



Installation Instruction

[Transport](#) | [Installation](#) | [Operation](#) | [Maintenance](#)



Flat and Vertical Vario Drycooler

Series: GVH, GVV and GFH

This manual is to be considered part of the unit.

Read and follow this manual carefully before starting work on the unit.

Always keep this manual accessible and in the immediate vicinity of the unit.

guntner.com/us

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1. Warranty statement

The supplier warrants the product to be free from defects in workmanship and materials under normal usage for the period outlined below. The supplier further warrants against defects in workmanship and materials of the product for a period of 24 months from the date of purchase (the "Warranty Period"), provided that the product is correctly installed and operated within the recommended limits of the manufacturer's technical documentation.

The supplier at its option shall repair or replace, free of charge to the purchaser, all components of the product which are or become defective during the Warranty Period as a result of defects in design, workmanship or materials, ordinary wear and tear excluded, provided, however, that:

- The product is applied correctly
- All operating and installation instructions for the product are complied with
- System component and piping design is in accordance with good refrigeration practice
- Nitrogen or an inert gas is introduced into the piping during the brazing of the piping installation

This warranty shall not include ordinary maintenance or cleaning of the product, or defects in the installation of the product. This warranty also does not cover physical damage to the product during transit, after purchase of the product but before installation.

The purchaser must request repair or replacement of the defective component through a written notice to the supplier, and must provide the purchaser with the time and opportunity to make such repair or replacement. Otherwise, the supplier will be freed from liability for the defect.

Any transport and exchange costs for the repair or replacement shall be borne by the purchaser. The supplier shall also not be liable for costs incurred in dismantling or fitting replacement parts or for any independent inspection undertaken by the purchaser. The purchaser shall return any allegedly defective goods, postage or freight paid, to the supplier at the address below. Upon receipt of the goods and inspection there of the supplier shall repair or replace, at the supplier's discretion, the defective components and shall return the same to the purchaser, return postage and freight paid. This shall constitute full compliance of the supplier's warranty obligations hereunder.

The seller accepts no liability for the direct or indirect consequences of any modifications of or repairs to the product made out by the purchaser or by a third party without the prior consent of the supplier.

This warranty applies only to the repair or replacement of components of the product and expressly excludes responsibility for damage and consequential damages not occurring to the product itself.

This warranty is the purchaser's exclusive remedy. The supplier expressly acknowledges that it shall not be liable to the purchaser or any client of the purchaser for any direct or indirect damages, injury to persons or property or any consequential damage or loss of profits arising from defective goods or workmanship or from any other cause whatsoever.

To obtain warranty service or to ask any questions regarding the foregoing, please contact our office:

Güntner US LLC
3601 Algonquin Road Suite 925
Rolling Meadows, Illinois 60008
847- 781-0900 Tel
847-781-0901 Fax
dg-us-service@guentner.com or sales.us@Guntner.com
Online support: <https://www.guntner-solutions.us/contact>

2. Important basic information

2.1 Safety instruction

2.1.1 Observing operation instruction

WARNING

Always keep the operating instructions in the unit's immediate vicinity at all times.
Ensure that the operating instructions are accessible to all people that have anything at all to do with the unit at all time.
Ensure that the operating instructions are read and understood by all people that have anything at all to do with the unit.

2.2 Legal notes

Warranty claim expires as follows:

Faults and damages that can be attributed to non-compliance with the specifications of these operating instructions.

Complaints that can be attributed to use of spare parts other than the original spare parts specified in the submittal offer documents.

Changes to the unit (working fluid, version, function, and operating parameters) namely the order related information specified in the submittal documents without the manufacturer's prior consent.

The operating instructions may not be reproduced electronically or mechanically, circulated, changed passed on to third parties, translated or used otherwise, in full or in part, without Güntner prior explicit written approval.

2.3 Operation instruction

2.3.1 Scope

These operation instruction apply for all condenser of the GVH/GVV/GFH series

NOTICE

You will find the precise type of your unit in the attached submittal documents.

2.3.2 Set-up and other applicable documents

The unit's operating instructions include the following parts:

- Installation & Operating Manual
- Submittal offer documents
- Submittal documents
- Submittal drawing/s, complete with technical data
- Electrical wiring diagram in terminal boxes

These operating instructions are part of the operating instructions manual of the system, provided by the system's installer.

2.4 Standards

2.4.1 Representation standards

The following text markups are used in these operating instructions:

Bold Requires special attention	Bold Requires special attention
Bicolor triangle Instructions	Bicolor triangle Instructions

2.4.2 List of abbreviations

Abbreviations Meaning	Abbreviations Meaning
Working fluid	Fluid used in a refrigeration system to absorb or reject heat throughout the process.
ISO	International Standardization Organization
Emergency STOP	Emergency lock out switch
°C	Degree Celsius
°F	Degree Fahrenheit
Bar	Unit of pressure (1,01972 kgf/cm ²) = 14,5037738 psi
Psi	Unit of pressure lb/in ²
L	Liter (liquid volume) ≈ 0.0353146667 ft ³
ft ³	Cubic foot (liquid volume)
Vol %	Volume percent (concentration level relative to a volume)
IP	Index of protection for electrical motors
Ppm	Parts per million, concentration figure, stands of “millionth”
Hz	Hertz (frequency)
3~	3 – phase rotating current
1~	Single phase alternating current
NEC	National Electrical Code (NAFPA 70)
NRTL	National Recognized Testing Laboratories
NEMA	National Electrical Motor Association
EPC	Electric Power Company
ASHRAE	American Society of Heating, Refrigeration and Air conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing Materials
OSHA	Occupation safety and Health Administration

2.5 Standards for safety signs and notices

2.5.1 General safety signs and their meaning in this operating instructions

⚠ WARNING
Dangerous situation that will definitely cause serious injury or death if it is not avoided.
⚠ WARNING
Dangerous situation that could cause serious injury or death if it is not avoided.

⚠ WARNING

Dangerous situation that could cause slight to moderate injury if it is not avoided.

NOTICE

Refers you to possible damage to property.

2.5.2 Warning signs and their meaning in this operation instructions



Warns against hand injuries

Hands or fingers can be crushed, pulled in or otherwise injured with non-compliance.



Warns against hot surfaces

The temperature is over 113 °F (45 °C) burns can occur.



Warns against presence of electrical equipment

Danger of an electric shock if electrical components are touched.



Warns against flammable substances

Use of ignition sources can cause fire at set-up point.



Warns against harm to health

Contact with or inhaling harmful to health or irritant substances can cause injuries or damage the health.



Warns against operate fans without guard grille

With automatic fan start during maintenance work there is a danger of pinching/trapping to limbs and / or fingers.

2.5.3 Prohibition signs and their meaning in these operation instructions

**Flames / flammable substances prohibited**

Ignition sources must be prevented and ignition sources are not allowed.

**Smoking prohibited**

Smoking is forbidden.

2.5.4 Mandatory signs and their meaning in these operation instructions

**Eye protection required**

Eye protection: Use protective cover, protective glasses or face protection.

**Hand protection required**

Protective gloves must be used to protect against mechanical and chemical dangers (see imprinted pictograms).

**Respiratory protection required**

Breathing apparatus must be suitable for the working fluid used. Breathing apparatus must consist of:

- At least two independent breathing devices (self-contained breathing apparatus)

**Protective clothing required**

Personal protective clothing must be suitable for the working fluid used and for low temperatures, and must have good heat insulation properties.

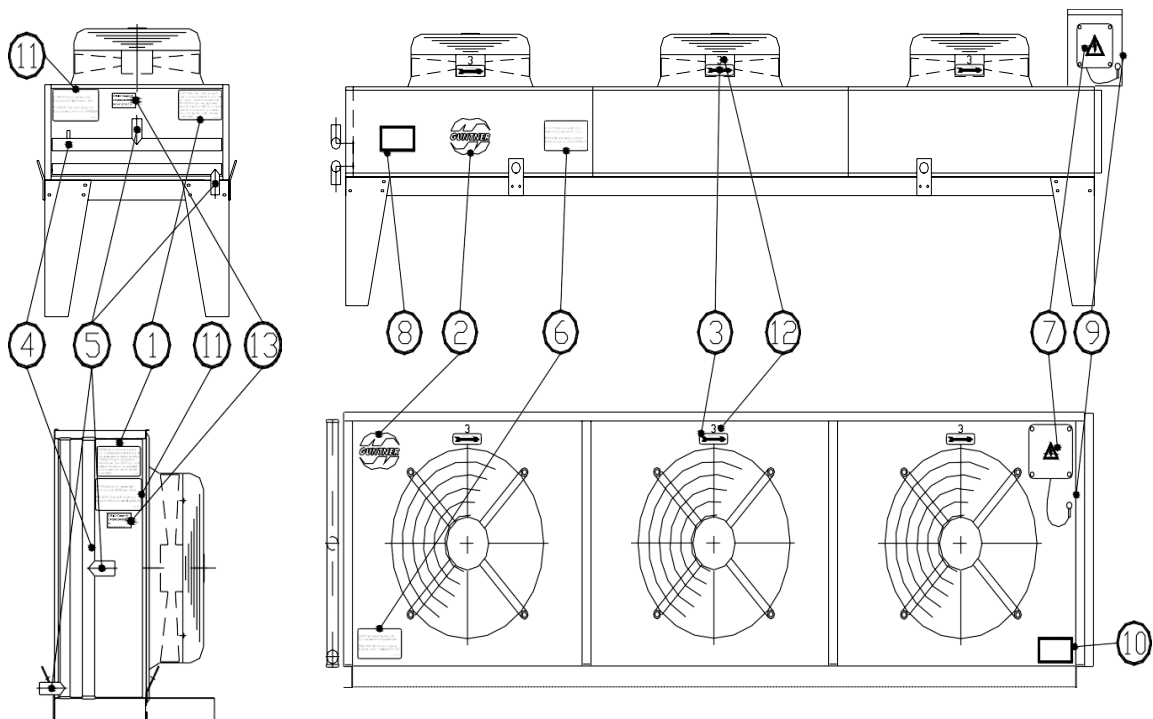


Lock out required (Lock – out Procedure)

Deactivate the electrical system and secure against being switching on while undertaking maintenance and/or repair work.

3. Safety

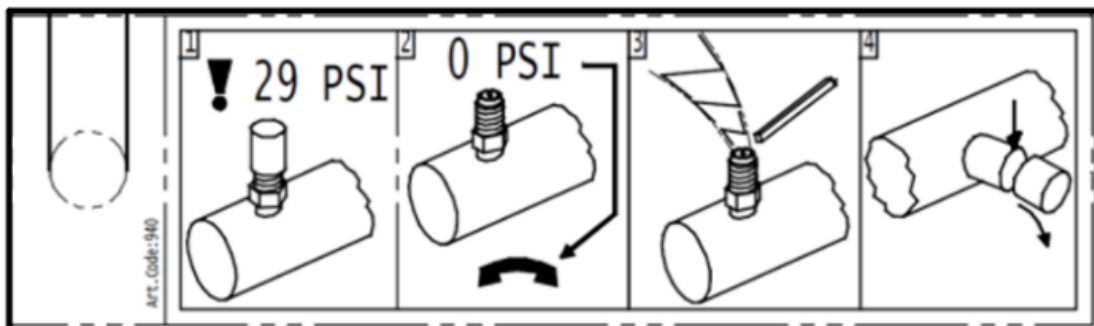
3.1 Labeling on the unit



Position of labels on the unit

3.1.1 Safety sign on the unit

Holding charge during transportation to be released at Schrader valve (cambiar imagen a psi)



Inspection door



Electric shock hazard



3.1.2 Other signs and notes on the unit

Unit Nameplate (reference label for a GVH/GFH unit)

Güntner de México S.A. de C.V.
 Rogelio Gonzalez 1000, Apodaca, México 66600
 www.guentner.com.mx



Project number	900687
Unit description	GVH 090.2A/2 – M(L).M
Serial number	300/504603.0001
Year of manufacture	2012
Rated working pressure	464 PSI
Test pressure Medium Date	507 PSI air 22.Feb.2012
Refrigerant (PLEASE MARK!)	R22 R404a R134a R507A
Electrical supply	460V 3~ 60Hz Y
Fan motor(HP) FLA RPM each	2 4.7 800(VT01201U)
Fan motor quantity	2
FLA MCA Max fuse	9.40 Amps 10.57 Amps 20 Amps
Drawing	GCSN06 – VT01201U – NL – 00000 – 01
OUTDOOR	USE
Info	GUNTNER US

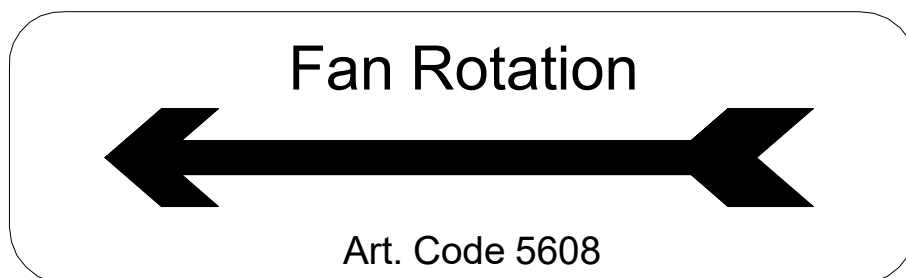


Made in México

Güntner logo



Fan rotation



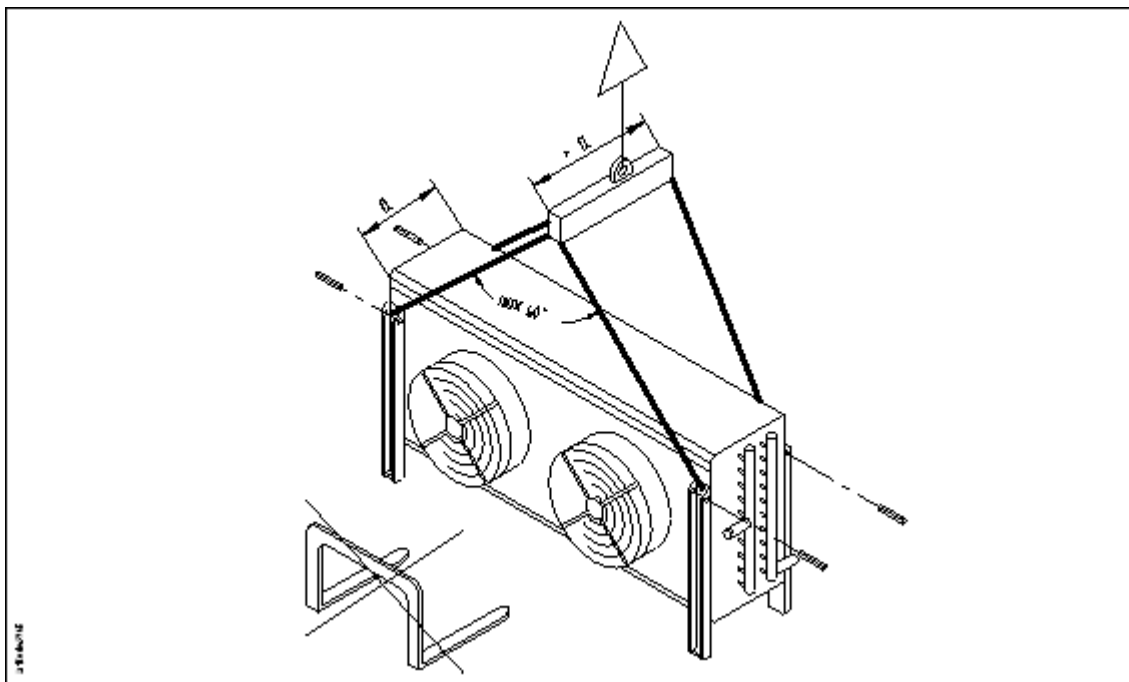
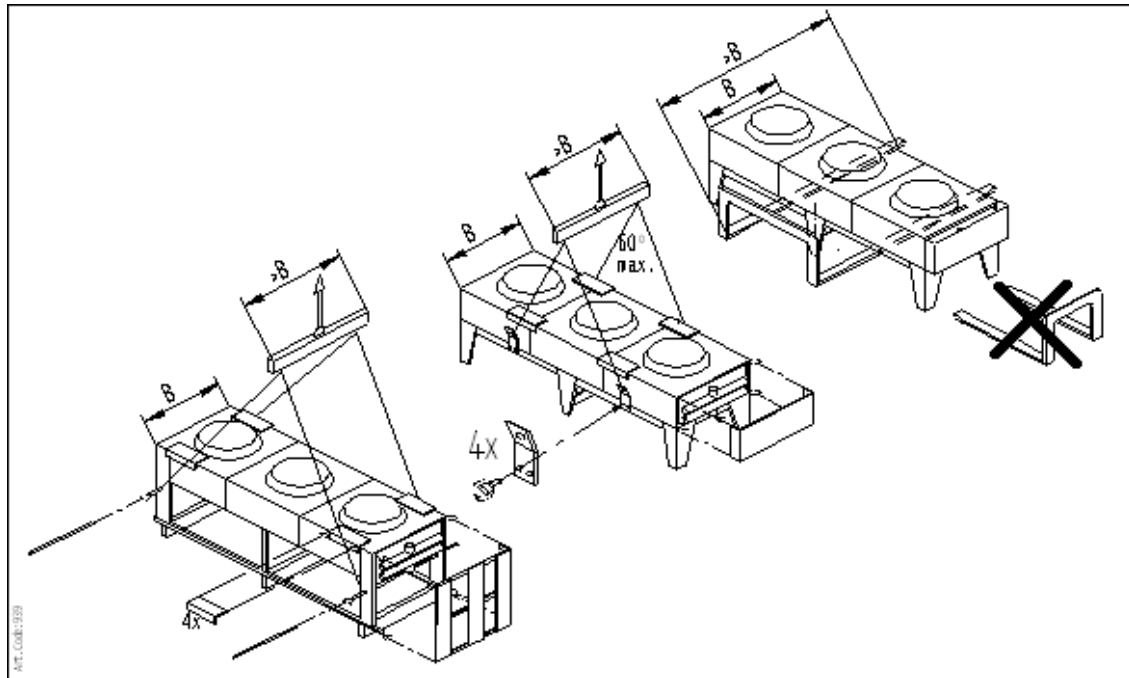
Working fluid connections



Electrical grounding point



Rigging instruction



3.2 Basic safety notices

3.2.1 How to act in an emergency

⚠ WARNING**Danger of injuries**

The refrigerants that are used (R134a, R404A, R407C, R507, R22, CO₂, etc.) are classified according to the ASHRAE Standard 34-2024. Other working fluids such as water, glycol, and oil are not classified under ASHRAE Standard 34-2024; therefore, appropriate safety measures shall be applied as required for their specific hazards.

The safety classification shall consist of two or three alphanumeric characters (e.g. A2, A2L, A3, B1, B2L or B3). The first capital letter indicates the toxicity and the Arabic numeral denotes the flammability. Toxicity refrigerant classification shall be assigned to one of the two classes – A or B – based on allowable exposure. Class A signifies refrigerants for which toxicity has not been identified at concentrations less than or equal to 400 ppm by volume. Class B signifies refrigerants for which there is evidence of toxicity at concentrations below 400 ppm by volume.

Flammability refrigerant classification shall be assigned to the following classes – 1, 2, 2L or 3 – based on flammability. Test shall be conducted in accordance with ASTM E681 using a spark ignition source. Testing of all halocarbon refrigerants shall be in accordance with the Annex of ASTM E681. Single-compound refrigerants shall be assigned a single flammability classification. Refrigerant blends shall be assigned flammability classifications as specified in ASHRAE Standard 34-2024. Blends shall be assigned flammability classification based on their worst case of formulation for flammability (WCF) and worst case of fractionation for flammability (WCFF), as determined from a fraction analysis. A fraction analysis for flammability is not required if the component of the blend are all in one class; the blend shall be that same class.

There is no imminent danger for the staff. However, refrigerants of the group A1 are generally heavier than air and may flow off to rooms on a lower level. In still air there may be an increase of the ground level concentration. With high concentrations there is a danger of suffering from disordered cardiac rhythm and suffocation due to a reduced oxygen concentration, especially at ground level.

Unauthorized people must not have access to the unit. Please ensure that the refrigerants and/or working fluids released from the unit cannot penetrate the interior of the building or put people at risk in any other way.

The following safety measures and procedures shall be followed, together with all relevant requirements contained in ASHRAE Standards 15 and 34.

- With unexpected serious working fluid releases, leave the machine room immediately and activate the emergency STOP switch set up in a safe place, e.g. with:
- Visibly leaking working fluid liquid or vapor from the heat exchanger or piping components
- Sudden large release (release and evaporation of the greater part of the entire working fluid charge in a short time, e.g. in less than 5 minutes)
- Activation of the working fluid detector
- Have experienced, trained personnel with prescribed protective clothing perform all necessary protective and other measures:
- Use respiratory protection
- Use a room air-independent breathing apparatus with maintenance work in high working fluid concentration in the room air
- Divert released working fluid vapor and liquid safely in accordance with OSHA requirements
- Ensure that no working fluid enters water system or sewage

3.2.2 Personnel, care requirements

⚠ WARNING

The unit must only be put into operation, operated, maintained and repaired by trained, experienced and qualified personnel. People that are responsible for the operation, maintenance, repair and evaluation of systems and their components must have the required training and specialist knowledge for their work. Qualified or expert means the ability to satisfactorily perform the activities required for the operation, maintenance, repair and evaluation of refrigeration systems and their components.

The unit may be operated by operating personnel that have no specific knowledge of refrigeration engineering, but have sufficient knowledge and experience with regard to the mode of operation, and daily monitoring of this system. These operating personnel may not make any adjustments to settings on the system.

Changes to the unit, which the manufacturer has first agreed to in writing, may only be made by the instructed and qualified personnel.

Electrical installation:

Only qualified personnel familiar with AC motors and associated machinery should plan or implement the installation, start-up and subsequent maintenance of the system. Failure to comply may result in personnel injury and/or equipment damage.

3.3 Proper intended use

3.3.1 Proper intended use

The GVH/GVV/GFH Vario series are intended for installation in a refrigeration system and for outdoor installations. The units cool the working fluid by giving off heat to the air that is moved by fans over the dry heat exchanger surface.

The unit is delivered for operation with a specific operating point:

- Working fluid feed type
- Airflow volume
- Air inlet temperature
- Relative air humidity.

The specified operating point is provided in the submittal offer documents.

3.3.2 Operation conditions

The unit is a component of a refrigeration system including its working fluid circuit. The purpose of these operating instructions, as part of the operating instructions manual (of which these operating instructions are a part), is to restrict the dangers to people and property and the environment from the unit and the working fluid used in it to a minimum. These dangers are essentially connected with the physical and chemical properties of the working fluid and with the pressures and temperatures that occur in the working fluid-carrying components of the unit (see Residual hazards with working fluids).

⚠ WARNING

Danger of injuries and damage to property

The unit must only be used in accordance with the proper intended use. The operator must ensure that when operating, monitoring and maintaining the unit, the working fluid does not deviate from submittal information specified in the order-specific offer documents.

The operator must ensure that maintenance measures are performed in compliance with the system's operating instructions manual.

Charging the unit is only permitted following written approval by the manufacturer. You will find the order related proper use as intended in the submittal documents.

Do not exceed the maximum operating pressure stated on the unit's nameplate.

3.3.3 Improper use

⚠ WARNING

Danger of injuries and damage to property

Working fluid and their combinations with water or other substances in the working fluid components have chemical and physical effects from the inside on the materials surrounding them. The unit must only be charged with the specified working fluid for the unit. Charging the unit with another working fluid results in:

- Material, wall thickness, tensile strength, corrosive resistance, shaping process and testing are not suitable for the working fluid used and do not withstand the possible pressures and stresses that might occur.
- The unit not being resistant to the other working fluid and the other working fluid mixture.
- The unit not remaining leak tight during operation and when shut down.
- A possible sudden release of working fluid could directly endanger people and/or property and the environment.
- The maximum permissible operating pressure specified on the nameplate must not be exceeded! If the operating pressure is exceeded.
- The structural and welding materials will not withstand the foreseeable mechanical, thermal and chemical stresses and the pressure that can occur during operation and when shut down.
- The unit will not remain leak tight during operation and when shut down.
- There may be a possible working fluid release after a rupture or leakage on working fluid-carrying components, which would result in the following dangers:
 - Danger of component rupturing
 - Dangers of poisoning
 - Fire hazard
 - Frostbite hazard (caused by liquid working fluid)
 - Suffocation hazard
 - Hazards caused by panic reactions
 - Environmental pollution

⚠ WARNING

The GVH/GVV/GFH Vario units must not be used,

Where it is possible that short or prolonged effect caused by contact, inhalation or ingestion of the working fluid might result in harmful hazards.

Where the possibility exists of a sudden large release (release and evaporation) of the greater part of the entire charge in a short time (e.g. in less than 5 minutes).

The unit must not be changed without prior written consent by Güntner. Changes to the unit are:

- Changing the operating point (see Unit)
- Changing the fan capacity (air volume)
- Changing the working fluid flow-through volume
- Changing over to another working fluid.

The unit must not be operated if safety devices recommended by the manufacturer are not available, not properly installed or not fully functional.

The unit must not be operated if it is damaged or demonstrates faults. All damages and faults must be reported to Güntner immediately and must be removed immediately.

Work on the unit must not be performed without the personal protective equipment specified in these operating instructions.

3.4 Mechanical residual hazards

3.4.1 Fins, sharp unit corners and edges

⚠ WARNING



Warns against hand injuries

Danger of cuts on hands and fingers from the fins and sharp corners and edges of the unit.



Use reliable hand protection

3.4.2 Fans

⚠ WARNING	
	Warns against hand injuries There is a danger of fingers being cut off from rotating fan blades, injury hazard for the hands and danger of being pulled into the equipment from loose elements such as air, necklaces or clothing parts.
	Do not operate fans without guard grille. Pinch/trap point hazard! With automatic fan start during maintenance work there is a danger of pinching/trapping to limbs and / or fingers.
	Lock-out procedure required before you begin maintenance work in which you must remove the fan guard. Secure the unit against unintentional switching on again by removing the electric fuses for the unit. Secure the unit with a suitable warning sign referring to unintentional switching on. Ensure correct LOCK-OUT procedure.

3.5 Electrical residual hazards

⚠ WARNING	
	Warns against presence of electrical equipment Direct and indirect contact with voltage-carrying parts of motors and electrical switchgear can cause serious injuries or death.
	Lock-out procedure required before you begin maintenance work. See the refrigeration system's documentation for this. Secure the unit against unintentional switching on again by removing the electric fuses for the unit. Secure the unit with a suitable warning sign referring to unintentional switching on. Please note that the mains cables may also be carrying voltage, even if the unit is powered off. Work on electrical equipment must only be performed by people that have the required expertise (e.g. an electrician or an electro- technically instructed person) and who are authorized to do so by the operator.

3.6 Thermal residual hazards

3.6.1 Danger of burns

⚠ WARNING	
	Warns against hot surfaces With refrigerant temperatures of above 113 °F (45 °C) there is hazard of burns on piping components and headers inlet or outlet.
	Use hand protection

3.7 Residual hazards with working fluids.

⚠ WARNING
Danger of harm to health and environmental damage! Refrigerants of the group A are generally heavier than air and may flow off to rooms on a lower level. In still air there may be an increase of the ground level concentration. With high concentrations there is a danger of suffering from disordered cardiac rhythm and suffocation due to a reduced oxygen concentration, especially at ground level. Refrigerants of Group B have higher toxicity and can pose health risks even at low concentrations. In case of a leak, they may accumulate in poorly ventilated areas, and exposure can lead to acute health effects. Proper ventilation, monitoring, and strict handling procedures are essential.

⚠ WARNING

- Unauthorized people must not have access to the unit.
- Ensure working rooms are well-ventilated in order to prevent inhalation of high vapor concentration.
- Please ensure that the working fluids releases from the unit cannot penetrate the interior of the building or put people at risk in any other way. The vapors and gases of the working fluids must be kept from penetrating neighboring rooms, staircases, yards, passages or drainage system and must be discharged without risk.
- Monitor the working fluids concentration in the ambient air to ensure constant compliance with limit values.

Test the tightness of the unit regulatory, as specified in this operating instruction (see Inspection and maintenance plan)



Fire hazard

Work with fire or sparks, e.g. grinding, welding, etc., ensure suitable firefighting equipment is on-site. In particular be aware of the danger of ignition of unintentionally carried in oil residues or working fluids



Ensure that provided firefighter equipment is provided in sufficient quantities, that it functions properly and that the extinguishing agent does not react with the CFC/HFC refrigerant. Smoke during work is forbidden



Frostbite hazard

Splashing working fluids under effervescence can cause frostbite on eyes and skin. When removing faults after working fluids spills, you must be vigilant for remaining working fluids still under effervescence.



Danger of poisoning

Working fluids contact with fire can form toxic combustion products.

Prevent working fluids contact with open fire. Welding and soldering must therefore only take place after completely draining the relevant section of the system of the working fluids. Ensure good ventilation



With emergency work in high refrigerant concentration in the room air wear a room air-independent breathing apparatus.

3.8 Residual hazards caused by vibrations

WARNING

Danger of injuries and damage to property caused by loose components

If fans are damaged during fan operation, segments of the fan blades can severely injure people and/or cause damage to property close to the fan.

Fans, components and cables in the system must be designed, constructed and integrated so that dangers caused by vibrations that these or other parts of the system generate are reduced to an absolute minimum, while incorporating all available means for reducing vibrations, preferably at the source.

NOTICE

Damage to property caused by vibrations

Vibrations that are increased by imbalances, as created by dirt or fan blade damage, are possible during operation. The vibrations are transferred to the unit, where they can cause damage and damage the unit mounting or components connected to the unit.

Check the fan blades and fan guard/s regularly for dirt and the fans' smooth running (see Fans).

3.9 Residual hazards caused by pressurized parts

WARNING

Injury and damage to property caused by pressurized parts that contain working fluids.

Breaks in pressurized pipes or pressurized components of the unit can cause injuries or damage to property caused by working fluid releases. A sudden large release of the working fluid with its hazardous properties after a break or leak on pressurized components of the unit can cause the following hazards:

- Oxygen displacement
- Toxicity and health Hazards
- Chemical Burns.
- Flammability.
- Frostbite (caused by working fluid squirting/splashing)
- Suffocation
- Panic
- Environmental pollution

Ensure that the unit in question is pressure-free before maintenance work begins or remove the working fluid from the unit in question.

Only perform maintenance work – especially brazing work – on the unit in question after completely removing the working fluid from the unit.

3.10 Residual hazards caused by defective installation

⚠ WARNING

Injuries and damage to property caused by defective installation Defective installation results in hazards caused by:

- Break or leak on liquid-carrying unit components and pipes
- Absence of release devices to prevent liquid escape: Liquid that can heat up during refrigeration system shutdown state and can cause pipe or connection flanges to break when it expands.
- Uneven load distribution on the fixtures with the danger of stresses within the unit or unit displacement (breaks or leaks on working fluid-carrying components of the unit and pipes; danger of breaking off).
- Insufficient securing of working fluid-carrying lines against mechanical damage. On-site connections: loaded installation; effect of forces on the distribution and header pipes with the danger of breaks or leaks on working fluid-carrying components of the unit and pipes; danger of breaking off.
- Breaking and falling danger of the unit with hazard of escaping working fluid and exposed electrical cables.
- Danger of damage caused by environment - conditional hazard sources (production, transport and other processes at the working area).
- Unit functional faults caused by air entering and / or leaving obstructions.
- Obstruction of complete inspection checks and maintenance, i.e. no unobstructed accessibility to the working fluid and / or electrical components, connections and cables, no recognizable identifiers on the pipes and insufficient space for tests.

Ensure that:

- The units are to be installed on the mounting points corresponding with their weights and tightened with fixing bolts. The operator or installer is responsible for ensuring that the bolted connections are of an adequate strength.
- The diameters of the mounting holes have been statically determined by the manufacturer and the fixing bolts are adapted accordingly.
- The fixing bolts are secured against loosening by means of an appropriate locking device.
- The fixing bolts are not over tightened or stripped.
- All fixing bolts are tightened equally to achieve a load distribution on the connections that is as balanced as possible.
- All mounting points maintain the same spacing to the finished level permanently and under load, so that no mechanical stress occurs in the unit structure. The units are anchored in their mounting position in order to prevent the equipment from moving.
- The functional safety of the fixing bolts is tested as part of the maintenance periods. See Maintenance.
- The unit is mounted and set up so that it is not damaged by environment-conditional hazard sources (production, transport and other processes at the final installation point) or its functioning is not disturbed by the interventions of unauthorized persons.
- The units are mounted and set up so that unobstructed air entering/ air living is constantly available without any air short circuiting.
- The units are mounted so that they can be inspected, checked and maintained from all sides at all times, i.e. there must be unobstructed access to the working fluid-carrying and electrical components, connections and lines, the pipeline labeling must be identifiable and adequate space must be available for testing.

⚠ WARNING

- The working fluid-carrying lines are protected against mechanical damage. On-site connections: when installing keep the unit free of load; force must not be exerted on the distribution and header pipes.
- The following must be observed without fail when installing the unit:
 - Imperative adherence to spacing from objects that could be endangered by an effect of the working fluids.
 - Provision of measures to safeguard protective objects from a working fluids concentration of more than permissible.
 - Flammable materials must not be placed below the unit.
 - Set up and mount units as follows: In areas that are used for inner-plant traffic, the pipelines to and from the unit must only be installed with connections and fittings that cannot be removed.
 - Relief devices to prevent liquid releases must be provided and available.
 - Sub-cooled liquid must only be present in a minimal amount in system sections in shutdown state.
 - That when switching over a duty pump to a reserve pumps no liquid, cold working fluid remains in the pump.

3.11 Residual hazards with break during operation

⚠ WARNING

Injuries and damage to property caused by break during operation

- Residual hazards with break during operation (see Residual hazards caused by defective installation),
- Non-compliance with maximum permissible operating pressure (see Operating conditions),
- Disregarding pressurized line sections with maintenance (see Residual hazards caused by pressurized parts.)
- Disregarding residual hazards caused by vibration (see Residual hazards caused by vibrations result in ruptures during operation and maintenance. This results in dangers caused by:
 - Loose components (see Residual hazards caused by pressurized parts.)
 - Working fluid releases (see Residual hazards with Working fluids).

Ensure that:

- The installation is fault-free.
- The maximum permissible operating pressure is always adhered to.
- Pressurized line sections are de-pressurized before any or all maintenance and repair work.
- Vibrations from the refrigeration system (vibrations caused by refrigeration system compressors, components and lines) and from the fan (imbalances caused by frosting or dirt build-up or damages) are reduced with all available means and brought down to an absolute minimum.
- Relief devices to prevent liquid releases are provided and available.
- Sub-cooled liquid only be present in a minimal amount in system sections in shutdown state.

3.12 Residual hazards caused by loose components or liquids

⚠ WARNING

Injuries and damage to property caused by loose components or liquids.

Residual hazards caused by loose components and liquids (see Residual hazards with break during operation).

3.13 Residual hazards with disposal

⚠ WARNING

Danger of injuries and damage to property caused by working fluids.

The following notes are recommendations for the proper professional disposal of the unit. Applicable waste disposal laws are binding for the country of operation:

- Disposal must only be carried out by experts.
- All unit components, e.g. working fluid, refrigerator oil, heat exchangers, fans must be disposed of properly as specified.
- Used working fluid that is not determined for re-use, must be treated as waste and safely disposed of. There must be no emissions into the environment.
- The working fluids must be transferred into a working fluid container in compliance with the respective safety measures. This special working fluid container must be suitable for the working fluid. It must be easy to identify and labeled for the working fluid, e.g. "HFC R404A recovered".
- A disposable single-use container must not be used, as working fluid vapor residues in the container escape during disposal.
- The working fluid container must not be overfilled. The maximum permissible pressure of the container must not be exceeded during the removal process.
- The working fluid must not be filled in a liquid container that contains another or an unknown working fluid, working fluid and/or substance. This other or unknown working fluid must not be released into the atmosphere, but rather identified, treated again, or properly disposed of as specified.
- An officially authorized facility can be used for destroying the working fluid.
- Used working fluid oil that has been recovered from the unit and cannot be treated again, must be kept in a separate, suitable container, treated as waste and safely disposed of.
- It must be ensured that all unit components containing working fluids and working fluid oil, are disposed of properly as specified.
- The unit consists predominantly of the basic materials copper, aluminum, galvanized steel (heat exchanger and casing), steel, polyamide (motors). These materials can be handled by the waste industry, including in paint-treated state, to recycling via mechanical and thermal separation.
- Before scrapping the working fluid-carrying unit components must be drained, whereby the pressure must be reduced to at least 8.7 psi (0.6 bar) absolute for a unit pipe volume up to and including 7.0 ft³ (200 l), and to 4.3 psi (0.3 bar) absolute for a unit pipe volume over 7.0 ft³ (200 l). The pressure reduction process is then ended when the pressure no longer increases and remains constant, and the unit is at ambient temperature.

⚠ WARNING

Danger of environmental pollution

Operate the facility for recovering or disposing of working fluid so that the danger of a working fluid or working fluid oil emission into environment is kept to a minimum.

Ensure that no working fluid enters water system or sewage.

Güntner transportation packaging is made from environmentally compatible material and is suitable for recycling.

4. Technical data

4.1 Unit

NOTICE

The fans' capacity values depend on the ambient temperature and on the external pressure at the working point.

All electrical components and devices must be installed in accordance with applicable national and local codes and regulations such as national electrical code (NEC). Installation must comply with specifications regarding wire types, conductor sizes, branch circuit protection and disconnect devices. Failure to do so may result in personal injury and/or equipment damage.

Project number	See order – submittal documents – unit nameplate
Unit name	See order – submittal documents – unit nameplate
Manufacturer number	See order – submittal documents – unit nameplate
Production year	See order – submittal documents – unit nameplate
Working fluid	See order – submittal documents – unit nameplate
Volume	See order – related offer documents
Permissible operation pressure	464.1 psi (32.0 bar)
Test pressure	510.5 psi (35.2 bar)
Permissible air humidity	100 %
Test date	See order – submittal documents – unit nameplate
Test medium	Dry air
Weight	See order – submittal documents – unit nameplate

4.2 Fans

Fan type	See order – related offer documents
Protection rating	Insulation class F
Current type	3 ~ rotating current
Voltage	460V/3~/60Hz 230V/3~/60Hz 400V/3~/60Hz 400V/3~/50Hz 575V/3~/60Hz
Permissible air temperature	Usage range -40 °F to +131 °F (-40 °C to +55 °C)
Protective device	Thermo contacts (break contact-protective device for preventing thermal overload)

4.3 Nomenclature

Example	Meaning	Possible variants
G	Company	G üntner
F	Function	F : Fluid/Drycooler V : Condenser
H	Position	H : Horizontal V : Vertical
090	Fan diameter	050, 052 : 500mm 065, 067 : 650mm 080, 082 : 800mm 090, 092 : 900mm
.3	Version	.1 : 1st Version .2 : 2nd Version .3 : 3rd Version Etc...
B	Module	A,B,C and D*
/	Slash	Illustration only
2x5	Fans Quantity	1 2 , 2x2 3 , 2x3 4 , 2x4 5 , 2x5 6 , 2x6
N	Sound Level	N - Normal M - Medium L - Low S - Very Low E - Extremely low
L	Voltage/Phases/ Frequency	J,I - 400V/3F/60HZ L, K - 460V/3F/60HZ S, D - 400V/3F/50HZ U, V - 230V/3F/60HZ H - 575V/3F/60HZ 1 - 200-277V/1F/50-60HZ 2 - 380-480V/3F/50-60HZ 3 - 100-240V/1F/50-60HZ 4 - 200-240V/3F/50-60HZ
/	Slash	Illustration only
2P	Number of steps (Drycoolers only)	1P - 1 step 2P - 2 steps Etc...
.M	Country of origin	.M - Made in México

*For module info check the following tables.

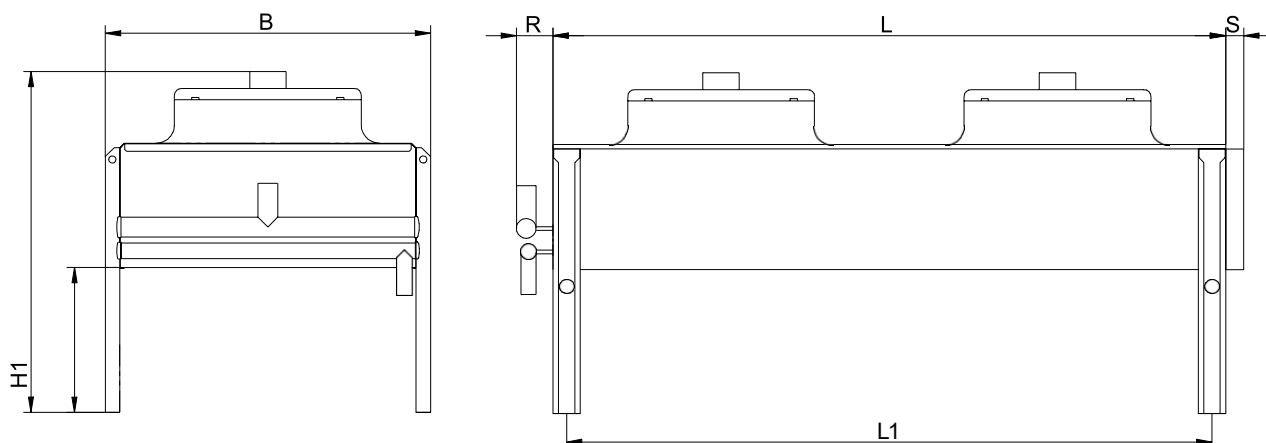
GVH.1 /GW.1/GFH.1 /GFV.1				
CANT. VENT. 050, 065				
	1	2,2×2	3,2×3	4
A	875 mm	1800 mm	2725 mm	3650 mm
B	1075 mm	2200 mm	3325 mm	4450 mm
C	1275 mm	2600 mm	3925 mm	5250 mm
D	N/A	N/A	N/A	N/A

GFH.2 / GFV.2 y GVHA / GVV.4						
CANT. VENT. 080, 090						
	1	2,2×2	3,2×3	4,2×4	5, 2x5	6,2x6
A	1900 mm	3800 mm	5700 mm	7600 mm	9500 mm	11400 mm
B	2300 mm	4600 mm	6900 mm	9200 mm	11500 mm	N/A
C	1900 mm	3800 mm	5700 mm	7600 mm	9500 mm	11400 mm
D	2300 mm	4600 mm	6900 mm	9200 mm	11500 mm	N/A

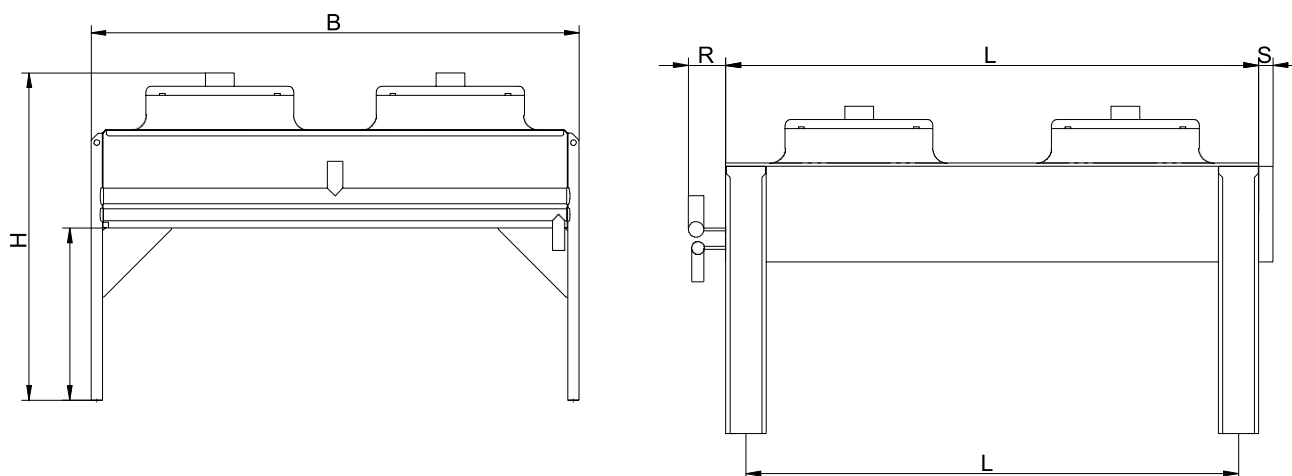
4.4 Dimensions

Horizontal units (fan diameter 500 mm and 650 mm)

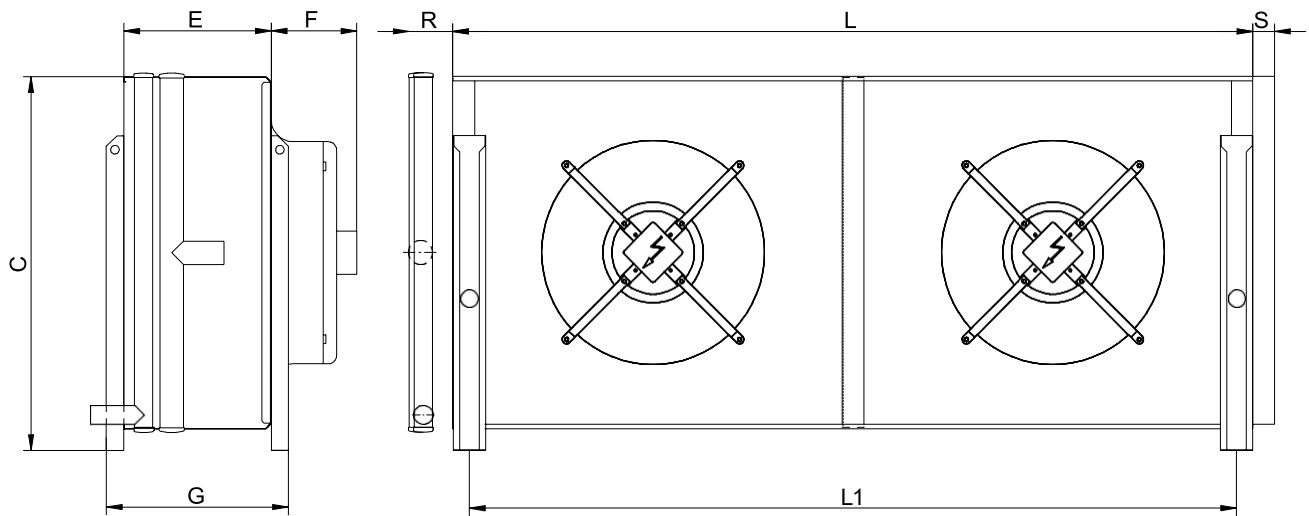
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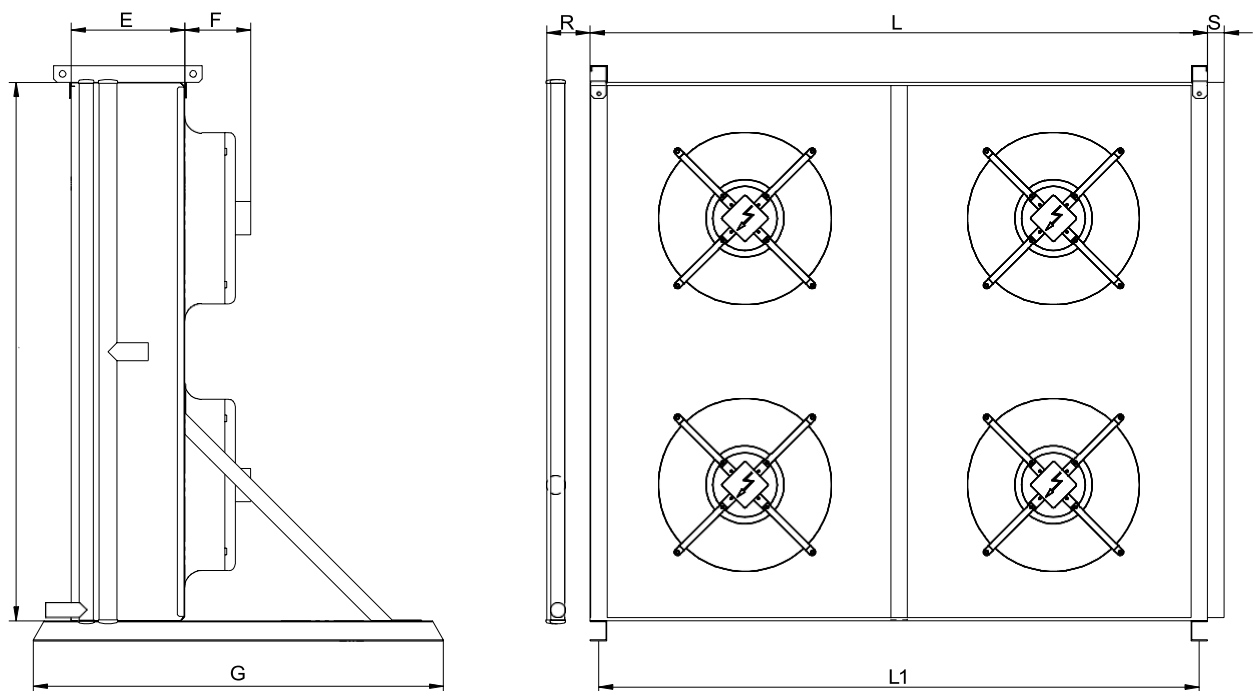
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GVH - GFH Model	B		H		H1		L		L1		R		S	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
050.1A/1	895	35 1/4	950	37 3/8	400	15 3/4	925	36 7/16	850	33 7/16	100	3 15/16	50	1 15/16
050.1A/2	895	35 1/4	950	37 3/8	400	15 3/4	1850	72 13/16	1775	69 7/8	100	3 15/16	50	1 15/16
050.1A/3	895	35 1/4	950	37 3/8	400	15 3/4	2775	109 1/4	2700	106 5/16	100	3 15/16	50	1 15/16
050.1B/3	895	35 1/4	950	37 3/8	400	15 3/4	3375	132 7/8	3300	129 15/16	100	3 15/16	50	1 15/16
050.1B/4	895	35 1/4	950	37 3/8	400	15 3/4	4500	177 3/16	2213	87 1/8	120	4 12/16	50	1 15/16
050.1C/1	895	35 1/4	950	37 3/8	400	15 3/4	1325	52 3/16	1250	49 3/16	100	3 15/16	50	1 15/16
050.1C/2	895	35 1/4	950	37 3/8	400	15 3/4	2650	104 5/16	2575	101 3/8	100	3 15/16	50	1 15/16
050.1C/3	895	35 1/4	950	37 3/8	400	15 3/4	3975	156 1/2	3900	153 9/16	100	3 15/16	50	1 15/16
050.1A/2x2	1695	66 3/4	1150	45 1/4	600	23 5/8	1850	72 13/16	1775	69 7/8	130	5 1/8	50	1 15/16
050.1A/2x3	1695	66 3/4	1150	45 1/4	600	23 5/8	2775	109 1/4	2700	106 5/16	130	5 1/8	50	1 15/16
050.1C/2x2	1695	66 3/4	1150	45 1/4	600	23 5/8	2650	104 5/16	2575	101 3/8	130	5 1/8	50	1 15/16
050.1C/2x3	1695	66 3/4	1150	45 1/4	600	23 5/8	3975	156 1/2	3900	153 9/16	130	5 1/8	50	1 15/16
065.1A/1	1145	45 1/16	950	37 3/8	400	15 3/4	925	36 7/16	850	33 7/16	100	3 15/16	50	1 15/16
065.1A/2	1145	45 1/16	950	37 3/8	400	15 3/4	1850	72 13/16	1775	69 7/8	110	4 5/16	50	1 15/16
065.1A/3	1145	45 1/16	950	37 3/8	400	15 3/4	2775	109 1/4	2700	106 5/16	120	4 12/16	50	1 15/16
065.1B/1	1145	45 1/16	950	37 3/8	400	15 3/4	1125	44 5/16	1050	41 5/16	100	3 15/16	50	1 15/16
065.1B/2	1145	45 1/16	950	37 3/8	400	15 3/4	2250	88 9/16	2175	85 10/16	110	4 5/16	50	1 15/16
065.1B/3	1145	45 1/16	950	37 3/8	400	15 3/4	3375	132 7/8	3300	129 15/16	120	4 12/16	50	1 15/16
065.1B/4	1145	45 1/16	950	37 3/8	400	15 3/4	4500	177 3/16	2213	87 1/8	130	5 1/8	50	1 15/16
065.1C/1	1145	45 1/16	950	37 3/8	400	15 3/4	1325	52 3/16	1250	49 3/16	100	3 15/16	50	1 15/16
065.1C/2	1145	45 1/16	950	37 3/8	400	15 3/4	2650	104 5/16	2575	101 3/8	110	4 5/16	50	1 15/16
065.1C/3	1145	45 1/16	950	37 3/8	400	15 3/4	3975	156 1/2	3900	153 9/16	130	5 1/8	50	1 15/16
065.1A/2x2	2195	86 7/16	1150	45 1/4	600	23 5/8	1850	72 13/16	1775	69 7/8	130	5 1/8	50	1 15/16
065.1A/2x3	2195	86 7/16	1150	45 1/4	600	23 5/8	2775	109 1/4	2700	106 5/16	130	5 1/8	50	1 15/16
065.1B/2x2	2195	86 7/16	1150	45 1/4	600	23 5/8	2250	88 9/16	2175	85 5/8	130	5 1/8	50	1 15/16
065.1B/2x3	2195	86 7/16	1150	45 1/4	600	23 5/8	3375	132 7/8	3300	129 15/16	130	5 1/8	50	1 15/16
065.1B/2x4	2195	86 7/16	1150	45 1/4	600	23 5/8	4500	177 3/16	2213	87 1/8	130	5 1/8	50	1 15/16
065.1C/2x2	2195	86 7/16	1150	45 1/4	600	23 5/8	2650	104 5/16	2575	101 3/8	130	5 1/8	50	1 15/16
065.1C/2x3	2195	86 7/16	1150	45 1/4	600	23 5/8	3975	156 1/2	3900	153 9/16	130	5 1/8	50	1 15/16



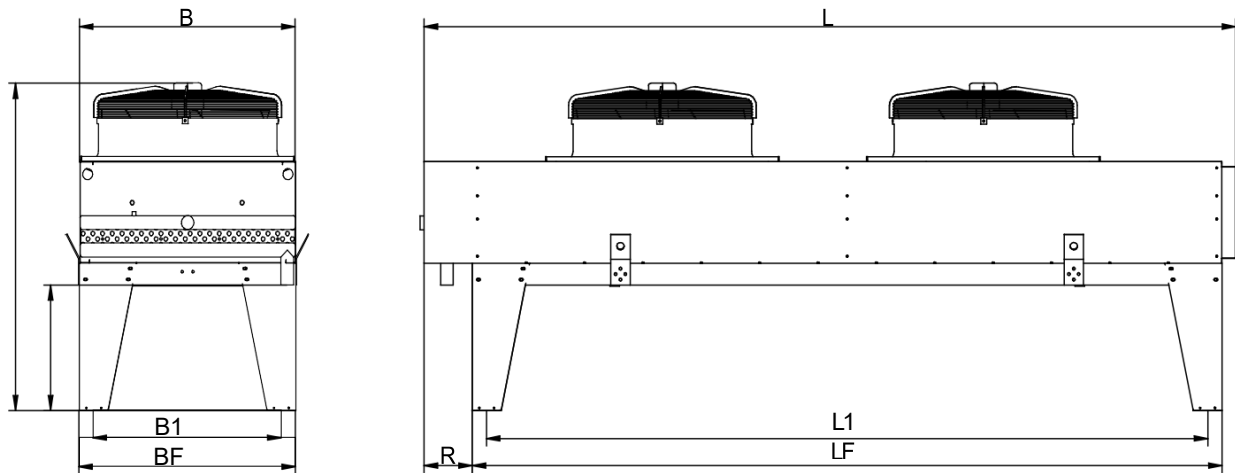
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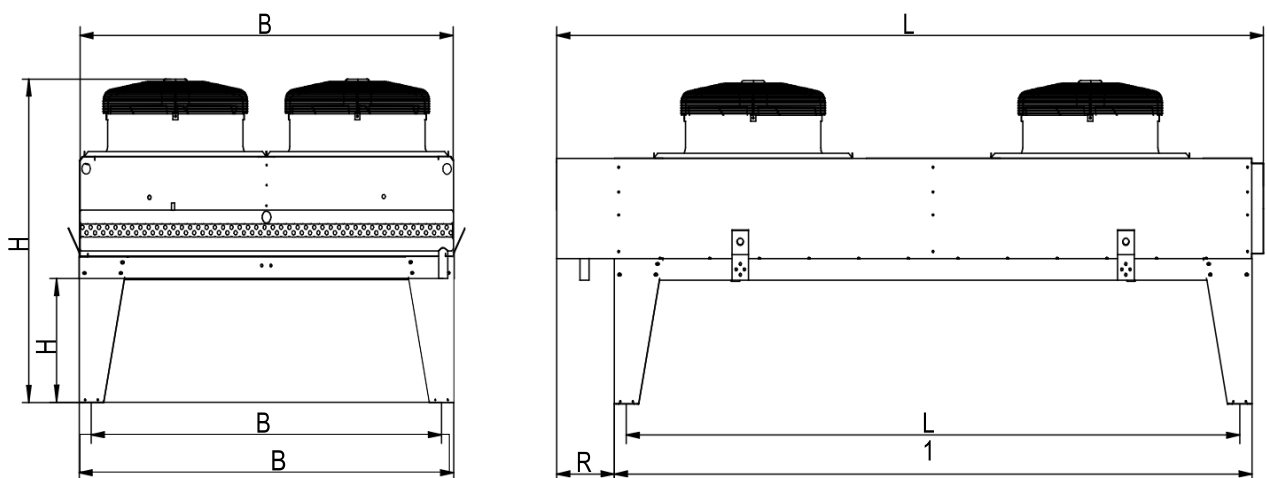
GVV - GFH Model	G		C		L		L1		E		F		R		S	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
050.1A/1	380	14 15/16	875	34 7/16	925	36 7/16	850	33 7/16	340	13 3/8	210	8 1/4	100	3 15/16	50	1 15/16
050.1A/2	380	14 15/16	875	34 7/16	1850	72 13/16	1775	69 7/8	340	13 3/8	210	8 1/4	100	3 15/16	50	1 15/16
050.1A/3	380	14 15/16	875	34 7/16	2775	109 1/4	2700	106 5/16	340	13 3/8	210	8 1/4	100	3 15/16	50	1 15/16
050.1B/3	380	14 15/16	875	34 7/16	3375	132 7/8	3300	129 15/16	340	13 3/8	210	8 1/4	100	3 15/16	50	1 15/16
050.1B/4	380	14 15/16	875	34 7/16	4500	177 3/16	4425	174 3/16	340	13 3/8	210	8 1/4	120	4 3/4	50	1 15/16
050.1C/1	380	14 15/16	875	34 7/16	1325	52 3/16	1250	49 3/16	340	13 3/8	210	8 1/4	100	3 15/16	50	1 15/16
050.1C/2	380	14 15/16	875	34 7/16	2650	104 5/16	2575	101 3/8	340	13 3/8	210	8 1/4	100	3 15/16	50	1 15/16
050.1C/3	380	14 15/16	875	34 7/16	3975	156 1/2	3900	153 9/16	340	13 3/8	210	8 1/4	100	3 15/16	50	1 15/16
050.1A/2x2	1230	48 7/16	1725	67 15/16	1850	72 13/16	1800	70 7/8	340	13 3/8	210	8 1/4	130	5 1/8	50	1 15/16
050.1A/2x3	1230	48 7/16	1725	67 15/16	2775	109 1/4	2725	107 5/16	340	13 3/8	210	8 1/4	130	5 1/8	50	1 15/16
050.1C/2x2	1230	48 7/16	1725	67 15/16	2650	104 5/16	2600	102 3/8	340	13 3/8	210	8 1/4	130	5 1/8	50	1 15/16
050.1C/2x3	1230	48 7/16	1725	67 15/16	3975	156 1/2	3925	154 1/2	340	13 3/8	210	8 1/4	130	5 1/8	50	1 15/16
065.1A/1	380	14 15/16	1125	44 5/16	925	36 7/16	850	33 7/16	340	13 3/8	230	9 1/16	100	3 15/16	50	1 15/16
065.1A/2	380	14 15/16	1125	44 5/16	1850	72 13/16	1775	69 7/8	340	13 3/8	230	9 1/16	110	4 5/16	50	1 15/16
065.1A/3	380	14 15/16	1125	44 5/16	2775	109 1/4	2700	106 5/16	340	13 3/8	230	9 1/16	120	4 3/4	50	1 15/16
065.1B/1	380	14 15/16	1125	44 5/16	1125	44 5/16	1050	41 5/16	340	13 3/8	230	9 1/16	100	3 15/16	50	1 15/16
065.1B/2	380	14 15/16	1125	44 5/16	2250	88 9/16	2175	85 5/8	340	13 3/8	230	9 1/16	110	4 5/16	50	1 15/16
065.1B/3	380	14 15/16	1125	44 5/16	3375	132 7/8	3300	129 15/16	340	13 3/8	230	9 1/16	120	4 3/4	50	1 15/16
065.1B/4	380	14 15/16	1125	44 5/16	4500	177 3/16	4425	174 3/16	340	13 3/8	230	9 1/16	130	5 1/8	50	1 15/16
065.1C/1	380	14 15/16	1125	44 5/16	1325	52 3/16	1250	49 3/16	340	13 3/8	230	9 1/16	100	3 15/16	50	1 15/16
065.1C/2	380	14 15/16	1125	44 5/16	2650	104 5/16	2575	101 3/8	340	13 3/8	230	9 1/16	110	4 5/16	50	1 15/16
065.1C/3	380	14 15/16	1125	44 5/16	3975	156 1/2	3900	153 9/16	340	13 3/8	230	9 1/16	130	5 1/8	50	1 15/16
065.1A/2x2	1230	48 7/16	2225	87 5/8	1850	72 13/16	1800	70 7/8	340	13 3/8	230	9 1/16	130	5 1/8	50	1 15/16
065.1A/2x3	1230	48 7/16	2225	87 5/8	2775	109 1/2	2725	107 5/16	340	13 3/8	230	9 1/16	130	5 1/8	50	1 15/16
065.1B/2x2	1230	48 7/16	2225	87 5/8	2250	88 9/16	2200	86 5/8	340	13 3/8	230	9 1/16	130	5 1/8	50	1 15/16
065.1B/2x3	1230	48 7/16	2225	87 5/8	3375	132 7/8	3325	130 7/8	340	13 3/8	230	9 1/16	130	5 1/8	50	1 15/16
065.1B/2x4	1230	48 7/16	2225	87 5/8	4500	177 3/16	4450	175 3/16	340	13 3/8	230	9 1/16	130	5 1/8	50	1 15/16
065.1C/2x2	1230	48 7/16	2225	87 5/8	2650	104 5/16	2600	102 3/8	340	13 3/8	230	9 1/16	130	5 1/8	50	1 15/16
065.1C/2x3	1230	48 7/16	2225	87 5/8	3975	156 1/2	3925	154 1/2	340	13 3/8	230	9 1/16	130	5 1/8	50	1 15/16

Horizontal units (fan diameter 800 mm and 900 mm)

Single row



Double row

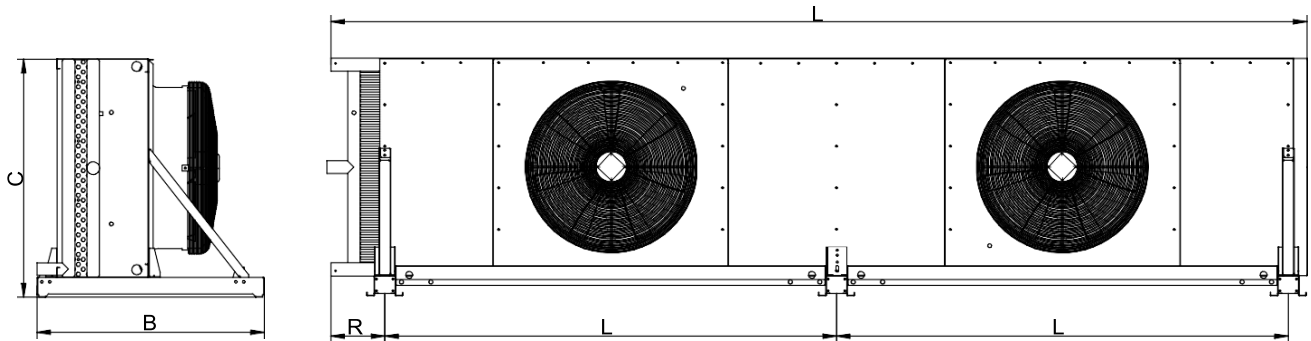


GVH-GFH Mode	B		B1		BF		H		H1		L		L1		LF		R	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
080.4A/1	1116	43 15/16	1013	39 7/8	1113	43 13/	1500	59 1/16	600	23 5/8	2270	89 3/8	1854	73	1954	76 15/16	248	9 3/4
080.4A/2	1116	43 15/16	1013	39 7/8	1113	43 13/	1500	59 1/16	600	23 5/8	4170	164 3/16	3754	147 13/16	3854	151 3/4	248	9 3/4
080.4A/3	1116	43 15/16	1013	39 7/8	1113	43 13/	1500	59 1/16	600	23 5/8	6070	239	2827	111 5/16	5754	226 9/16	248	9 3/4
080.4A/4	1116	43 15/16	1013	39 7/8	1113	43 13/	1500	59 1/16	600	23 5/8	8070	317 11/16	3777	148 11/16	7654	301 5/16	348	13 11/16
080.4A/5	1116	43 15/16	1013	39 7/8	1113	43 13/	1500	59 1/16	600	23 5/8	9970	392 1/2	3152	124 1/8	9554	376 1/8	348	13 11/16
080.4A/6	1116	43 15/16	1013	39 7/8	1113	43 13/	1500	59 1/16	600	23 5/8	11870	467 5/16	3785	149	11454	450 15/16	348	13 11/16
080.4B/1	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	2670	105 1/8	2254	88 3/4	2354	92 11/16	248	9 3/4
080.4B/2	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	4970	195 11/16	4554	179 5/16	4654	183 1/4	248	9 3/4
080.4B/3	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	7270	286 1/4	3427	134 15/16	6954	273 3/4	248	9 3/4
080.4B/4	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	9670	380 11/16	3052	120 3/16	9254	364 5/16	348	13 11/16
080.4B/5	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	11970	471 1/4	3818	150 5/16	11554	454 7/8	348	13 11/16
080.4C/1	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	2270	89 3/8	1854	73	1954	76 15/16	248	9 3/4
080.4C/2	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	4170	164 3/16	3754	147 13/16	3854	151 3/4	248	9 3/4
080.4C/3	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	6070	239	2827	111 5/16	5754	226 9/16	248	9 3/4
080.4C/4	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	8070	317 11/16	3777	148 11/16	7654	301 5/16	348	13 11/16
080.4C/5	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	9970	392 1/2	3152	124 1/8	9554	376 1/8	348	13 11/16
080.4C/6	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	11870	467 5/16	3785	149	11454	450 15/16	348	13 11/16
080.4D/1	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	2670	105 1/8	2254	88 3/4	2354	92 11/16	248	9 3/4
080.4D/2	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	4970	195 11/16	4554	179 5/16	4654	183 1/4	248	9 3/4
080.4D/3	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	7270	286 1/4	3427	134 15/16	6954	273 3/4	248	9 3/4
080.4D/4	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	9670	380 11/16	3052	120 3/16	9254	364 5/16	348	13 11/16
080.4D/5	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	11970	471 1/4	3818	150 5/16	11554	454 7/8	348	13 11/16
080.4A/2x2	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	4270	168 1/8	3754	147 13/16	3854	151 3/4	348	13 11/16
080.4A/2x3	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	6170	242 15/16	2827	111 5/16	5754	226 9/16	348	13 11/16
080.4A/2x4	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	8070	317 11/16	3777	148 11/16	7654	301 5/16	348	13 11/16
080.4A/2x5	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	9970	392 1/2	3152	124 1/8	9554	376 1/8	348	13 11/16
080.4A/2x6	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	11870	467 5/16	3786	149 1/16	11454	450 15/16	348	13 11/16
080.4B/2x2	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	5070	199 5/8	4554	179 5/16	4654	183 1/4	348	13 11/16
080.4B/2x3	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	7370	290 3/16	3427	134 15/16	6954	273 3/4	348	13 11/16
080.4B/2x4	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	9670	380 11/16	3052	120 3/16	9254	364 5/16	348	13 11/16
080.4B/2x5	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	11970	471 1/4	3818	150 5/16	11554	454 7/8	348	13 11/16
090.4A/1	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	2270	89 3/8	1854	73	1954	76 15/16	248	9 3/4
090.4A/2	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	4170	164 3/16	3754	147 13/16	3854	151 3/4	248	9 3/4
090.4A/4	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	8070	317 11/16	3777	148 11/16	7654	301 5/16	348	13 11/16
090.4A/5	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	9970	392 1/2	3152	124 1/8	9554	376 1/8	348	13 11/16
090.4A/6	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	11870	467 5/16	3785	149	11454	450 15/16	348	13 11/16

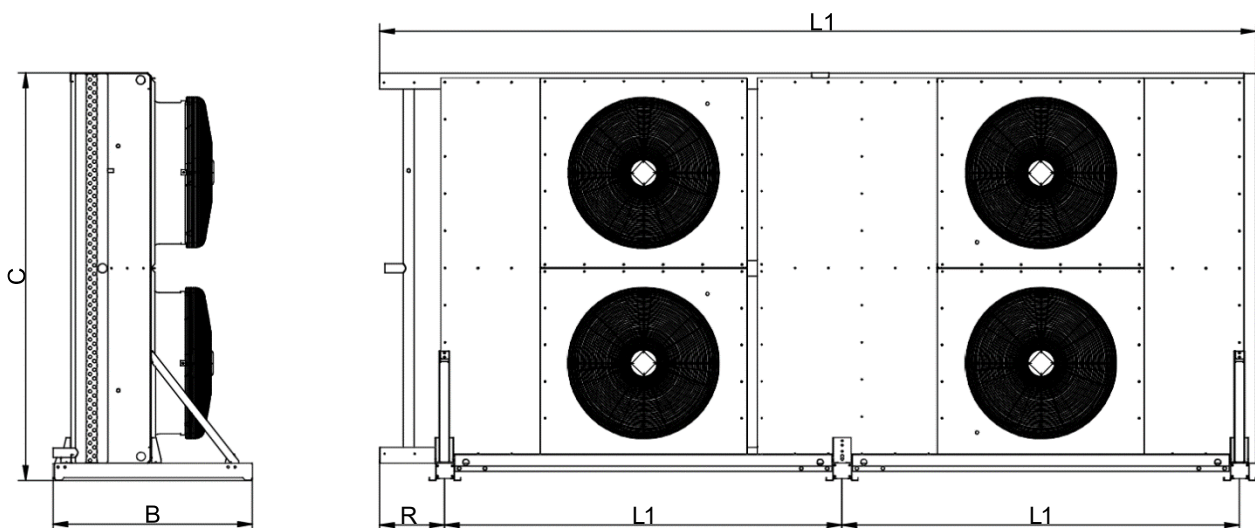
GVH - GFH Mode	B		B1		BF		H		H1		L		L1		LF		R	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
090.4B/1	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	2670	105 1/8	2254	88 3/4	2354	92 11/16	248	9 3/4
090.4B/2	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	4970	195 11/16	4554	179 5/16	4654	183 1/4	248	9 3/4
090.4B/3	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	7270	286 1/4	3427	134 15/16	6954	273 3/4	248	9 3/4
090.4B/4	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	9670	380 11/16	3052	120 3/16	9254	364 5/16	348	13 11/16
090.4B/5	1116	43 15/16	1013	39 7/8	1113	43 13/16	1500	59 1/16	600	23 5/8	11970	471 1/4	3818	150 5/16	11554	454 7/8	348	13 11/16
090.4C/1	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	2270	89 3/8	1854	73	1954	76 15/16	248	9 3/4
090.4C/2	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	4170	164 3/16	3754	147 13/16	3854	151 3/4	248	9 3/4
090.4C/3	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	6070	239	2827	111 5/16	5754	226 9/16	248	9 3/4
090.4C/4	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	8070	317 11/16	3777	148 11/16	7654	301 5/16	348	13 11/16
090.4C/5	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	9970	392 1/2	3152	124 1/8	9554	376 1/8	348	13 11/16
090.4C/6	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	11870	467 5/16	3785	149	11454	450 15/16	348	13 11/16
090.4D/1	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	2670	105 1/8	2254	88 3/4	2354	92 11/16	248	9 3/4
090.4D/2	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	4970	195 11/16	4554	179 5/16	4654	183 1/4	248	9 3/4
090.4D/3	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	7270	286 1/4	3427	134 15/16	6954	273 3/4	248	9 3/4
090.4D/4	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	9670	380 11/16	3052	120 3/16	9254	364 5/16	348	13 11/16
090.4D/5	1516	59 11/16	1413	55 5/8	1513	59 9/16	1500	59 1/16	600	23 5/8	11970	471 1/4	3818	150 5/16	11554	454 7/8	348	13 11/16
090.4A/2x2	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	4270	168 1/8	3754	147 13/16	3854	151 3/4	348	13 11/16
090.4A/2x3	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	6170	242 15/16	2827	111 5/16	5754	226 9/16	348	13 11/16
090.4A/2x4	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	8070	317 11/16	3777	148 11/16	7654	301 5/16	348	13 11/16
090.4A/2x5	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	9970	392 1/2	3152	124 1/8	9554	376 1/8	348	13 11/16
090.4A/2x6	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	11870	467 5/16	3785	149	11454	450 15/16	348	13 11/16
090.4B/2x2	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	5070	199 5/8	4554	179 5/16	4654	183 1/4	348	13 11/16
090.4B/2x3	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	7370	290 3/16	3427	134 15/16	6954	273 3/4	348	13 11/16
090.4B/2x4	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	9670	380 11/16	3052	120 3/16	9254	364 5/16	348	13 11/16
090.4B/2x5	2266	89 3/16	2163	85 3/16	2263	89 1/8	1500	59 1/16	600	23 5/8	11970	471 1/4	3818	150 5/16	11554	454 7/8	348	13 11/16

Vertical units (fan diameter 800 mm and 900 mm)

Single row



Double row



GVV - GFH Model	B		C		L		L1		R1	
	mm	in	mm	in	mm	in	mm	in	mm	in
080.4A/1	1153	45 3/8	1209	49 9/16	2270	89 3/8	1900	74 13/16	275	10 13/16
080.4A/2	1153	45 3/8	1209	49 9/16	4170	164 3/16	1900	74 13/16	275	10 13/16
080.4A/3	1153	45 3/8	1209	49 9/16	6070	239	1900	74 13/16	275	10 13/16
080.4A/4	1153	45 3/8	1209	49 9/16	8070	317 11/16	1900	74 13/16	375	14 3/4
080.4A/5	1153	45 3/8	1209	49 9/16	9970	392 1/2	1900	74 13/16	375	14 3/4
080.4A/6	1153	45 3/8	1209	49 9/16	11870	467 5/16	1900	74 13/16	375	14 3/4

GVV - GFH Model	B		C		L		L1		R1	
	mm	in	mm	in	mm	in	mm	in	mm	in
080.4B/1	1153	45 3/8	1209	49 9/16	2670	105 1/8	2300	90 9/16	275	10 13/16
080.4B/2	1153	45 3/8	1209	49 9/16	4970	195 11/16	2300	90 9/16	275	10 13/16
080.4B/3	1153	45 3/8	1209	49 9/16	7270	286 1/4	2300	90 9/16	275	10 13/16
080.4B/4	1153	45 3/8	1209	49 9/16	9670	380 11/16	2300	90 9/16	375	14 3/4
080.4B/5	1153	45 3/8	1209	49 9/16	11970	471 1/4	2300	90 9/16	375	14 3/4
080.4C/1	1153	45 3/8	1609	65 15/16	2270	89 3/8	1900	74 13/16	275	10 13/16
080.4C/2	1153	45 3/8	1609	65 15/16	4170	164 3/16	1900	74 13/16	275	10 13/16
080.4C/3	1153	45 3/8	1609	65 15/16	6070	239	1900	74 13/16	275	10 13/16
080.4C/4	1153	45 3/8	1609	65 15/16	8070	317 11/16	1900	74 13/16	375	14 3/4
080.4C/5	1153	45 3/8	1609	65 15/16	9970	392 1/2	1900	74 13/16	375	14 3/4
080.4C/6	1153	45 3/8	609	65 15/16	11870	467 5/16	1900	74 13/16	375	14 3/4
080.4D/1	1153	45 3/8	1609	65 15/16	2670	105 1/8	2300	90 9/16	275	10 13/16
080.4D/2	1153	45 3/8	1609	65 15/16	4970	195 11/16	2300	90 9/16	275	10 13/16
080.4D/3	1153	45 3/8	1609	65 15/16	7270	286 1/4	2300	90 9/16	275	10 13/16
080.4D/4	1153	45 3/8	1609	65 15/16	9670	380 11/16	2300	90 9/16	375	14 3/4
080.4D/5	1153	45 3/8	1609	65 15/16	11970	471 1/4	2300	90 9/16	375	14 3/4
080.4A/2x2	1153	45 3/8	2359	96 11/16	4270	168 1/8	1900	74 13/16	375	14 3/4
080.4A/2x3	1153	45 3/8	2359	96 11/16	6170	242 15/16	1900	74 13/16	375	14 3/4
080.4A/2x4	1153	45 3/8	2359	96 11/16	8070	317 11/16	1900	74 13/16	375	14 3/4
080.4A/2x5	1153	45 3/8	2359	96 11/16	9970	392 1/2	1900	74 13/16	375	14 3/4
080.4A/2x6	1153	45 3/8	2359	96 11/16	11870	467 5/16	1900	74 13/16	375	14 3/4
080.4B/2x2	1153	45 3/8	2359	96 11/16	5070	199 5/8	2300	90 9/16	375	14 3/4
080.4B/2x3	1153	45 3/8	2359	96 11/16	7370	290 3/16	2300	90 9/16	375	14 3/4
080.4B/2x4	1153	45 3/8	2359	96 11/16	9670	380 11/16	2300	90 9/16	375	14 3/4
080.4B/2x5	1153	45 3/8	2359	96 11/16	11970	471 1/4	2300	90 9/16	375	14 3/4
090.4A/1	1153	45 3/8	1209	49 9/16	2270	89 3/8	1900	74 13/16	275	10 13/16
090.4A/2	1153	45 3/8	1209	49 9/16	4170	164 3/16	1900	74 13/16	275	10 13/16
090.4A/3	1153	45 3/8	1209	49 9/16	6070	239	1900	74 13/16	275	10 13/16
090.4A/4	1153	45 3/8	1209	49 9/16	8070	317 11/16	1900	74 13/16	375	14 3/4
090.4A/5	1153	45 3/8	1209	49 9/16	9970	392 1/2	1900	74 13/16	375	14 3/4
090.4A/6	1153	45 3/8	1209	49 9/16	11870	467 5/16	1900	74 13/16	375	14 3/4
090.4B/1	1153	45 3/8	1209	49 9/16	2670	105 1/8	2300	90 9/16	275	10 13/16
090.4B/2	1153	45 3/8	1209	49 9/16	4970	195 11/16	2300	90 9/16	275	10 13/16
090.4B/3	1153	45 3/8	1209	49 9/16	7270	286 1/4	2300	90 9/16	275	10 13/16
090.4B/4	1153	45 3/8	1209	49 9/16	9670	380 11/16	2300	90 9/16	375	14 3/4
090.4B/5	1153	45 3/8	1209	49 9/16	11970	471 1/4	2300	90 9/16	375	14 3/4
090.4C/1	1153	45 3/8	1609	65 15/16	2270	89 3/8	1900	74 13/16	275	10 13/16
090.4C/2	1153	45 3/8	1609	65 15/16	4170	164 3/16	1900	74 13/16	275	10 13/16
090.4C/3	1153	45 3/8	1609	65 15/16	6070	239	1900	74 13/16	275	10 13/16
090.4C/4	1153	45 3/8	1609	65 15/16	8070	317 11/16	1900	74 13/16	375	14 3/4
090.4C/5	1153	45 3/8	1609	65 15/16	9970	392 1/2	1900	74 13/16	375	14 3/4
090.4C/6	1153	45 3/8	1609	65 15/16	11870	467 5/16	1900	74 13/16	375	14 3/4
090.4D/1	1153	45 3/8	1609	65 15/16	2670	105 1/8	2300	90 9/16	275	10 13/16
090.4D/2	1153	45 3/8	1609	65 15/16	4970	195 11/16	2300	90 9/16	275	10 13/16
090.4D/3	1153	45 3/8	1609	65 15/16	7270	286 1/4	2300	90 9/16	275	10 13/16
090.4D/4	1153	45 3/8	1609	65 15/16	9670	380 11/16	2300	90 9/16	375	14 3/4
090.4D/5	1153	45 3/8	1609	65 15/16	11970	471 1/4	2300	90 9/16	375	14 3/4
090.4A/2x2	1153	45 3/8	2359	96 11/16	4270	168 1/8	1900	74 13/16	375	14 3/4
090.4A/2x3	1153	45 3/8	2359	96 11/16	6170	242 15/16	1900	74 13/16	375	14 3/4
090.4A/2x4	1153	45 3/8	2359	96 11/16	8070	317 11/16	1900	74 13/16	375	14 3/4
090.4A/2x5	1153	45 3/8	2359	96 11/16	9970	392 1/2	1900	74 13/16	375	14 3/4
090.4A/2x6	1153	45 3/8	2359	96 11/16	11870	467 5/16	1900	74 13/16	375	14 3/4
090.4B/2x2	1153	45 3/8	2359	96 11/16	5070	199 5/8	2300	90 9/16	375	14 3/4
090.4B/2x3	1153	45 3/8	2359	96 11/16	7370	290 3/16	2300	90 9/16	375	14 3/4
090.4B/2x4	1153	45 3/8	2359	96 11/16	9670	380 11/16	2300	90 9/16	375	14 3/4
090.4B/2x5	1153	45 3/8	2359	96 11/16	11970	471 1/4	2300	90 9/16	375	14 3/4

5. Set-up and function

The condenser consists of:

- a heat exchanger arranged as consisting of pipe coils fitted with fins (copper tube, aluminum fin), headers and header's outlets .
- a self-supporting enclosure structure with side support and number of legs. The enclosure consists of galvanized sheet steel, painted.
- and – depending on the version – with one or more low noise axial fans, with maintenance –free motors.

The GVH/GVV/GFH Vario series are a refrigeration system component. The refrigeration system is a combination of working fluid-carrying components and fittings connected with one another, which form a closed circuit, in which the working fluid circulates.

The working fluid absorbs heat at low temperature and low pressure and evaporates (cold side), and at higher temperature and higher pressure gives off the heat gain and cools itself (warm side). The unit cools the working fluid by giving off heat to the air that is moved by fans over the dry heat exchanger surface.

The refrigerants that are used (e.g. R134a, R404A, R407C, R507, R22, CO₂, NH₃, etc.) are classified according to the ASHRAE Standard 34-2024 (see Residual hazards with working fluids). Other working fluids such as water, glycol, and oil are not classified under ASHRAE Standard 34 2024; therefore, appropriate safety measures shall be applied as required for their specific hazards.

6. Fan motor

NOTICE

During longer storage or downtime periods, the fans must be operated for 2 to 4 hours each month.

NOTICE

In the case of fans with condensate holes, any sealed (plugged) condensate drain holes must be opened at least every six months.

In the case of fans with condensate holes, any sealed (plugged) condensate drain holes must be opened at least every six months.

AC technology

The AC motors are protected against overheating by a thermo-contact.

For motors with thermo-contact, the thermo-contact has to be wired in the switch cabinet in such a way that turning on the motor with triggered thermo-contact is not possible. A locking device is recommended for preventing reactivation.

Motors with PTC resistors require an additional trigger device for the installed thermistors. Locking is recommended to prevent reactivation. Max. 2.5 V test voltage or current-limited meters may be used on thermistors.

For motors with direct start and a connection value > 4.0 kW, a startup current limitation (soft start using thyristor) may be necessary.

If frequency converters for speed control are used, the following has to be observed for external rotor motors:

Between frequency converter and motor, an effective all-pole sine filter has to be installed (sinus-shaped output voltage, filter effective between phase against phase, phase against earth)

Güntner frequency converters feature this function as standard. Güntner three-phase standard motors are suitable for direct operation on frequency converters.

The three-phase fan motors can be operated by means of star-delta with two speeds and/or with speed control. The direction of rotation must be checked. If the direction is wrong, it can be changed by interchanging two phases.

Electronic technology

NOTICE

The fan motors avail of a separate electronic power circuit. This power circuit is controlled via Güntner Motor Management (GMM). The motors can be powered at single-phase (220V-277V, 1~, 50/60 Hz) and three-phase (480V, 3~, 50/60 Hz) voltages. Please refer to the wiring diagrams or motor terminal box information for the electrical connection.

7. Transportation, rigging and storage

7.1 Safety

⚠ WARNING

Crushing danger with falling objects

The GVH/GVV/GFH unit's empty weight is between 626 lb (284 kg) and 5778 lb (2621 kg). It can slip and fall off the means of transport, causing serious injuries or death. Heavy impacts or vibrations can damage the unit.

Observe the instructions on the transport labels on the packed units. Ensure that the assigned staff is trained for proper unloading and rigging.

Use a transporting device appropriate for the unit's weight (see Transportation, rigging and storage, page 38). You will find the weight of the packed unit in the submittal offer documents.

Ensure that nobody is under the unit or near the loaded area during the rigging.

Observe even distribution of unit weight for transport. Observe that the main unit weight is always on the fan side. Observe the instructions on the transport labels on the packed units (see Other signs and notes on the unit, page 12).

Secure the unit against slipping and mechanical damage.

When rigging by crane: The hooks and lifting gear of the load lifting equipment must be only attached at the points specified by the manufacturer. Ensure that the unit casing is not crushed by slings, by incorporating sufficient protection around casing if required.

⚠ WARNING

Use auxiliary rigging equipment when and where required. Use a rigging device appropriate for the unit's weight. You will find the weight of the unit in submittal documents (see Setup and other applicable documents, page 7). Do not use connection pieces and header pipes as hooking points for lifting, pulling, fixing or mounting. This can cause leaks.

Rig the unit carefully. In particular avoid setting the unit down hard.

Only step on to units with firm, tough and safe footwear, and only when required.

If the units do not have any railings, walking on them with a safety device that prevents falling.

7.2 Transportation and storage

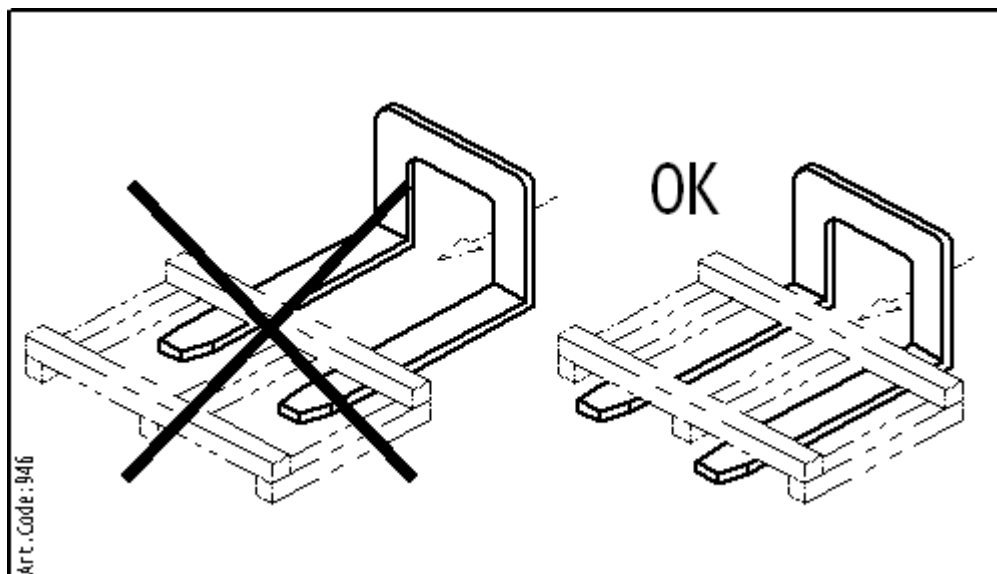
NOTICE

Read and observe all rigging signs on the units' packaging

Prolonged mechanical stresses caused by uneven road surfaces and potholes and vibrations during transport by ship can cause transportation damage. Before transportation by sea or in countries with difficult transport routes, attachment parts that are likely to vibrate – in particular fans and base stands – must be removed for transportation.

- Rigging the unit at the job site
- Unloading the unit
- Rig and unload the crated unit with suitable transport equipment (e.g. forklift, crane) at the job site.

CAUTION: When transporting with a forklift: Only lift the crated unit with a fork lengths extending beyond the outer reach of the crated skid section.



7.3 Storage before installation

NOTICE

Danger of corrosion and dirt build-up

Moisture and dirt must be prevented from entering the unit.

Protect the unit against dust, dirt, moisture and wetness, damage and other harmful effects. Harmful effects: see Safety instructions for set-up and start-up

Do not store the unit for longer than necessary. Only store the units in their original packaging until installation.

Store the unit at a protected place free of dust, dirt, moisture, and damage-free until it is installed (well-ventilated halls or roofed storage site).

If the unit installation is delayed with regard to the planned installation time: protect the unit against weather and other harmful effects and dirt and other contaminants with an appropriate cover. The unit must also be well-ventilated here.

8. Set-up and start up

8.1 Safety

8.1.1 Safety instructions for set-up and start up

⚠ WARNING

Danger of injuries and damage to property with leaking Working fluids

Incorrect installation can cause the danger of working fluid leaks when the unit is into operation, and injuries or damage to property can occur (see Residual hazards with Working fluids).

Follow the set-up instructions in this chapter precisely and apply extreme care.

NOTICE

Damage to the system's cooling equipment

Foreign materials and contaminants in the working fluid circuit can impair the effectiveness or damage components. Particularly harmful contaminants are:

- Moisture
- Atmospheric air
- Welding or brazing residues
- Rust
- Soot/ash/cinders
- Metal cuttings
- Unstable oils
- Dust and dirt of all kinds

NOTICE

Moisture in the working fluid-carrying components of the unit can have the following consequences:

- Water separation and ice formation cause faults in the switching and control fittings of the refrigeration system
- Acidification
- Ageing and working fluid oil decay
- Corrosion

Atmospheric air and other non-condensable gases can have the following consequences:

- Working fluid oil oxidation
- Chemical reactions between a working fluid and a working fluid oil
- Increased condensing pressure in the system

Chemical reactions between a working fluid and working fluid oil with the absence of moisture or atmospheric air with ageing and working fluid and working fluid oil decay can have the following consequences:

- Formation of organic and inorganic acids
- Increased discharge temperature in the system
- Corrosion
- Bad lubrication, increased wear and tear through to system or failure
- Accelerated chemical processes (decomposition)
- Mechanical and electrical faults in the refrigeration system

Ensure with installation (connecting the working fluid-carrying components of the unit to the working fluid-carrying system of the installation) that internal contamination is strictly avoided.

Perform the installation with extreme cleanliness.

Finish all on-site pipe installation work before releasing the holding charge.

Only release the holding charge at the Schrader valve immediately before final installation.

Only remove the sealing caps on the distribution and header pipe immediately before final connection.

NOTICE**Danger of corrosion and dirt build-up**

Humidity and dirt must not get into the unit's interior. If humidity or dirt gets into the unit's interior, fittings and other components of the refrigeration installation can be damaged.

Protect the unit against dust, contamination, moisture and wetness, damage and other harmful influences. Harmful influences are, for example:

- Mechanical: Damages caused by impacts, objects falling on or against, collisions with transport equipment, etc.
- Physical: Damages caused by close by exposure to flammable gases
- Chemical: Damages caused by contaminated atmospheres (salt, acid, chlorine, sulphur-containing, or similar)
- Thermal: Damages caused by exposure to heat sources

Start as soon as possible with installation.

⚠ WARNING

Only qualified personnel familiar with AC motors or EC motors and associated machinery should plan or implement the installation in accordance with local and national applicable codes and regulations. Failure to comply may result in personal injury and/or equipment damage.

8.1.2 System – side safety requirements

The unit is a component of an installation and can only be operated in conjunction with the installation

- All equipment required for operating the unit must be integrated into the switching and activation equipment:
 - Electric: fans
 - Working fluid: valves and fittings
- An emergency STOP switch that can be actuated without danger must be installed.
- The working fluid-side and electrical connections must be available within the system. The connections must be specified in the submittal documents.
- The power supply of the fan motors must be provided in accordance with the specifications on the nameplate on the fan motors.
- A lock-out device for preventing unexpected start-up (repairs switch), which separates all active conductors from the power supply (all-pole switch-off), must be provided for the fans
- The fan motors' switch-on/off device must be secured (e.g. with a padlock) to prevent uncontrolled fan start-up.
- The electrical motor, disconnect switch, terminal box and electrical panel connections must be provided in accordance with the respective connection diagrams.

- It must be possible to shut off the unit if a leak occurs.
- People wearing ambient air-independent breathing apparatus in full protective clothing must also be able to activate all safety-relevant shut-off fittings.
- It must be possible to activate all devices meant for diverting released working fluid from a safe position.

8.1.3 Customer – side safety requirements

⚠ WARNING	
	Danger of injuries and damage to property The unit contains a working fluid (see Residual hazards with working fluids. The refrigerants that are used (e.g. R134a, R404A, R407C, R507, R22, CO₂, NH₃, etc.) are classified according to the ASHRAE Standard 34-2024. Other working fluids such as water, glycol, and oil are not classified under ASHRAE Standard 34 2024; therefore, appropriate safety measures shall be applied as required for their specific hazards.
	- Refrigerant that, when gaseous, are non-flammable irrelevant of their concentration in air. - Refrigerant with a time-weighted, averaged concentration that have no adverse effects on the majority of staff that are exposed every day during a normal 8 hour working day to this concentration, which is greater than or equal to 400 ppm (Volume/Volume)
	There is no imminent danger for the staff. However refrigerants of the group A1 are generally heavier than air and may flow off to room on a lower level. In still air there may be an increased of the ground level concentration. With high concentration there is a danger of suffering from disordered cardiac rhythm and suffocation due to a reduced oxygen concentration, especially at ground level. Unauthorized people must not have access to the unit. Please ensure that the working fluid released from the unit cannot penetrate the interior of the building or put people at risk in any other way.
⚠ WARNING	
Danger of environmental pollution • Ensure that no working fluid enters water system or sewage. • Operate the facility for recovering or disposing of working fluid so that the danger of a working fluid or working fluid oil emission into the environmental is kept as low as possible.	

8.2 Requirements at the installation location

You will find the dimensions and weights in the submittal documents.

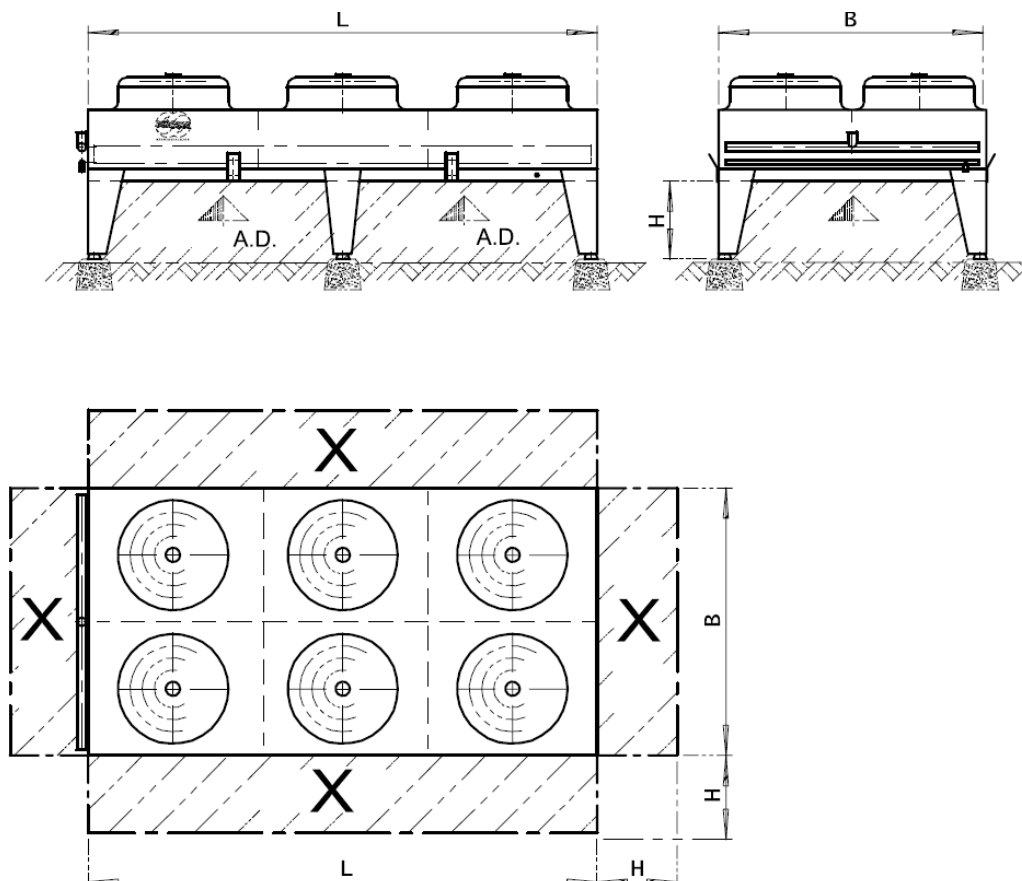
- Ensure that the unit is installed so that is not damaged by environmental-conditional hazard sources (production, transport and other processes at the set-up point) and its functioning are not disturbed by the interventions of unauthorized persons.
- Position the unit so that it cannot be damaged by internal traffic or transport processes.
- Enable optimum unit control and accessibility:
 - o Place the unit so that is can be monitored and controlled from all sides at all times.
 - o Ensure that sufficient space is provided for maintenance.
 - o Ensure that all liquid-carrying components, connection lines, all electrical connections and lines are easy to access.
 - o Ensure that the pipes' identification is clearly visible.

NOTICE

Lightning antenna beside the unit are recommended as lightning protection

Several units can be placed space-saving in rows with high nominal capacity to cover high capacities. With double or multiple row set-ups a substructure is required to guarantee sufficient air-side volume.

Outdoor installation



A.D: Air direction

X: Space required Unit dimension

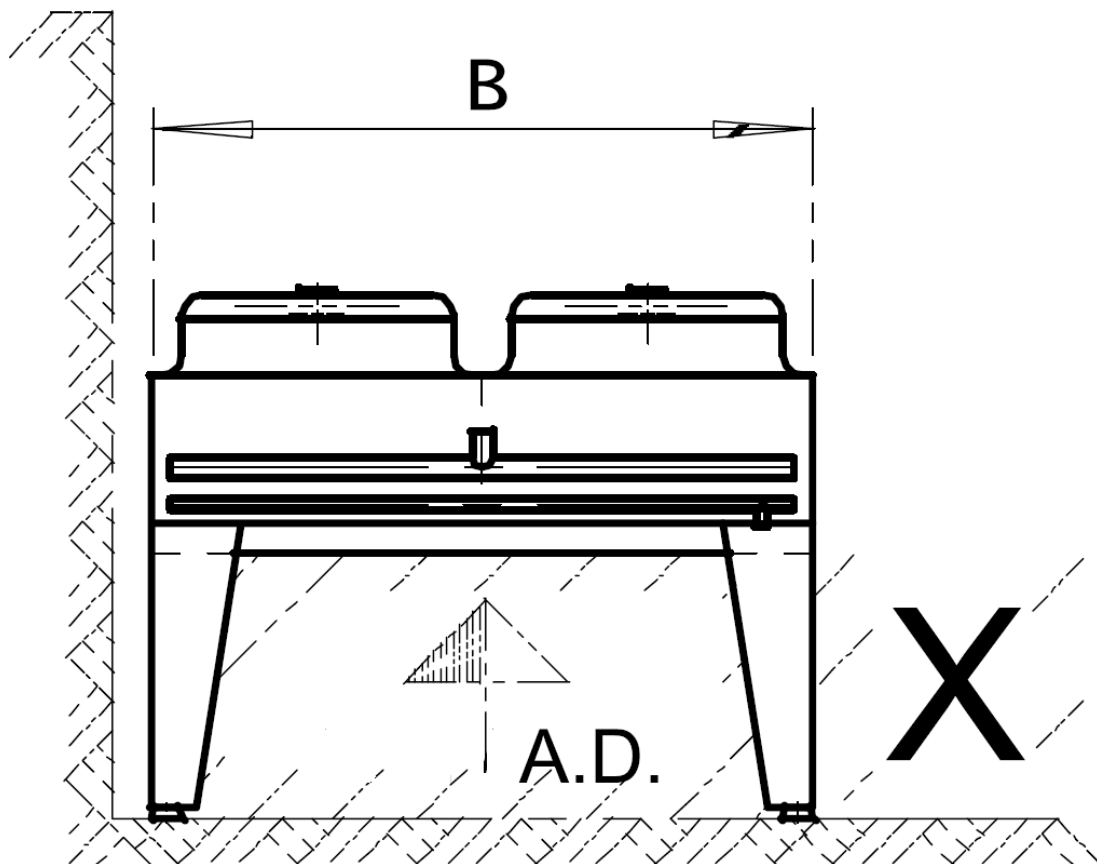
L: Length in inches or mm, B: Width in inches or mm, H: free flow height in inches or mm

Heat exchanger free flow area: $A_A: L \times B$

Heat exchanger afflux area: $A_Z: 2 \times (L + B) \times H$

Condition: $A_Z \geq 0.7 \times A_A$

Installation of a horizontal unit close to a wall



A.D: Air direction

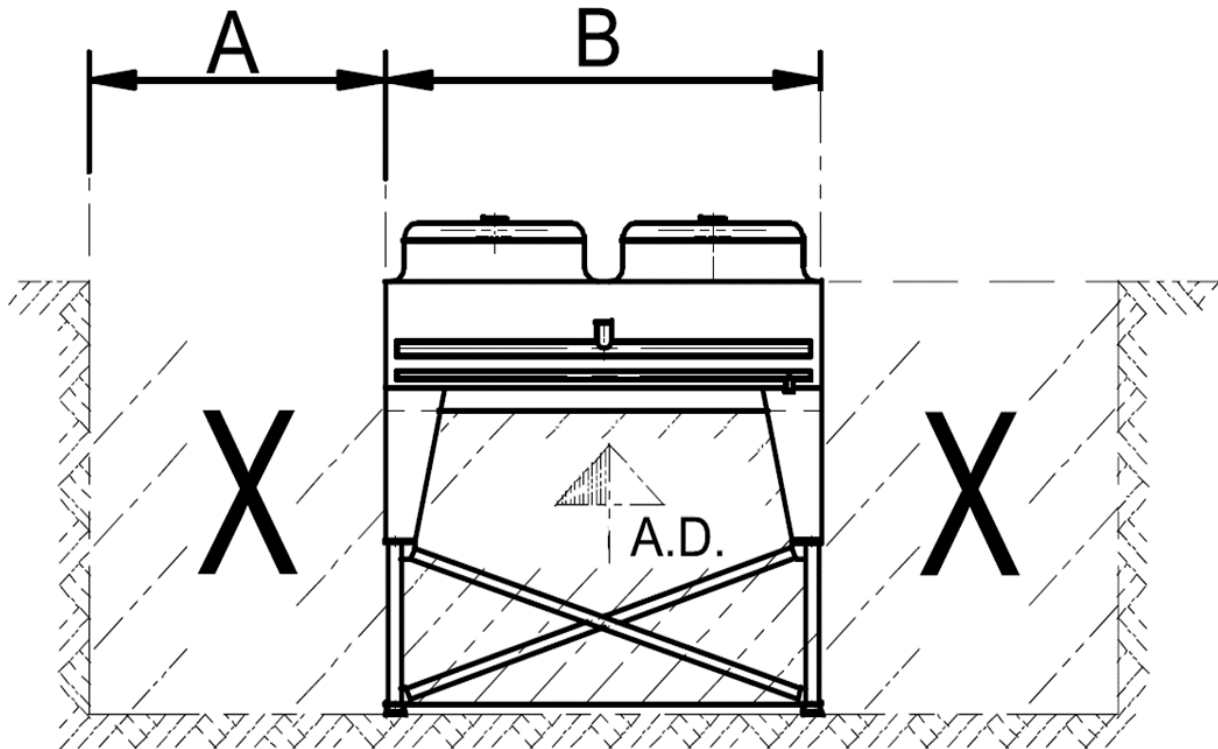
X: Space required

Feet must be extended from standard length to a special length

If your standard legs are 15 3/4" (400 mm) it is needed to extend them up to 31 1/2" (800 mm)

If your standard legs are 23 5/8" (600 mm) it is needed to extend them up to 39 3/8" (1000 mm)

Installation of a horizontal unit in a pit



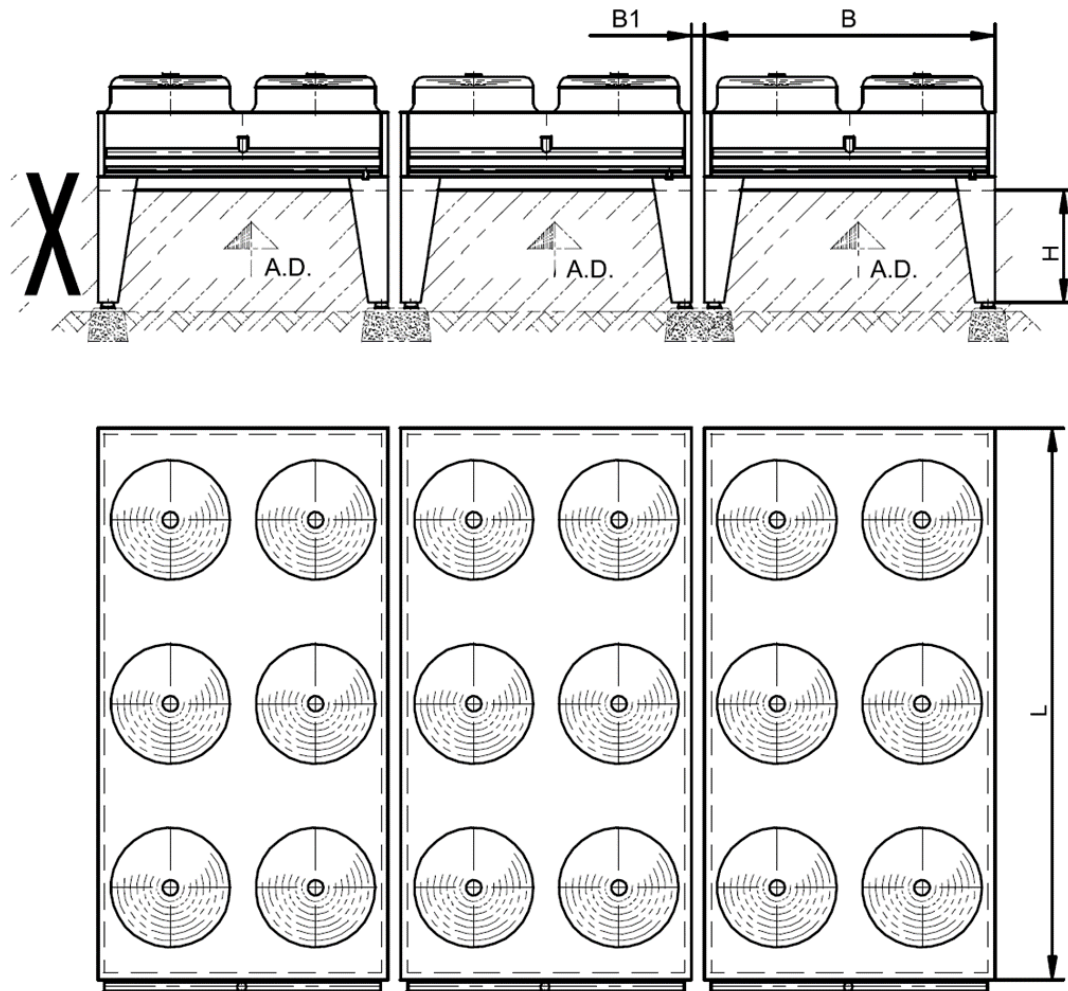
A.D: Air direction

X: Space required Unit dimension

B: Width in inches or mm

$A > 0.7 \times B$ (without any auxiliary device to increase air throw)

Installation of several horizontal units



A.D: Air direction

X: Space required
Unit dimension

L: Length in inches or mm, B: Width in inches or mm, H: free flow height in inches or mm

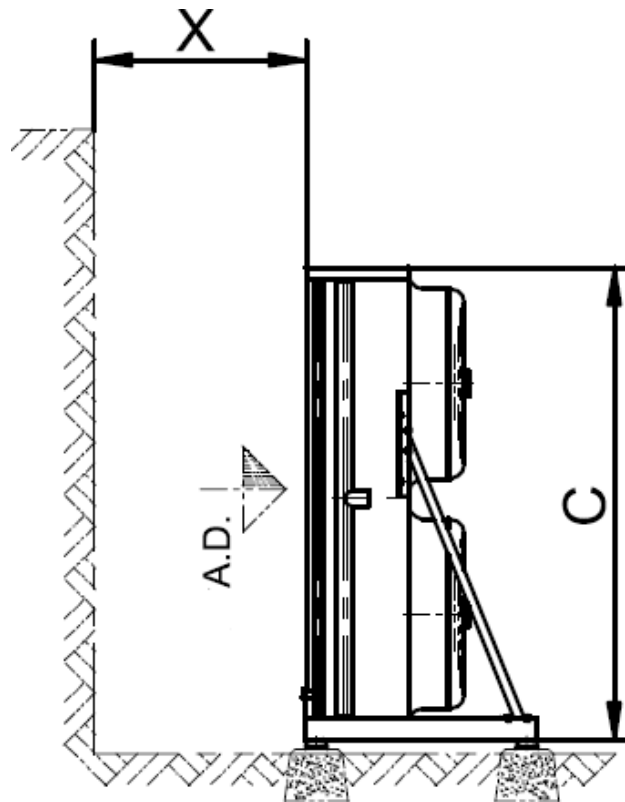
Minimum distance B1: 5/16" (80 mm)

Incident flow area: $A_A: L \times B \times n$ (n: number of units)

Heat exchanger afflux area: $A_Z: 2 \times L \times H + 2 \times n \times B \times H$

H is given by the condition: $A_Z \geq 0.7 \times A_A$ therefore H is a function of n, L and B

Installation of a vertical unit close to a wall



A.D : Air direction

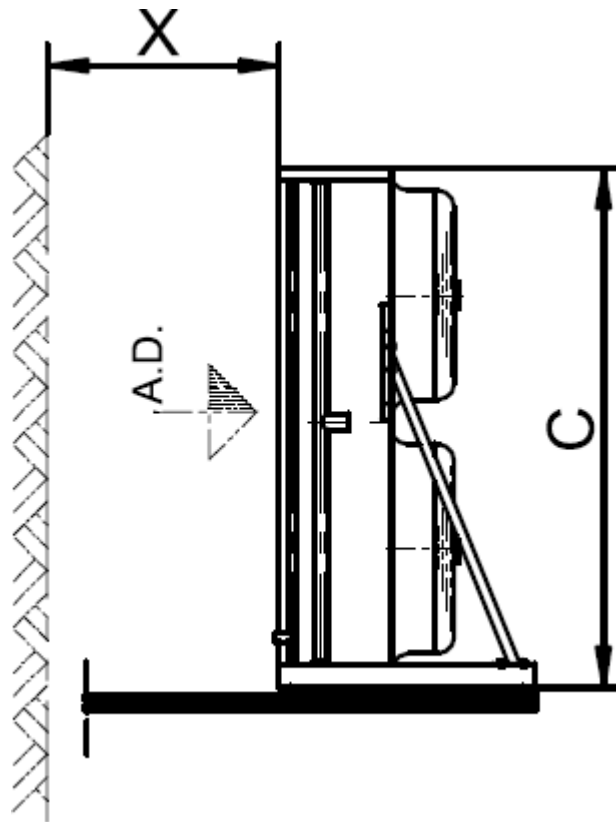
X: Distance from wall required
Unit dimension

C: Unit height in inches or mm,
Condition:

For single row unit: $X > 0.6 \times C$

For double row unit: $X > 0.5 \times C$

Installation of a vertical unit on a bracket or support close to a wall



A.D : Air direction

X: Distance from wall required ($X > 15 \frac{3}{4}"$ (400 mm))
 Unit dimension
 C: Unit height in inches or mm,

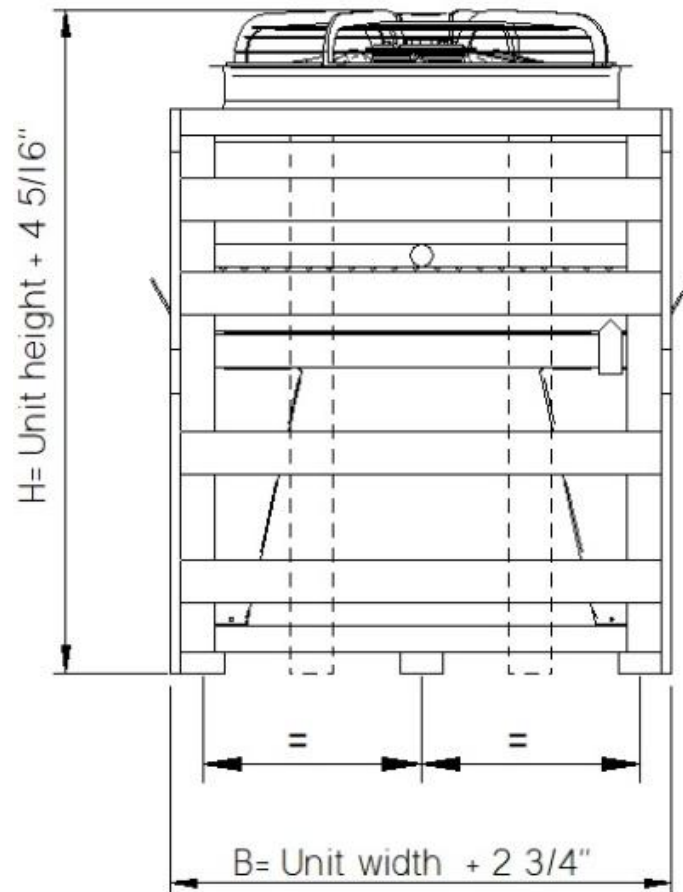
Condition:

For single row unit: $X > 0.50 \times C$

For double row unit: $X > 0.35 \times C$

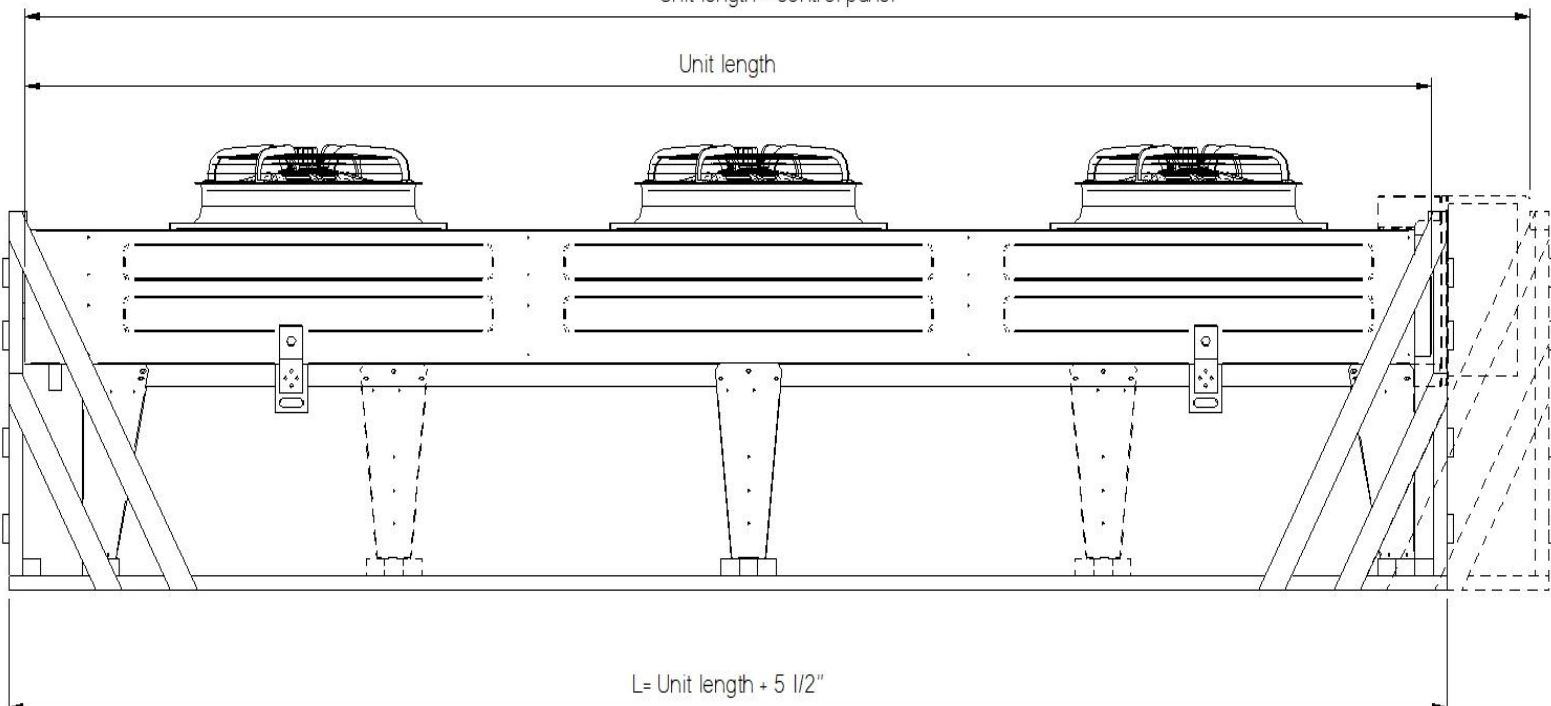
8.3 Unpacking the unit

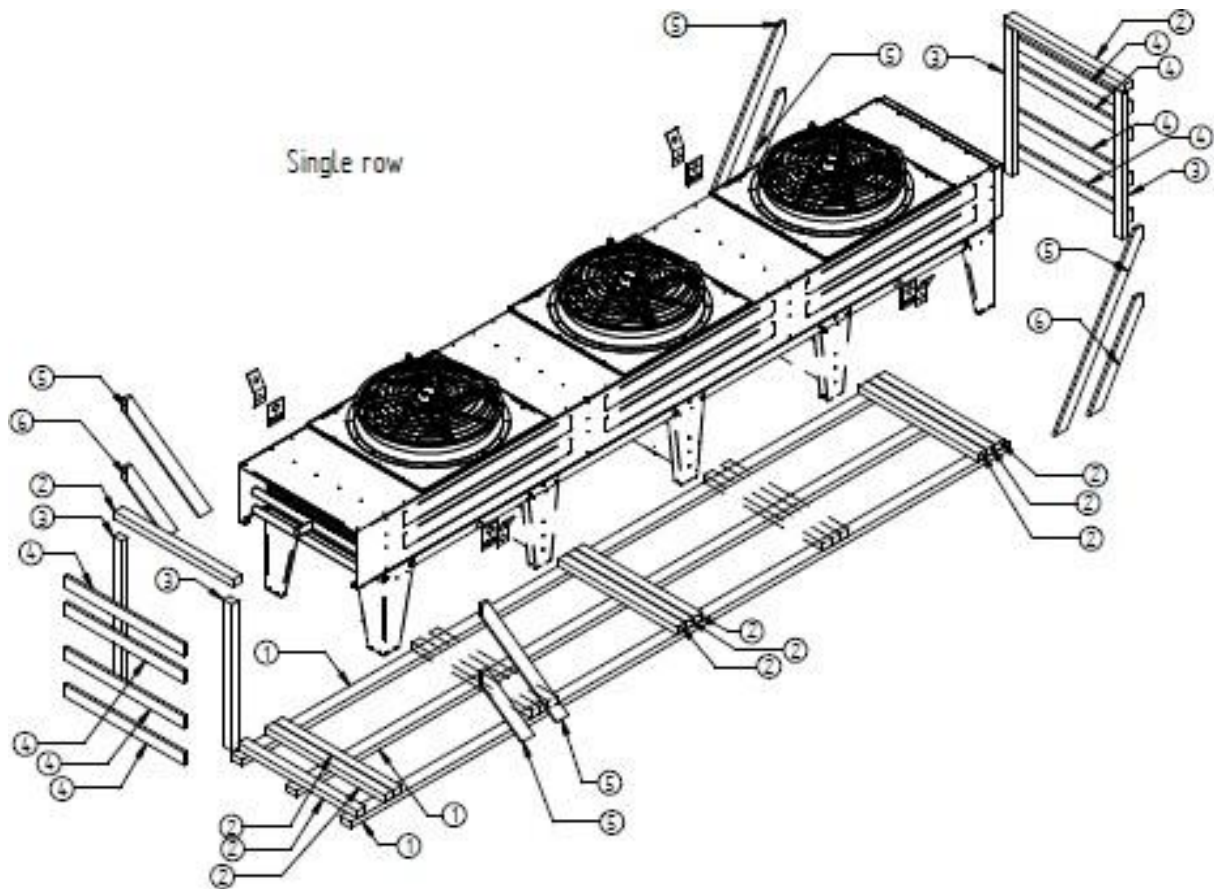
Horizontal units



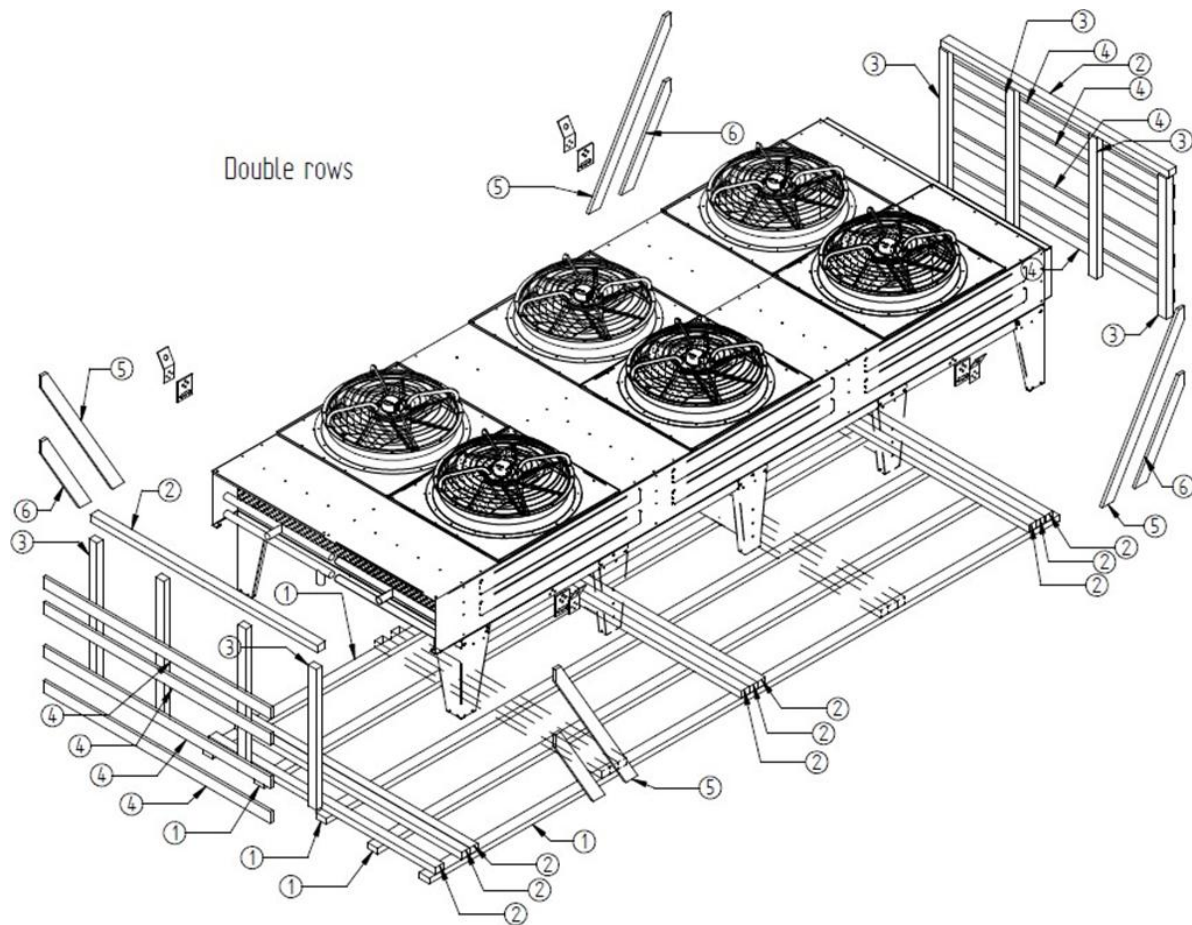
Unit length + Control panel

Unit length



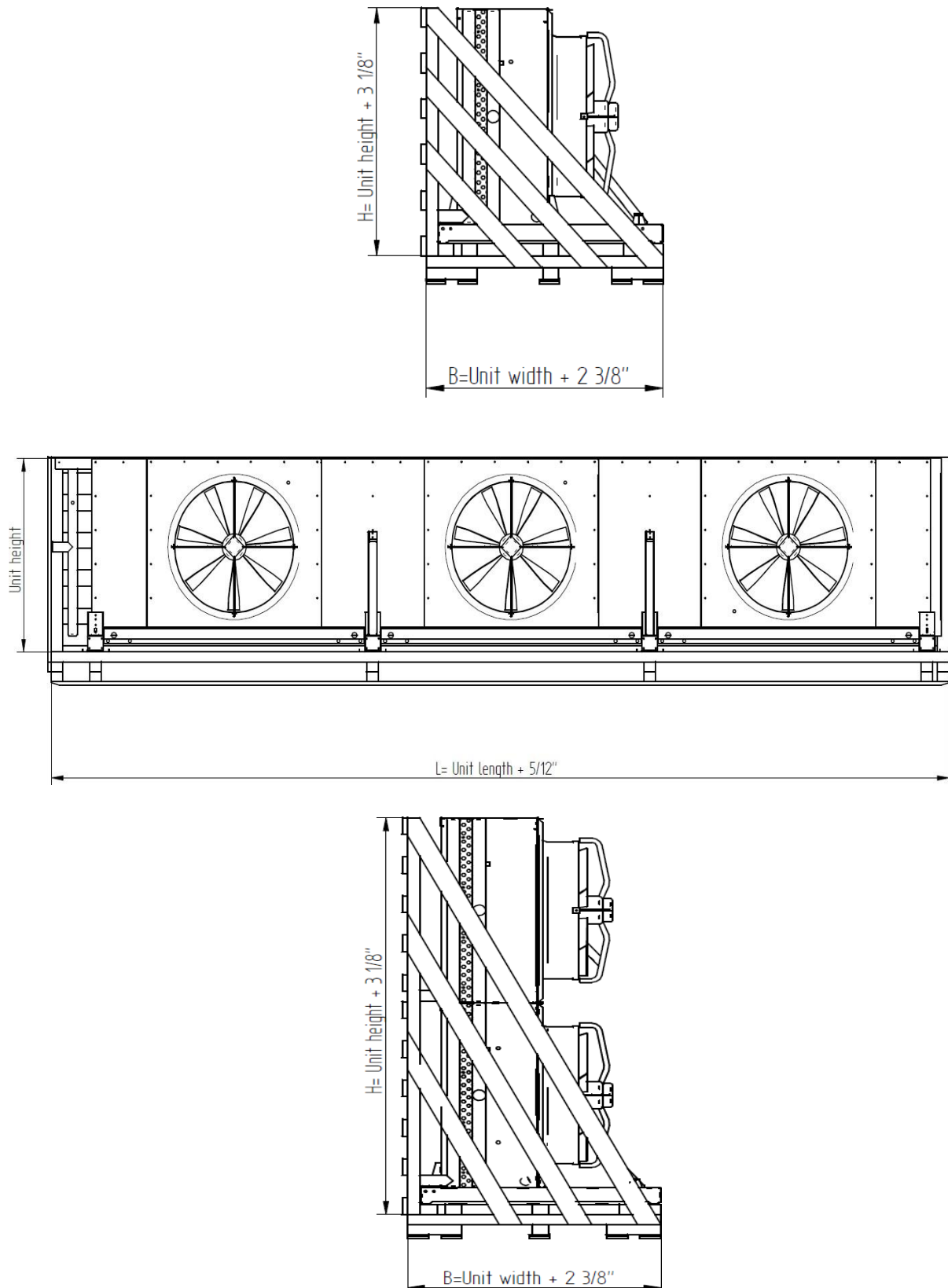


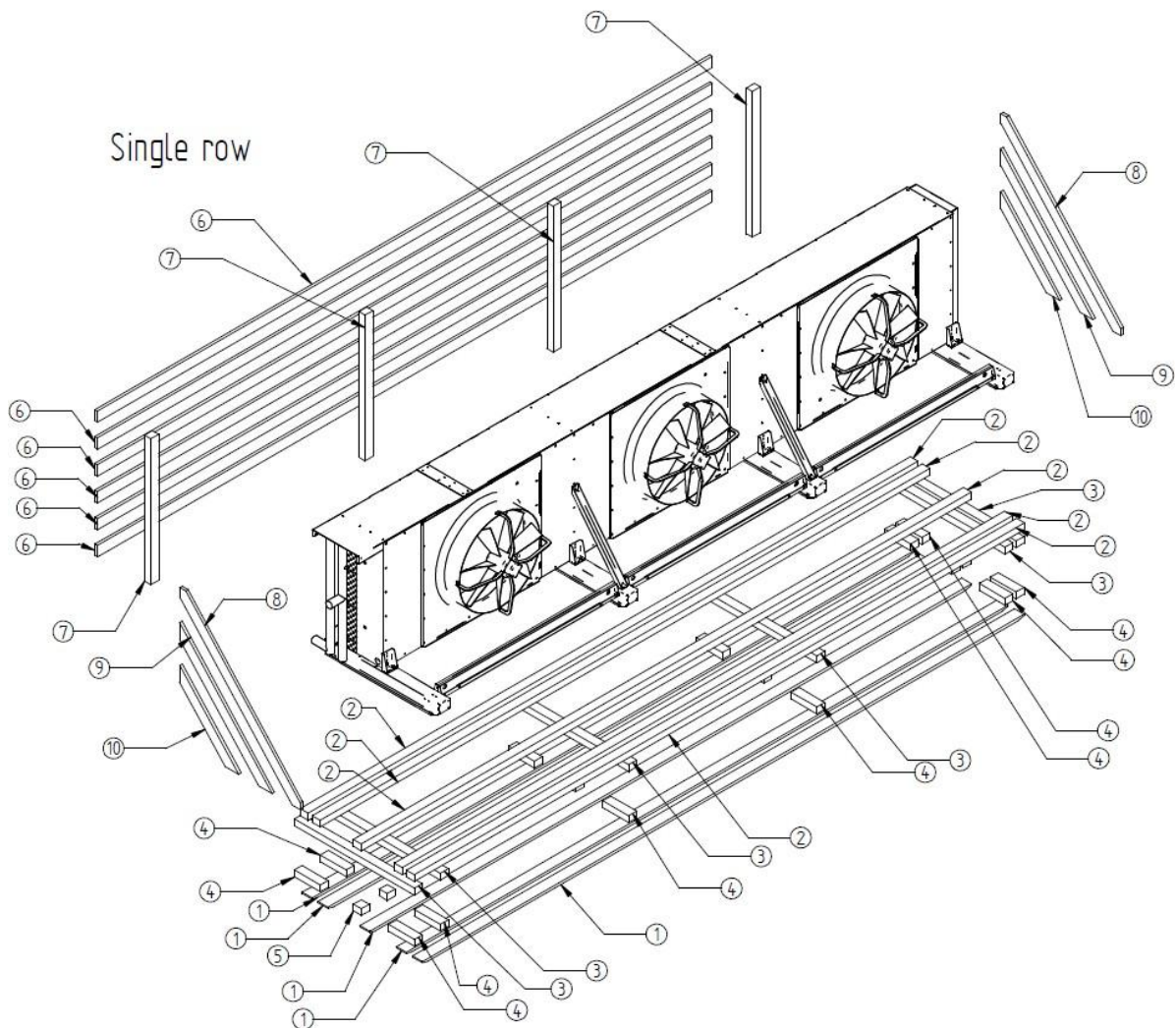
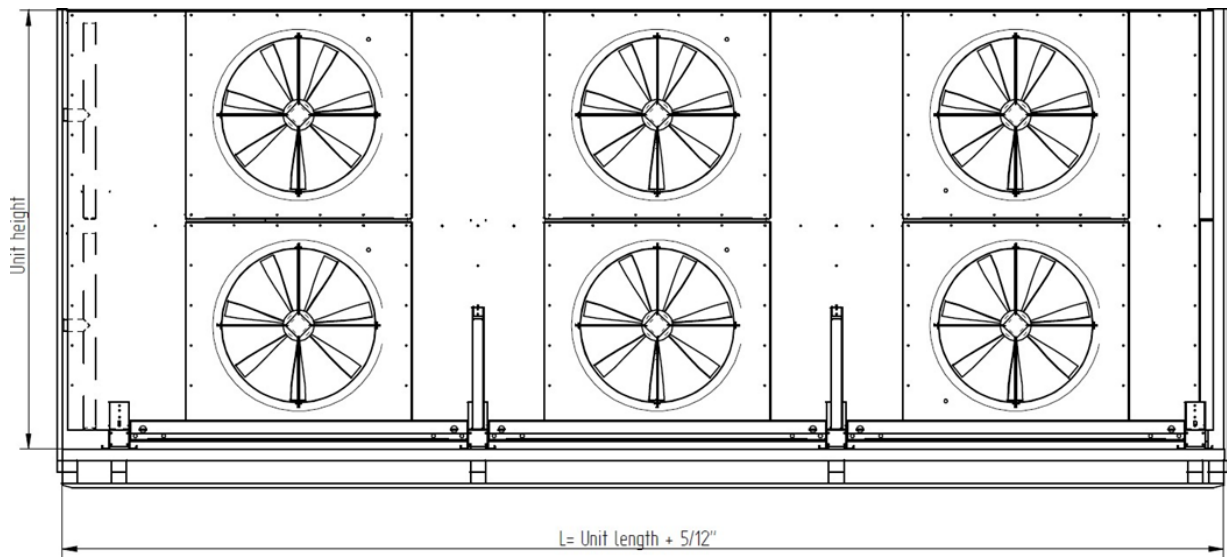
Item	Dimension
1	4" X 2"
2	3" X 2 3/8" (80 mm X 60 mm)
3	3" X 2 3/8" (80 mm X 60 mm)
4	4" X 1"
5	4" X 1"
6	4" X 1"

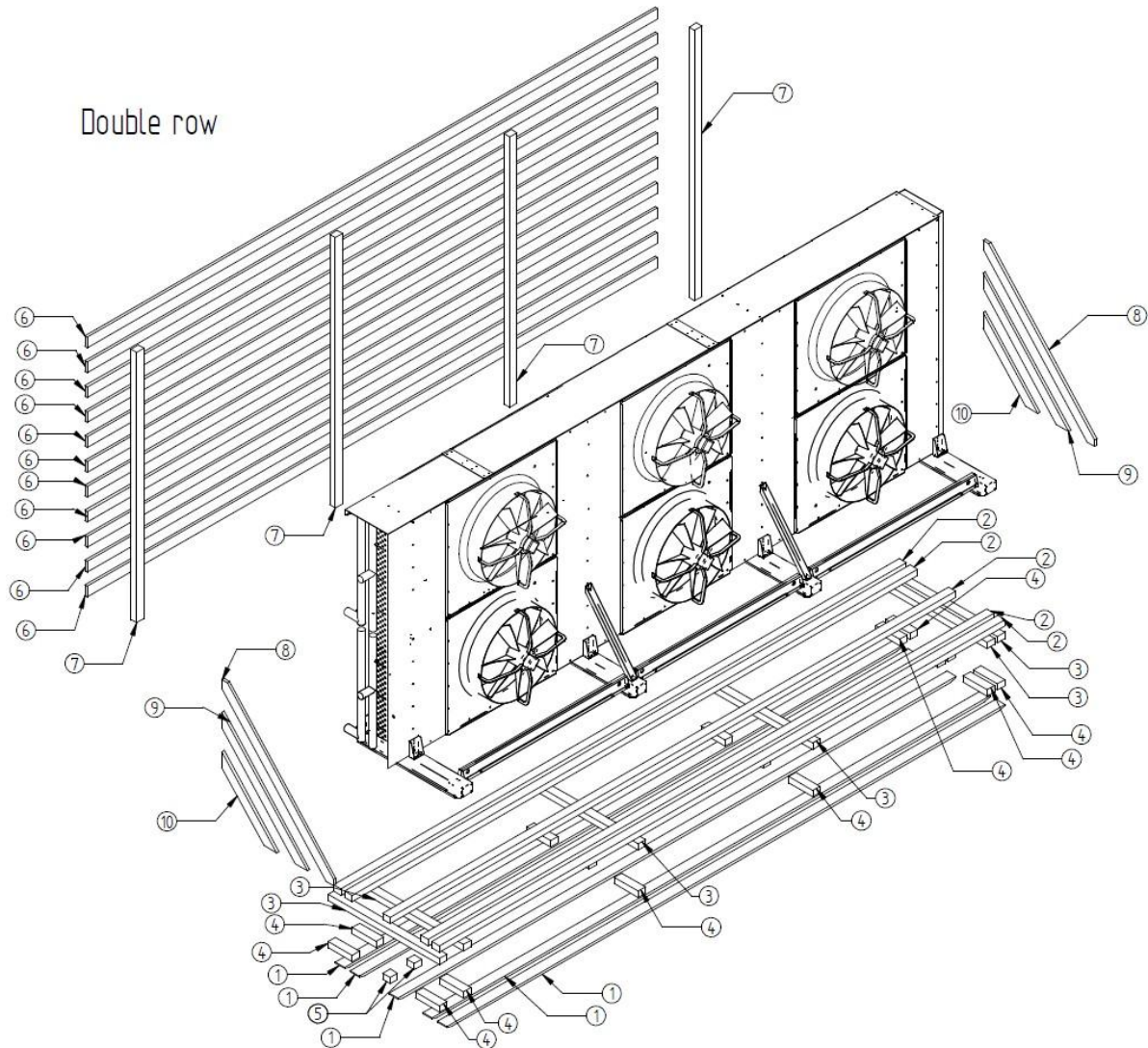


Item	Dimension
1	4" X 2"
2	3" X 2 3/8" (80 mm X 60 mm)
3	3" X 2 3/8" (80 mm X 60 mm)
4	4" X 1"
5	4" X 1"
6	4" X 1"

Vertical units







Item	Dimension
1	4" X 1"
2	3" X 2 3/8" (80 mm X 60 mm)
3	3" X 2 3/8" (80 mm X 60 mm)
4	3" X 2 3/8" (80 mm X 60 mm)
5	3" X 2 3/8" (80 mm X 60 mm)
6	4" X 1"

⚠ WARNING

The transport vehicle's capacity must be at least 1.5-times the weight of the unit.

Check delivery scope on completeness. For complete delivery scope, refer to the submittal documents.

Any transport damage and / or missing part must be recorded on the bill of delivery. The facts must be immediately reported to the manufacturer in writing. Damaged fins can be straightened on-site with a fin comb.

Check transport excess pressure: The units are delivered by the manufacturer with approx. 30 psi (2 bar) holding pressure (clean dry air). Check transport pressure at the Schrader valve (pressure measurement).

NOTE: For pressure-less unit, report immediately to manufacturer and note missing pressure on delivery note. A pressure-less unit indicates possible leaks on the unit.

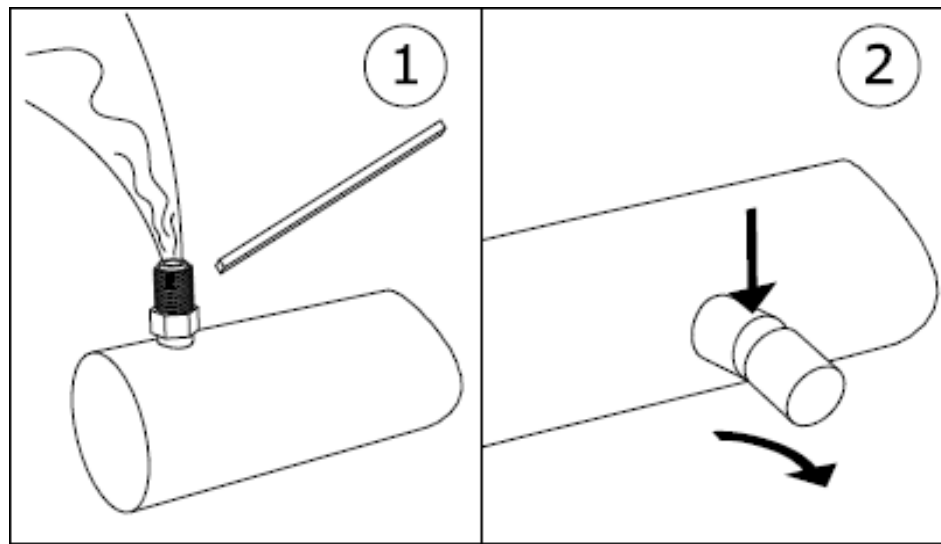
⚠ WARNING

Danger of injuries or damage to property caused by escaping working fluid!

A pressure-less unit indicates leaks on the unit due to transport damage. Leaking working fluid due to leaks on the unit can lead to injuries or even death (see Residual hazards with working fluids). Do not take the unit into operation!

Check transport holding charge and release pressure (only prior to final installation).

Remove sealing caps.



1: Check and release charge pressure 2: remove sealing caps

NOTICE

Danger of corrosion and dirt build-up

Moisture and dirt must be prevented from entering the unit.

Protect the unit against dust, dirt, moisture, wet conditions, damaging and other detrimental influences. Detrimental influences: see Safety instructions for set-up and start-up.

Begin with the installation as soon as possible.

8.4 Installation

8.4.1 System-side requirements for stress-free installation

Prevent stresses in the unit:

- Ensure that all mounting points have the same spacing to the mounting level.
- Ensure that all mounting points maintain the same spacing to the mounting level under load and when permanently positioned.
- Set up and mount units as follows: Airflow must not be impaired by obstructions.
- The units must be installed on mounting points that are appropriate for the unit's weight and then bolted with securing bolts. The operator or installer of the equipment is responsible for ensuring that the bolted connections are of an adequate strength. The following instructions must be observed when mounting the units:
- The diameter of the mounting holes has been statically determined by the manufacturer; the mounting bolts must be sized accordingly. When calculating the transferring bearing strength it is imperative to take into account the total weight of the unit (= structural weight + weight of pipe content + additional weight, such as water, dirt or similar).
- The mounting bolts must be secured to prevent against loosening with an appropriate locking device.
- The mounting bolts must not be over tightened or stripped.
- All mounting bolts must be tightened equally.
- Prevent the unit from shifting in its position. Fix the unit in its position. Tighten the mounting bolts and secure then against loosening.
- Only fix the unit to the intended mounting points.

8.4.2 Mounting the unit

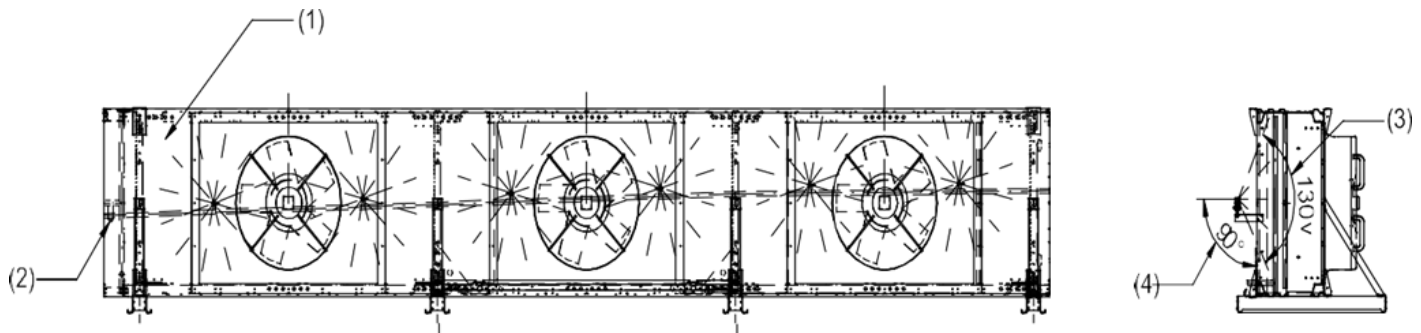
WARNING

Danger of injuries and damage to property with released working fluid

In case of improper installation, working fluid leaks can occur during operation of the installation, this can lead to injuries or damage to property (see Residual hazards with Working fluids)

Only fix the unit to the mounting points intended for this.

8.5 Operating with water spray system



- (1): Unit nameplate
- (2): Water spray system inlet (inclination of 1° to 1.5° for draining)
- (3): Spray nozzle angle
- (4): Nozzle location

Limited water spraying is recommended for reducing peak capacity levels. The following must be observed when using a water spraying system with unknown water quality:

- Operation with water spraying system max. 50 hours/year
- Soft water ($\leq 4^\circ \text{dH}$); used softening system where required
- Water spraying system with max. 43.5 psi (3 bar).
- Pipe system with nozzles can be provided

NOTICE

High corrosion danger (high voltage potential, Cu/Al) and scale built up on fins if inadmissible water quality is used

Only use water in admissible quality.

8.5.1 Connect the unit to the system

⚠ WARNING

Danger of injuries and damage to property Improper connection to the system causes hazards:

- Leaks result in escaping Working fluids (see Residual hazards with working fluids).
- Soldering and welding work on pressurized parts can result in fires or explosions.
- Smoking or open light can cause fires.
- Ensure that stresses and vibrations from the system are not passed on to the unit.
- Only lay working fluid-side connections stress-free! The on-site pipeline system must be braced before connecting to the unit!
- Evacuate the unit. Soldering and welding work is only permitted on unpressurised units!
- The use of open fire at the installation site is forbidden. Fire extinguishers and extinguishing agents used to protect the equipment and the operating staff must comply with the local or national requirements.
- Ensure that working fluid detectors and alarm systems for warning about explosion or fire dangers, about health-endangering concentrations and for control purposes at the unit working point

Install the pipes and ensure:

- Release devices to prevent liquid escapes must be provided and available.
- That in shutdown state sub-cooled liquid is only present a minimum level in system sections.
- That the pipeline installation is kept as short as possible. Use as few bends as possible, and if bends are necessary, use big radius elbows.

8.5.2 Unit electrical connections and protections

Field wiring should comply with national and local standards, codes and regulations. The power supply voltage, phase and frequency must match what is shown on the unit data plate. Each motor was wired so that the fan rotation is counterclockwise.

The fan motor terminal blocks are located in the junction box on the opposite side of working fluid connection. Below you will find standard fan motor terminal diagram for typical unit wiring with 230V- 460V/3~/60Hz power. If a mounted control panel is provided, wiring to only one set of terminal blocks is required. Review the wiring diagram supplied with unit. Provide, when required, and adjust individual motor overload protection in accordance with local applicable codes and regulations.

Customer Power Supply

Incoming Power

1/230V/60Hz

FLA 2.04 Amp.

MCA 2.21Amp.

MOP 15 Amp.

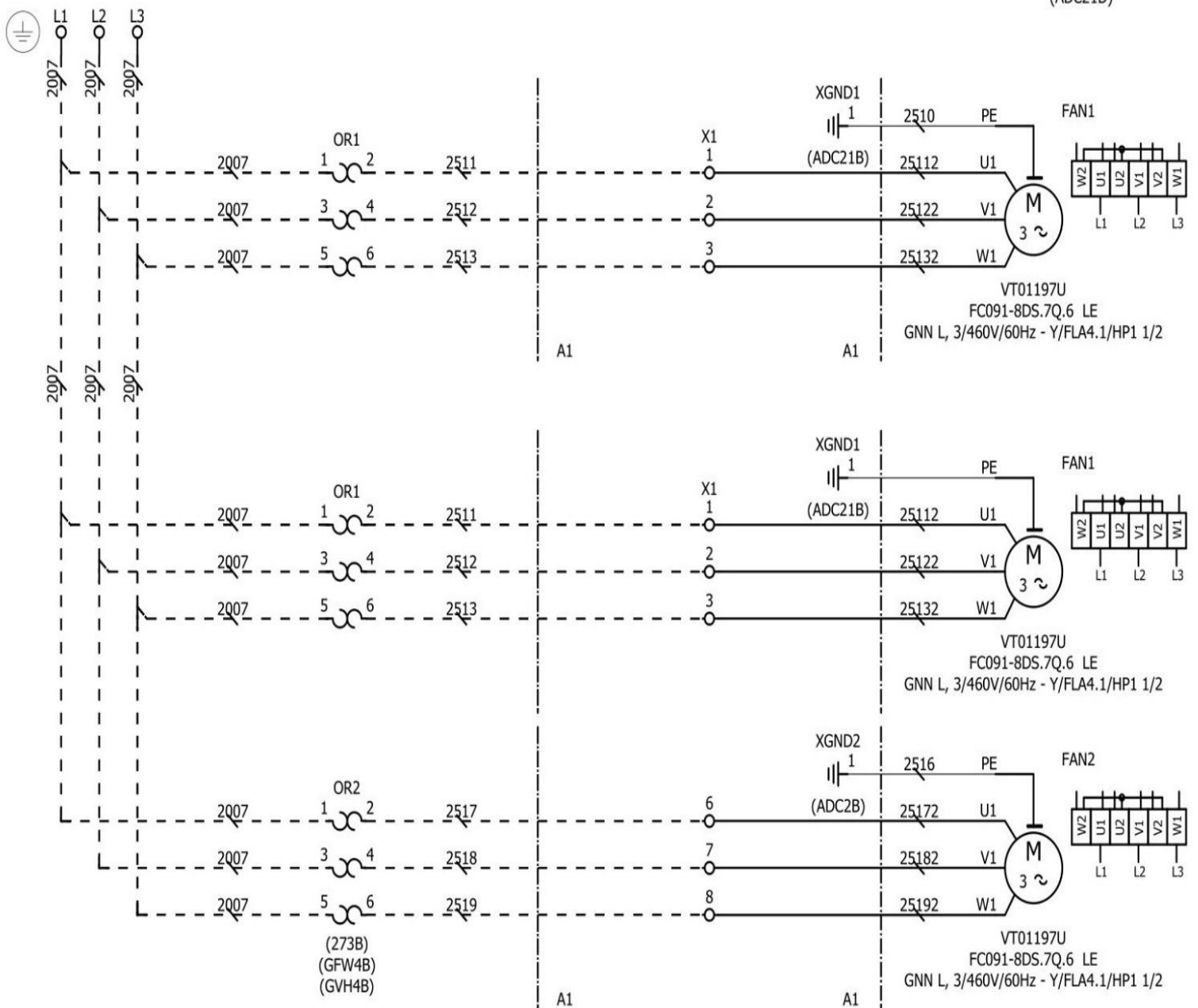
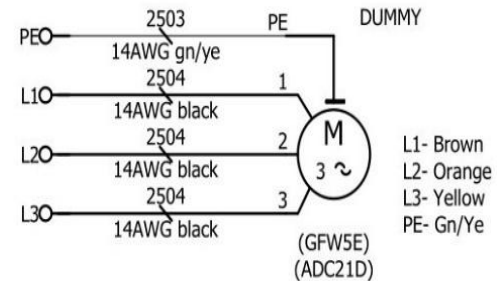
Motor overload protective device is required and shall be rated according to applicable installation code!

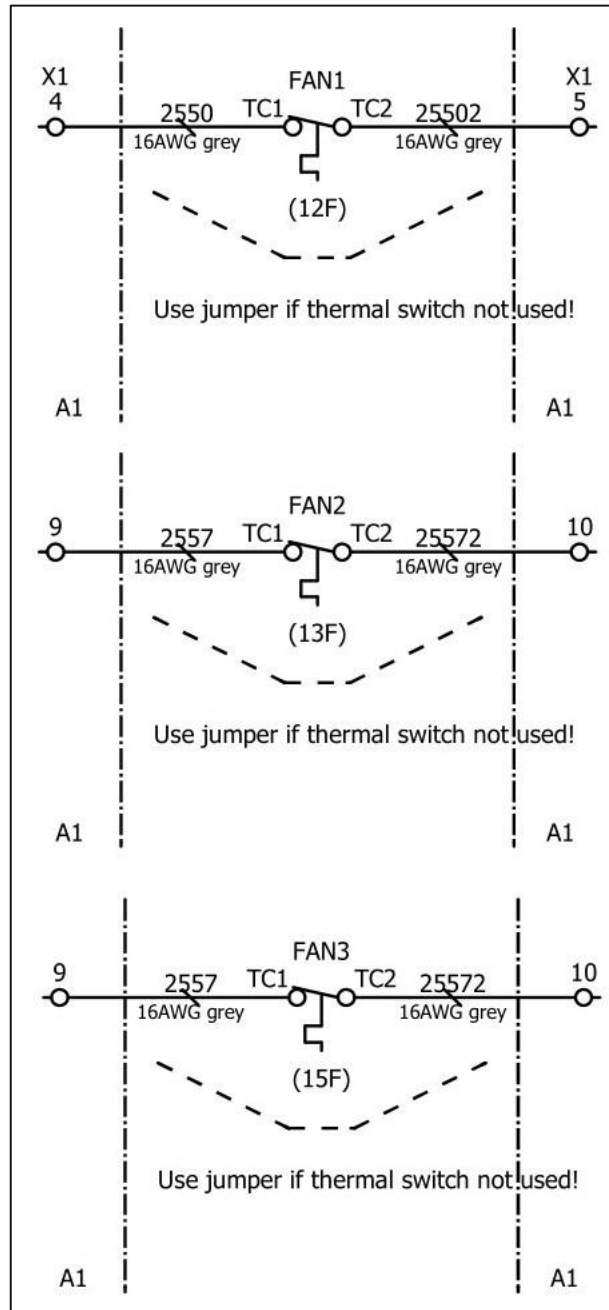
XGND1 Grounding Lug

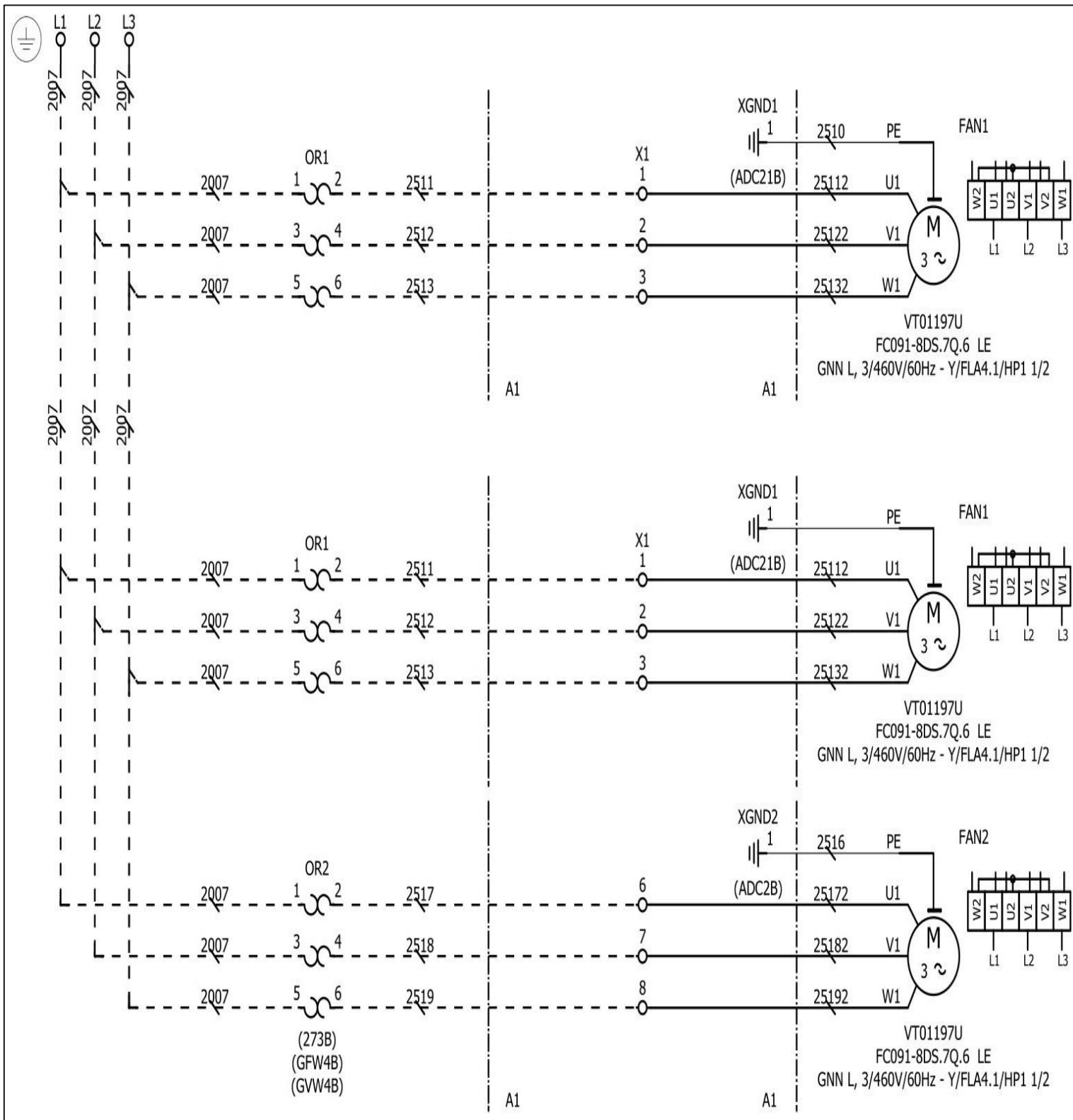
XGND2 Grounding Lug

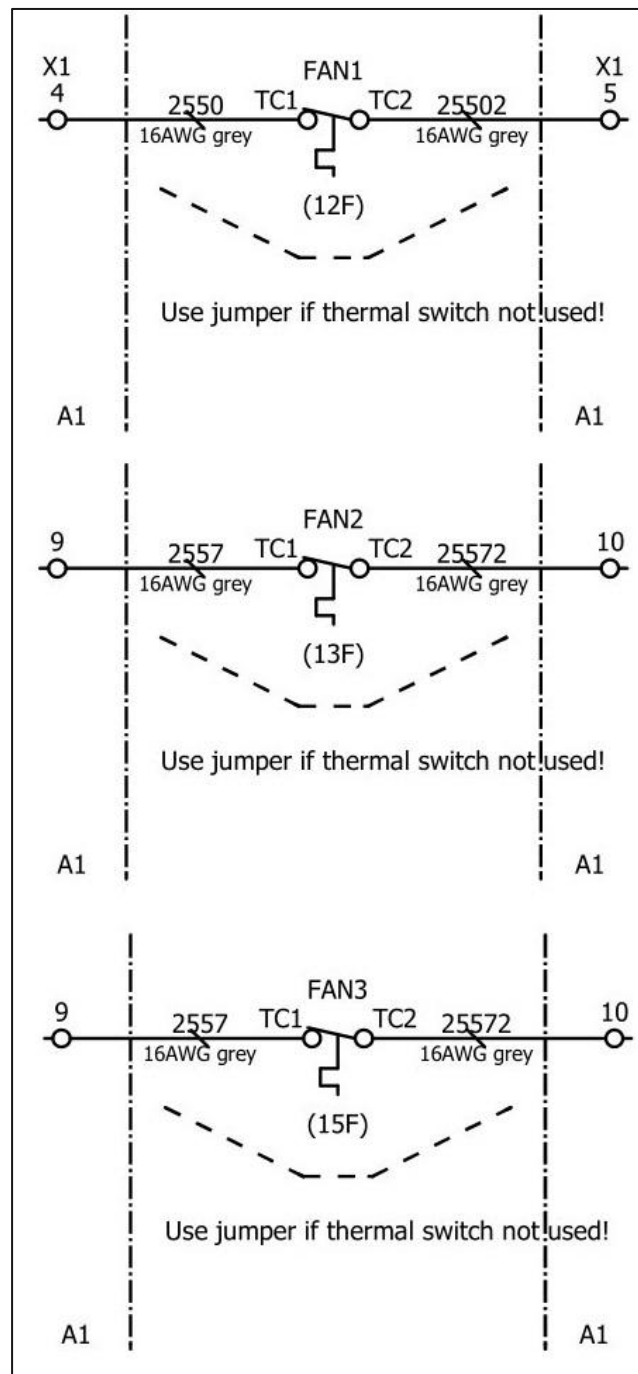
X1 Terminal Block 5 pole Terminal Block 5 pole

Unless otherwise indicated use for Motor Power Wiring:









8.6 Perform acceptance test

WARNING

Danger of injuries and damage to property.

Released Working fluids can cause injuries or even death (see Residual hazards with Working fluids).

Perform the following acceptance test with an expert before starting up the unit after making important changes and after a unit change-out.

- Ensure that there are no restrictions to the air path/s.
- Ensure that the electrical supply feed is in accordance with nameplate data. Connect all control wiring where required.
- Test the unit for vibrations and movements that can be caused by the fans and operation of the system. Remove oscillations, vibrations and movements following consultation with the manufacturer or independently.
- Perform visual inspection of the structural design, the brackets and fixtures for mounting.
- Check and re-tighten all bolts and threaded connections, especially on the fans.
- Check installation of pipe connections.
- Check bracing of working fluid-carrying connection pipes.
- Ensure that the unit is protected against mechanical damage.
- Ensure that the unit is protected against inadmissible heating up and cooling down.
- Check the fan guard protection is properly in place and securely fastened.
- Ensure that optimum unit control and accessibility are guaranteed.
- Ensure that the unit is placed so that it can be monitored and controlled from all sides at all times
- Ensure sufficient space for regular maintenance
- Ensure all working fluid-carrying components, connections and lines and all electrical connections and lines are easy to access
- Ensure pipes are easy to identify
- Check heat exchanger surfaces for dirt and clean as required (see Unit cleaning).
- Perform function tests on the fans (rotation direction).
- Check electrical connections of the fan motors for possible damage.

- Check the quality of the bracing connections, the electrical connections and the fixture connections.
- Perform pressure test with test gas and with a test pressure of 1.1 times the permissible operating pressure: check the connection seals and detect leaks, e.g. with foaming agent, or similar.
- Check corrosion protection: Perform a visual inspection on all bends, components and component holders that are not heat-insulated. Document and archive test results.
- Perform test run. Observe and check unit during test run, in particular for:
 - Fan smooth running (bearing noises, contact noises, imbalances, etc.).
 - Fan power consumption
 - Leaks
- Report all defects to the manufacturer immediately. Remove defects following consultation with the manufacturer.
- Check the unit and the unit's interaction within the system again after 48 operating hours, especially on the connections and at the fan terminals, and document the test results.

8.7 Test readiness for operation

Ensure that all electrical protective measures are operational.

Ensure that all working fluid-carrying connections are securely fastened.

Ensure that all electrical connections (fan panels and junction boxes) are effected securely fastened.

Ensure the all threaded connections on the fans, the unit fixing bolts and all other threaded connections are firmly tightened.

8.8 Putting the unit into operation for the first time

⚠ WARNING

Danger of injuries and damage to property

Released working fluids can cause injuries or even death (see Residual hazards with working fluids).

Only put the unit into operation, when:

- The units has been properly mounted and connected (see Installation),
- You have performed a complete acceptance test (see Perform acceptance test).
- You have performed a test for ensuring the system's readiness for operation (see Test readiness for operation) and all safety precautions (see Safety) have been taken.

Follow the operating instructions manual of the system

Contact the manufacturer immediately if you want to operate the unit under different operating conditions as those defined in the submittal documents.

Switch the system on.

Activate the unit:

- Open the valves on the inlet and outlet-side system.
- Activate fans

Wait until the operating point is reached. After the operating point has been reached, the unit is ready to operate.

Parameters for setting the operating points see submittal documents. Operating point:

- Condensation temperature
- Airflow volume
- Air inlet temperature

To ensure the specified operating point is complied with, the actuators for the operational set point must be secured against unauthorized access (e.g. by sealing, screwing on caps, removing hand wheels, etc.)

9. Operation

9.1 Safety

⚠ WARNING



There is a danger of fingers being cut off from the rotating fan blades, injury hazard for the hands and danger of being pulled in with loose elements such as hair, necklaces or clothing parts.

Do not operate fans without fan guard/s
Ensure that the optional hinged fan panel assemblies are fixed and secured against unintentional or unauthorized opening.

⚠ WARNING

Warns against hot surfaces



With refrigerant temperatures of above 113 °F (45 °C) there is hazard of burns on piping components and headers inlet or outlet. (see Thermal residual hazards, page 20).

Do not touch any parts of the unit without protective gloves when the unit is in operation.

9.2 Putting the unit into operation

To operate the unit the system including the electrical system must be in operation. The unit must be started up by opening the respective valves on the entering and leaving sides of the unit and by activating to the electrical system as follows (see system operating instructions manual):

- Switch on electrical control system
- Open all shut off valves for working fluid-carrying lines
- Switch on fan motors

9.3 Taking the unit out of operation

The unit/s is a system component of the refrigeration installation. The unit is taken out of operation by switching off the system in accordance with the refrigeration system operating instructions manual for the entire installation. To do this, the working fluid-carrying lines must be shut off from the electrical system (see refrigeration system operating instructions manual):

- Switch off fans
- Switch off electrical control system
- Close working fluid-carrying line's shut off valves

NOTE: When shut down consider maximum operating pressure. If necessary, take precautions so that it cannot be exceeded.

NOTICE

If unit is shutdown for one month or longer, place the fans into operation for approx. 2-4 hours a month to maintain their functionality.

9.4 Shutting down the unit

⚠ WARNING

Danger of injuries and damage to property

Released working fluids can cause injuries or even death (see Residual hazards with working fluids, and see Residual hazards caused by pressurized parts.)

Ensure that the maximum operating pressure is not exceeded during the shutdown period.

NOTICE

Danger of corrosion and dirt build-up

Moisture and dirt must be prevented from entering the unit.

Protect the unit against dust, dirt, moisture, wet conditions, damaging and other detrimental influences (see Safety instructions for set-up and start-up).

With shutdown times of a month or longer put the fans into operation for approx. 2-4 hours a month to maintain their functionality.

Take the unit out of operation (see Taking the unit out of operation).

Secure the unit:

When shutdown consider maximum operating pressure (see Technical data). If necessary, take precautions so that it cannot be exceeded.

Secure the fan motor drives against switching on again (lock-out procedure).

Secure working fluid-carrying lines against pressurizing.

Secure unit against detrimental influences at the installation or storage location (see Safety instructions for set-up and start-up) in order to keep all unit components in good state for proper use and to conserve the usability of the unit. For this purpose, special storage conditions (see Storage before installation) and preventive measures for corrosion protection have to be provided, regular testing of the functionality of the fans and of the unit taken out of operation have to be effected.

Evacuate the unit: Completely release working fluid and, if applicable, working fluid oil (see Residual hazards with disposal).

9.5 Restarting the unit after shutdown

The unit must be put back into operation after a shutdown in accordance with the system-specific set-up in accordance with the operating instructions manual as follows:

Test the unit's readiness for operation (see Test readiness for operation). Perform pressure test and visual inspection for corrosion protection.

NOTE: The pressure test with recommissioning must only be carried out with appropriate media at appropriate test pressure.

Put the unit into operation (see Putting the unit into operation).

9.6 Unit change over to new working fluid

WARNING

Danger of injuries and damage to property.

Considerable dangers can be caused with operation with another working fluid without prior manufacturer approval (Improper use).

The unit must not be changed over to another working fluid without prior written consent by Güntner.

Ensure that the unit manufacturer has agreed to the changeover.

Ensure that the right working fluid is re-filled. Ensure that all materials used in the unit are compatible with the new working fluid.

Ensure that the permissible pressure is not exceeded.

Check that the new working fluid can be used without requiring a new test certificate for the unit.

The safety device for the unit must be changed out or reset.

Mixtures with residues of working fluid and oil, for example, must be prevented.

All information concerning the working fluid must be changed accordingly.

The complete documentation, including these operating instructions and the system operating instructions manual must be changed accordingly.

Perform acceptance test (see Perform acceptance test, page 62).

10. Troubleshooting

10.1 Safety

⚠ WARNING
Danger of injuries and damage to property
Faults that are described in these operating instructions must only be rectified by suitable qualified and trained personnel (see Personnel, care requirements).
With faults that occur during the operation, monitoring and maintenance of the complete system, inform Güntner immediately.

10.2 Service

Güntner de México S.A. de

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Office Fax: +1 847 781 09 01

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10.3 Troubleshooting table

Fault	Possible cause(s)	Action
Fan motor is not running	Power supply interrupted	Restore power supply
	Fan blade stuck	Enable fan to rotate freely
Bearing noises	Defective fan motor	Renew bearing or fan motor
Unit vibrating	Defective fan blades	Change fan blades
	Loose fan fixture	Tighten fixture
Unit capacity not achieved	Heat exchanger is very dirty on the air side	Clean
	Fans not running properly or down	Repair, change out fans
	Working fluid	pressure
Working fluid leaking	Unit working fluid carrying components leaking	working fluid

10.4 Dealing with faults

Try to determine the size of the leak.

Activate Emergency STOP switch. Valves, motors and other components are therefore switched off to prevent working fluid from leaking.

Close shut-off valves, especially to the liquid side, where possible in sections, so that the working fluid quantity in the leakage area is kept as low as possible. If possible evacuate/drain the systems section in question and move the working fluid/ to other systems sections. Here too it must be ensured that no liquid working fluid is locked in by shutting off system sections.

11. Maintenance

11.1 Safety

11.1.1 Before starting all maintenance

⚠ WARNING

Danger of injuries and damage to property with leaking working fluid (see Residual hazards with Working fluids).

Only perform maintenance work – especially welding work – on the leaking unit after completely removing the working fluid from the unit!

Perform the following safety measures before beginning all maintenance work:

- Drain the unit's heat exchanger coil.
- Clean and evacuate out the unit's heat exchanger coil.

11.1.2 With all maintenance work

⚠ WARNING

Danger of injuries and damage to property with leaking Working fluids Leaking working fluid can cause the following hazard situations and injuries:



Warning against explosion-risk and flammable substances in the working area.

Unintentionally refrigerant oil residue can ignite.

- Ensure that there is no unintentionally refrigerant oil residue in the working area
- Keep the risk area free of direct and indirect ignition sources.
- Before releasing for maintenance for the unit obtain the required approvals for work for the unit that can involve ignition sources (e.g. grinding, welding, soldering, etc.).
- With all work involving ignition sources (e.g. grinding, welding, etc.) in the work area, keep suitable fire extinguishing equipment.
- Do not bring any open flames or hot gases (e.g. candles, matches, welding beads, welding sparks, glowing cinders or tobacco) into the working area.

⚠ WARNING



Warns against health-endangering irritants in the work area

CFC/HFC refrigerant under effervescence still present can evaporate. Inhalation of refrigerant vapor causes harmful to health irritations and lack oxygen.

- Release refrigerant vapor and / or refrigerant liquid must not reach adjacent rooms, staircases, yards, passages or drainage systems.
- Use respiratory protection
- Use a room air-independent breathing apparatus with maintenance work in high CFC/HFC refrigerant concentrations in the affected area.
- Ensure the work is well ventilated
- Divert leaked refrigerant vapor and / or liquid safely.



Warns against cold

Still present CFC/HFC refrigerant under effervescence has a temperature of 32 °F (0 °C). Contact with refrigerant under effervescence caused by spraying causes frostbite



- Use eye protection



- Use hand protection

- Ensure that the unit in question is pressure-free before maintenance work begins or the refrigerant is removed up from the unit in question.
- Power off the electrical system and secure it against unintentional switching on again (lock-out procedures).
- Isolated the unit to be worked on from the refrigeration system and secure it.

NOTICE



Lock-out procedure required

When working at the entering and leaving paths of the fans and heat exchanger, objects can get into the fans and therefore cause faults and damage on the components.

- Power off the fans before beginning maintenance work and secure them against switching on again.

- After the work has finished do not allow any objects to be in the entering and leaving paths of the fans or the working area.

11.1.3 After all maintenance work

⚠ WARNING

Danger of injuries and damage to property with leaking Working fluids (see Residual hazards with Working fluids).

Perform the following safety measures after finishing all maintenance work:

- Ensure the switching and activation devices, the measuring and display devices and the safety devices function properly.
- Ensure the working fluid fittings are functional.
- Ensure that hinged fan assemblies (optional) are fixed in their original position and secured against unintentional or unauthorized opening.
- Check the identification of the pipelines and ensure this is visible and legible.
- Check the mounting and corrosion protection of the components in question.
- Ensure the electrical connections (fans) are functional.
- Ensure the temperature and air humidity at the working area are the same as that in the submittal documents.
- Perform a pressure test and a tightness test (see operating instructions manual annex).
- Perform an acceptance test (see Perform acceptance test).
- Perform a pressure test (see operating instructions manual annex).

11.2 Inspection and maintenance plan

The regular safety – related checking of condensers in refrigeration system, is a prerequisite for meeting the local requirements and / or national requirements and these must be performed by a "qualified person". The operator must determine the test intervals for the complete system and the system components on the basis of a safety - related evaluation. Nevertheless, as with every technical installation, results, whereby it can generally be said the most frequent causes are not material errors, but operating errors, cannot be ruled out.

The checks to be performed are listed in the following sections as time-scaled checklists.

11.2.1 Fans

The manufacturer's operating specifications take priority for this component. Güntner recommends proceeding in accordance with the following inspection and maintenance plan:

d = daily, w=weekly, m = monthly, y = yearly				
Work to be performed	d	w	m	y
Check fans for dirty build-up •With dirt build-ups: Clean fans (see Unit cleaning)	X			
Check the fan drive for smooth running •Vibrations on the unit: remove imbalances •Where required, tighten and correct blade fixtures and blade settings		X		
Fan motor bearing: Running sound and smoothness changes •Change out fan motor			X	
Fan motor: Is a new bearing due? •Change out fan motor				X
Fan impeller: corrosion on bolts •Change out fan	*			
Impeller blades: Corrosion or damage on blades •Change out fan				X

*: Recommended every six months

11.2.2 Unit heat exchanger

⚠ WARNING

Danger of injuries and damage to property with leaking working fluids (see Residual hazards with working fluids)

Perform a regular external check (visual inspection) on the unit every 5 years.
Güntner recommends you have the test performed by an expert.

d = daily, w=weekly, m = monthly, y = yearly				
Work to be performed	d	w	m	y
Check heat exchanger for dirt build-up •With dirt build-ups: Clean heat exchanger (see Unit cleaning)	X			
Check heat exchanger's general condition • Damages found: remove damages		X		
Check heat exchanger's operating point (see Operation,) • Change in fan capacity found: Restore required system – side conditions • Change in surface temperatures found: restore required system – side conditions			X	
Check heat exchanger and connections for tightness • Repair unit sections (see Remove leaks)				X*
Check heat exchanger for working fluid pressure rating •Restore required system – side conditions				X*
Check heat exchanger for corrosion • Corrosion or damages on core tubes, fins, support structures, pipe connections, fixtures: repair unit sections affected				X*

*: Recommended every six months

11.2.3 Care and maintenance plan

Measure	Cleaning agent	Interval
Component cleaning	Mechanically	As required (visual inspection)
Complete cleaning	Warm water or environmentally safe cleaning agent	After 120 hours After 720 hours
Leak check		After six months
Corrosion protection check		After six months

11.3 Maintenance work

11.3.1 Remove leaks

⚠ WARNING

Danger of injuries and damage to property with Working fluids (see Residual hazards with Working fluids).

- Have leaks removed as quickly as possible by an expert.
- Do not fill with a working fluid other than that specified in accordance with the order-related offer documents!
- Only put the unit back into operation when all leaks have been repaired.

- Perform all work including pressure, acceptance and functional test (see Perform acceptance test, page 62, and see Test readiness for operation).

11.4 Unit cleaning

11.4.1 General

The following applies for cleaning: The operator must ensure that the cleaning agent is environmentally friendly. Harmful to the environment, substances, e.g. acid-forming, are forbidden.

ACHTUNG - ATTENTION - ATTENTION - ATENCIÓN

Bei der Verwendung von Reinigungsmitteln in Kühlräumen, ist auf die Korrosionsbeständigkeit der Materialien des Kühlers gegenüber dem verwendeten Reinigungsmittel zu achten!

When cleaning agents are used inside the cold room, the corrosion resistance of the cooler materials to the applied cleaning agent has to be observed!

Lors de l'utilisation des détergents dans les chambres froides, il faut observer à la résistance à la corrosion des matériaux de l'appareil qui entrent en contact direct avec les détergents.

Cuando se apliquen agentes limpiadores en los productos instalados en cámaras frías, se debe tener cuidado que no corroen los materiales usados para la construcción del producto!

- Clean casing by rinsing with warm water approx. 77 °F (25 °C) and/or with environmentally friendly cleaning agents.
- Rinse thoroughly with water after using cleaning agents.
- Allow casing to dry completely.
- Check working fluid-carrying and electrical connections (see Test readiness for operation).

11.4.2 Heat exchanger cleaning

Drain the unit (see system).

Shut off the unit (see system).

Power off the fans (see system).

Clean the heat exchanger with one of the following procedures:

- Cleaning with compressed air (see Cleaning with compressed air).
- Hydraulic cleaning (see Hydraulic cleaning)
- Cleaning with brushes or brushes and compressed air (see Cleaning with brushes or brushes and compressed air, page 75).

NOTICE

Danger of damage to property

The fins can be damaged with too high a pressure, too small a distance or a cleaning jet that hits the fins at an angle. Mechanical cleaning with hard objects (e.g. steel brushes, screw drivers, or similar) can damage the heat exchanger surface.

- Use a pressure of maximum 725 psi (50 bar) with hydraulic cleaning and maximum 1160 psi (80 bar) with cleaning with compressed air.
- Maintain a minimum distance from the fins of 8 in (+/- 200 mm).
- Always aim the jet vertically (maximum ±5 degree deviation) at the fins.
- Do not use any hard objects when cleaning.

Switch fans on (see system).

Open liquid side (see system).

Open high-pressure side (see system).

11.4.2.1 Cleaning with compressed air

Blast heat exchanger (maximum 1160 psi (80 bar) pressure) with compressed air to remove dirt and contaminants.

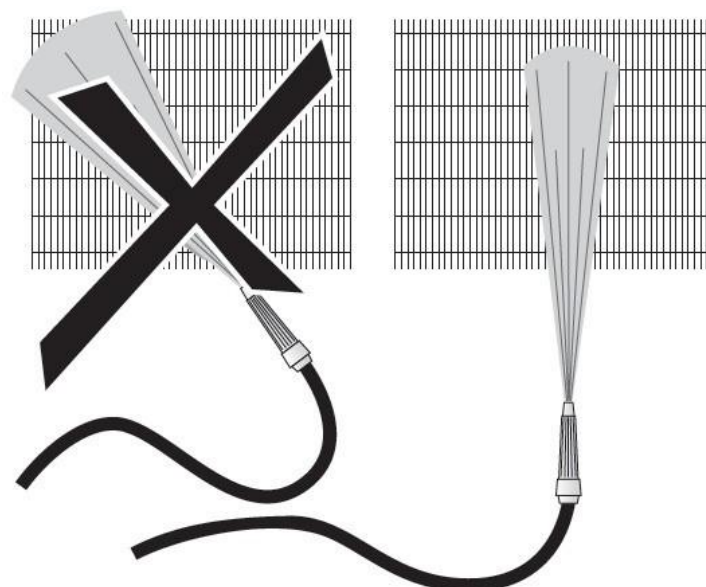
NOTE: Hold the jet of the cleaner vertical to the fins (maximum deviation of ±5 degrees) to prevent fins from bending

11.4.2.2 Hydraulic cleaning

⚠ WARNING	
	Lock-out procedure required Direct and indirect contact with voltage-carrying parts of motors and electrical lines can cause serious injuries or death. Water and cleaning agents conduct electricity. •Power off the fans when cleaning with water or pressurized steam.
NOTICE	
Danger of damage to property Water or steam jets can damage fans, electrical lines or other components. •Ensure that electrical connections and motors, as well as components and stored goods in the working area are not in the path of water or steam jets. Cover these if required.	

Heavier deposit or greasy dirt must be removed with a high-pressure water jet (maximum 725 psi (50 bar) pressure), steam pressure jet (maximum 725 psi (50 bar) pressure), min. 8 in (+/- 200 mm) distance with flat jet nozzle, or using neutral cleaning agent where applicable, always against the airflow direction. Ensure here:

- With oily and greasy dirt it helps to add a cleaning agent to the water.
- When applying chemical agents ensure that they are not aggressive towards the unit's materials. Rinse the unit off after the treatment.
- Cleaning should be done from inside to the outside (but always opposing the dirt onset) and from top to bottom, so that the dirt can be removed without returning.
- Hold the jet of the cleaner vertical to the fins (heat exchanger – maximum deviation of ± 5 degrees) to prevent fins from bending.



Continue cleaning until all dirt has been removed.

11.4.2.3 Cleaning with brushes or brushed with compressed air

Remove dry dust or dirt with a brush, a hand brush or with compressed air (maximum 1160 psi (80 bar) pressure, minimum distance of 8 in (+/- 200 mm) to the fins; against the airflow direction or with a powerful industrial vacuum cleaner. Ensure here:

- Use soft brushes (no steel brushes or similar).
- Where possible, cleaning should be from the top down. Where possible, cleaning should be from top to bottom, so that the dirt can be removed without the possibility of returning to cleaned parts. Continue cleaning until all dirt has been removed.
- Always brush the fins lengthways – never across.

11.4.3 Fans cleaning

WARNING

Danger of cutting, pinching

There is a danger of fingers being cut off from the rotating fan blades, injury hazard for the hands and the danger of being pulled in due to lose element such as hair, necklaces or clothing parts.

Power off the unit before you begins maintenance work. Secure the unit against unintentional switching on again by removing the electric fuses for the unit. Secure the unit with a suitable warning sign referring to unintentional switching on (Lock-out procedure).

Dirt build-ups and frost and/or icing on the fans and the fan guard grilles must be removed regularly; otherwise they will cause imbalances or destruction and power losses.

Power off the unit and secure it against unintentional switching on.

Clean fans with one of the following procedures:

NOTE: Danger of damage to property. Mechanical cleaning with hard objects (e.g. steel brushes, screw drivers, or similar) damages the fan.

Cleaning with compressed air: Blow fans with compressed air (maximum 145 psi (10 bar) pressure; minimum distance 8 in (+/- 200 mm)) to remove dirt and contaminants. Continue cleaning until all dirt has been removed.

Cleaning with compressed air and brushes: Remove dry dust or dirt with a brush, a hand brush or with compressed air (maximum 145 psi (10 bar) pressure, minimum distance of 8 in (+/- 200 mm)) or with a powerful industrial vacuum cleaner.

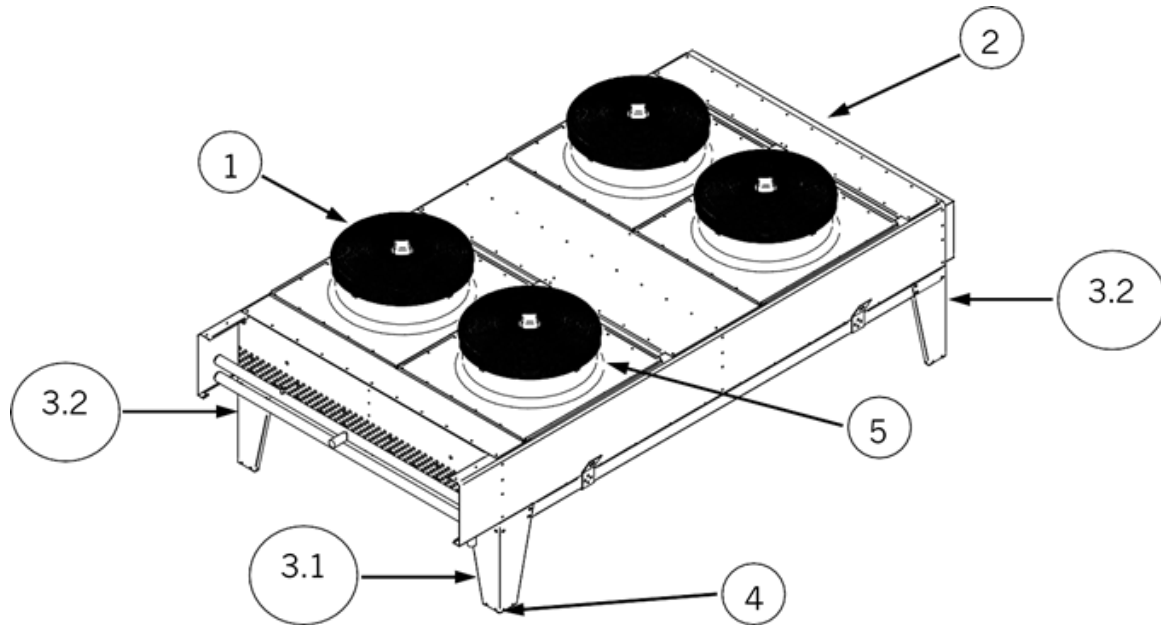
Ensure here: use soft brushes (no steel brushes or similar). Continue cleaning until all dirt has been removed.

Mount fan guard/s.

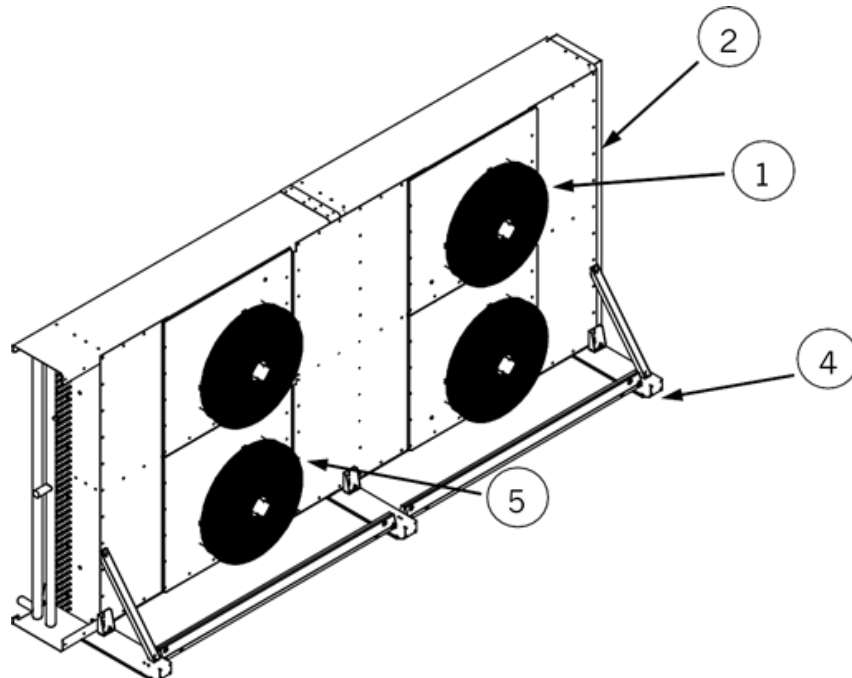
Switch unit on.

12. Spare parts

Horizontal unit



Vertical Unit



Listed below are the major replacement parts of the GVH/GVV/GFH series. The standard motor is external rotor type.

GVH

Item	Part	GVH 050.2	GVH 065.2	GVH 080.2	GVH 090.2
1	Motor sound level N @ 230V/3~/60Hz	VT01188U	VT01191U	VT01224U	VT01196U
	Motor sound level N @ 460V/3~/60Hz	VT01188U	VT01191U	VT01224U	VT01196U
	Motor sound level N @ 400V/3~/60Hz	VT01188U	VT01191U	VT01224U	VT01196U
	Motor sound level N @ 400V/3~/50Hz	VT01188U	VT01191U	VT01224U	VT01196U
	Motor sound level N @ 575V/3~/60Hz	VT01306U	VT01314U	VT01328U	VT01331U
	Motor sound level M @ 230V/3~/60Hz	n/a	n/a	VT01225U	VT01201U
	Motor sound level M @ 460V/3~/60Hz	n/a	n/a	VT01225U	VT01201U
	Motor sound level M @ 400V/3~/60Hz	n/a	n/a	VT01225U	VT01201U
	Motor sound level M @ 400V/3~/50Hz	n/a	n/a	VT01225U	VT01201U
	Motor sound level M @ 575V/3~/60Hz	n/a	n/a	VT01323U	VT01333U
	Motor sound level L @ 230V/3~/60Hz	VT01189U	VT01177U	VT01226U	VT01197U
	Motor sound level L @ 460V/3~/60Hz	VT01189U	VT01177U	VT01226U	VT01197U
	Motor sound level L @ 400V/3~/60Hz	VT01189U	VT01177U	VT01226U	VT01197U
	Motor sound level L @ 400V/3~/50Hz	VT01189U	VT01177U	VT01226U	VT01197U
	Motor sound level L @ 575V/3~/60Hz	VT01307U	VT01312U	VT01329U	VT01330U
	Motor sound level S @ 230V/3~/60Hz	n/a	n/a	VT01227U	VT01202U
	Motor sound level S @ 460V/3~/60Hz	n/a	n/a	VT01227U	VT01202U
	Motor sound level S @ 400V/3~/60Hz	n/a	n/a	VT01227U	VT01202U
	Motor sound level S @ 400V/3~/50Hz	n/a	n/a	VT01227U	VT01202U
	Motor sound level S @ 575V/3~/60Hz	n/a	n/a	VT01324U	VT01334U
	Motor @ 380-460V/3~/50-60Hz	n/a	n/a	VT03025U	VT03030U
2	Junction box for 1 fan	1 X 4514 for AC fans and for EC fans			
	Junction box for 2 fans	1 X 4608 for AC fans / 1 X 4514 for EC fans			
	Junction box for 3 fans	1 X 4515 for AC fans / 1 X 4608 for EC fans			
	Junction box for 4 fans	1 X 4515 for AC fans / 1 X 4608 for EC fans			
	Junction box for 5 fans	1 X 4609 for AC fans / 1 X 4515 for EC fans			
	Junction box for 6 fans	1 X 4609 for AC fans / 1 X 4515 for EC fans			
	Junction box for 2 X 2 fans	1 X 4515 for AC fans / 1 X 4608 for EC fans			
	Junction box for 2 X 3 fans	1 X 4609 for AC fans / 1 X 4515 for EC fans			
	Junction box for 2 X 4 fans	1 X 4609 for AC fans and for EC fans			
	Junction box for 2 X 5 fans	2 X 4609 for AC fans / 1 X 4609 for EC fans			
Junction box for 2 X 6 fans	2 X 4609 for AC fans / 1 X 4609 for EC fans				
3.1	Corner foot height 9 15/16" (250 mm)	n/a		AY6.360S	
	Corner foot height 15 3/4" (400 mm)	AY174.1S (only for 1 or 2 fans) AY178.1S		n/a	
	Corner foot height 23 5/8" (600 mm)	AY178.2S	AY6.316S	Corner foot height 23 5/8" (600 mm)	AY178.2S
	Corner foot height 31 1/2" (800 mm)	AY178.3S	AY6.363S	Corner foot height 31 1/2" (800 mm)	AY178.3S
	Corner foot height 39 3/8" (1000 mm)	AY178.4S	AY6.366S	Corner foot height 39 3/8" (1000 mm)	AY178.4S
3.2	Corner foot height 9 15/16" (250 mm)	n/a		AY6.361S	
	Corner foot height 15 3/4" (400 mm)	AY174.1S (only for 1 or 2 fans)		n/a	
	Corner foot height 23 5/8" (600 mm)	AY178.1S		AY6.317S	
	Corner foot height 31 1/2" (800 mm)	AY178.2S		AY6.364S	
	Corner foot height 39 3/8" (1000 mm)	AY178.3S		AY6.367S	
3.3	Middle foot height 9 15/16" (250 mm)	n/a		AY6.362S	
	Middle foot height 15 3/4" (400 mm)	AY178.1S		n/a	
	Middle foot height 23 5/8" (600 mm)	AY178.2S		AY6.319S	
	Middle foot height 31 1/2" (800 mm)	AY178.3S		AY6.365S	
	Middle foot height 39 3/8" (1000 mm)	AY178.4S		AY6.368S	
4	Vibration damper	4906			
5	Repair switch	1407			

GVV

Item	Part	GVV 050.2	GVV 065.2	GVV 080.2	GVV 090.2
1	Motor sound level N @ 230V/3~/60Hz	VT01188U	VT01191U	VT01224U	VT01196U
	Motor sound level N @ 460V/3~/60Hz	VT01188U	VT01191U	VT01224U	VT01196U
	Motor sound level N @ 400V/3~/60Hz	VT01188U	VT01191U	VT01224U	VT01196U
	Motor sound level N @ 400V/3~/50Hz	VT01188U	VT01191U	VT01224U	VT01196U
	Motor sound level N @ 575V/3~/60Hz	VT01306U	VT01314U	VT01328U	VT01331U
	Motor sound level M @ 230V/3~/60Hz	n/a	n/a	VT01225U	VT01201U
	Motor sound level M @ 460V/3~/60Hz	n/a	n/a	VT01225U	VT01201U
	Motor sound level M @ 400V/3~/60Hz	n/a	n/a	VT01225U	VT01201U
	Motor sound level M @ 400V/3~/50Hz	n/a	n/a	VT01225U	VT01201U
	Motor sound level M @ 575V/3~/60Hz	n/a	n/a	VT01323U	VT01333U
	Motor sound level L @ 230V/3~/60Hz	VT01189U	VT01177U	VT01226U	VT01197U
	Motor sound level L @ 460V/3~/60Hz	VT01189U	VT01177U	VT01226U	VT01197U
	Motor sound level L @ 400V/3~/60Hz	VT01189U	VT01177U	VT01226U	VT01197U
	Motor sound level L @ 400V/3~/50Hz	VT01189U	VT01177U	VT01226U	VT01197U
	Motor sound level L @ 575V/3~/60Hz	VT01307U	VT01312U	VT01329U	VT01330U
	Motor sound level S @ 230V/3~/60Hz	n/a	n/a	VT01227U	VT01202U
	Motor sound level S @ 460V/3~/60Hz	n/a	n/a	VT01227U	VT01202U
	Motor sound level S @ 400V/3~/60Hz	n/a	n/a	VT01227U	VT01202U
	Motor sound level S @ 400V/3~/50Hz	n/a	n/a	VT01227U	VT01202U
	Motor sound level S @ 575V/3~/60Hz	n/a	n/a	VT01324U	VT01334U
	Motor @ 380-460V/3~/50-60Hz	n/a	n/a	VT03025U	VT03030U
2	Junction box for 1 fan	1 X 4514 for AC fans and for EC fans			
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	Junction box for 2 X 5 fans	2 X 4609 for AC fans / 1 X 4609 for EC fans			
	Junction box for 2 X 6 fans	2 X 4609 for AC fans / 1 X 4609 for EC fans			
4	Vibration damper	4906			
5	Repair switch	1407			

GFH

Item	Part	GVV 050.2	GVV 065.2	GVV 080.2	GVV 090.2
1	Motor sound level N @ 230V/3~/60Hz	VT01188U	VT01191U	VT01224U	VT01196U
	Motor sound level N @ 460V/3~/60Hz	VT01188U	VT01191U	VT01224U	VT01196U
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	Junction box for 2 X 4 fans	1 X 4609 for AC fans and for EC fans			
	Junction box for 2 X 5 fans	2 X 4609 for AC fans / 1 X 4609 for EC fans			
	Junction box for 2 X 6 fans	2 X 4609 for AC fans / 1 X 4609 for EC fans			
4	Vibration damper	4906			
5	Repair switch	1407			