H). Welded connection.
D. Electric fan disconnector switch (on request). Single switch for all fans or one for each fan.
E. Electrical panel with switch or junction box.
F. Support or anchoring point structure.
G. Anti-vibration mounts (on request).
H. Electric fans.
I. Lifting brackets.
J. Exchanger coil.
K. Conveyor.
L. Adiabatic spray system (on request).
M. Adiabatic panel system (on request).

2.2 Operating principle



The refrigerant gas or process fluid enters the cooling coils (B) through the manifolds (A).
Air at atmospheric temperature (cold) (C), taken in by the fans (D) flows through the cooling coils (B) and is let out once heated up in the upper part of the unit.
This process cools the gas or liquid which once cooled will be fed back to the return circuit through the pipes (E).

2.3 Intended and not recommended uses

The equipment is exclusively designed to cool the liquid or gas used in the cooling/air conditioning system.

DANGER
The equipment has not been designed to operate in areas at risk of explosion.

WARNING
The equipment must be used only and exclusively for the purposes for which it was designed and built as established in the contract.

In case of malfunction, failure, breakage etc. always check this manual before servicing the equipment and, if necessary, contact the design department at STEFANI S.p.A..

It is prohibited to use the equipment with products other than those for which it was built as defined in the contract.

2.4 Technical specifications

The operating data, the types of fluid used, the technical and performance specifications are indicated in the technical data sheet of the Stefani selection software. For information on the equipment or to receive a copy of the technical data sheet, please contact STEFANI S.p.A. quoting the serial number shown on the CE marking data plate. (See paragraph 1.7)

For operating conditions outside the indicated limits, please refer to the technical-commercial data sheet approved at the time of ordering.

2.5 Overall dimensions and weight of the equipment

The empty weight of the unit is shown on the data plate provided on the machine.

The correct unit dimensions are indicated exclusively in the construction drawings approved at the time of ordering.

3 Safety

3.1 General warnings

The equipment may only be used by authorised professionals for the sole purpose for which it was designed and built.

DANGER
Before putting the equipment into operation, read this manual thoroughly.

DANGER
Do not use the equipment when under the influence of medications or other substances that may affect your prompt reaction and ability to focus.

DANGER
Authorised professionals should only carry out operations or actions that fall within the sphere of competence of the role and qualification assigned.

WARNING
Do not make any changes to the equipment in order to obtain any other levels of performance than those for which the equipment was designed and built unless authorised by the manufacturer.

WARNING
Do not bypass, remove, modify or otherwise render ineffective the safety, protection and/or control devices of the equipment.

WARNING
Always keep the equipment work areas and access routes free from materials and/or other items that may hinder movement or imply a risk of accidents for the operator.

CAUTION
The work area must always be adequately lit.

DANGER
Do not introduce hands, arms or any other body part into areas with moving parts.

WARNING
At the end of any operation that has required the removal of guards, barriers or other protections, restore them and ensure their original correct positioning and effectiveness.

DANGER
Keep containers containing flammable substances away from the equipment.

The equipment is built in compliance with the technical safety standards in force at the time of its placing on the market.

The safety measures to be adopted in the workplace are listed in a specific directive in force in the country in which the equipment is used. They must be applied and made known to the user.
The safety warnings in this manual are intended to further protect the health of operators.

CAUTION
In case of fire, use powder extinguishers.

3.2 Equipment safety devices

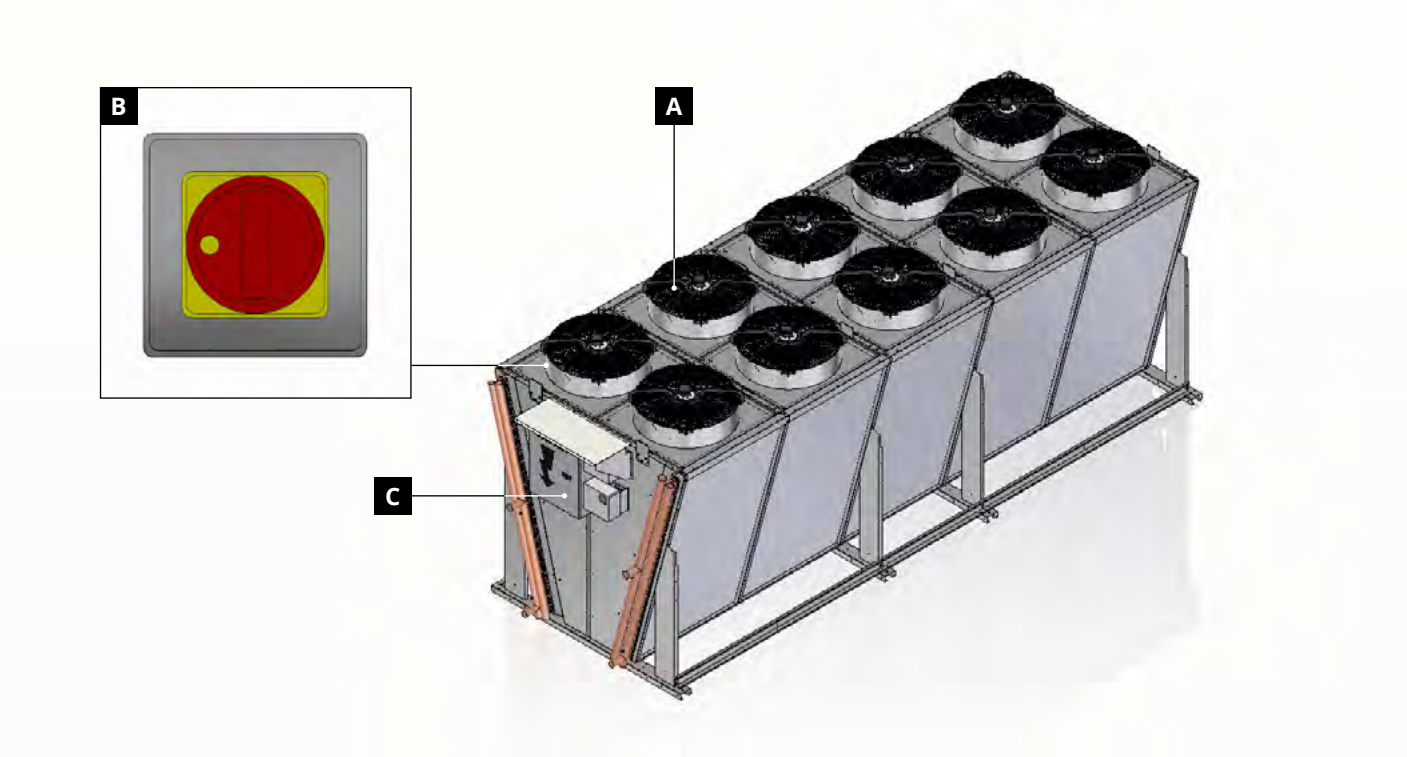
CAUTION
Replacing safety components is an operation that may affect the safety of the equipment.
Safety components should be exclusively replaced by qualified personnel.

The safety devices must be kept in working order. For any replacement of safety components, use original spare parts only.

The equipment safety devices include all the technical means implemented to allow the use of the equipment in safe conditions, in compliance with the regulations in force at the time of equipment construction.
The equipment is provided with fixed guards, and, on a case by case basis and according to customer requests, with disconnector switches and signalling devices as well as warning labels specifically designed to ensure the safety of operators and machining processes.

3.2.1 Fixed guards and safety devices

The following figure shows the location of the guards and of the other safety devices provided or which may be provided on the equipment.



A. Accident prevention grille.
B. Disconnectors for electrical power supply to the fan motors (if provided).
C. Main disconnector switch (if provided).

3.3 Safety labels

The following safety labels are provided on the machine.

CAUTION
The labels must be replaced if worn or illegible.

CAUTION
Moving parts.

CAUTION
Centre of gravity symbol for the safe handling of packaged equipment. The point where the label is affixed is the actual centre of gravity

CAUTION
Symbol indicating electrically live areas near cables, junction boxes and electrical panels: check for no live parts if you need to access the electrical connections

3.4 Personal protective equipment

CAUTION
Depending on the operations carried out on the equipment, it is mandatory to wear personal protective equipment (PPE) as indicated in the following table.

PPE	Operation
	Wear during inspection operations.
	Wear during maintenance operations on the equipment, depending on the service performed.
	Wear when lifting the equipment.

CAUTION
Operators and maintenance workers must observe the accident prevention regulations locally in force in the country of use of the equipment.

CAUTION
Assigned PPE may not be changed. The manufacturer declines all responsibility for any personal injuries caused by failure to use the required PPE.

CAUTION
Operators and technicians should not wear clothing and accessories that could get caught in parts of the equipment, such as: loose clothing, ties, belts, necklaces, bracelets, watches, earrings, rings, etc.

3.5 Residual risks

The parts (A) of the exchanger coil are made up of a series of thin blades used to exchange heat.

DANGER
Abrasion or cut.
The fins of the exchanger coil are very sharp due to their fine thickness.
Wear protective gloves to avoid injuries when cleaning the blades and use special tools to handle them.

DANGER
Moving parts.
If the safety guards or access walls to the ventilation sections are removed, there is a persistent danger associated with the fan impeller movement.

4 Transport and handling

The packaging type and method is chosen based on the means of transport used and the place of destination of the goods.
The packages are always accompanied by a packing list.
Disposal of any packaging up to the installation site is the customer's responsibility.

4.1 General warnings

Upon receipt of the goods, check their condition and immediately report any damage suffered in transport.

WARNING
The indications given in this chapter only refer to the handling of packages on the customer's premises. Assembly and installation should be carried out by the appointed professionals (1.2).

WARNING
Lift the equipment and any equipment parts following the instructions given in this chapter.

WARNING
Use suitable, tested and certified lifting equipment.

WARNING
Lifting and transport must be carried out by personnel specifically trained for this purpose.

CAUTION
The equipment should be stored in a dust-free environment, protected from humidity and aggressive substances, ensuring good ventilation to avoid condensation and re-evaporation cycles on the surfaces.

4.2 Lifting and transporting packaged equipment

DANGER
Be careful during all transport and handling operations. Do not stand under suspended loads.

4.3 Handling

To lift the equipment, follow the instructions in this paragraph.

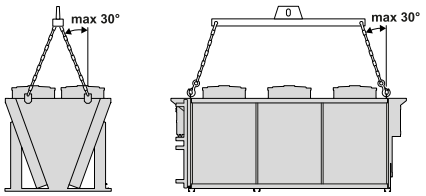
For the weight of the different units see par. 2.5.

The equipment can only be moved with lifting systems using upper or lower lifting points depending on the type of equipment. The lifting systems must be suitable for the shape and weight of the unit.

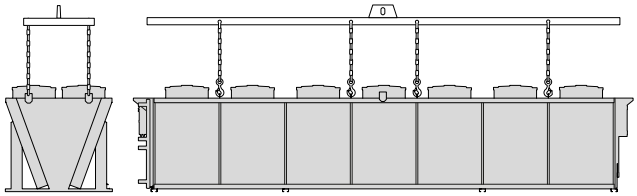
Handling by lifting via top hooking

Lifting method valid for all equipment from module 2.2 to 9.2.

Secure the lifting equipment to the provided hooking points, following the methods shown below.



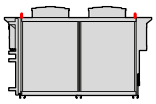
Example of lifting 6 electric fans.



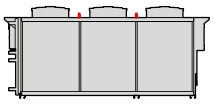
Example of lifting 14 electric fans.

Lifting of different OSTRO models

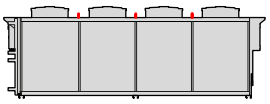
80-90-100/2



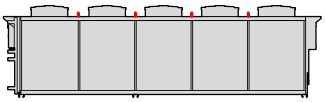
80-90-100/3



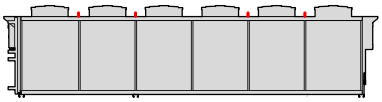
80-90-100/4



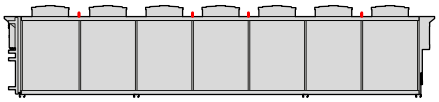
80-90-100/5



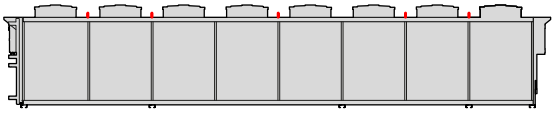
80-90-100/6



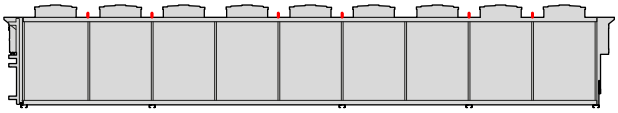
80-90-100/7



80-90-100/8



80-90-100/9



5 Installation

The design of the system in which the equipment is integrated and its installation must be carried out in accordance with the EN 378 standard.

The installation and initial start-up of the equipment should be carried out by professionals. Stefani will not supply any initial start-up service unless previously agreed.

For the required characteristics and skills of installation technicians, see par. 1.2.

CAUTION
The equipment should not be installed if it shows obvious signs of damage.

The hydraulic and electrical connections must be equipped with appropriate disconnecting devices for any maintenance operations to be carried out safely.

The equipment must be protected from water hammer in systems where this phenomenon might occur.

5.1 Unpacking

To remove the packaging (if any), follow the instructions contained in this manual.
Generally the packages consist of lower wooden crosspieces positioned under the support profiles (see chapter 5.3.1 ref. letter A)

Carefully remove the packaging while leaving the unit on the pallet for handling (where applicable).

5.2 Environmental conditions and preparations for installation

The equipment is designed and built to work, in permitted conditions, in an external environment.

5.2.1 Environmental conditions

The area where the equipment is to be installed must ensure good support at ground level or safe anchoring to the ceiling, safe accessibility for operators, good natural and/or artificial lighting (according to current regulations) to guarantee good visibility during servicing and/or inspections with little or no sunlight.

WARNING
The equipment must be installed at a location clearly designated as a technical area so as to allow access to authorised professionals only.

If customised factory provisions are required, in the ordering phase the customer must provide Stefani S.p.A. with the required specifications regarding structures, connections and environmental conditions.

DANGER
The equipment should not be installed in partially and/or totally explosive atmospheres.

5.2.2 Provisions for installation

Depending on the type of equipment to be installed, the following should be provided at the site of installation:

- For liquid-type equipment: liquid recovery system, in case it is necessary to drain the liquid.
- For gas-type equipment: gas recovery system, in case it is necessary to drain the gas.
- System for recovering water used for cleaning the equipment.

5.2.3 Checks before installation

Preconditions necessary for installation:

- Check that all the agreed provisions are available.
- Check that the lighting system is adequate.
- Check that the flooring meets the agreed specifications.

5.3 Positioning and anchoring

DANGER
Be careful during all transport and handling operations.

DANGER
Do not stand under suspended loads.

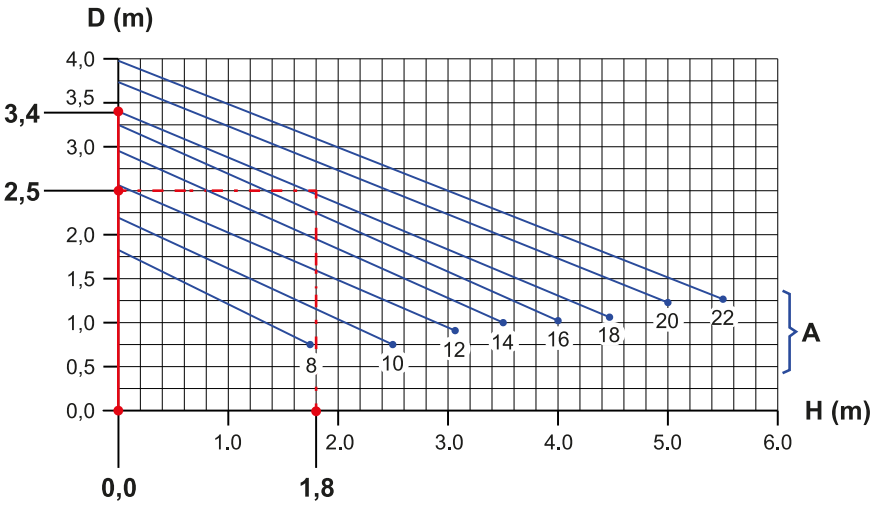
The flooring or structure where the equipment is to be fixed must be suitable to support its weight.

For the weight of the equipment, see par. 2.5.

5.3.1 Distances from walls or other machines

The clearance around the equipment must be sufficient to allow inspections, cleaning and any maintenance to be regularly performed.

The diagrams shown in this paragraph should be used to check the correct distancing of the condensers (equipment) from any walls or the correct gap between condensers.

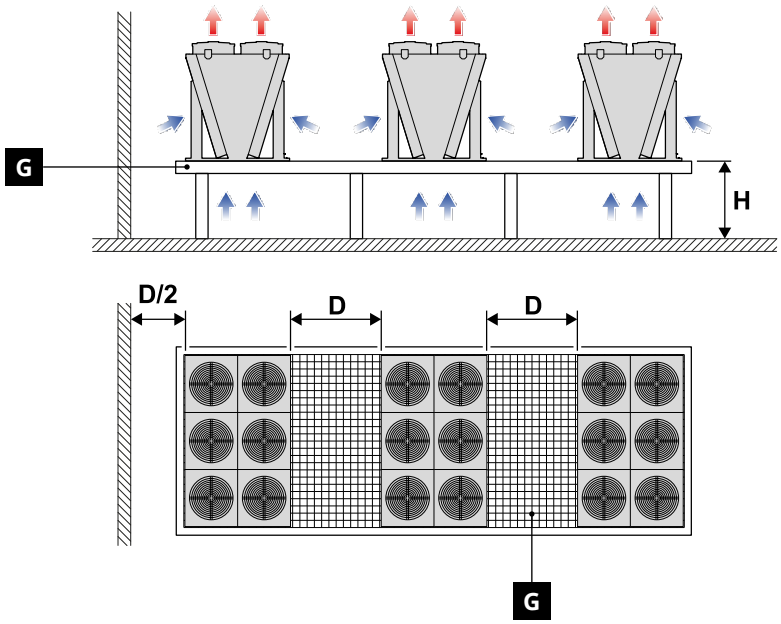


The graph shows that the distance D (m) varies between approximately 1.8 and 4 metres depending on the number of fans and on the installation height above ground.
A = number of fans.
D (m) = distance in metres between equipment units.
H (m) = installation height above ground on a grille (G) for the passage of air.
This application example refers to an installation with 3 condensers having 6 fans each.

Table with application example

A = number of fans	H (m)	D (m)	D/2 (≥ 0,7 m) *
18	0,0	3,4	1,7
18	1,8	2,5	1,25

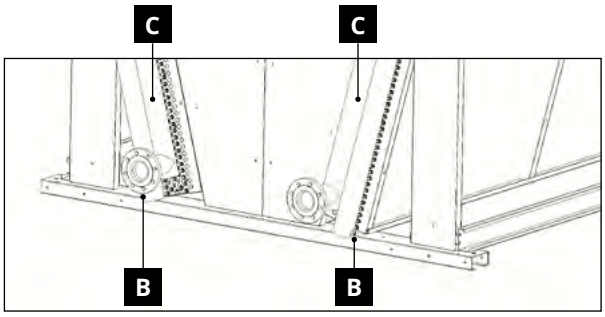
* The distance from the wall must be greater than 0.7 m.

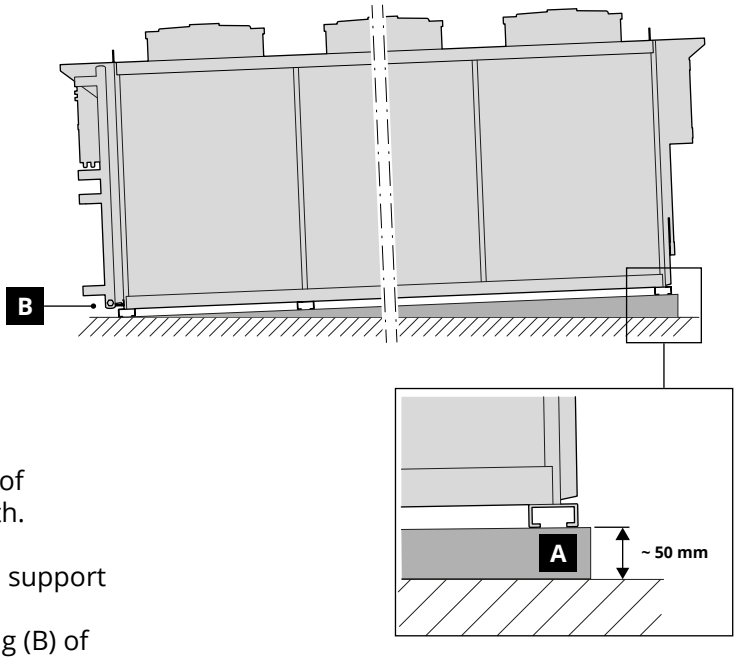


G = Grille for the passage of air.

5.3.2 Positioning, levelling and anchoring

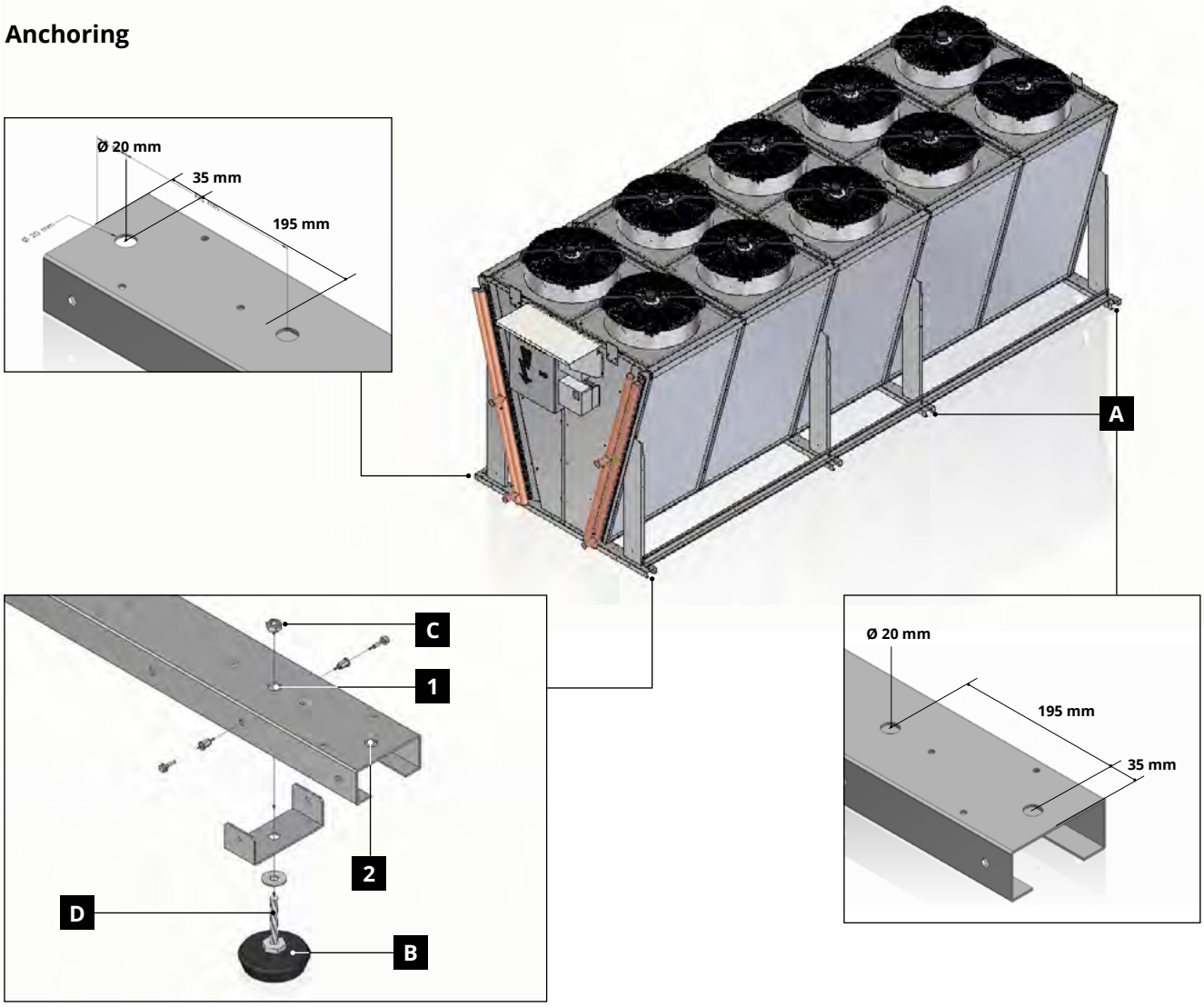
Positioning





The equipment must be installed to a minimum angle of approximately 5 cm (A) lengthways - whatever its length. Otherwise it is possible to use height-adjustable feet.
The equipment must be appropriately shimmed at the support points in contact with the floor.
The equipment must be inclined towards the drain plug (B) of the manifold (C).
The tilt angle helps the complete drainage of the refrigerant fluid contained in the exchanger coil.
If there is a risk of the fluid freezing inside the pipes making it impossible to ensure complete system drainage helped by the equipment tilt, the emptying and blowing procedure described in paragraph 6.3 should be applied.

Anchoring



Depending on requirements and the provisions that the customer intends to use, the fixing/support to the foundation or flooring can be achieved in different ways as specified below.

- Using expansion bolts fixed to the foundation on the profiles (A) of the structure.
- Supported by special levelling vibration dampers (B1) or with an anchoring bell-type mounts (B2). - Standard application.
- By simply resting it on the foundation/flooring with an interposed strip of NBR rubber all along the profile length.

1. Standard positioning/anchoring hole.
2. Hole for special anchoring.

C. M6 open threaded insert.
D. M6 x 20 TE screw.

5.4 Adiabatic system installation (if provided)

If the adiabatic system is to be supplied, specific installation instructions should be obtained.

5.5 Connections

5.5.1 Electrical connection/wiring

Depending on order requirements, the equipment can come with electrical systems.

For electrical connection and/or wiring, please refer to the diagrams on the machine or request them from Stefani S.p.A.

The sizing of the main power cable and the electrical connection of the equipment and/or the various users should be provided by the Customer.

The equipment electrical connections should be carried out by qualified personnel.

Before carrying out the electrical connections, make sure that the power supply to the power line is disconnected.

The electrical connection must be carried out only after completing the positioning/anchoring and completing the installation of all the parts that make up the equipment.

The electrical power supply system must be equipped with a protection device against overloading and short circuits.

5.5.2 Connection of the distribution system pipes

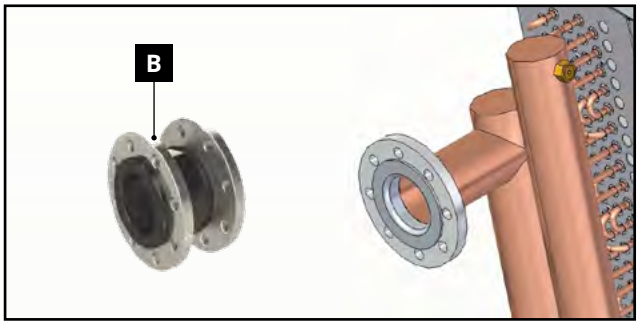
The sizing of the gas or refrigerant fluid pipes and their connection to the equipment should be ensured by the Customer.

The connection of the gas or refrigerant liquid pipes to the equipment must be carried out by specialised personnel.

Equipment connection to the gas or refrigerant pipe lines must be carried out only after completing the positioning/anchoring and completing the installation of all the parts that make up the equipment.

Devices allowing for the expansion of liquids and for gas overpressure must be provided on the system.

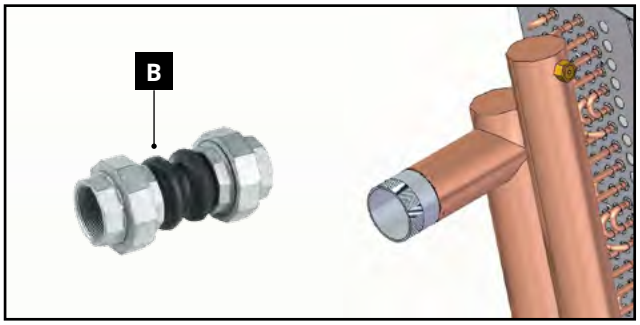
Pipe connection with flanged sleeve



Close to the connection points, an adhesive plate is applied to the manifold indicating the inlet (IN) or outlet (OUT).

For connections to the manifold, use flexible joints similar to joint (B), with suitable characteristics.

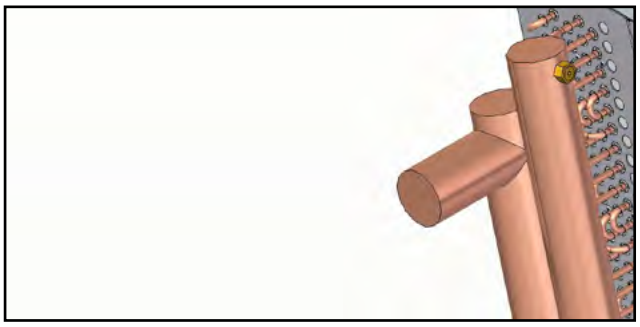
Pipe connection with threaded sleeve



Close to the connection points, an adhesive plate is applied to the manifold indicating the inlet (IN) or outlet (OUT).

For connections to the manifold, use flexible joints similar to joint (B), with suitable characteristics.

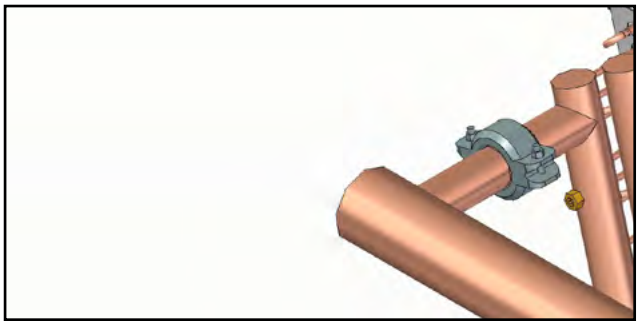
Pipe connection with welding terminals



Close to the connection points, an adhesive plate is applied to the manifold indicating the inlet (IN) or outlet (OUT).

Remove the head of the manifold connection fitting, bring the pipe close and weld it.

Victaulic



Close to the connection points, an adhesive plate is applied to the manifold indicating the inlet (IN) or outlet (OUT).

A special housing is provided on the manifold for the typical coupling of victaulic systems (not included in the supply.)

CAUTION

Before completing the connections of the manifolds and distributors, make sure that the exchanger is not under pressure due to the dry air pre-charge provided by the manufacturer.

Any equipment that works with HFC, AMMONIA or CO_2 refrigerant gases must be correctly placed under vacuum to ensure complete removal of humidity and condensation.

5.6 Relocation

Equipment relocation operations must be carried out exclusively by authorised specialised technicians.

Safety recommendations for handling:

To relocate the equipment, use its designated hooking points as indicated.

For equipment relocation, use suitable, tested and certified lifting equipment.

5.7 Checks before commissioning

Before putting the equipment into operation, carry out the following checks:

- Check that fixing complies with the requirements (to the ground / to the ceiling / to the wall).
- Check system tightness.
- Check the functionality of the fixed guards.
- Check that the electrical power cables comply with the rated power supply (machine absorption).
- Check that any other tools and installation and packaging materials have been removed from the machine.
- After prolonged storage, check the general cleanliness of the machine.

Do not operate the equipment if even just one of the points listed in this paragraph has not been successfully ticked.

5.8 Commissioning

Equipment commissioning is carried out upon completion of installation operations and basically consists in the first machine start-up. It is carried out by the same technicians who installed the equipment.

The following information must be observed for commissioning purposes:

- Check the correct direction of rotation of the electric fans.
- Ensure the efficient operation of the safety devices.

6 Use

6.1 Starting and stopping the equipment

This equipment should be started at the same time as the system for which it is intended. For its starting and stopping, please refer to the installation manual.

6.2 Equipment safety

Ensuring the equipment safety means making it impossible to start the equipment and control any movement whenever any action (e.g. cleaning , maintenance, etc.) on it or on its parts is required.

To ensure the equipment safety, the following should be carried out:

- Turn off the equipment via the ON-OFF / 0-1 control devices or via the control inputs provided on the equipment - if any.

DANGER
Intermittently turning off power to the equipment can cause irreparable damage to the electrical and electronic components.

- Disconnect power to the equipment, or to the device being serviced, using the provided disconnecting devices (main switch, dedicated maintenance disconnectors for each individual fan).

DANGER
After having disconnected voltage supply to the equipment, electronic fans still imply a residual risk due to possible electric discharges between the mains conductor and the protection conductor connection.
Before working on the equipment wait until all the electronic components are completely voltage-free. Check the voltage charge depletion times in the dedicated manuals.

- Open the drain valves of the pump units supplied with the adiabatic systems and ensure that all pressure is completely released.

DANGER
The presence of any residual pressure is potentially dangerous if the hydraulic circuit has to be serviced.

- Drain the exchanger hydraulic system.

DANGER
Open the drain valves of the exchanger hydraulic system to exhaust the pressure.

DANGER
It is up to the operator to ensure that no one can unintentionally energise the equipment while the operator is carrying out maintenance or other operations.

6.3 Equipment drainage procedure

PPE to be worn

WARNING
Secure the equipment. See par. 6.2.

This operation should be carried out by qualified personnel, according to the F-GAS standard.

Carry out draining operations in consideration of the different equipment supply systems.

TYPE OF SUPPLY	PROCEDURE
Natural refrigerant gases HFO or HFC	Refer to the legal provisions in force in the country of installation. E.g. for EU countries: European Directive 517/2014/EU. Non-EU countries: it is up to the user to check which standards to refer to.
Secondary fluids	It is up to the user to check the safety data sheet to ensure that the fluid used is not potentially harmful for the environment.

Pure water	It is up to the user to prevent stagnant water from freezing inside the unit causing pipe breakage and non-repairable damage to the unit.
	• Ensure minimal angling in the direction of the inlet and outlet manifolds. See par. 5.3.2.
	• Pressurise the exchanger with compressed air until the rated operating pressure is reached.
	Pressurisation can be achieved in the following ways:
	  • Via the vent valves.
	  • Through a special fitting installed upstream of the machine and a shut-off valve to be installed downstream of the outlet manifold. The coupling upstream of the equipment must be installed leading up to a shut-off valve (not supplied by the manufacturer) so that the instantaneous opening of the shut-off valve installed downstream allows an air flow capable of driving any water stagnation towards the drain. The pressurisation operation must be repeated until there is no significant amount of water left to be drained.

7 Maintenance

7.1 General warnings

WARNING
Authorised operators should only carry out operations on the equipment within their specific field of expertise and wear any necessary and suitable PPE (personal protective equipment).

DANGER
Any maintenance, cleaning or repair operation carried out while the electrical system is live can cause serious personal injuries and even death.

WARNING
Always disconnect the equipment from energy sources before carrying out maintenance and/or replacement operations.

DANGER
Use barriers to segregate the area where maintenance is being carried out and place a sign on the control panel indicating that the equipment has been stopped for maintenance.

DANGER
It is forbidden to walk or stand under the equipment while it is lifted.

DANGER
For all work to be carried out at heights, use appropriate safe and stable equipment to reach the required action points.

Maintenance workers must be aware of the movement and function of each component in every part that requires maintenance. It is advisable for the maintenance technician to keep a log of all service operations carried out.

7.2 Description of the symbols used in the maintenance chapter

This paragraph describes the symbols used in the maintenance chapter.

Icon used	Description
	Mechanical service
	Electrical service

7.3 Routine maintenance

Routine maintenance is the set of operations to be carried out according to a given schedule. Their intended purpose is to keep the equipment in good working order.

CAUTION
Perform routine maintenance accurately and according to the schedule provided by the manufacturer.

7.3.1 Routine maintenance schedule

The following table shows the list of recommended actions and the time intervals at which they need to be carried out.
The “Reference” column shows the number of the paragraph describing how to carry out the required service.

Type	Description	Frequency	Reference
	General checks.	• One week after start-up. • Subsequently every 4 months.	7.3.2
	Check the condition of the electric fans.	Every 3 months.	7.3.3
	Check the operation of the main disconnector.	Every 3 months.	7.3.4
	General cleaning.	Every 6 months.	7.3.5
	Check for gas leaks.	According to the legislation in force in the country of destination	7.3.6
	Replacement of fan motors	When necessary.	7.3.7

7.3.2 General checks

Type of action	Person in charge	Frequency	Materials and equipment
		 • One week after start-up. • Subsequently every 4 months.	

PPE to be worn 

- Check for any dirt on the cooling coils.
- Check for any dirt on the adiabatic unit walls.
- Check for any unusual noise.

In the event of excessive dirt build-up, or in the presence of unusual and/or suspicious noises, service the equipment as required to resolve the problems that have occurred.

7.3.3 Check the condition of the electric fans

Type of action	Person in charge	Frequency	Materials and equipment
		 Every 3 months.	

PPE to be worn 

- Check for any of the following faults:
  - Unusual noise.
  - Vibrations.
  - Absorption issues.
- Check the bearings of the electric fans.
  - Unusual bearing noise.
- If any problems are observed, replace the electric fans.

7.3.4 Check the operation of the main disconnector

Type of action	Person in charge	Frequency	Materials and equipment
		 Every 3 months.	

PPE to be worn 

 Faulty or malfunctioning safety devices must be promptly repaired or replaced.

Check the operation of the main disconnector:

- With the unit running, turn the main switch to 0/OFF.
- All downstream equipment must stop.

7.3.5 General cleaning

Type of action	Person in charge	Frequency	Materials and equipment
		 Every 6 months.	Standard cleaning equipment

PPE to be worn 

WARNING
Turn the main disconnector switch to 0/OFF.

CAUTION
If the equipment works in a dusty environment, cleaning should be carried out more frequently.

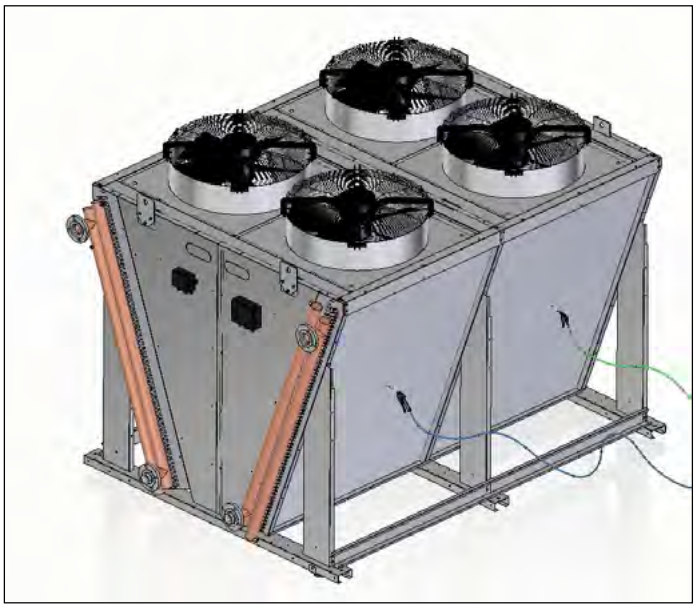
For normal cleaning operations following contact with liquids or aggressive or unknown substances, Stefani SpA recommends washing with plenty of water at room temperature.

If detergents must be used, Stefani SpA recommends using mild agents that do not alter the pH of the materials, followed by plenty of rinsing with water to wash away any deposits and residues.

It is recommended to avoid the use of products containing the following substances:
- Sodium hypochlorite (bleach) or chlorinated liquids
- Highly acid liquids
- Organic solvents such as acetone or trichlorethylene
- Highly basic liquids such as caustic soda and other alkaline substances
- Ammonia or ammonia-based solutions

All these substances can damage the paint finish, if any, or etch the metal parts and damage the exchanger. To reduce the risk of corrosion triggers, we recommend using detergents, including mild ones, at temperatures >20° on parts and we always recommend rinsing - even if not required by the detergent manufacturer.

Perform general cleaning of the equipment and surrounding area. During cleaning, check the condition and integrity of the various parts of the equipment. In case of faults or damage, contact the maintenance technician for any service/replacement that may be needed. Carefully clean the motors from any foreign matter that could prevent efficient cooling.



To clean the exchanger coils, a jet of compressed air or pressurised water or steam can be used; alternatively, use a non-metallic bristle brush.

In case of very damp or greasy dirt, clean with a high pressure water jet or with the aid of a steam jet cleaner.
If necessary, use an environmentally friendly detergent and rinse after treatment.

Cleaning with a compressed air jet

Set the pressure to max 8 bar, keep a minimum distance from the slats of no less than 250/300 mm, direct the jet vertically (max deviation +/- 5°) onto the slats to avoid bending them.

Cleaning with a water jet

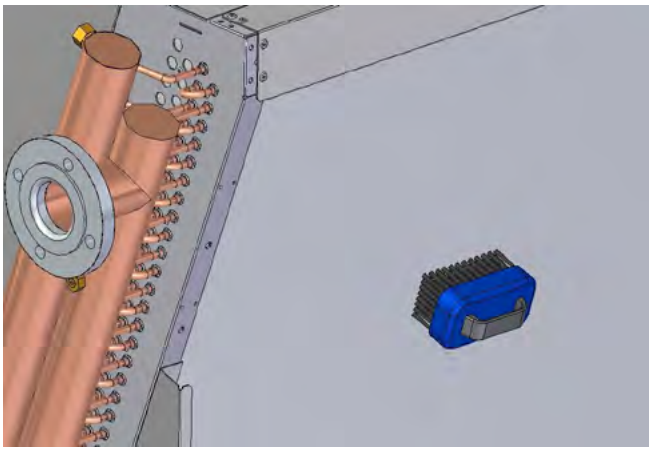
Use a pressure washer with a max pressure of 50 bar, keep a minimum distance from the slats of no less than 250/300 mm, direct the jet vertically (max deviation +/- 5°) onto the slats to avoid bending them.

Cleaning with a steam jet

Use a steam jet pressure washer (max 50 bar) at a minimum distance of 250 mm, direct the jet vertically.

Cleaning with a brush

Use soft brushes (not made of steel or similar materials), where possible clean from the inside out and from top to bottom so as not to transfer dirt to already cleaned parts.



7.3.6 Check for gas leaks

Type of action	Person in charge	Frequency	Materials and equipment
		 According to FGAS directive	

PPE to be worn 

Check the tightness of the pipes.

DANGER
Certain liquids or gases used in the equipment can be highly polluting and/or harmful to human health.

7.3.7 Replacement of fan motors

Type of action	Person in charge	Frequency	Materials and equipment
		 When necessary.	Socket wrench

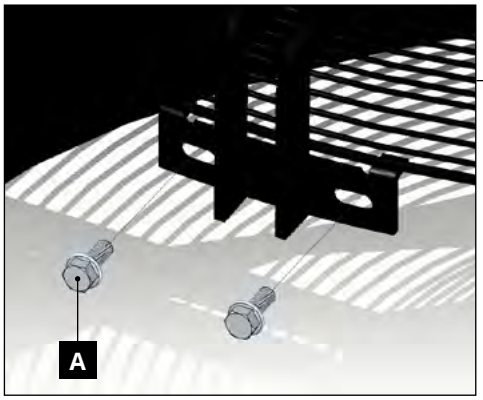
PPE to be worn 

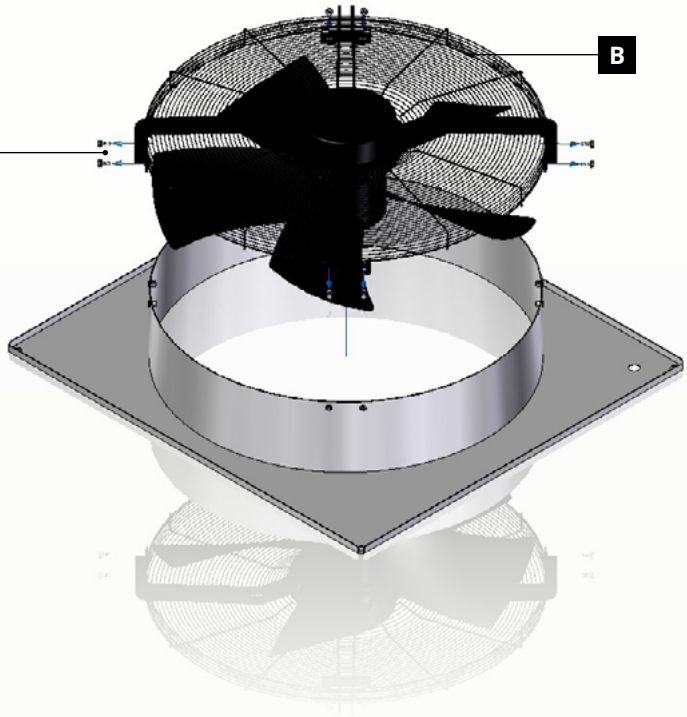
WARNING
Turn the main disconnector switch to 0/OFF.

WARNING
If the equipment is fitted with electrical line disconnector switches for each fan, rotate the disconnector lever to the 0 (zero) or OFF position and padlock the lever in that position.

Before servicing a fan it is necessary to:
1. Disconnect power to the fan.
2. Remove the wiring and pull out the cable from any anchoring system that may secure it to the protection grille.
3. Support the fan with lifting equipment using straps.
4. Remove the screws securing the fan to the conveyor.

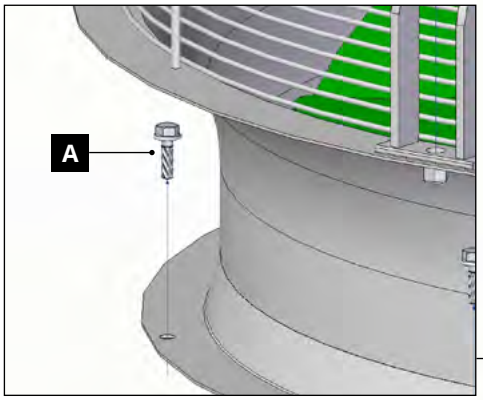
External rotor axial fan.
Radial fixing with bolts for a grille with raised nozzle.

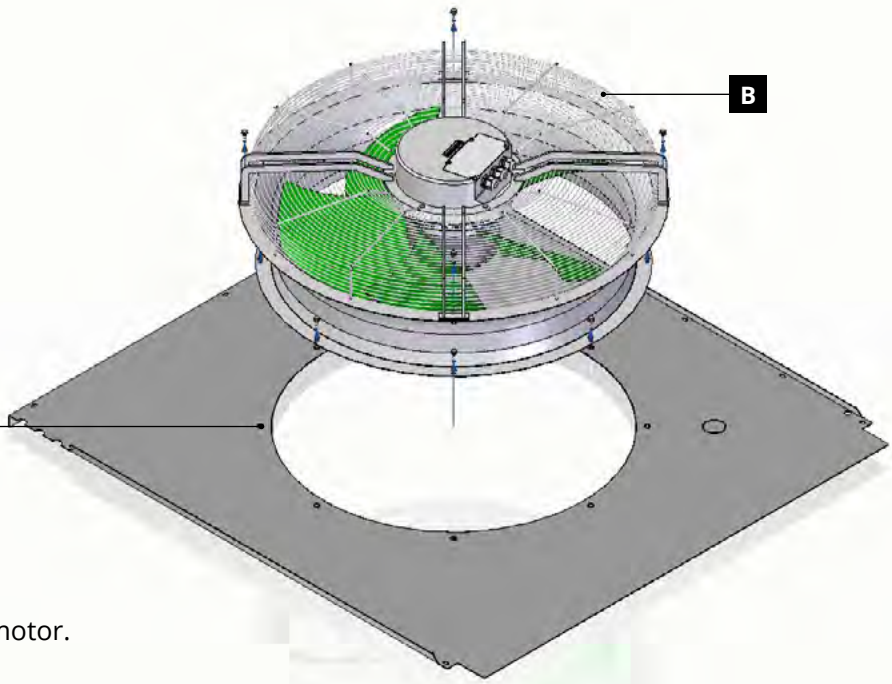




1. Unscrew the screws (A).
2. Lift and remove the guard (B) with the motor.
3. Replace the motor.
4. Reassemble all the parts in reverse order.

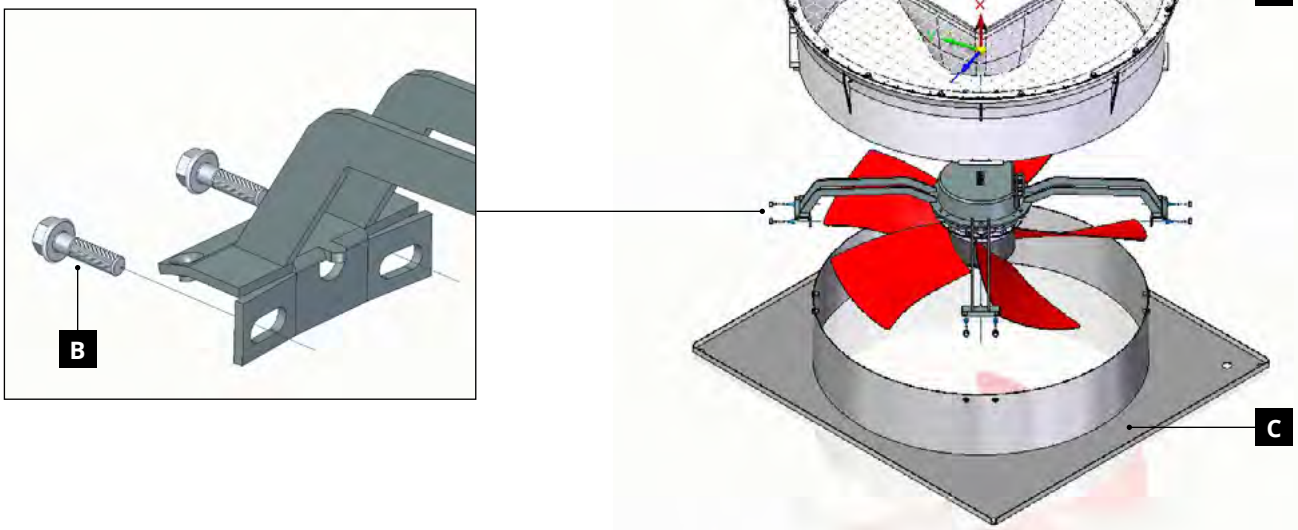
External rotor axial fan with ring.
Radial fixing with grille bolts.





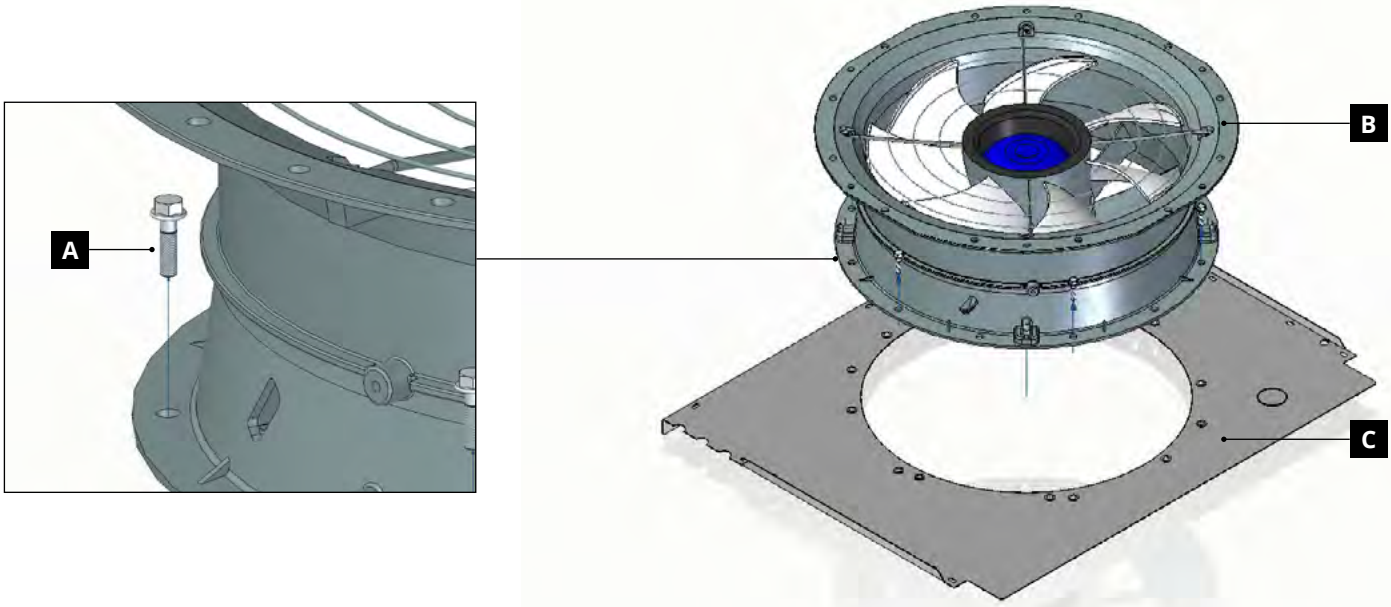
1. Unscrew the screws (A).
2. Lift and remove the guard (B) with the motor.
3. Lift and remove the collar (C).
4. Replace the motor.
5. Reassemble all the parts in reverse order.

Fans with Axitop silencer device.



1. Remove the technopolymer diffuser (A).
2. Remove the bolts (B) that secure the support spokes radially to the conveyor (C).
3. Replace the motor.
4. Reassemble all the parts in reverse order.

ZA+ type fan with technopolymer ring.



1. Unscrew the screws (A) that secure the technopolymer ring to the flat nozzle (C).
2. Lift and remove the ring (B) with the motor.
3. Replace the motor.
4. Reassemble all the parts in reverse order.

8 Dismantling and disposal

Dispose of the equipment or any of its parts by separating the scrapped materials bearing in mind their different nature (e.g.: metal, plastic parts, rubber, oils, etc.). The equipment is built with modular recyclable parts. Disposal must take place in compliance with the laws and regulations applicable in the country where the equipment is installed.

9 Spare parts

For any spare part requests, please contact our Quality Department by quoting:

- The machine code
- The description
- The Serial Number
- The part to be supplied and the relevant quantity

To order electrical system parts, please refer to the components in the wiring diagram.

STEFANI S.p.A. will submit an offer for the requested spare parts.

QUALITY DEPT.
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USE, MAINTENANCE & INSTALLATION MANUAL

OSTRO / OSTRO-L / OSTRO-XL

CONDENSERS (H) AND LIQUID COOLERS (W) WITH AXIAL FANS

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