

AlfaBlue BC/BN/BX

Instruction manual



- Product description
- Product labels
- Unpacking & lifting
- Installation
- Maintenance
- Spare parts

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1 Important information



1.1 Disclaimer

This Instruction Manual applies to all AlfaBlue BC condensers, BN ammonia condensers and BX gas coolers, and is supplied in combination with the product manual AHE00049. 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. If there are any inconsistencies between the manual and the technical construction file, the manual prevails unless explicitly specified.

1.2 Intended use

Air cooled condensers and gas 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. Heat exchanger 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

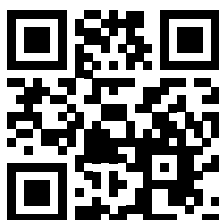
1.3 Where to find product information

Detailed technical data for individual product models are available in order related documents, on the product sticker 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 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.



AlfaBlue BC



AlfaBlue BN



AlfaBlue BX

2 Product description

2.1 Introduction

The AlfaBlue series is a wide range of heavy-duty air cooled condensers and CO₂ gas coolers for refrigeration and air conditioning applications. AlfaBlue products are available for both horizontal and vertical air direction, either in single (M) or dual (D) coil execution.

- AlfaBlue BC condensers for all HFO and HFC refrigerants.
- AlfaBlue BN condensers for ammonia systems.
- AlfaBlue BX gas coolers for CO₂ refrigerant systems.

2.2 Finned coil

Innovative coil design manufactured from Cu tubes (K65 for BX) and corrugated aluminium turbo fins for maximized capacity or industrial power fins for long lasting performance. Fin spacings 2.1 up to 3.0 mm. Separate connections in the D series provide the opportunity for independent operation of both condenser coils. Each heat exchanger is leak tested with dry air and finally supplied with a nitrogen pre-charge. Higher design/test pressures on request.

Model	Design pressure	Test pressure
AlfaBlue BC	33 bar	47 bar
AlfaBlue BCP	33 bar	47 bar
AlfaBlue BCH	45 bar	65 bar
AlfaBlue BN	30 bar	45 bar
AlfaBlue BX	120 bar	172 bar

2.3 Construction

Frame construction provides high rigidity for protection against vibration and thermal expansion. Casing and framework of corrosion resistant pre-galvanized sheet steel, epoxy powder coated white RAL 9002. Separated fan sections.

2.4 Fans

High efficiency AC or EC fan motors, available in 3 fan diameters (800, 910 & 1000 mm) and several noise levels, power supply 400/50/3. Motors with external rotor, protection class IP54 according to DIN 40050. Integrated thermo contacts provide reliable protection against thermal overload.

2.5 Optional features

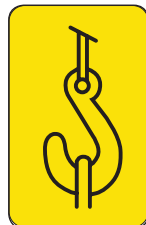
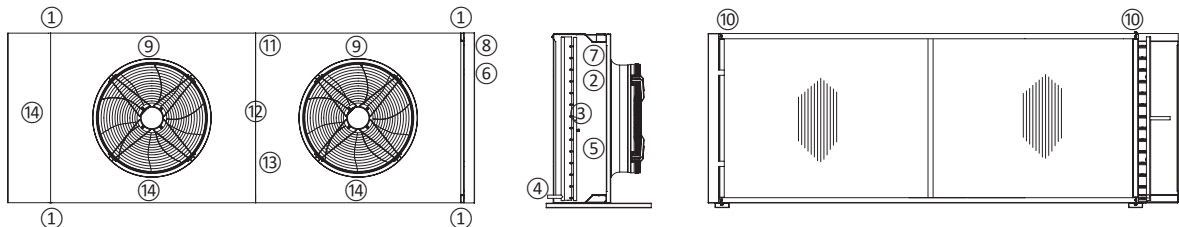
- Mounting feet for vertical airflow (500 mm, 850 mm and 1200 mm)
- Coil options:
Epoxy pre-painted aluminium fins (EP), seawater resistant aluminium alloy fins (SWR), copper fins (CU), F-coat treatment (FC)
- Vibration dampers (VD)
- Sub-cooling circuit (SC, only for BC and BN)
- Spray water device (KW)
- Stainless steel header tubes for on-site welding connections (BX only, on request)
- Electrical options:
 - Switch on/off (SW)
 - AC Motors wired to a common terminal box (CB)
 - Basic Switchboard for AC fans (BS)
 - Basic Switchboard for AC fans+ Fan step control (BSP)
 - EC Motors wired to a common terminal box (CBP)
 - EC Motors wired to a common terminal box + master controller + pressure probe (CBMP)
 - Basic Switchboard for EC fans (ECCB)
 - Basic switchboard for EC fans+ master controller (ECCBM)
 - Basic switchboard for EC fans+ master controller+ pressure probe (ECCBMP)
 - EC fan speed control cabinet (ICM)
 - EC fan speed control cabinet + pressure probe (ICMP)

2.6 Code description

B	C	M	P	S	E	80	2	s	.2	A	D	*	CR	Feet	*	AL	2.1	CU	*
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

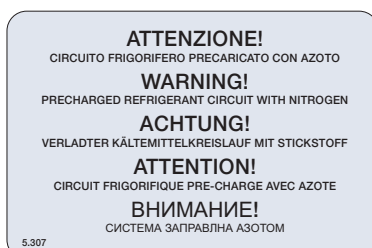
- 1 AlfaBlue
- 2 Family (C=Condenser, N=Ammonia Condenser, X=Gas Cooler)
- 3 Number of fan rows (M=1, D=2)
- 4 Dedicated series (blank=default, P=propane R290, H=R410A)
- 5 Sound level/fan code (T=turbo, S-standard, L=low, Q=quiet, R=residential)
- 6 EC fan (blank= AC fan, E= EC fan)
- 7 Fan diameter (80=800 mm, 90=910 mm, 100=1000 mm)
- 8 Number of fans per row (1 to 6)
- 9 Short coil module (blank=default, s=short coil module)
- 10 Version number
- 11 Tube rows code (A, B, C, D, E)
- 12 Fan motor connection (D=delta, Y=star)
- 13 Number of circuits (only for BX)
- 14 Packing (P=pallet, PP= pallet with protection for headers and coil, CR=crate, SK=container skid)
- 15 Feet=mounting feet supplied mounted (type of feet according to airflow selected)
blank=mounting feet supplied loose
- 16 Electrical accessories
- 17 Fin material/coating (Al=aluminium, IF=industrial fins, SWR=seawater resistant fins, EP=epoxy coated alu, FC=F-coat)
- 18 Fin spacing (2.1, 2.3, 2.5, 3.0 mm)
- 19 Tube material (BC: CU=copper, BN: SS=stainless steel, BX: K65=copper K65)
- 20 Options

3 Product labels



1. Lifting point

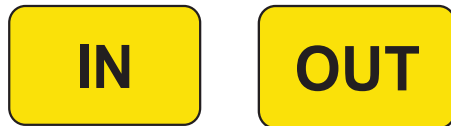
Use all marked lifting points when lifting from above. Lifting points available for both horizontal and vertical airflow setup.



2. Nitrogen precharge warning

Units are delivered from the manufacturer with an overpressure.

Check pressure on the schrader valve. With unpressurised unit: Immediate report to manufacturer and note on bill of delivery.



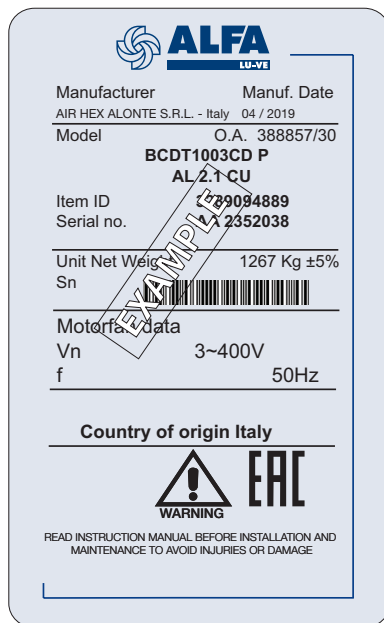
3. & 4. In/Out

Refrigerant connections inlet and outlet.

5. Hot surfaces

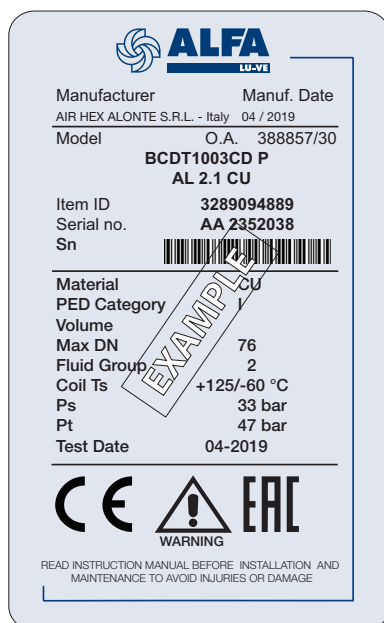
Warning: danger of burns. Wear adequate protection. Applied to the INLET header.

6. Product label

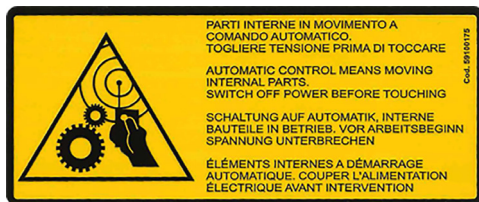


Model	Code description
Item ID Serial no.	To be communicated when ordering spare parts as they identify the unit.
O.A.	Order acknowledgement number
Unit Net Weight	Check before any lifting operation to ensure that proper lifting tools are used.

7. Product label - coil



Model	Code description
Item ID Serial no.	To be communicated when ordering spare parts as they identify the unit.
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



8. Moving parts

Warning: moving parts.

Switch off power supply before any maintenance or installation activities.



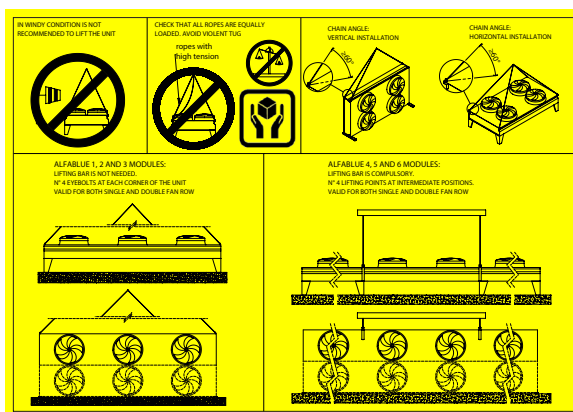
9. Fan direction

Sticker indicates fan rotation direction.



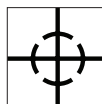
10. Sharp surfaces

Warning: danger of cutting injuries. Wear adequate protection.



11. Lifting instructions

Detailed lifting instructions.



12. & 13. Centre of gravity/Handle with care

When lifting the unit using a forklift, always place the forks under the center of gravity.

When handling the unit using a forklift, always take maximum care.



Both stickers are applied on the protective plastic foil covering the units during transportation.



14. Do not walk

Don't walk on the headers or on the fan cowls.

Stickers on this page are not represented in the stickers overview illustration.



Electrical warning

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



Fan motor

Fan motor item number.



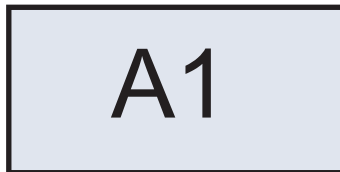
Connection box identifier

Connection box power. One for each fan row. Only for units featuring the corresponding option.



Signal box identifier

Connection box for EC fans signal. Only for units featuring the corresponding option.



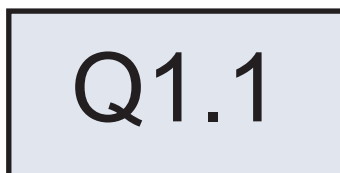
Master Controller identifier

Only for units featuring the corresponding option.



Switchboard identifier

Only for units featuring the corresponding option (ICM/ECCB).



Switch ON/OFF identifier

Only for units featuring the corresponding option (ICM/ECCB).



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 product manual for Air cooled condensers & gas coolers AHE00049.

4.1 Packing

By default, all units are shipped in horizontal airflow position. If vertical airflow is selected, mounting feet come loose. Units are mounted on a wooden pallet, wrapped with plastic foil. As an optional, open crate (single fan row models) or protection for headers and coil (dual fan row models) can be selected. AlfaBlue for vertical airflow can be ordered with mounted feet. These units are shipped in mounting position with a pallet for on-site handling.

4.2 Shipping dimensions

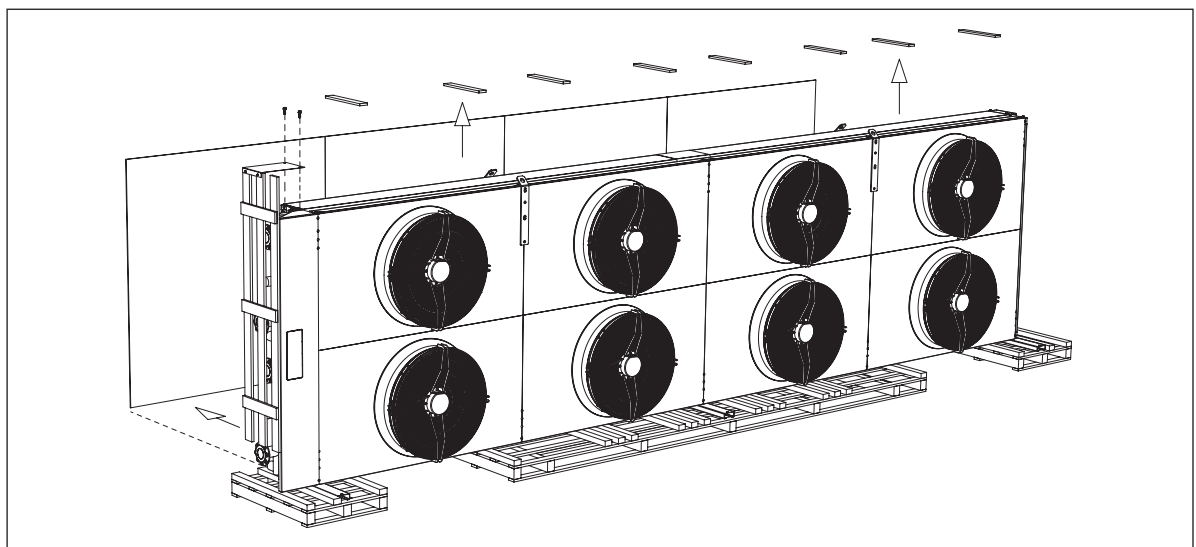
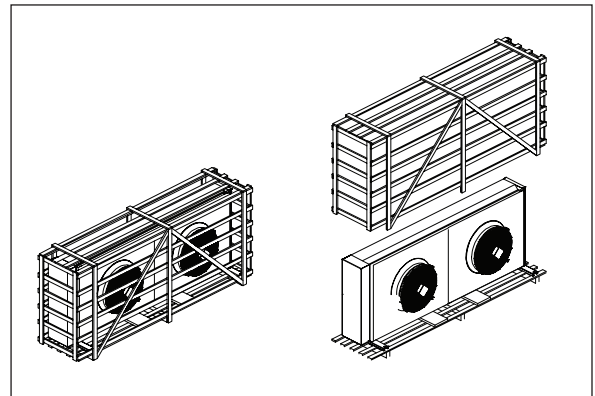
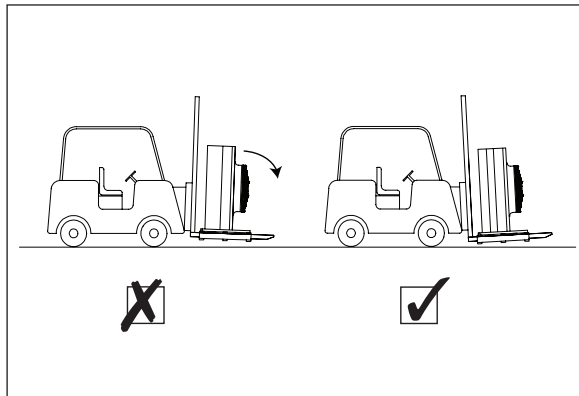
Dimensions in the table refer to basic units without any option, shipped in horizontal airflow position with the different packing options available.

Model	Pallet packing (with and without protections)			Model	Crate packing (only for single fan row models)		
	Width (m)	Height (m)	Length (m)		Width (m)	Height (m)	Length (m)
B*M 801s	0.97	1.69	2.25	B*M 801s	1.09	1.75	2.29
B*M 802s	0.97	1.69	3.65	B*M 802s	1.09	1.75	3.69
B*M 803s	0.97	1.69	5.05	B*M 803s	1.09	1.75	5.09
B*M 804s	0.97	1.69	6.45	B*M 804s	1.09	1.75	6.49
B*M 805s	0.97	1.69	7.85	B*M 805s	1.09	1.75	7.89
B*M 801	1.10	1.71	2.55	B*M 801	1.09	1.75	2.64
B*M 802	1.10	1.71	4.30	B*M 802	1.09	1.75	4.39
B*M 803	1.10	1.71	6.05	B*M 803	1.09	1.75	6.14
B*M 804	1.10	1.71	7.78	B*M 804	1.09	1.75	7.89
B*M 805	1.10	1.71	9.53	B*M 805	1.09	1.75	9.64
B*M 901-1001	1.10	1.71	2.90	B*M 901-1001	1.09	1.75	2.99
B*M 902-1002	1.10	1.71	5.00	B*M 902-1002	1.09	1.75	5.09
B*M 903-1003	1.10	1.71	7.10	B*M 903-1003	1.09	1.75	7.19
B*M 904-1004	1.10	1.71	9.18	B*M 904-1004	1.09	1.75	9.29
B*D 802	1.10	2.52	4.3				
B*D 803	1.10	2.52	6.05				
B*D 804	1.10	2.52	7.78				
B*D 805	1.10	2.52	9.53				
B*D 806	1.10	2.52	11.28				
B*D 902-1002	1.10	2.52	5				
B*D 903-1003	1.10	2.52	7.1				
B*D 904-1004	1.10	2.52	9.18				
B*D 905-1005	1.10	2.52	11.28				

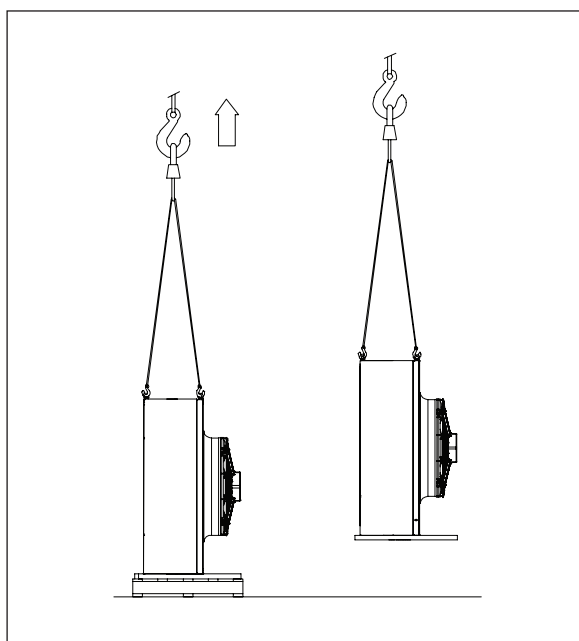
4.3 Checks at delivery

Schrader valve is not present in AlfaBlue BCP models. Prior to installation, carefully check the coil and in particular headers and curves for mechanical damages.

4.4 Unpacking



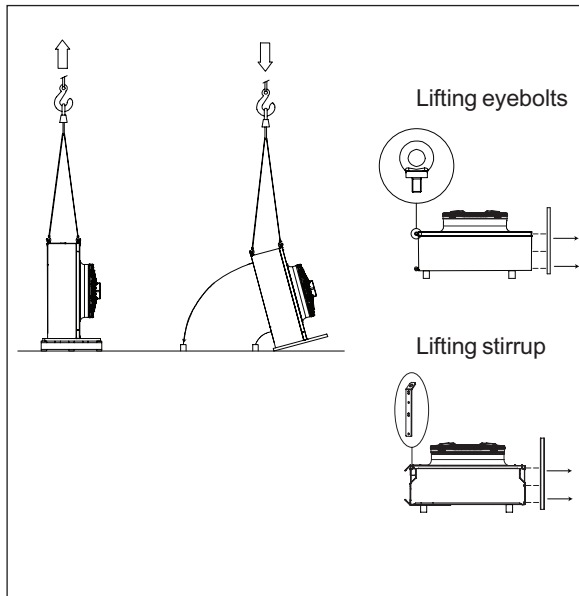
The unit is shipped on a pallet, handling can take place with use of a forklift. Remove cover crate or wooden protections on headers and coil (if present).



Unscrew from pallet.

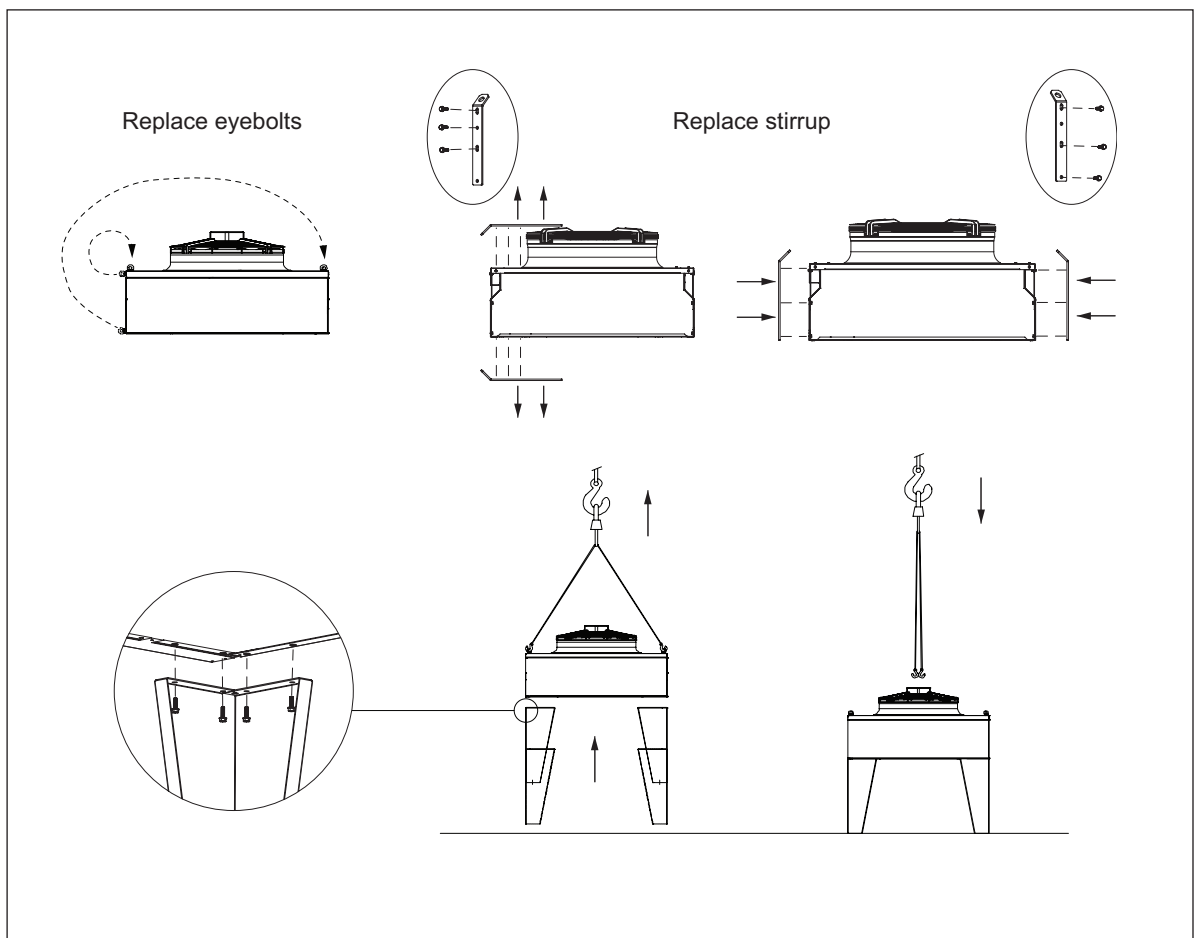
The unit is now ready to be lifted into mounting position. During this procedure the operator must never stand nor walk below the suspended load.

4.5 Feet mounting for vertical airflow



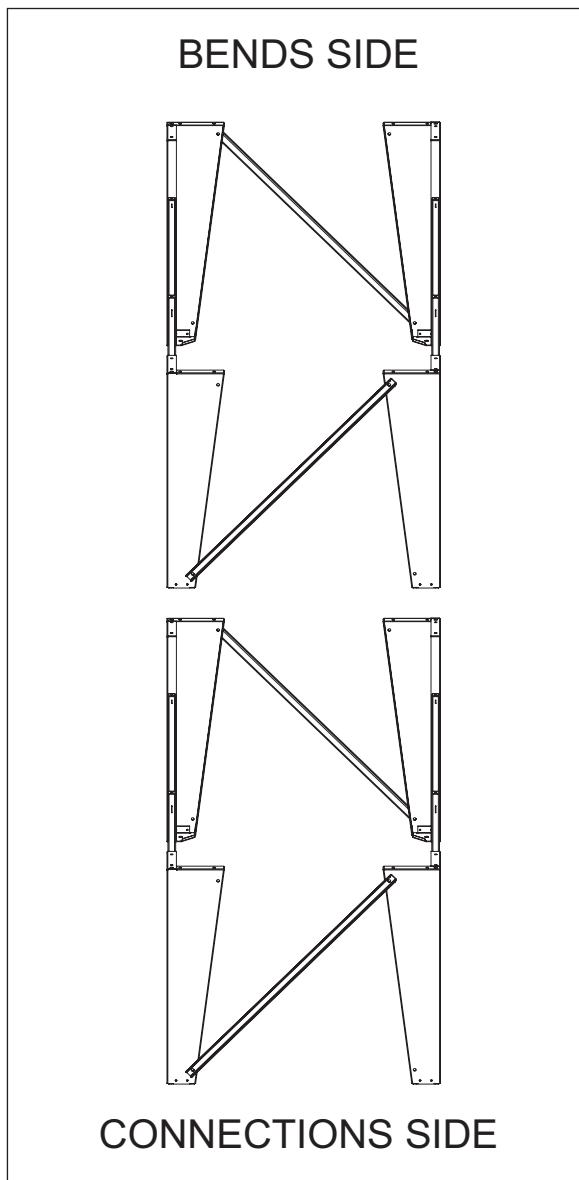
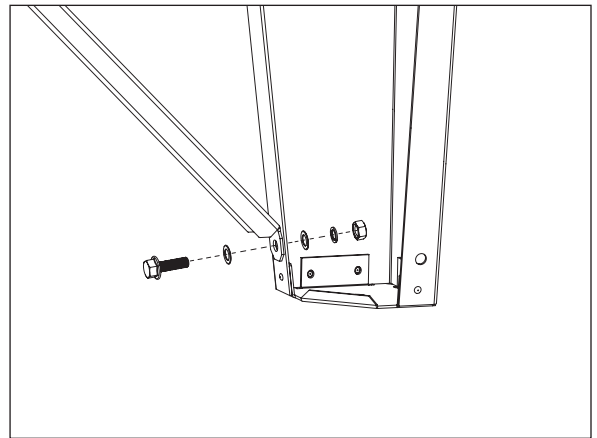
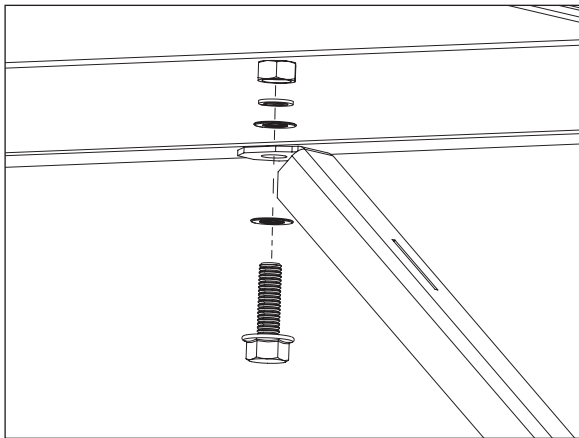
If units designated for vertical airflow have been ordered with loose feet, the heat exchangers are packed and shipped in horizontal airflow position. Mounting feet must be mounted prior to installation according to the following procedure. During this procedure the operator must never stand nor walk below the suspended load.

- 1) Lift unit from pallet and tilt 90° onto supports. Use supports for each mounting foot position. Supports must span the full casing width to avoid damages. Supports must be placed under the load-bearing frame and not under the coil.
- 2) Remove and reposition lifting eyebolts or lifting stirrups as shown in the illustrations.
- 3) Remove all mounting profiles.
- 4) Fit mounting feet on both sides of the casing at all vacant mounting profile positions.
- 5) With all mounting feet in place, the unit is ready for further positioning and installation.



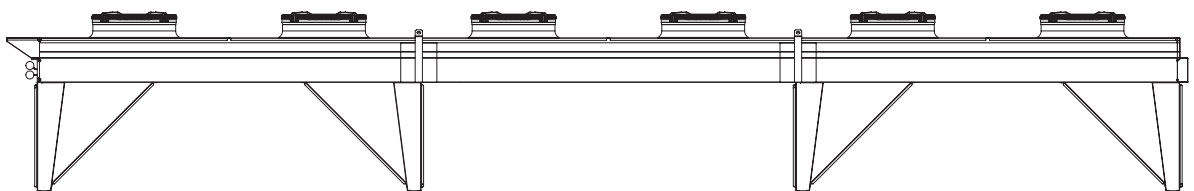
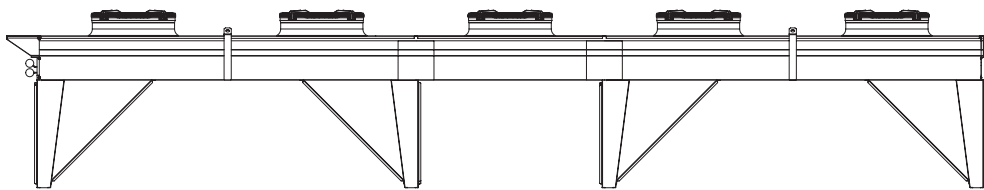
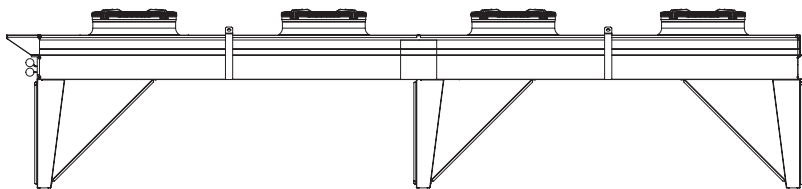
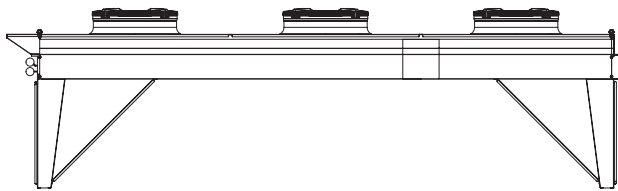
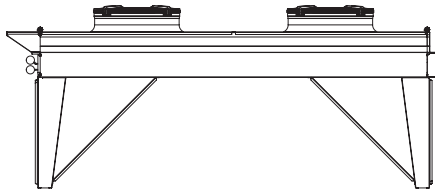
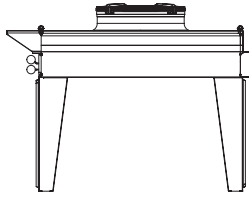
4.6 Wind braces for 1200 mm feet

Place and fix the wind braces as shown: each beam has a hole which shall be facing upwards.



The illustration shows how to mount the wind braces on the width side of the heat exchanger: beams shall be mounted alternated in order to reinforce the structure properly.

The illustration below shows the wind braces positioning on the length side of the heat exchanger.



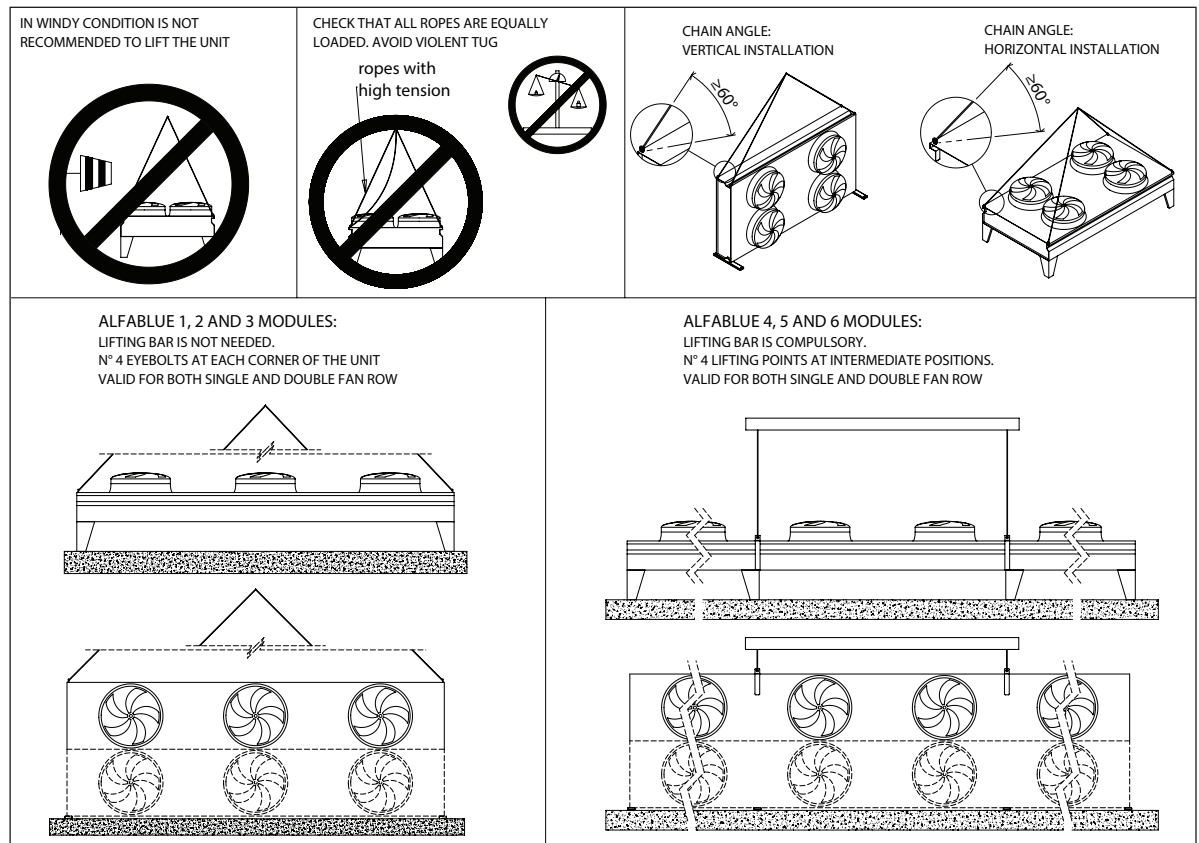


4.7 Lifting from above

All AlfaBlue models for both horizontal and vertical airflow are fitted with 4 lifting points. Hence the illustrations apply to all AlfaBlue models for both horizontal and vertical airflow. AlfaBlue heat exchangers can be lifted from above. Use a hoisting beam when necessary, as indicated.



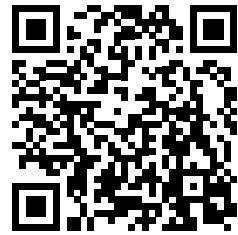
- Attach belts or hooks to all lifting points.
- Respect the allowable chain angles. The load on the lifting chains shall be equally distributed on all the lifting points.
- **For all models it is mandatory to use all indicated lifting positions during any lifting operation.**



5 Installation

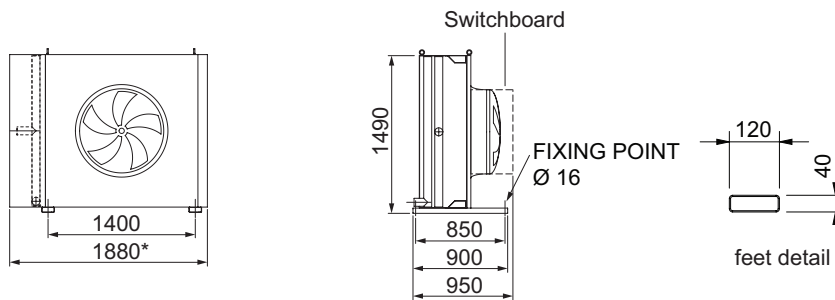


Always follow guidelines and instructions as given in product manual AHE00049. Detailed drawings showing all required mounting and refrigerant connection dimensions are available for download on alfa.luvegroup.com.

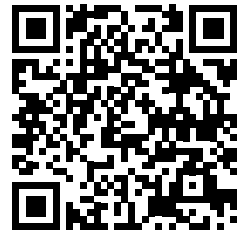
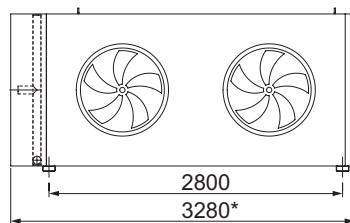


Dimensional drawings
AlfaBlue BC

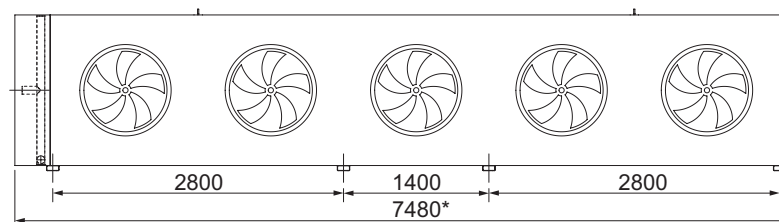
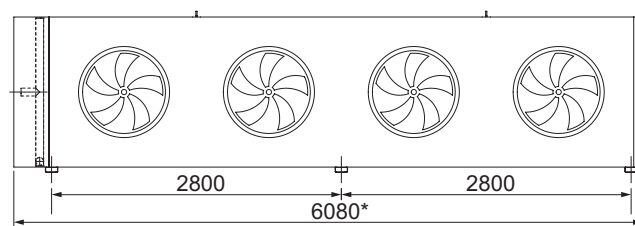
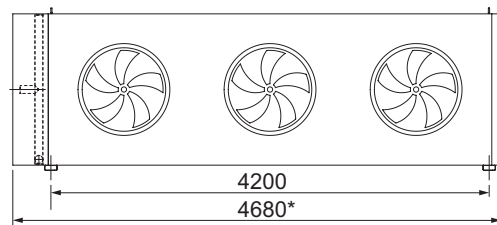
5.1 Mounting dimensions B*M 800s horizontal airflow



Dimensional drawings
AlfaBlue BN

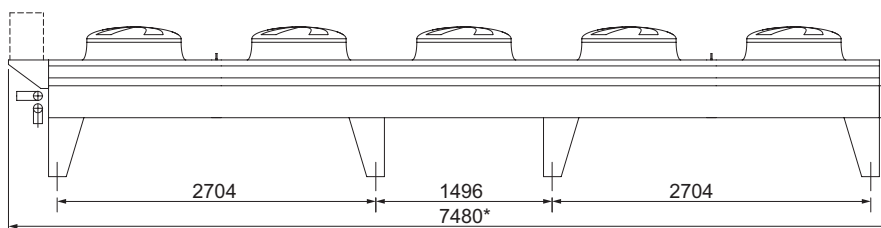
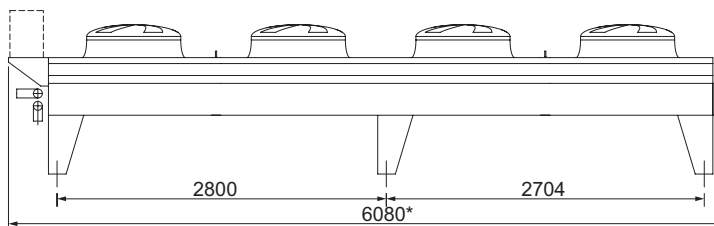
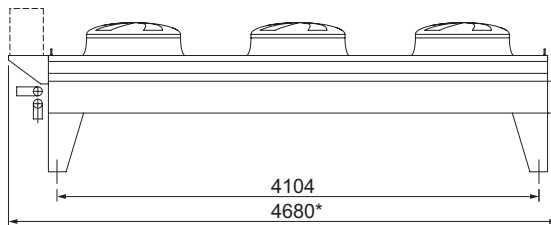
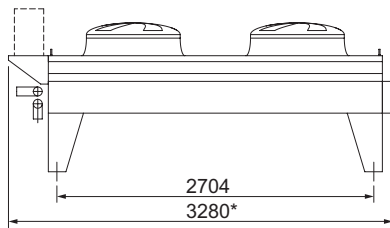
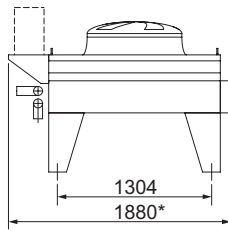
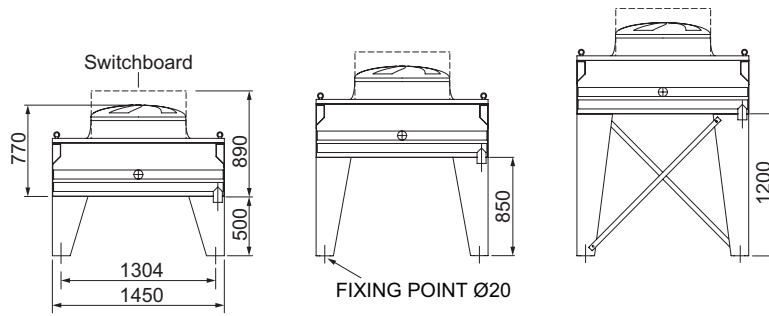


Dimensional drawings
AlfaBlue BX



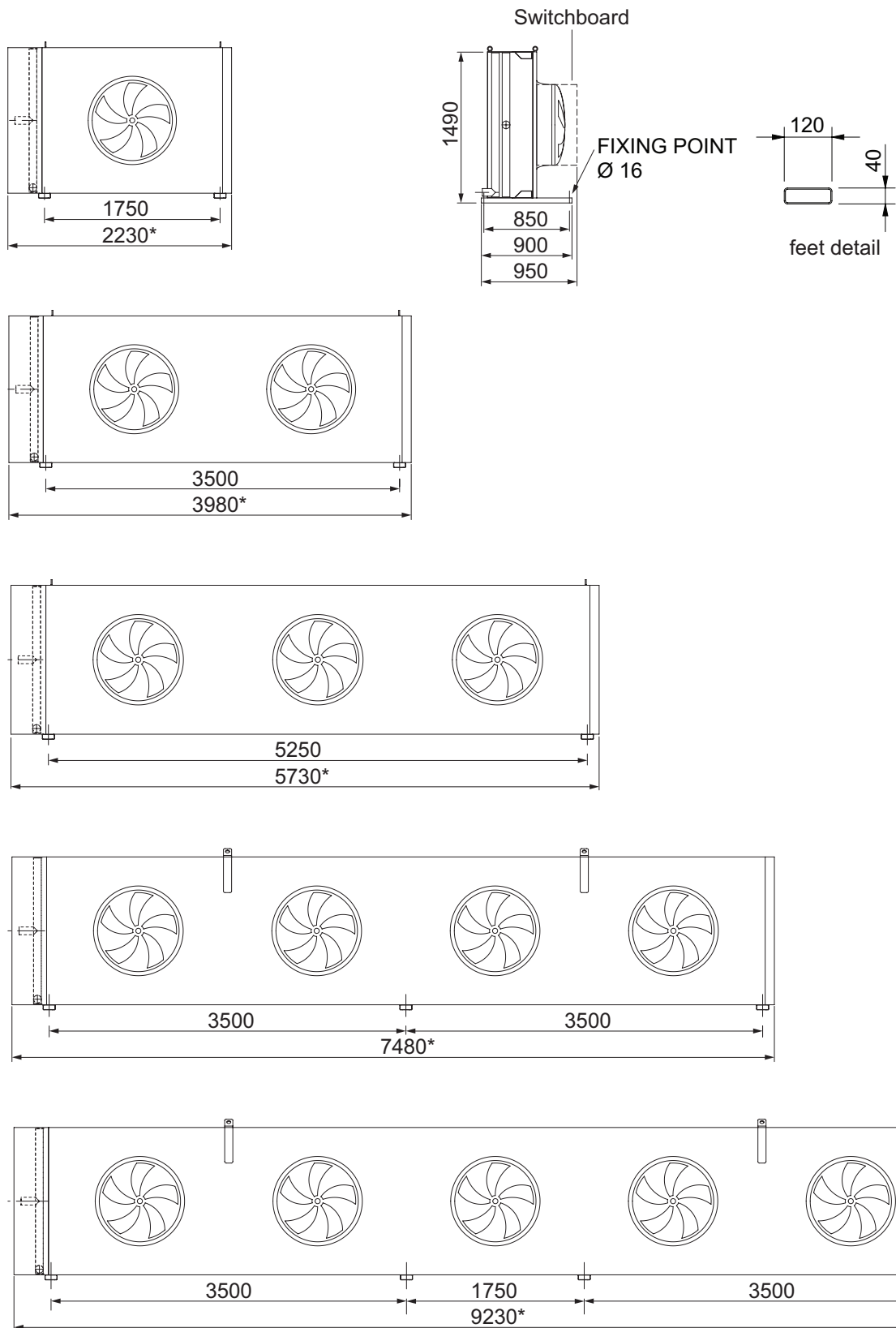
* +60 mm for SS tubes (BN as standard)

5.2 Mounting dimensions B*M 800s vertical airflow



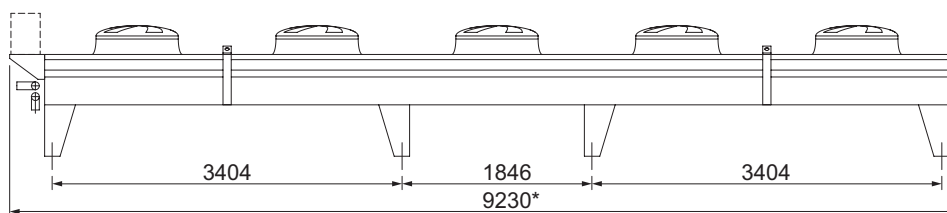
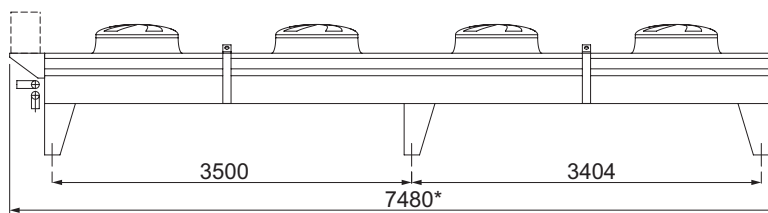
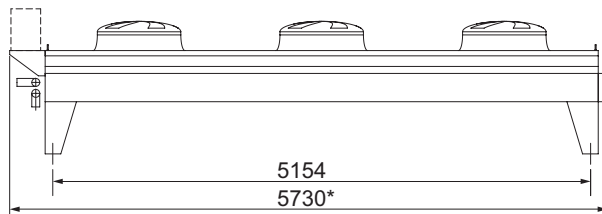
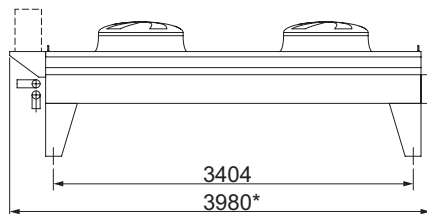
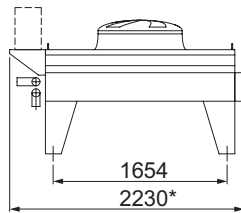
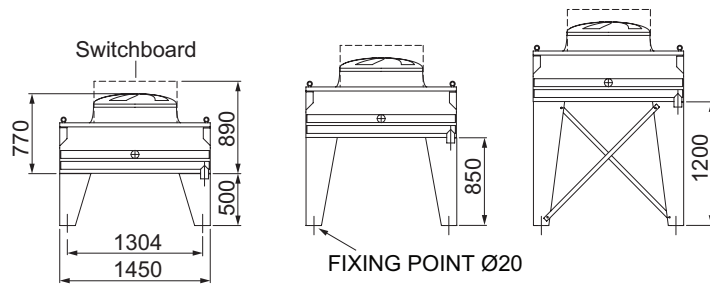
* +60 mm for SS tubes (BN as standard)

5.3 Mounting dimensions B*M 800 horizontal airflow



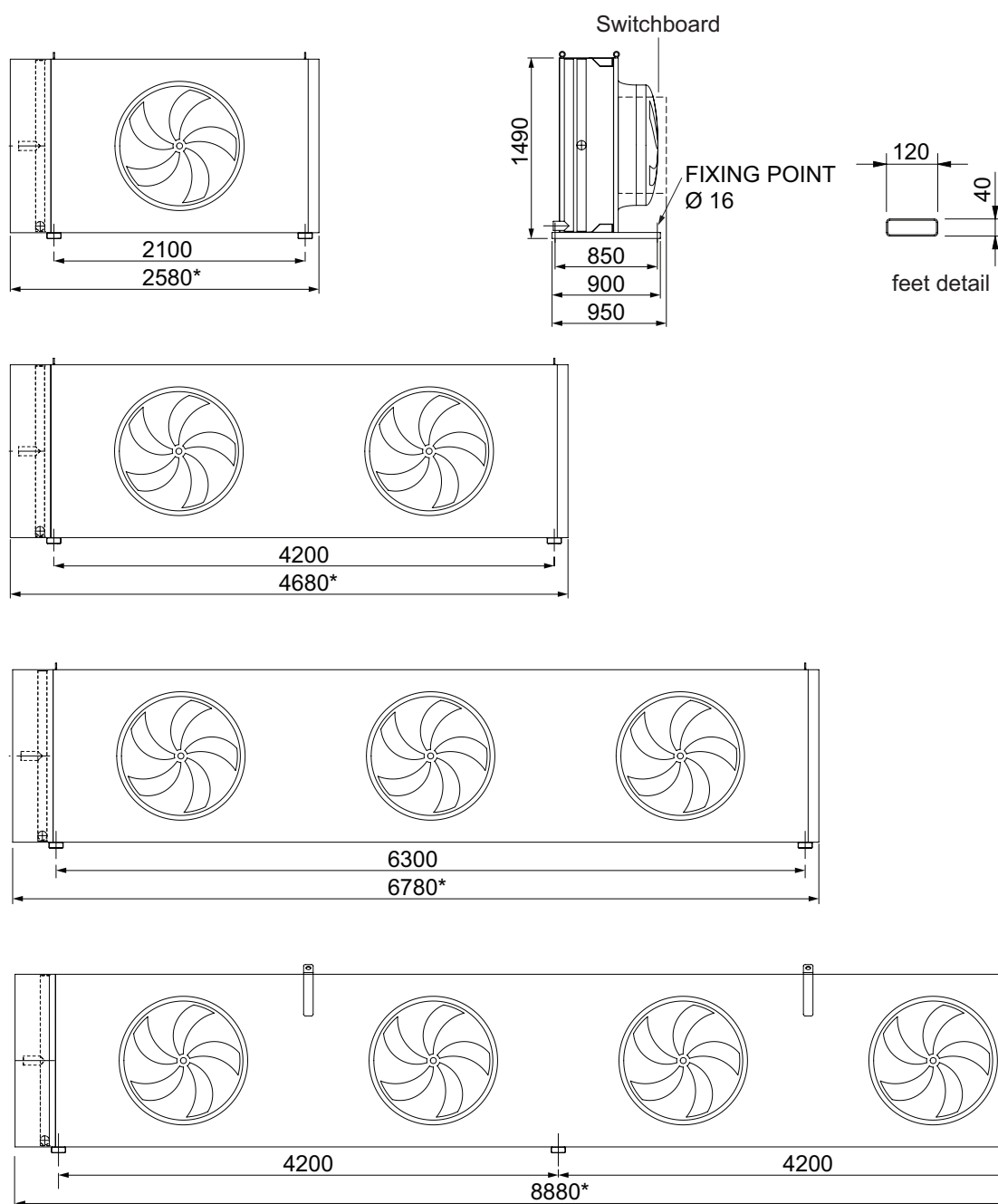
* +60 mm for SS tubes (BN as standard)

5.4 Mounting dimensions B*M 800 vertical airflow



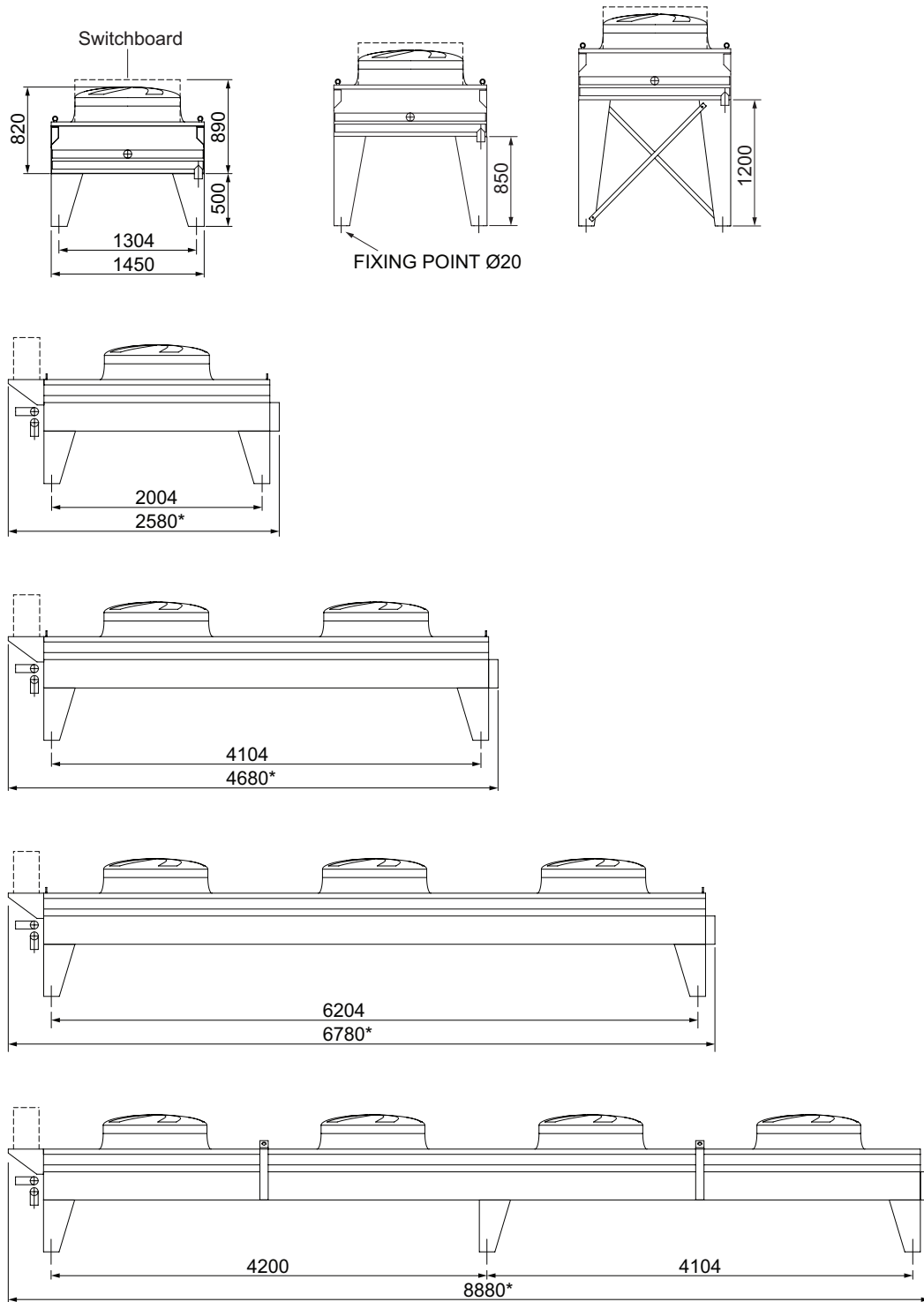
* +60 mm for SS tubes (BN as standard)

5.5 Mounting dimensions B*M 900-1000 horizontal airflow



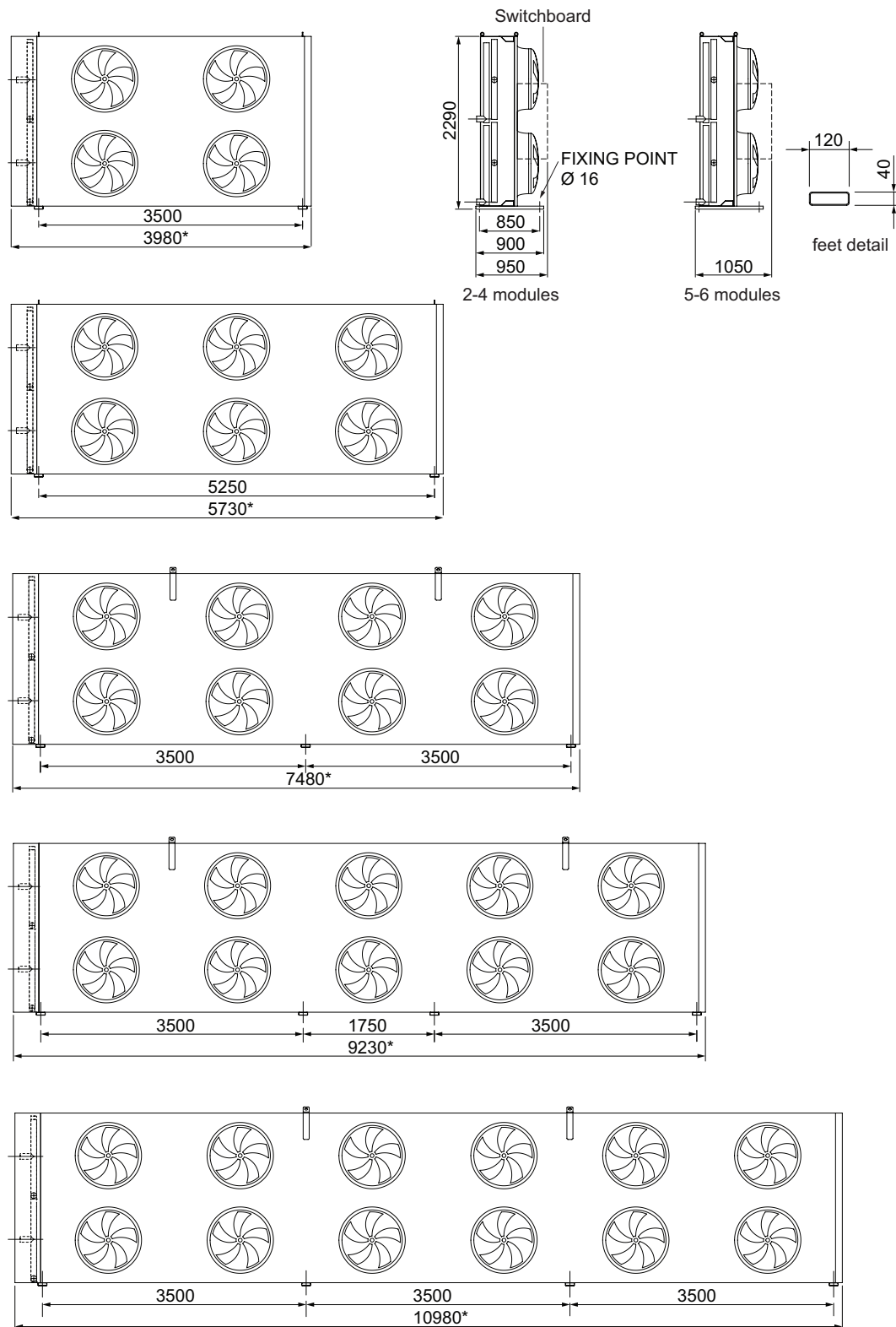
* +60 mm for SS tubes (BN as standard)

5.6 Mounting dimensions B*M 900-1000 vertical airflow



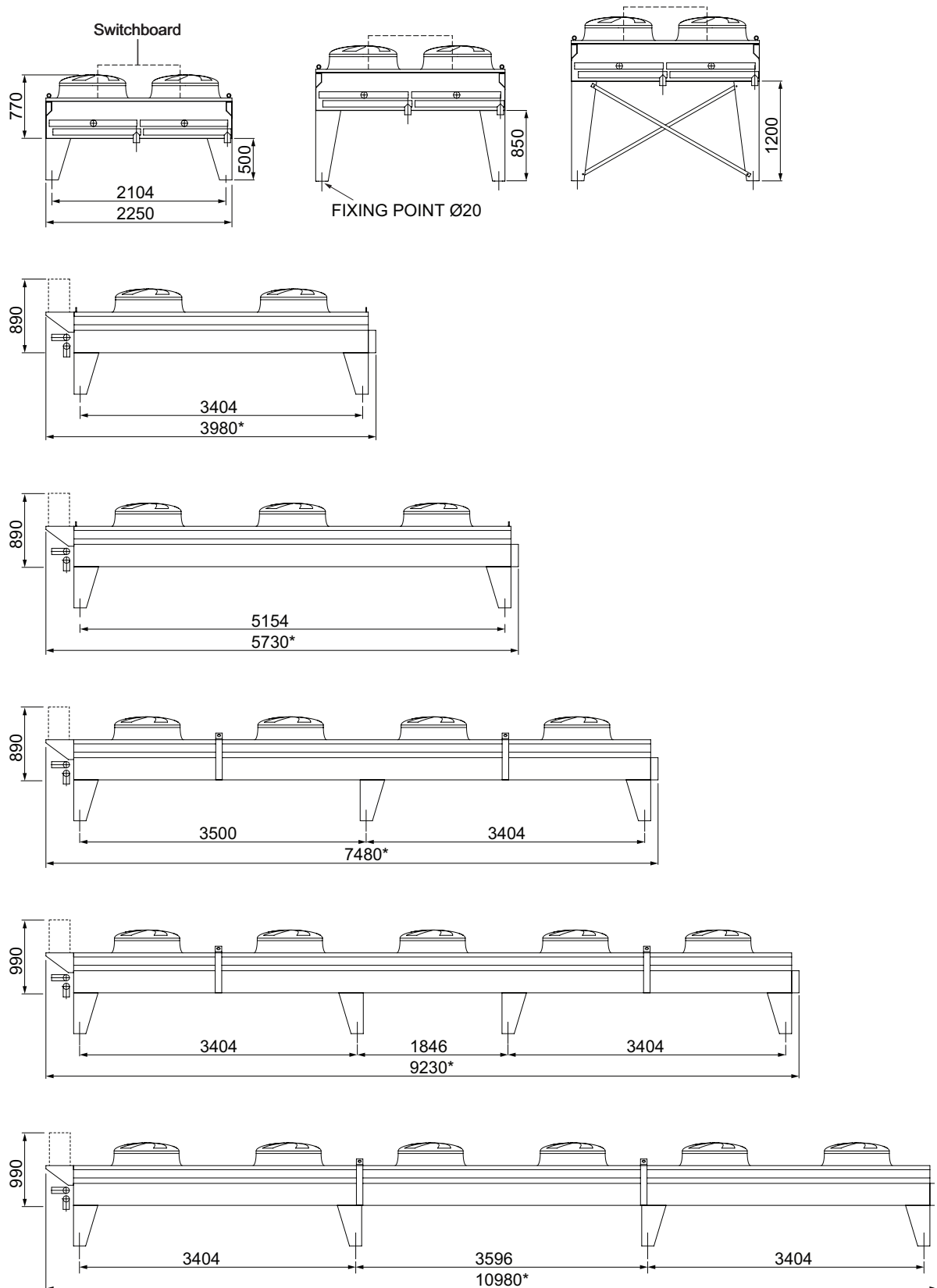
* +60 mm for SS tubes (BN as standard)

5.7 Mounting dimensions B*D 800 horizontal airflow



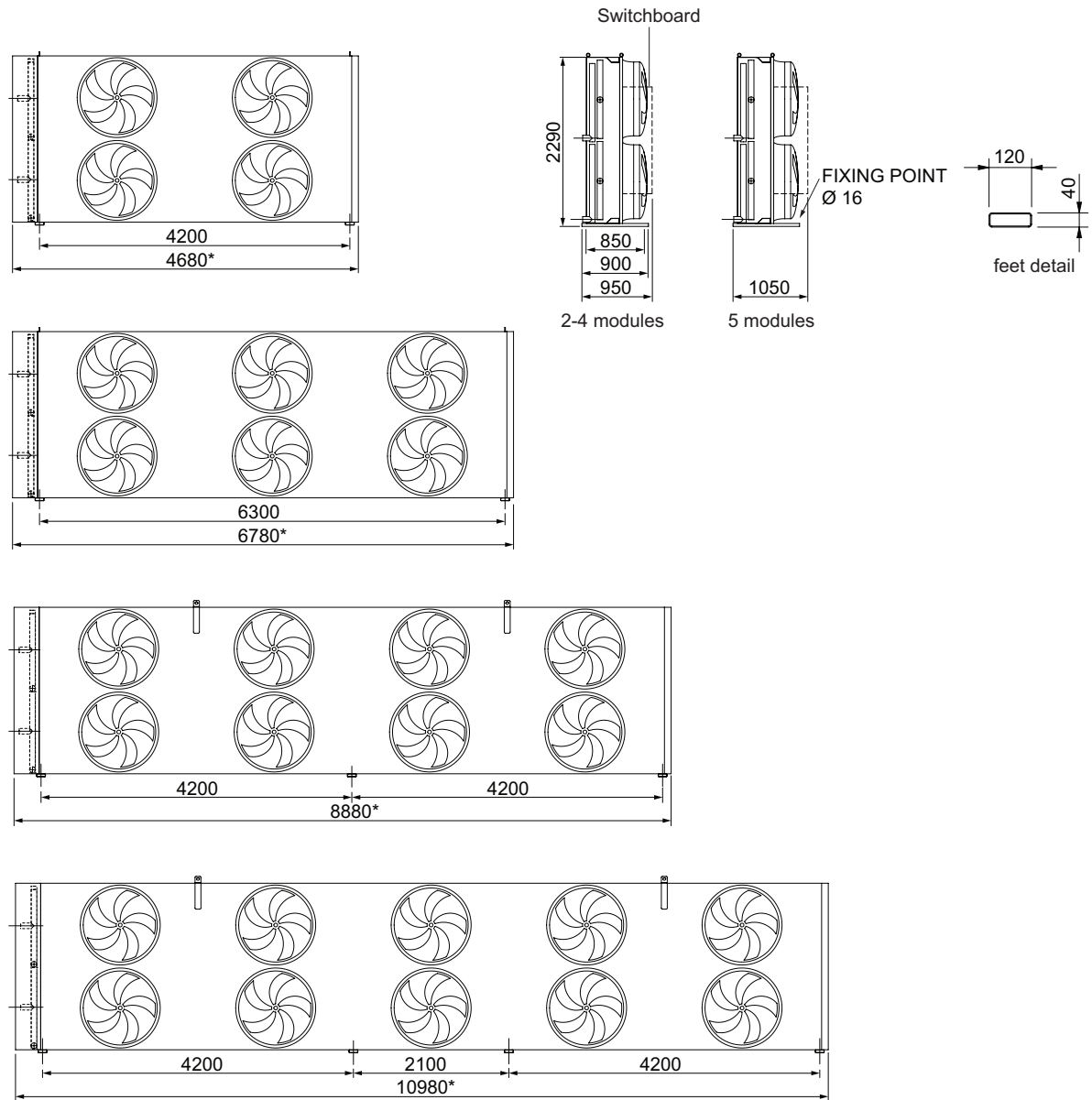
* +60 mm for SS tubes (BN as standard)

5.8 Mounting dimensions B*D 800 vertical airflow



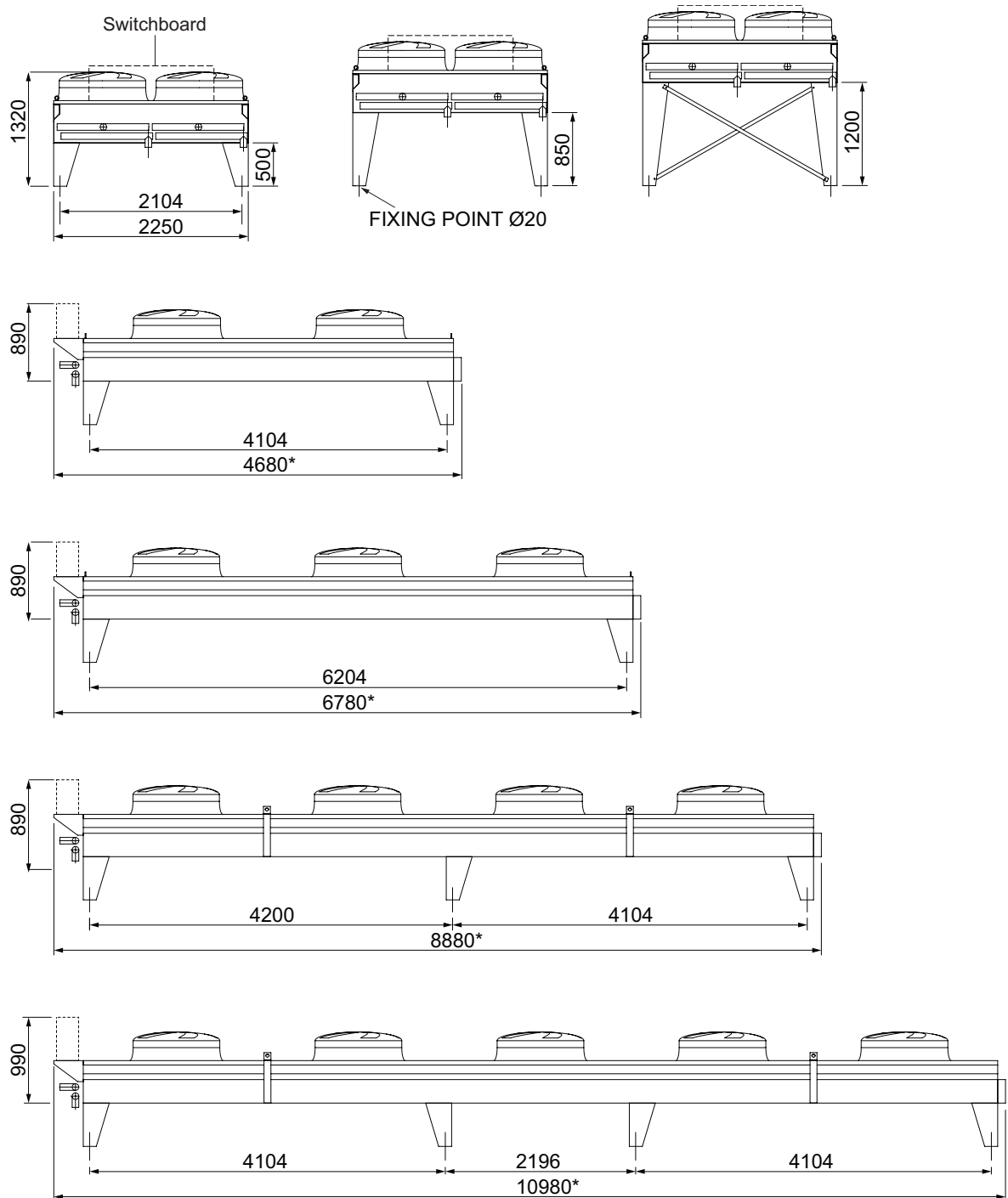
* +60 mm for SS tubes (BN as standard)

5.9 Mounting dimensions B*D 900-1000 horizontal airflow



* +60 mm for SS tubes (BN as standard)

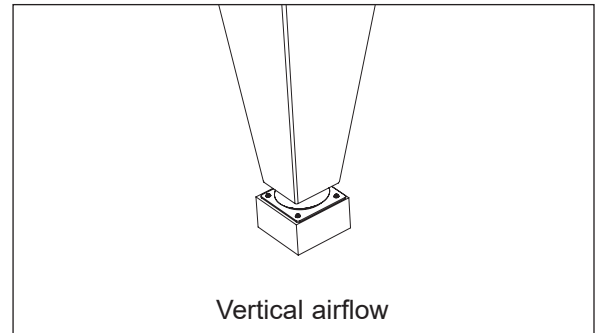
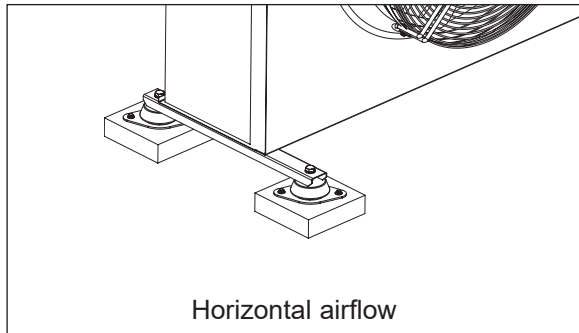
5.10 Mounting dimensions B*D 900-1000 vertical airflow



* +60 mm for SS tubes (BN as standard)

5.11 Concrete mounting base

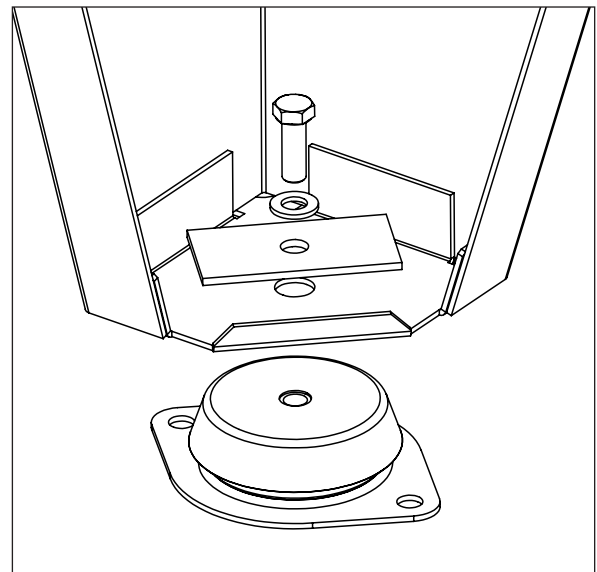
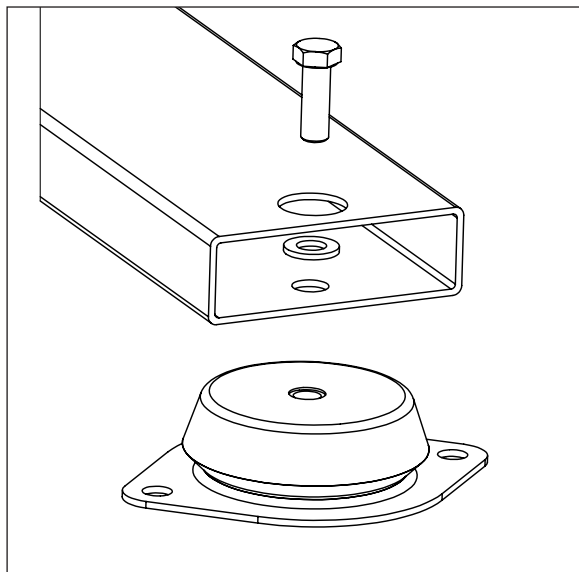
To avoid oxidation of the equipment feet, it is recommended to mount the heat exchanger on concrete mounting bases.



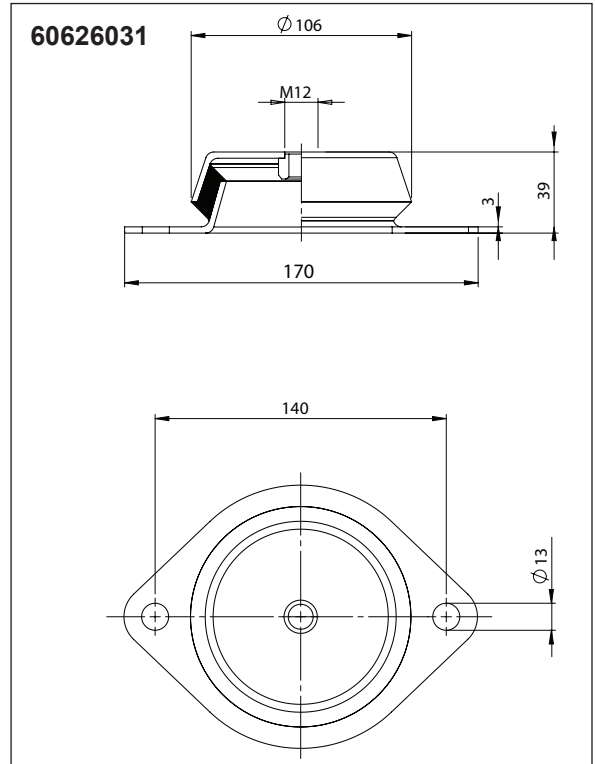
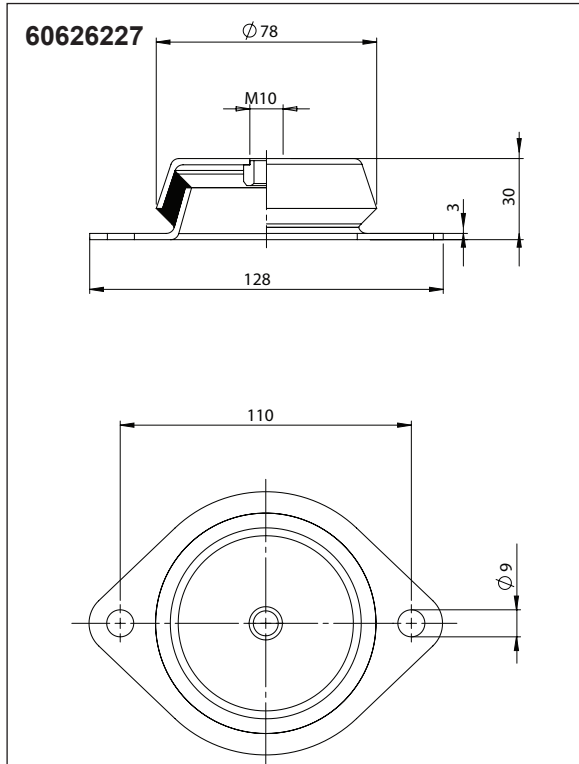
5.12 Vibration dampers

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 bolts.

Isolating material: natural rubber, hardness 60° Sha



AlfaBlue model		nr. of vibration dampes	Kit code	Item code
Single row	801s, 802s, 803s 801, 802, 803 901, 902, 1001, 1002	4	10999345SP	60626227
	804s, 804, 904, 1004	6	10999346SP	
	805s, 805	8	10999347SP	
	903, 1003	6	10999079SP	60626031
Dual row	802s, 803s, 802, 803, 902, 903, 1002,1003	4	11360111SP	60626031
	804s, 804, 904, 1004	6	10999079SP	
	805s, 805, 905, 1005, 806	8	10999080SP	



For up to date item codes and spare parts kits contact your local Alfa LU-VE representative.

5.13 Expansion joints



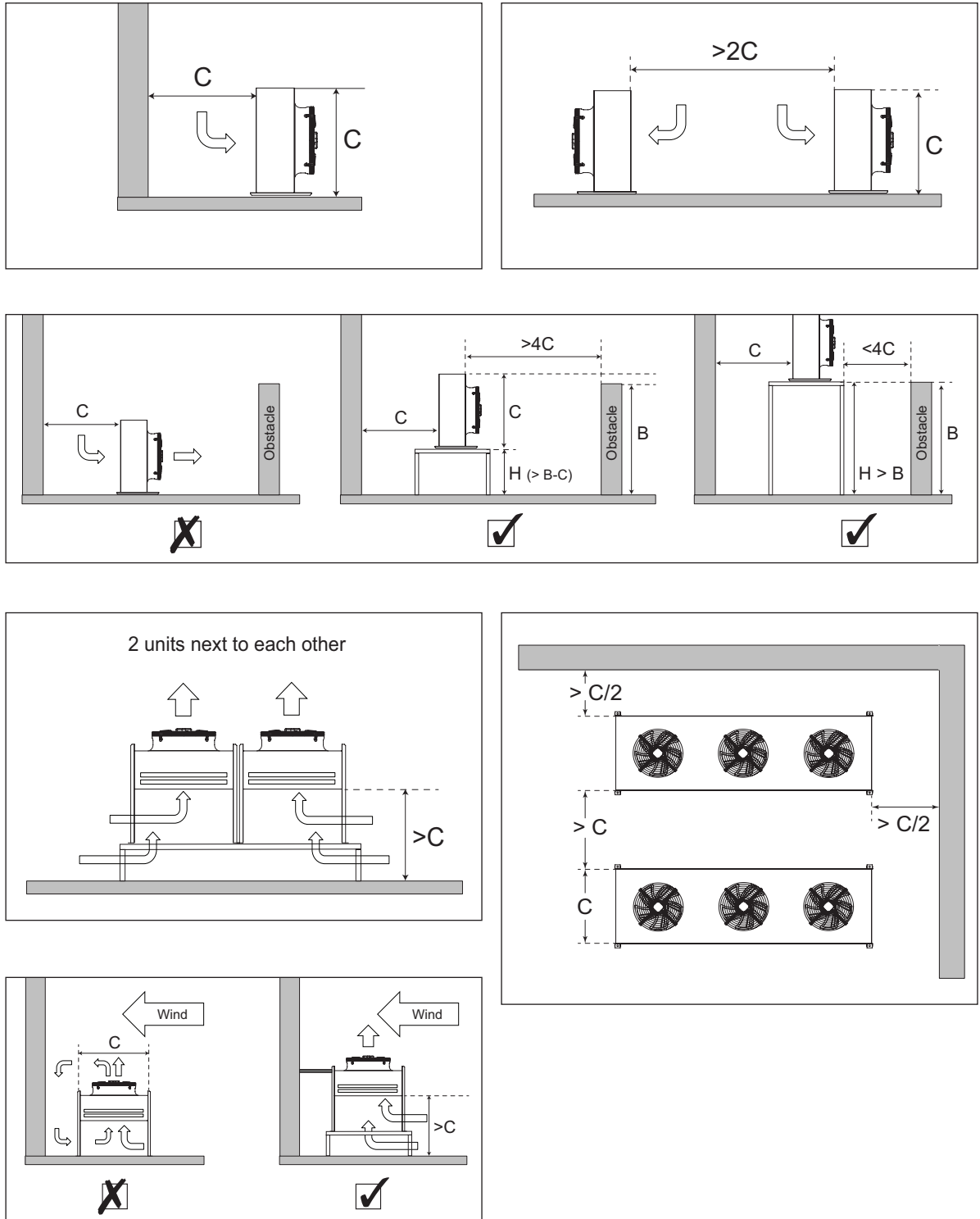
Alfa LU-VE recommends the installation of expansion joints on both inlet and outlet connections. Expansion joints are elastic elements which, if properly installed, absorb the thermal expansions of the tubing. Expansion joints are also helpful in order to reduce vibrations in the piping.



5.14 Positioning

The following conditions are to be met when positioning and installing the unit:

- Place the unit outdoor in such a way that it can be monitored and accessed for maintenance from all sides at all times.
- Verify the structures supporting capacity regarding the weight of the unit(s), including the liquid.
- As a rule of thumb the (unrestricted) air-inlet surface area should at least equal the coil surface of the unit(s).
- Recirculation of heated air is to be avoided at all times.



Contact Alfa LU-VE to determine optimal unit spacing for specific conditions on site. Special care should be taken in particular circumstances such as:

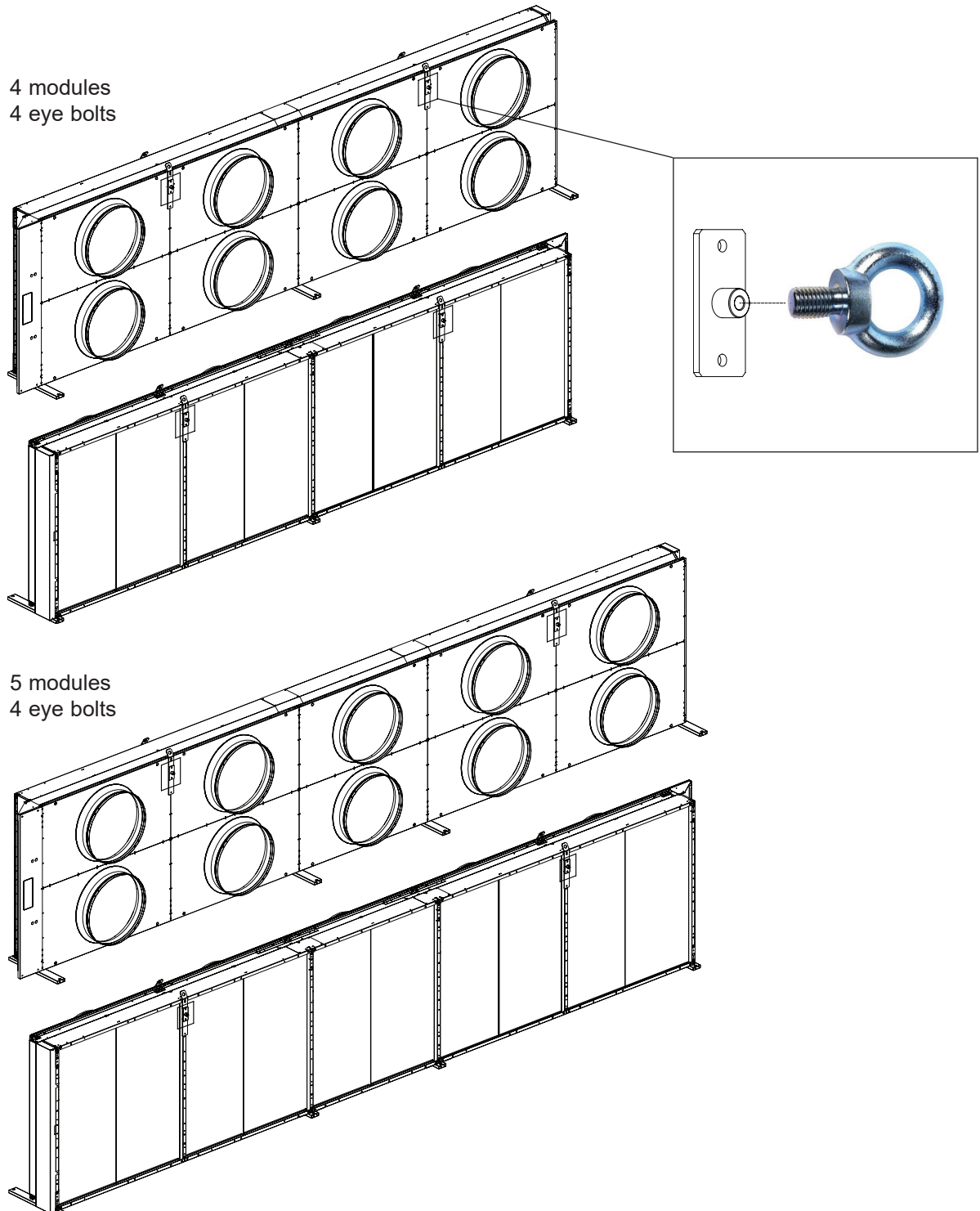
- When the installation site is exposed to strong winds.
- When walls or other obstructions with different configuration than the ones shown in the examples are present on site.
- When severe environmental influences are likely to affect to the unit.

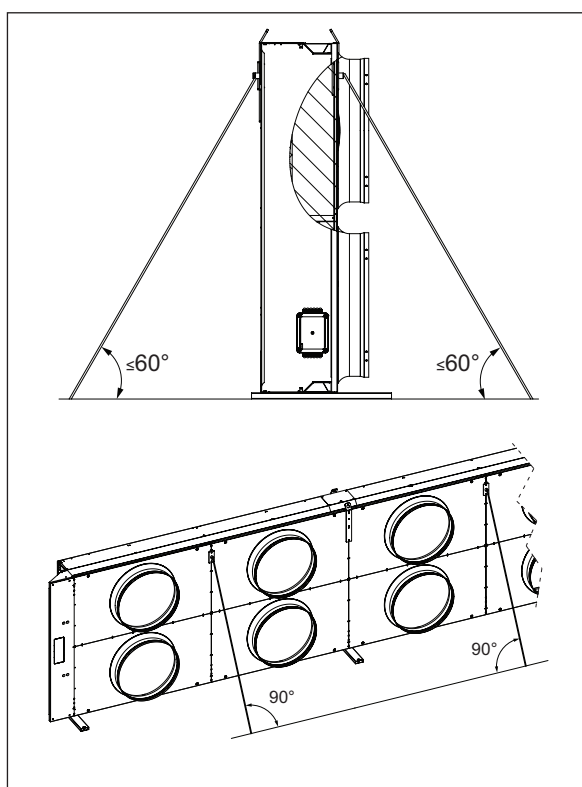
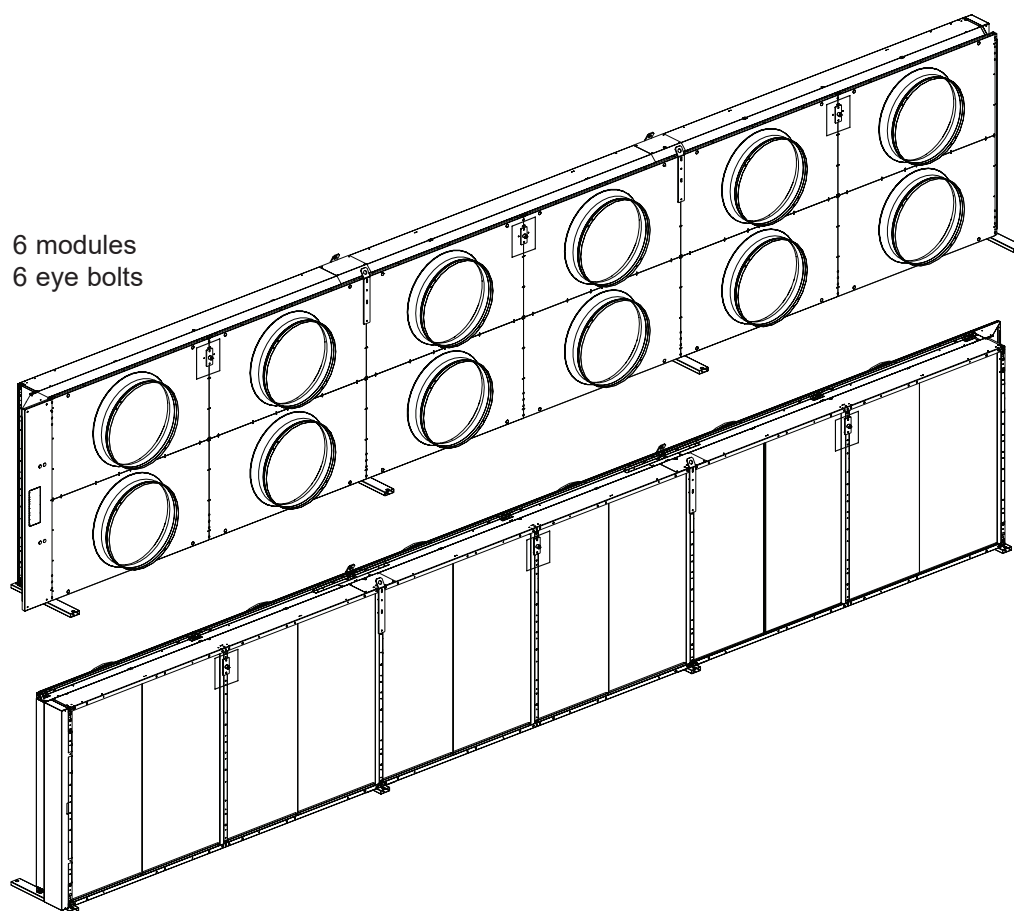
5.15 Wind braces for 4-5-6 modules B*D horizontal airflow models

When dual fan row units with 4, 5 or 6 modules are installed with horizontal airflow it is mandatory to anchor the unit to the ground with wind braces.

Horizontal airflow installation for dual fan row models with 4, 5 or 6 modules is allowed with wind braces only for sites with winds < 25 m/s. When the installation site is exposed to winds > 25 m/s contact your local Alfa LU-VE representative for advise.

Fix M16 eyebolts (not included in the scope of supply) to the pre-installed plates both on the coil side and on the fan side of the unit as shown.





Attach a steel rope to each eye bolt. Steel ropes are not included in the scope of supply.
Min Ø 11 mm or breaking load > 78,5 kN.

Anchor the steel ropes to the ground or to the installation structure with M16 anchor bolts.
Angle of rope as shown.

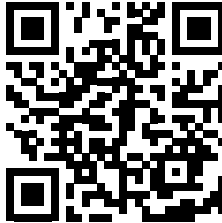


5.16 Electrical connections

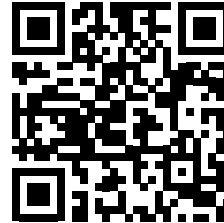
The following data determine which connection diagram is to be selected and respected for electrical installation:

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

Detailed 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
AlfaBlue BC



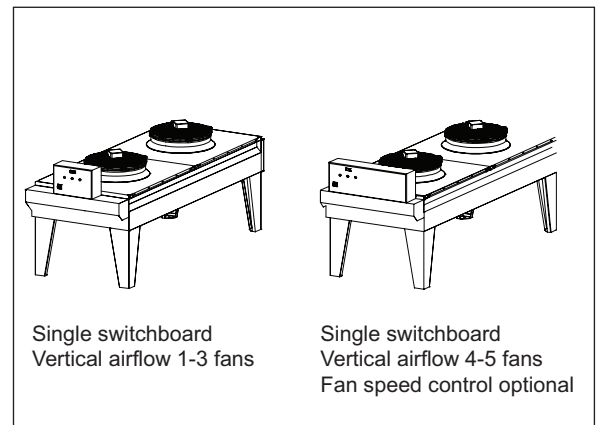
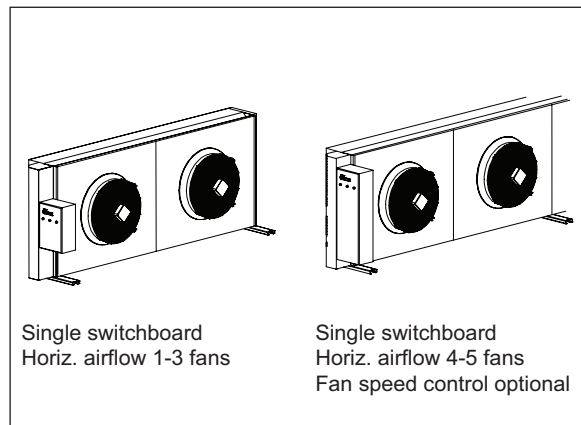
Electrical connections
AlfaBlue BN



Electrical connections
AlfaBlue BX

5.17 Switchboard

If a switchboard option is selected, it is delivered by the factory in the final installation layout. For AC fans different airflow installation corresponds to a different electrical board and manifold cover plate.

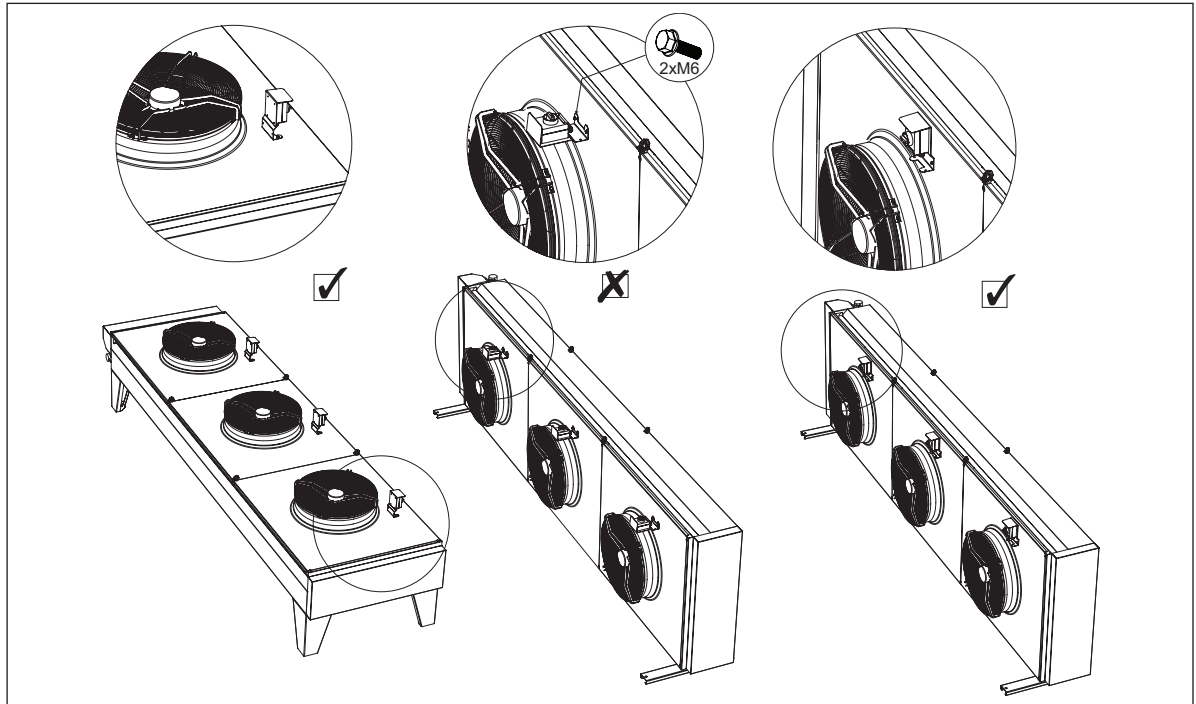


5.18 Switch on/off (option SW)

If switch on/off (SW) is selected, the default positioning is for vertical airflow installation.

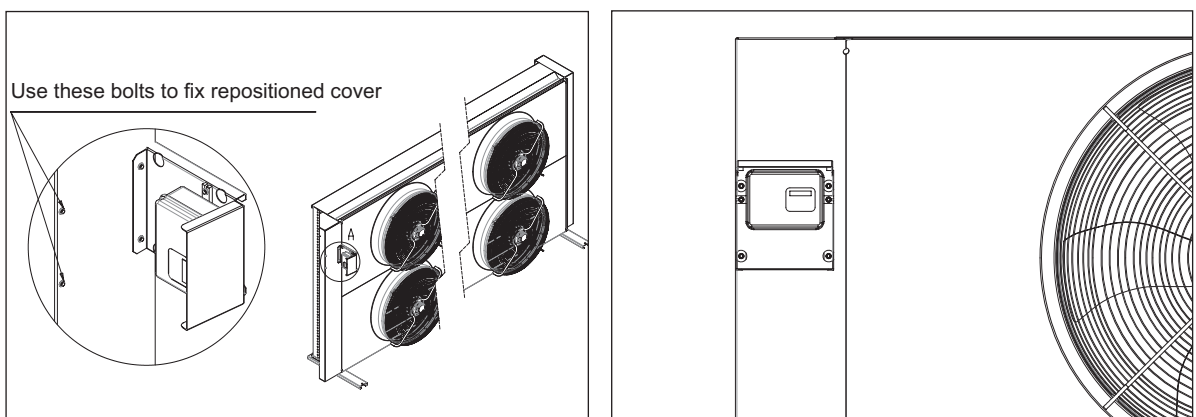
The cover design is such that it can be used both for horizontal and vertical airflow installation.

To adjust the switch positioning to the actual positioning on site: unscrew the cover fixing screws, turn it as shown and replace fixing screws.



5.19 Master controller (options CBMx and ECCBMx)

If master controller is included in the scope of supply (when CBMx or ECCBMx options are selected), the default positioning is for vertical airflow installation. The cover design is such that it can be used both for horizontal and vertical airflow installation. If units are installed with horizontal airflow repositioning might be needed on site: unscrew the cover fixing screws, turn it as shown and replace fixing screws.



6 Operation



6.1 Start-up procedure

The following checks are to be performed at system start-up.

- Verify there are no leaks in the refrigerant circuit and connections.
- Switch on fan power supply.
- Start the fans and verify fan direction.
- After some operating time, 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 refrigerant supply and switch off electrical power supply.
- Make sure neither refrigerant nor power supply can be resumed accidentally or unexpectedly.
- Drain all liquid refrigerant into a suitable vessel.
- Evacuate the coil to remove any remaining refrigerant gas.

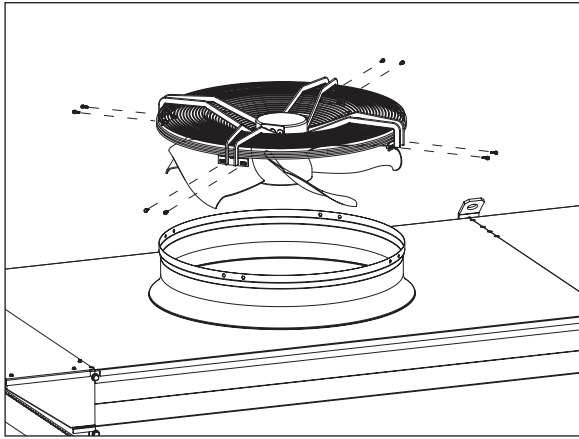


7 Maintenance

Always follow guidelines and instructions as given in product manual AHE00049.



7.1 Fan replacement

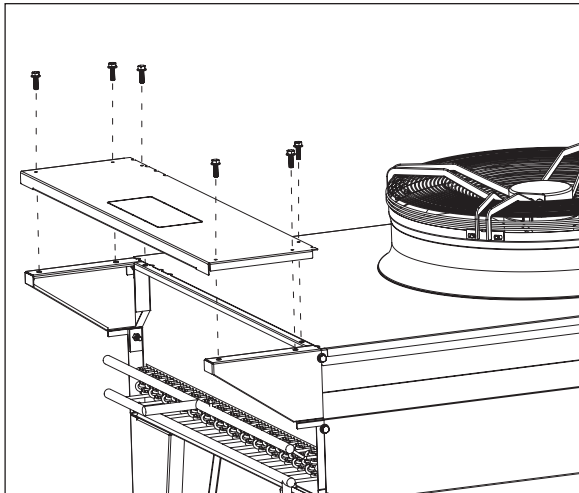


Always disconnect power supply before performing any maintenance activities on fans and fan motors. Disconnect fan cabling.

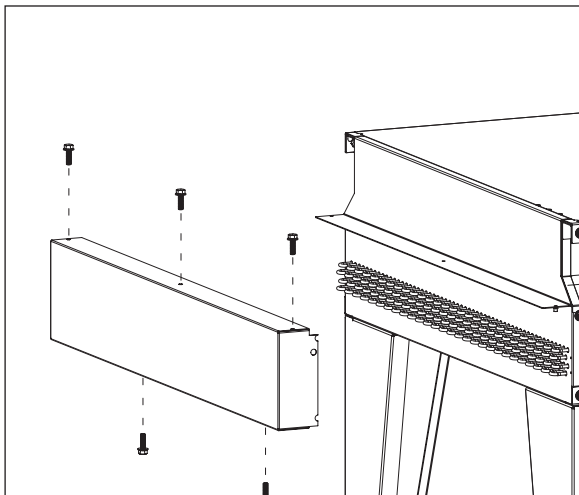
Unscrew fixing bolts and remove old fan. Mount new fan in identical position. Use an anti-corrosion compound when remounting the fixing bolts.

Restore electric connection when the new fan has been mounted.

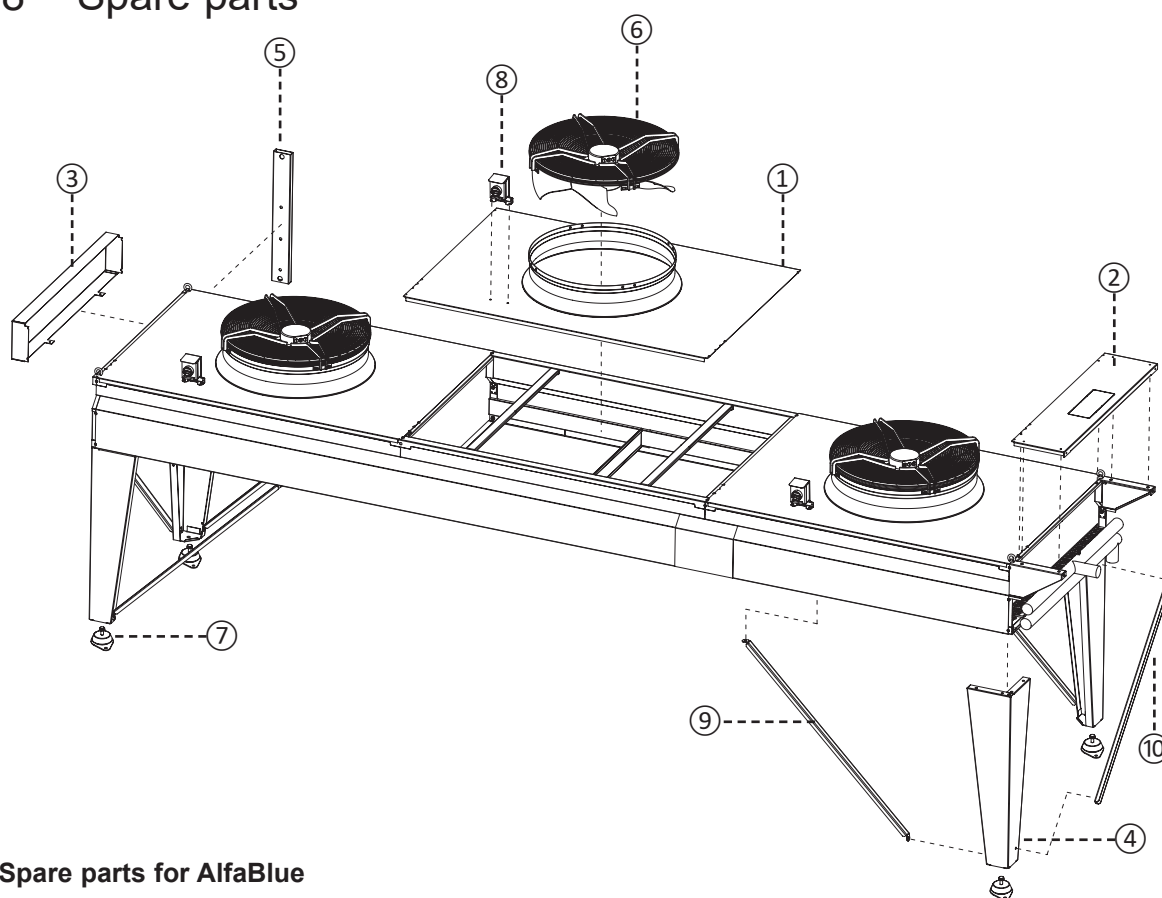
7.2 End covers



End covers can be removed for inspection, cleaning and maintenance purposes. To remove end covers, loosen fixing bolts.



8 Spare parts



Spare parts for AlfaBlue

Component	Partfinder	On request
① Fan plate		✓
② Connection cover		✓
③ Bend cover		✓
④ Mounting feet for vertical airflow		✓
⑤ Mounting feet for horizontal airflow		✓
⑥ Fan	✓	
⑦ Vibration damper	✓	
⑧ Switch ON/OFF	✓	
⑨ Wind braces for 1200 mm feet (length side)		✓
⑩ Wind braces for 1200 mm feet (width side)		✓

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



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