



Air handling unit

X-CUBE compact



Read the instructions prior to performing any task!

TROX® TECHNIK
The art of handling air

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About this manual

This operating manual enables operating or service personnel to use the X-CUBE compact air handling unit (AHU) safely and efficiently.

The operating manual must be kept near the air handling unit to be available for use at all times.

The operating manual is intended for use by the facility manager.

It is essential that the facility manager (↪ *Chapter 2.9.1 'Qualified staff' on page 14*) reads and fully understands this manual before starting any work. The basic prerequisite for safe working is to comply with the safety notes and all instructions in this manual.

The local regulations for health and safety at work and the general safety regulations for the area of application of the air handling unit also apply.

Illustrations in this manual are mainly for information and may differ from the actual design of the air handling unit.

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To ensure that your request is processed as quickly as possible, please keep the following information ready:

- Product name
- TROX order number
- Delivery date
- Brief description of the fault

Online	www.troxtechnik.com
Phone	+49 2845 202-400

Limitation of liability

The information in this manual has been compiled with reference to the applicable standards and guidelines, the state of the art, and our expertise and experience of many years.

The manufacturer does not accept any liability for damages resulting from:

- Non-compliance with this manual
- Incorrect use
- Operation or handling by untrained individuals
- Unauthorised modifications
- Technical changes
- Use of non-approved replacement parts

The actual scope of delivery may differ from the information in this manual for bespoke constructions, additional order options or as a result of recent technical changes.

The obligations agreed in the order, the general terms and conditions, the manufacturer's terms of delivery, and the legal regulations in effect at the time the contract is signed shall apply.

We reserve the right to make technical changes.

Defects liability



For details regarding defects liability please refer to Section VI, Warranty Claims, of the Delivery and Payment Terms of TROX GmbH.

The Delivery and Payment Terms of TROX GmbH are available at www.troxtechnik.com.

Other applicable documentation

In addition to these instructions, the following documents apply:

- Order confirmation
- Air handling unit data sheet from TROX GmbH
- Product drawings
- Data sheets for components from other suppliers, if any
- Circuit diagram for the air handling unit
- Additional drawings, if any
- X-CUBE compact operating manual
- Installation and commissioning manual for X-CUBE compact accessories

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1 Overview

Unit with rotary heat exchanger

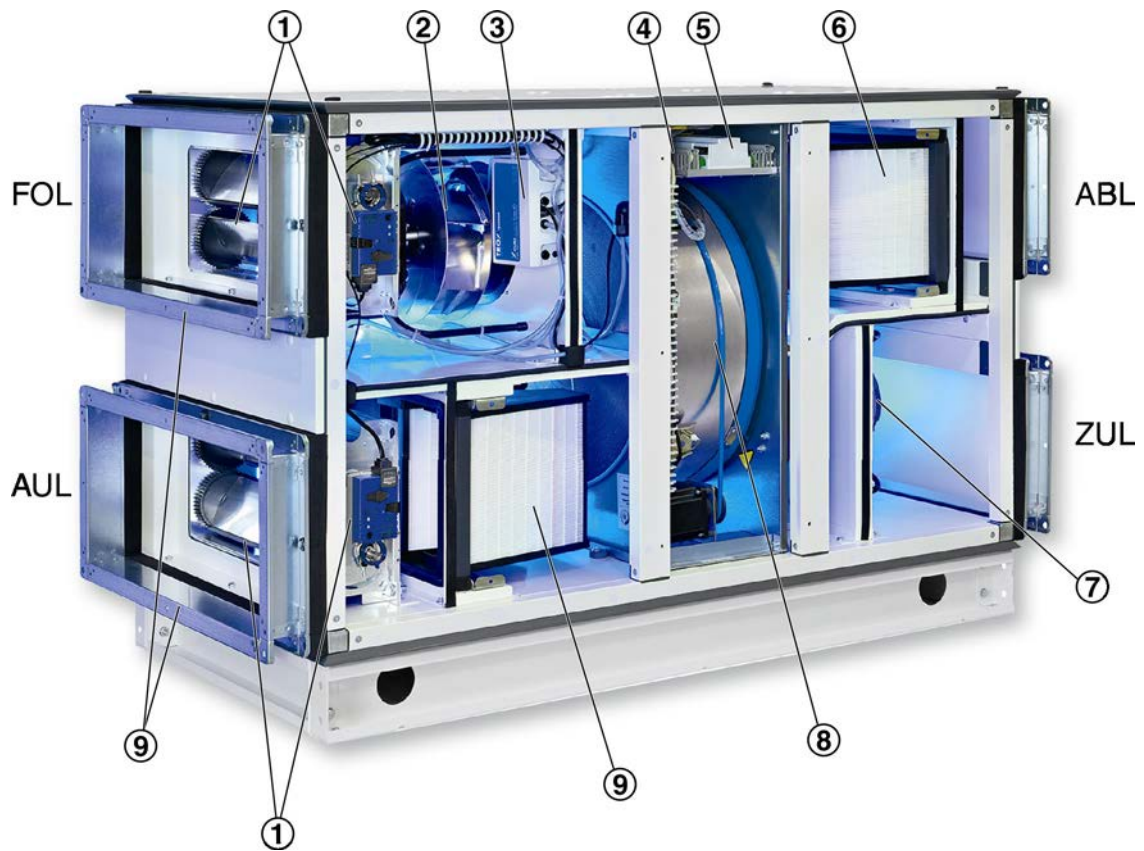


Fig. 1: Unit with rotary heat exchanger

- | | | | |
|---|------------------------------------|-----------|----------------------------|
| 1 | Multileaf damper | 8 | Rotary heat exchanger |
| 2 | Extract air fan | 9 | Outdoor air filter |
| 3 | Fan IO | 10 | Noise insulating connector |
| 4 | Controls for rotary heat exchanger | ABL (ETA) | Extract air |
| 5 | X-CUBE control | AUL (ODA) | Outdoor air |
| 6 | Extract air filter | FOL (EHA) | Exhaust air |
| 7 | Supply air fan | ZUL (SUP) | Supply air |

Unit with plate heat exchanger

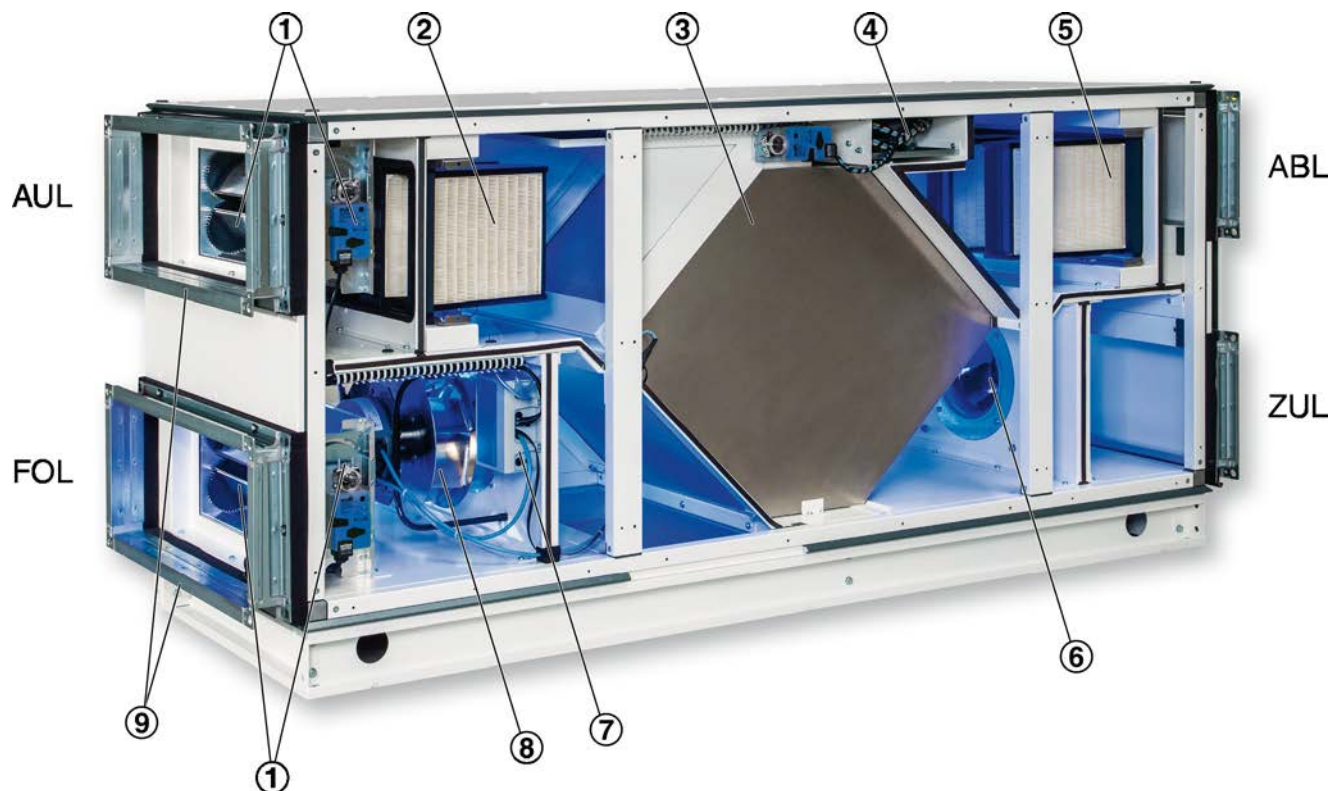


Fig. 2: Unit with plate heat exchanger

- | | | | |
|---|----------------------|-----------|----------------------------|
| 1 | Multileaf dampers | 8 | Extract air fan |
| 2 | Outdoor air filter | 9 | Noise insulating connector |
| 3 | Plate heat exchanger | ABL (ETA) | Extract air |
| 4 | X-CUBE control | AUL (ODA) | Outdoor air |
| 5 | Extract air filter | FOL (EHA) | Exhaust air |
| 6 | Supply air fan | ZUL (SUP) | Supply air |
| 7 | Fan IO | | |

1.1 Supply package

Number	Designation
1	Air handling unit
1	Operating manual
1	Transport and installation manual
1	Attachments, accessories and installation material, if any
1	Loading equipment, if required

1.2 AHU labelling

Eco label

The energy efficiency of the AHU has been certified to EUROVENT, Appendix 'Data sheets' on page 94. For more information see <http://www.eurovent-certification.com>

2 Safety

2.1 Symbols used in this manual

Safety notes

Symbols are used in this manual to alert readers to areas of potential hazard. Signal words express the degree of the hazard.

Comply with all safety instructions and proceed carefully to avoid accidents, injuries and damage to property.

DANGER!

Imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING!

Potentially hazardous situation which, if not avoided, may result in death or serious injury.

CAUTION!

Potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE!

Potentially hazardous situation which, if not avoided, may result in property damage.

ENVIRONMENT!

Environmental pollution hazard.





Tips and recommendations



Useful tips and recommendations as well as information for efficient and fault-free operation.





Specific safety notes

The following symbols are used in safety notes to alert you to specific hazards:

Warning signs	Type of danger
	Warning – hand injuries.
	Warning – high-voltage.
	Warning - danger of falling.
	Warning – danger zone.

Additional markers

In order to highlight instructions, results, lists, references and other elements, the following markers are used in this manual:

Marker	Explanation
 1., 2., 3. ...	Step-by-step instructions
	Results of actions
	References to sections in this manual and to other applicable documents
	Lists without a defined sequence
[Switch]	Operating elements (e.g. push buttons, switches), display elements (e.g. LEDs)
'Display'	Screen elements (e.g. buttons or menus)

2.2 Correct use

The TROX X-CUBE air handling unit is designed exclusively for the treatment of air, i.e. transporting, filtering, heating, cooling, humidifying and dehumidifying air.

Correct use also involves complying with all the information provided in this manual.

Any use that goes beyond the correct use or any different use of the unit is regarded as incorrect use.

The system owner is solely responsible for all damages resulting from incorrect use.

Incorrect use

WARNING!

Danger due to incorrect use!

Incorrect use of the air handling unit can lead to dangerous situations.

- Do not use outdoors without sufficient protection against the effects of weather.
- Do not use in rooms with potentially explosive atmospheres.
- Do not use in rooms with conductive dusts.
- Do not use in rooms with strong electromagnetic fields
- Do not use in rooms with aggressive room air components, e.g. sand.
- Do not use in wet areas.
- Do not use for applications or in environments that do not meet the design specifications (see TROX data sheet for the air handling unit).
- Do not use as a structural element or as a roof for a building.
- Do not use as a smoke extract system in the event of a fire.

2.3 Safety signs

The following symbols and signs are usually found in the work area. They apply to the very location where they are found.

WARNING!


Danger due to illegible signage!

Over time, stickers and signs may fade or become otherwise illegible, meaning that hazards cannot be identified and necessary operating instructions cannot be followed. There is then a risk of injury.

- Ensure that all of the safety, warning and operating information is clearly legible.
- Replace illegible signs or stickers immediately.

Earthing



You find this sticker on the electrical console and at all equipotential bonding connection points of the AHU, see  'Equipotential bonding' on page 9.

Electrical voltage



Only skilled qualified electricians must work on AHU components and in internal spaces with this sign.

Unauthorised persons must not enter areas, open cabinets or work on components where an electrical voltage is present and which are hence marked with this symbol.

Fan run down time



This sticker is found below the mains isolator on the operating side.

Switch off the mains isolator before you open an inspection access panel. Then wait for at least 2 minutes until the fan has come to a standstill.

Risk to life from charges stored in fan capacitors!



This sticker is found on each fan motor.

Fans contain capacitors, which may hold electrical charges even after power is turned off. Before you start working on a fan, disconnect the power supply. Then wait for 5 minutes to ensure that the capacitors have become fully discharged. Only skilled qualified electricians are allowed to work on fan motors.

Hot surfaces on the rotary heat exchanger motor



The surfaces of the rotary heat exchanger motor can get very hot during operation. Skin contact with hot surfaces causes severe skin burns.

Before you start working, make sure that all surfaces have cooled down to ambient temperature.

2.4 Safeguards

Defective safeguards

WARNING!

Risk to life from defective safeguards!

The mains cable between the utility grid and the mains isolator carries a hazardous electrical voltage. Defective or disabled safeguards can cause serious or even fatal injuries.

- Do not disable or bypass any safeguards.

AHU casing

The AHU casing is made from steel panels with duplex powder coating on all sides. This construction ensures that no parts can be ejected from the unit in case of a fault. This construction also protects the interior of the AHU from environmental effects.

Mains isolator

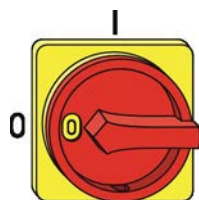


Fig. 3: Mains isolator

The mains isolator (Fig. 3) is located on the operating side of the air handling unit. When you turn the mains isolator to '0', the supply voltage to the AHU is immediately switched off.

You can lock the mains isolator in the '0' position (with a padlock) to secure it against being switched on accidentally so that you can safely work on the respective component (e.g. fan).

Equipotential bonding

A skilled qualified electrician has to connect the AHU to the local earth bar; this is done as part of installation. Equipotential bonding prevents electrostatic ignition hazards.

Motor protection switch

Motor protection switches are safety devices for switching, protecting and isolating motors or actuators on electric circuits. Motor protection switches protect motors against destruction due to overload, short circuits, locking during start-up, or failure of a live wire in three-phase systems. They also have a thermal tripping mechanism and an electromechanic tripping mechanism (short circuit protection). The motor protection switches are located in the electrical console.

Compression latch

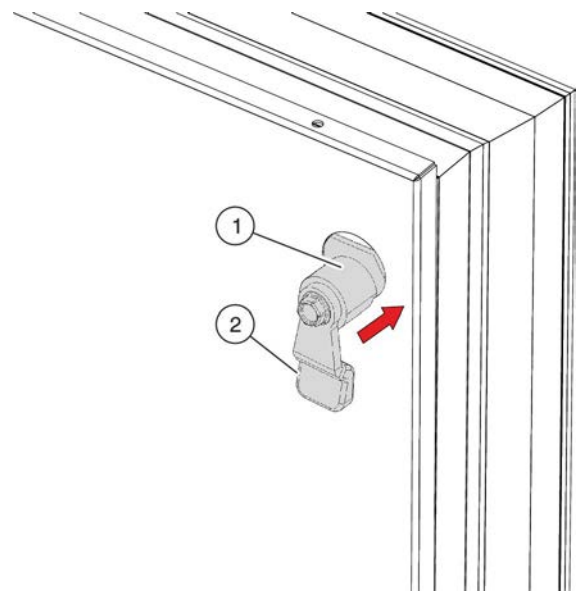


Fig. 4: Compression latch

The inspection access panels are fitted with compression latches (Fig. 4/1). Turning the latch moves the tongue (Fig. 4/2) first into closing position and then in axial direction (Fig. 4/arrow) so that the contact pressure is increased. This ensures that the inspection access panels are securely closed and that no air escapes from the AHU.

Securing the unit against being switched on accidentally

2.5 Securing the unit against being switched on accidentally

Securing the unit against being switched on accidentally

⚠ WARNING!

Risk to life from unauthorised people starting the unit or from people starting the unit accidentally!

If someone who is not authorised starts the unit, or if someone starts the unit accidentally, people could be seriously or even fatally injured.

Before you switch on the unit, make sure that

- Nobody is inside the AHU.
- all inspection access panels have been closed
- no tools or materials have been left inside the AHU

1. ▶ Use the mains isolator to switch off the AHU.

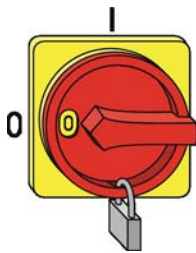


Fig. 5: Securing the mains isolator

2. ▶

⚠ WARNING!

Electric shock hazard!

The power cable which connects the AHU to the mains holds electrical charges even after power is turned off.

Switch off the power supply to the AHU by turning the mains isolator to '0'.

3. ▶ Secure the mains isolator with a padlock (Fig. 5).
4. ▶ Keep the key in a safe place.
5. ▶ Cover the mains isolator with a notice informing people that work is in progress.

2.6 Work areas and hazardous areas

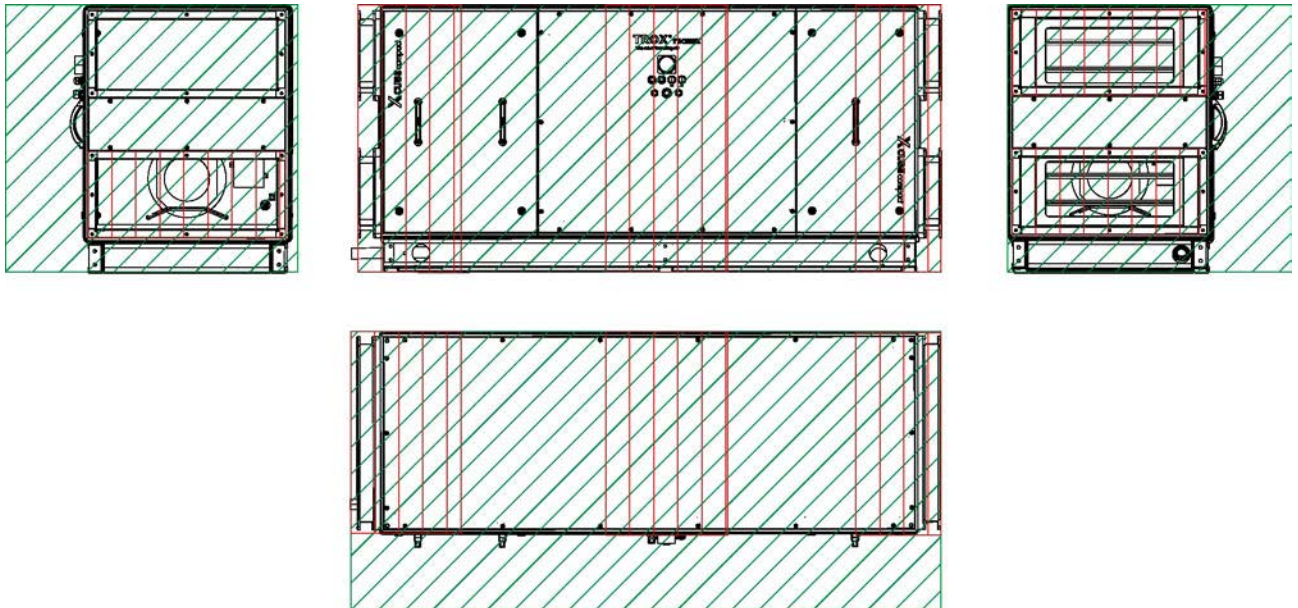




Fig. 6: Hazardous areas

-  Work areas
-  Hazardous area

Areas from where you can access fans, electric air heaters and switch cabinets are hazardous areas. You can access these hazardous areas only after you open an inspection access panel.

Before installation is complete, open air inlets and outlets are also considered hazardous areas.

2.7 Residual risks

The air handling unit is a state-of-the-art product and meets current safety requirements. Residual risks cannot be excluded, however, and you should proceed with caution. This section describes the residual risks that have been identified in a risk assessment.

Always observe the safety notes provided in the following chapters of this manual to reduce health hazards and prevent any hazardous situations.

2.7.1 General workplace hazards

Working at height

WARNING!

Risk of a fall when you work at height!

Working at height without using any fall protection equipment, or using unsuitable or damaged equipment to get up to where you work at height, may lead to yourself or others falling from height; people on the ground may be at risk from falling parts or tools. This can cause serious or even fatal injuries.

- Only use equipment that is suitable, stable and strong enough for the job, maintained and checked regularly.
- Stop materials or objects from falling.
- Wear safety shoes, protective clothing and a hard hat.
- Wear a safety harness.

Leaks

CAUTION!

Risk of injury from slipping on a contaminated floor!

If a machine or component leaks, liquids may be getting onto the floor. People could slip and injure themselves.

- Remove any liquids on the floor quickly.
- Wear non-slip safety shoes.
- Note the safety data sheets provided by the liquid manufacturers.
- Attach warning notices and mandatory action signs wherever liquids may get onto the floor.

2.7.2 Electric shock hazards

Electric current

DANGER!

Danger of death due to electric current!

Danger of electric shock! Do not touch any live components! Damaged insulation or damaged parts are a life threatening hazard.

- Have work on the electrical system carried out only by skilled qualified electricians.
- If the insulation is damaged, disconnect the power supply immediately and have the insulation repaired.
- Before you start working on electric systems and equipment, switch off the supply voltage and secure it against being switched on accidentally. Comply with the following safety rules:
 - Switch off the air handling unit at the local isolator and at the mains isolator (provided by others)
 - Secure it against being switched on accidentally.
 - Disconnect the AHU from the mains power supply for the building.
 - Ensure that no voltage is present.
 - Connect to the earth; short circuit connection.
 - Either cover nearby parts that carry a voltage or install barriers.
- Do not bypass or disable any circuit breakers. Be sure to maintain the correct current rating when you replace a circuit breaker.
- Ensure that live parts do not come into contact with moisture. Moisture can cause a short circuit.

Stored charges

DANGER!

Risk to life from charges stored in capacitors!

Many components contain capacitors, which may hold electrical charges even after power is turned off. Contact with these components can result in serious or fatal injuries.

- Before you start working on any component that contains capacitors, disconnect the component from the power supply. Then wait for 10 minutes to ensure that the capacitors have become fully discharged.

2.7.3 Hazards from the hydraulic system

Jet of liquid from a defective hydraulic system

DANGER!

Risk to life from high pressure fluid injection!

If a hose or a pipe or an AHU component becomes defective, a jet of coolant, refrigerant or compressor oil under pressure may escape. The jet of liquid can cause serious injuries as well as frostbite and burns.

- Do not stand or hold objects in the path of a jet of liquid. Keep people away from the hazardous area.
- Immediately initiate an emergency stop. If necessary, initiate further measures to reduce the pressure and stop the jet of liquid.
- Remove escaping liquids and dispose of them correctly.
- Have any defective components repaired immediately.

2.7.4 Hazards from high temperatures

Hot surfaces

WARNING!

Risk of injury from hot surfaces!

The surfaces of the heating coil can get very hot during operation. Skin contact with hot surfaces causes severe skin burns.

- Wear heat-resistant protective clothing and gloves whenever you work near a potentially hot surface.
- Before you start working, make sure that all surfaces have cooled down to ambient temperature.

2.7.5 Hazardous substances and operating fluids

Operating fluids with glycol

WARNING!

Health risk from operating fluids that contain glycol!

The operating fluids in the heating coil and cooling coil contain glycol, which can damage your health if it comes into contact with your skin, if you swallow it or if you inhale the vapour or mist.

- Avoid contact with operating fluids that contain glycol.
- Work must only be carried out by HVAC technicians.
- Do not eat, drink or smoke while handling operating fluids that contain glycol.
- Wash your hands when you interrupt or finish your work.
- If you have come into contact with an operating fluid that contains glycol, follow the first aid instructions given on the safety data sheet for the operating fluid.
- When you have to handle an operating fluid that contains glycol, wear the personal protective equipment specified in the safety data sheet for the operating fluid.

Lubricants

WARNING!

Health risk from lubricants!

Contact with lubricants can induce allergies and skin irritation.

- Wear protective gloves when handling lubricants.
- Be careful not to swallow lubricants or inhale the vapours.
- If any lubricant has got into your eyes, rinse your eyes thoroughly with plenty of water and seek medical attention if necessary.
- If your skin has come into contact with any lubricant, wash your hands thoroughly with plenty of water and soap.
- Comply with the safety data sheets provided by the lubricant manufacturer.

2.7.6 Fire hazards

Fire protection

WARNING!

Risk of injury from insufficient or inadequate fire-fighting!

If there is a fire and the fire extinguisher is not in working order or is unsuitable for the class of fire, this can result in serious or even fatal injuries and considerable damage to property.

- Make sure that all fire extinguishers are suitable for the expected class of fire.
- Check fire extinguishers every 2 years to ensure that they are in working order.
- Refill each fire extinguisher after it has been used.
- Use only extinguishing agents and replacement parts that comply with the information specified on the fire extinguisher.
- If you have to use a fire extinguisher, make sure you know how to use it safely (see instructions on the extinguisher).

Damaged fan parts

WARNING!

Risk of fire from damaged fan parts!

Grinding rotors or overheating bearings can cause a fire and eventually serious or even fatal injuries.

- Do not put a damaged or defective fan into operation.
- The power consumption must not exceed the specified nominal current.
- Make sure that the maximum motor speed is not exceeded.

2.8 System owner's responsibility

System owner

The system owner is a natural or legal person who for commercial or business purposes owns or manages the air handling unit or allows third parties to use or operate it, but continues to bear legal responsibility for the safety of users, staff or third parties while the product is in use.

System owner's obligations

The unit is intended for commercial use. The system owner is therefore subject to the legal obligations of occupational health and safety regulations.

In addition to the safety notes in this manual, the applicable regulations for safety, accident prevention and environmental protection must also be complied with.

In particular:

- The system owner must be aware of the applicable occupational health and safety regulations and carry out a risk assessment to determine any additional hazards that may exist or result from the specific working conditions at the installation location of the air handling unit. The system owner has to create operating instructions for the air handling unit that reflect the results of this risk assessment.
- The system owner has to ensure, throughout the entire operating period of the air handling unit, that these operating instructions conform to applicable standards and guidelines; in case of any deviation, the system owner has to adapt the instructions.
- The system owner must secure the air handling unit to prevent access by unauthorised individuals.
- The system owner must clearly define the responsibilities for operation, maintenance, cleaning, trouble-shooting and removal.
- The system owner has to ensure that all individuals who handle or use the air handling unit have read and understood this manual.
- The system owner must regularly provide training for the personnel and inform them of any dangers.
- The system owner must provide the employees with the required personal protective equipment.
- The system owner must ensure that the maintenance intervals specified in this manual are observed.
- The system owner must have all safeguards tested regularly to ensure that they are functional and complete.
- The system owner must observe the local fire regulations.
- The system owner must document and permanently save the control matrix on which commissioning is based. The system owner must save both a digital version and a hardcopy of the initial version of the control matrix.
- The system owner must document and save any changes to the control matrix.

Hygiene requirements

The system owner has to comply with the local regulations and harmonised standards for hygiene requirements. This includes compliance with

- specific maintenance and inspection intervals for AHUs
- specifications for connected ducts and air terminal devices

2.9 Personnel

2.9.1 Qualified staff

Qualification

The work described in this manual has to be carried out by individuals with the qualification, training, knowledge and experience described below:

Facility manager

Facility managers have been instructed so that they are able to avoid any potential hazards related to the work under consideration. Facility managers must not carry out any jobs beyond regular operation unless explicitly stated in this manual and unless the system owner has specifically agreed to them. Instruction is provided by the HVAC contractor when the system is handed over.

Facility managers are responsible for cleaning the unit, for carrying out functional tests and regular checks, for maintenance and for smaller adjustments.

HVAC technician

HVAC technicians are individuals who have sufficient professional or technical training in the field they are working in to enable them to carry out their assigned duties at the level of responsibility allocated to them and in compliance with the relevant guidelines, safety regulations and instructions. HVAC technicians are individuals who have in-depth knowledge and skills related to HVAC systems; they are also responsible for the professional completion of the work under consideration.

HVAC technicians are individuals who have sufficient professional or technical training, knowledge and actual experience to enable them to work on HVAC systems, understand any potential hazards related to the work under consideration, and recognise and avoid any risks involved.

Hygiene inspector

Hygiene inspectors are individuals who have sufficient professional or technical training, knowledge and actual experience to enable them to carry out hygiene inspections on air handling units. Hygiene inspectors have undergone additional training in the fields of air hygiene and indoor air quality.

Hygiene inspectors have been trained in the field of air hygiene and indoor air quality, and they know the relevant standards and guidelines.

Skilled qualified electrician

Skilled qualified electricians are individuals who have sufficient professional or technical training, knowledge and actual experience to enable them to work on electrical systems, understand any potential hazards related to the work under consideration, and recognise and avoid any risks involved.

Any work has to be carried out by individuals who can be expected to carry out their assigned duties reliably. Individuals whose reaction time is delayed due to alcohol, drugs or other medication must not carry out any work.

Passwords

The web server of the AHU is password protected to prevent unauthorised individuals from entering or changing data (see [Chapter 4.8.2.1 'Logging in to the web server'](#) on page 31).

Instruction

System owners must regularly instruct their personnel. The instruction procedure has to be documented for further reference.

At least the following details have to be documented:

- Date of instruction
- Names of persons being instructed
- Type of instruction
- Name of instructor
- Signature of person being instructed

2.9.2 Unauthorised persons

WARNING!

Risk to life! Unauthorised access to the hazardous area and work area must be prevented!

Unauthorised persons who do not fulfil the requirements specified here are usually not aware of the dangers in the work area. There is a risk to life and limb for unauthorised people.

- Keep unauthorised persons away from hazardous areas and work areas.
- Instruct these persons to leave the hazardous area or work area.
- Stop work while unauthorised persons are present in the hazardous area or work area.

2.10 Personal protective equipment

Personal protective equipment is equipment that protects the user against health or safety risks at work.

Personal protective equipment must be worn for various types of work; the protective equipment required is listed in this manual together with the description of each type of work.

Description of personal protective equipment

Hearing protection



Hearing protection protects against hearing damage resulting from noise exposure.

Industrial safety helmet



Industrial safety helmets protect the head from falling objects, swinging loads, and impacts with stationary objects.

Protective clothing



Protective clothing is close fitting, with low tear resistance, close fitting sleeves, and no projecting parts. It prevents entanglement in moving machinery.

Do not wear jewellery.

Protective gloves



Protective gloves are used to protect hands from friction, abrasions, punctures, or deeper injuries.

Safety harness



The safety harness protects personnel from falling when there is an increased risk of falling. The risk of falling is increased when certain height differences are exceeded and the workspace is not secured by a railing.

The safety harness must be worn in such a way that the safety rope is connected to the safety harness and to a secure attachment point; provide shock absorbers if necessary.

Safety harnesses must only be used by personnel who have been specifically trained to use them.

Measures to take if a harmful substance has been released

Safety shoes



Safety shoes protect the feet against crushing, falling parts, and slipping on slippery ground.

Safety goggles



Safety goggles protect the eyes from flying particles and liquid splashes.

2.11 Environmental protection

! NOTICE!

Risk of harm to the environment due to the incorrect handling of hazardous materials and substances.

Many substances are hazardous. If you handle them incorrectly or dispose of them incorrectly, they can considerably harm the environment.

- If you have to handle or dispose of substances that can harm the environment, follow the instructions below.
- If any hazardous substances have escaped to the environment, immediately take suitable measures to avoid further damage. If you are in doubt, inform the local authorities about the damage and enquire about suitable measures to be taken.

The following substances and materials which are hazardous to the environment are used in this product:

Coolant, glycol

Coolants may contain substances that are toxic and pose a hazard to the environment. They must not be released into the environment. Commission a specialist disposal company to dispose of hazardous substances and materials.

Only use one of the following glycols for the air handling unit:

- Propylene glycol
- Ethylene glycol

Lubricants

Lubricants such as greases and oils contain toxic substances. Lubricants must not be released into the environment. Commission a specialist disposal company to dispose of hazardous substances and materials.

2.12 Measures to take if a harmful substance has been released

Coolant, glycol

Coolants that contain glycol are hazardous, so please note:

Personal safety:

- Bring people to safety.
- Wear protective equipment.
- Provide sufficient ventilation in work areas, and extract harmful substances.
- Do not inhale vapours or aerosols. Avoid contact with the eyes and skin.

Environmental protection:

- Harmful substances must not enter sewerage systems or bodies of water. Use collection devices.
- Use sand, earth or a similar absorbent material to absorb any spills, and fill the contaminated material into a container so that it can be safely disposed of.
- If a hazardous substance has been released to a body of water or into the sewerage system, immediately inform the local authorities.

Comply with the safety data sheet provided by the manufacturer.

Lubricants

Comply with the safety data sheet provided by the manufacturer.

3 Functional description

3.1 Overview

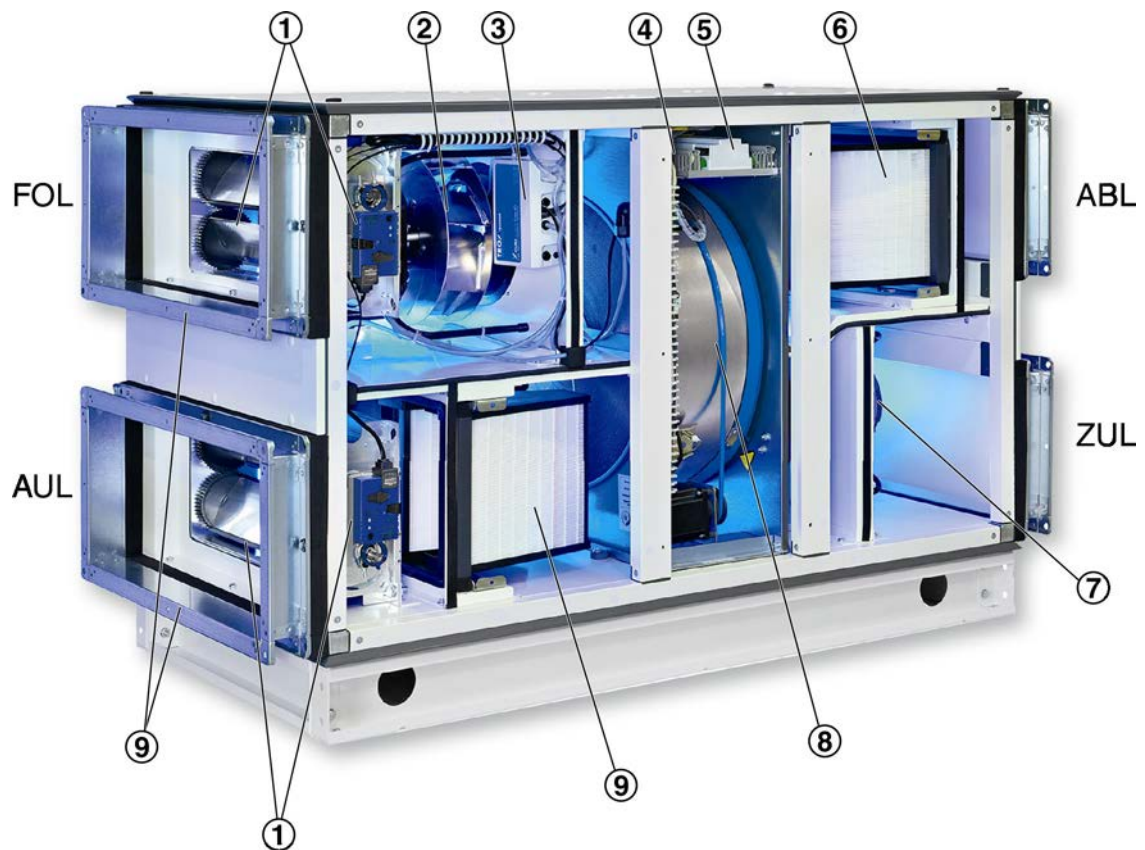


Fig. 7: X-CUBE compact with rotary heat exchanger

1	Multileaf damper	8	Rotary heat exchanger
2	Extract air fan	9	Outdoor air filter
3	Fan IO	10	Noise insulating connector
4	Controls for rotary heat exchanger	ABL (ETA)	Extract air
5	X-CUBE control	AUL (ODA)	Outdoor air
6	Extract air filter	FOL (EHA)	Exhaust air
7	Supply air fan	ZUL (SUP)	Supply air

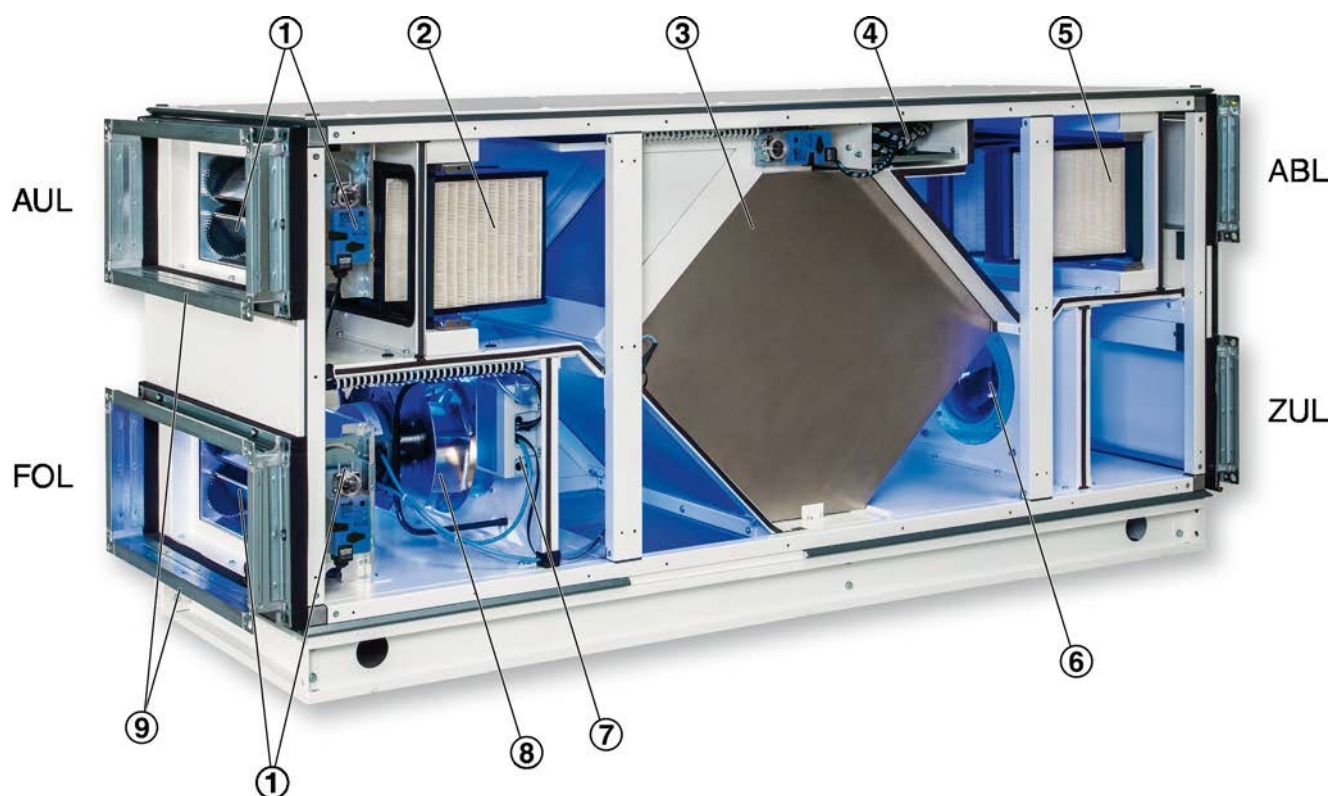


Fig. 8: X-CUBE compact with plate heat exchanger

1	Multileaf dampers	8	Extract air fan
2	Outdoor air filter	9	Noise insulating connector
3	Plate heat exchanger	ABL (ETA)	Extract air
4	X-CUBE control	AUL (ODA)	Outdoor air
5	Extract air filter	FOL (EHA)	Exhaust air
6	Supply air fan	ZUL (SUP)	Supply air
7	Fan IO		

For technical data see [Chapter 10 'Technical data' on page 75](#).

3.2 Function of the air handling unit

General function

The AHU consists of several casing units with components. The AHU is used for one or several air treatment functions:

- Circulation
- Filtering
- Heating
- Cooling
- Heat recovery
- Humidification
- Dehumidification

3.3 Components

Centrifugal fan

The centrifugal fan moves air through the AHU and the entire ventilation system.

The chamber with the centrifugal fan is a hazardous area; the inspection access panels are marked accordingly and allow access for authorised individuals only. Before you access the centrifugal fan, use the local isolator to switch off the air handling unit and secure it against being switched on accidentally.

Filter

Filters are used to separate contaminants from the outdoor air and extract air. The supply air filter protects the AHU and the ventilation system from dust particles in the outdoor air. The extract air filter protects the AHU from contaminated extract air.

The filter class that should be used depends on the application of the AHU. A high-efficiency filter not only separates contaminants from the air, it also prevents allergens, such as pollen or spores in the outdoor air, from getting into the indoor air. This helps to prevent or at least minimise allergic reactions in human beings.

It is hence essential to keep filter media in an AHU dry, clean and hygienically safe.

The level of contamination of filters is monitored by a differential pressure sensor in each Fan IO. The pressure is measured both upstream and downstream of filters. The higher the differential pressure, the higher the level of filter contamination. If the specified maximum value is exceeded, you have to change the filter element.

You can access the filter through an inspection access panel.

'Filter' comprises:

- Filter chamber
- Filter frame
- Filter medium

Multileaf dampers

Multileaf dampers are used to control or shut off airflows in an AHU. You can access multileaf dampers through an inspection access panel.

Rotary heat exchanger

The rotary heat exchanger transfers thermal energy from the extract air flow to the supply air flow. Supply air and extract air are alternately (counter flow) led past a rotating storage mass. In the process the thermal energy of the extract air is transferred to the storage mass and then from the storage mass to the supply air.

You can access the rotary heat exchanger for maintenance and cleaning through an inspection access panel.

Plate heat exchanger

The recuperative plate heat exchanger transfers thermal energy from the extract air flow to the supply air flow. Supply air and extract air are alternately (counter flow) led past the stacked corrugated metal plates. In the process the thermal energy of the extract air is transferred to the supply air.

Recuperative systems keep the supply air and extract air completely separate; no mixing occurs. This is why plate heat exchangers are particularly suitable for applications where hygiene and air cleanliness are of utmost importance.

You can access the plate heat exchanger for maintenance and cleaning through an inspection access panel.

Noise insulating connector

The noise insulating connector is fitted between the AHU and the ducting. It prevents the transmission of noise and vibrations from the AHU to the ducting.

3.4 Control



X-CUBE control

X-CUBE control is the control system for the air handling unit.

It controls all other integral and external control and communication devices connected to the AHU. X-CUBE control provides communication interfaces for various peripheral devices and units.

The user interface of X-CUBE control allows you to configure the entire system and to make adjustments.

You can access the user interface in two ways:

- Touch panel ( 'Touch panel for the AHU' on page 22)
- Web server access via PC (provided by others) ( Chapter 4.8.2.1 'Logging in to the web server' on page 31)


Fan IO

The Fan IO is used to provide control input to the fan (supply air or extract air) and to multileaf damper actuators; it is also used to monitor filters (differential pressure). The Fan IO can also be used to control various sensors, alarm systems and actuators for heating and cooling systems. X-CUBE control and Fan IO communicate via Modbus.

Rotary heat exchanger control module (RHX 2)

The rotary heat exchanger control module (RHX 2) controls the rotary heat exchanger motor. X-CUBE control and the rotary heat exchanger control module communicate via Modbus.

Electrical console

The electrical console is an integral part of the AHU. It supplies voltage to all electrical parts of the AHU. Depending on the AHU construction variant, it may also contain X-CUBE control inputs and outputs as well as motor protection switches ( 'Motor protection switch' on page 9) for the motors in the AHU.

3.5 Accessories

Various accessory modules are available to expand the function of the X-CUBE compact air handling unit.

The modules have a spigot which allows for direct connection to the X-CUBE compact, or they can be installed in the ductwork and remote from the X-CUBE compact.

Heating coil module XCC-HM



Fig. 9: Heating coil module XCC-HM

If required, the heating coil module heats the supply air to the specified setpoint value. The required heating energy comes from an external energy source and is transferred to the airflow by a heat exchanger.

You can access the heating coil for maintenance and cleaning through an inspection access panel.

Cooling coil module XCC-CM



Fig. 11: Cooling coil module XCC-CM

If required, the cooling coil module cools the supply air to the specified setpoint value. The required cooling energy comes from an external energy source and is transferred to the airflow by a heat exchanger.

You can access the cooling coil module for maintenance and cleaning through an inspection access panel.

PWW heating coil module XCC-HD



Fig. 10: PWW heating coil module XCC-HD

If required, the PWW heating coil module heats the supply air to the specified setpoint value. The required heating energy comes from an external energy source and is transferred to the airflow by a heat exchanger.

The heating coil module is intended for installation in a duct.

Heating/cooling coil module XCC-HCM



Fig. 12: Heating/cooling coil module XCC-HCM

The heating/cooling coil module is a combination of heating coil and cooling coil and provides the functions of both those modules.

You can access the heating/cooling coil module for maintenance and cleaning through an inspection access panel.

Electric air heater XCC-EHD



Fig. 13: Electric air heater XCC-EHD

The electric air heater heats the airflow to the specified setpoint value. The required heating energy is transferred to the airflow by electric heating elements.

The electric air heater is an accessory that can be installed in the duct. It can be used to increase the supply air temperature or to heat the outdoor air.

Cable glands

The casing panels of components that need supply voltage or a control cable (such as fans, actuators, anti-frost thermostats) are fitted with cable glands.

3.6 Connections and interfaces

Duct connections of the air handling unit

Duct connection	Meaning
Extract air (ETA/ABL)	Duct through which the extract air from rooms enters the AHU.
Supply air (SUP/ZUL)	Duct through which the supply air flows from the AHU into rooms.
Outdoor air (ODA/AUL)	Duct through which outdoor air enters the AHU.
Exhaust air (EHA/FOL)	Duct through which air is led outside.

Connections for heating coil and cooling coil operating fluids

Used to lead the heat transfer fluid (by others) into the heating coil or cooling coil and out again.

Condensate drains

Used to discharge condensate.

3.7 Operating modes

Use the touch panel, the digital control panel or the web server to select one of the following operating modes:

Touch panel	Digital control panel	Web server	Description
		Stop	Standby mode
		Low speed	Manual mode with low fan speed
		High speed	Manual mode with high fan speed
		Weekly program Calendar	Automatic mode (weekly program or calendar)
	—	—	Service stop The AHU stops running, but voltage supply remains on. Use this mode to carry out service (maintenance). You can deactivate this mode only on the touch panel. The web server displays 'Stop', the digital control panel displays

Note: You can use the touch panel, the digital control panel or the web server to select an operating mode. None of these entry modes has preference; the AHU runs with the operating mode that was selected last (except for service stop).

Under normal conditions the AHU should run based on calendar or 'weekly program' (weekly schedule).

3.8 Operating and display elements

3.8.1 Mains isolator

The mains isolator is located on the operating side of the air handling unit. The mains isolator is used to switch on the supply voltage to the air handling unit. When you switch on the mains isolator, all components of the AHU are supplied with power.

3.8.2 Inspection access panels

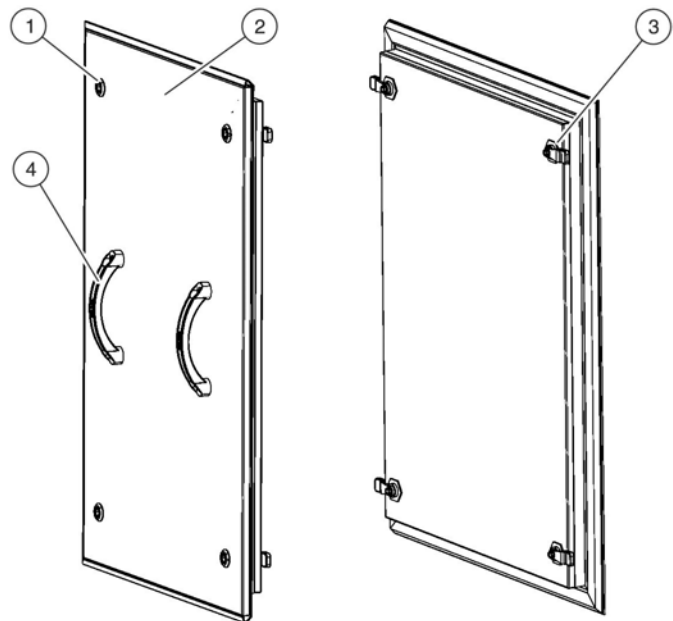


Fig. 14: Inspection access panels

- 1 Lock
- 2 Inspection access panel
- 3 Compression latch
- 4 Handle

Inspection access panels (Fig. 14/2) are located at the front of the AHU; they allow you to access various AHU components.

The inspection access panels are closed by means of a compression latch (Fig. 14/3) and an additional lock (Fig. 14/1); some panels can be opened with a handle (Fig. 14/4), and some panels with a special key (not shown).

3.8.3 Touch panel

Touch panel for the AHU



Fig. 15: Touch panel

The touch panel (Fig. 15) is basically an X-CUBE control user interface [↗ Chapter 4.8.1.3 'Communication parameters' on page 27](#).

Alternatively, you can use a web browser on your PC. To do so, you have to establish a connection from the AHU to your PC or network (see the X-CUBE compact transport and installation manual for details).

In addition, you can use a control panel ([↗ 'Digital control panel XCC-CD-RD' on page 23](#), optional) to adjust some parameters for the AHU.

3.8.3.1 Control panels

Digital control panel XCC-CD-RD



Fig. 16: Control panel

The optional control panel (Fig. 16) has a touch screen with GUI and allows you to set control parameters for the AHU.

Functions:

- Setting ventilation control (according to the factory setting on the AHU)
- Setting the room temperature setpoint [°C]
- Setting a temporary volume flow rate increase (boost mode)
- Displaying current alarms

Analogue control panel XCC-CD-RA



Fig. 17: Control panel

The analogue control panel is used to change the room temperature.

The selector allows you to set a room temperature setpoint or to change the supply air temperature within a certain range (± 5 °C).

4 Operation

4.1 Safety notes regarding operation

Incorrect operation

WARNING!

Risk of injury from incorrect operation!

Incorrect operation can cause serious injuries and considerable damage to property.

- Read the operating manual.
- Follow the instructions in in this manual.
- Before you start working, ensure that:
 - All inspection access panels and covers have been closed.
 - All safeguards have been installed and function correctly.
 - Nobody is inside the AHU.
- Do not open any covers or inspection access panels while the unit is in operation.
- Do not disable or bypass any safeguards while the unit is in operation.

Working at height

WARNING!

Risk of a fall when you work at height!

Working at height without using any fall protection equipment, or using unsuitable or damaged equipment to get up to where you work at height, may lead to yourself or others falling from height; people on the ground may be at risk from falling parts or tools. This can cause serious or even fatal injuries.

- Only use equipment that is suitable, stable and strong enough for the job, maintained and checked regularly.
- Stop materials or objects from falling.
- Wear safety shoes, protective clothing and a hard hat.
- Wear a safety harness.

4.2 Emergency switch-off

- Switch off the mains isolator (provided by others) and secure it against being switched on accidentally, Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.
- Raise the alarm.
- If there is no risk to your own health, rescue other people from the hazardous area.
- Notify the emergency services.

- Provide first aid.
- Get yourself to safety. Take people in danger with you.

4.3 Switch-off in the event of a fire

The owner of the ventilation and air conditioning system has to include the air handling unit in the fire protection strategy for the building. The system owner has to define the steps to be followed in the event of a fire.

4.4 Preparing a (re)start

Risk of entrapment in units with whole body access

WARNING!

Risk of entrapment where there is whole body access into air handling units!

Entrapment in an air handling unit can cause serious injury or even death.

- When you have to work on the air handling unit, secure the air handling unit against being switched on accidentally.
- Before you switch on the air handling unit again, make sure that nobody is inside.

Before you start the AHU

Before you start the AHU, ensure that:

- Nobody is inside the AHU and no objects have been left inside the AHU.
- All filter elements have been inserted and are intact.
- All connections for water, electricity etc. are intact and open.
- The AHU casing has been completely closed.
- Ventilation (if required) in the installation room has been switched on.

4.5 Starting the air handling unit

Personnel:

- Facility manager



Fig. 18: How to turn the mains isolator

1. ▶ Turn the mains isolator for the AHU (Fig. 18) to 'I'.
 - ⇒ The AHU starts up and is then ready for operation. The touch panel is switched on and displays the user interface.

If you are using a web browser

2. ▶ Switch on the PC (provided by others).
 - ⇒ The PC starts up.
3. ▶ Open the web browser.
4. ▶ Enter the following address into the address line:
 - <http://IP address/>
Example: <http://192.168.0.200/>
 - ⇒ This displays the user interface.

4.6 Checks during operation

The following checks must be carried out each week while the air handling unit is in operation:

- Check the differential pressure on the filter, [↗ 'Viewing the operating status' on page 32.](#)
- Check the system pressure of the heating and cooling coil operating fluids according to the instructions of the system manufacturer (system by others).
- Check the air handling unit for faults.

4.7 Tips for operation

Follow the maintenance schedule

Follow the maintenance schedule to ensure economic and energy-efficient operation of each AHU component. If a filter is contaminated, the fan and the entire AHU consume more power.

Keep the building usage in mind

Ensure that the operating mode of the AHU fits the requirements of the building. If the building usage changes, you may have to adapt the operating mode.

Demand-based control

Demand-based control ensures optimum operation and prevents excessive energy consumption.

4.8 Configuring the AHU

You can use the following devices to configure the AHU:

- Touch panel (part of the supply package) 26
- Web server (PC by others / network) 32
- Control panel (optional) 46

4.8.1 Configuration with the touch panel

4.8.1.1 Navigation on the touch panel



Fig. 19: Touch panel

The touch panel reacts to the pressure from your fingers.



Fig. 20: Screen saver

The screen saver shows system time, date and current room temperature (actual temperature, e.g. from the control panel).

If you touch the screen saver, the home screen displays.

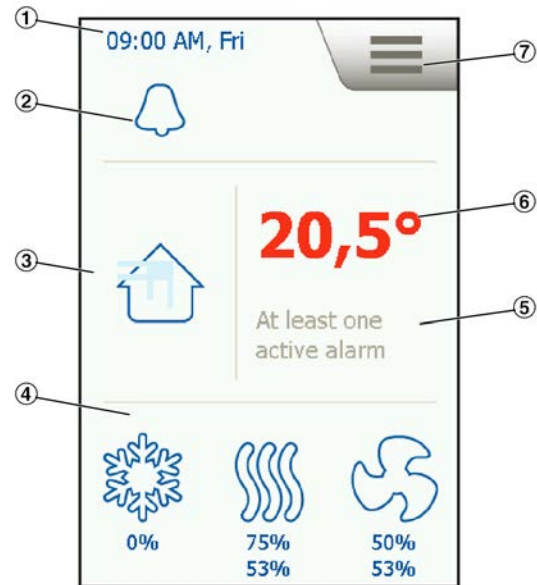


Fig. 21: Home screen

- 1 System time and day of the week
- 2 Current alarms, if any
- 3 Opens the system overview
- 4 Quick start – opens the settings for the respective component. To select components for display, go to 'Menu → Home'
- 5 System status (text)
- 6 Temperature setpoint
- 7 Menu



Fig. 22: Menu navigation

4.8.1.2 Login

Some settings require you to log in.



To log in, enter your password (number pad) and confirm your entry with ✓.

Default password: 0022

Login expires after some time and you will have to log in again.

4.8.1.3 Communication parameters

Personnel:

- Facility manager

The X-CUBE compact controller has a factory set static IP address. This allows you to establish a cable network connection from the controller to your PC.

Default communication parameters:

Parameter	Value
DHCP or static IP	Static IP
IP address	192.168.2.1
Network mask	255.255.255.0
Gateway	10.10.10.1
Primary DNS	10.10.10.18
Secondary DNS	10.10.10.19

If you have entered the correct communication settings and if you have connected a network cable, you can enter the IP address in the web browser and then access the web server of the AHU. If you need to adjust any communication parameters, you can do so on the touch panel.

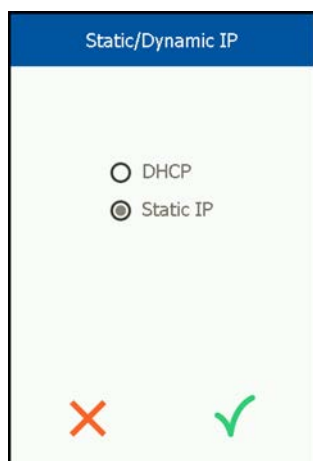
If you intend to integrate the AHU with a network, you can set the IP address to 'DHCP'; the controller will then receive a dynamic IP address via the network.

Setting the static IP address

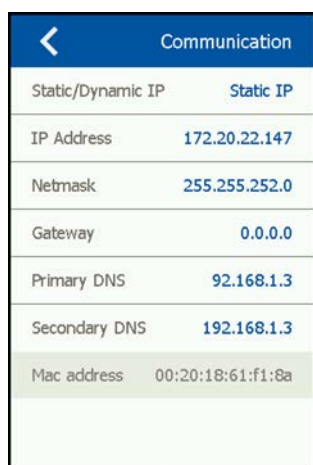
- ▶ Select 'Menu → Communication'.

Communication	
Static/Dynamic IP	Static IP
IP Address	172.20.22.147
Netmask	255.255.252.0
Gateway	0.0.0.0
Primary DNS	92.168.1.3
Secondary DNS	192.168.1.3
Mac address	00:20:18:61:f1:8a

- ▶ Select 'Static/Dynamic IP'.



3. ▶ Select 'Static IP' and confirm with ✓.

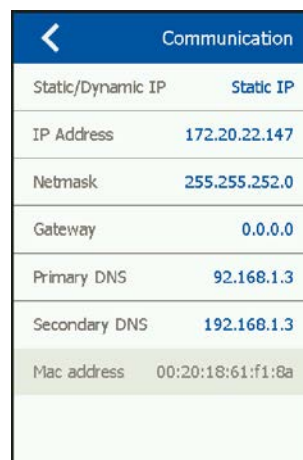


4. ▶ Set the following parameters:

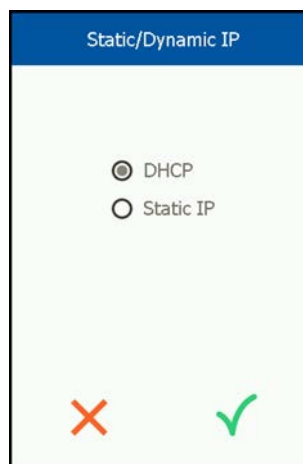
- IP address
Be sure to enter the correct IP address on the controller: it is the same as for the PC except for the last digit, which is different.
 - Netmask (use same value as on PC).
 - Gateway (use same value as on PC).
 - Primary DNS (use same value as on PC).
 - Secondary DNS (use same value as on PC).
- ⇒ The communication parameters for connecting a PC have been set; to call the web server, enter the set IP address in the web browser.

Setting a dynamic IP address

1. ▶ Select 'Menu → Communication'.



2. ▶ Select 'Static/Dynamic IP'.



3. ▶ Select DHCP and confirm with ✓.
- ⇒ The IP address of the X-CUBE controller is automatically assigned. The IP address from the router displays (given that the network connection is correct).

Displaying the AHU configuration

4. ▶ Open the browser on your PC and enter the displayed address into the address line, e.g. `http://10.5.110.227/`
- ⇒ The AHU configuration displays.

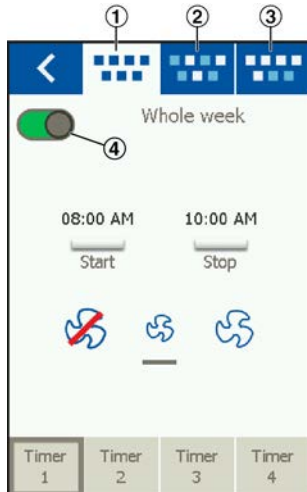
4.8.1.4 'Weekly program' (weekly schedule)

Personnel:

- Facility manager

A 'weekly program' allows you to set the AHU operating times.

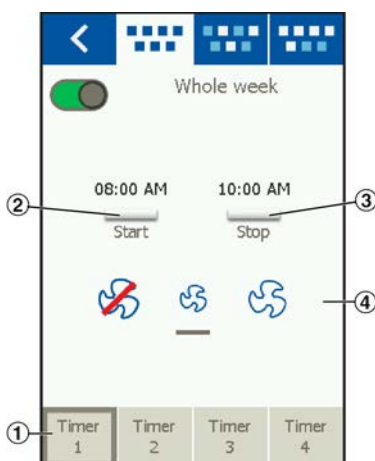
- Select 'Menu → Weekly program'.



- You can choose between three 'weekly programs':

- Whole week: Identical schedule for all days.
- Daily program: Different schedule for every day.
- Weekday & weekend: Different schedules for working days and weekends.

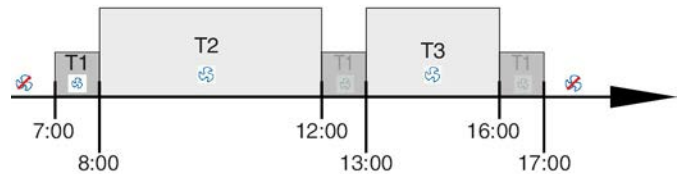
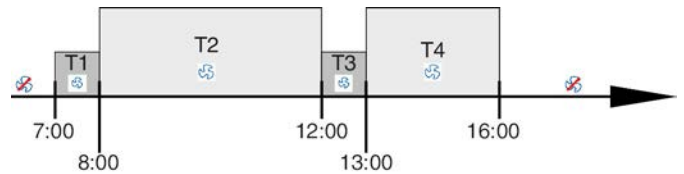
Select a weekly program, then use the switch ④ to activate it. Only one program (schedule) can be active at a time.



- Select a 'timer' (period, up to four per day).
 - Start time.
 - End time.
 - Set the fan speed.

- Fan off
- Low speed
- High speed

Set additional 'timers' (periods) and days as required.



- Set the 'timers' as shown in the examples. Note that has the lowest priority and the highest priority.

This means that in example 2 the first period (Timer 1) (7:00-17:00) can be overridden with T2 and T3 .

Timer 1 can, however, not be overridden with .

Note: 'Extended operation' overrides 'Weekly program'.

Manual settings on the control panel override both the 'Weekly program' and 'Extended operation'.

Fan speeds (project-specific) are set as part of commissioning: 'Menu → Unit components → '.

4.8.1.5 Temperature setpoint

Personnel:

- Facility manager

Go to the home screen and select the temperature setpoint value.

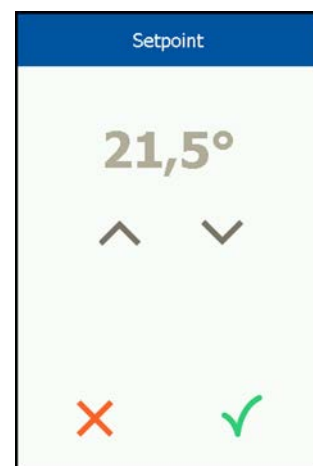


Fig. 23: Setting the temperature

- Use the arrow keys to set the required setpoint, then confirm your entry with .

⇒ The temperature setpoint has been set.

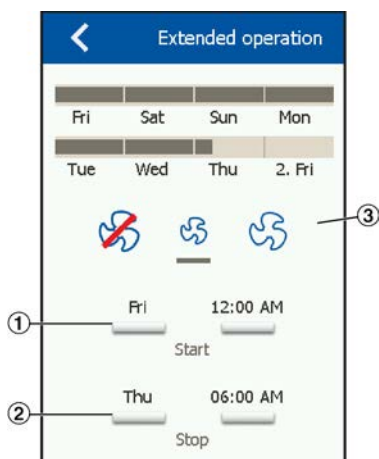
4.8.1.6 Extended operation

Personnel:

- Facility manager

The 'Extended operation' screen allows you to override the fan speed set in the current weekly program. Override automatically starts and stops at the times you set here. The maximum override period is 7 days.

1. ▶ Select 'Menu → Extended operation'.



2. ▶
 - ① - Set the start time for extended operation.
 - ② - Set the end time for extended operation.
 - ③ - Set the fan speed.

- Extended operation off
- Override of weekly program at low speed
- Override of weekly program at high speed

Extended operation is activated immediately and overrides the weekly program as soon as the start time is reached. Extended operation ends automatically with the end time.

Note: Manual settings on the control panel override both the 'Weekly program' and 'Extended operation'.

Note that you cannot override 'Service stop' on the control panel.

4.8.1.7 Time and date

Personnel:

- Facility manager

Select 'Menu → Settings → Time & date'.

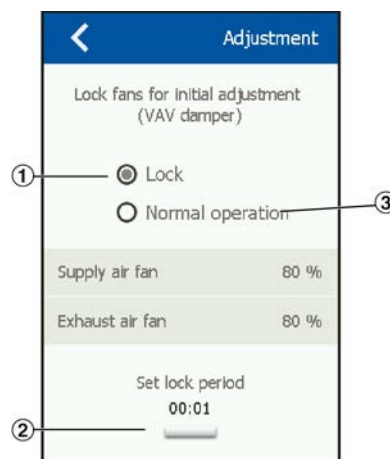


- ▶ Set the date and time; your settings are applied immediately.

4.8.1.8 Adjustment

You can lock the fan speed during commissioning if, for example, you have to adjust volume flow controllers. The AHU will then provide a constant volume flow.

1. ▶ Select 'Menu → Settings → Adjustment'.



2. ▶ To lock the fan speed, select 'Lock' ①, then set a period ②.
 - ⇒ The fan continues to run at the current speed for the set period of time.

Deactivate the fan speed lock

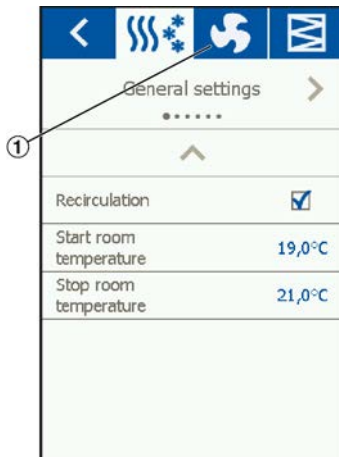
3. ▶ To deactivate the fan speed lock, select 'Normal operation' ③.

4.8.1.9 Operating mode

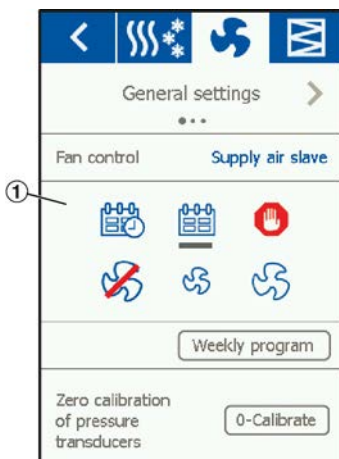
Personnel:

- Facility manager

- On the touch panel select 'Menu → Unit components'.



- Select the fan symbol ①.



- Set the operating mode ①:

- Auto mode 'Calendar' AHU operation is based on the calendar; you can define the calendar mode on the web server.
- Auto mode 'Weekly program' AHU operation is based on a 'weekly program' (weekly schedule); you can define the weekly program with the touch panel.
- Service stop The AHU stops running, but voltage supply remains on. Use this mode to carry out service (maintenance). You can deactivate this mode only on the touch panel.
- Standby mode
- Manual mode with low fan speed
- Manual mode with high fan speed

Note: You can also use the digital control panel or the web server to select an operating mode. None of these entry modes has preference; the AHU runs with the operating mode that was selected last (except for service stop).

Under normal conditions the AHU should run based on calendar or 'weekly program' (weekly schedule).

4.8.2 Configuration with the web interface

4.8.2.1 Logging in to the web server

Personnel:

- Facility manager

The interface for communication between the AHU and the web server should have been configured as part of initial commissioning. No further settings need to be made. (X-CUBE compact transport and installation manual, Initial commissioning)

There are three login levels to access the web server. Each level has different access rights for operating, maintenance or configuration functions.

Level	User name	Pass-word	Function
User	USER	0001	Setpoints
Installer	INSTALLE	0022	Setpoints and control settings
Service	SERVICE	0333	Service parameters

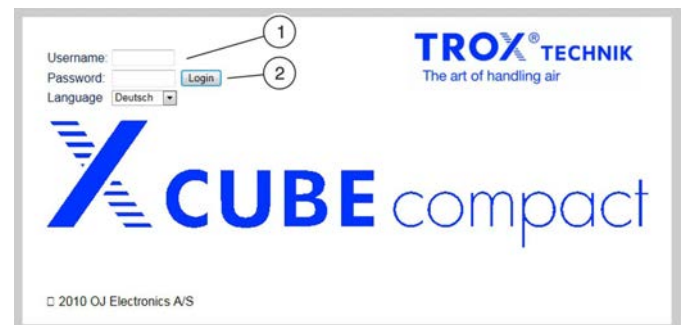


Fig. 24: Logging in to the web server

- Enter your user name (Fig. 24/1).
- Enter your password.
- Click on 'Login' (Fig. 24/2).
 - ⇒ You have been logged in to the web server.

4.8.2.2 Setting parameters

Viewing the operating status

Personnel:

- Facility manager

The 'Status' screen shows the current temperature values of the AHU and the status of each component.

- ▶ On the main menu, select 'Service → Air handling unit → Status'.

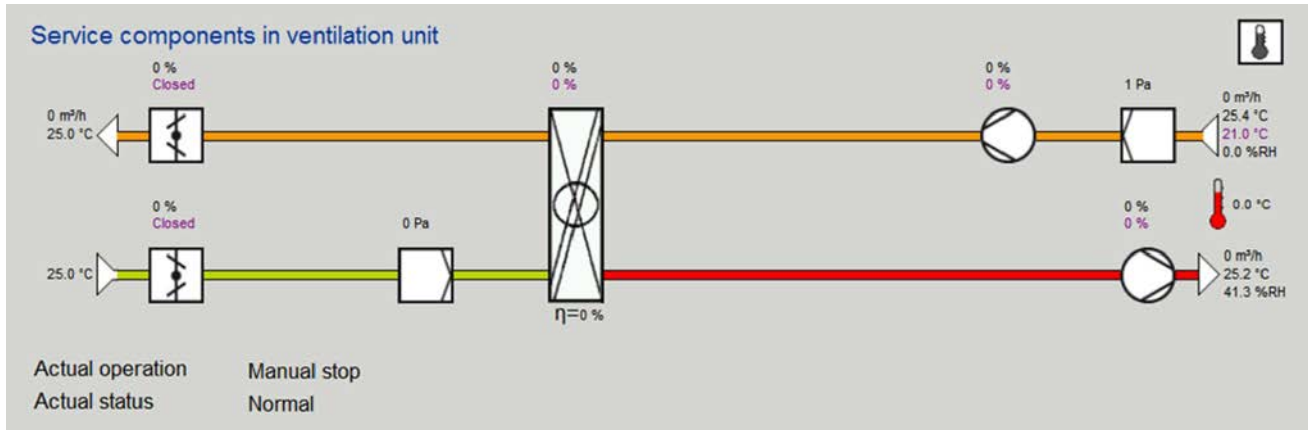


Fig. 25: System overview

- ⇒ The system overview shows the status of each component or temperature values. To see additional information for a component, click on the component.

Symbol	AHU component	Additional information
	Exhaust air	<ul style="list-style-type: none"> ■ Exhaust air flow rate ■ Exhaust air temperature
	Exhaust air damper	<ul style="list-style-type: none"> ■ Degree of opening [%] of the exhaust air damper
	Extract air fan	<ul style="list-style-type: none"> ■ Extract air fan speed – actual value [%] ■ Extract air fan speed – setpoint value [%]
	Heat recovery unit	<ul style="list-style-type: none"> ■ Percentage of heat recovery – actual value ■ Percentage of heat recovery – setpoint value ■ Heat recovery efficiency [%]
	Extract air filter	<ul style="list-style-type: none"> ■ Extract air filter – differential pressure [Pa]

Symbol	AHU component	Additional information
	Extract air	<ul style="list-style-type: none"> Extract air flow rate Extract air temperature – actual value Extract air temperature – setpoint value
	Outdoor air	<ul style="list-style-type: none"> Outdoor air temperature
	Outdoor air damper	<ul style="list-style-type: none"> Degree of opening [%] of the outdoor air damper
	Outdoor air filter	<ul style="list-style-type: none"> Outdoor air filter – differential pressure [Pa]
	Supply air fan	<ul style="list-style-type: none"> Supply air fan speed – actual value [%] Supply air fan speed – setpoint value [%]
	Supply air	<ul style="list-style-type: none"> Supply air flow rate Supply air temperature

Selecting a language

Personnel:

- Facility manager

The 'Set language' screen allows you to select the language for the web interface.

- On the main menu, select 'Installer → Language'.



Fig. 26: Setting the language

- Select a language.
 - ⇒ The display language has been set.

Communication parameters

Personnel:

- Facility manager

The X-CUBE compact controller has a factory set static IP address. This allows you to establish a cable network connection from the controller to your PC.

Default communication parameters:

Parameter	Value
DHCP or static IP	Static IP
IP address	192.168.2.1
Network mask	255.255.255.0
Gateway	10.10.10.1
Primary DNS	10.10.10.18
Secondary DNS	10.10.10.19

If you have entered the correct communication settings and if you have connected a network cable, you can enter the IP address in the web browser and then access the web server of the AHU. If you need to adjust any communication parameters, you can do so with the touch panel or the web server.

Setting the static IP address

- ▶ On the main menu, select 'Installer' → 'Communication' → 'Internet'.

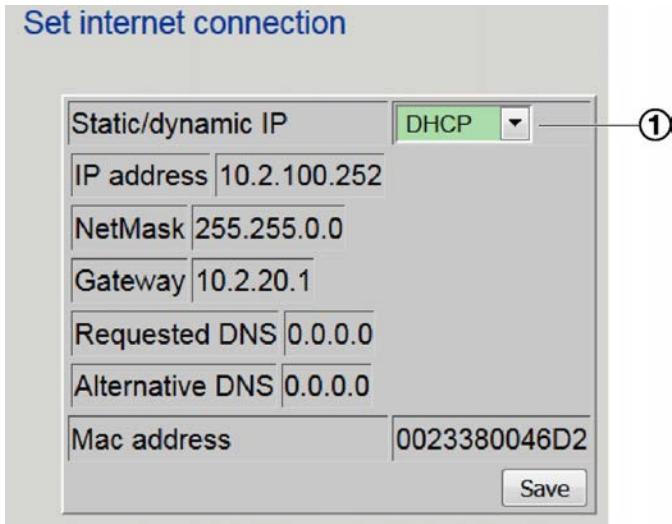


Fig. 27: Setting the static IP address

- ▶ Select 'Static IP' from the drop down list (Fig. 27/1), then set the following parameters:
 - IP address
Be sure to enter the correct IP address on the controller: it is the same as for the PC except for the last digit, which is different.
 - Netmask (use same value as on PC).
 - Gateway (use same value as on PC).
 - Primary DNS (use same value as on PC).
 - Secondary DNS (use same value as on PC).
- ▶ Click on 'Save'.
 - ⇒ The communication parameters for connecting a PC have been set; to call the web server, enter the set IP address in the web browser.

If you intend to integrate the AHU with a network, you can set the IP address to 'DHCP'; the controller will then receive a dynamic IP address via the network.

Setting a dynamic IP address

- ▶ On the main menu, select 'Installer' → 'Communication' → 'Internet'.

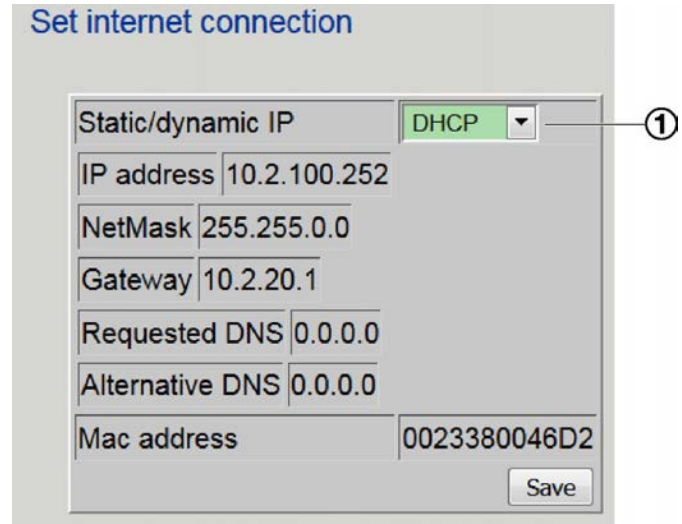


Fig. 28: Setting a dynamic IP address

- ▶ Select 'DHCP' from the drop down list (Fig. 28/1).
- ▶ Click on 'Save'.
 - ⇒ The IP address of the X-CUBE controller is automatically assigned. The IP address assigned by the router is then displayed (given that the network connection is correct).

Displaying the AHU configuration

- ▶ Open the browser on your PC and enter the displayed address into the address line, e.g. <http://10.2.100.252/>
 - ⇒ The AHU configuration displays.

Setting Modbus RTU

- ▶ On the main menu, select 'Installer' → 'Communication' → 'Modbus'.

Fig. 29: Setting Modbus RTU

- ▶
 - Enter the 'Modbus address'.
 - Select a 'Baud rate'.
 - Set 'Start bit'.
 - Select no. of 'Stop bits'.
 - Set 'Parity'.
- ▶ Click 'Save' to confirm your settings.

Locking the fan speed

Personnel:

- Facility manager

You can lock the fan speed during commissioning if, for example, you have to adjust volume flow controllers. The AHU will then provide a constant volume flow.

- ▶ On the main menu, select 'Installer' → 'Adjustment'.

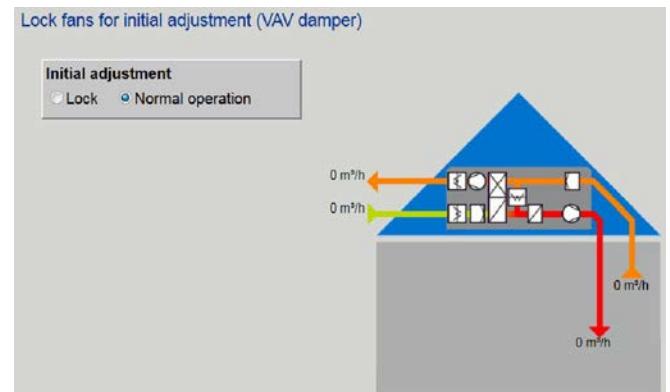


Fig. 30: Fan speed

- ▶ Select 'Lock' or 'Normal operation'.
 - ⇒ Selecting 'Lock' displays the screen in Fig. 31.

Air Type	Flow Rate
Supply air	0 %
Extract air	0 %

2:29:29

Fig. 31: Setting a lock period

- ▶ Set the period by clicking on the clock.
 - ⇒ The volume flow rate will then remain constant for the set period of time. After the set period of time has elapsed, the AHU returns to normal operation.

Temperature control ('temperature regulation')

Personnel:

- Facility manager

The 'Set temperature regulation' screen allows you to set parameters for temperature control.

- On the main menu, select 'Installer' → 'Temperature'.

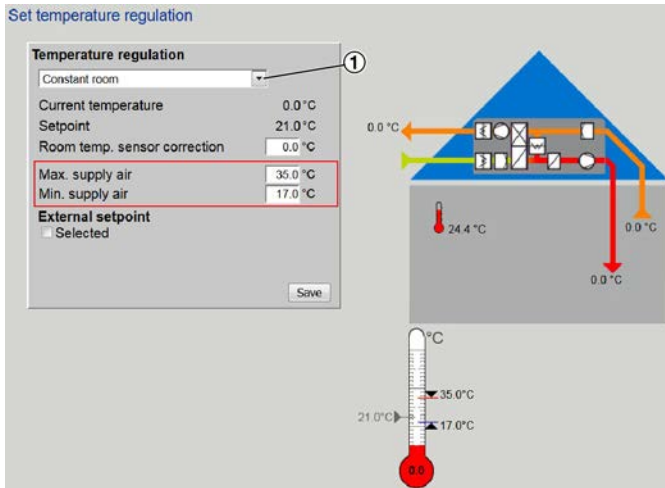


Fig. 32: Setting temperature control ('temperature regulation')

- Select a function from the drop down list (Fig. 32/1):

Constant supply air - A temperature sensor in the supply air duct is used to keep the supply air temperature constant.

Constant extract air - A temperature sensor in the extract air duct is used to keep the extract air temperature constant.

Constant room - A temperature sensor in the room is used to keep the room air temperature constant.

Constant supply air/extract air difference - The temperature is controlled in such a way that the difference between supply air temperature and extract air temperature remains at a constant level. This control strategy is typically used for low-turbulence laminar flow or displacement flow ventilation; for example, air is supplied to the room near the floor and at a temperature lower than the room air temperature, while extract air is removed near the ceiling.

- Set the temperature values:

Room temperature sensor correction - To compensate for measurement inaccuracies of the temperature sensor, you can set a correction factor of ± 3.5 °C.

Max. supply air - Enter a maximum value for the supply air temperature.

Min. supply air - Enter a minimum value for the supply air; recommended: 17 °C

- If there is an outdoor air temperature sensor ('external setpoint'), tick the 'Selected' checkbox.

- Click on 'Save'.

⇒ The temperature control settings have been saved.

Temperature setpoint

- On the main menu, select 'User' → 'Temperature'.

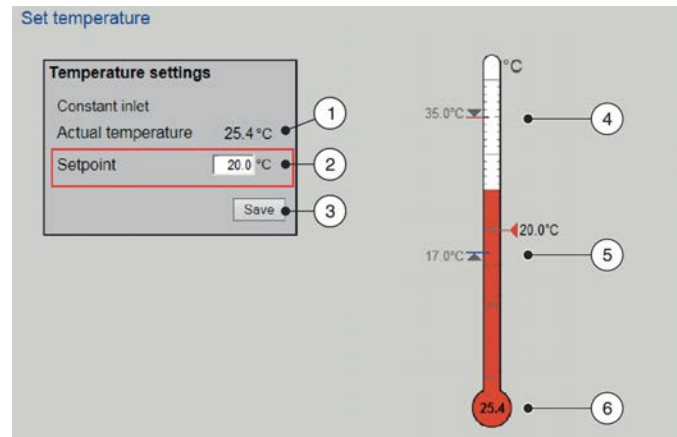


Fig. 33: Temperature setting

- Enter a temperature setpoint (Fig. 33/2).

- Click on 'Save' (Fig. 33/3).

Displayed temperatures:

1 + 6 - Actual temperature

4 - Max. supply air temperature (not with 'Constant supply air' mode)

5 - Min. supply air temperature (not with 'Constant supply air' mode)

⇒ The AHU will control the temperature such that the setpoint is achieved and maintained.

Night purge

Personnel:

- Facility manager

The 'Set summer night cooling' screen (Fig. 34) allows you to activate night purge and to set a period of time for night purge. The night purge function allows for the building to be cooled with outdoor air during the nights (i.e. outside of operating hours); this may be useful during the summer months. Night purge is activated as soon as all of the required settings have been made.

Saving energy

Night purge provides a high energy savings potential since rooms can be cooled down to a certain extent at night without the requirement for cooling energy.

- ▶ On the main menu, select 'Installer' → 'Temperature' → 'Summer night'.

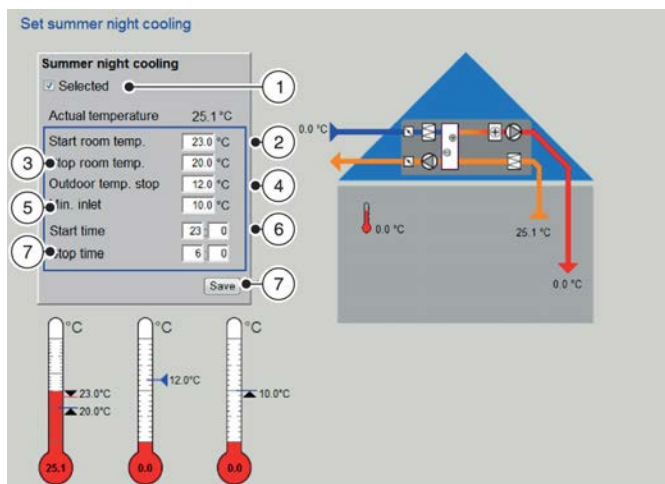


Fig. 34: Night purge

- ▶ Enter the room air start temperature for night purge ('Start room temp.', Fig. 34/2).
 - ⇒ If the room air temperature exceeds this temperature during the defined period of time, night purge is activated.



If there is a temperature sensor installed in the room, the room temperature is monitored continuously. If there is no temperature sensor installed in the room, the room temperature is determined based on the extract air temperature. Night purge is then activated at the set start time.

- ▶ Enter the room air end temperature for night purge ('Stop room temp.', Fig. 34/3).
 - ⇒ If the room air temperature is lower than this temperature ('stop room temp.'), night purge is inactive.

- ▶ Enter the outdoor air end temperature ('Outdoor temp. stop', Fig. 34/4) for night purge.
 - ⇒ If the outdoor air temperature is lower than the temperature you enter here, night purge is inactive.
- ▶ Enter the minimum supply air temperature for night purge ('Min. inlet', Fig. 34/5).
 - ⇒ If the supply air temperature is lower than the temperature you enter here, night purge is inactive.
- ▶ Enter the night purge start time (Fig. 34/6).
 - ⇒ Night purge starts at this time.
- ▶ Enter the night purge end time ('Stop time', Fig. 34/7).
 - ⇒ Night purge ends at this time.
- ▶ Tick the checkbox (Fig. 34/1) to activate night purge.
 - ⇒ Night purge has been activated.

Summer and winter compensation

Personnel:

- Facility manager

The 'Set summer/winter compensation' screen (Fig. 35) allows you to set temperature compensation values for summer and winter.

If this function is active, the temperature setpoint will be corrected in summer or winter based on the outdoor air temperature.

Summer mode - In the temperature range from 'Summer start' to 'Summer maximum' the temperature setpoint is dynamically decreased by the 'Summer temp. diff.' value.

Winter mode - In the temperature range from 'Winter start' to 'Winter maximum' the temperature setpoint is dynamically increased by the 'Winter temp. diff.' value.

Summer/winter compensation is only possible with control mode 'Constant supply air', 'Constant extract air' or 'Constant room'.

- ▶ On the main menu, select 'Installer → Summer/winter → compensation'.

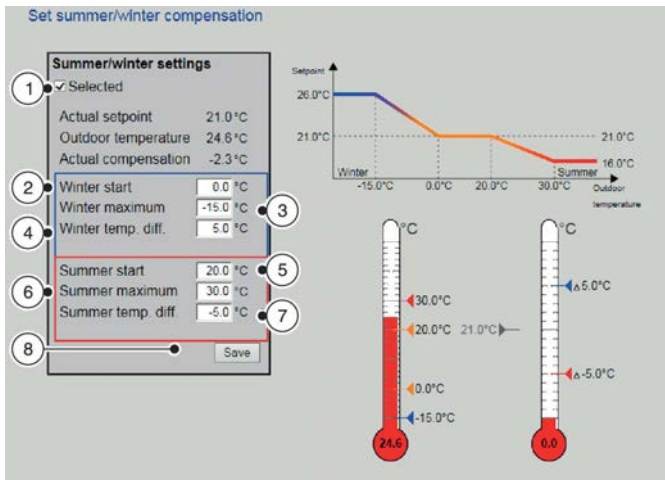


Fig. 35: Summer/winter compensation

- ▶ Tick the checkbox (Fig. 35/1) to activate summer/winter compensation.
- ▶ Enter the outdoor air temperature at which winter compensation shall start (Fig. 35/2).
- ▶ Enter the outdoor air temperature for maximum winter compensation (Fig. 35/3).
- ▶ Enter the maximum winter compensation value (Fig. 35/4).
- ▶ Enter the outdoor air temperature at which summer compensation shall start (Fig. 35/5).
- ▶ Enter the outdoor air temperature for maximum summer compensation (Fig. 35/6).
- ▶ Enter the maximum summer compensation value (Fig. 35/7).

- ▶ Save your settings for summer/winter compensation.

⇒ Summer/winter compensation has been set.

Automatic summer/winter change-over

Personnel:

- Facility manager

Use this function if you want the system to change automatically between summer mode and winter mode based on the outdoor air temperature. .

- ▶ On the main menu, select 'Installer → Summer/Winter → Sum/Win ch.over'.

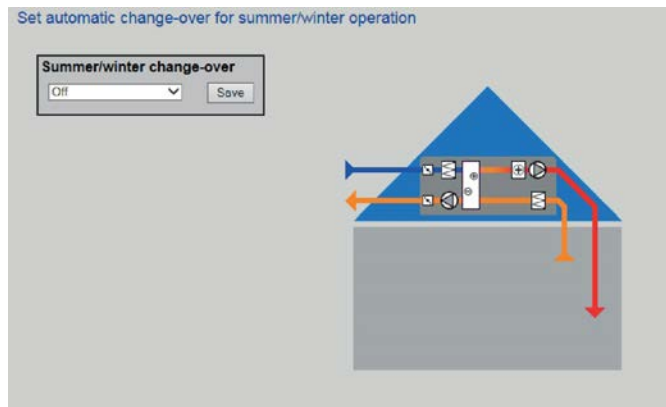


Fig. 36: Summer/winter change

- ▶ Select the desired type of control from the drop-down list (Fig. 36/1).
 - Off**
 - There will be no change between summer mode and winter mode.
 - Outdoor temperature**
 - The system changes to summer mode when the outdoor air temperature exceeds the 'Change-over temp.' for summer.
 - The system changes to winter mode when the outdoor air temperature falls below the 'Change-over temp.' for winter.
 - Calendar**
 - The system changes between summer mode and winter mode based on the calendar dates you set.
 - Summer**
 - The system runs permanently in summer mode.
 - Winter**
 - The system runs permanently in winter mode.

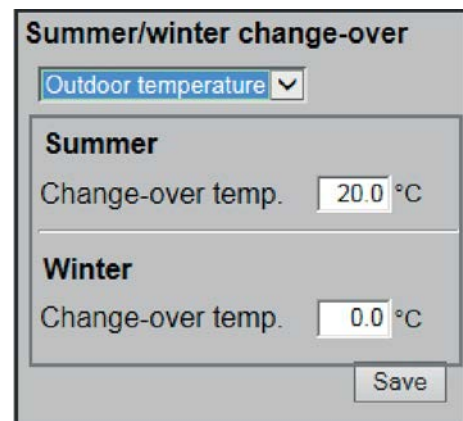


Fig. 37: Outdoor air temperature

- ▶ If you choose 'Outdoor temperature' as the type of control, you also have to set the summer and winter change-over temperatures (Fig. 37).

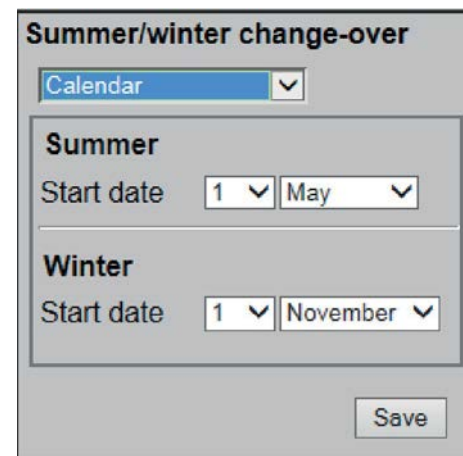


Fig. 38: Calendar

- ▶ If you choose 'Calendar' as the type of control, you also have to set the summer start date and the winter start date (Fig. 38).
- ▶ Click on 'Save'.
 - ⇒ Automatic summer/winter change-over has been set.

Override control for outputs

Personnel:

- Facility manager

Use the 'Override' function (Fig. 39) when you carry out service or maintenance jobs, to check whether the outputs work correctly. The 'Override' function cannot be used if there are any active alarms.

The example below shows how to override the extract air fan speed.

- ▶ On the main menu, select 'Service → Air handling unit → Status'.

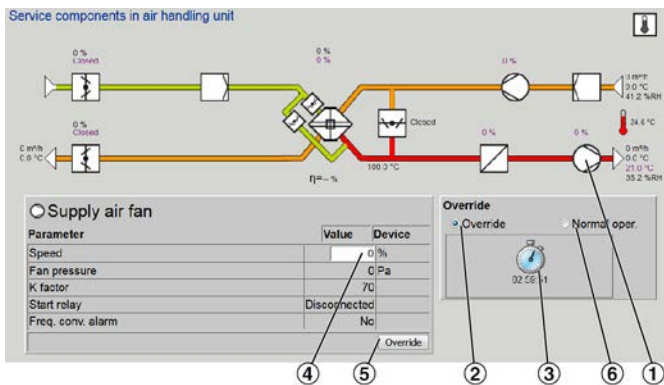


Fig. 39: Override function

- ▶ Click on the AHU component (Fig. 39/1) for which you want to override a parameter setting (e.g. extract air fan).
- ▶ Click on 'Override' (Fig. 39/2).
- ▶ Click on the clock (Fig. 39/3) to set a time.
- ▶ Enter the override percentage for the extract air fan speed (Fig. 39/4).
- ▶ Click on 'Override' (Fig. 39/5).

⇒ Override is active, and the percentage value you have entered is now the current setpoint value.

Once the set time has elapsed, the AHU returns automatically to normal operation.

To deactivate override and return to normal operation, select 'Normal oper.'.

Viewing measured values

Personnel:

- Facility manager

The 'Logging of data' screen (Fig. 40) allows you to view the measured values for the last 7 days or for the last 24 hours. You can view the following measured values:

- Inlet [m³/h or Pa]: Supply air; depending on the type of fan speed control
- Exhaust [m³/h or Pa]: Extract air; depending on the type of fan speed control
- Temperature [°C]
- Flow [m³/h]: Volume flow rate
- Alarm: No. of active alarms
- Heating/cooling [%]: Heating/heat recovery/cooling

- ▶ On the main menu, select 'Service → Alarm log → Data log'.

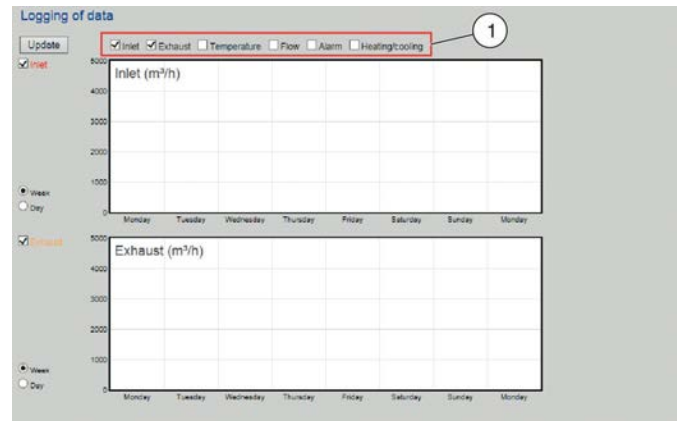


Fig. 40: Viewing measured values

- ▶ Select the parameter for which you want to view measured values (Fig. 40/1).

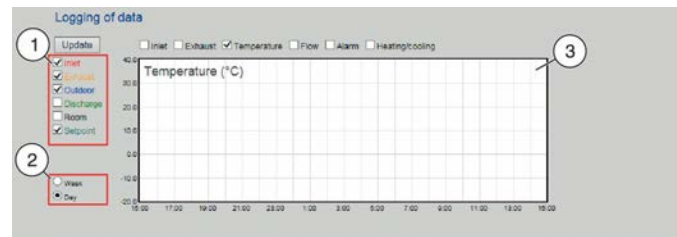


Fig. 41: Selecting measured values

- ▶ Click 'Week' or 'Day', depending on the period for which you want to view measured values (Fig. 41/2).
- ▶ Select the parameter for which you want to view measured values (Fig. 41/1).
- ▶ Click on the diagram (Fig. 41/3) to enlarge the display.

Operating mode

Personnel:

- Facility manager

The 'Select fan speed' screen (Fig. 42) allows you to set the AHU operating mode.

1. ▶ On the main menu, select 'User → Operation → Speed'.

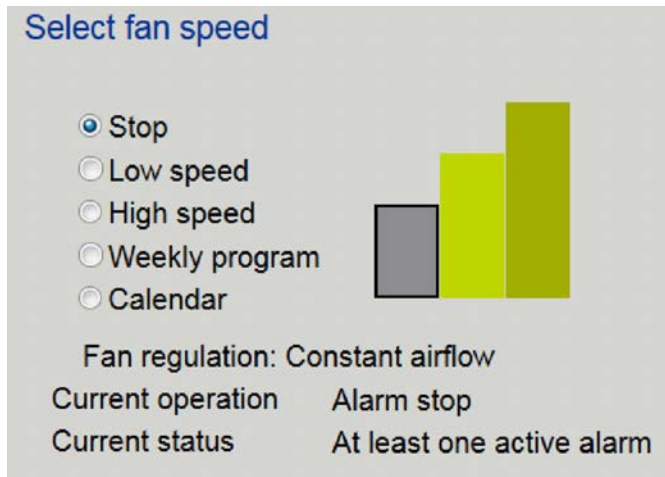


Fig. 42: Setting the fan speed

2. ▶ Select an operating mode, ↗ Chapter 3.7 'Operating modes' on page 22.

The current fan mode ('fan regulation'), operating mode ('current operation') and system status are displayed in the lower part of the screen.

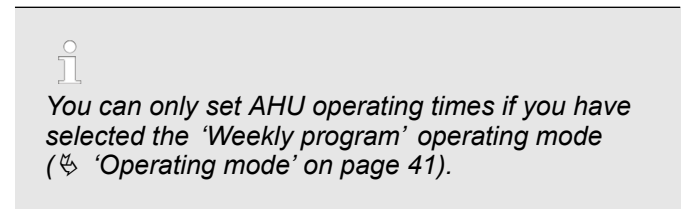
Note: You can deactivate a service stop only on the touch panel ↗ on page 31.

'Weekly program' (weekly schedule)

Personnel:

- Facility manager

A 'weekly program' allows you to set the AHU operating times.



1. ▶ On the main menu, select 'User → Operation → Set weekly program'.

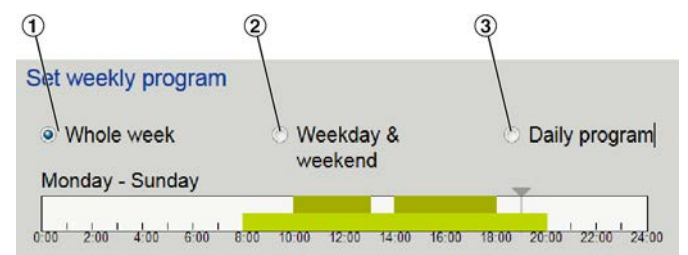


Fig. 43: Weekly program

2. ▶ You can choose between three 'weekly programs':

- ① - Whole week: Identical schedule for all days.
- ② - Weekday & weekend: Different schedules for working days and weekends.
- ③ - Daily program: Different schedule for every day.

Select a weekly program, only one program (schedule) can be active at a time.

Operating times (example)

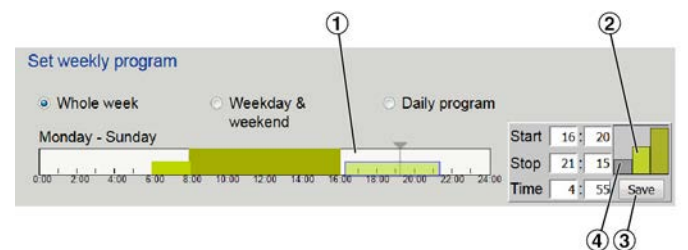


Fig. 44: Operating times

3. ▶ To set a new timer (period of time), first click on the white area (Fig. 44/1), then select the fan speed (low speed or high speed) (Fig. 44/2). Enter the start and stop times using the keyboard, or move the bar using the mouse. Then save your settings (Fig. 44/3).

You can set up to four 'timers' (periods).

To change a timer, mark the period with the mouse and change it. Then save your settings (Fig. 44/2).

To delete a timer, mark it with the mouse, then select 'Stop' (grey bar – Fig. 44/4); this deletes the timer.

Note: 'Extended operation' overrides 'Weekly program'.

Manual settings on the control panel override both the 'Weekly program' and 'Extended operation'.

Fan speeds (project-specific) are set as part of commissioning.

Calendar

A calendar allows you to set the AHU operating times.



You can only set AHU operating times if you have selected the 'Calendar' operating mode (↔ 'Operating mode' on page 41).

- ▶ On the main menu, select 'User → Operation → Schedule Base'.

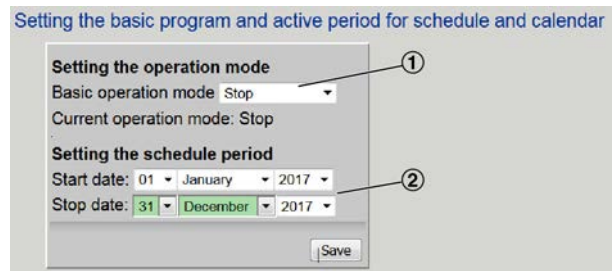


Fig. 45: Setting a 'basic program'.

- ▶ Select a basic operating mode (Fig. 45/1).

The basic operating mode you set here is used in the following cases:

- Outside of the set period.
- If no other action has been set in the daily schedule.
- In the daily schedule before the first set action, e.g. 07:00 = 'low speed', then from 00:00 to 7:00 = basic mode.

- ▶ Set the start date and stop date (Fig. 45/2) for the calendar function.
- ▶ Click 'Save'.
- ▶ On the main menu, select 'User → Operation → Daily schedule'.

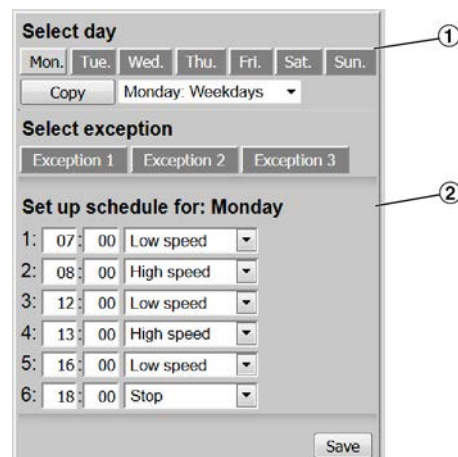


Fig. 46: Setting a daily schedule

- ▶ First select a day of the week (Fig. 46/1), then set the times (1-6) and the fan speed.

Tip: If you have made settings for Monday, you can use 'Copy' to apply them to other days.

The 'Exception 1-3' fields allow you to set operating times other than the daily schedule. To set exceptions, use the 'Exceptions' and 'Calendar' tags.

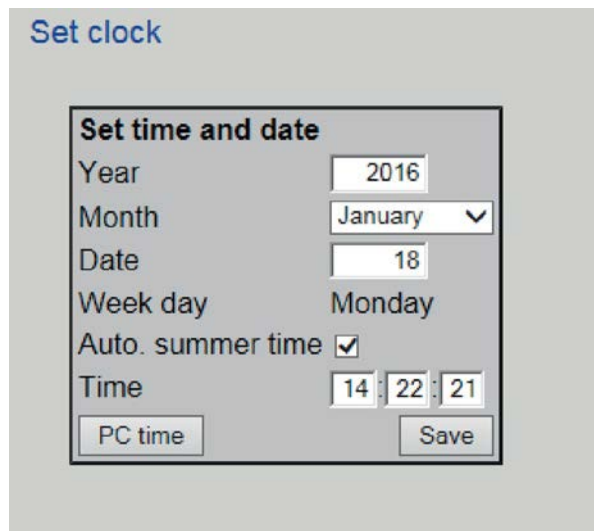
Time and date

Personnel:

- Facility manager

The 'Set clock' screen (Fig.) allows you to set the time and date.

1. ▶ On the main menu, select 'User → Time and date'.



2. ▶ To use the date and time from your PC, click on 'PC time'. You can also enter the time and date manually and save your entries with 'Save'.

Temperature setpoint

Personnel:

- Facility manager

The 'Set temperature' screen (Fig. 47) shows the current temperature and allows you to set a temperature setpoint.

1. ▶ On the main menu, select 'User → Temperature'.

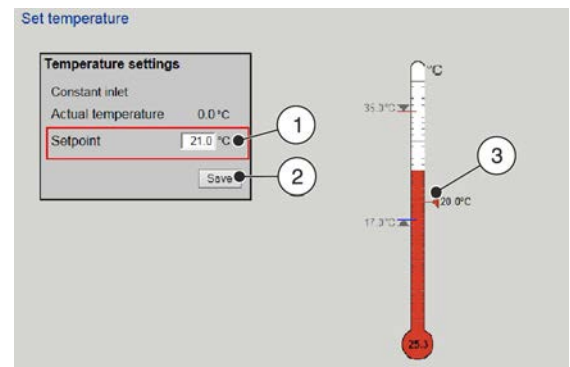


Fig. 47: Setting a temperature setpoint value

2. ▶ Enter the temperature setpoint into the 'Setpoint' field (Fig. 47/1) or move the red triangle on the thermometer (Fig. 47/3) to the required temperature setpoint.
3. ▶ Click on 'Save' (Fig. 47/2).

Extended operation

Personnel:

- Facility manager

The 'Extended operation' (Fig. 48) screen allows you to override the fan speed set in the current weekly program. Override automatically starts and stops at the times you set here. The maximum override period is 7 days.

1. ▶ On the main menu, select 'User' → 'Extended operation'.

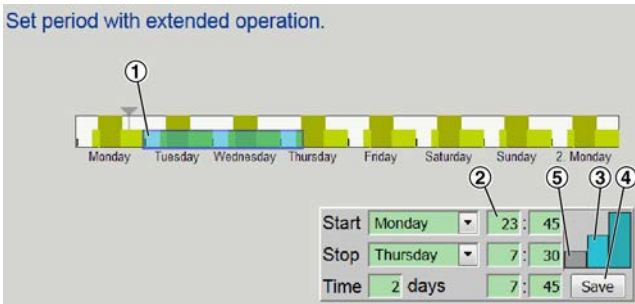


Fig. 48: Setting extended operation

2. ▶ Click on the white area within the week view (Fig. 48/1).
3. ▶ Set the start and stop times (Fig. 48/2) for extended operation.
4. ▶ Click the light-blue rectangle for a low fan speed or the dark-blue rectangle for a high fan speed (Fig. 48/3).
5. ▶ Click on 'Save' (Fig. 48/4).

⇒ Extended operation is activated immediately and overrides the weekly program as soon as the start time is reached. Extended operation ends automatically with the end time.

Note: Manual settings on the control panel override both the 'Weekly program' and 'Extended operation'.



To end extended operation, click on the grey rectangle (Fig. 48/5).

Operating mode for the event of a fire

Personnel:

- Facility manager

Use this function to override the set AHU operating mode in the event of a fire. The supply air and extract air temperature sensors are monitored; if a set value is exceeded, the system generates a fire alarm, and the AHU is controlled according to the settings you make here.

If the actual temperature exceeds the set extract air or supply air temperature:

- A fire alarm ('A' alarm) is generated
- The fan speed is changed
- The fire dampers are actuated
- Heating and cooling systems may be switched off

1. ▶ On the main menu, select 'Service' → 'Air handling unit' → 'Fire alarm'.

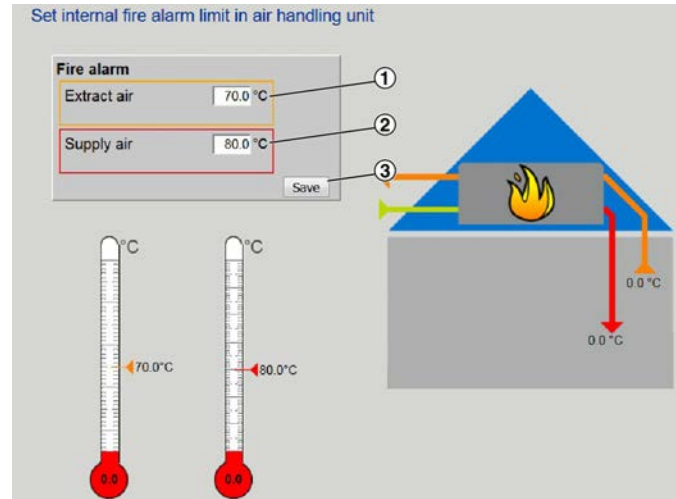


Fig. 49: Setting temperature limits for a fire alarm

2. ▶ Enter the extract air temperature limit (Fig. 49/1).
3. ▶ Enter the supply air temperature limit (Fig. 49/2).
4. ▶ Click on 'Save' (Fig. 49/3).
5. ▶ On the main menu, select 'Installer' → 'Fire' → 'Ventilation'.

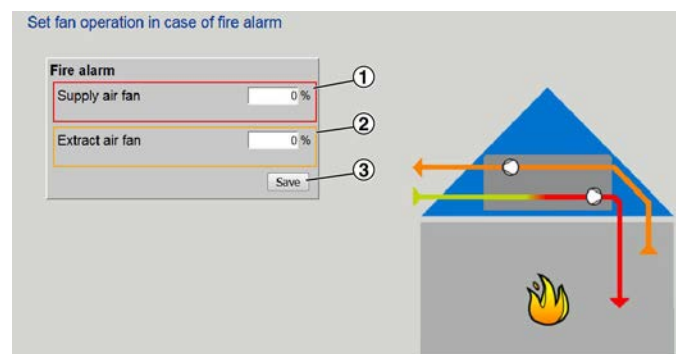


Fig. 50: Setting the fans for the event of a fire

6. ▶ Enter a value for the supply air fan (Fig. 50/1).

If you enter 0%, the fans will be switched off in the event of a fire.

7. ▶ Enter a value for the extract air fan (Fig. 50/2).
8. ▶ Click on 'Save' (Fig. 50/3).
9. ▶ If fire dampers are controlled from the AHU, go to the main menu and select '*Installer* → *Fire* → *Fire damper*'. Then choose for each fire damper what should happen in the event of a fire.

4.8.3 Configuration with the digital control panel

Control panel functions

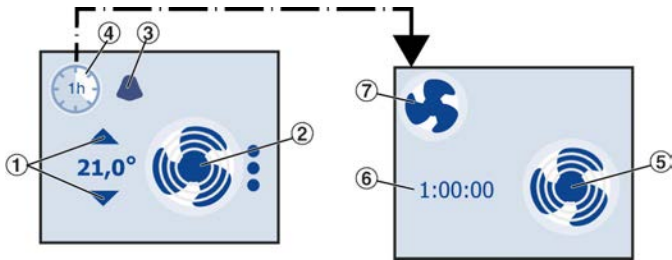


Fig. 51: Display

Function	Symbol	Description
Temperature		Use the arrows ① to set the room temperature setpoint. You can set any value [°C] that is within the range defined on the AHU. If no arrows are being displayed, the AHU has not been set for temperature control.
Ventilation	Select the fan symbol ② to set one of the following modes:	
		Manual ventilation at the lowest speed (fan stage).
		Manual ventilation at the highest speed (fan stage).
		Automatic ventilation; the fan speed depends on the weekly program.
		Ventilation off.
Fault	Fault ③	
		Fault that does not affect the function of the AHU. (blue)
		The AHU has been stopped due to a fault. Service required. (red)
Boost		Select this symbol ④ to set the maximum fan speed (max. ventilation, boost).
		Select this symbol ⑤ to set the 'boost timer' ⑥. The system goes into boost mode if there has been no user input for approx. 10 seconds.
		To end boost mode, select this symbol ⑦.

4.9 Switching the AHU off

Personnel:

- Facility manager

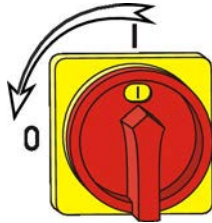


Fig. 52: How to turn the mains isolator

1. ▶ Turn the mains isolator for the AHU to the '0' position.
 - ⇒ The AHU shuts down. The touch panel is switched off.
2. ▶ Secure the AHU against being switched on accidentally, see [Chapter 2.5 'Securing the unit against being switched on accidentally'](#) on page 10.
 - ⇒ The AHU has been secured against being switched on accidentally. It is safe to start working now.

Downtime for more than 3 months

If downtime lasts 3 months or longer:

- Physically disconnect the entire AHU from the mains.
- Ensure that any residual energy is dissipated.
- Remove all operating and auxiliary materials and all fluids and dispose of them in an environmentally friendly manner.

Downtime of 1 year or longer

If downtime lasts 1 year or longer:

- Replace the bearings.
- If an automatic lubricator for the bearings is in place, remove the used lubricant and replace it with new lubricant; follow the instructions of the fan manufacturer.
- Remove the droplet eliminator and demister for cleaning.

4.10 After shutdown

Decommissioning

WARNING!

Risk of injury from incorrect decommissioning!

Incorrect decommissioning may lead to dangerous situations.

- Appoint an HVAC technician for decommissioning.
- Appoint a skilled qualified electrician and refrigeration technician for decommissioning.

Decommissioning if there is a risk of frost

A decommissioned AHU has to be protected from frost. This requires that you drain the following components after the AHU has been shut down:

- Heating coil
- Cooling coil
- Condensate drip trays
- Drain traps

Decommissioning the rotary heat exchanger

If the unit is down for up to 3 months (e.g. in summer), start the fan every 2 weeks so it retains its self-cleaning function.

5 Maintenance

The air handling unit requires regular maintenance. Regular care and maintenance ensure operational readiness, functional reliability and long service life of the air handling unit.



Maintenance can also be performed by the TROX Technical Service (optional) (↪ 'TROX Technical Service' on page 3).

5.1 Safety notes regarding maintenance

Incorrect maintenance

WARNING!

Risk of injury from incorrect maintenance!

Incorrect maintenance can cause serious injuries and considerable damage to property.

- Before you start maintenance, switch off the air handling unit and secure it against being restarted accidentally.
- Have only authorised persons carry out maintenance.
- Before you start, make sure that there is sufficient clearance for the work you have to complete.
- Keep the work area tidy and clean. Parts and tools that are loosely stacked or left lying around are a source of accident.
- When you reinstall previously removed parts, follow the correct procedure, use all fixing elements and tighten all screws with the correct torque.
- Before you recommission the unit, make sure that:
 - All maintenance jobs have been completed according to this manual.
 - Nobody is inside the AHU.
 - All inspection access panels and covers have been closed.
 - All safeguards have been installed and function correctly.

Inspection access panels tipping over

WARNING!

Risk of injury from inspection access panels falling or tipping over!

When you open or move inspection access panels, they may fall or tip over. Falling or toppling loads can cause serious injuries.

- Be careful when you move inspection access panels.
- After setting an inspection access panel down, secure it to prevent it from tipping over.
- Wear protective gloves and safety shoes when you open an inspection access panel.

Working at height

WARNING!

Risk of a fall when you work at height!

Working at height without using any fall protection equipment, or using unsuitable or damaged equipment to get up to where you work at height, may lead to yourself or others falling from height; people on the ground may be at risk from falling parts or tools. This can cause serious or even fatal injuries.

- Wear a safety harness.
- Only access roofs with suitable and intact fall protection equipment in place (ladders, railings, safety harness).
- Start working only if the components you have to work on are easily accessible.
- Stop materials or objects from falling.
- Wear safety shoes, protective clothing and a hard hat.

Rotating parts of a fan

 **WARNING!**

Risk of injury from rotating parts in the fan!

Rotating parts in the fan can cause serious injuries.

- Do not reach into the moving fan or tamper with it.
- Do not open any covers or inspection access panels while the unit is in operation.
- Make sure that the rotor is inaccessible while in operation.
- The fan does not stop immediately! Check that no parts are moving before you open an inspection access panel.
- Switch off the AHU before you start working on movable fan parts and secure it against accidentally being switched on again, ↪ *Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10*. Wait until all parts have come to a standstill.

Movable parts of multileaf dampers

 **WARNING!**

Crushing hazard from movable parts!

Closing multileaf dampers may crush your hands and arms.

- Do not reach between the damper blades.
- Prevent access to crush points: Either install dampers on ducts or use fixed guards.
- Before you open an inspection access panel, switch off the air handling unit and secure it against being switched on accidentally.

Rotating parts of the rotary heat exchanger

 **WARNING!**

Risk of injury from rotating parts in the rotary heat exchanger!

Rotating parts in the rotary heat exchanger can cause serious injuries.

- Do not reach into the moving storage mass or tamper with it.
- Do not open any covers or inspection access panels while the unit is in operation.
- Make sure that the storage mass is inaccessible while in operation.
- Switch off the system before you start working on movable parts of the rotary heat exchanger and secure it against accidentally being switched on again, ↪ *Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10*. Wait until all parts have come to a standstill.

5.2 Securing the unit against being switched on accidentally

See: ↪ *Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10*

5.3 Maintenance plan

The following sections describe the maintenance jobs required to ensure efficient and fault-free operation.

If during regular checks you detect increased wear, change the maintenance intervals accordingly and carry out more frequent checks for wear and tear. If you have any questions about maintenance and maintenance intervals, contact the TROX Technical Service, ☎ 'TROX Technical Service' on page 3.



You may also commission the TROX Technical Service to carry out maintenance (☎ 'TROX Technical Service' on page 3).

AHU hygiene inspection

Interval	Maintenance work	Personnel
Every two years	Check AHU for hygienic conditions.	Hygiene inspector





Ducting and air terminal devices (by others)

Interval	Maintenance work	Personnel
Every 6 months	Check supply air and extract air terminal devices for contamination, damage and corrosion. If necessary, clean and repair them according to the manufacturer's instructions.	Facility manager
	Check external weather louvres for contamination, damage and corrosion. If necessary, clean and repair them according to the manufacturer's instructions.	Facility manager
	Check ducts for damage. If necessary, repair them according to the manufacturer's instructions.	Facility manager
	Check flexible connectors for leakage, correct function and damage. If necessary, repair them according to the manufacturer's instructions.	Facility manager
Every 12 months	Clean supply air and extract air terminal devices.	Facility manager
	Check outdoor air and exhaust air terminal devices for contamination, damage and corrosion. If necessary, clean and repair them according to the manufacturer's instructions.	Facility manager
	Check the inside of ducts in at least 2 spots for contamination, damage, corrosion and condensation. If necessary, check further spots and determine whether cleaning is required.	Facility manager
	Check flexible connectors for leakage, correct function and damage.	Facility manager

AHU casing

Interval	Maintenance work	Personnel
Every 6 months	Visually check AHU casing units for contamination, damage and corrosion. Clean if necessary.	Facility manager
Every 12 months	Check joints between AHU casing units for leakage.	Facility manager
	Check casing for condensation build-up.	Facility manager
	Check panel seals.	Facility manager
	Check panel seals and fasteners for firm fit and function.	Facility manager
	Check equipotential bonding.	Facility manager

 **Filter**

Interval	Maintenance work	Personnel
Every month	Visually check filter element for contamination, ↪ Chapter 5.4.2  'Checking the filter element for contamination' on page 55 . Replace filter element if the maximum differential pressure is exceeded, ↪ Chapter 5.4.4  'Replacing the filter element' on page 58 .	Facility manager
	Check filter element for odours and moisture penetration. Replace filter element, if necessary, ↪ Chapter 5.4.4  'Replacing the filter element' on page 58 .	Facility manager
	Check filter frames and clamping rails for contamination, secure seating, damage and corrosion. Clean if necessary.	Facility manager
Every 12 months	Replace filter elements, ↪ Chapter 5.4.4  'Replacing the filter element' on page 58 .	Facility manager
	Check filter frames and clamping rails for secure seating, damage and corrosion.	Facility manager

 **Cooling coil**

Interval	Maintenance work	Personnel
Every 3 months	Check condensate drip tray and droplet eliminator for contamination, damage, corrosion and leakage. Clean and repair if necessary.	Facility manager
	Check function of condensate drain and drain trap. Clean and repair if necessary.	Facility manager
Every 6 months	Check heat exchanger for contamination, damage, corrosion and leakage.	HVAC technician
Every 12 months	Check function of feed and return pipes.	HVAC technician
	Check condensate drip tray and droplet eliminator for contamination, damage and corrosion.	Facility manager
	Check function of condensate drain and drain trap.	Facility manager

 **Heating coil**

Interval	Maintenance work	Personnel
Every 6 months	Check heat exchanger for contamination, damage, corrosion and leakage.	HVAC technician
Every 12 months	Check function of feed and return pipes.	HVAC technician

Rotary heat exchanger

Interval	Maintenance work	Personnel
Every 3 months	Visually check the rotary heat exchanger for foreign matter, contamination, hygienic condition, damage and corrosion. Clean if necessary.	Facility manager
	Visually check seals for wear, contamination, foreign matter and contact. The seals must be close to the storage mass, but not in contact with it. Clean if necessary.	Facility manager
	Check drive belt for wear and tension.	HVAC technician
	Visually check the rotor for imbalance and runout.	Facility manager
	Check bearings for overheating, vibration and running noise.	Facility manager
	Check rotor operation monitoring function.	HVAC technician

Multileaf dampers

Do not use oil or grease on multileaf dampers with gears.

Interval	Maintenance work	Personnel
Every 6 months	Visually check for contamination, damage and corrosion.	Facility manager
	Check whether damper blades move smoothly.	Facility manager
	Check function of damper bearings and linkage.	Facility manager
Every 12 months	Check actuator function.	HVAC technician

Electric duct air heater

Interval	Maintenance work	Personnel
Every 6 months	Visually check the electric duct air heater for contamination and damage.	Facility manager
	Check electric duct air heater for correct function.	Skilled qualified electrician

Electric motors

Interval	Maintenance work	Personnel
Every 6 months	Visually check for contamination, damage and corrosion.	Facility manager
	Check motors for bearing noise.	Facility manager
Every 12 months	Check electrical connections.	Skilled qualified electrician
	Measure current consumption and compare it with nominal current.	Skilled qualified electrician
	Check all safeguards for correct function.	Skilled qualified electrician

☞ Centrifugal fan with direct drive

Interval	Maintenance work	Personnel
Every 6 months	Visually check for contamination, damage and corrosion. Clean if necessary.	Facility manager
	Visually check anti-vibration elements for damage and correct function.	Facility manager
	Check seals for fit and damage.	Facility manager
	Check motor for bearing noise.	Facility manager
	Check the equipotential bonding. Repair if necessary.	Skilled qualified electrician

Control valves

Interval	Maintenance work	Personnel
Every 6 months	Visually check for contamination, damage and corrosion. Clean if necessary.	Facility manager
	Check connections and free movement.	Facility manager
Every 12 months	Check function of control valves.	HVAC technician

🔊 Sound attenuator (by others)

Interval	Maintenance work	Personnel
Every 6 months	Visually check for contamination, damage and corrosion. Clean if necessary.	Facility manager

📄 Plate heat exchanger

Interval	Maintenance work	Personnel
Every 3 months	Check condensate drain, condensate drip tray and drain trap for correct function and contamination. Clean if necessary.	Facility manager
Every 6 months	Visually check plate heat exchanger for contamination, damage and corrosion. Clean if necessary.	Facility manager
	Check heat exchanger for leakages.	Facility manager

Electrical components and devices

Interval	Maintenance work	Personnel
Every 6 months	Visually check sensors for contamination, damage and corrosion. Clean if necessary.	Facility manager
Every 12 months	Check sensor connections.	Skilled qualified electrician
	Check sensor function.	Skilled qualified electrician
	Check actuators for contamination, damage and corrosion.	Facility manager
	Check actuator input signals, and check operating and adjustment ranges.	Skilled qualified electrician
	Check anti-frost thermostat.	Facility manager
	Check local isolators.	Skilled qualified electrician

X-CUBE control

Interval	Maintenance work	Personnel
Every 12 months	Check cable glands and terminals for secure seating.	Skilled qualified electrician
	Check for contamination, damage and corrosion.	Facility manager
	Check that all protective covers are in place.	Facility manager
	Check functional elements.	Skilled qualified electrician
	Check switching and control procedures.	Skilled qualified electrician
	Check manual, automatic and remote control functions.	Facility manager

Controls

Interval	Maintenance work	Personnel
Every 12 months	Check that controllers have been correctly installed and check the ambient conditions.	Skilled qualified electrician
	Check integral power supply (backup batteries).	Skilled qualified electrician
	Check functional elements, and operating and display devices.	Facility manager
	Check input signals.	Skilled qualified electrician
	Check circuits and control signals.	Skilled qualified electrician
	Check parameters.	Facility manager

5.4 Maintenance

5.4.1 Opening the inspection access panels

Personnel:

- Facility manager

Protective equipment:

- Industrial safety helmet
- Protective gloves

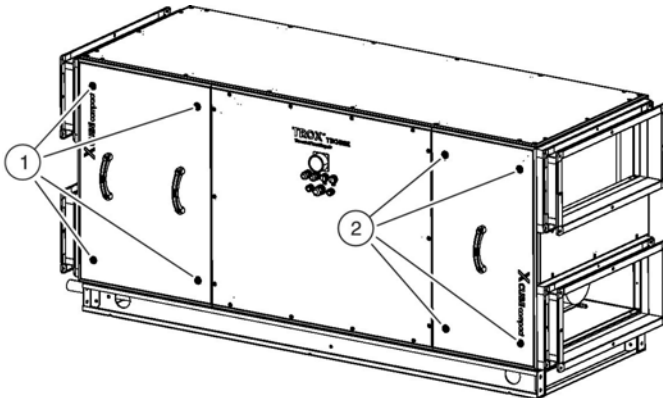


Fig. 53: Opening the inspection access panels

- ▶ Use a 10 mm Allen key to open the compression latches (Fig. 53/1+2) of the left and right inspection access panels at the front.
- ▶ Remove the two inspection access panels by their handles.

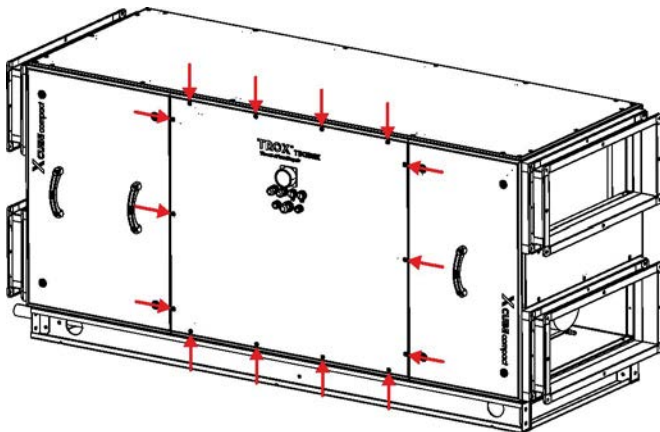


Fig. 54: Inspection access panel in the middle

- ▶ Loosen the screws (Fig. 54/arrows) of the inspection access panel in the middle.
- ▶ Carefully remove the inspection access panel.

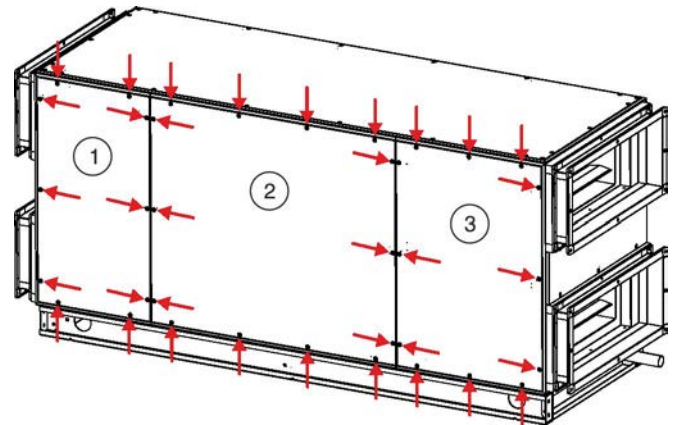


Fig. 55: Inspection access panels at the rear

- ▶ Loosen the screws (Fig. 55/arrows) of the three inspection access panels at the rear (Fig. 55/1+2+3).
- ▶ Remove the three inspection access panels (Fig. 55/1+2+3).
 - ⇒ The inspection access panels are open.

5.4.2 Checking the filter element for contamination

To check the filter element for contamination, check the differential pressure, 'Viewing the operating status' on page 32.

If the maximum differential pressure is exceeded, replace the filter, Chapter 5.4.4 'Replacing the filter element' on page 58.



The maximum differential pressure is given on the filter label on the inspection access panel.

5.4.3 Cleaning the AHU

Unless specified otherwise, use

- lint free cloths
- non-corrosive and silicone free cleaning agents

Unless specified otherwise, use lint free cloths and non-corrosive and silicone free cleaning agents to clean the AHU and AHU casing units.

When you remove dirt or dust, ensure that it does not get into adjacent parts of the system. Remove dirt and dirty water carefully and dispose of them correctly.

🗑️ Cleaning the heating coil

WARNING!

Risk of injury from hot surfaces!

The surfaces of the heating coil can heat up to 100 °C during operation. Skin contact with hot surfaces causes severe skin burns.

- Wear heat-resistant protective clothing and gloves whenever you work near a potentially hot surface.
- Before you start working, make sure that all surfaces have cooled down to ambient temperature.

CAUTION!

Danger of injury from sharp edges, sharp corners and thin sheet metal parts!

Sharp edges, sharp corners and thin sheet metal parts of the heating coil may cause cuts or grazes.

- Be careful when you are working on the heating coil.
- Wear protective gloves, safety shoes and a hard hat.

Clean the heating coil while installed.

Ensure the following:

- Use only water, compressed air or a vacuum cleaner.
- Do not use a high pressure cleaner or high pressure steam cleaner.
- Be careful so as not to damage the fins.
- Use only cleaning agents with a pH value between 7 and 9.
- Prevent dirt and dust from getting into adjacent parts of the system.
- Carefully remove dirt and dirty water.
- Dispose correctly of dirt and dirty water.

🗑️ Cleaning the cooling coil

WARNING!

Risk of injury from cold surfaces!

The surfaces of the cooling coil can cool down to -20 °C during operation. Skin contact with cold surfaces causes frostbite and cold burns.

- Wear protective clothing and gloves that protect you from the cold when you work near a potentially cold surface.
- Before you start working, make sure that all surfaces have warmed up to ambient temperature.

CAUTION!

Danger of injury from sharp edges, sharp corners and thin sheet metal parts!

Sharp edges, sharp corners and thin sheet metal parts of the cooling coil may cause cuts or grazes.

- Be careful when you are working on the cooling coil.
- Wear protective gloves, safety shoes and a hard hat.

Clean the cooling coil while installed.

Ensure the following:

- Use only water, compressed air or a vacuum cleaner.
- Do not use a high pressure cleaner or high pressure steam cleaner.
- Be careful so as not to damage the fins.
- Use only cleaning agents with a pH value between 7 and 9.
- Prevent dirt and dust from getting into adjacent parts of the system.
- Carefully remove dirt and dirty water.
- Dispose correctly of dirt and dirty water.

🗑️ Cleaning the rotary heat exchanger

CAUTION!

Danger of injury from sharp edges, sharp corners and thin sheet metal parts!

Sharp edges, sharp corners and thin sheet metal parts of the rotary heat exchanger may cause cuts or grazes.

- Be careful when you are working on the rotary heat exchanger.
- Wear protective gloves, safety shoes and a hard hat.

If the rotary heat exchanger has been idle for 14 days or more, you should clean it; clean it while installed.

Please note:

- Clean gently – the storage mass is very thin (<0.1 mm).
- Remove dust and fibres with a soft brush or a vacuum cleaner.
- Use only water, compressed air or a vacuum cleaner.
- If you use air or water for cleaning, make sure that the air or water jet is parallel to the fins as otherwise they may become damaged.

- If you use a high-pressure cleaner or a high-pressure steam cleaner:
 - Use a flat 40° nozzle (type WEG40/04).
 - Water pressure of 100 bar max.
- Remove oils with hot water (70 °C max.) or degreasing cleaning agents or by immersion.
- Be careful so as not to damage the fins.
- Use only cleaning agents with a pH value between 7 and 9.
- When you remove dirt or dust, ensure that it does not get into adjacent parts of the system.
- Carefully remove dirt and dirty water.
- Dispose correctly of dirt and dirty water.

Cleaning the plate heat exchanger

CAUTION!

Danger of injury from sharp edges, sharp corners and thin sheet metal parts!

Sharp edges, sharp corners and thin sheet metal parts of the plate heat exchanger may cause cuts or grazes.

- Be careful when you are working on the plate heat exchanger.
- Wear protective gloves, safety shoes and a hard hat.

Ensure the following:

- Use only water, compressed air or a vacuum cleaner.
- Do not use a high pressure cleaner or high pressure steam cleaner.
- Direct air jets or water jets only at an angle of 90° onto surfaces.
- Be careful so as not to damage the fins.
- Use only cleaning agents with a pH value between 7 and 9.
- Prevent dirt and dust from getting into adjacent parts of the system.
- Carefully remove dirt and dirty water.
- Dispose correctly of dirt and dirty water.

Removing the plate heat exchanger

Personnel:



- Facility manager

Protective equipment:

- Safety harness
- Industrial safety helmet
- Safety shoes
- Protective gloves

Special tool:

- TROX special key

1. ▶ Switch off the air handling unit and secure it against being switched on accidentally,  Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.
2. ▶ Open the inspection access panels for the plate heat exchanger,  Chapter 5.4.1 'Opening the inspection access panels' on page 55.

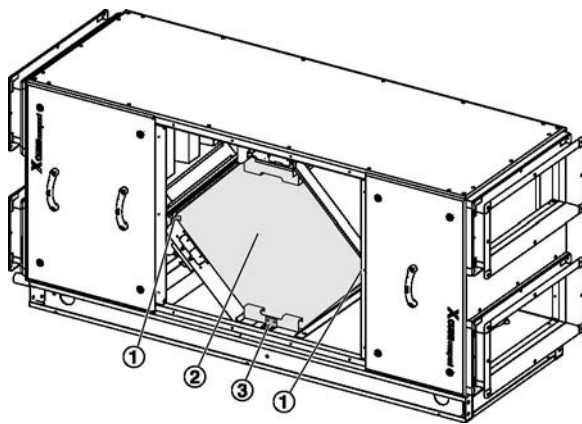


Fig. 56: Removing the brackets

3. ▶ Remove the two brackets at the sides (Fig. 56/1) of the plate heat exchanger and the one at the bottom (Fig. 56/1).

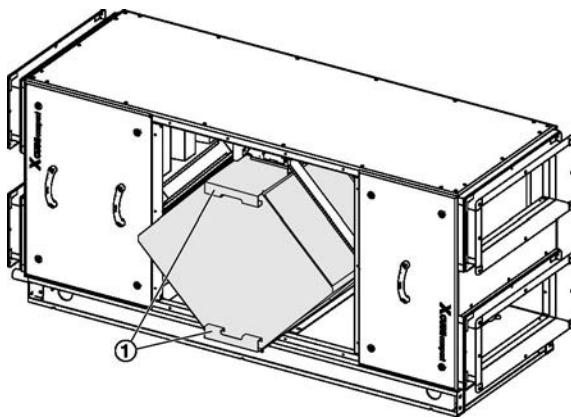


Fig. 57: Pulling out the plate heat exchanger

4. ▶ Pull out the plate heat exchanger by the handles (Fig. 57/1).
 - ⇒ The plate heat exchanger has been removed.
5. ▶ Clean the plate heat exchanger.
6. ▶ Re-install the plate heat exchanger by following the steps in reverse order.
7. ▶ Close the inspection access panels.
8. ▶ Prepare restart, ⚡ 'Before you start the AHU' on page 24.
9. ▶ Remove the padlock from the mains isolator.
10. ▶ Restart the air handling unit, ⚡ Chapter 4.5 'Starting the air handling unit' on page 25.

5.4.4 ➤ Replacing the filter element

Missing filter element

⚠ CAUTION!

Risk of injury due to a missing filter element!

If no filter element has been fitted in the AHU, dust and germs can get into the ventilation system and will be spread by the AHU. People may fall seriously ill as a consequence.

- Do not put the AHU into operation if no filter element has been fitted.
- Make sure that enough spare filter elements are readily available.

Replacing a filter element on a mounting rail

Personnel:

- Facility manager

Protective equipment:

- Safety harness
- Industrial safety helmet
- Safety shoes
- Protective gloves

Special tool:

- TROX special key

1. ▶ Switch off the air handling unit and secure it against being switched on accidentally, [Chapter 2.5 'Securing the unit against being switched on accidentally'](#) on page 10.
2. ▶ Open the inspection access panels for the filter, [Chapter 5.4.1 'Opening the inspection access panels'](#) on page 55.

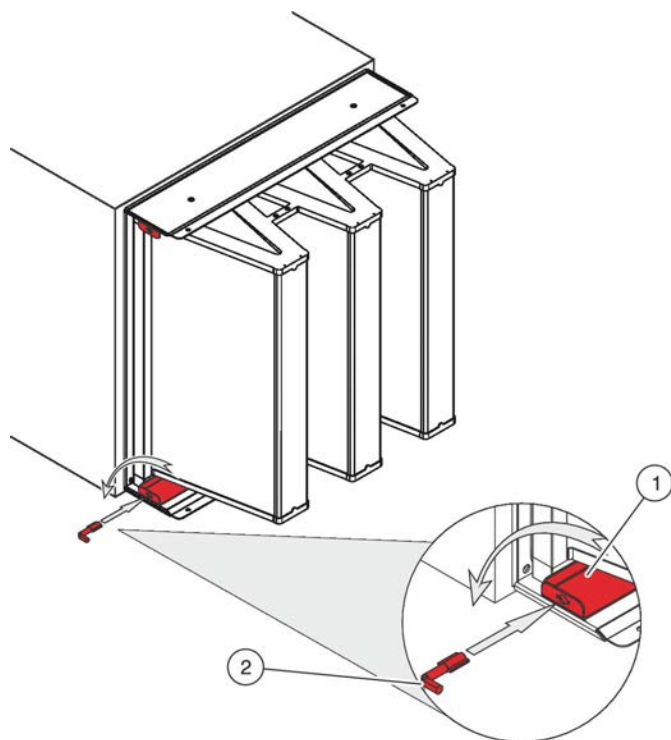


Fig. 58: Inserting the special key

3. ▶ Insert the special key (Fig. 58/2) into the recess of each clamping rail (Fig. 58/1) and turn it anti-clockwise by 90°.

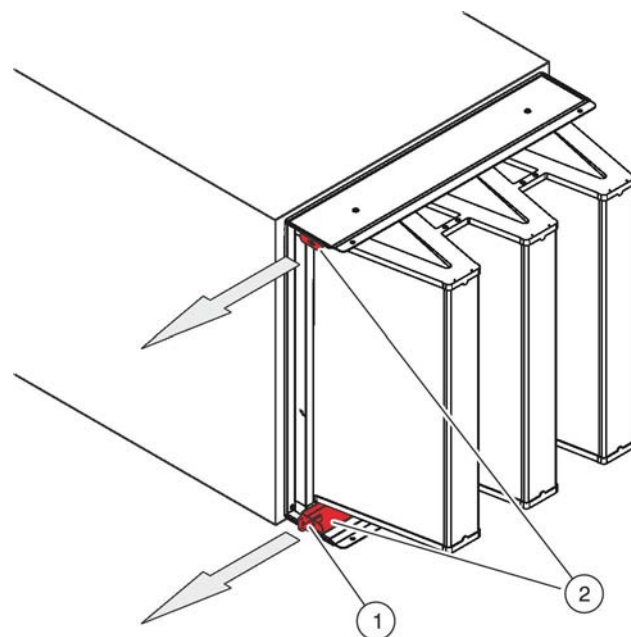


Fig. 59: Releasing the clamping rails

4. ▶ Use the special key (Fig. 59/1) to pull out the clamping rails (Fig. 59/2) as far as they will go.
 - ⇒ The filter element has been released.

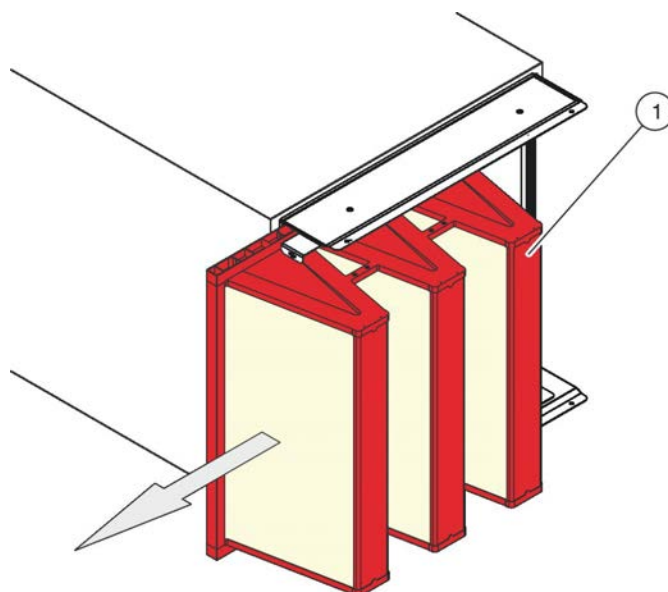


Fig. 60: Removing the filter element

5. ▶ Pull out the filter element (Fig. 60/1) sideways.

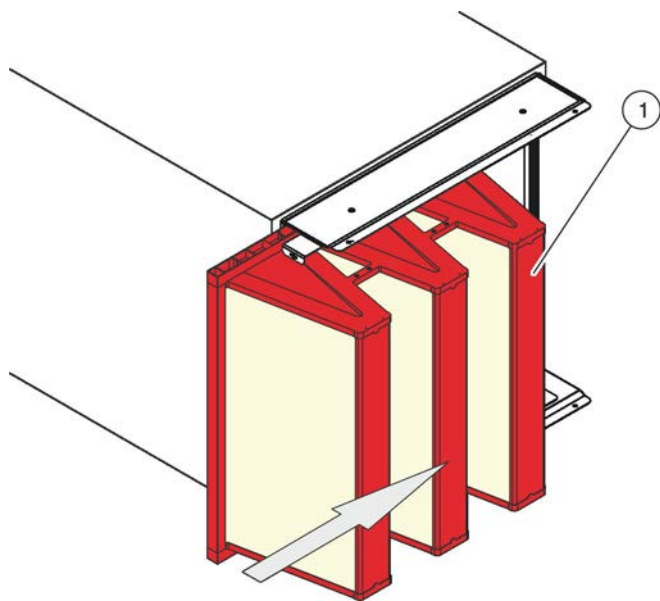


Fig. 61: Replacing the filter element

6. ▶ Slide the new filter element (Fig. 61/1) in from the side.

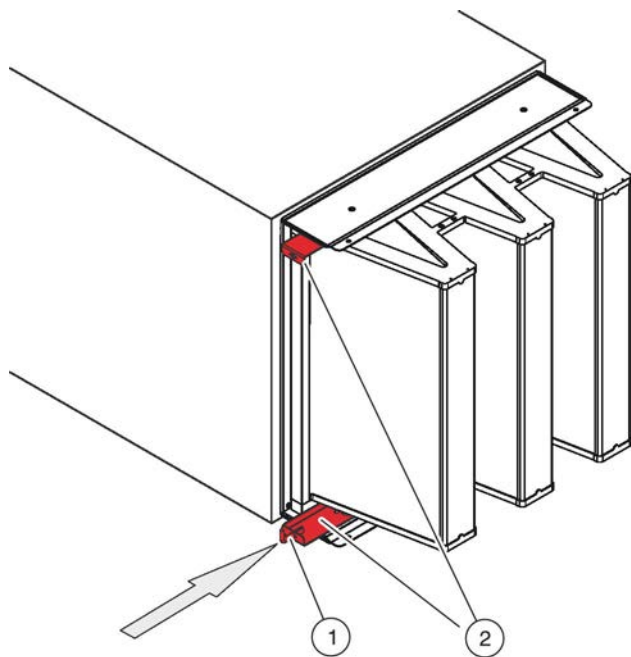


Fig. 62: Pushing the clamping rails in

7. ▶ Use the special key (Fig. 62/1) to push the clamping rails (Fig. 62/2) in as far as they will go.
 - ⇒ The filter element has been fitted.
8. ▶ Close the inspection access panels.
9. ▶ Prepare restart, ⚡ 'Before you start the AHU' on page 24.
10. ▶ Remove the padlock from the mains isolator.
11. ▶ Restart the air handling unit, ⚡ Chapter 4.5 'Starting the air handling unit' on page 25.

12. ▶ Go to the X-CUBE control user interface and enter the new filter element (see software documentation).

5.5 After maintenance

Personnel:

- Facility manager

1. ▶ Prepare restart, ⚡ 'Before you start the AHU' on page 24.
2. ▶ Remove the padlock from the mains isolator.
3. ▶ Restart the air handling unit, ⚡ Chapter 4.5 'Starting the air handling unit' on page 25.

6 Faults

6.1 Safety notes regarding troubleshooting

Incorrect troubleshooting

WARNING!

Risk of injury due to incorrect troubleshooting!

Incorrect troubleshooting can cause serious injuries and considerable damage to property.

- Before you start maintenance, switch off the air handling unit and secure it against being restarted accidentally.
- Refer to the list of possible faults to see who should or should not clear a fault.
- Before you start, make sure that there is sufficient clearance for the work you have to complete.
- Keep the work area tidy and clean. Parts and tools that are loosely stacked or left lying around are a source of accident.
- Before you recommission the unit, make sure that:
 - All faults have been rectified according to this manual.
 - Nobody is inside the AHU.
 - All inspection access panels and covers have been closed.
 - All safeguards have been installed and function correctly.

Inspection access panels tipping over

WARNING!

Risk of injury from inspection access panels falling or tipping over!

When you open or move inspection access panels, they may fall or tip over. Falling or toppling loads can cause serious injuries.

- Be careful when you move inspection access panels.
- After setting an inspection access panel down, secure it to prevent it from tipping over.
- Wear protective gloves and safety shoes when you open an inspection access panel.

Rotating parts of a fan

WARNING!

Risk of injury from rotating parts in the fan!

Rotating parts in the fan can cause serious injuries.

- Do not reach into the moving fan or tamper with it.
- Do not open any covers or inspection access panels while the unit is in operation.
- Make sure that the rotor is inaccessible while in operation.
- The fan does not stop immediately! Check that no parts are moving before you open an inspection access panel.
- Switch off the AHU before you start working on movable fan parts and secure it against accidentally being switched on again, see *Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10*. Wait until all parts have come to a standstill.

Movable parts of multileaf dampers

WARNING!

Crushing hazard from movable parts!

Closing multileaf dampers may crush your hands and arms.

- Do not reach between the damper blades.
- Prevent access to crush points: Either install dampers on ducts or use fixed guards.
- Before you open an inspection access panel, switch off the air handling unit and secure it against being switched on accidentally.

Rotating parts of the rotary heat exchanger

⚠ WARNING!

Risk of injury from rotating parts in the rotary heat exchanger!

Rotating parts in the rotary heat exchanger can cause serious injuries.

- Do not reach into the moving storage mass or tamper with it.
- Do not open any covers or inspection access panels while the unit is in operation.
- Make sure that the storage mass is inaccessible while in operation.
- Switch off the system before you start working on movable parts of the rotary heat exchanger and secure it against accidentally being switched on again, *Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.* Wait until all parts have come to a standstill.

6.2 X-CUBE control alarms

Alarms are displayed on the X-CUBE control user interface. Faults are displayed as text messages on the user interface.

You can view alarms on the touch panel or on the web interface. Alarms are displayed as text messages, which you can acknowledge (reset the alarm).

Alarm displays on the touch panel

Personnel:

- Facility manager



Fig. 63: Alarm display

	Reduced operation of the AHU due to a fault. Service required.
(blue)	
	The AHU has been stopped due to a fault. Service required.
(red)	

Alarms are generally acknowledged (reset) automatically as soon as the fault for an alarm has been rectified. Some alarms require manual acknowledgement, e.g. fire alarms.

Resetting alarms

1. ▶ Select 'Menu → Alarms' or the alarm symbol (Fig. 63/1, displays only for current alarms).

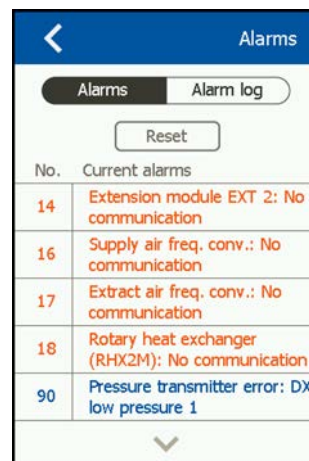


Fig. 64: List of alarms

2. ▶ To reset a current alarm, select 'Reset'. If a fault has not been rectified, it will reappear.

The 'Alarms' screen shows the current alarms. To see earlier alarms, select 'Alarm log'.

Alarm displays on the web interface

Personnel:

- Facility manager

Current alarms are displayed with an alarm number and a text. 'A' alarms are displayed in red, 'B' alarms are displayed in blue.

1. ▶ On the main menu, select 'Service → Alarms'.
⇒ The 'Alarms' screen (Fig. 65) displays.

No.	Alarm
1	Fire alarm
131	FanIO 1 (Air2-FanIO21): No communication
135	Damper actuator (Heat exchanger): ID 133: No communication

Fig. 65: Alarms

2. ▶ Click 'Reset alarms' (Fig. 65) to reset alarms.
⇒ The alarms are then deleted from the list. Current alarms will, however, reappear on the new alarm list.
3. ▶ On the main menu, select 'Service → Alarm log'.
⇒ The 'Alarm log' screen (Fig. 66) displays.

Time	Date	No.	Alarm
10:41	12.01.2016	135	Damper actuator (Heat exchanger): ID 133: No communication
10:41	12.01.2016	131	FanIO 1 (Air2-FanIO21): No communication
10:41	12.01.2016	1	Fire alarm
9:02	11.01.2016	135	Damper actuator (Heat exchanger): ID 133: No communication
9:02	11.01.2016	131	FanIO 1 (Air2-FanIO21): No communication
9:02	11.01.2016	1	Fire alarm
8:59	11.01.2016	135	Damper actuator (Heat exchanger): ID 133: No communication
8:59	11.01.2016	132	FanIO 2 (Air2-FanIO21): No communication
8:59	11.01.2016	131	FanIO 1 (Air2-FanIO21): No communication
8:59	11.01.2016	1	Fire alarm
12:02	6.01.2016	135	Damper actuator (Heat exchanger): ID 133: No communication
12:02	6.01.2016	131	FanIO 1 (Air2-FanIO21): No communication
12:02	6.01.2016	1	Fire alarm
6:54	15.12.2015	135	Damper actuator (Heat exchanger): ID 133: No communication
6:54	15.12.2015	131	FanIO 1 (Air2-FanIO21): No communication
6:54	15.12.2015	1	Fire alarm

Fig. 66: List of alarms

4. ▶ The list of alarms (Fig. 66) shows the last 16 alarms, including date and time and alarm number.
5. ▶ On the main menu, select 'Service → Alarm forecast'.
⇒ The 'Possible alarms' list (Fig. 67) displays.

Time	No.	Possible alarms
------	-----	-----------------

Fig. 67: Possible alarms

These are alarms which occurred, but have not yet been activated by the system.

For an overview of 'A' alarms and 'B' alarms, limit values and delays, see the list of alarms in the appendix (☞ Appendix 'List of alarms' on page 86).

6.3 List of faults



You may also commission the TROX Technical Service to carry out maintenance (☞ 'TROX Technical Service' on page 3).

Fault description	Cause	Remedy	Personnel
The supply air flow rate is not sufficient.	The filter element is contaminated.	In this order: <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ☞ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10. Replace the filter element, ☞ Chapter 5.4.4 ☞ Replacing the filter element' on page 58. 	Facility manager
	The operating time has been exceeded.	In this order: <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ☞ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10. Replace the filter element, ☞ Chapter 5.4.4 ☞ Replacing the filter element' on page 58. 	Facility manager
	Service life has been exceeded.	In this order: <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ☞ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10. Replace the filter element, ☞ Chapter 5.4.4 ☞ Replacing the filter element' on page 58. 	Facility manager
Frost protection is active.	The anti-frost thermostat detected a low temperature, and frost protection has been activated to ensure that no AHU components freeze and become damaged. The AHU has been switched off automatically.	In this order: <ul style="list-style-type: none"> Secure the AHU against being switched on accidentally, ☞ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10. Check the thermostat settings. The temperature set on the thermostat must not be lower than 5 °C. Check whether cooling coil, heating coil and/or run around coil system contain heat transfer fluid. If necessary, replenish the heat transfer fluid according to the instructions from the system or component manufacturer. 	Facility manager
Preventive frost protection is active.	Preventive frost protection mode has been activated to protect the heating coils.	In this order: <ul style="list-style-type: none"> Secure the AHU against being switched on accidentally, ☞ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10. 	Facility manager

Fault description	Cause	Remedy	Personnel
Preventive frost protection is active.	Preventive frost protection mode has been activated to protect the heating coils.	<ul style="list-style-type: none"> Check the thermostat settings. The temperature set on the thermostat must not be lower than 5 °C. Check whether cooling coil, heating coil and/or run around coil system contain heat transfer fluid. If necessary, replenish the heat transfer fluid according to the instructions from the system or component manufacturer. 	
Fire damper has been triggered – unit has been switched off.	There is a fire. The AHU has been switched off automatically.	Initiate fire-fighting.	Facility manager
	The fusible link is defective. The AHU has been switched off automatically.	Contact the TROX Technical Service, <i>↪ 'TROX Technical Service' on page 3.</i>	Facility manager
Fire damper has been triggered – unit has not been switched off.	There is a fire.	Initiate fire-fighting.	Facility manager
	The fusible link is defective.	Contact the TROX Technical Service, <i>↪ 'TROX Technical Service' on page 3.</i>	Facility manager
Locked by central fire alarm system	There is a fire. The fire alarm system (by others) has generated an alarm. The AHU has been switched off automatically.	Initiate fire-fighting.	Facility manager
	False alarm. The fire alarm system (by others) has generated an alarm. The AHU has been switched off automatically.	The fire alarm system should be inspected; contact the manufacturer of the fire alarm system.	Facility manager
Fault – 24 V control voltage.	The 24 V DC power supply unit in the electrical console is faulty. The AHU has been switched off automatically.	Commission a skilled qualified electrician to rectify the fault.	Facility manager
	A short circuit (24 V DC) has occurred. The AHU has been switched off automatically.	Commission a skilled qualified electrician to rectify the fault.	Facility manager
Fault – MCB.	The circuit breaker in the electrical console was triggered due to a short circuit.	<p>In this order:</p> <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, <i>↪ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
MCB for the extract air fan has been tripped.	Motor current too high due to blocked motor. The MCB for the fan motor has been tripped, and the AHU has been switched off.	<p>In this order:</p> <ul style="list-style-type: none"> Secure the AHU against being switched on accidentally, <i>↪ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
	Motor current too high due to short circuit. The MCB for the fan motor has been tripped, and the AHU has been switched off.	<p>In this order:</p> <ul style="list-style-type: none"> Secure the AHU against being switched on accidentally, <i>↪ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> 	Facility manager

List of faults

Fault description	Cause	Remedy	Personnel
MCB for the extract air fan has been tripped.	Motor current too high due to short circuit. The MCB for the fan motor has been tripped, and the AHU has been switched off.	<ul style="list-style-type: none"> Commission a skilled qualified electrician to rectify the fault. 	
	Motor current too high due to defective bearings. The MCB for the fan motor has been tripped, and the AHU has been switched off.	<p>In this order:</p> <ul style="list-style-type: none"> Secure the AHU against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
MCB for the pump has been tripped.	Motor current too high due to blocked motor. The MCB for the heating coil pump has been tripped.	Commission a skilled qualified electrician to rectify the fault.	Facility manager
	Motor current too high due to short circuit. The MCB for the heating coil pump has been tripped.	Commission a skilled qualified electrician to rectify the fault.	Facility manager
	Motor current too high due to defective bearings. The MCB for the heating coil pump has been tripped.	Commission a skilled qualified electrician to rectify the fault.	Facility manager
There is an external lock (AHU has not been released).	The AHU has been switched off due to an external lock.	Release of the external lock is required.	Facility manager
Alarm. The rotor operation monitoring function has detected a problem.	The rotor operation monitoring function has detected a problem.	<p>In this order:</p> <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Visually check the V-belt for damage; contact a skilled qualified electrician for repair, if necessary. 	Facility manager
Defective Modbus cable system.	The bus cable in the AHU has become detached or cut.	Commission a skilled qualified electrician to rectify the fault.	Facility manager
Pump fault.	The communication cable to the component has become detached or cut.	<p>In this order:</p> <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
	No voltage is supplied to the component.	<p>In this order:</p> <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager

Fault description	Cause	Remedy	Personnel
Valve not functioning.	The communication cable to the component has become detached or cut.	In this order: <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
	No voltage is supplied to the component.	In this order: <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
Multileaf damper not functioning (Modbus fault).	The communication cable to the component has become detached or cut.	In this order: <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
	No voltage is supplied to the component.	In this order: <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
Differential pressure sensor not functioning (Modbus fault).	The communication cable to the component has become detached or cut.	In this order: <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
	No voltage is supplied to the component.	In this order: <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
Bypass damper for the plate heat exchanger not functioning (Modbus fault).	The communication cable to the component has become detached or cut.	In this order: <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager

List of faults

Fault description	Cause	Remedy	Personnel
Bypass damper for the plate heat exchanger not functioning (Modbus fault).	The communication cable to the component has become detached or cut.	<ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, <i>☞ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	
	No voltage is supplied to the component.	<p>In this order:</p> <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, <i>☞ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
Speed of the rotary heat exchanger is too high or too low (Modbus fault).	The communication cable to the component has become detached or cut.	<p>In this order:</p> <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, <i>☞ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
	No voltage is supplied to the component.	<p>In this order:</p> <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, <i>☞ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
Rotary heat exchanger alarm has been generated (Modbus fault).	The communication cable to the component has become detached or cut.	<p>In this order:</p> <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, <i>☞ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
	No voltage is supplied to the component.	<p>In this order:</p> <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, <i>☞ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> Commission a skilled qualified electrician to rectify the fault. 	Facility manager
Electric duct air heater not functioning (Modbus fault).	The communication cable to the component has become detached or cut.	<p>In this order:</p> <ul style="list-style-type: none"> Switch off the AHU and secure it against being switched on accidentally, <i>☞ Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> 	Facility manager

Fault description	Cause	Remedy	Personnel
Electric duct air heater not functioning (Modbus fault).	The communication cable to the component has become detached or cut. No voltage is supplied to the component.	<ul style="list-style-type: none"> ■ Commission a skilled qualified electrician to rectify the fault. <p>In this order:</p> <ul style="list-style-type: none"> ■ Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> ■ Commission a skilled qualified electrician to rectify the fault. 	Facility manager
Internal fault with supply air fan; acknowledgement on AHU may be necessary.	The integral frequency inverter for the fan is not functioning correctly. The AHU has been switched off.	<p>In this order:</p> <ul style="list-style-type: none"> ■ Secure the AHU against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> ■ Commission a skilled qualified electrician to rectify the fault. 	Facility manager
Internal fault with extract air fan; acknowledgement on AHU may be necessary.	The integral frequency inverter for the fan is not functioning correctly. The AHU has been switched off.	<p>In this order:</p> <ul style="list-style-type: none"> ■ Secure the AHU against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> ■ Secure the AHU against being switched on accidentally. ■ Commission a skilled qualified electrician to rectify the fault. 	Facility manager
The thermal cut-out for the electric heater has been triggered.	The airflow above the air heater is too low. The air heater is overheating.	<p>In this order:</p> <ul style="list-style-type: none"> ■ Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> ■ Commission a skilled qualified electrician to rectify the fault. 	Facility manager
Electric duct air heater – consolidated alarms.	The thermal cut-out on the air heater has been triggered.	<p>In this order:</p> <ul style="list-style-type: none"> ■ Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> ■ Commission a skilled qualified electrician to rectify the fault. 	Facility manager
The airflow monitor for the electric duct air heater has been triggered.	No airflow. Ducts have been shut off.	<p>In this order:</p> <ul style="list-style-type: none"> ■ Switch off the AHU and secure it against being switched on accidentally, ↪ <i>Chapter 2.5 'Securing the unit against being switched on accidentally' on page 10.</i> ■ Commission a skilled qualified electrician to rectify the fault. 	Facility manager

After troubleshooting

6.4 Troubleshooting

➤ Replacing a filter element

See: ↗ *Chapter 5.4.4* ➤ *Replacing the filter element*
on page 58

6.5 After troubleshooting

Personnel:

- Facility manager
- 1. ▶ Prepare restart, ↗ *'Before you start the AHU'*
on page 24.
- 2. ▶ Remove the padlock from the mains isolator.
- 3. ▶ Restart the air handling unit, ↗ *Chapter*
4.5 *'Starting the air handling unit'* on page 25.

7 Replacement parts

7.1 Safety notes regarding replacement parts

Incorrect replacement parts

 **WARNING!**

Risk of injury from the use of incorrect replacement parts!

Incorrect or faulty replacement parts pose a risk to health and safety, and their use can cause malfunction, damage to property and total failure of equipment.

- Use only original replacement parts from TROX.

 **WARNING!**

Risk of injury from the incorrect installation of replacement parts!

Incorrect installation of replacement parts can lead to dangerous situations.

- Filter elements may be replaced by facility managers.
All other replacement parts have to be installed by the TROX Technical Service, skilled qualified electricians or HVAC technicians.

7.2 Ordering replacement parts



One spare filter element should always be available such that the air handling unit does not have to be switched off.

Replacement parts can be ordered from the TROX Technical Service, ☎ 'TROX Technical Service' on page 3.

8 Accessories

Accessories

TROX special key

9 Disassembly and disposal

9.1 Safety notes regarding disassembly and disposal

Incorrect disassembly

DANGER!

Risk to life from incorrect assembly and disassembly!

Incorrect assembly or disassembly can result in risks to life and limb and in environmental hazards.

- Before you start disassembly, professionally disconnect all electrical cables.
 - Only a skilled qualified electrician must disconnect the power supply.
 - Ensure that no voltage is present.
- Before you start disassembly, correctly drain all operating fluids.
 - Disconnect operating fluid pipes and hoses.
 - Ensure that operating fluids are disposed of correctly.
- If you have any questions regarding disassembly, refer to the assembly instructions in this manual.

Pay attention to the component manufacturers' documentation.
- Only trained specialist personnel must remove any components.
- If necessary, use additional personal protective equipment for outdoor installations, e.g. a safety harness.

Improper transport equipment

WARNING!

Risk to life from using improper transport equipment!

If packages are lifted without adequate transport equipment and if they are not properly secured, they may fall off and lead to fatal injuries.

- Move components only in the position in which they are to be installed.
- Stand clear of suspended loads.
- Do not move additional loads on top of a package.
- Use only the intended lashing points.
- Make sure that no load is imposed on pipes, ducts or cables.
- Use only approved lifting gear and slings that are suitable and sufficient for the load to be carried.
- Do not tie ropes and chains or make knots or place them on sharp edges.
- Use lifting equipment only to lift packages or units, not to push or pull them.
- Ensure that ropes, belts and chains do not twist.
- Ensure that transport equipment has been correctly assembled, fastened and secured before you use it to lift anything.
- Secure all doors, dampers and panels.
- Move packages without any jerky movements and put them down when you leave your workplace.
- Lifting eyes are designed for one-time use only and not for permanently suspending loads.
- Transport tubes are designed for one-time use only and not for permanently suspending loads.

Unbalanced loads and centre of gravity

WARNING!

Risk of injury from falling or toppling loads!

Loads may be unbalanced, i.e. the centre of gravity may not be obvious. If the load is not properly attached to the lifting equipment, it may topple and fall. Falling or toppling loads can cause serious injuries.

- When you use a crane to move loads, ensure that the centre of gravity of the load is directly beneath the crane hook.
- Lift any load carefully and keep an eye on it to see whether it will stay in place. If required, change the lashing point(s).

Sharp edges, sharp corners and thin sheet metal parts

 **CAUTION!****Danger of injury from sharp edges, sharp corners and thin sheet metal parts!**

Sharp edges, sharp corners and thin sheet metal parts of the heat exchanger or of the cooling or heating coil may cause cuts or grazes.

- Be careful when working on these components.
- Wear protective gloves, safety shoes and a hard hat.

 **ENVIRONMENT!****Risk of harm to the environment due to incorrect disposal of goods and packaging!**

Incorrect disposal can harm the environment.

- Have electronic waste, electronic components and operating fluids (refrigerant, compressor oil, lubricants etc.) disposed of by an approved specialist disposal company.

9.2 Disassembly

Personnel:

- HVAC technician
- Skilled qualified electrician

Protective equipment:

- Industrial safety helmet
- Protective clothing
- Hearing protection
- Protective gloves
- Safety shoes

1. ▶ Disconnect electrical cables.
Ensure that no voltage is present.
2. ▶ Remove all operating fluids.
Properly dispose of all operating fluids.
3. ▶ Disconnect operating fluid pipes and hoses.
4. ▶ Open all module connectors and base frame connectors.
5. ▶ Remove the individual unit components.
Use suitable transport equipment to move unit components away from the site.

9.3 Disposal

If no return or disposal agreement is in place, any disassembled components should be disposed of by an approved specialist disposal company.

Components that are no longer required should be recycled:

- Scrap the metals.
- Take plastic parts to be recycled.
- Dispose of other components and waste in a suitable manner, i.e. depending on their material properties.

Electrical and electronic components

Electrical and electronic components can contain materials and substances that are hazardous to health and the environment and which must not get into household and commercial waste.

As electrical and electronic components may also contain recyclables (e.g. precious metals), they must be provided for recycling or disposal by a specialist disposal company.

Chemicals

Chemicals (solvents, cleaning agents, operating fluids, etc.) affect the air, soil, water, and human health in various ways. In some cases, valuable substances can be extracted from them.

Chemicals must therefore not get into the air, soil, sewerage system, surface water or groundwater.

Commission an approved specialist disposal company to recover or dispose of chemicals.

Coolant, glycol

Coolants may contain substances that are toxic and pose a hazard to the environment. They must not be released into the environment. Commission a specialist disposal company to dispose of hazardous substances and materials.

Batteries

Battery components are toxic and pose a hazard to the environment. Batteries must not be disposed of with domestic waste. Batteries must only be disposed of by locally approved specialist companies.

Lubricants

Lubricants such as greases and oils contain toxic substances. They must not be released into the environment. Commission a specialist disposal company to dispose of hazardous substances and materials.

10 Technical data

10.1 Dimensions and weights

Air handling unit with rotary heat exchanger

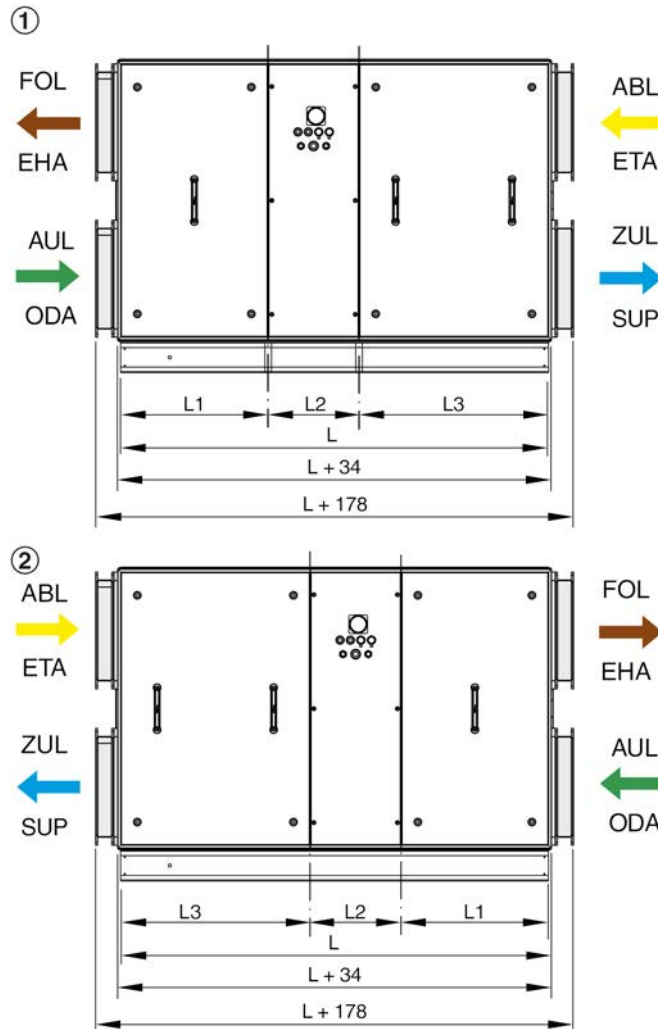


Fig. 68: Dimensions for units with rotary heat exchanger (illustration shows X-CUBE-C-*-R1300)

- 1 X-CUBE-C-R-R / **** / ** / **
- 2 X-CUBE-C-L-R / **** / ** / **

Type	Total (L x T x H) [mm]	Module 1 L ₁ [mm]	Module 2 L ₂ [mm]	Module 3 L ₃ [mm]	Construction ¹⁾	
					1 part [kg]	3 parts [kg]
R5250	1864 x 1318 x 1588	870	324	670	622	695
R4200	1704 x 1156 x 1518	775	324	605	551	580
R3000	1604 x 1006 x 1318	725	324	555	446	471
R2000	1524 x 856 x 1118	675	324	525	346	367
R1300	1444 x 706 x 918	625	324	495	271	288

Lengths given apply to the base frame

1) Total weight for construction with 1 module or with 3 modules, same dimensions

Air handling unit with plate heat exchanger

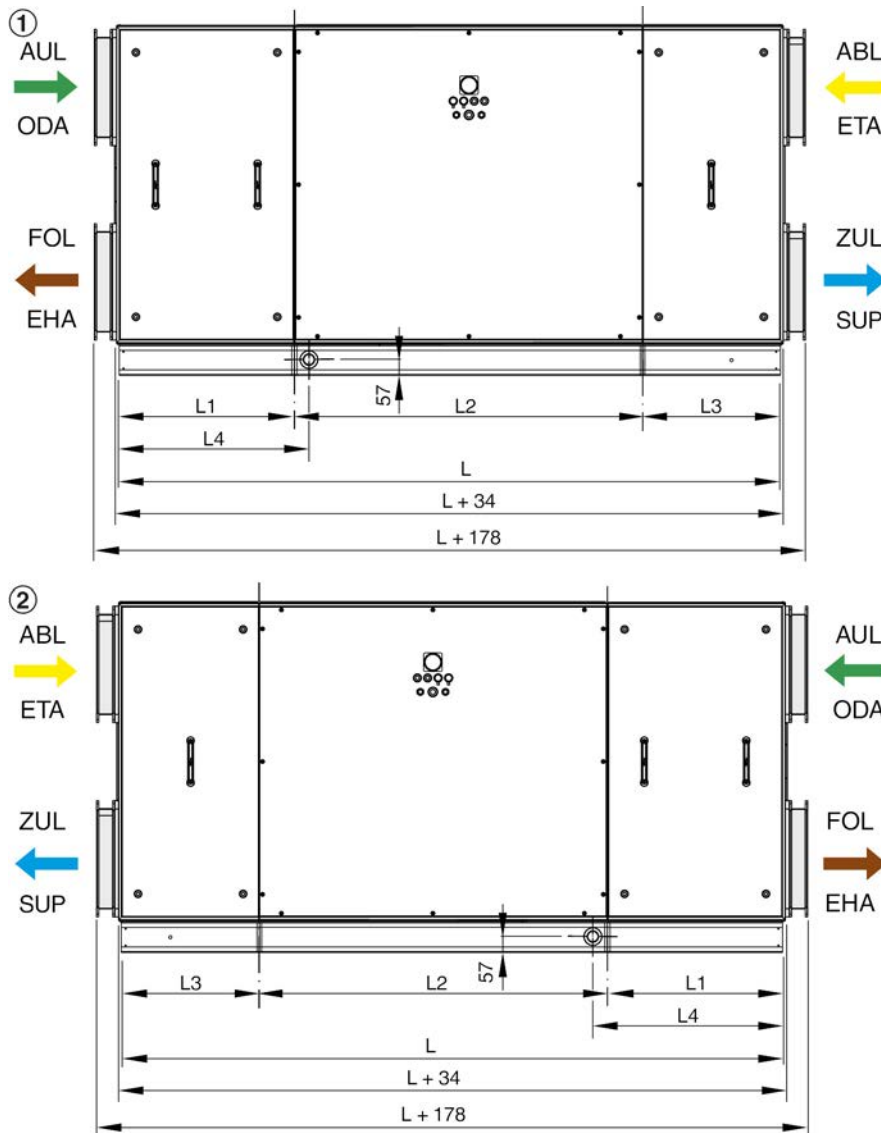


Fig. 69: Dimensions for units with plate heat exchanger (illustration shows X-CUBE-C-*-P1230)

- 1 X-CUBE-C-R-P / **** / ** / **
- 2 X-CUBE-C-L-P / **** / ** / **

Type	Total (L x T x H) [mm]	Module 1 L ₁ [mm]	Module 2 L ₂ [mm]	Module 3 L ₃ [mm]	L ₄ [mm]	Construction ¹⁾	
						1 part [kg]	3 parts [kg]
P3600	2576 x 1318 x 1257	750	1246	580	800.5	715	733
P2400	2526 x 942 x 1257	725	1246	555	775.5	565	579
P1800	2366 x 754 x 1257	625	1246	495	675.5	453	472
P1230	2083 x 754 x 974	625	963	495	675.5	365	380

Lengths given apply to the base frame

1) Total weight for construction with 1 module or with 3 modules, same dimensions

10.2 Data sheet

The data sheets for the air handling unit can be found in the appendix, see (↗ Appendix 'Data sheets' on page 94).

10.3 Operating conditions

Operating conditions for the air handling unit

Data	Value	Unit
Operating temperature	-30 – +50	°C
Air temperature	-30 – +70	°C
Humidity	0 – 100 %	°C

11 FAQ

No.	Question	Answer
1	How to connect accessory modules (e.g. heating coil, heating/cooling coil, digital control panel) to the controls (CB-1 or CB-2 control module) and to X-CUBE control?	For information on how to commission accessory modules and for the relevant system diagrams see the 'Installation and commissioning manual – Accessories for X-CUBE compact', chapter 5, Connection diagrams. (☞ <i>X-CUBE compact transport and installation manual</i>)
2	How to establish bus communication between an accessory module (e.g. heating coil, heating coil/cooling coil module) and the air handling unit?	For information on how to commission accessory modules see the 'Installation and commissioning manual – Accessories for X-CUBE compact', chapter 3, Establishing bus communication, and chapter 2, Setting bus addresses for accessories. (☞ <i>X-CUBE compact transport and installation manual</i>)
3	Where do I find technical data for the air handling unit, e.g. dimensions, weight, output, or whether the unit casing can be divided?	For the complete technical data see the 'Operating manual – X-CUBE compact air handling units', chapter 10, Technical data. (☞ <i>Chapter 10 'Technical data' on page 75</i>)
4	Where do I connect the PT1000 temperature sensors to the X-CUBE control system?	The PT1000 room temperature sensor is to be connected to terminals X2/13/14, and the PT1000 outdoor air temperature sensor is to be connected to terminals X2/15/16 of the X-CUBE Control master. See the circuit diagrams in the transport and installation manual (appendix). (☞ <i>X-CUBE compact transport and installation manual</i>)
5	Where do I connect the analogue XCC-CD-RA control panel and the digital XCC-CD-RD control panel to the X-CUBE control system?	For information on how to connect the control panels see the connection diagrams in the 'Installation and commissioning manual – Accessories for X-CUBE compact units', chapter 5.1, XCC-CD-RA, and chapter 5.2, XCC-CD-RD. For information on cables and settings see the wiring diagrams. The maximum cable length is 30 m. (☞ <i>X-CUBE compact transport and installation manual</i>)
6	How do I find out whether the digital room control panel XCC-CD-RD has been correctly connected to the X-CUBE control system, and how is the communication to the room control panel being monitored?	The digital control panel is to be connected according to the wiring diagram in the 'Installation and commissioning manual – Accessories for X-CUBE compact', chapter 5.2, XCC-CD-RD. (☞ <i>X-CUBE compact transport and installation manual</i>) If the unit has been correctly connected, the time and date are displayed on the digital control panel. If date and time are not displayed, check whether the RJ12 Modbus cable of the control panel has been correctly connected to port A (RJ12). If the RJ12 Modbus cable has been connected to port B or C, connect it to the correct port A.

No.	Question	Answer
7	Where and how do I connect the fire damper to the X-CUBE control system? How many fire dampers can I connect to X-CUBE control?	<p>Connect the fire damper to terminals X2/1/2 on the X-CUBE Control master (NC contact). You can connect up to 300 fire dampers (in series) with one NC contact. For information on how to connect fire dampers see the corresponding electrical circuit diagram in the transport and installation manual (appendix).</p> <p>(↪ <i>X-CUBE compact transport and installation manual</i>)</p> <p>When one or more fire dampers are released, the system stops operating. The dampers will not automatically reopen after they have been released. You will have to unlock the system manually using the touch panel.</p>
8	How many motorised fire dampers can I connect to the compact unit?	<p>You cannot connect any motorised fire dampers to the air handling unit. For motorised fire dampers we recommend you to use a TNC-Easy module. A TNC-Easy module allows for connecting up to 12 motorised fire dampers. For more information contact your TROX sales representative.</p>
9	How do I attach an accessory module directly to the air handling unit, and how do I attach it if a staggered arrangement is required?	<p>The 'Transport and installation manual – X-CUBE compact air handling unit', chapter 'Installing accessories', contains information on how to attach an accessory module to the air handling unit.</p> <p>(↪ <i>X-CUBE compact transport and installation manual</i>)</p> <p>In case there is not enough space to attach an accessory module directly to the air handling unit:</p> <p>See 'Installing accessories' ↪ <i>X-CUBE compact transport and installation manual</i>.</p>
10	Can I detach the plate heat exchanger so that it is easier to bring it into the installation room?	<p>Yes, see 'Removing the plate heat exchanger' ↪ 57</p>
11	Do I need a separate voltage supply for an accessory module and for the controls modules (CB-1 or CB-2)?	<p>Yes, you need 230 V AC supply voltage.</p>
12	What does the error message 'Contact is sticking' mean and how do I solve the problem?	<p>This error message only appears when an accessory module is used. If an accessory module with a controls module (CB-1 or CB-2) has been ordered, the extension module is factory set to address 8. You then have to check the bus address on the controls module and to enter the correct settings for bus communication. See chapters 2 and 3 of the 'Installation and commissioning manual – Accessories for X-CUBE compact units' (↪ <i>X-CUBE compact transport and installation manual</i>).</p> <p>.</p>
13	Which communication interfaces are available on the air handling unit?	<p>TCP/IP BACnet, Modbus and Modbus RTU. If you need a LON interface, you can order a special module for that purpose (subject to charge).</p>

12 Glossary

Exhaust air – EHA

Air that flows from an internal space to the outside.

Extract air – ETA

Air that flows out of a conditioned room.

Indoor air – IDA

Air in a conditioned internal space.

ODA – Outdoor air

Untreated air that flows through an inlet into the air handling unit or a building.

Recirculated air – RCA

Extract air that is reconditioned in the air handling unit and supplied to an internal space again.

Secondary air – SEC

Air that is conditioned and then supplied to the same room from which it was extracted.

Supply air – SUP

Air that is supplied to a conditioned internal space; it is also conditioned air that enters an air handling unit.

Transfer air – TRA

Air that flows from one conditioned internal space to another conditioned internal space.

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Appendix

A Declaration of conformity



EG Konformitätserklärung

im Sinne der Maschinenrichtlinie 2006/42/EG Anhang II 1A

EC declaration of conformity according to the EU Machinery Directive 2006/42/EG, Annex II, 1.A
Déclaration CE de conformité conformément à la Directive machine CE 2006/42/CE, Annexe II, 1.A

Hersteller:
Manufacturer:
Fabricant:

TROX GmbH
Heinrich-Trox-Platz
47504 Neukirchen-Vluyn
Germany

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen

Person residing within the Community authorised to compile the relevant technical documentation:
Personne établie dans la Communauté autorisée à établir le dossier technique pertinent:

Jan Heymann, TROX GmbH
Heinrich-Trox-Platz
47504 Neukirchen-Vluyn
Germany

Produkt:

Product:
Produit:

X-CUBE / X-CUBE-Compact

Hiermit erklären wir, dass das oben genannte Produkt allen einschlägigen Bestimmungen der folgenden EG-Richtlinien entspricht:

It is expressly declared that the product fulfils all relevant provisions of the following EU Directives:

Une déclaration précisant expressément que la produit satisfait à l'ensemble des dispositions pertinentes des directives CE suivantes:

- **Maschinenrichtlinie 2006/42/EG**
Machinery Directive 2006/42/EC
Directive sur les machines-outils 2006/42/EC
- **Niederspannungsrichtlinie 2006/95/EG**
Low Voltage Directive 2006/95/EC
Directive 2006/95/EC concernant la basse tension
- **Richtlinie 2004/108/EG Elektromagnetische Verträglichkeit**
Directive 2004/108/EC Electromagnetic Compatibility
Directive 2004/108/EC concernant la compatibilité électromagnétique
- **Richtlinie 2009/125/EG Umweltgerechte Gestaltung energieverbrauchsrelevanter Produkte**
Directive 2009/125/EC Ecodesign requirements for energy-related products
Directive 2009/125/CE Coconception applicables aux produits liés à l'énergie

Angewandte harmonisierte Normen:

Applied harmonized standards
Normes harmonisées appliquées

- **EN ISO 12100-1/-2, Sicherheit von Maschinen**
EN ISO 12100-1/-2, Machinery safety
EN ISO 12100-1/2, sécurité des machines
- **EN ISO 13857, Sicherheitsabstände gegen Berührung**
EN ISO 13857, Safety distances
EN ISO 13857, distances de sécurité évitant le contact
- **EN 60204-1, Elektrische Ausrüstung von Maschinen**
EN 60204-1, Electrical equipment of machinery
EN 60204-1, équipement électrique des machines
- **EN 61000-6-1, Störfestigkeit**
EN 61000-6-1, Interference emissions
EN 61000-6-1, résistance aux interférences
- **EN 61000-6-2, Störfestigkeit**
EN 61000-6-2, Interference immunity (for industrial applications)
EN 61000-6-2, résistance aux interférences

Bei einer nicht mit uns abgestimmten Änderung der Maschine/Baugruppe verliert diese EG-Konformitätserklärung ihre Gültigkeit.

This declaration of EC conformity shall become null and void when the machine/modul is subjected to any modification that has not met with our approval.

Lorsqu'une modification non approuvée par nous est effectuée sur le bloc, la présente déclaration de conformité CE perd sa validité.

Die Inbetriebnahme ist so lange untersagt bis festgestellt wurde, dass die Maschine, in die diese Maschine eingebaut werden soll, den Bestimmungen der Maschinenrichtlinie 2006/42/EG entspricht.

The machinery must not be put into service until the machinery into which it is to be incorporated, has been declared in conformity with the provisions of the Directive 2006/42/EC

La mise en service de la machine, dans laquelle cette machine doit être incorporée, est interdite tant que sa conformité aux dispositions de la directive n'a pas été établie.

Neukirchen-Vluyn, 04.01.2016

Jan Heymann
CE-Beauftragter
Authorised Representative, CE-marked products

B List of alarms

Alarmlist, OJ-Air2 SW 3.24				WEB Text		HTERM Text			
Alarm-number	Alarm-type	Alarm-delay sec.	Alarm-limit	Auto reset	Unit stop	WEB text	Pop-up text	Alarm number	Alarm text
1	A	3	N/A		X	Fire alarm	Firealarm	Alarm 1	Fire alarm
2	A	3	N/A		X	External fire thermostat alarm	External Fire thermostat	Alarm 2	External fire thermostat alarm
3	A	3	N/A		X	Internal fire alarm	High inlet/exhaust temperature in ventilation unit	Alarm 3	Internal fire alarm
4	B	3	N/A	X	X	External stop	External stop	Alarm 4	External stop
7	A	3	N/A	X	X	Inlet EC Controller (Air2ECxxx): No communication	Air2EC not connected to bus in FanIO port B, errors in the bus cable, Air2EC must be in data A	Alarm 7	Inlet EC Controller (Air2ECxxx): No communication
8	A	3	N/A	X	X	Exhaust EC Controller (Air2ECxxx): No communication	Air2EC not connected to bus in FanIO port B, errors in the bus cable, Air2EC must be in data A	Alarm 8	Exhaust EC Controller (Air2ECxxx): No communication
9	B	1200	N/A	X		Filter monitor flow compensation not calibrated	Filter pressure reference not measured. Activated after 20 minutes.	Alarm 9	Filter monitor flow compensation not calibrated
10	B	3	N/A	X		Handset (Air2Hterm): No communication	Handset not connected to bus	Alarm 10	Handset: No communication
11	A	3	N/A	X	X	FanIO 1 (Air2FanIO): No communication	FanIO not connected to bus in FanIO port A, wrong setting on the DIP switch in the FanIO	Alarm 11	FanIO 1: No communication
12	A	3	N/A	X	X	FanIO 2 (Air2FanIO): No communication	FanIO not connected to bus in FanIO port A, wrong setting on the DIP switch in the FanIO	Alarm 12	FanIO 2: No communication
13	A	3	N/A	X	X	Extension module 1 (Air2EX1): No communication	Air2EX1 not connected to bus	Alarm 13	Extension module 1: No communication
14	A	3	N/A	X	X	Extension module 2 (Air2EX1): No communication	Air2EX1 not connected to bus	Alarm 14	Extension module 2: No communication
15	B	3	N/A	X	X	Lon gateway (Air2Lon): No communication	Air2Lon not connected to bus1	Alarm 15	Lon gateway: No communication
16	A	3	N/A	X	X	Inlet frequency conv. (OJ-Fcxxx): No communication	OJ-Fc not connected to bus in FanIO port B	Alarm 16	Inlet frequency conv.: No communication
17	A	3	N/A	X	X	Exhaust frequency conv. (OJ-Fcxxx): No communication	OJ-Fc not connected to bus in FanIO port B	Alarm 17	Exhaust frequency conv.: No communication
18	A	3	N/A	X	X	Rotary heat exchanger (RHXM): No communication	RHXM not connected to bus	Alarm 18	Rotary heat exchanger: No communication
19	A	3	N/A	X	X	Pressure transducer (PT1H): No communication	PT1H not connected to bus, fault in bus cable, address button incorrectly set	Alarm 19	Pressure transducer (PT1H): No communication
20	A	10	N/A	X	X	Temperature sensor fault: Supply air	Inlet temp. sensor disconnected/short-circuited	Alarm 20	Temperature sensor fault: Supply air
21	A	10	N/A	X	X	Temperature sensor fault: Extract	Exhaust temp. sensor disconnected/short-circuited	Alarm 21	Temperature sensor fault: Extract
22	A	10	N/A	X	X	Temperature sensor fault: Room	Room temp. sensor disconnected/short-circuited	Alarm 22	Temperature sensor fault: Room
23	A	10	N/A	X	X	Temperature sensor fault: Exhaust	Discharge temp. sensor disconnected/short-circuited	Alarm 23	Temperature sensor fault: Exhaust
24	A	10	N/A	X	X	Temperature sensor fault: Outdoor temperature	Outdoor temp. sensor disconnected/short-circuited	Alarm 24	Temperature sensor fault: Outdoor temperature
25	A	10	N/A	X	X	Temperature sensor fault: Water battery 1	Water battery temp. sensor disconnected/short-circuited	Alarm 25	Temperature sensor fault: Water battery
26	A	10	N/A	X	X	Temperature sensor fault: Heat recovery	Recovery temp. sensor disconnected/short-circuited	Alarm 26	Temperature sensor fault: Heat recovery
27	A	10	N/A	X	X	Pump alarm, heating 1	Water battery 1 fault	Alarm 27	Pump alarm, heating
28	A	3	N/A	X	X	Frost alarm, water battery 1	Low flow temperature	Alarm 28	Frost alarm, water battery
30	A	3	N/A	X	X	Inlet frequency conv. (OJ-Fcxxx): Low supply voltage (Vlo)	Low mains voltage	Alarm 30	Inlet frequency conv.: Low supply voltage (Vlo)
31	A	3	N/A	X	X	Inlet frequency conv. (OJ-Fcxxx): High supply voltage (Vhi)	High mains voltage	Alarm 31	Inlet frequency conv.: High supply voltage (Vhi)
32	A	3	N/A	X	X	Inlet frequency conv. (OJ-Fcxxx): High output current (Ihi)	Short-circuit in motor or cable	Alarm 32	Inlet frequency conv.: High output current (Ihi)
33	A	3	N/A	X	X	Inlet frequency conv. (OJ-Fcxxx): High temperature (Thi)	High ambient temperature	Alarm 33	Inlet frequency conv.: High temperature (Thi)
34	A	3	N/A	X	X	Inlet frequency conv. (OJ-Fcxxx): Lacking supply phase	Mains voltage lacks a phase	Alarm 34	Inlet frequency conv.: Lacking supply phase
35	B	3	N/A			Inlet frequency conv. (OJ-Fcxxx): High internal ripple voltage	Mains voltage unstable	Alarm 35	Inlet frequency conv.: High internal ripple voltage
37	A	3	N/A		X	Frequency converter alarm, inlet	Frekv. onrf. alarm indbl.	Alarm 37	Frequency converter alarm, inlet
38	B	600	N/A			Filter, inlet	Pressure drop across inlet filter too high	Alarm 38	Filter, inlet
39	A	10	N/A	X	X	FanIO 1 (Air2FanIO): +24 V DC overloaded	+ 24 V DC from FanIO1 terminals 1,4,16, 18 short-circuited	Alarm 39	FanIO 1: +24V DC overloaded
40	A	3	N/A	X	X	Exhaust frequency conv. (OJ-Fcxxx): Low supply voltage (Vlo)	Low mains voltage	Alarm 40	Exhaust frequency conv.: Low supply voltage (Vlo)
41	A	3	N/A	X	X	Exhaust frequency conv. (OJ-Fcxxx): High supply voltage (Vhi)	High mains voltage	Alarm 41	Exhaust frequency conv.: High supply voltage (Vhi)
42	A	3	N/A	X	X	Exhaust frequency conv. (OJ-Fcxxx): High output current (Ihi)	Short-circuit in motor or cable	Alarm 42	Exhaust frequency conv.: High output current (Ihi)
43	A	3	N/A	X	X	Exhaust frequency conv. (OJ-Fcxxx): High temperature (Thi)	High ambient temperature	Alarm 43	Exhaust frequency conv.: High temperature (Thi)
44	A	3	N/A	X	X	Exhaust frequency conv. (OJ-Fcxxx): Lacking supply phase	Mains voltage lacks a phase	Alarm 44	Exhaust frequency conv.: Lacking supply phase

Alarmlist, OJ-Air2 SW 3.24				WEB Text		HTERM Text			
Alarm-number	Alarm-type	Alarm-delay sec.	Alarm-Limit	Auto reset	Unit stop	WEB text	Pop-up text	Alarm number	Alarm text
45	B	3	N/A			Exhaust frequency conv. (OJ-Fcxxx): High internal ripple voltage	Mains voltage unstable	Alarm 45	Exhaust frequency conv.: High internal ripple voltage
47	A	3	N/A		X	Frequency converter alarm, exhaust	Frequency converter alarm, exhaust	Alarm 47	Frequency converter alarm exhaust
48	B	600	N/A			Filter exhaust	Pressure drop across exhaust filter too high	Alarm 48	Filter, exhaust
49	A	10	N/A		X	FanIO 2 (Air2FanIO): +24 V DC overloaded	+ 24 V DC from FanIO1 terminals 14,16,18 short-circuited	Alarm 49	FanIO 2: +24V DC overloaded
50	B	3	N/A			Rotary heat exchanger (RHXM): No rotation	No pulse from rotation monitor	Alarm 50	Rotary heat exchanger No rotation
51	B	3	N/A			Rotary heat exchanger (RHXM): Low supply voltage (Vlo)	Low mains voltage	Alarm 51	Rotary heat exchanger.: Low supply voltage (Vlo)
52	B	3	N/A			Rotary heat exchanger (RHXM): High supply voltage (Vhi)	High mains voltage	Alarm 52	Rotary heat exchanger.: High supply voltage (Vhi)
53	B	3	N/A			Rotary heat exchanger (RHXM): High output current (Ihi)	Short-circuit in motor or cable	Alarm 53	Rotary heat exchanger High output current (Ihi)
54	B	3	N/A			Rotary heat exchanger (RHXM): High internal temperature	High ambient temperature	Alarm 54	Rotary heat exchanger: High internal temperature
55	B	3	N/A			Rotary heat exchanger (RHXM): Torque overload	Rotor resists movement, e.g. due to backing alignment. Step motor incapable of turning rotor at correct rpm.	Alarm 55	Rotary heat exchanger.: Torque overload
58	A	300	N/A		X	Frost alarm, heat exchanger	Discharge temperature below frost limit despite bypass damper being ordered to open fully (OV).	Alarm 58	Frost alarm, heat exchanger
59	A	600	N/A		X	No heat recovery, low temperature	Recovery temp. in fluid coupling recovery battery too low for more than 10 minutes.	Alarm 59	No heat recovery, low temperature
60	A	600	SP-5°C		X	Low inlet temperature	Inlet temperature too low for more than 10 minutes	Alarm 60	Low inlet temperature
61	B	600	SP-5°C			High inlet temperature	Inlet temperature too high for more than 10 minutes	Alarm 61	High inlet temperature
62	B	1200	SP-5°C			Low exhaust temperature	Exhaust temperature too low for more than 20 minutes	Alarm 62	Low exhaust temperature
63	B	1200	SP+5°C			High exhaust temperature	Exhaust temperature too high for more than 20 minutes	Alarm 63	High exhaust temperature
65	B	300	N/A	X		Heatingf out out due to low air volume	Air volume through electric heating battery too low for more than 5 minutes.	Alarm 65	Heatingf cut out due to low air volume
66	B	3	N/A			Electric battery1: overheating alarm	Overheat thermostat in electric heating battery has cut out.	Alarm 66	Electric battery: overheating alarm
67	B	3	N/A			Reduced air volume	Air volume reduced due to insufficient availability of heating for more than 10 minutes.	Alarm 67	Reduced air volume
68	B	3	N/A			Contact for electric heating battery1 stuck	Water battery fault	Alarm 68	Contact for electric heating battery stuck
70	B	1200	N/A	X		High VOC/CO2	VOC/CO2 level too high for more than 20 minutes	Alarm 70	High VOC/CO2
71	B	600	SP-10%			Low inlet air volume	Inlet air volume too low for more than 10 minutes	Alarm 71	Low inlet air volume
72	B	600	SP+10%			High inlet air volume	Inlet air volume too high for more than 10 minutes	Alarm 72	High inlet air volume
73	B	600	SP-10%			Low exhaust air volume	Exhaust air volume too low for more than 10 minutes.	Alarm 73	Low exhaust air volume
74	B	600	SP+10%			High exhaust air volume	Exhaust air volume too high for more than 10 minutes.	Alarm 74	High exhaust air volume
75	B	600	SP-10%			Low inlet air pressure	Inlet pressure too low for more than 10 minutes.	Alarm 75	Low inlet air pressure
76	A	600	SP+10%			High inlet air pressure	Inlet pressure too high for more than 10 minutes.	Alarm 76	High inlet air pressure
77	B	600	SP-10%			Low exhaust air pressure	Exhaust pressure too low for more than 10 minutes.	Alarm 77	Low exhaust air pressure
78	A	600	SP+10%			High exhaust air pressure	Exhaust pressure too high for more than 10 minutes.	Alarm 78	High exhaust air pressure
80	B	3	N/A			Cooling fault	Cooling fault	Alarm 80	Cooling fault
81	B	3	N/A			Low cooling pressure circuit 1	Cooling circuit 1: Pressure in evaporator too low. Insufficient coolant/leaks.	Alarm 81	Low cooling pressure circuit 1
82	B	3	N/A			High cooling pressure circuit 1	Cooling circuit 1: Pressure in condenser too high. Too much coolant.	Alarm 82	High cooling pressure circuit 1
83	B	3	N/A			Cooling fault 1: Compressor 1 overheated circuit 1	High temperature in condenser.	Alarm 83	Cooling fault 1: Compressor 1 overheated circuit 1
84	B	3	N/A			Cooling fault 2: Compressor 2 overheated circuit 1	Cooling fault 1	Alarm 84	Cooling fault 2: Compressor 2 overheated circuit 1
85	B	3	N/A			Low cooling pressure circuit 2	Cooling circuit 2: Pressure in evaporator too low. Insufficient coolant/leaks.	Alarm 85	Low cooling pressure circuit 2
86	B	3	N/A			High cooling pressure circuit 2	Cooling circuit 2: Pressure in condenser too high. Too much coolant. High temperature in condenser.	Alarm 86	High cooling pressure circuit 2
87	B	3	N/A			Cooling fault 3: Compressor 1 overheated circuit 2	Cooling fault 3	Alarm 87	Cooling fault 3: Compressor 1 overheated circuit 2
88	B	3	N/A			Cooling fault 4: Compressor 2 overheated circuit 2	Cooling fault 4	Alarm 88	Cooling fault 4: Compressor 2 overheated circuit 2

Alarmlist, OJ-Air2 SW 3.24					WEB Text	HTERM Text			
Alarm-number	Alarm-type	Alarm-delay sec.	Alarm Limit	Auto reset	Unit stop	WEB text	Pop-up text	Alarm number	Alarm text
90	B	3	N/A			Pressure sensor fault: DX low pressure 1	DX low pressure 1	Alarm 90	Pressure sensor fault: DX low pressure 1
91	B	3	N/A			Pressure sensor fault: DX high pressure 1	DX high pressure 1	Alarm 91	Pressure sensor fault: DX high pressure 1
92	B	3	N/A			Pressure sensor fault: DX low pressure 2	DX low pressure 2	Alarm 92	Pressure sensor fault: DX low pressure 2
93	B	3	N/A			Pressure sensor fault: DX high pressure 2	DX high pressure 2	Alarm 93	Pressure sensor fault: DX high pressure 2
94	B	3	N/A	X		VOC/CO2 sensor not configured	VOC/CO2 sensor not configured	Alarm 94	VOC/CO2 sensor not configured
95	B	3	N/A	X		FanOpt: Inlet not configured	FanOpt: Inlet not configured	Alarm 95	FanOpt: Inlet not configured
96	B	3	N/A	X		FanOpt: exhaust not configured	FanOpt: exhaust not configured	Alarm 96	FanOpt: exhaust not configured
100	A	3	N/A	X	X	Pressure sensor 0 (PT16202): No communication	Pressure sensor 0 (PT16202): No communication	Alarm 100	Pressure sensor 0 (PT16202): No communication
101	A	3	N/A	X	X	Pressure sensor 1 (PT16202): No communication	Pressure sensor 1 (PT16202): No communication	Alarm 101	Pressure sensor 1 (PT16202): No communication
103	A	3	N/A	X	X	Pressure sensor 3 (PT16202): No communication	Pressure sensor 3 (PT16202): No communication	Alarm 103	Pressure sensor 3 (PT16202): No communication
104	A	3	N/A	X	X	Pressure sensor 4 (PT16202): No communication	Pressure sensor 4 (PT16202): No communication	Alarm 104	Pressure sensor 4 (PT16202): No communication
105	A	3	N/A	X	X	Pressure sensor 5 (PT16202): No communication	Pressure sensor 5 (PT16202): No communication	Alarm 105	Pressure sensor 5 (PT16202): No communication
106	A	3	N/A	X	X	Pressure sensor 6 (PT16202): No communication	Pressure sensor 6 (PT16202): No communication	Alarm 106	Pressure sensor 6 (PT16202): No communication
107	A	3	N/A	X	X	Pressure sensor 7 (PT16202): No communication	Pressure sensor 7 (PT16202): No communication	Alarm 107	Pressure sensor 7 (PT16202): No communication
108	A	3	N/A	X		Extension module45 1 (Air2EX145): No communication	Extension module45 1 (Air2EX145): No communication	Alarm 108	Extension module45 1 (Air2EX145): No communication
109	A	3	N/A	X		Extension module45 2 (Air2EX145): No communication	Extension module45 2 (Air2EX145): No communication	Alarm 109	Extension module45 2 (Air2EX145): No communication
111	B	3	N/A	X		Inlet pressure transducer (PT16202): No communication	PT16202 not connected to bus: fault in bus cable: address burton incorrectly set.	Alarm 111	Inlet pressure sensor (PT16202): No communication
112	B	3	N/A	X		Exhaust pressure transducer (PT16202): No communication	PT16202 not connected to bus: fault in bus cable: address burton incorrectly set.	Alarm 112	Exhaust pressure sensor (PT16202): No communication
113	B	10	N/A	X		VOC/CO2 sensor fault	VOC/CO2 sensor disconnected/short-circuited: Sensor not configured for analog Input.	Alarm 113	VOC/CO2 sensor fault: VOC/CO2 sensor disconnected/short-circuited
115	A	3	N/A	X		Inlet EC Controller (Air2ECxxx): Alarm stop	Motor stopped due to alarm from EC Controller	Alarm 115	Inlet EC Controller (Air2ECxxx): Alarm stop
116	A	3	N/A	X		Inlet EC Controller (Air2ECxxx): Blocked rotor	Blocked EC motor	Alarm 116	Inlet EC Controller (Air2ECxxx): Blocked rotor
117	B	3	N/A			Inlet EC Controller (Air2ECxxx): Current limit active	Rampup time to short: Motor overloaded: Wrong motor type	Alarm 117	Inlet EC Controller (Air2ECxxx): Current limit active
118	B	3	N/A			Inlet EC Controller (Air2ECxxx): Low supply voltage (Vlo)	Low mains voltage	Alarm 118	Inlet EC Controller (Air2ECxxx): Low supply voltage (Vlo)
119	B	3	N/A			Inlet EC Controller (Air2ECxxx): High supply voltage (Vhi)	High mains voltage	Alarm 119	Inlet EC Controller (Air2ECxxx): High supply voltage (Vhi)
120	B	3	N/A			Inlet EC Controller (Air2ECxxx): High internal ripple voltage	High ambient temperature: Overload EC Controller	Alarm 120	Inlet EC Controller (Air2ECxxx): High internal ripple voltage
122	A	3	N/A	X		Exhaust EC Controller (Air2ECxxx): Alarm stop	Motor stopped due to alarm from EC Controller	Alarm 122	Exhaust EC Controller (Air2ECxxx): Alarm stop
123	A	3	N/A	X		Exhaust EC Controller (Air2ECxxx): Blocked rotor	Blocked EC motor	Alarm 123	Exhaust EC Controller (Air2ECxxx): Blocked rotor
124	B	3	N/A			Exhaust EC Controller (Air2ECxxx): Current limit active	Rampup time to short: Motor overloaded: Wrong motor type	Alarm 124	Exhaust EC Controller (Air2ECxxx): Current limit active
125	B	3	N/A			Exhaust EC Controller (Air2ECxxx): Low supply voltage (Vlo)	Low mains voltage	Alarm 125	Exhaust EC Controller (Air2ECxxx): Low supply voltage (Vlo)
126	B	3	N/A			Exhaust EC Controller (Air2ECxxx): High supply voltage (Vhi)	High mains voltage	Alarm 126	Exhaust EC Controller (Air2ECxxx): High supply voltage (Vhi)
127	B	3	N/A			Exhaust EC Controller (Air2ECxxx): High temperature (Thi)	High ambient temperature: Overload EC Controller	Alarm 127	Exhaust EC Controller (Air2ECxxx): High temperature (Thi)
128	B	3	N/A			Exhaust EC Controller (Air2ECxxx): High internal ripple voltage	Mains voltage unstable	Alarm 128	Exhaust EC Controller (Air2ECxxx): High internal ripple voltage
129	B	3	N/A			Inlet EC Controller (Air2ECxxx): Lacking supply phase	Mains voltage lacks a phase	Alarm 129	Inlet EC Controller (Air2ECxxx): Lacking supply phase
130	B	3	N/A			Exhaust EC Controller (Air2ECxxx): Lacking supply phase	Mains voltage lacks a phase	Alarm 130	Exhaust EC Controller (Air2ECxxx): Lacking supply phase
131	A	3	N/A	X	X	FanIO 1 (Air2FanIO21): No communication	FanIO not connected to bus in FanIO port 'A': fault in bus cable: FanIO DIP switch incorrectly set.	Alarm 131	FanIO 1 (Air2FanIO21): No communication
132	A	3	N/A	X	X	FanIO 2 (Air2FanIO21): No communication	FanIO not connected to bus in FanIO port 'A': fault in bus cable: FanIO DIP switch incorrectly set.	Alarm 132	FanIO 2 (Air2FanIO21): No communication
133	A	3	N/A	X	X	Damper actuator (Inlet), ID 130: No communication	Actuator not connected to bus: Error in bus cable: Address of actuator must be set to 130dec / 82hex.	Alarm 133	Damper actuator (Inlet), ID 130: No communication
134	A	3	N/A	X	X	Damper actuator (Exhaust), ID 131: No communication	Actuator not connected to bus: Error in bus cable: Address of actuator must be set to 131dec / 83hex.	Alarm 134	Damper actuator (Exhaust), ID 131: No communication
135	A	3	N/A	X	X	Damper actuator (Recirculation), ID 132: No communication	Actuator not connected to bus: Error in bus cable: Address of actuator must be set to 132dec / 84hex.	Alarm 135	Damper actuator (Recirculation), ID 132: No communication
136	A	3	N/A	X	X	Damper actuator (Heat exchang), ID 133: No communication	Actuator not connected to bus: Error in bus cable: Address of actuator must be set to 133dec / 85hex.	Alarm 136	Damper actuator (Heat exchang), ID 133: No communication
137	A	3	N/A	X	X	Damper actuator (Drying damper), ID 134: No communication	Actuator not connected to bus: Error in bus cable: Address of actuator must be set to 134dec / 86hex.	Alarm 137	Damper actuator (Drying damper), ID 134: No communication

Alarmlist, OJ-Air2 SW 3.24					WEB Text		HTERM Text		
Alarm-number	Alarm-type	Alarm-delay sec.	Alarm-limit	Auto reset	Unit stop	WEB text	Pop-up text	Alarm number	Alarm text
138	A	3	N/A	X	X	Damper actuator (6) ID 135: No communication	Actuator not connected to bus. Error in bus cable. Address of actuator must be set to 135ddcc / 8B7hex.	Alarm 138	Damper actuator (6) ID 135: No communication
139	A	3	N/A	X	X	Damper actuator (Smoke evacuation damper) ID 136: No communication	Actuator not connected to bus. Error in bus cable. Address of actuator must be set to 136ddcc / 8B8hex.	Alarm 139	Damper actuator (Smoke evacuation damper) ID 136: No communication
140	A	3	N/A	X	X	Damper actuator (8) ID 137: Ingen Kommunikation	Actuator not connected to bus. Error in bus cable. Address of actuator must be set to 137ddcc / 8B9hex.	Alarm 140	Damper actuator (8) ID 137: No communication
141	A	3	N/A	X	X	Valve actuator (Heating1), ID 138: No communication	Actuator not connected to bus. Error in bus cable. Address of actuator must be set to 138ddcc / 8BAhex.	Alarm 141	Valve actuator (Heating1), ID 138: No communication
142	A	3	N/A	X	X	Valve actuator (Cooling), ID 139: No communication	Actuator not connected to bus. Error in bus cable. Address of actuator must be set to 139ddcc / 8BBhex.	Alarm 142	Valve actuator (Cooling), ID 139: No communication
143	A	3	N/A	X	X	Valve actuator (Heating2), ID 140: No communication	Actuator not connected to bus. Error in bus cable. Address of actuator must be set to 140ddcc / 8BChex.	Alarm 143	Valve actuator (Heating2), ID 140: No communication
144	A	3	N/A	X	X	Valve actuator (Heat recovery), ID 141: No communication	Actuator not connected to bus. Error in bus cable. Address of actuator must be set to 141ddcc / 8BDhex.	Alarm 144	Valve actuator (Heat recovery), ID 141: No communication
145	A	3	N/A	X	X	Valve actuator (Preheater), ID 142: No communication	Actuator not connected to bus. Error in bus cable. Address of actuator must be set to 142ddcc / 8BEhex.	Alarm 145	Valve actuator (Preheater), ID 142: No communication
146	A	3	N/A	X	X	Valve actuator (Combi battery), ID 143: No communication	Actuator not connected to bus. Error in bus cable. Address of actuator must be set to 143ddcc / 8BFhex.	Alarm 146	Valve actuator (6), ID 143: No communication
147	A	3	N/A	X	X	Valve actuator (7) ID 144: No communication	Actuator not connected to bus. Error in bus cable. Address of actuator must be set to 144ddcc / 90Bhex.	Alarm 147	Valve actuator (7) ID 144: No communication
148	A	3	N/A	X	X	Valve actuator (8) ID 145: No communication	Actuator not connected to bus. Error in bus cable. Address of actuator must be set to 145ddcc / 90Chex.	Alarm 148	Valve actuator (8) ID 145: No communication
149	B	10	N/A	X		Damper actuator (Inlet): Can not reach the setpoint.	Please check if damper is stuck.	Alarm 149	Damper actuator (Inlet): Can not reach the setpoint
150	B	10	N/A	X		Damper actuator (Exhaust): Can not reach the setpoint.	Please check if damper is stuck.	Alarm 150	Damper actuator (Exhaust): Can not reach the setpoint
151	B	10	N/A	X		Damper actuator (Recirculation): Can not reach the setpoint.	Please check if damper is stuck.	Alarm 151	Damper actuator (Recirculation): Can not reach the setpoint
152	B	10	N/A	X		Damper actuator (Heat exchanger): Can not reach the setpoint.	Please check if damper is stuck.	Alarm 152	Damper actuator (Heat exchanger): Can not reach the setpoint
153	B	10	N/A	X		Damper actuator (Drying damper): Can not reach the setpoint.	Please check if damper is stuck.	Alarm 153	Damper actuator (Drying damper): Can not reach the setpoint
157	B	10	N/A	X		Valve actuator (Heating1): Can not reach the setpoint.	Please check if valve is stuck.	Alarm 157	Valve actuator (Heating1): Can not reach the setpoint
158	B	10	N/A	X		Valve actuator (Cooling): Can not reach the setpoint.	Please check if valve is stuck.	Alarm 158	Valve actuator (Cooling): Can not reach the setpoint
159	B	10	N/A	X		Valve actuator (Heating2): Can not reach the setpoint.	Please check if valve is stuck.	Alarm 159	Valve actuator (Heating2): Can not reach the setpoint
160	B	10	N/A	X		Valve actuator (Heatexchanger): Can not reach the setpoint.	Please check if valve is stuck.	Alarm 160	Valve actuator (Heatexchanger): Can not reach the setpoint
161	B	10	N/A	X		Valve actuator (Preheater): Can not reach the setpoint.	Please check if valve is stuck.	Alarm 161	Valve actuator (Preheater): Can not reach the setpoint
162	B	10	N/A	X		Valve actuator (Combi battery): Can not reach the setpoint.	Please check if valve is stuck.	Alarm 162	Valve actuator (Combi battery): Can not reach the setpoint
163	B	10	N/A	X		Valve actuator (7): Can not reach the setpoint.	Please check if valve is stuck.	Alarm 163	Valve actuator (7): Can not reach the setpoint
164	B	10	N/A	X		Valve actuator (8): Can not reach the setpoint.	Please check if valve is stuck.	Alarm 164	Valve actuator (8): Can not reach the setpoint
166	B	360	N/A			Firedamper not closed	Alarm 166 activated	Alarm 166	Firedamper not closed
167	B	360	N/A			Firedamper not open	Alarm 167 activated	Alarm 167	Firedamper not open
168	B	300	N/A	X		Heating2 cut out due to low air volume	Air volume through electric heating battery too low for more than 5 minutes.	Alarm 168	Heating 2 cut out due to low air volume
169	B	30	N/A			Electric battery 2: overheating alarm	Overheat thermostat in electric heating battery 2 has cut out.	Alarm 169	Electric battery2: overheating alarm
170	B	30	N/A			Contact for electric heating battery 2 is stuck	Digital Input "Heating battery 2 fault" activated when heating relay 21 open. Contactor burnt out.	Alarm 170	Contact for electric heating battery 2 is stuck
171	A	10	N/A	X	X	Temperature sensor fault: Water battery 2	Water battery temp. sensor disconnected/short-circuited: sensor not configured for a temperature input	Alarm 171	Temperature sensor fault: Water battery 2
172	A	10	N/A	X	X	Pump alarm, heating 2	Digital Input Heating battery 2 fault	Alarm 172	Pump alarm, Waterbattery 2
173	A	3	N/A	X	X	Frost alarm, water battery 2	Low flow temperature: defective circulation pump: low outdoor temperature	Alarm 173	Frost alarm, water battery 2
174	A	10	N/A	X	X	Temperature sensor fault: combi battery	Combi battery return water sensor disconnected/short-circuited: sensor not configured for a temperature input	Alarm 174	Temperature sensor fault: Combi battery
175	A	10	N/A	X	X	Pump alarm: combi battery	Digital Input "combi battery alarm" open Alarm from circulation pump	Alarm 175	Pump alarm: Combi battery
176	A	3	N/A	X	X	Combi battery heating frost alarm	Combi battery heating frost alarm	Alarm 176	Combi battery (Heating): Frostalarm
177	A	3	N/A	X	X	Combi battery cooling frost alarm	Combi battery cooling frost alarm	Alarm 177	Combi battery (cooling): Frostalarm
178	B	10	N/A			Alarm from heat recovery unit or circulation pump	Digital Input "Heat recov. alarm" open or alarm from circulation pump	Alarm 178	Alarm from heatrecycling or circulationspump
179	B	10	N/A	X		Temperature sensor fault: heat pump	Air Temp. sensor beside heat pump condenser disconnected/short-circuited: sensor not configured for a temperature input. Frost thermostat tripped: Flow temperature low, Circulation pump error, outdoor temperature low.	Alarm 179	Temperature sensor fault: Heat pump
180	A	10	N/A	X	X	Frostalarm air	Frostalarm air	Alarm 180	Frostalarm, air

Alarmlist, OJ-Air2 SW 3.24					WEB Text		HTERM Text		
Alarm-number	Alarm type	Alarm-delay sec.	Alarm Limit	Auto reset	Unit stop	WEB text	Pop-up text	Alarm number	Alarm text
181	B	3	N/A	X		Pressure sensor heatpump not configured (Only special customer SW)	Pressure sensor for dynamic de-icing of heatpump is not configured	Alarm 181	Pressure sensor heatpump not configured
182	B	1200	N/A	X		Dynamic de-icing heatpump not measured (Only special customer SW)	Dynamic de-icing heatpump not measured	Alarm 182	Dynamic de-icing heatpump not measured
183	B	3	N/A	X		Pressure sensor cross-flow heat exchanger not configured (Only special customer SW)	Pressure sensor cross-flow heat exchanger not configured	Alarm 183	Pressure sensor cross-flow heat exchanger not configured
184	B	1200	N/A	X		Dynamic de-icing cross-flow heat exchanger not measured (Only special customer SW)	Dynamic de-icing cross-flow heat exchanger not measured	Alarm 184	Dynamic de-icing cross-flow heat exchanger not measured
187	B	10	N/A			VVB cool/freeze, Pump Alarm (Only special customer SW)	VVB cool/freeze, Pump Alarm	Alarm 187	VVB cool/freeze, Pump Alarm
188	B	10	N/A	X		Temperature sensor fault: VVB cool/freeze, before condenser (Only special customer SW)	VVB cool/freeze temp. sensor disconnected/short-circuited, sensor not configured for a temperature input	Alarm 188	Temperature sensor fault: VVB cool/freeze, before condenser
189	B	10	N/A	X		Temperature sensor fault: VVB cool/freeze, after condenser (Only special customer SW)	Shunt battery temp. sensor disconnected/short-circuited, sensor not configured for a temperature input	Alarm 189	Temperature sensor fault: VVB cool/freeze, after condenser
190	B	10	N/A	X		Temperature sensor 1 fault: Room (Only special customer SW)	Room temp. sensor 1 disconnected/short-circuited	Alarm 190	Temperature sensor 1 fault: Room
191	B	10	N/A	X		Temperature sensor 2 fault: Room (Only special customer SW)	Room temp. sensor 2 disconnected/short-circuited	Alarm 191	Temperature sensor 2 fault: Room
192	A	10	N/A		X	Return water sensor error (Only special customer SW)	Return water sensor disconnected/short-circuited.	Alarm 192	Return water sensor error
193	B	10	N/A	X		Return water sensor is not configured (Only special customer SW)	Return water sensor is not configured.	Alarm 193	Return water sensor is not configured
194	B	10	N/A	X		Humidity sensor (HTH6202): No communication	Humidity sensor (HTH6202): No communication	Alarm 194	No communication, Modbus, HTH-6202, sensor
195	B	10	N/A	X		Humidity sensor (HTH6203): No communication	Humidity sensor (HTH6203): No communication	Alarm 195	No communication, Modbus, HTH-6203, sensor
196	B	10	N/A	X		Output, humidifier, not configured	Output, humidifier, not configured	Alarm 196	Outputs, humidifier, not configured
197	B	10	N/A	X		Humidifier alarm	Alarm input from humidifier	Alarm 197	Alarm input from humidifier
198	B	1200	N/A	X		Inlet humidity high	Inlet humidity high	Alarm 198	Inlet humidity high
199	B	1200	N/A	X		Inlet humidity low	Inlet humidity low	Alarm 199	Inlet humidity low
200	B	1200	N/A	X		Exhaust humidity high	Exhaust humidity high	Alarm 200	Exhaust humidity high
201	B	1200	N/A	X		Exhaust humidity low	Exhaust humidity low	Alarm 201	Exhaust humidity low
202	B	10	N/A	X		Sensor error, Watercooling	Sensor error, Watercooling	Alarm 202	Sensor error, Watercooling
203	A	3	N/A	X	X	EXT. 3: No communication	EXT. 3: No communication	Alarm 203	EXT. 3: No communication
204	A	3	N/A	X	X	EXT. 4: No communication	EXT. 4: No communication	Alarm 204	EXT. 4: No communication
205	A	3	N/A	X	X	EXT. 5: No communication	EXT. 5: No communication	Alarm 205	EXT. 5: No communication
206	A	3	N/A	X	X	EXT. 6: No communication	EXT. 6: No communication	Alarm 206	EXT. 6: No communication
207	A	3	N/A	X	X	EXT. 7: No communication	EXT. 7: No communication	Alarm 207	EXT. 7: No communication
208	B	3	N/A	X		Roomcontrol: No communication	Roomcontrol: No communication	Alarm 208	Roomcontrol: No communication
209	B	3	N/A	X		VOC Sensor: No communication	VOC Sensor: No communication	Alarm 209	VOC sensor: error Measure value out of range
210	B	600	N/A	X		VOC sensor error: Measure value out of range	VOC sensor error: Measure value out of range	Alarm 210	VOC sensor: error Measure value out of range
211	B	10	N/A	X		Humidity sensor (HTH6204): No communication	Humidity sensor (HTH6204): No communication	Alarm 211	No communication, Modbus HTH-6204, sensor
212	B	10	N/A	X		Dewpoint sensor error	Dewpoint sensor error	Alarm 212	Dewpoint sensor error
214	A	3	N/A	X	X	EXT. 8: No communication	EXT. 8: No communication	Alarm 214	EXT. 8: No communication
215	B	30	N/A	X		Contact for preheater battery stuck	Contact for preheater battery stuck	Alarm 215	Contact for electric preheater battery stuck
216	B	30	N/A	X		Preheater: Overheating alarm	Preheater: Overheating alarm	Alarm 216	Preheater: Overheating alarm
217	A	10	N/A	X	X	Preheater, hotwater sensor error	Preheater, hotwater sensor error	Alarm 217	Preheater, Hotwater sensor error
218	A	10	N/A		X	Preheater, Pump alarm	Preheater, Pump alarm	Alarm 218	Preheater, Pump alarm
219	A	3	N/A		X	Preheater, Frost alarm	Preheater, Frost alarm	Alarm 219	Preheater, Frost alarm
220	A	10	N/A	X	X	Preheater, Air flow sensor error	Preheater, Air flow sensor error	Alarm 220	Preheater, Air flow sensor error
221	B	300	N/A	X		Preheater, Power reduced	Preheater, Power reduced	Alarm 221	Preheater, Power reduced

Alarmlist, OJ-Air2 SW 3.24					WEB Text	Pop-up text	Alarm- nummer	Alarmtext	HTERM Text
Alarm- nummer	Alarm- type	Alarm- forsink sek.	Alarm- reset	Auto- reset	Anlag stop	WEB text	Pop-up text	Alarm- nummer	Alarmtext
222	B	300	N/A	X	X	Heat recovery efficiency is lower than min. Setpoint	Heat recovery efficiency is lower than min. Setpoint	Alarm 222	Heat recovery/efficiency is lower than min. Setpoint
223	A	3	N/A	X	X	Inlet frequency conv. (ATV) : No communication	ATV not connected to bus in FanIO port B	Alarm 223	Inlet frequency converter (ATV) No communication
224	A	3	N/A	X	X	Exhaust frequency conv. (ATV): No communication	ATV not connected to bus in FanIO port B	Alarm 224	Exhaust frequency converter (ATV) No communication
225	A	10	N/A			Error: ATV Inlet frequency converter	An error occurred in the ATV Inlet frequency converter, more information through the ATV Interface	Alarm 225	Error: ATV Inlet frequency converter
226	A	10	N/A			Error: ATV exhaust frequency converter	An error occurred in the ATV exhaust frequency converter, more information through the ATV Interface	Alarm 226	Error: ATV exhaust frequency converter
227	A	3	N/A		X	Frostalarm - fluid coupled heat exchanger	Frostalarm - fluid coupled heat exchanger	Alarm 227	Frost alarm Fluid coupled heat exchanger
228	B	30	N/A			Contact for electrical frostprotection battery stuck	Contact for electrical frostprotection battery stuck	Alarm 228	Contact for electrical frostprotection battery stuck
229	B	30	N/A			Electric frostprotection battery: overheating alarm	Electric frostprotection battery: overheating alarm	Alarm 229	Electrical frostprotection battery: Overheating alarm
230	B	300	N/A	X		Reduced frostprotection on electric frostprotection battery	Reduced frostprotection on electric frostprotection battery	Alarm 230	Reduced frostprotection on electrical frostprotection battery
231	B	1200	N/A	X		De-icing pressure, rotating heatrecovery, not calibrated	De-icing pressure, rotating heatrecovery, not calibrated	Alarm 231	De-icing pressure, rotating heatrecovery, not calibrated: Dynamic pressure regulation cannot be used.
232	B	3	N/A	X		PTH-sensor (ETA/EHA), rotating heatrecovery, not configured	PTH-sensor (ETA/EHA), rotating heatrecovery, not configured	Alarm 232	PTH-sensor (ETA/EHA), rotating heatrecovery, not configured
233	B	1800	N/A	X		Rotating heat recovery frozen	Rotating heat recovery frozen	Alarm 233	Rotating heat exchanger is frozen
234	B	1800	N/A			Rotating heat recovery is soiled	Rotating heat recovery is soiled	Alarm 234	Rotating heat exchanger is soiled
235	A	3	N/A		X	Inlet EC-2 Controller: Alarm stop	Inlet EC-2 Controller: Alarm stop	Alarm 235	Inlet EC-2 Controller : Alarm stop
236	A	3	N/A		X	Inlet EC-2 Controller: Blocked rotor	Inlet EC-2 Controller: Blocked rotor	Alarm 236	Inlet EC-2 Controller : Blocked rotor
237	B	3	N/A			Inlet EC-2 Controller: Current limit active	Inlet EC-2 Controller: Current limit active	Alarm 237	Inlet EC-2 Controller : Current limit active
238	B	3	N/A			Inlet EC-2 Controller: Low supply voltage (Vio)	Inlet EC-2 Controller: Low supply voltage (Vio)	Alarm 238	Inlet EC-2 Controller : Low supply voltage (Vio)
239	B	3	N/A			Inlet EC-2 Controller: High supply voltage (Vhi)	Inlet EC-2 Controller: High supply voltage (Vhi)	Alarm 239	Inlet EC-2 Controller : High supply voltage (Vhi)
240	B	3	N/A			Inlet EC-2 Controller: High temperature (Thi)	Inlet EC-2 Controller: High temperature (Thi)	Alarm 240	Inlet EC-2 Controller : High temperature (Thi)
241	B	3	N/A			Inlet EC-2 Controller: High internal ripple voltage	Inlet EC-2 Controller: High internal ripple voltage	Alarm 241	Inlet EC-2 Controller : High internal ripple voltage
242	A	3	N/A	X		Exhaust EC-2 Controller: Alarm stop	Exhaust EC-2 Controller: Alarm stop	Alarm 242	Exhaust EC-2 Controller : Alarm stop
243	A	3	N/A		X	Exhaust EC-2 Controller: Blocked rotor	Exhaust EC-2 Controller: Blocked rotor	Alarm 243	Exhaust EC-2 Controller : Blocked rotor
244	B	3	N/A			Exhaust EC-2 Controller: Current limit active	Exhaust EC-2 Controller: Current limit active	Alarm 244	Exhaust EC-2 Controller : Current limit active
245	B	3	N/A			Exhaust EC-2 Controller: Low supply voltage (Vio)	Exhaust EC-2 Controller: Low supply voltage (Vio)	Alarm 245	Exhaust EC-2 Controller : Low supply voltage (Vio)
246	B	3	N/A			Exhaust EC-2 Controller: High supply voltage (Vhi)	Exhaust EC-2 Controller: High supply voltage (Vhi)	Alarm 246	Exhaust EC-2 Controller : High supply voltage (Vhi)
247	B	3	N/A			Exhaust EC-2 Controller: High temperature (Thi)	Exhaust EC-2 Controller: High temperature (Thi)	Alarm 247	Exhaust EC-2 Controller : High temperature (Thi)
248	B	3	N/A			Exhaust EC-2 Controller: High internal ripple voltage	Exhaust EC-2 Controller: High internal ripple voltage	Alarm 248	Exhaust EC-2 Controller : High internal ripple voltage
249	B	3	N/A			Inlet EC-2 Controller: Lacking supply phase	Inlet EC-2 Controller: Lacking supply phase	Alarm 249	Inlet EC-2 Controller : Lacking supply phase
250	B	3	N/A			Exhaust EC-2 Controller: Lacking supply phase	Exhaust EC-2 Controller: Lacking supply phase	Alarm 250	Exhaust EC-2 Controller : Lacking supply phase
251	A	3	N/A	X	X	Inlet EC-2 Controller: No communication	Inlet EC-2 Controller: No communication	Alarm 251	Inlet EC-2 Contrl.: No communication
252	A	3	N/A	X	X	Exhaust EC-2 Controller: No communication	Exhaust EC-2 Controller: No communication	Alarm 252	Exhaust EC-2 Contl.: No communication
253	B	3	N/A			Temperature sensor (TTH-6202): No communication	Temperature sensor (TTH-6202): No communication	Alarm 253	Temperature sensor (TTH-6202): No communication
254	B	3	N/A			Temperature sensor (TTH-6203): No communication	Temperature sensor (TTH-6203): No communication	Alarm 254	Temperature sensor (TTH-6203): No communication
255	B	3	N/A			Supply airflow correction temperature sensor fault	Supply airflow correction temperature sensor fault	Alarm 255	Supply airflow correction temperature sensor fault
256	B	10	N/A	X		Temperature sensor fault: Addon sensor 1	Temperature sensor fault: Addon sensor 1	Alarm 256	Temperature sensor fault: Addon sensor 1
257	B	10	N/A	X		Temperature sensor fault: Addon sensor 2	Temperature sensor fault: Addon sensor 2	Alarm 257	Temperature sensor fault: Addon sensor 2
258	B	10	N/A	X		Temperature sensor fault: Addon sensor 3	Temperature sensor fault: Addon sensor 3	Alarm 258	Temperature sensor fault: Addon sensor 3
259	B	10	N/A	X		Temperature sensor fault: Addon sensor 4	Temperature sensor fault: Addon sensor 4	Alarm 259	Temperature sensor fault: Addon sensor 4

Alarmlist, OJ-Air2 SW 3.24					WEB Text	HTERM Text			
Alarm-nummer	Alarm-type	Alarm-forsink sek.	Alarm-grensé	Auto reset	Anlag stop	WEB text	Pop-up text	Alarm-nummer	Alarmtext
260	A	3	N/A		X	Inlet controller 1 has the wrong type number or is defect	Replace controller 1	Alarm 260	Inlet controller 1 has the wrong type no. or is defect
261	A	3	N/A		X	Inlet controller 2 has the wrong type number or is defect	Replace controller 2	Alarm 261	Inlet controller 2 has the wrong type no. or is defect
262	A	3	N/A		X	Discharge/exhaust controller 1 has the wrong type number or is defect	Replace controller 1	Alarm 262	Discharge/exhaust controller 1 has the wrong type number or is defect
263	A	3	N/A		X	Discharge/exhaust controller 2 has the wrong type number or is defect	Replace controller 2	Alarm 263	Discharge/exhaust controller 2 has the wrong type number or is defect
264	A	10	N/A	X	X	Room sensor (TTH-6040-W): No communication	Room sensor (TTH-6040-W): No communication	Alarm 264	Room sensor (TTH-6040-W): No communication
265	B	10	N/A	X		Low oil level in DX/HP cooling compressor	Low oil level in DX/HP cooling compressor	Alarm 265	Low oil level in DX/HP cooling compressor
266	A	10	N/A	X		Manual firemanstop	Manual firemanstop	Alarm 266	AHU stopped from the fire man
267	B	10	N/A	X		Bypass smoke evacuation is active with external fan	Bypass smoke evacuation is active with external fan	Alarm 267	Bypass smoke evacuation is active with external fan
268	B	10	N/A	X		Room temperature from BMS system is out of range	Room temperature from BMS system is out of min/max range - AHU will use the extract sensor	Alarm 268	Room temperature from BMS is out of range
269	B	10	N/A	X		Outdoor temperature from BMS system is out of range	Outdoor temperature from BMS system is out of min/max range - AHU will use internal outdoor sensor	Alarm 269	Outdoor temperature from BMS is out of range
270	B	10	N/A	X		Smoke evacuation fan error: Motor did not start	Smoke evacuation fan error: Motor did not start	Alarm 270	Smoke evacuation fan error: Motor did not start
271	B	10	N/A	X		Change outdoor filter and reset timer	The pre defined time for change of outdoor filter is out - change filter and reset timer for filter change	Alarm 271	Change outdoor filter and reset the timer
272	B	10	N/A	X		Change extract filter and reset timer	The pre defined time for change of extract filter is out - change filter and reset timer for filter change	Alarm 272	Change extract filter and reset the timer
273	B	10	N/A	X		Supply air frequency inverter: Power reduction is activated	Supply air frequency inverter: Power reduction is activated	Alarm 273	Supply air frequency inverter: Power reduction is activated
274	B	10	N/A	X		Extract air frequency inverter: Power reduction is activated	Extract air frequency inverter: Power reduction is activated	Alarm 274	Extract air frequency inverter: Power reduction is activated
275	A	10	N/A	X		Supply air FC-DV Controller: Rotor blocked	Supply air FC-DV Controller: Rotor blocked	Alarm 275	Supply air FC-DV Controller: Rotor blocked
276	A	10	N/A	X		Extract air FC-DV Controller: Rotor blocked	Extract air FC-DV Controller: Rotor blocked	Alarm 276	Extract air FC-DV Controller: Rotor blocked

C **Data sheets**

Sorted by unit design volume flow rate

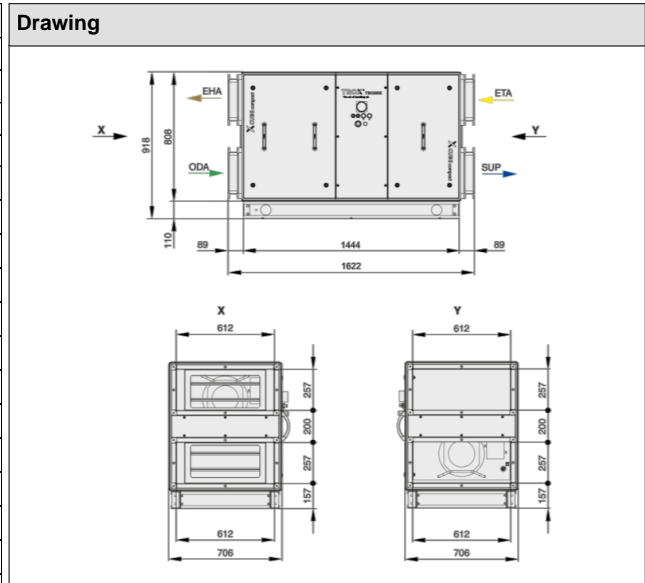
X-CUBE-C-R-R/1300/3P/F7



Operating side
Heat recovery
Device division
Filter class
Multileaf dampers
Surface (interior / exterior)
Dimensions(mm)
Duct connection(mm)
Weight(kg)
Total amount

right
Heat wheel
threefold
ePM1-60% (F7)
2 dampers inside (class 2, EN 1751)
Powder-coated
1478 x 706 x 918 (length x depth x height)
612 x 257 (width x height)
288
1

Performance data	Supply air	Extract air	
Volume flow	1300	1300	m ³ /h
Ext. differential pressure	250	250	Pa
Air velocity	1,7	1,7	m/s
Velocity class (EN 13053)	V2	V2	
Heat recovery	Supply air	Extract air	
Winter:			
Intake (temp. / rel. humidity)	-12,0 / 80	22,0 / 40	°C / %
Outlet (temp. / rel. humidity)	15,0 / 38	-2,9 / 95	°C / %
Total thermal capacity	15,0		kW
Summer:			
Intake (temp. / rel. humidity)	32,0 / 40	26,0 / 50	°C / %
Outlet (temp. / rel. humidity)	27,3 / 53	30,8 / 38	°C / %
Thermal efficiency (dry)	79,7	79,7	%
Thermal efficiency (dry) 1:1	79,7		%
Type of HRS	P-E16-540		
Heat recovery class (EN	H1		
Pressure drop (dry)	187	187	Pa
Filters	Supply air	Extract air	
Class	F7(ePM1-60%)	F7(ePM1-60%)	
Pressure drop A/E/D	53/200/127	53/200/127	Pa
Filter area	7,6	7,6	m ²
Eurovent energy efficiency	Class B	Class B	
Fan	Supply air	Extract air	*1) *2)
Type of fan	R3G250PR1715	R3G250PR1715	
Total power consumption	0,39	0,39	kW
SFPv value / Class	940 / 2	940 / 2	W/(m ³ /s)
Class P (EN 13053)	P1	P1	
Static efficiency	52,6	52,6	%
Nominal power	0,7	0,7	kW
Nominal current	3,0	3,0	A
Nominal voltage	1~200-277	1~200-277	V
Speed	2.656	2.656	1/min
Pressure increase	569	569	Pa
Heater/Cooler	Supply air		
Without pre heater			
Without heater:			
Without cooler:			
Damper	Supply air	Extract air	
Pressure drop	5	5	Pa



Controller	
1 x	TROX X-CUBE control
1 x	Hand-held control panel
1 x	External RJ45 interface
2 x	Damper actuator, modulating 5 Nm, 24 V via Modbus connection
2 x	FanIO coupling module
4 x	Temperature sensor Pt 1000
1 x	Rotary isolator switch
1 x	Filter warning indication

Acoustic Data									
f[Hz]	63	125	250	500	1k	2k	4k	8k	Lw A [db(A)]
ODA:	57	56	57	52	48	40	34	33	54
SUP:	76	77	78	75	71	68	66	66	77
ETA:	57	56	57	52	48	40	34	33	54
EHA:	76	77	78	75	71	68	66	66	77
CAS:	60	64	51	40	37	32	26	16	50

Casing variant: X-CUBE

*1) The fan configuration is done on dry conditions.

*2) The fan system effect is taken into account in the fan performances.

X-CUBE-C-R-R/1300/3P/F7



Operating side	right
Heat recovery	Heat wheel
Device division	threefold
Filter class	ePM1-60% (F7)
Multileaf dampers	2 dampers inside (class 2, EN 1751)
Surface (interior / exterior)	Powder-coated
Dimensions(mm)	1478 x 706 x 918 (length x depth x height)
Duct connection(mm)	612 x 257 (width x height)
Weight(kg)	288
Total amount	1

Information requirements for NRVUs as referred to in Article 4(2):

Typology: NRVU, BVU
Type of installed drive: see drive information
Type of HRS: other
Filter warning indication

Decomposition drawing:

For safety notes regarding disassembly and disposal, please refer to the transport and installation manual for 'Air handling units, X-CUBE Compact including X-CUBE Compact accessories'. The manual is shipped with the air handling unit, but can also be downloaded from <http://www.troxtechnik.com>.

	Total	Supply/Extract air	
HRS thermal efficiency:	79,7		%
Nominal NRVU flow rate:		1300 / 1300	m³/h
Effective electric power input:	0,78	0,39 / 0,39	kW
SFP int:	934	467 / 467	W/(m3/s)
Face velocity at design flow:		1,7 / 1,7	m/s
Nominal external pressure:		250 / 250	Pa
Internal pressure drop of ventilation components:		246 / 246	Pa
Static efficiency at operating point:		52,6 / 52,6	%
Static efficiency according to EU 327:		62,5 / 62,5	%
Internal leakage:	3,9		%
External leakage:	L1(M) / L2(R)		
Energy performance of the filters:		Class B / Class B	
Sound power level:	50		dB(A)
Eco design requirements for RVUs 2016:	complied		
Eco design requirements for RVUs 2018:	complied		

Unit details:

Supply and extract air unit, compact construction, with highly efficient heat recovery. The high-quality casing is a frame construction with fitted double skin panels, powder-coated on both sides, for demanding hygiene requirements. Unit is ready to operate due to integral, bus-based X-CUBE control system; prepared for BACnet and Modbus; other bus systems are possible. (Duct connection and electrical connections are to be made by others.) Quick-release filter clamping device and high-quality F7 minipleat filter inserts for both supply air and extract air. Fresh air and exhaust air multileaf dampers with aerodynamically profiled aluminium blades, low leakage to EN 1751, class 2; all four duct connecting spigots prevent the transmission of structure-borne noise. Centrifugal fans with backward curved blades (plug fans) and EC motors are infinitely variable and ensure optimum efficiency and the lowest sound pressure level even under partial loads; they comply with the future IE4 efficiency class. All units are tested for CE conformity and carry the CE mark. Galvanised sheet steel, degreased, with thick film iron phosphate. Powder-coated (approx. RAL 9016).

X-CUBE-C-R-R/2000/3P/F7

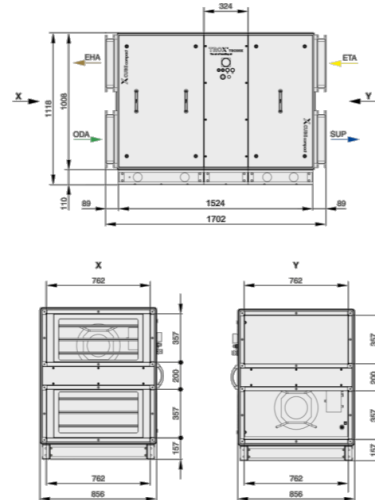


Operating side
Heat recovery
Device division
Filter class
Multileaf dampers
Surface (interior / exterior)
Dimensions(mm)
Duct connection(mm)
Weight(kg)
Total amount

right
Heat wheel
threefold
ePM1-60% (F7)
2 dampers inside (class 2, EN 1751)
Powder-coated
1558 x 856 x 1118 (length x depth x height)
762 x 357 (width x height)
367
1

Performance data	Supply air	Extract air	
Volume flow	2000	2000	m ³ /h
Ext. differential pressure	250	250	Pa
Air velocity	1,6	1,6	m/s
Velocity class (EN 13053)	V2	V2	
Heat recovery	Supply air	Extract air	
Winter:			
Intake (temp. / rel. humidity)	-12,0 / 80	22,0 / 40	°C / %
Outlet (temp. / rel. humidity)	15,3 / 37	-3,2 / 95	°C / %
Total thermal capacity	23,3		kW
Summer:			
Intake (temp. / rel. humidity)	32,0 / 40	26,0 / 50	°C / %
Outlet (temp. / rel. humidity)	27,2 / 53	30,8 / 38	°C / %
Thermal efficiency (dry)	80,5	80,5	%
Thermal efficiency (dry) 1:1	80,5		%
Type of HRS	P-E16-700		
Heat recovery class (EN	H1		
Pressure drop (dry)	171	171	Pa
Filters	Supply air	Extract air	
Class	F7(ePM1-60%)	F7(ePM1-60%)	
Pressure drop A/E/D	63/200/132	63/200/132	Pa
Filter area	11,3	11,3	m ²
Eurovent energy efficiency	Class B	Class B	
Fan	Supply air	Extract air	*1) *2)
Type of fan	R3G280PS10J5	R3G280PS10J5	
Total power consumption	0,57	0,57	kW
SFPv value / Class	910 / 2	910 / 2	W/(m ³ /s)
Class P (EN 13053)	P1	P1	
Static efficiency	54,6	54,6	%
Nominal power	1,0	1,0	kW
Nominal current	1,6	1,6	A
Nominal voltage	2~380-480	2~380-480	V
Speed	2.614	2.614	1/min
Pressure increase	557	557	Pa
Heater/Cooler	Supply air		
Without pre heater			
Without heater:			
Without cooler:			
Damper	Supply air	Extract air	
Pressure drop	5	5	Pa

Drawing



Controller

1 x	TROX X-CUBE control
1 x	Hand-held control panel
1 x	External RJ45 interface
2 x	Damper actuator, modulating 5 Nm, 24 V via Modbus connection
2 x	FanIO coupling module
4 x	Temperature sensor Pt 1000
1 x	Rotary isolator switch
1 x	Filter warning indication

Acoustic Data

f[Hz]	63	125	250	500	1k	2k	4k	8k	Lw A [db(A)]
ODA:	51	51	57	53	49	42	38	35	54
SUP:	69	68	76	74	73	72	67	65	78
ETA:	51	51	57	53	49	42	38	35	54
EHA:	69	68	76	74	73	72	67	65	78
CAS:	52	55	49	39	38	35	27	15	45

Casing variant: X-CUBE

*1) The fan configuration is done on dry conditions.

*2) The fan system effect is taken into account in the fan performances.

X-CUBE-C-R-R/2000/3P/F7



Operating side	right
Heat recovery	Heat wheel
Device division	threefold
Filter class	ePM1-60% (F7)
Multileaf dampers	2 dampers inside (class 2, EN 1751)
Surface (interior / exterior)	Powder-coated
Dimensions(mm)	1558 x 856 x 1118 (length x depth x height)
Duct connection(mm)	762 x 357 (width x height)
Weight(kg)	367
Total amount	1

Information requirements for NRVUs as referred to in Article 4(2):

Typology: NRVU, BVU
Type of installed drive: see drive information
Type of HRS: other
Filter warning indication

Decomposition drawing:

For safety notes regarding disassembly and disposal, please refer to the transport and installation manual for 'Air handling units, X-CUBE Compact including X-CUBE Compact accessories'. The manual is shipped with the air handling unit, but can also be downloaded from <http://www.troxtechnik.com>.

	Total	Supply/Extract air	
HRS thermal efficiency:	80,5		%
Nominal NRVU flow rate:		2000 / 2000	m³/h
Effective electric power input:	1,14	0,57 / 0,57	kW
SFP int:	876	438 / 438	W/(m3/s)
Face velocity at design flow:		1,6 / 1,6	m/s
Nominal external pressure:		250 / 250	Pa
Internal pressure drop of ventilation components:		239 / 239	Pa
Static efficiency at operating point:		54,6 / 54,6	%
Static efficiency according to EU 327:		61,4 / 61,4	%
Internal leakage:	4,1		%
External leakage:	L1(M) / L2(R)		
Energy performance of the filters:		Class B / Class B	
Sound power level:	45		dB(A)
Eco design requirements for RVUs 2016:	complied		
Eco design requirements for RVUs 2018:	complied		

Unit details:

Supply and extract air unit, compact construction, with highly efficient heat recovery. The high-quality casing is a frame construction with fitted double skin panels, powder-coated on both sides, for demanding hygiene requirements. Unit is ready to operate due to integral, bus-based X-CUBE control system; prepared for BACnet and Modbus; other bus systems are possible. (Duct connection and electrical connections are to be made by others.) Quick-release filter clamping device and high-quality F7 minipleat filter inserts for both supply air and extract air. Fresh air and exhaust air multileaf dampers with aerodynamically profiled aluminium blades, low leakage to EN 1751, class 2; all four duct connecting spigots prevent the transmission of structure-borne noise. Centrifugal fans with backward curved blades (plug fans) and EC motors are infinitely variable and ensure optimum efficiency and the lowest sound pressure level even under partial loads; they comply with the future IE4 efficiency class. All units are tested for CE conformity and carry the CE mark. Galvanised sheet steel, degreased, with thick film iron phosphate. Powder-coated (approx. RAL 9016).

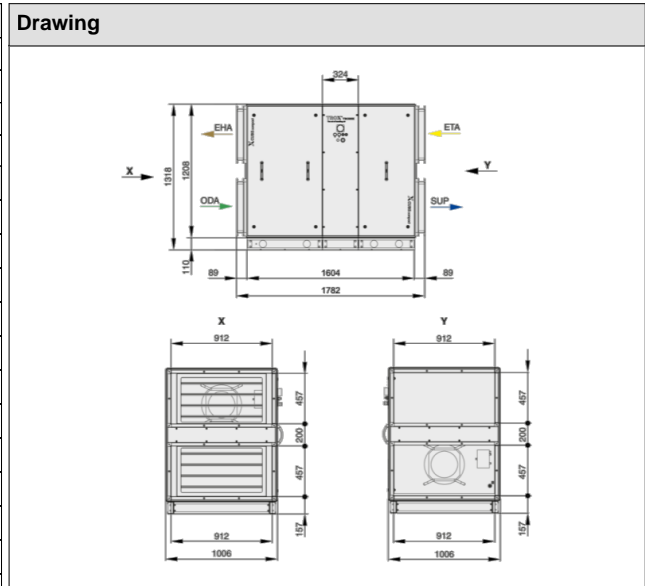
X-CUBE-C-R-R/3000/3P/F7



Operating side
Heat recovery
Device division
Filter class
Multileaf dampers
Surface (interior / exterior)
Dimensions(mm)
Duct connection(mm)
Weight(kg)
Total amount

right
Heat wheel
threefold
ePM1-60% (F7)
2 dampers inside (class 2, EN 1751)
Powder-coated
1638 x 1006 x 1318 (length x depth x height)
912 x 457 (width x height)
471
1

Performance data	Supply air	Extract air	
Volume flow	3000	3000	m ³ /h
Ext. differential pressure	250	250	Pa
Air velocity	1,7	1,7	m/s
Velocity class (EN 13053)	V2	V2	
Heat recovery	Supply air	Extract air	
Winter:			
Intake (temp. / rel. humidity)	-12,0 / 80	22,0 / 40	°C / %
Outlet (temp. / rel. humidity)	15,2 / 38	-3,1 / 95	°C / %
Total thermal capacity	34,9		kW
Summer:			
Intake (temp. / rel. humidity)	32,0 / 40	26,0 / 50	°C / %
Outlet (temp. / rel. humidity)	27,2 / 53	30,8 / 38	°C / %
Thermal efficiency (dry)	80,3	80,3	%
Thermal efficiency (dry) 1:1	80,3		%
Type of HRS	P-E16-850		
Heat recovery class (EN	H1		
Pressure drop (dry)	174	174	Pa
Filters	Supply air	Extract air	
Class	F7(ePM1-60%)	F7(ePM1-60%)	
Pressure drop A/E/D	87/200/143	87/200/143	Pa
Filter area	13,7	13,7	m ²
Eurovent energy efficiency	Class B	Class B	
Fan	Supply air	Extract air	*1) *2)
Type of fan	R3G310PH3801	R3G310PH3801	
Total power consumption	0,81	0,81	kW
SFPv value / Class	900 / 2	900 / 2	W/(m ³ /s)
Class P (EN 13053)	P1	P1	
Static efficiency	58,8	58,8	%
Nominal power	1,7	1,7	kW
Nominal current	2,5	2,5	A
Nominal voltage	2~380-480	2~380-480	V
Speed	2.577	2.577	1/min
Pressure increase	572	572	Pa
Heater/Cooler	Supply air		
Without pre heater			
Without heater:			
Without cooler:			
Damper	Supply air	Extract air	
Pressure drop	5	5	Pa



Controller	
1 x	TROX X-CUBE control
1 x	Hand-held control panel
1 x	External RJ45 interface
2 x	Damper actuator, modulating 5 Nm, 24 V via Modbus connection
2 x	FanIO coupling module
4 x	Temperature sensor Pt 1000
1 x	Rotary isolator switch
1 x	Filter warning indication

Acoustic Data									
f[Hz]	63	125	250	500	1k	2k	4k	8k	Lw A [db(A)]
ODA:	63	54	59	57	53	51	47	39	59
SUP:	73	67	72	72	76	76	75	68	82
ETA:	63	54	59	57	53	51	47	39	59
EHA:	73	67	72	72	76	76	75	68	82
CAS:	58	54	46	38	40	39	35	18	46

Casing variant: X-CUBE

*1) The fan configuration is done on dry conditions.

*2) The fan system effect is taken into account in the fan performances.

X-CUBE-C-R-R/3000/3P/F7



Operating side	right
Heat recovery	Heat wheel
Device division	threefold
Filter class	ePM1-60% (F7)
Multileaf dampers	2 dampers inside (class 2, EN 1751)
Surface (interior / exterior)	Powder-coated
Dimensions(mm)	1638 x 1006 x 1318 (length x depth x height)
Duct connection(mm)	912 x 457 (width x height)
Weight(kg)	471
Total amount	1

Information requirements for NRVUs as referred to in Article 4(2):

Typology: NRVU, BVU
Type of installed drive: see drive information
Type of HRS: other
Filter warning indication

Decomposition drawing:

For safety notes regarding disassembly and disposal, please refer to the transport and installation manual for 'Air handling units, X-CUBE Compact including X-CUBE Compact accessories'. The manual is shipped with the air handling unit, but can also be downloaded from <http://www.troxtechnik.com>.

	Total	Supply/Extract air	
HRS thermal efficiency:	80,3		%
Nominal NRVU flow rate:		3000 / 3000	m³/h
Effective electric power input:	1,62	0,81 / 0,81	kW
SFP int:	904	452 / 452	W/(m3/s)
Face velocity at design flow:		1,7 / 1,7	m/s
Nominal external pressure:		250 / 250	Pa
Internal pressure drop of ventilation components:		266 / 266	Pa
Static efficiency at operating point:		58,8 / 58,8	%
Static efficiency according to EU 327:		61,1 / 61,1	%
Internal leakage:	4,0		%
External leakage:	L1(M) / L2(R)		
Energy performance of the filters:		Class B / Class B	
Sound power level:	46		dB(A)
Eco design requirements for RVUs 2016:	complied		
Eco design requirements for RVUs 2018:	complied		

Unit details:

Supply and extract air unit, compact construction, with highly efficient heat recovery. The high-quality casing is a frame construction with fitted double skin panels, powder-coated on both sides, for demanding hygiene requirements. Unit is ready to operate due to integral, bus-based X-CUBE control system; prepared for BACnet and Modbus; other bus systems are possible. (Duct connection and electrical connections are to be made by others.) Quick-release filter clamping device and high-quality F7 minipleat filter inserts for both supply air and extract air. Fresh air and exhaust air multileaf dampers with aerodynamically profiled aluminium blades, low leakage to EN 1751, class 2; all four duct connecting spigots prevent the transmission of structure-borne noise. Centrifugal fans with backward curved blades (plug fans) and EC motors are infinitely variable and ensure optimum efficiency and the lowest sound pressure level even under partial loads; they comply with the future IE4 efficiency class. All units are tested for CE conformity and carry the CE mark. Galvanised sheet steel, degreased, with thick film iron phosphate. Powder-coated (approx. RAL 9016).

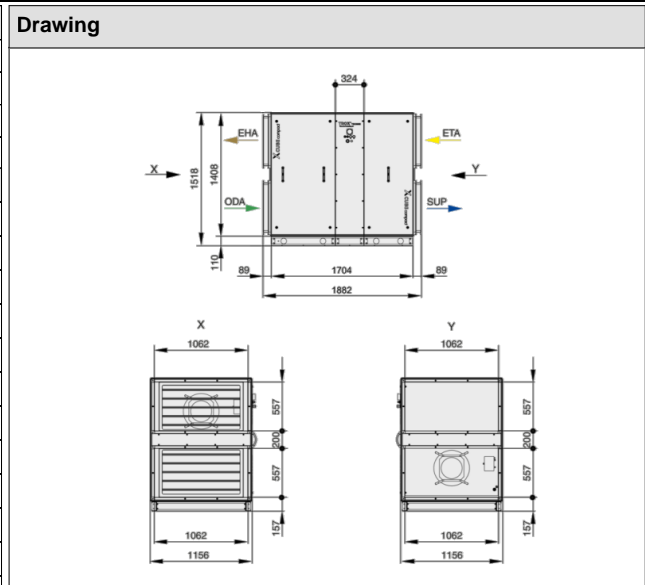
X-CUBE-C-R-R/4200/3P/F7



Operating side
Heat recovery
Device division
Filter class
Multileaf dampers
Surface (interior / exterior)
Dimensions(mm)
Duct connection(mm)
Weight(kg)
Total amount

right
Heat wheel
threefold
ePM1-60% (F7)
2 dampers inside (class 2, EN 1751)
Powder-coated
1738 x 1156 x 1518 (length x depth x height)
1062 x 557 (width x height)
580
1

Performance data	Supply air	Extract air	
Volume flow	4200	4200	m ³ /h
Ext. differential pressure	250	250	Pa
Air velocity	1,7	1,7	m/s
Velocity class (EN 13053)	V2	V2	
Heat recovery	Supply air	Extract air	
Winter:			
Intake (temp. / rel. humidity)	-12,0 / 80	22,0 / 40	°C / %
Outlet (temp. / rel. humidity)	15,2 / 38	-3,1 / 95	°C / %
Total thermal capacity	48,8		kW
Summer:			
Intake (temp. / rel. humidity)	32,0 / 40	26,0 / 50	°C / %
Outlet (temp. / rel. humidity)	27,2 / 53	30,8 / 38	°C / %
Thermal efficiency (dry)	80,3	80,3	%
Thermal efficiency (dry) 1:1	80,3		%
Type of HRS	P-E16-1004		
Heat recovery class (EN	H1		
Pressure drop (dry)	175	175	Pa
Filters	Supply air	Extract air	
Class	F7(ePM1-60%)	F7(ePM1-60%)	
Pressure drop A/E/D	60/200/130	60/200/130	Pa
Filter area	24,4	24,4	m ²
Eurovent energy efficiency	Class B	Class B	
Fan	Supply air	Extract air	*1) *2)
Type of fan	R3G355PH4901	R3G355PH4901	
Total power consumption	1,20	1,20	kW
SFPv value / Class	931 / 2	931 / 2	W/(m ³ /s)
Class P (EN 13053)	P1	P1	
Static efficiency	54,3	54,3	%
Nominal power	1,7	1,7	kW
Nominal current	2,6	2,6	A
Nominal voltage	2~380-480	2~380-480	V
Speed	2.363	2.363	1/min
Pressure increase	559	559	Pa
Heater/Cooler	Supply air		
Without pre heater			
Without heater:			
Without cooler:			
Damper	Supply air	Extract air	
Pressure drop	5	5	Pa



Controller	
1 x	TROX X-CUBE control
1 x	Hand-held control panel
1 x	External RJ45 interface
2 x	Damper actuator, modulating 5 Nm, 24 V via Modbus connection
2 x	FanIO coupling module
4 x	Temperature sensor Pt 1000
1 x	Rotary isolator switch
1 x	Filter warning indication

Acoustic Data									
f[Hz]	63	125	250	500	1k	2k	4k	8k	Lw A [db(A)]
ODA:	51	57	61	58	56	52	49	41	61
SUP:	63	68	71	73	77	75	76	68	82
ETA:	51	57	61	58	56	52	49	41	61
EHA:	63	68	71	73	77	75	76	68	82
CAS:	46	55	46	38	41	38	35	18	46

Casing variant: X-CUBE

*1) The fan configuration is done on dry conditions.

*2) The fan system effect is taken into account in the fan performances.

X-CUBE-C-R-R/4200/3P/F7



Operating side	right
Heat recovery	Heat wheel
Device division	threefold
Filter class	ePM1-60% (F7)
Multileaf dampers	2 dampers inside (class 2, EN 1751)
Surface (interior / exterior)	Powder-coated
Dimensions(mm)	1738 x 1156 x 1518 (length x depth x height)
Duct connection(mm)	1062 x 557 (width x height)
Weight(kg)	580
Total amount	1

Information requirements for NRUVs as referred to in Article 4(2):

Typology: NRUV, BVU
Type of installed drive: see drive information
Type of HRS: other
Filter warning indication

Decomposition drawing:

For safety notes regarding disassembly and disposal, please refer to the transport and installation manual for 'Air handling units, X-CUBE Compact including X-CUBE Compact accessories'. The manual is shipped with the air handling unit, but can also be downloaded from <http://www.troxtechnik.com>.

	Total	Supply/Extract air	
HRS thermal efficiency:	80,3		%
Nominal NRUV flow rate:		4200 / 4200	m³/h
Effective electric power input:	2,40	1,20 / 1,20	kW
SFP int:	882	441 / 441	W/(m3/s)
Face velocity at design flow:		1,7 / 1,7	m/s
Nominal external pressure:		250 / 250	Pa
Internal pressure drop of ventilation components:		239 / 239	Pa
Static efficiency at operating point:		54,3 / 54,3	%
Static efficiency according to EU 327:		66,1 / 66,1	%
Internal leakage:	3,9		%
External leakage:	L1(M) / L2(R)		
Energy performance of the filters:		Class B / Class B	
Sound power level:	46		dB(A)
Eco design requirements for RVUs 2016:	complied		
Eco design requirements for RVUs 2018:	complied		

Unit details:

Supply and extract air unit, compact construction, with highly efficient heat recovery. The high-quality casing is a frame construction with fitted double skin panels, powder-coated on both sides, for demanding hygiene requirements. Unit is ready to operate due to integral, bus-based X-CUBE control system; prepared for BACnet and Modbus; other bus systems are possible. (Duct connection and electrical connections are to be made by others.) Quick-release filter clamping device and high-quality F7 minipleat filter inserts for both supply air and extract air. Fresh air and exhaust air multileaf dampers with aerodynamically profiled aluminium blades, low leakage to EN 1751, class 2; all four duct connecting spigots prevent the transmission of structure-borne noise. Centrifugal fans with backward curved blades (plug fans) and EC motors are infinitely variable and ensure optimum efficiency and the lowest sound pressure level even under partial loads; they comply with the future IE4 efficiency class. All units are tested for CE conformity and carry the CE mark. Galvanised sheet steel, degreased, with thick film iron phosphate. Powder-coated (approx. RAL 9016).

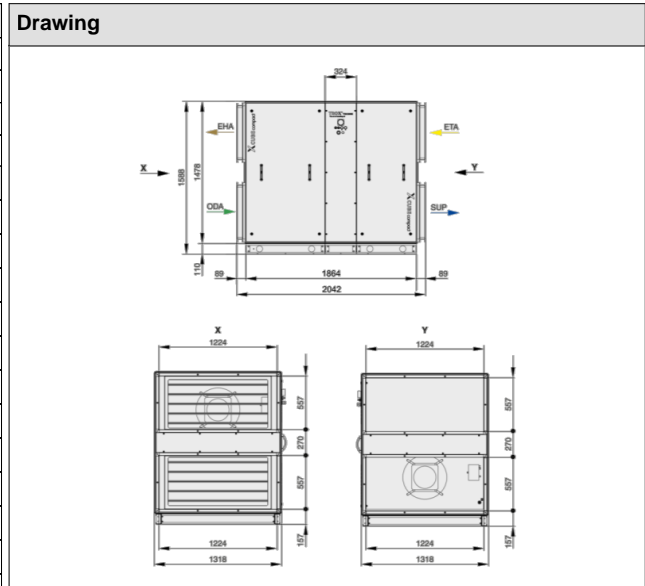
X-CUBE-C-R-R/5250/3P/F7



Operating side
Heat recovery
Device division
Filter class
Multileaf dampers
Surface (interior / exterior)
Dimensions(mm)
Duct connection(mm)
Weight(kg)
Total amount

right
Heat wheel
threefold
ePM1-60% (F7)
2 dampers inside (class 2, EN 1751)
Powder-coated
1898 x 1318 x 1588 (length x depth x height)
1224 x 557 (width x height)
695
1

Performance data	Supply air	Extract air	
Volume flow	5250	5250	m ³ /h
Ext. differential pressure	250	250	Pa
Air velocity	1,7	1,7	m/s
Velocity class (EN 13053)	V2	V2	
Heat recovery	Supply air	Extract air	
Winter:			
Intake (temp. / rel. humidity)	-12,0 / 80	22,0 / 40	°C / %
Outlet (temp. / rel. humidity)	15,3 / 37	-3,2 / 95	°C / %
Total thermal capacity	61,3		kW
Summer:			
Intake (temp. / rel. humidity)	32,0 / 40	26,0 / 50	°C / %
Outlet (temp. / rel. humidity)	27,2 / 53	30,8 / 38	°C / %
Thermal efficiency (dry)	80,6	80,6	%
Thermal efficiency (dry) 1:1	80,6		%
Type of HRS	P-E16-1145		
Heat recovery class (EN	H1		
Pressure drop (dry)	167	167	Pa
Filters	Supply air	Extract air	
Class	F7(ePM1-60%)	F7(ePM1-60%)	
Pressure drop A/E/D	54/200/127	54/200/127	Pa
Filter area	33,6	33,6	m ²
Eurovent energy efficiency	Class B	Class B	
Fan	Supply air	Extract air	*1) *2)
Type of fan	R3G400PA2771	R3G400PA2771	
Total power consumption	1,36	1,36	kW
SFPv value / Class	824 / 2	824 / 2	W/(m ³ /s)
Class P (EN 13053)	P1	P1	
Static efficiency	59,0	59,0	%
Nominal power	3,0	3,0	kW
Nominal current	4,6	4,6	A
Nominal voltage	2~380-480	2~380-480	V
Speed	1.954	1.954	1/min
Pressure increase	549	549	Pa
Heater/Cooler	Supply air		
Without pre heater			
Without heater:			
Without cooler:			
Damper	Supply air	Extract air	
Pressure drop	5	5	Pa



Controller	
1 x	TROX X-CUBE control
1 x	Hand-held control panel
1 x	External RJ45 interface
2 x	Damper actuator, modulating 5 Nm, 24 V via Modbus connection
2 x	FanIO coupling module
4 x	Temperature sensor Pt 1000
1 x	Rotary isolator switch
1 x	Filter warning indication

Acoustic Data									
f[Hz]	63	125	250	500	1k	2k	4k	8k	Lw A [db(A)]
ODA:	58	61	61	59	58	54	48	40	62
SUP:	68	73	72	76	79	78	76	68	84
ETA:	58	61	61	59	58	54	48	40	62
EHA:	68	73	72	76	79	78	76	68	84
CAS:	52	60	46	40	43	41	35	17	49

Casing variant: X-CUBE

*1) The fan configuration is done on dry conditions.

*2) The fan system effect is taken into account in the fan performances.

X-CUBE-C-R-R/5250/3P/F7



Operating side	right
Heat recovery	Heat wheel
Device division	threefold
Filter class	ePM1-60% (F7)
Multileaf dampers	2 dampers inside (class 2, EN 1751)
Surface (interior / exterior)	Powder-coated
Dimensions(mm)	1898 x 1318 x 1588 (length x depth x height)
Duct connection(mm)	1224 x 557 (width x height)
Weight(kg)	695
Total amount	1

Information requirements for NRVUs as referred to in Article 4(2):

Typology: NRVU, BVU
Type of installed drive: see drive information
Type of HRS: other
Filter warning indication

Decomposition drawing:

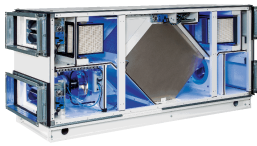
For safety notes regarding disassembly and disposal, please refer to the transport and installation manual for 'Air handling units, X-CUBE Compact including X-CUBE Compact accessories'. The manual is shipped with the air handling unit, but can also be downloaded from <http://www.troxtechnik.com>.

	Total	Supply/Extract air	
HRS thermal efficiency:	80,6		%
Nominal NRVU flow rate:		5250 / 5250	m³/h
Effective electric power input:	2,72	1,36 / 1,36	kW
SFP int:	768	384 / 384	W/(m3/s)
Face velocity at design flow:		1,7 / 1,7	m/s
Nominal external pressure:		250 / 250	Pa
Internal pressure drop of ventilation components:		227 / 227	Pa
Static efficiency at operating point:		59,0 / 59,0	%
Static efficiency according to EU 327:		62,8 / 62,8	%
Internal leakage:	3,8		%
External leakage:	L1(M) / L2(R)		
Energy performance of the filters:		Class B / Class B	
Sound power level:	49		dB(A)
Eco design requirements for RVUs 2016:	complied		
Eco design requirements for RVUs 2018:	complied		

Unit details:

Supply and extract air unit, compact construction, with highly efficient heat recovery. The high-quality casing is a frame construction with fitted double skin panels, powder-coated on both sides, for demanding hygiene requirements. Unit is ready to operate due to integral, bus-based X-CUBE control system; prepared for BACnet and Modbus; other bus systems are possible. (Duct connection and electrical connections are to be made by others.) Quick-release filter clamping device and high-quality F7 minipleat filter inserts for both supply air and extract air. Fresh air and exhaust air multileaf dampers with aerodynamically profiled aluminium blades, low leakage to EN 1751, class 2; all four duct connecting spigots prevent the transmission of structure-borne noise. Centrifugal fans with backward curved blades (plug fans) and EC motors are infinitely variable and ensure optimum efficiency and the lowest sound pressure level even under partial loads; they comply with the future IE4 efficiency class. All units are tested for CE conformity and carry the CE mark. Galvanised sheet steel, degreased, with thick film iron phosphate. Powder-coated (approx. RAL 9016).

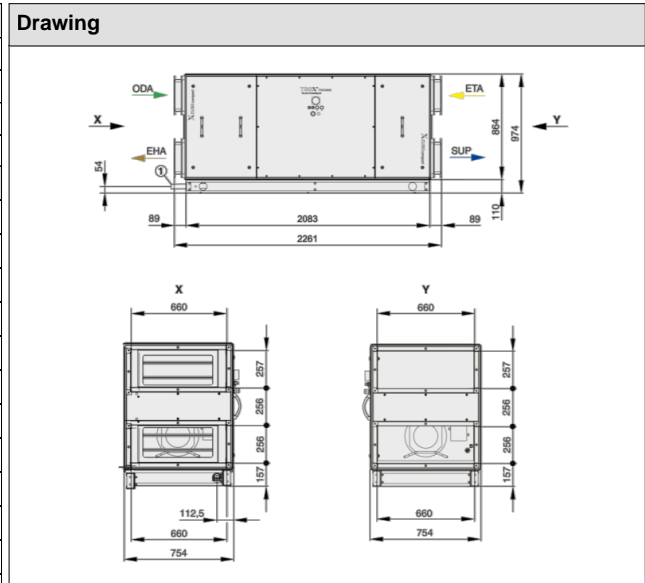
X-CUBE-C-R-P/1230/3P/F7



Operating side
Heat recovery
Device division
Filter class
Multileaf dampers
Surface (interior / exterior)
Dimensions(mm)
Duct connection(mm)
Weight(kg)
Total amount

right
Counterflow plate heat exchanger
threefold
ePM1-60% (F7)
2 dampers inside (class 2, EN 1751)
Powder-coated
2117 x 754 x 974 (length x depth x height)
660 x 257 (width x height)
380
1

Performance data	Supply air	Extract air	
Volume flow	1230	1230	m ³ /h
Ext. differential pressure	250	250	Pa
Air velocity	1,3	1,3	m/s
Velocity class (EN 13053)	V1	V1	
Heat recovery	Supply air	Extract air	
Winter:			
Intake (temp. / rel. humidity)	-12,0 / 80	22,0 / 40	°C / %
Outlet (temp. / rel. humidity)	18,9 / 8	-0,4 / 87	°C / %
Total thermal capacity	12,0		kW
Summer:			
Intake (temp. / rel. humidity)	32,0 / 40	26,0 / 50	°C / %
Outlet (temp. / rel. humidity)	26,9 / 54	31,1 / 37	°C / %
Thermal efficiency (dry)	84,8	84,8	%
Thermal efficiency (dry) 1:1	84,8		%
Type of HRS	GS80/512		
Heat recovery class (EN	H1		
Pressure drop (dry)	149	149	Pa
Filters	Supply air	Extract air	
Class	F7(ePM1-60%)	F7(ePM1-60%)	
Pressure drop A/E/D	49/200/125	49/200/125	Pa
Filter area	7,6	7,6	m ²
Eurovent energy efficiency	Class B	Class B	
Fan	Supply air	Extract air	*1) *2)
Type of fan	R3G250PR1715	R3G250PR1715	
Total power consumption	0,35	0,35	kW
SFPv value / Class	887 / 2	887 / 2	W/(m ³ /s)
Class P (EN 13053)	P1	P1	
Static efficiency	51,0	51,0	%
Nominal power	0,7	0,7	kW
Nominal current	3,0	3,0	A
Nominal voltage	1~200-277	1~200-277	V
Speed	2.551	2.551	1/min
Pressure increase	528	528	Pa
Heater/Cooler	Supply air		
Without pre heater			
Without heater:			
Without cooler:			
Damper	Supply air	Extract air	
Pressure drop	5	5	Pa



Controller	
1 x	TROX X-CUBE control
1 x	Hand-held control panel
1 x	External RJ45 interface
2 x	Damper actuator, modulating 5 Nm, 24 V via Modbus connection
2 x	FanIO coupling module
4 x	Temperature sensor Pt 1000
1 x	Rotary isolator switch
3 x	Damper actuator
1 x	Filter warning indication

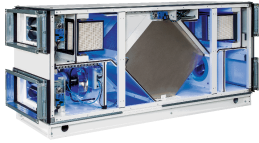
Acoustic Data									
f[Hz]	63	125	250	500	1k	2k	4k	8k	Lw A [db(A)]
ODA:	56	55	57	52	47	39	33	32	53
SUP:	75	76	77	74	70	67	65	65	76
ETA:	56	55	57	52	47	39	33	32	53
EHA:	75	76	77	74	70	67	65	65	76
CAS:	59	63	50	39	35	31	25	15	48

Casing variant: X-CUBE

*1) The fan configuration is done on dry conditions.

*2) The fan system effect is taken into account in the fan performances.

X-CUBE-C-R-P/1230/3P/F7



Operating side	right
Heat recovery	Counterflow plate heat exchanger
Device division	threefold
Filter class	ePM1-60% (F7)
Multileaf dampers	2 dampers inside (class 2, EN 1751)
Surface (interior / exterior)	Powder-coated
Dimensions(mm)	2117 x 754 x 974 (length x depth x height)
Duct connection(mm)	660 x 257 (width x height)
Weight(kg)	380
Total amount	1

Information requirements for NRVUs as referred to in Article 4(2):

Typology: NRVU, BVU
Type of installed drive: see drive information
Type of HRS: other
Filter warning indication

Decomposition drawing:

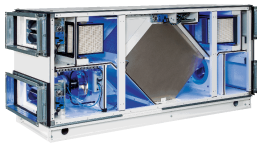
For safety notes regarding disassembly and disposal, please refer to the transport and installation manual for 'Air handling units, X-CUBE Compact including X-CUBE Compact accessories'. The manual is shipped with the air handling unit, but can also be downloaded from <http://www.troxtechnik.com>.

	Total	Supply/Extract air	
HRS thermal efficiency:	84,8		%
Nominal NRVU flow rate:		1230 / 1230	m³/h
Effective electric power input:	0,70	0,35 / 0,35	kW
SFP int:	796	398 / 398	W/(m3/s)
Face velocity at design flow:		1,3 / 1,3	m/s
Nominal external pressure:		250 / 250	Pa
Internal pressure drop of ventilation components:		203 / 203	Pa
Static efficiency at operating point:		51,0 / 51,0	%
Static efficiency according to EU 327:		62,5 / 62,5	%
Internal leakage:	1,3		%
External leakage:	L1(M) / L2(R)		
Energy performance of the filters:		Class B / Class B	
Sound power level:	48		dB(A)
Eco design requirements for RVUs 2016:	complied		
Eco design requirements for RVUs 2018:	complied		

Unit details:

Supply and extract air unit, compact construction, with highly efficient heat recovery. The high-quality casing is a frame construction with fitted double skin panels, powder-coated on both sides, for demanding hygiene requirements. Unit is ready to operate due to integral, bus-based X-CUBE control system; prepared for BACnet and Modbus; other bus systems are possible. (Duct connection and electrical connections are to be made by others.) Quick-release filter clamping device and high-quality F7 minipleat filter inserts for both supply air and extract air. Fresh air and exhaust air multileaf dampers with aerodynamically profiled aluminium blades, low leakage to EN 1751, class 2; all four duct connecting spigots prevent the transmission of structure-borne noise. Centrifugal fans with backward curved blades (plug fans) and EC motors are infinitely variable and ensure optimum efficiency and the lowest sound pressure level even under partial loads; they comply with the future IE4 efficiency class. All units are tested for CE conformity and carry the CE mark. Galvanised sheet steel, degreased, with thick film iron phosphate. Powder-coated (approx. RAL 9016).

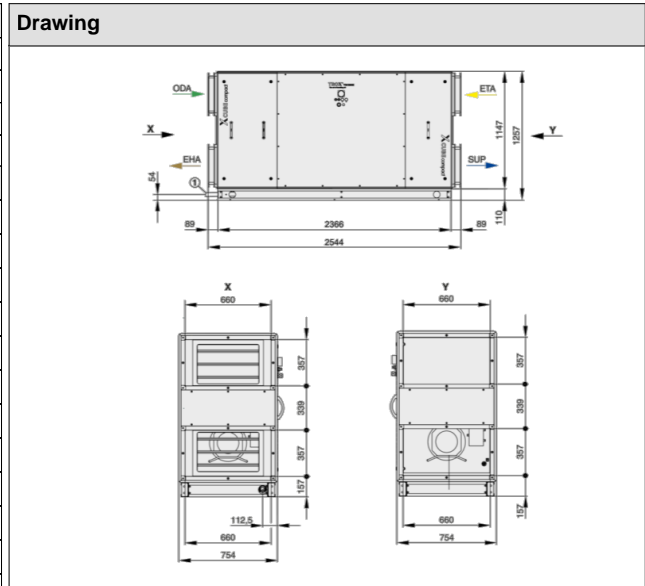
X-CUBE-C-R-P/1800/3P/F7



Operating side
Heat recovery
Device division
Filter class
Multileaf dampers
Surface (interior / exterior)
Dimensions(mm)
Duct connection(mm)
Weight(kg)
Total amount

right
Counterflow plate heat exchanger
threefold
ePM1-60% (F7)
2 dampers inside (class 2, EN 1751)
Powder-coated
2400 x 754 x 1257 (length x depth x height)
660 x 357 (width x height)
472
1

Performance data	Supply air	Extract air	
Volume flow	1800	1800	m³/h
Ext. differential pressure	250	250	Pa
Air velocity	1,4	1,4	m/s
Velocity class (EN 13053)	V1	V1	
Heat recovery	Supply air	Extract air	
Winter:			
Intake (temp. / rel. humidity)	-12,0 / 80	22,0 / 40	°C / %
Outlet (temp. / rel. humidity)	18,6 / 8	-0,4 / 90	°C / %
Total thermal capacity	17,3		kW
Summer:			
Intake (temp. / rel. humidity)	32,0 / 40	26,0 / 50	°C / %
Outlet (temp. / rel. humidity)	27,0 / 53	31,0 / 37	°C / %
Thermal efficiency (dry)	83,8	83,8	%
Thermal efficiency (dry) 1:1	83,8		%
Type of HRS	GS110/500		
Heat recovery class (EN)	H1		
Pressure drop (dry)	188	188	Pa
Filters	Supply air	Extract air	
Class	F7(ePM1-60%)	F7(ePM1-60%)	
Pressure drop A/E/D	41/200/120	41/200/120	Pa
Filter area	13,7	13,7	m²
Eurovent energy efficiency	Class B	Class B	
Fan	Supply air	Extract air	*1) *2)
Type of fan	R3G250PR1715	R3G250PR1715	
Total power consumption	0,48	0,48	kW
SFPv value / Class	847 / 2	847 / 2	W/(m³/s)
Class P (EN 13053)	P1	P1	
Static efficiency	58,3	58,3	%
Nominal power	0,7	0,7	kW
Nominal current	3,0	3,0	A
Nominal voltage	1~200-277	1~200-277	V
Speed	2.919	2.919	1/min
Pressure increase	563	563	Pa
Heater/Cooler	Supply air		
Without pre heater			
Without heater:			
Without cooler:			
Damper	Supply air	Extract air	
Pressure drop	5	5	Pa



Controller	
1 x	TROX X-CUBE control
1 x	Hand-held control panel
1 x	External RJ45 interface
2 x	Damper actuator, modulating 5 Nm, 24 V via Modbus connection
2 x	FanIO coupling module
4 x	Temperature sensor Pt 1000
1 x	Rotary isolator switch
3 x	Damper actuator
1 x	Filter warning indication

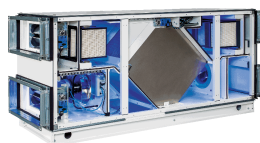
Acoustic Data									
f[Hz]	63	125	250	500	1k	2k	4k	8k	Lw A [db(A)]
ODA:	61	58	58	54	51	43	37	38	56
SUP:	79	77	77	75	73	70	68	69	79
ETA:	61	58	58	54	51	43	37	38	56
EHA:	79	77	77	75	73	70	68	69	79
CAS:	61	63	49	39	37	33	27	19	49

Casing variant: X-CUBE

*1) The fan configuration is done on dry conditions.

*2) The fan system effect is taken into account in the fan performances.

X-CUBE-C-R-P/1800/3P/F7



Operating side	right
Heat recovery	Counterflow plate heat exchanger
Device division	threefold
Filter class	ePM1-60% (F7)
Multileaf dampers	2 dampers inside (class 2, EN 1751)
Surface (interior / exterior)	Powder-coated
Dimensions(mm)	2400 x 754 x 1257 (length x depth x height)
Duct connection(mm)	660 x 357 (width x height)
Weight(kg)	472
Total amount	1

Information requirements for NRVUs as referred to in Article 4(2):

Typology: NRVU, BVU
Type of installed drive: see drive information
Type of HRS: other
Filter warning indication

Decomposition drawing:

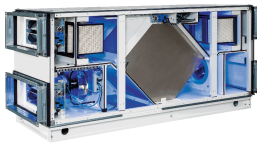
For safety notes regarding disassembly and disposal, please refer to the transport and installation manual for 'Air handling units, X-CUBE Compact including X-CUBE Compact accessories'. The manual is shipped with the air handling unit, but can also be downloaded from <http://www.troxtechnik.com>.

	Total	Supply/Extract air	
HRS thermal efficiency:	83,8		%
Nominal NRVU flow rate:		1800 / 1800	m³/h
Effective electric power input:	0,96	0,48 / 0,48	kW
SFP int:	802	401 / 401	W/(m3/s)
Face velocity at design flow:		1,4 / 1,4	m/s
Nominal external pressure:		250 / 250	Pa
Internal pressure drop of ventilation components:		234 / 234	Pa
Static efficiency at operating point:		58,3 / 58,3	%
Static efficiency according to EU 327:		62,5 / 62,5	%
Internal leakage:	1,2		%
External leakage:	L1(M) / L2(R)		
Energy performance of the filters:		Class B / Class B	
Sound power level:	49		dB(A)
Eco design requirements for RVUs 2016:	complied		
Eco design requirements for RVUs 2018:	complied		

Unit details:

Supply and extract air unit, compact construction, with highly efficient heat recovery. The high-quality casing is a frame construction with fitted double skin panels, powder-coated on both sides, for demanding hygiene requirements. Unit is ready to operate due to integral, bus-based X-CUBE control system; prepared for BACnet and Modbus; other bus systems are possible. (Duct connection and electrical connections are to be made by others.) Quick-release filter clamping device and high-quality F7 minipleat filter inserts for both supply air and extract air. Fresh air and exhaust air multileaf dampers with aerodynamically profiled aluminium blades, low leakage to EN 1751, class 2; all four duct connecting spigots prevent the transmission of structure-borne noise. Centrifugal fans with backward curved blades (plug fans) and EC motors are infinitely variable and ensure optimum efficiency and the lowest sound pressure level even under partial loads; they comply with the future IE4 efficiency class. All units are tested for CE conformity and carry the CE mark. Galvanised sheet steel, degreased, with thick film iron phosphate. Powder-coated (approx. RAL 9016).

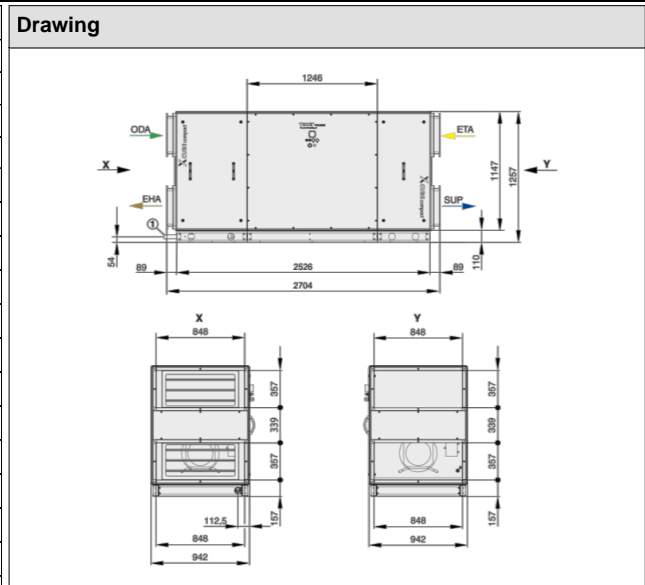
X-CUBE-C-R-P/2400/3P/F7



Operating side
Heat recovery
Device division
Filter class
Multileaf dampers
Surface (interior / exterior)
Dimensions(mm)
Duct connection(mm)
Weight(kg)
Total amount

right
Counterflow plate heat exchanger
threefold
ePM1-60% (F7)
2 dampers inside (class 2, EN 1751)
Powder-coated
2560 x 942 x 1257 (length x depth x height)
848 x 357 (width x height)
579
1

Performance data	Supply air	Extract air	
Volume flow	2400	2400	m ³ /h
Ext. differential pressure	250	250	Pa
Air velocity	1,5	1,5	m/s
Velocity class (EN 13053)	V1	V1	
Heat recovery	Supply air	Extract air	
Winter:			
Intake (temp. / rel. humidity)	-12,0 / 80	22,0 / 40	°C / %
Outlet (temp. / rel. humidity)	18,7 / 8	-0,4 / 90	°C / %
Total thermal capacity	23,2		kW
Summer:			
Intake (temp. / rel. humidity)	32,0 / 40	26,0 / 50	°C / %
Outlet (temp. / rel. humidity)	27,0 / 53	31,0 / 37	°C / %
Thermal efficiency (dry)	84,0	84,0	%
Thermal efficiency (dry) 1:1	84,0		%
Type of HRS	GS110/700		
Heat recovery class (EN	H1		
Pressure drop (dry)	177	177	Pa
Filters	Supply air	Extract air	
Class	F7(ePM1-60%)	F7(ePM1-60%)	
Pressure drop A/E/D	62/200/131	62/200/131	Pa
Filter area	13,7	13,7	m ²
Eurovent energy efficiency	Class B	Class B	
Fan	Supply air	Extract air	*1) *2)
Type of fan	R3G310PH3801	R3G310PH3801	
Total power consumption	0,70	0,70	kW
SFPv value / Class	924 / 2	924 / 2	W/(m ³ /s)
Class P (EN 13053)	P1	P1	
Static efficiency	53,7	53,7	%
Nominal power	1,7	1,7	kW
Nominal current	2,5	2,5	A
Nominal voltage	2~380-480	2~380-480	V
Speed	2.365	2.365	1/min
Pressure increase	563	563	Pa
Heater/Cooler	Supply air		
Without pre heater			
Without heater:			
Without cooler:			
Damper	Supply air	Extract air	
Pressure drop	5	5	Pa



Controller	
1 x	TROX X-CUBE control
1 x	Hand-held control panel
1 x	External RJ45 interface
2 x	Damper actuator, modulating 5 Nm, 24 V via Modbus connection
2 x	FanIO coupling module
4 x	Temperature sensor Pt 1000
1 x	Rotary isolator switch
3 x	Damper actuator
1 x	Filter warning indication

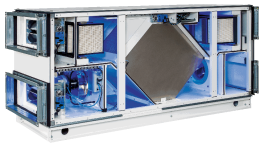
Acoustic Data									
f[Hz]	63	125	250	500	1k	2k	4k	8k	Lw A [db(A)]
ODA:	53	55	57	54	50	47	42	35	56
SUP:	66	70	71	71	76	74	72	66	80
ETA:	53	55	57	54	50	47	42	35	56
EHA:	66	70	71	71	76	74	72	66	80
CAS:	50	57	46	37	40	37	32	16	46

Casing variant: X-CUBE

*1) The fan configuration is done on dry conditions.

*2) The fan system effect is taken into account in the fan performances.

X-CUBE-C-R-P/2400/3P/F7



Operating side	right
Heat recovery	Counterflow plate heat exchanger
Device division	threefold
Filter class	ePM1-60% (F7)
Multileaf dampers	2 dampers inside (class 2, EN 1751)
Surface (interior / exterior)	Powder-coated
Dimensions(mm)	2560 x 942 x 1257 (length x depth x height)
Duct connection(mm)	848 x 357 (width x height)
Weight(kg)	579
Total amount	1

Information requirements for NRVUs as referred to in Article 4(2):

Typology: NRVU, BVU
Type of installed drive: see drive information
Type of HRS: other
Filter warning indication

Decomposition drawing:

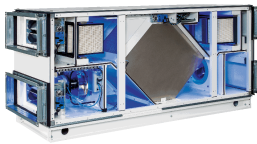
For safety notes regarding disassembly and disposal, please refer to the transport and installation manual for 'Air handling units, X-CUBE Compact including X-CUBE Compact accessories'. The manual is shipped with the air handling unit, but can also be downloaded from <http://www.troxtechnik.com>.

	Total	Supply/Extract air	
HRS thermal efficiency:	84,0		%
Nominal NRVU flow rate:		2400 / 2400	m³/h
Effective electric power input:	1,40	0,70 / 0,70	kW
SFP int:	908	454 / 454	W/(m3/s)
Face velocity at design flow:		1,5 / 1,5	m/s
Nominal external pressure:		250 / 250	Pa
Internal pressure drop of ventilation components:		244 / 244	Pa
Static efficiency at operating point:		53,7 / 53,7	%
Static efficiency according to EU 327:		61,1 / 61,1	%
Internal leakage:	1,2		%
External leakage:	L1(M) / L2(R)		
Energy performance of the filters:		Class B / Class B	
Sound power level:	46		dB(A)
Eco design requirements for RVUs 2016:	complied		
Eco design requirements for RVUs 2018:	complied		

Unit details:

Supply and extract air unit, compact construction, with highly efficient heat recovery. The high-quality casing is a frame construction with fitted double skin panels, powder-coated on both sides, for demanding hygiene requirements. Unit is ready to operate due to integral, bus-based X-CUBE control system; prepared for BACnet and Modbus; other bus systems are possible. (Duct connection and electrical connections are to be made by others.) Quick-release filter clamping device and high-quality F7 minipleat filter inserts for both supply air and extract air. Fresh air and exhaust air multileaf dampers with aerodynamically profiled aluminium blades, low leakage to EN 1751, class 2; all four duct connecting spigots prevent the transmission of structure-borne noise. Centrifugal fans with backward curved blades (plug fans) and EC motors are infinitely variable and ensure optimum efficiency and the lowest sound pressure level even under partial loads; they comply with the future IE4 efficiency class. All units are tested for CE conformity and carry the CE mark. Galvanised sheet steel, degreased, with thick film iron phosphate. Powder-coated (approx. RAL 9016).

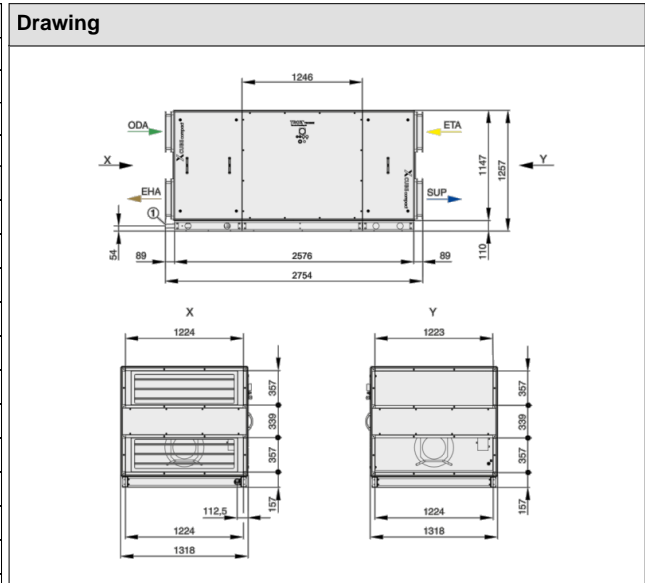
X-CUBE-C-R-P/3600/3P/F7



Operating side
Heat recovery
Device division
Filter class
Multileaf dampers
Surface (interior / exterior)
Dimensions(mm)
Duct connection(mm)
Weight(kg)
Total amount

right
Counterflow plate heat exchanger
threefold
ePM1-60% (F7)
2 dampers inside (class 2, EN 1751)
Powder-coated
2610 x 1318 x 1257 (length x depth x height)
1224 x 357 (width x height)
733
1

Performance data	Supply air	Extract air	
Volume flow	3600	3600	m ³ /h
Ext. differential pressure	250	250	Pa
Air velocity	1,6	1,6	m/s
Velocity class (EN 13053)	V1	V1	
Heat recovery	Supply air	Extract air	
Winter:			
Intake (temp. / rel. humidity)	-12,0 / 80	22,0 / 40	°C / %
Outlet (temp. / rel. humidity)	18,6 / 8	-0,4 / 90	°C / %
Total thermal capacity	34,7		kW
Summer:			
Intake (temp. / rel. humidity)	32,0 / 40	26,0 / 50	°C / %
Outlet (temp. / rel. humidity)	27,0 / 53	31,0 / 37	°C / %
Thermal efficiency (dry)	83,8	83,8	%
Thermal efficiency (dry) 1:1	83,8		%
Type of HRS	GS110/1000		
Heat recovery class (EN)	H1		
Pressure drop (dry)	188	188	Pa
Filters	Supply air	Extract air	
Class	F7(ePM1-60%)	F7(ePM1-60%)	
Pressure drop A/E/D	41/200/120	41/200/120	Pa
Filter area	33,6	33,6	m ²
Eurovent energy efficiency	Class B	Class B	
Fan	Supply air	Extract air	*1) *2)
Type of fan	R3G355PH4901	R3G355PH4901	
Total power consumption	1,03	1,03	kW
SFPv value / Class	905 / 2	905 / 2	W/(m ³ /s)
Class P (EN 13053)	P1	P1	
Static efficiency	54,5	54,5	%
Nominal power	1,7	1,7	kW
Nominal current	2,6	2,6	A
Nominal voltage	2~380-480	2~380-480	V
Speed	2.211	2.211	1/min
Pressure increase	563	563	Pa
Heater/Cooler	Supply air		
Without pre heater			
Without heater:			
Without cooler:			
Damper	Supply air	Extract air	
Pressure drop	5	5	Pa



Controller	
1 x	TROX X-CUBE control
1 x	Hand-held control panel
1 x	External RJ45 interface
2 x	Damper actuator, modulating 5 Nm, 24 V via Modbus connection
2 x	FanIO coupling module
4 x	Temperature sensor Pt 1000
1 x	Rotary isolator switch
3 x	Damper actuator
1 x	Filter warning indication

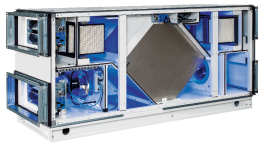
Acoustic Data									
f[Hz]	63	125	250	500	1k	2k	4k	8k	Lw A [db(A)]
ODA:	51	55	58	55	52	48	44	36	57
SUP:	65	68	69	73	75	74	73	66	80
ETA:	51	55	58	55	52	48	44	36	57
EHA:	65	68	69	73	75	74	73	66	80
CAS:	48	56	44	38	40	37	33	16	45

Casing variant: X-CUBE

*1) The fan configuration is done on dry conditions.

*2) The fan system effect is taken into account in the fan performances.

X-CUBE-C-R-P/3600/3P/F7



Operating side	right
Heat recovery	Counterflow plate heat exchanger
Device division	threefold
Filter class	ePM1-60% (F7)
Multileaf dampers	2 dampers inside (class 2, EN 1751)
Surface (interior / exterior)	Powder-coated
Dimensions(mm)	2610 x 1318 x 1257 (length x depth x height)
Duct connection(mm)	1224 x 357 (width x height)
Weight(kg)	733
Total amount	1

Information requirements for NRVUs as referred to in Article 4(2):

Typology: NRVU, BVU
Type of installed drive: see drive information
Type of HRS: other
Filter warning indication

Decomposition drawing:

For safety notes regarding disassembly and disposal, please refer to the transport and installation manual for 'Air handling units, X-CUBE Compact including X-CUBE Compact accessories'. The manual is shipped with the air handling unit, but can also be downloaded from <http://www.troxtechnik.com>.

	Total	Supply/Extract air	
HRS thermal efficiency:	83,8		%
Nominal NRVU flow rate:		3600 / 3600	m³/h
Effective electric power input:	2,06	1,03 / 1,03	kW
SFP int:	858	429 / 429	W/(m3/s)
Face velocity at design flow:		1,6 / 1,6	m/s
Nominal external pressure:		250 / 250	Pa
Internal pressure drop of ventilation components:		234 / 234	Pa
Static efficiency at operating point:		54,5 / 54,5	%
Static efficiency according to EU 327:		66,1 / 66,1	%
Internal leakage:	1,2		%
External leakage:	L1(M) / L2(R)		
Energy performance of the filters:		Class B / Class B	
Sound power level:	45		dB(A)
Eco design requirements for RVUs 2016:	complied		
Eco design requirements for RVUs 2018:	complied		

Unit details:

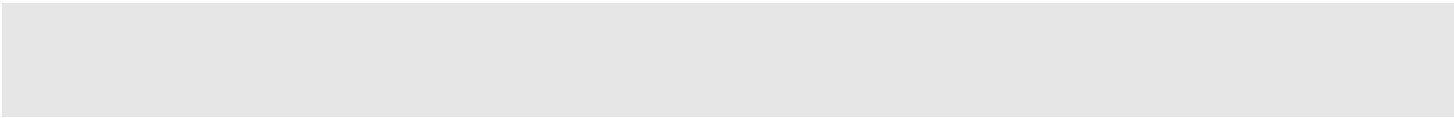
Supply and extract air unit, compact construction, with highly efficient heat recovery. The high-quality casing is a frame construction with fitted double skin panels, powder-coated on both sides, for demanding hygiene requirements. Unit is ready to operate due to integral, bus-based X-CUBE control system; prepared for BACnet and Modbus; other bus systems are possible. (Duct connection and electrical connections are to be made by others.) Quick-release filter clamping device and high-quality F7 minipleat filter inserts for both supply air and extract air. Fresh air and exhaust air multileaf dampers with aerodynamically profiled aluminium blades, low leakage to EN 1751, class 2; all four duct connecting spigots prevent the transmission of structure-borne noise. Centrifugal fans with backward curved blades (plug fans) and EC motors are infinitely variable and ensure optimum efficiency and the lowest sound pressure level even under partial loads; they comply with the future IE4 efficiency class. All units are tested for CE conformity and carry the CE mark. Galvanised sheet steel, degreased, with thick film iron phosphate. Powder-coated (approx. RAL 9016).

D Product information according to Commission Regulation (EU) No. 1253/2014, Annex V

Product information for non-residential ventilation units according to EU Regulation 1253/2014 Annex 5, Article 4(2) (ErP Directive)
All data refer to the max. nominal air flow rate to achieve ErP-2018 conformity

No.	Description according to Annex 5	All data refer to the max. nominal air flow rate to achieve ErP-2018 conformity													
		Relay heat exchanger				Multi-speed drive				Plate heat exchanger					
a)	Manufacturer's name	TROX GmbH													
b)	Manufacturer's model identifier	X-CUBE-CR-R1300 X-CUBE-CL-R1300	X-CUBE-CR-R2000 X-CUBE-CL-R2000	X-CUBE-CR-R3000 X-CUBE-CL-R3000	X-CUBE-CR-R4200 X-CUBE-CL-R4200	X-CUBE-CR-R5250 X-CUBE-CL-R5250	X-CUBE-CR-P1230 X-CUBE-CL-P1230	X-CUBE-CR-P1800 X-CUBE-CL-P1800	X-CUBE-CR-P2400 X-CUBE-CL-P2400	X-CUBE-CR-P3600 X-CUBE-CL-P3600					
c)	Type of drive installed	Air handling unit													
d)	Type of drive installed	Multi-speed drive													
e)	Type of HRS	Relay heat exchanger													
f)	Thermal efficiency of heat recovery (hrv)	78.0%	78.6%	78.8%	79.7%	79.0%	83.7%	82.8%	83.2%	82.8%	83.2%	83.2%	83.2%	79.5%	
g)	Nominal flow rate ($V_{air, nom}$)	1,500 m ³ /h = 0,416 m ³ /s	2,400 m ³ /h = 0,667 m ³ /s	3,500 m ³ /h = 0,972 m ³ /s	4,500 m ³ /h = 1,250 m ³ /s	6,200 m ³ /h = 1,722 m ³ /s	1,550 m ³ /h = 0,430 m ³ /s	2,200 m ³ /h = 0,611 m ³ /s	2,800 m ³ /h = 0,778 m ³ /s	2,800 m ³ /h = 0,778 m ³ /s	2,800 m ³ /h = 0,778 m ³ /s	2,800 m ³ /h = 0,778 m ³ /s	2,800 m ³ /h = 0,778 m ³ /s	4,200 m ³ /h = 1,167 m ³ /s	
h)	Effective electric power input (overall performance)	600 W	870 W	1,160 W	1,530 W	2,060 W	620 W	790 W	1,410 W	1,410 W	1,410 W	1,410 W	1,410 W	1,680 W	
i)	Effective electric power input (overall performance)	1,200 W	1,740 W	2,320 W	3,060 W	4,120 W	1,240 W	1,560 W	2,820 W	2,820 W	2,820 W	2,820 W	2,820 W	3,360 W	
j)	SFP limit 2016	1,108 W/(m ³ /s)	1,448 W/(m ³ /s)	1,068 W/(m ³ /s)	840 W/(m ³ /s)	950 W/(m ³ /s)	1,086 W/(m ³ /s)	1,092 W/(m ³ /s)	1,080 W/(m ³ /s)	1,080 W/(m ³ /s)	1,080 W/(m ³ /s)	1,080 W/(m ³ /s)	1,080 W/(m ³ /s)	1,028 W/(m ³ /s)	
k)	SFP limit 2018	1,188 W/(m ³ /s)	1,448 W/(m ³ /s)	1,409 W/(m ³ /s)	1,394 W/(m ³ /s)	1,302 W/(m ³ /s)	1,638 W/(m ³ /s)	1,632 W/(m ³ /s)	1,569 W/(m ³ /s)	1,569 W/(m ³ /s)	1,569 W/(m ³ /s)	1,569 W/(m ³ /s)	1,569 W/(m ³ /s)	1,505 W/(m ³ /s)	
l)	Face velocity at design flow rate	2,0 m/s	2,0 m/s	1,9 m/s	1,8 m/s	2,1 m/s	1,7 m/s	1,8 m/s	1,7 m/s	1,7 m/s	1,7 m/s	1,7 m/s	1,7 m/s	1,8 m/s	
m)	Nominal external pressure (ΔP _{e, nom})	460 Pa	350 Pa	350 Pa	350 Pa	350 Pa	400 Pa	350 Pa	650 Pa	650 Pa	650 Pa	650 Pa	650 Pa	450 Pa	
n)	Internal pressure drop of ventilation components (ΔP _{int, v}) (applies to supply and exhaust air side)	289 Pa	295 Pa	319 Pa	259 Pa	274 Pa	280 Pa	309 Pa	303 Pa	303 Pa	303 Pa	303 Pa	303 Pa	289 Pa	
o)	Internal pressure drop of non-ventilation components (ΔP _{int, nc}) (supply and exhaust air fan)	52,2%	54,0%	59,7%	55,1%	57,7%	51,6%	56,5%	56,0%	56,0%	56,0%	56,0%	56,0%	56,4%	
p)	Static efficiency of fans used in accordance with Regulation (EU) No 327/2011	62,5%	61,4%	61,1%	66,1%	62,8%	62,5%	62,5%	61,1%	61,1%	61,1%	61,1%	61,1%	66,1%	
q)	External leakage rate	3,4%	3,4%	3,4%	3,7%	3,2%	1,1%	1,0%	1,0%	1,0%	1,0%	1,0%	1,0%	1,0%	
r)	Energy performance, preferably energy classification, of the filters	F7 - Class B	F7 - Class B	F7 - Class B	F7 - Class B	F7 - Class B	F7 - Class B	F7 - Class B	F7 - Class B	F7 - Class B	F7 - Class B	F7 - Class B	F7 - Class B	F7 - Class B	
s)	Visual filter warning	Via manual control unit; alarm text is shown in the display; alarm 38 = supply air filter (for labor air) or alarm 48 = extract air filter (exhaust air)													
t)	Casing sound power level (L _{WA})	ODA: 57 dB (A) SUP: 80 dB (A) EHA: 80 dB (A) CAS: 53 dB (A)	ODA: 58 dB (A) SUP: 83 dB (A) EHA: 83 dB (A) CAS: 50 dB (A)	ODA: 61 dB (A) SUP: 86 dB (A) EHA: 85 dB (A) CAS: 49 dB (A)	ODA: 62 dB (A) SUP: 84 dB (A) EHA: 84 dB (A) CAS: 47 dB (A)	ODA: 65 dB (A) SUP: 87 dB (A) EHA: 87 dB (A) CAS: 52 dB (A)	ODA: 57 dB (A) SUP: 80 dB (A) EHA: 80 dB (A) CAS: 52 dB (A)	ODA: 59 dB (A) SUP: 82 dB (A) EHA: 82 dB (A) CAS: 52 dB (A)	ODA: 63 dB (A) SUP: 85 dB (A) EHA: 85 dB (A) CAS: 52 dB (A)	ODA: 63 dB (A) SUP: 85 dB (A) EHA: 85 dB (A) CAS: 52 dB (A)	ODA: 63 dB (A) SUP: 85 dB (A) EHA: 85 dB (A) CAS: 52 dB (A)	ODA: 63 dB (A) SUP: 85 dB (A) EHA: 85 dB (A) CAS: 52 dB (A)	ODA: 63 dB (A) SUP: 85 dB (A) EHA: 85 dB (A) CAS: 52 dB (A)	ODA: 63 dB (A) SUP: 85 dB (A) EHA: 85 dB (A) CAS: 52 dB (A)	ODA: 63 dB (A) SUP: 85 dB (A) EHA: 85 dB (A) CAS: 52 dB (A)
s)	Disassembly instructions	Safety instructions for disassembly and disposal can be found in the "RLT units X-CUBE-Compact" manual. The manual is included with the device and can also be downloaded from http://www.trox.de													

Further operating points and operating points including accessories (e.g. heater module etc.) can be calculated with the TROX Easy Product Finder (<http://www.trox.de>). The Easy Product Finder also checks ErP conformity.



TROX[®] TECHNİK

The art of handling air

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