



Alfa-V VDD

Instruction manual

Product description	_____
Product labels	_____
Unpacking and lifting	_____
Installation	_____
Maintenance	_____
Spare parts	_____



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1 Important information

1.1 Disclaimer

This Instruction Manual applies to all Alfa-V industrial dry coolers and is supplied in combination with the Air Cooled Liquid Coolers Product Manual AHE00050. Both manuals must be carefully examined and instructions should be followed up at all times. Alfa LU-VE does not accept liability for any damage resulting from non-compliance to the instructions as given in the manuals and order-related documents.

1.2 Intended use

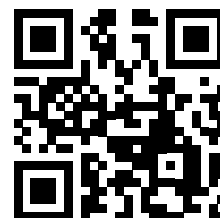
Liquid coolers are partly completed machinery according to Machine Directive 2006/42/EC and intended for incorporation in cooling systems. Declarations of Incorporation are available on alfa.luvegroup.com. The units may not be put into operation until the conformity of the complete machine or cooling system has been declared according to the following standards and directives:

- Pressure Equipment Directive 2014/68/EU
- Machine Directive 2006/42/EC
- Low Voltage Directive 2014/35/EU
- Electrical Equipment of Machines IEC 60204-1
- Electro Magnetic Compatibility 2014/30/EU
- Any applicable local or national legislation

1.3 Where to find product information

Detailed technical data for individual product models are available in order related documents, on the product label and in product data sheets. Comprehensive technical information for all Alfa LU-VE air heat exchanger products is available on-line on alfa.luvegroup.com. This includes:

- Product manuals
- Instruction manuals
- Product leaflets & brochures
- Product data sheets (selection software)
- Dimensional drawings
- Electrical wiring diagrams
- Certificates



Alfa-V VDD

Alfa LU-VE offers world-wide service and support. In case of any questions or uncertainty please contact your local Alfa LU-VE representative.

Contact addresses are available at alfa.luvegroup.com.

2 Product description

2.1 General information and application

The Alfa-V VDD series is a wide range of heavy duty dual fan row V-type dry coolers for HVAC, refrigeration and various industrial applications such as water/glycol cooling. For industrial applications, dry coolers are suitable for closed circuit cooling of various process liquids in f.i. food, power, process and general industries. Alfa-V VDD dry coolers provide high capacities at reduced power consumption and a compact footprint.

- Capacity range (water, EN1048): 100 up to 1800 kW
- Design pressure: 10 bar. Each heat exchanger leak tested with dry air

2.2 Standard configuration

- Finned coil:
 - Smooth copper tubing \varnothing 12 and 16 mm (VDD and VDD6) or SS304 stainless steel tubing 16 mm (VDDY).
 - Separate connections allow independent operation of both cooling coils.
- Fans:
 - 2 to 9 fan pairs, available in three fan diameters (\varnothing 800 mm, \varnothing 910 mm & \varnothing 1000 mm) and different noise levels. ErP compliant motors with dynamically and statically balanced external rotor, protection class IP54 according to DIN 40050 and integrated thermo contacts to provide reliable protection against thermal overload. AC power supplies 400/50/3, 400/60/3 and 460/60/3. EC power supply 380-480/50-60/3.
- Casing, supports and frame made of corrosion resistant galvanized steel (class C4-H). Separated fan sections and removable fan rings.
- Frame construction provides high rigidity for protection against vibration and thermal expansion.
- Stickers indicate fan direction and refrigerant in/out.

2.3 Options

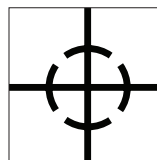
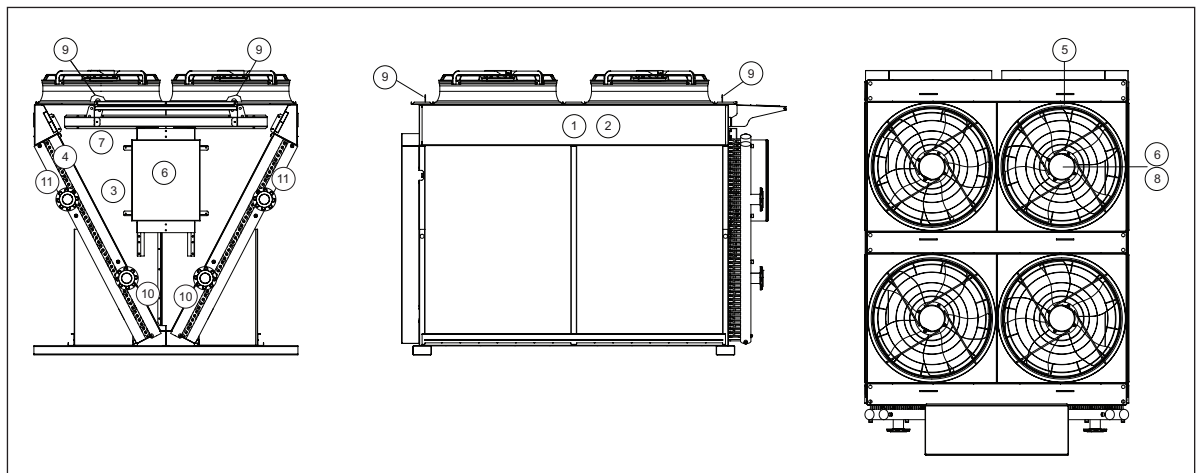
- Fin spacing (up to 3.0 mm)
- Coil corrosion protection
 - Epoxy coated aluminium fins (EP)
 - F-coat treatment (FC)
 - Seawater resistant aluminium AIMg (SWR)
 - Industrial R-fin (RIF)
 - Epoxy coated aluminium R-fin (REP)
 - Seawater resistant aluminium AIMg R-fin (RSWR)
- Coil protection grid (GR)
- Spray Water kit (KW)
- Water Spray System including pumping station (SWS)
- Casing coated RAL 9002 (other colors on special request)
- Container skid (SK)
- Ladder and railings
- Vibration dampers (VD)
- Expansion tank (ET)
- Special fan motors:
 - Protection class IP55
 - High-temperature motors
 - IEC standard motors (on special request)
- Electrical accessories:
 - Switch on/off (SW)
 - EC Motors wired to a common terminal box (CBP=connection box, CBMT=connection box and master controller+temperature signal)
 - Switchboard IP54 (BS)
 - AC fan step control cabinet (BST)
 - EC fan speed control cabinet (ICM)
 - Basic EC switchboard panel (ECCB)

2.4 Code description

VDD	SE	90	4	.1	B	D	72	SK	C4	*	-	AL	2.1	CU	*
1	2	3	4	5	6	7	8	9	10	11		12	13	14	15

- 1 Alfa-V dry cooler (VDD=standard Cu tube,VDD6=5/8" Cu, VDDY=5/8" SS304)
- 2 Sound level/fan code (T=turbo, S=standard, L=low, Q=quiet, R=residential, E=EC fan motor)
- 3 Fan diameter (80=800, 90=910, 100=1000 mm)
- 4 Number of fan pairs (2 to 9)
- 5 Alfa-V series II
- 6 Tube rows code (A, B, C, D)
- 7 Fan motor connection (D=delta, Y=star)
- 8 No of circuits
- 9 Packing (SK=container skid)
- 10 Case material
- 11 Electrical accessories
- 12 Fin material (AL=aluminium, IF=industrial fins, SWR=AlMg, EP=epoxy coated aluminium, FC=F-coat, RIF=industrial R-fin, REP=epoxy coated aluminium R-fin, RSWR=AlMg R-fin)
- 13 Fin spacing (2.0, 2.1, 2.3, 2.5, 3.0 mm)
- 14 Tube material (CU=copper, SS=stainless steel)
- 15 Options

3 Product labels



1. Centre of gravity


Forklifts can be used to lift 2 to 5 modules units only: always place the forks under the center of gravity.

**HANDLE
WITH CARE**




2. Handle with care



When handling the unit, always take maximum care.



Manufacturer	Manuf. Date
AIR HEX ALONTE S.R.L. - Italy	04 / 2019
Model	O.A. *****
VDD*****	

Item ID	*****
Serial no.	*****
Unit Net Weight 36 kg ±5%	
Sn 	
Motorfan data	
Vn	3~380/480V
f	50/60Hz

Country of origin Italy





WARNING


READ INSTRUCTION MANUAL BEFORE INSTALLATION AND MAINTENANCE TO AVOID INJURIES OR DAMAGE

3. Product label



Model	Refer to paragraph "2.4 Code description"
Item ID Serial no.	Communicate these when ordering spare parts as they identify the unit.
O. A.	Order Acknowledgement number
Unit Net Weight	Check before any lifting operation to ensure that proper lifting tools are used.



Manufacturer	Manuf. Date
AIR HEX ALONTE S.R.L. - Italy	04 / 2019
Model	O.A. *****
VDD*****	

Item ID	*****
Serial no.	*****
Sn 	
Material	CU
PED Category	Art. 4.3
Max DN	80
Fluid Group	2
Coil Ts	+110/-60 °C
Ps	10 bar
Pt	15 bar
Test Date	04-2019

Country of origin Italy

WARNING

READ INSTRUCTION MANUAL BEFORE INSTALLATION AND MAINTENANCE TO AVOID INJURIES OR DAMAGE

4. Product label - coil

Model	Refer to paragraph "2.4 Code description".
Item ID Serial no.	Communicate these when ordering spare parts as they identify the unit.
Material	Tube material
PED Category	According to PED
Max DN	Maximum diameter of the distributor tube
Fluid Group	According to PED
Coil Ts	Range of operating temperatures for the coil
Ps	Design pressure
Pt	Test pressure
Test date	Date on which the coil has been pressure tested in the factory



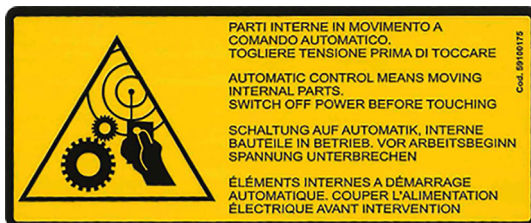
5. Fan direction

Sticker indicates fan rotation direction.



6. Electrical warning

Electrically powered component. Switch off power supply before any maintenance or installation activity.



7. Moving parts

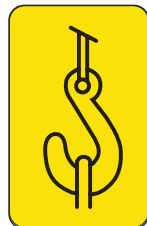
Warning: moving parts.

Switch off power supply before any maintenance or installation activity.



8. Fan motor

Fan motor item number.



9. Lifting lug

Use all marked lifting lugs when lifting from above.



10. & 11. In/Out

Refrigerant connections inlet and outlet.



Grounding

Whenever electrical components supplied by Alfa LU-VE have this sticker, is mandatory to ground them. The yellow/green grounding wire must be left longer than the others, to ensure that it is the last one to be detached from the terminals in the event of the cable being pulled off. Grounding is designed for the electrical equipment supplied with the unit and is not to be intended as protection from external sources.

4 Unpacking and lifting



Always follow guidelines and instructions as given in the air cooled liquid coolers product manual AHE00050.



Before lifting the unit, check the weight stated on the name plate, located on the inlet connection side. Verify that the lifting equipment supports at least the unit weight plus 10%.



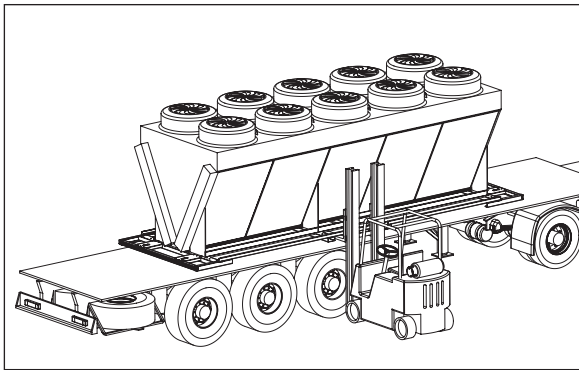
- Forklifts can be used only with 2 to 5 modules units.
- When forklifts are used, forks must be longer than 2.5 m for safe lifting and be fully inserted under the unit.
- Unit shall be lifted only when empty.

Alfa-V VDD dry coolers can be delivered either on standard trucks or in containers.



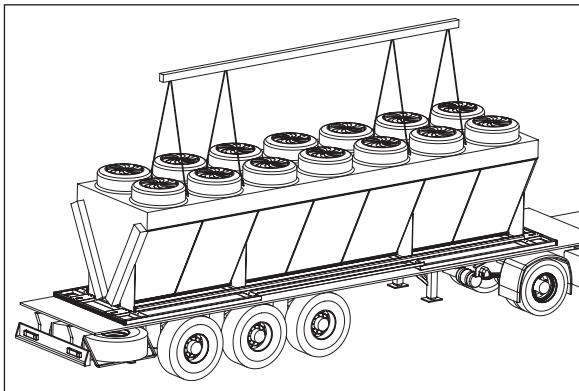
4.1 Unit delivered by standard truck

The procedure below applies to the unloading of units delivered on standard trucks.



2-5 fan pairs unit:

can be unloaded from the side of the truck with the use of a forklift.



6-9 fan pairs unit:

shall be always lifted from above.

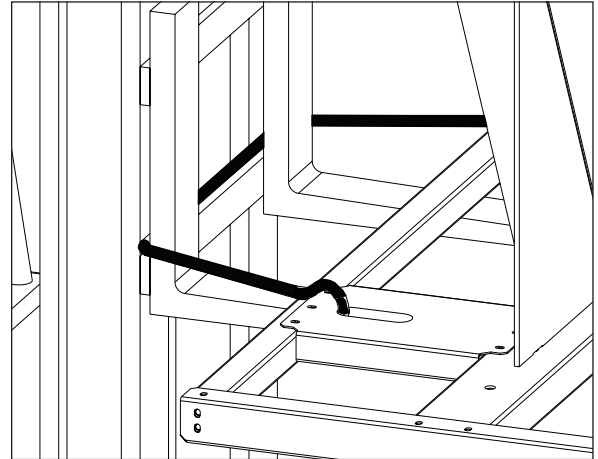
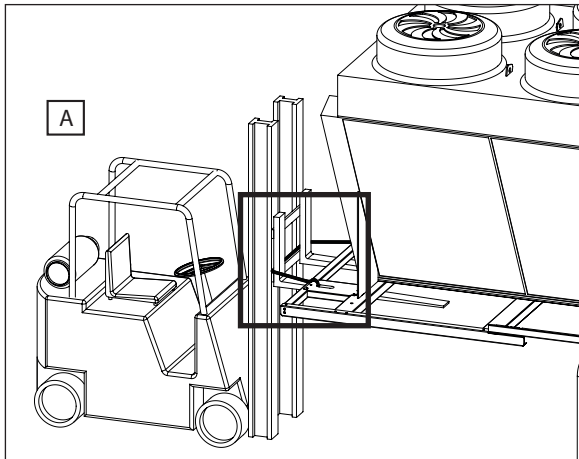
Follow the procedure described in paragraph "4.3 Lifting from above" for 6-8 modules unit. 9 fan pairs units are equipped by default with the container skid and should be unloaded following the procedure described in paragraph "4.2 Unit delivered in a container" even if they are delivered by standard truck.

4.2 Unit delivered in a container

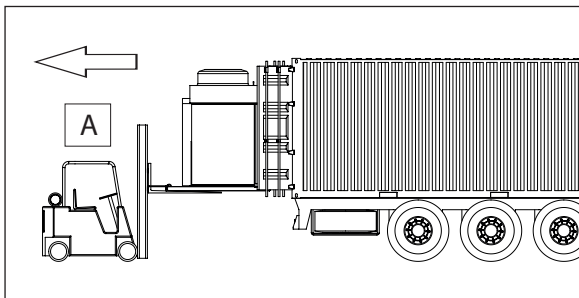
In case of container delivery, container skid option is to be selected in order to facilitate the loading and unloading operations. In case of 9 modules unit, skid is installed by default. Follow the procedure below to unload the unit:

- Remove any obstacle to allow the skid sliding out of the container.
- Ensure the truck is stopped.

Fix the chain to a forklift (identified by letter A) and the hooks in the skid holes.

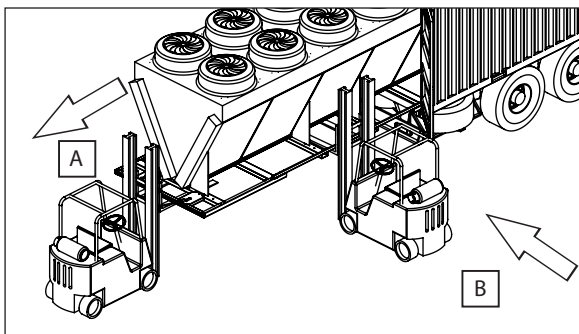


2-5 fan pairs unit



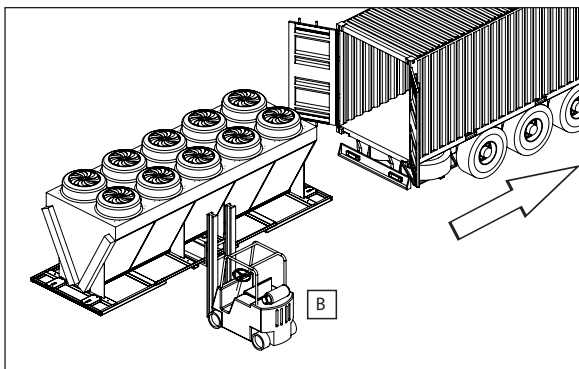
With forklift A, support the unit weight and pull it slowly out of the container. The unit must remain on the container floor for at least 1 m.

The space between the unit and the roof of the container is reduced. Contact with the roof can cause damage to the unit.



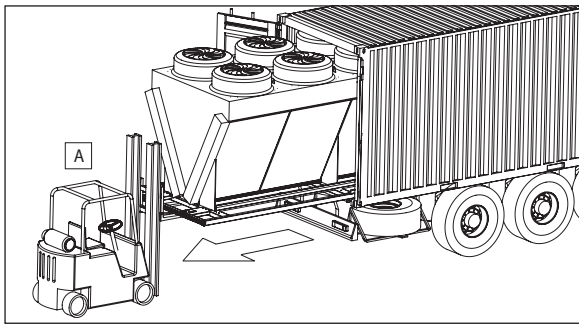
With a second forklift (identified by letter B), insert the forks (under the centre of gravity) and slightly lift the unit.

Remove hooks and chains and drive away with forklift A.



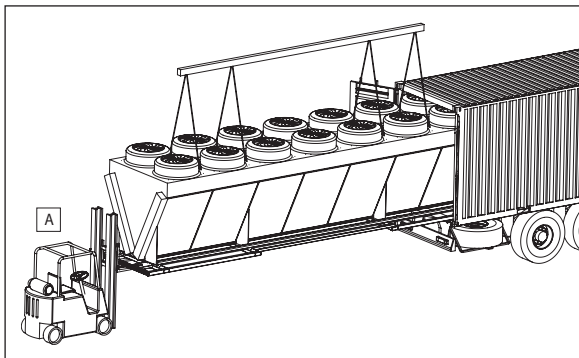
Slowly drive forward with the truck until the unit is completely outside the container.

6-9 fan pairs unit

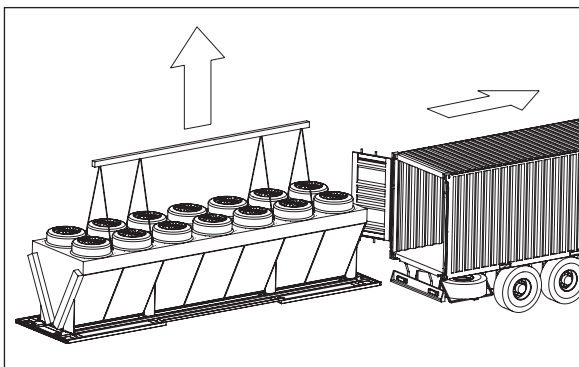


With forklift A, support the unit weight and pull it slowly out until all the lifting lugs are outside the container. The unit should remain on the container floor for at least 1 m.

The space between the unit and the roof of the container is reduced. Contact with the roof can cause damage to the unit.

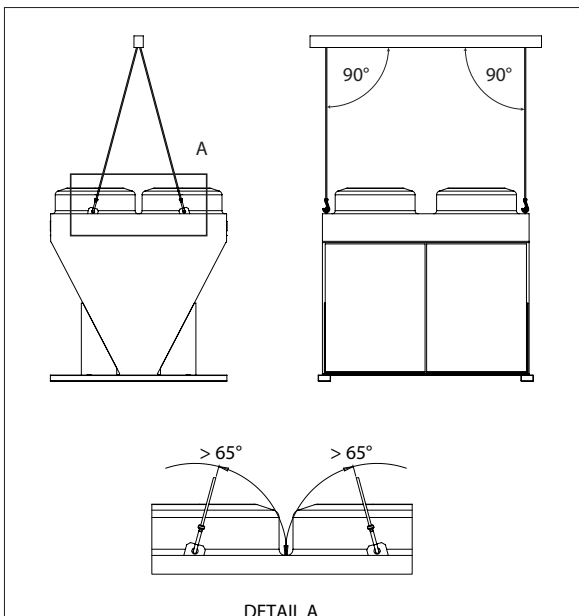


Attach all the lifting lugs to the crane hoisting beam following the procedure described in paragraph "4.3 Lifting from above".



When the crane holds up the unit, remove forklift A. Slightly lift the unit and slowly drive forward with the truck until the unit is completely outside the container.

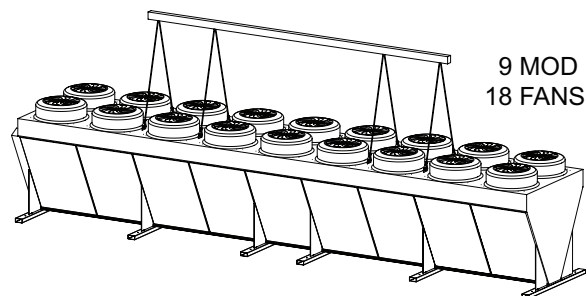
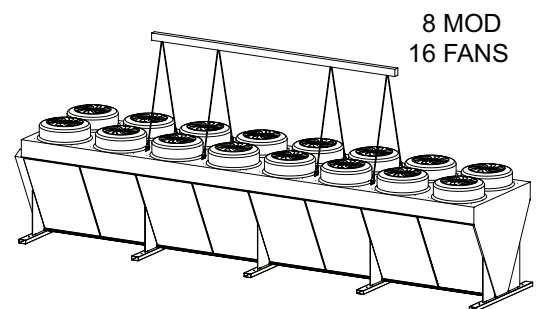
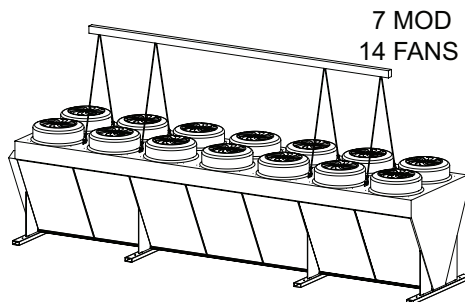
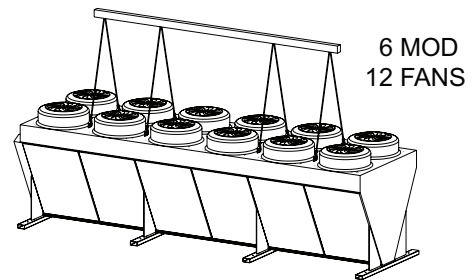
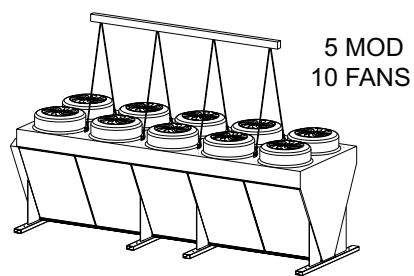
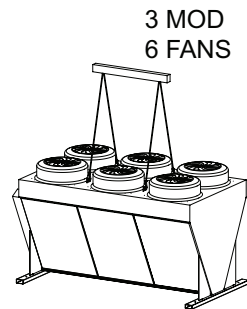
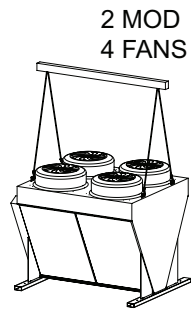
4.3 Lifting from above



Verify that lifting lugs are safely fixed to the unit and have no signs of damage. Attach the belts or hooks only to the lifting lugs as shown in the drawing on the next page.

Angle of chains as shown for all models.

Load on the lifting chains shall be equally distributed on all the lifting points. If one chain is not fully loaded another chain will be extra loaded. This is not allowed.



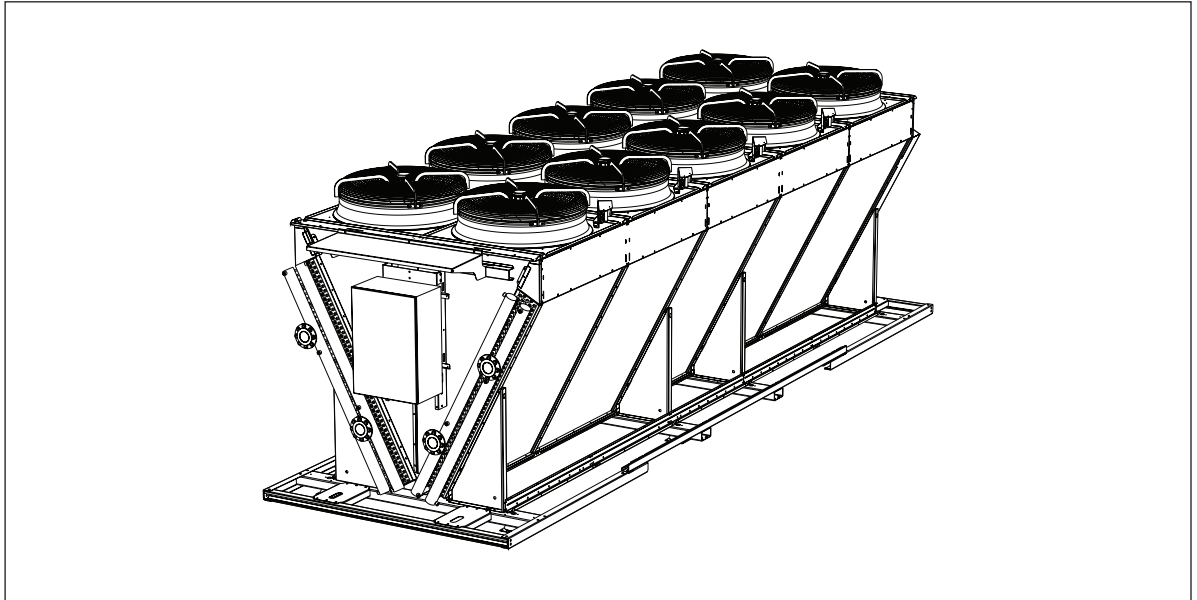
5 Installation



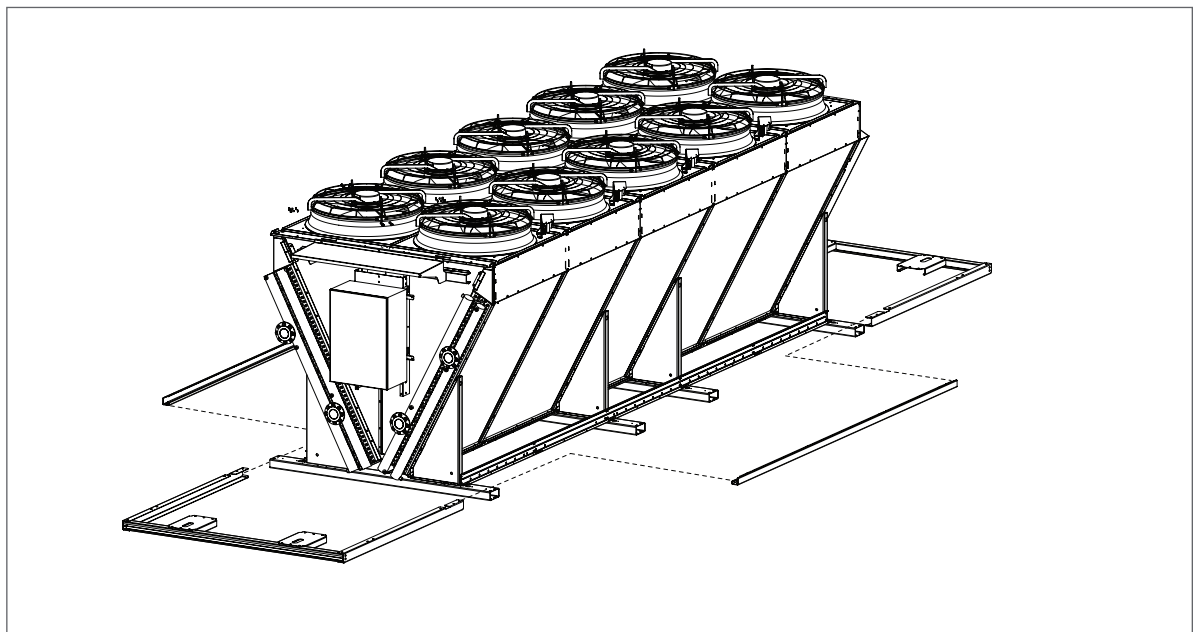
Always follow guidelines and instructions as given in the liquid coolers product manual AHE00050.

5.1 Container skid removal (if present)

Container skid option is selected in order to facilitate loading and unloading operations.

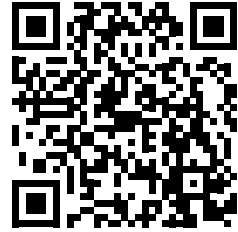


Container skid shall be removed before installation. Container skid components are connected to the unit by means of screws. To remove the skid it is needed to slightly lift the unit.



5.2 Mounting dimensions

Drawings showing all required mounting and liquid connection dimensions are available for download on alfa.luvegroup.com.



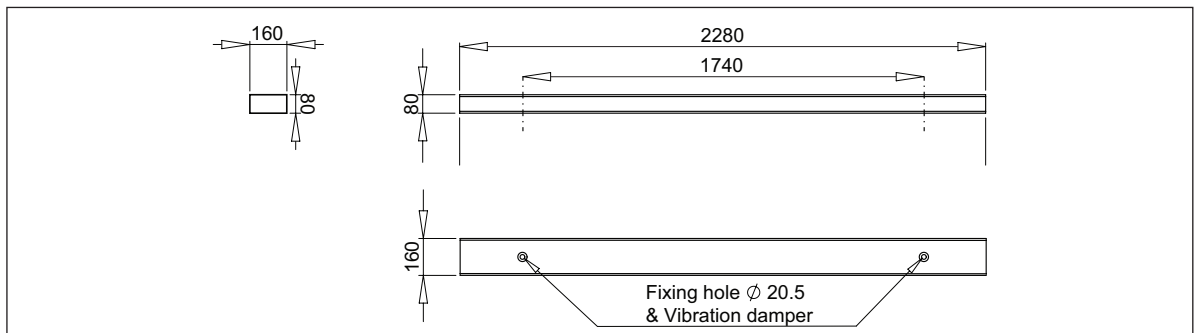
Dimensional drawings

5.3 Feet dimensions detail

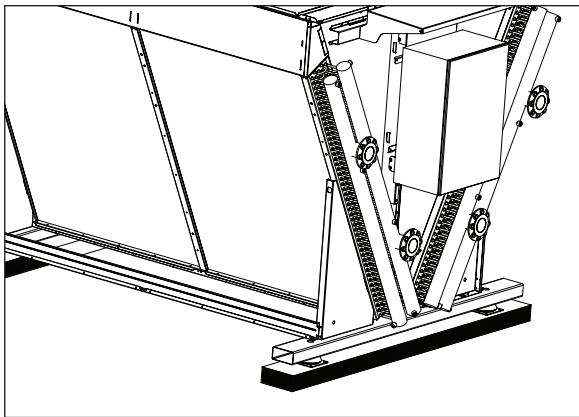
Feet dimensions are identical for all models.

Avoid any lateral torque on the feet when fixing the unit.

Fixing holes can be used to fix the unit to the ground or to a beam structure and for the installation of vibration dampers.

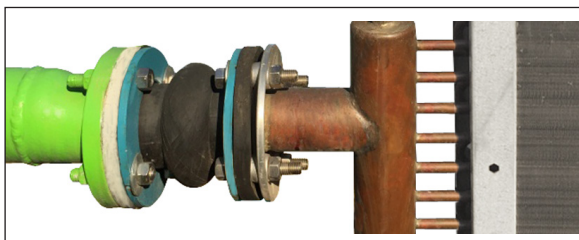


5.4 Concrete mounting base



To avoid oxidation of the equipment feet, it is strongly recommended to mount the heat exchanger on concrete mounting bases. One base for each foot. Base minimum dimensions are 100 mm height and 260 mm width.

5.5 Expansion joints

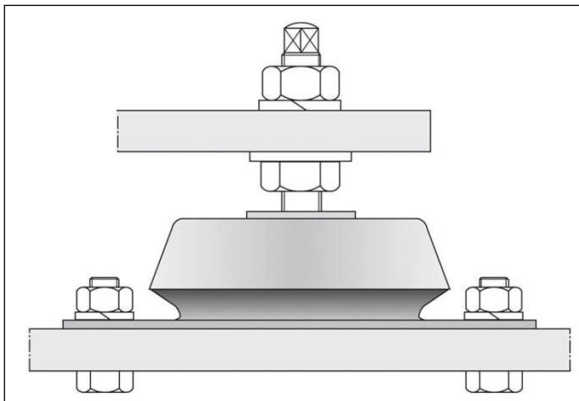
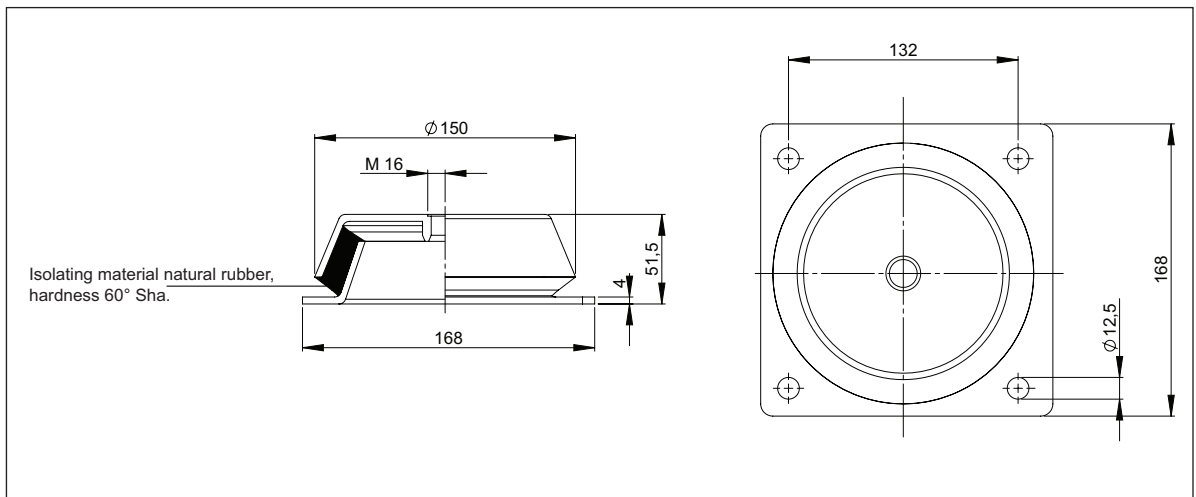


Alfa LU-VE recommends the installation of expansion joints on both inlet and outlet connections. Expansion joints are elastic elements which, if properly installed, absorb the thermal expansions of the tubing. Expansion joints are also helpful in order to reduce vibrations in the piping.

5.6 Vibration dampers

For active and passive isolation of vibrations and reducing noise transmission, Alfa LU-VE strongly recommends the installation of vibration dampers. Installation of vibration dampers must be carried out before positioning the unit. Vibration dampers are to be positioned between the unit feet and the mounting base with the supplied M16 screw.

Fan pairs	Vibration dampers
2	4
3	4
4	6
5	8
6	8
7	8
8	10
9	12



Picture shows an installation example using threaded bar, nut, grower washer, washer and locknut (not supplied).

This way vibration dampers can be used to make the cooler level adjusting the locknut. This is particularly useful with long units or irregular basement.

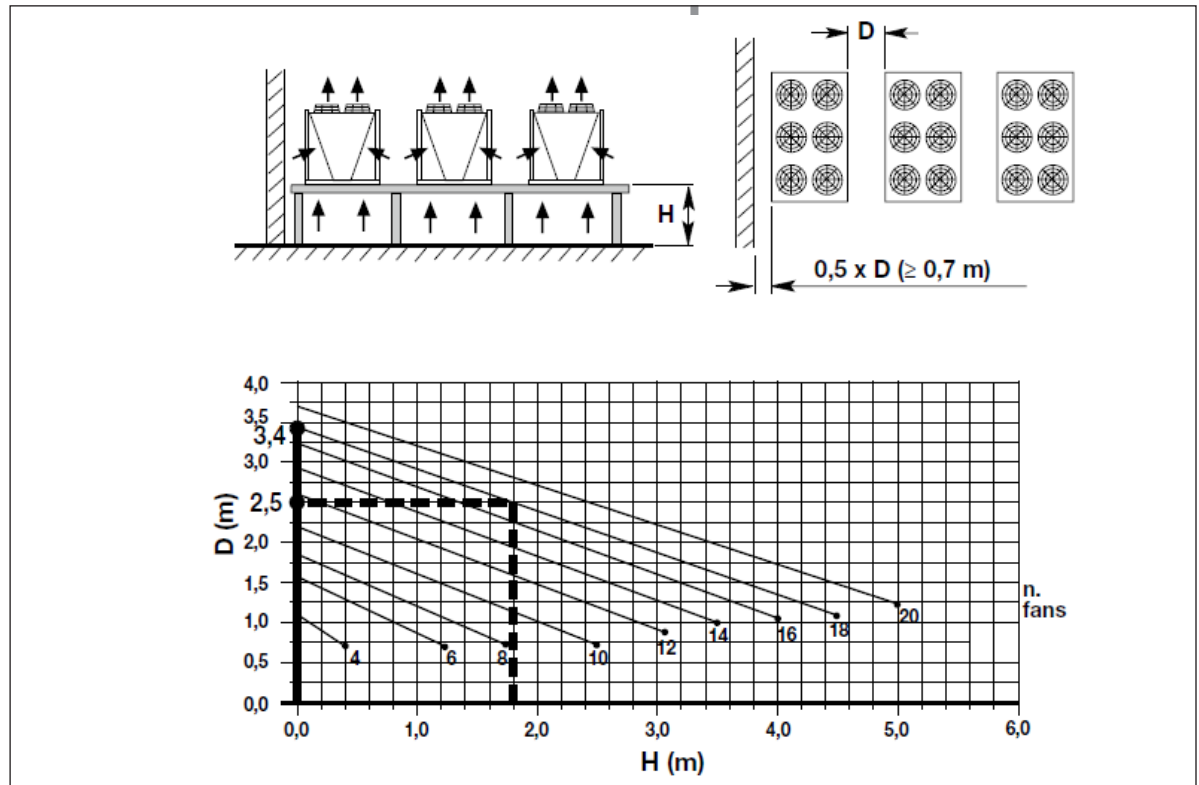
5.7 Installation layout guideline

Ensure installation is such that the following conditions are met:



- Place the unit outdoor in a such way that it can be monitored from all sides at all times.
- Ensure that sufficient space is available for maintenance.
- Verify the structures supporting capacity regarding the weight of the unit(s), including the liquid.

Place the cooler so that air can pass freely over the entire coil surface and if possible so that the wind direction does not affect the evacuation air, otherwise re-circulation might occur. This applies particularly to models that have low revs. See measurement indications below.

In case of doubt, to determine optimal unit spacing for specific conditions on site please contact your Alfa LU-VE representative for advise.



Example

		
n° fans	18	18
D (m)	3.4	2.5
H (m)	0	1.8

5.8 Electrical connections

The following data determine which connection diagram is to be selected and respected for electrical installation:

- Heat exchanger model indication
- Fan motor type
- Electrical accessories

Electrical connection diagrams are available for download on alfa.luvegroup.com. When in doubt always contact your local Alfa LU-VE representative for assistance.



Electrical connections

6 Operation



6.1 Start-up procedure

The following procedure is to be respected at every system start-up.



- Close the liquid-in valve and open the liquid-out valve.
- Open unit vent plug and then fill the unit while venting.
- When all air has been discharged from the liquid circuit, close unit vent plug.
- Start liquid pump.
- Open system inlet valve slowly until the appropriate liquid flow is reached.
- Verify there are no leaks in the liquid circuit and connections.
- Switch on fan power supply.
- Start the fans and verify fan direction.
- After some operating time, check the absence of air in the liquid circuit (vent if needed) and verify that current absorption does not exceed the value as given in the technical specifications.

6.2 Shutdown

If the unit requires emptying for maintenance, system shutdown or dismounting, proceed as follows:

- Stop liquid supply and switch off electrical power supply.
- Make sure neither liquid nor power supply can be resumed accidentally or unexpectedly.
- Close liquid-in and liquid out valves.
- Install a proper hose at the drain valves. Open venting and draining valves. Attention: fluid may be hot.
- Make sure all drained liquid will be collected in a suitable vessel.
- Compressed air helps to drain in less time. Compressed air shall be oil free.

7 Maintenance

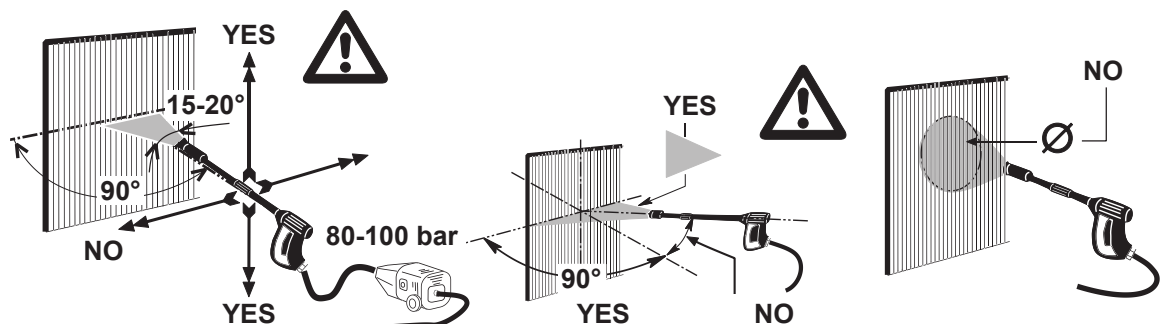


Ensure complete electrical isolation before performing any maintenance activity and always follow guidelines and instructions as given in the air cooled liquid coolers product manual AHE00050.

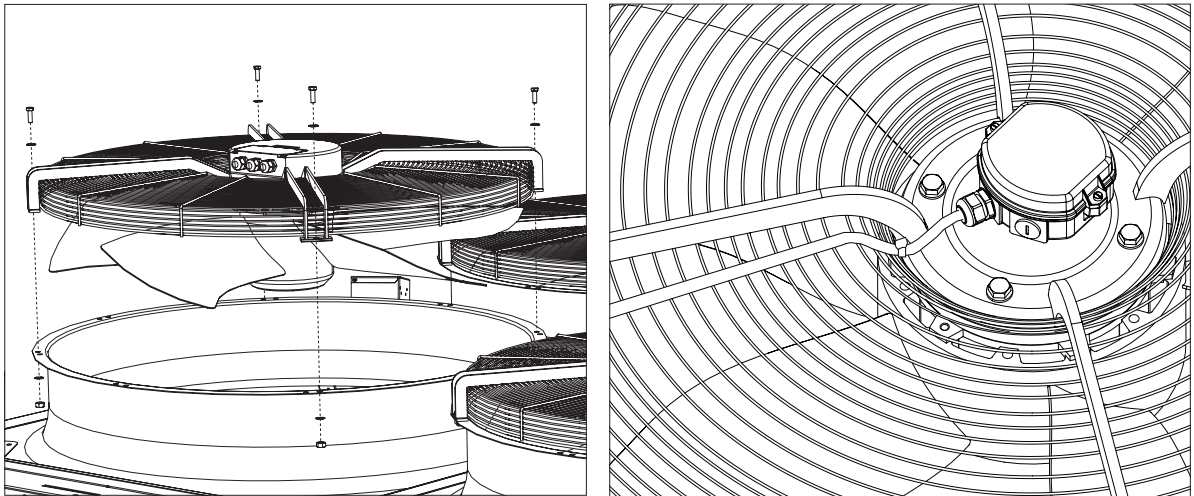
7.1 Cleaning

A coil block should be kept clean to guarantee it works well. The frequency of checks will depend on the site location and specific operating conditions. All Alfa-V coils can be washed by pressurized water up to 100 bar spraying, with flat fan jet perpendicular to fin direction to prevent bending or damaging. Care must be taken not to direct the water jet directly onto fan motors or electric control panels.

R-fin coils have been developed and tested to allow higher water pressure for washing, up to 150 bar and with inclined jet. Cleaning can be performed from outside the finned block without risk to collect water and dirtiness inside, thanks to the design of the bottom part of the frame that allows easy water and melted dirtiness flowing.



7.2 Fan replacement

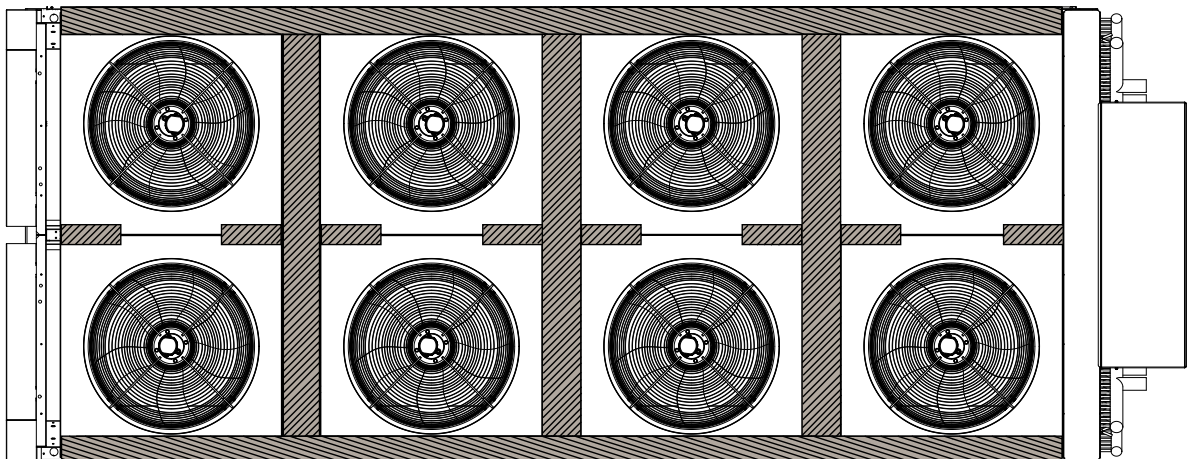



- Open the connection box. Disconnect fan cabling.
- Unscrew fixing bolts and remove old fan.
- Mount new fan assembly in identical position. Remount fasteners. Use an anti-corrosion coating like Geomet or comparable when remounting using new fixing bolts.
- Restore the electric connections (water trap as shown).
- Check for correct fan direction.

7.3 Stepping on the unit

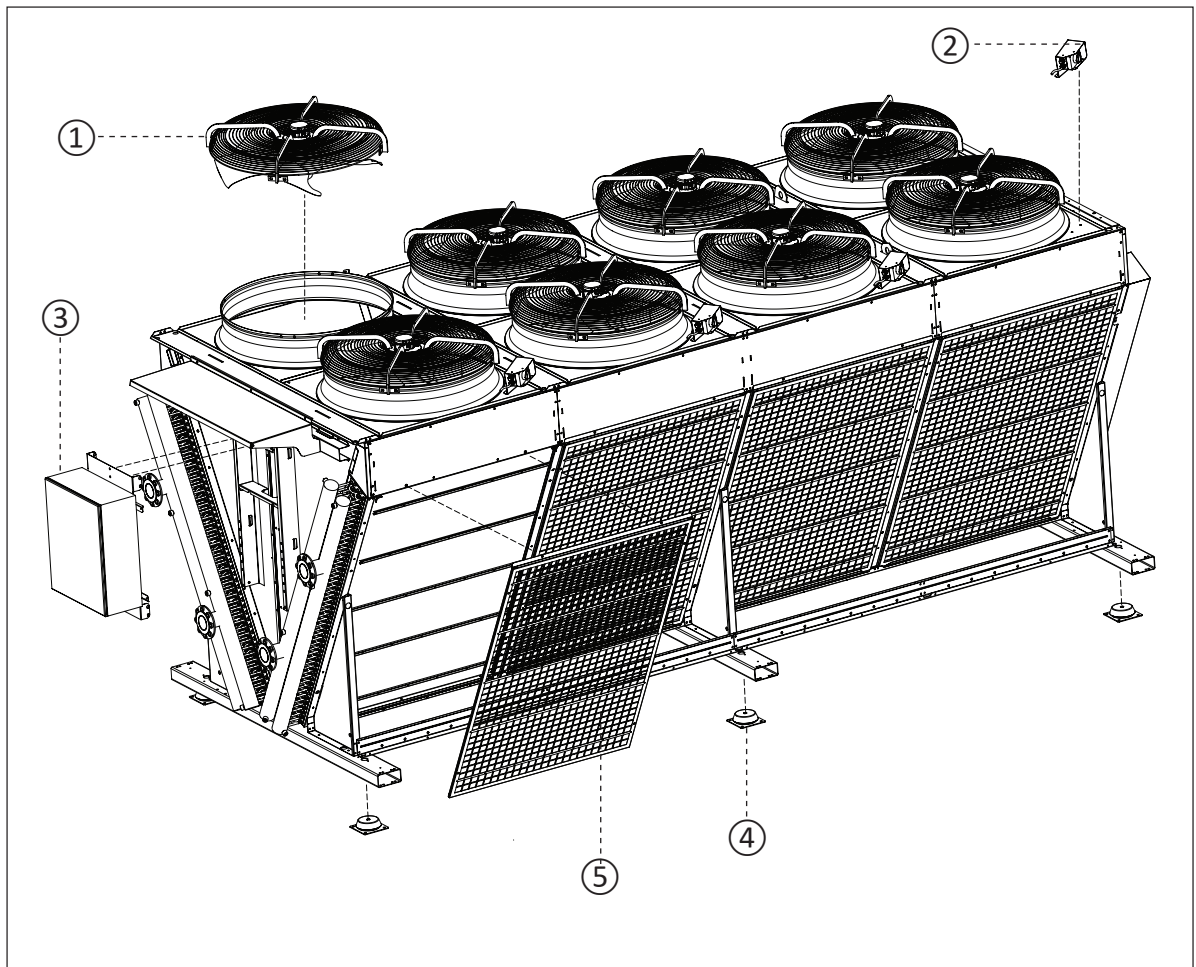


If for maintenance purposes it is required to step on the on the unit, always wear safety shoes. It is not allowed to step on the unit while it is working. Proper protection against falling shall be arranged with railings and safely fixed ladders. If the units do not have railings a safety device that prevents falling shall be used. Never step on the fan grids and on the liquid connections. It is not allowed to step outside the areas highlighted in the example below.



 = walkable areas

8 Spare parts



Spare parts for Alfa-V VDD

- ① Fan
- ② Switch on/off
- ③ Switchboard
- ④ Vibration damper
- ⑤ Protection grids (available on request)

Contact your local Alfa LU-VE representative for spare parts order and assistance.



alfa.luvegroup.com