Air handling units
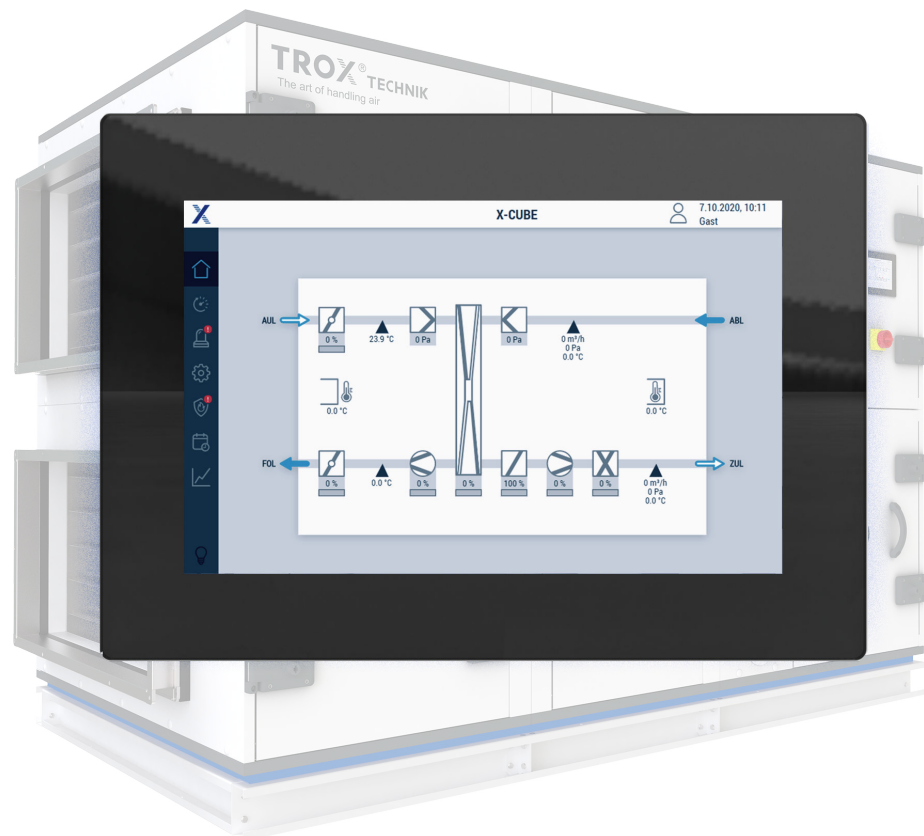
X-CUBE CONTROL 2

Controls visualisation for air handling units

TROX® TECHNIK

The art of handling air

Read the instructions prior to performing any task!

About this manual

This manual describes how to operate the air handling unit using the controls visualisation software.

This operating manual is intended for use by operators (instructed persons) and network administrators.

It is essential that instructed persons (♦ *Chapter 1.1 'Qualification' on page 6*) read and fully understand 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.

Other applicable documentation

In addition to these instructions, the following documents apply:

- Transport and installation manual
- Operating manual
- Order-specific approval drawing

TROX Technical Service

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.trox.de*
Phone	+49 (0) 2845 202400

Copyright

This document, including all illustrations, is protected by copyright and pertains only to the corresponding product.

Any use without our consent may be an infringement of copyright, and the violator will be held liable for any damage.

This applies in particular to:

- Publishing content
- Copying content
- Translating content
- Microcopying content
- Saving content to electronic systems and editing it

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.

Warranty claims

The provisions of the respective general delivery terms apply to warranty claims. For purchase orders placed with TROX GmbH, these are the regulations in section "VI. Warranty claims" of the Delivery Terms of TROX GmbH, see *www.trox.de/en/* .

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

ℹ

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 – 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)

1 Safety

1.1 Qualification

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

Network administrator
Network administrators design, install, configure and maintain the IT infrastructure in companies or organisations.

Operator
Operators have been instructed by the system owner to enable them to avoid any potential hazards related to the work under consideration. Operators 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.

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 various functions of the visualisation software are password protected to prevent unauthorised people from using it.

- Every user should have their own, unique user name and password.
- Make sure that each user knows only their own password.
- Do not share your access data with anyone.
- Do not use the same access data for both private and professional purposes.
- Do not store passwords on an internet browser.
- Store passwords (if you need to store them at all) in a safe place; use a password manager, for example.

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   Network configuration

The touch panel and X-CUBE Control are factory set in such a way that any visualisation data is displayed on the touch panel.

Factory setting

Own IP address:	`192.168.0.10` or `192.168.0.100`
Target address for visualisation:	`https://192.168.0.180:1020` or `https://192.168.0.200:1020`

ℹ️ *IMPORTANT*

If other IP addresses have been set previously, e.g. as part of commissioning, contact your network administrator.

Use the form in the appendix to document IP addresses and user names, ↳ Chapter 10 ' Configuration checklist' on page 89

2.1 Changing the target address for visualisation

Personnel:
■   Network administrator

If there is no X-CUBE visualisation (white display or error message `ERR_ADDRESS_UNREACHABLE`), check whether the correct IP address has been set; if not, correct it.

1. ▶ To show the *'System menu'* on the touch panel, swipe from the left edge to the centre.

   ⇨   Back with 🔙

2. ▶ Select *'Edit profile'*.

3. ▶ Select the *'General'* tab.
   Enter the IP address of the X-CUBE controller (target address of the controls visualisation) as follows:
   `https://[IP ADDRESS]:1020`

   ⇨   Apply with ✅.

2.2 Changing your own IP address

Personnel:
■   Network administrator

Important: This is not the IP address of the X-CUBE controller.
Changing that address is described in chapter 3.9.2.

1. ▶ To show the *'System menu'* on the touch panel, swipe from the left to the centre.

   ⇨   Back with 🔙

2. ▶ Select *'Edit profile'*.

3. ▶ Select the *'Bridge'* tab.

Go to the *'Start page'* field and enter your own IP address, also enter the subnet mask of the touch panel.

⇨   Apply with ✅.

2.3 Visualisation on external devices

You can also use other terminal devices (PC, notebook, tablet, web browser that supports HTML5) for visualisation.

Make sure that the terminal device and X-CUBE controller are part of the same network.

We recommend the following browsers:

■   Mozilla Firefox
■   Google Chrome
■   Microsoft Edge

To open the visualisation software, enter the IP address into the address line of the browser.
`https://192.168.0.180:1020` or `https://192.168.0.200:1020`

For more information ↳ *'Factory setting' on page 7*

3   User interface

3.1 Starting screen

Once the visualisation software has been opened without any errors, the loading progress and the web server version appear. The various pages of the visualisation software are loaded to the web browser to enable a smooth navigation.
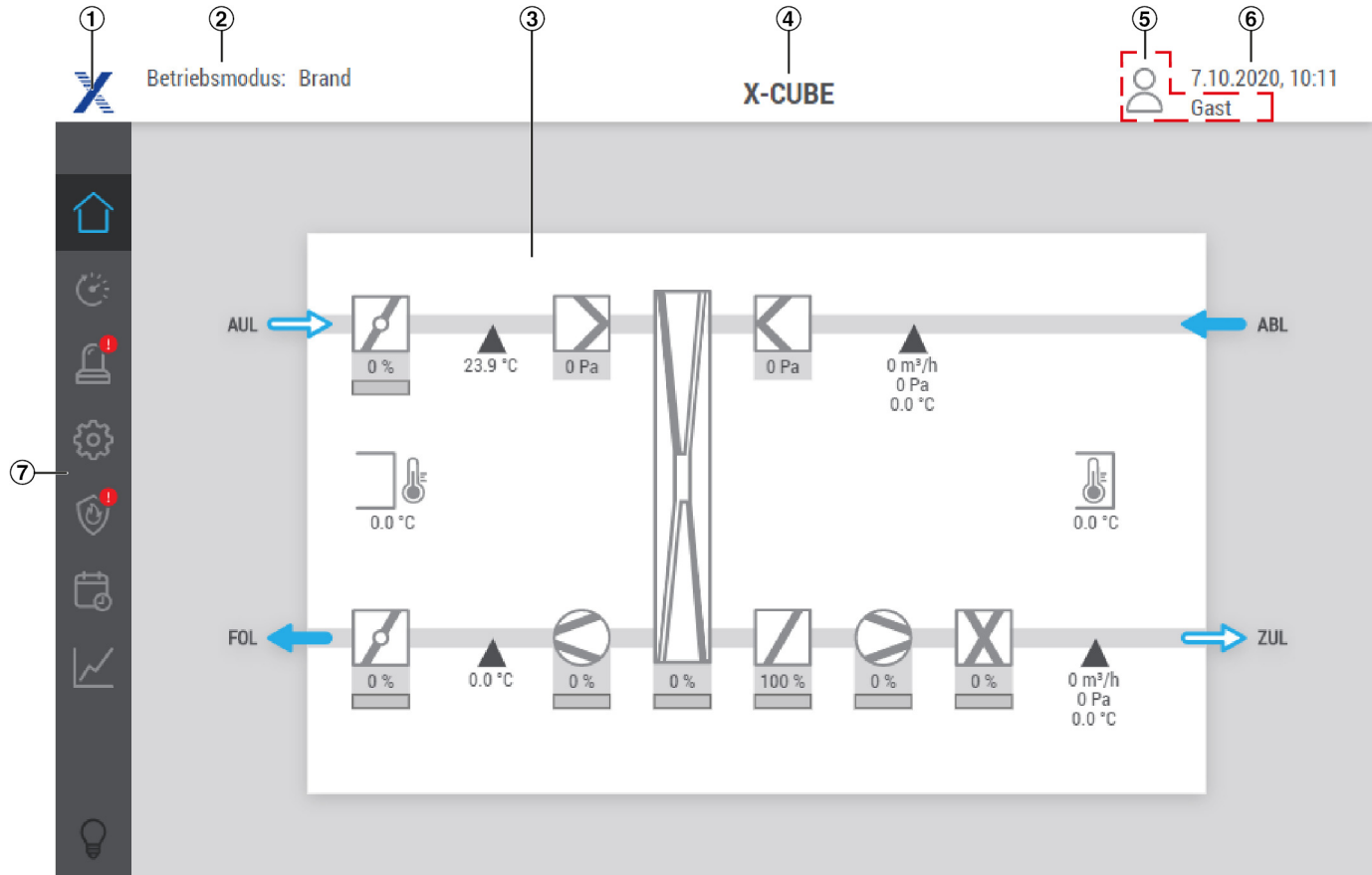

Fig. 1: Visualisation starting screen

The starting screen displays a system diagram. If you click on a component, the respective page opens. Header and main menu are always shown.

Item	Description
1	Select this symbol to display the software version. TROX Service will ask for the software version.
2	Current operating mode: ■ Off ■ Standby ■ Control ■ Frost protection ■ De-icing ■ Start-up time ■ Follow up ■ Hand ■ Night purge ■ Intermittent operation ■ Cooling protection ■ Fire

Item	Description
3	System diagram
4	Name of the system
5	Name and status of current user ▪ 👤 User not logged in (guest) ▪ 👤 User logged in (staff, service, admin) Select this symbol to open the log-in screen.
6	Shows date and time of the X-CUBE controller, To set: Go to *'Settings ➔ Basic settings'* .
7	Light switch (maintenance)
8	Main menu

Main menu

Icon	Menu item	Description
🏠	Start	Displays the starting screen.
⏱	State control	Displays the control status. Including ▪ Control strategy ▪ Setpoint and actual values: – Temperature control – Fan – Humidity control (optional)
🔔	Alarms	Shows all alarms 🟠 Indicates at least one warning. 🔴 Indicates at least one critical alarm. In case of a critical alarm, the X-CUBE is immediately switched off.
⚙	Settings	Opens the 'Settings' menu where you can make general settings.
🛡	Fire protection	Opens the 'Fire protection' menu, which shows the status of each fire damper and smoke detector. 🟠 Indicates at least one warning. 🔴 Indicates at least one critical alarm. In case of a critical alarm, the X-CUBE is immediately switched off.
📅	Schedules	Opens the 'Schedules' menu where you can set weekly schedules, vacation periods and public holidays.
📈	History	Opens the 'Trend' menu that shows trends for various parameters (e.g. temperature, humidity or pressure) and that allows you to download* trends. *not with a touch panel
💡	Maintenance light	Switches the maintenance light (if any) on or off. 💡 Maintenance light is off; select this symbol to switch it on 💡 Maintenance light is on; select this symbol to switch it off

System diagram symbols

Icon	Description
	Airflow to the left
	Airflow to the left
	Airflow to the right
	Airflow to the right
	Cooler ⭦ Chapter 5.10 ' Cooler (chilled water)' on page 52
	Damper ⭦ Chapter 5.1 ' Exhaust air damper / Outdoor air damper / Supply air damper / Extract air damper' on page 35
	Left fan ⭦ Chapter 5.3 'Supply air fan / extract air fan' on page 37
	Right fan ⭦ Chapter 5.3 'Supply air fan / extract air fan' on page 37
	Left filter ⭦ Chapter 5.2 ' Outdoor air filter, supply air filter, extract air filter' on page 36
	Right filter ⭦ Chapter 5.2 ' Outdoor air filter, supply air filter, extract air filter' on page 36
	Preheater ⭦ Chapter 5.8 ' Preheater/reheater (hot water)' on page 48 Reheater ⭦ Chapter 5.8 ' Preheater/reheater (hot water)' on page 48 Electric preheater ⭦ Chapter 5.9 ' Electric preheater / electric reheater' on page 51 Electric reheater ⭦ Chapter 5.9 ' Electric preheater / electric reheater' on page 51
	Humidifier ⭦ Chapter 5.12 ' Humidifier' on page 56

Icon	Description
	Plate heat exchanger ⭦ Chapter 5.5 'Plate heat exchanger' on page 42
	Heat recovery wheel ⭦ Chapter 5.4 'Heat recovery wheel' on page 40
	Run around coil ⭦ Chapter 5.7 ' Run around coil' on page 46
	Orange: Heating energy feed Blue: Cooling energy feed

Icon	Description
	Room sensor ↻ *Chapter 5.15 'Room sensor' on page 60*
	Weather sensor ↻ *Chapter 5.14 'Weather sensor' on page 59*
▲	Sensors ↻ *Chapter 5.13 'Sensors' on page 58*
	Smoke detector
OFF	Off
ON	On
✕	Function disabled
✓	Function enabled
OK	OK
!	Warning
!	Error
🖐	Hand control OK
🖐	Hand control Error

TROX® TECHNIK

3.2 ⟳ State control

This screen shows the control status. The display varies depending on the control strategy. Use '<' and '>' to navigate.
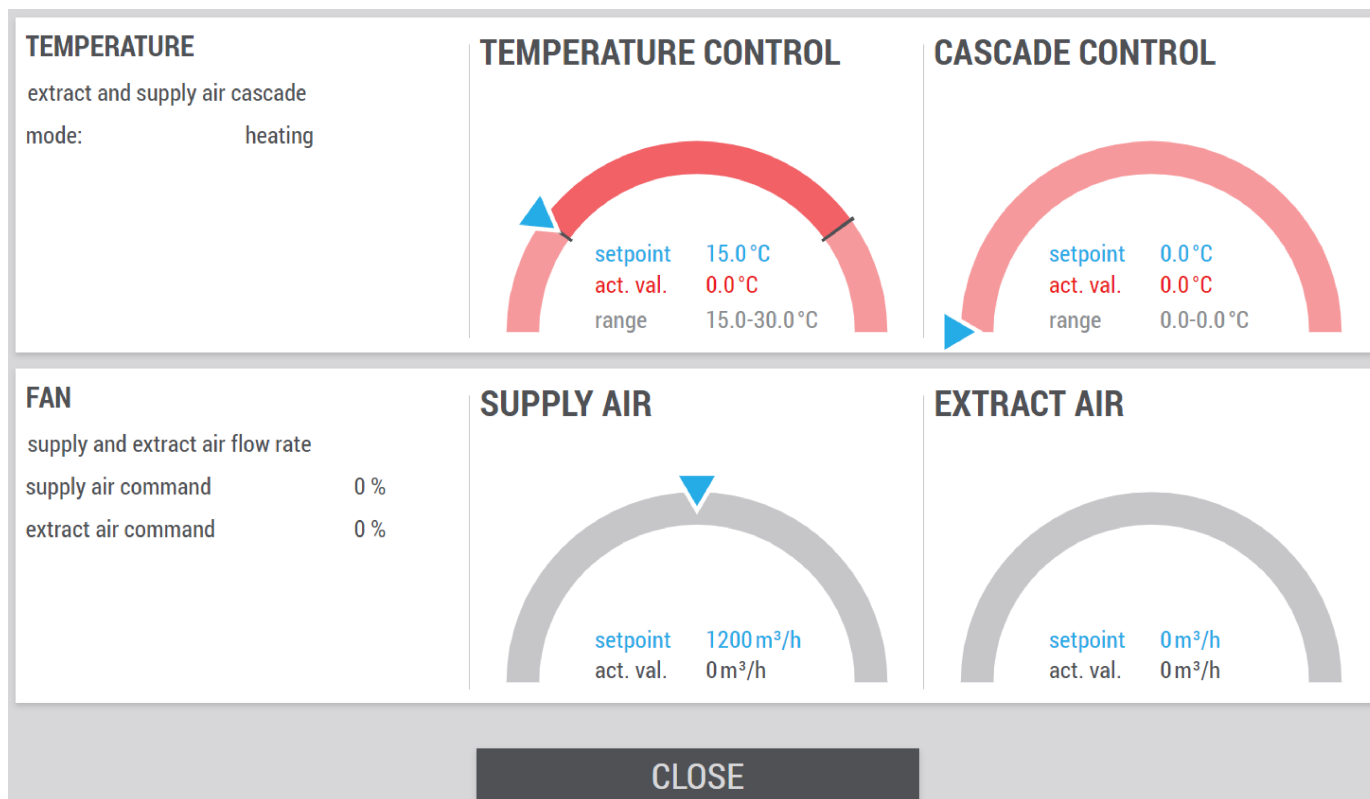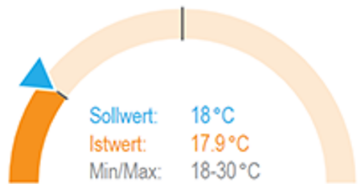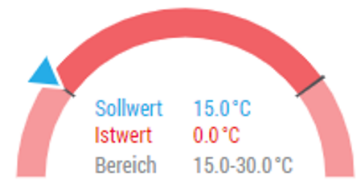
Fig. 2: Control status

Area	Parameter/description	
Temperature	Temperature control parameters	
	Extract air and supply air cascades	Current control strategy
	Mode: ■ Heating ■ Cooling	Current operating mode (heating shown)
Fan	Fan control parameters	
	Supply air duct pressure and extract air duct pressure	Control strategy
	Supply air command	
	Extract air command	
Temperature control	Temperature control parameters	
	Setpoint value	Shows the setpoint value
	Actual value	Shows the actual value
	Area	Setting range
Cascade control	Cascade control parameters	
	Setpoint value	Shows the setpoint value
	Actual value	Shows the actual value

Area	Parameter/description	
	Area	Setting range
Supply air	Supply air values	
	Setpoint value	Shows the setpoint value
	Actual value	Shows the actual value
Extract air	Shows extract air values	
	Setpoint value	Shows the setpoint value
	Actual value	Shows the actual value
Close	Close window	

Semi-circle display – explanation

Colour	Display	Description
Neutral/grey	 Sollwert: 22 °C Istwert: 22.3 °C Min/Max: 22-23 °C	Normal, error-free control Actual value within defined range
Orange	 Sollwert: 18 °C Istwert: 17.9 °C Min/Max: 18-30 °C	Actual value deviates from setpoint value
Red	 Sollwert 15.0 °C Istwert 0.0 °C Bereich 15.0-30.0 °C	Actual value exceeds displayed range

3.3 User management

Login

Select the ⊖ in the header to open the *'Login'* screen.

Fig. 3: Login screen

Enter your *'user name'* and *'password'*, then select *[LOGIN]*.

Also select a display language, either *[Deutsch]*, *[English]* or *[Français]*s; the display language you select will be used once you are successfully logged in.

If another user wants to log in, the current, active user first has to log out. To log out, open the log-in screen and select *[LOGOUT]*.

Factory settings

User name	Default password	Access rights	Automatic logout after …	Activities
Guest	-	Guest	-	Read access only
userStaff	userStaff	Staff	15 minutes	Can change set-points and schedules
userService	userService	Service	1 hour	Can change controller settings, external devices and the central BMS interface

Be sure to change the default login data when you are commissioning the system to prevent any unauthorised persons from accessing the visualisation.

As long as you are using the default user name and default password to log in, the following warning will be shown:
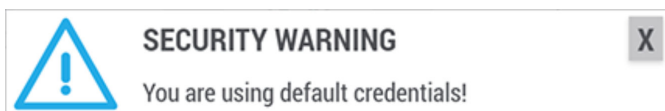
To create a new user or edit an existing user, go to the log-in screen and select *[SETTINGS]*.

Please note: Your access rights allow you to change your own user data as well as to create and change users that have the same or fewer access rights than you.

user name	rights	edit	delete
userAdmin	Admin	✎	
userService	Service	✎	🗑
userStaff	Staff	✎	🗑

+ NEW USER	DELETE	CLOSE

Fig. 4: Log-in settings

Editing users

Go to the *'edit'* column and select ✎ to edit user data.

USER	
old username	userService
new username	
password	
confirm password	
rights	Service

APPLY	CLOSE

Fig. 5: Editing users

You may change the *'user name'* and the *'password'* for a user. Select *'APPLY'* to save your entries.

Creating a new user

Select *[+ NEW USER]* to create a new user.

USER	
user name	
password	
confirm password	
rights	Staff

APPLY	CLOSE

Fig. 6: Creating a new user

Enter the user name, password and level of access rights*, then select *[APPLY]* to save your entries.

Your access rights allow you to create users that have the same or fewer access rights than you.

3.4 Alarm list

This screen shows all alarms.

Fig. 7: Alarm overview

> ℹ️ *You can sort the alarms by selecting a column header.*

Explanation

Column	Icon/description	
1	Alarm no.	
2	🔵ℹ️	Information
	🟠❗	Warning
	🔴❗	Critical alarm. In case of a critical alarm, the X-CUBE is immediately switched off.
3	Time the alarm occurred.	
4	Alarm description	
5	Alarm ID	
	History	Opens the 'Alarm history' window where you can download the alarm history as a csv file.

Colu mn	Icon/description	
		Acknowledge/delete all alarms. Alarms for unsolved errors will be displayed again after a short while. This function requires at least 'Staff' access rights.
Close		Close window

History

This screen shows the alarm history.
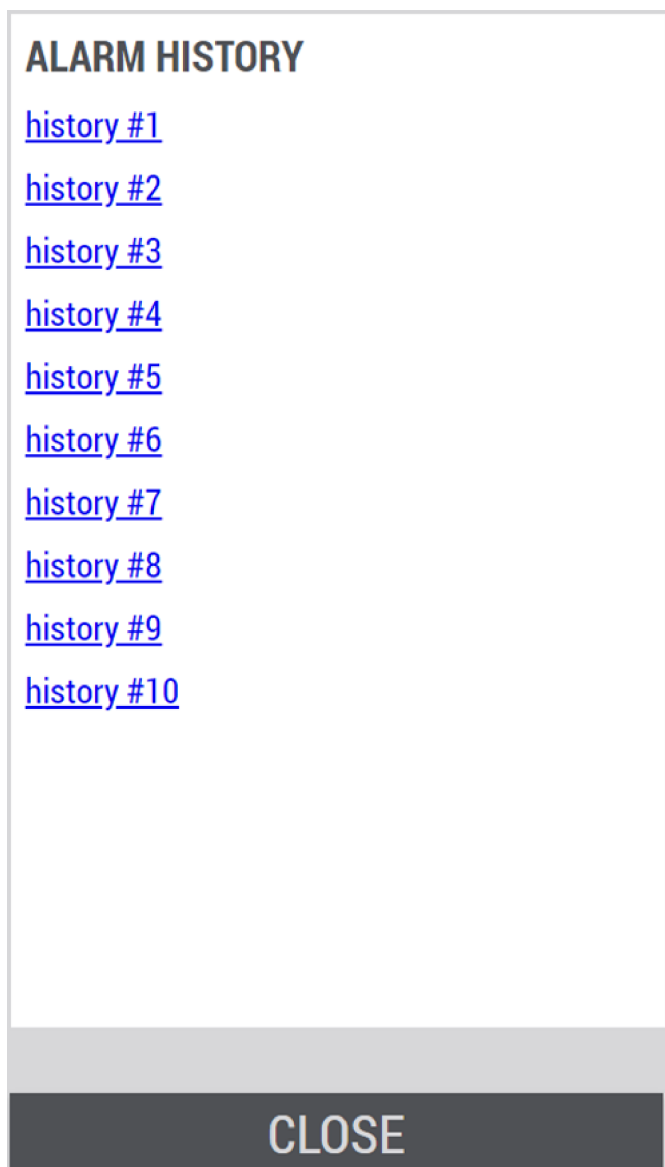
Fig. 8: 'Alarm history' window

To download alarms as csv files, select a history; 'history #1' shows the newest alarms, 'history #10' shows the oldest alarms. The alarm history comprises up to 2000 entries with time stamp, error text and priority. If a logged in user acknowledges or deletes an alarm, this information will be saved together with the user name.

4 General settings

4.1 Switching the system on/off

Schedule for setpoint sets

The setpoint schedule allows you to use different setpoint profiles.

You can set:

- 1 weekly schedule
- 7 profiles
- 10 timings to which you can assign one setpoint set each.

For example, you can assign each day of the week a profile with up to 10 timings.

weekly schedule			profile 1	setpoint set	
monday	profile 1	⌄	00:00	Control 1	⌄
tuesday	profile 1	⌄	01:00	Control 1	⌄
wednesday	profile 4	⌄	02:00	Control 2	⌄
thursday	profile 3	⌄	03:00	Control 3	⌄
friday	profile 5	⌄	00:00	Standby	⌄
saturday	profile 6	⌄	00:00	Standby	⌄
sunday	profile 7	⌄	00:00	Standby	⌄
			00:00	Standby	⌄
			00:00	Standby	⌄
			00:00	Standby	⌄

| SETPOINT SETS | APPLY | CLOSE |

Fig. 9: 'Setpoint schedule' window

Defining setpoint sets

Fig. 10: 'Setpoint sets' window

Area	Parameter	Description
Setpoint values	Name	Enter a name for the setpoint set.
	Temperature from	Set a temperature range.
	Temperature to	Energy-efficient control with dead band: If this value is within the defined range, there is no active heating or cooling. To achieve a certain setpoint, enter the same value into both fields.
	Humidity from	Set a humidity range.
	Humidity to	Energy-efficient control with dead band: If this value is within the defined range, there is no active humidifying or dehumidifying. To achieve a certain setpoint, enter the same value into both fields.
	Supply fan	Enter the setpoint values for supply air and extract air fans in a unit of measure that is suitable for the control strategy.
	Extract fan	
External devices	Device 1 - 20	Schedules can also be used for external devices. Enter the value for the external device.

Example 1

Given		
Operating time	-	Each working day from 06:00 to 18:00h with the same setpoint values
Setting	-	Monday to Friday - profile 1, Saturday and Sunday - profile 2

Personnel:
- Operator

1. ▶ Go to the main menu 🗓 ➜ *'Setpoint schedule'*.

Defining a *'Weekly schedule'*
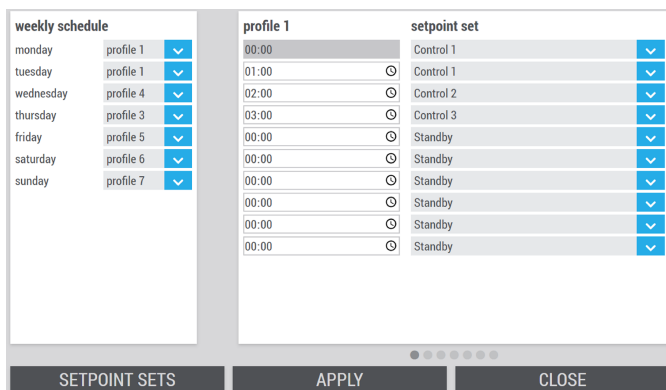
Fig. 11: 'Setpoint schedule' window

2. ▶ Monday to Friday   - Profile 1

   Saturday and Sunday - Profile 2
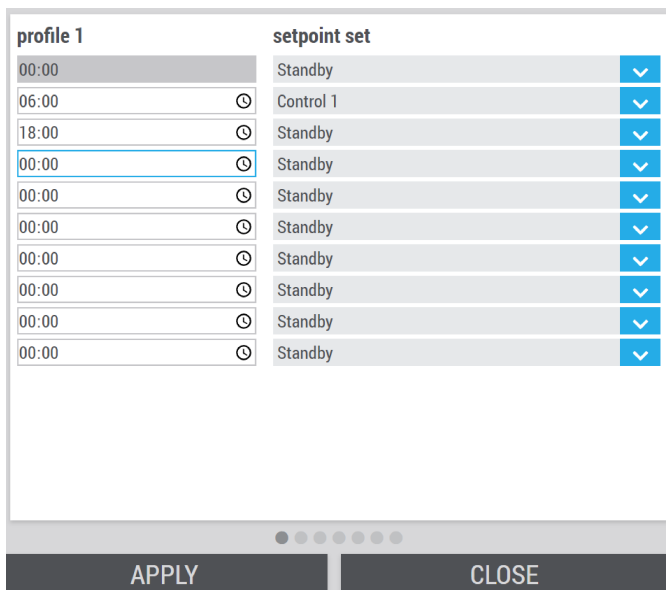
Defining *'Profile 1'*

Fig. 12: Setpoint schedule – Profile 1

3. ▶ 06:00 - Control 1

   18:00 - Standby

   Set all other timings to 00:00 and 'Standby'.

Select *[APPLY]* to save your entries.

⇨ When you save your entries, the next profile is shown with the entries you have just made.

Defining *'Profile 2'*
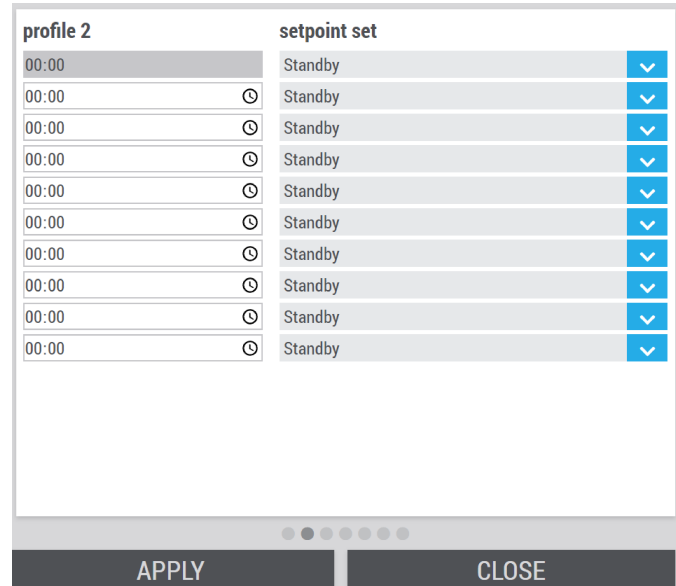
Fig. 13: Setpoint schedule – Profile 2

4. ▶ Set all timings to 00:00 and 'Standby'.

   Select *[APPLY]* to save your entries.

   ⇨ When you save your entries, the next profile is shown with the entries you have just made.

5. ▶ Select the *[Setpoint sets]* button to open the screen where you can define the setpoint sets, ♨ *'Defining setpoint sets'* on page 19 .

Example 2

Given		
Operating time	-	Continuous 24-hour control with the same setpoints on all working days
Setting	-	Monday to Friday - profile 1, Saturday and Sunday - profile 2

Personnel:
- Operator

1. ▶ Go to the main menu 📅 ➔ *'Setpoint schedule'* .

Defining a *'Weekly schedule'*
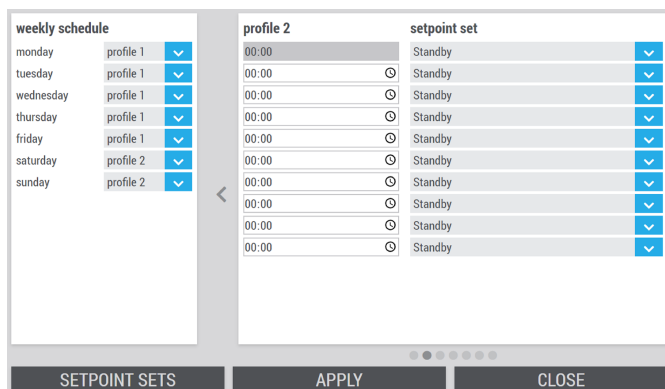
Fig. 14: 'Setpoint schedule' window

2. ▶ Monday to Friday   - Profile 1

       Saturday and Sunday - Profile 2
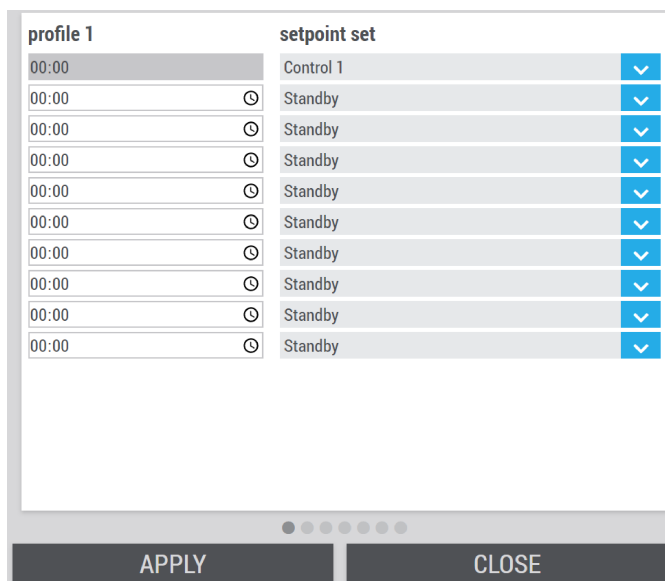
Defining *'Profile 1'*

Fig. 15: Setpoint schedule

3. ▶ 00:00 - Control 1

Set all other timings to 00:00 and 'Standby'.

Select *[APPLY]* to save your entries.

⇨ When you save your entries, the next profile is shown with the entries you have just made.

Defining *'Profile 2'*
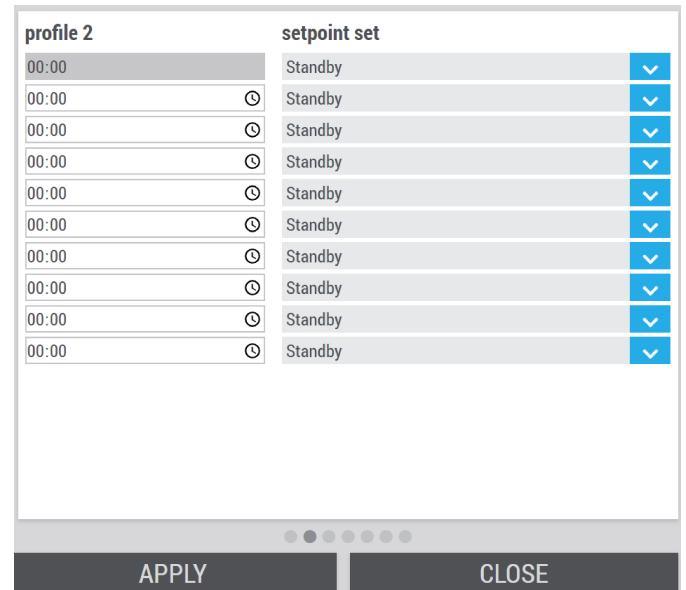
Fig. 16: Setpoint schedule_2a

4. ▶ Set all timings to 00:00 and 'Standby'.

Select *[APPLY]* to save your entries.

⇨ When you save your entries, the next profile is shown with the entries you have just made.

5. ▶ Select the *[Setpoint sets]* button to open the screen where you can define the setpoint sets, ↳ *'Defining setpoint sets'* on page 19 .

4.1.1 Setting holidays

Go to the main menu 🗓 ➜ *'Holidays'*.

X-CUBE Control automatically sets all German public holidays.

Fig. 17: 'Holidays' window

Column	Description
Name	Name of the public holiday
Date	Date of the public holiday (calculated automatically)
Daily profile	Here you can select the setpoint set to be applied to the holiday.
Enable	Enable the holiday settings with the toggle button:

⬜▪	(grey)	Disabled
🟦	(blue)	Enabled

Select *[APPLY]* to save your entries.

4.1.1.1 Setting user-defined holidays

Go to the main menu 🗓 ➜ *'User-defined holidays'*.

Here you can define an additional 15 holidays.

Fig. 18: 'User-defined holidays' window

Column	Description
Name	Enter a name for the user-defined holiday.
Date	Enter a date for the user-defined holiday.
Daily profile	Here you can select the setpoint set to be applied to the holiday.
Enable	Enable the holiday settings with the toggle button:

⬜▪	(grey)	Disabled
🟦	(blue)	Enabled

Select *[APPLY]* to save your entries.

4.1.2 Setting a vacation

Go to the main menu 📅 ➜ *'Vacation'*.

Here you can define 7 vacation periods.

Fig. 19: Vacation

Column	Description		
Name	Enter a name for the vacation.		
Start	Enter the start and end dates of the vacation period.		
End			
Daily profile	Select the setpoint set to be applied to the vacation.		
Enable	Enable the vacation settings with the toggle button:		
	⬜🔲 (grey)	Disabled	
	🔵⬜ (blue)	Enabled	

Select *[APPLY]* to save your entries.

4.1.3 Setpoint additional time

Go to the main menu 🗓 ➔ *'Setpoint additional time'* .

This option allows you to switch on the X-CUBE even if no schedule is active.

setpoint additional time		
enable		◻️▬
abort		◻️▬
enable room control unit		◻️▬
setpoint set	Control 1	⌄
duration	60	min
enabled		**OFF**
remaining time	PT0S	

APPLY	CLOSE
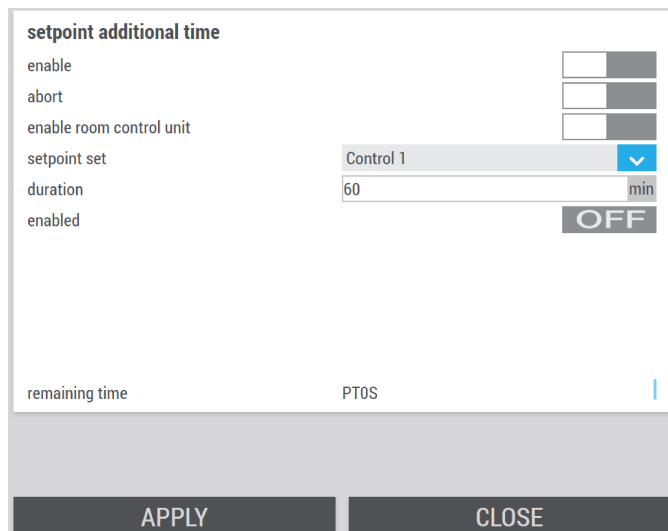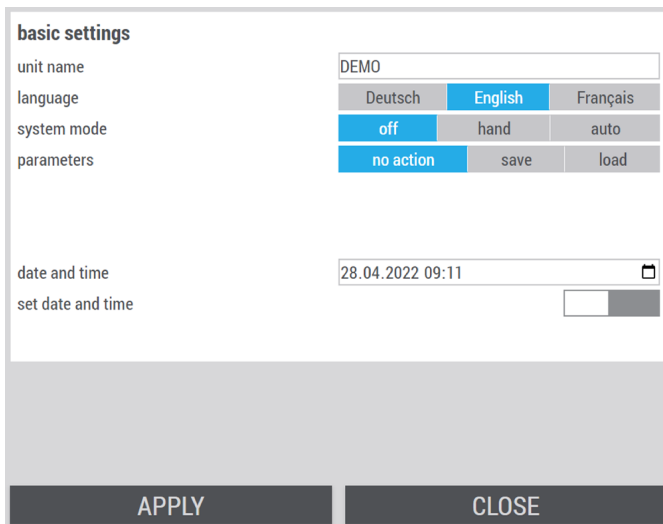
Fig. 20: 'Setpoint additional time' window

Name	Description		
Enable	You can start an additional period of time (extend the operating time) with the toggle button.		
	◻️▬ (grey)	Additional time disabled	
	▬◻️ (blue)	Additional time enabled	
Cancel	You can stop ('abort') an additional period of time with the toggle button.		
	◻️▬ (grey)	Continue additional time	
	▬◻️ (blue)	Stop (abort)	
Enable room control unit	You can enable a room control unit (room control panel) with the toggle button.		
	◻️▬ (grey)	Room control unit enabled	
	▬◻️ (blue)	Room control unit disabled	
Setpoint set	Select the setpoint set to be used during additional time.		
Duration	Enter the additional time in minutes.		
Enabled	Status of additional time.		
	OFF (grey)	Additional time disabled	
	ON (blue)	Additional time enabled	
Remaining time	Indicates the remaining additional time.		

Select *[APPLY]* to save your entries.

4.2 Basic settings

Go to the main menu ⚙ ➔ *'Basic settings'* .

basic settings	
unit name	DEMO
language	Deutsch / **English** / Français
system mode	**off** / hand / auto
parameters	**no action** / save / load
date and time	28.04.2022 09:11
set date and time	(toggle)

APPLY   CLOSE

Fig. 21: Basic settings

Name	Description		
Unit name	This appears in the header on the starting screen.		
Date and time	Activate the toggle button and enter the date and time for the X-CUBE controller.		
	⬜ (grey)	Inactive	
	🟦 (blue)	Enter a new date and time	
	The controller is fitted with a battery powered real time clock with automatic switching between summer time and winter time.		
Language	Here you can change the display language.		
System mode	**Off:** X-CUBE is off.		
	Hand: X-CUBE is in manual mode. In manual mode all components can be controlled manually. **Note:** *Safety functions and interlock functions remain enabled; for example, fans cannot be switched on while dampers are closed.*		
	Auto: X-CUBE is controlled automatically based on a schedule, by the central BMS, by an external device or a room control unit (room control panel).		
Parameters	**Save:** Used to save parameters to an XML file in X-CUBE Control.		
	Load: Used to activate new parameters for X-CUBE Control.		

Select *[APPLY]* to save your entries.

4.3 Control strategy

Go to the main menu ⚙ ➔ *'Control strategy'*.
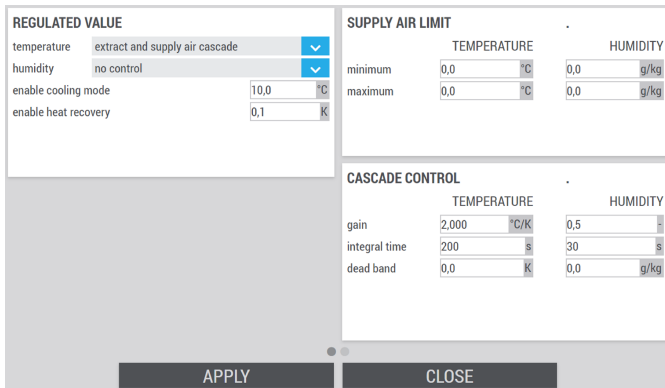
Fig. 22: 'Control strategy' window #1

Name	Description	

REGULATED VALUE	**Temperature:** Enter the temperature control strategy.
	
	 ■ No control
	 ■ Maintaining a constant value
	   – Constant supply
	   – Constant extract
	   – Constant room
	 ■ Cascade control
	   – Extract air and supply air cascades
	   – Room air and supply air cascades
	   – X-AIRCONTROL	

	Humidity: Enter the humidity control strategy.
	
	 ■ No control
	 ■ Maintaining a constant value
	   – Constant supply
	   – Constant extract
	   – Constant room
	 ■ Cascade control
	   – Extract air and supply air cascades
	   – Room air and supply air cascades	

	Enable cooling mode: Enter the minimum outside air temperature to enable active cooling.	
	Enable heat recovery: Enter the minimum difference between outside air temperature and extract air temperature to enable heat recovery.	
SUPPLY AIR LIMITS	Enter supply air temperature and supply air humidity. Select values that protect the building structure. This function requires 'Service' access rights.	
CASCADE CONTROL	Gain	Enter the values for cascade PI control for temperature and, if necessary, humidity.
	Integral time	
	Dead band	PI control will start only after this value has been reached.

Select *[APPLY]* to save your entries and open window #2.

'Control strategy' window #2
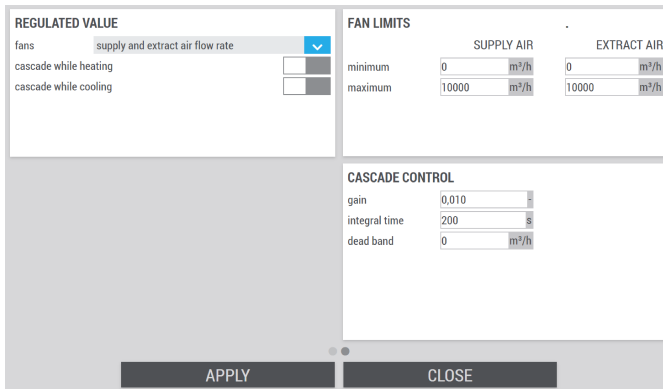
Fig. 23: 'Control strategy' window #2

Name	Description

REGULATED VALUE	**Fans:** Enter the fan control strategy.
	
	■ No control
	■ Pressure control
	  – Supply air duct pressure
	  – Extract air duct pressure
	  – Differential pressure
	  – Supply air duct and extract air duct pressures
	■ Air quality
	  – CO_2 content
	  – VOC content
	■ Volume flow rate
	  – Supply air flow rate
	  – Extract air flow rate
	  – Supply air and extract air flow rates
	■ Temperature control
	  – Extract air temperature
	  – Room temperature
	■ Airflow extract duct pressure
	■ X-AIRCONTROL

	Cascade while heating/ cooling	Use the toggle button to enable the fans to support heating or cooling. This applies only to the *'Room temperature and extract air temperature'* control strategies.	
		(grey)	Off
		(blue)	On

FAN LIMITS	Enter the minimum and maximum values for the volume flow rate setpoint. This applies only to the room temperature and extract air temperature control strategies.	
CASCADE CONTROL	This applies only to the room temperature and extract air temperature control strategies. This function requires 'service' access rights.	
	Gain / integral time	Enter the values for cascade PI control for the volume flow rate setpoint.
	Dead band	PI control will start only after this value has been reached.

Select *[APPLY]* to save your entries.

4.4 Central BMS

Go to the main menu ⚙ ➜ *'Building management system'* .
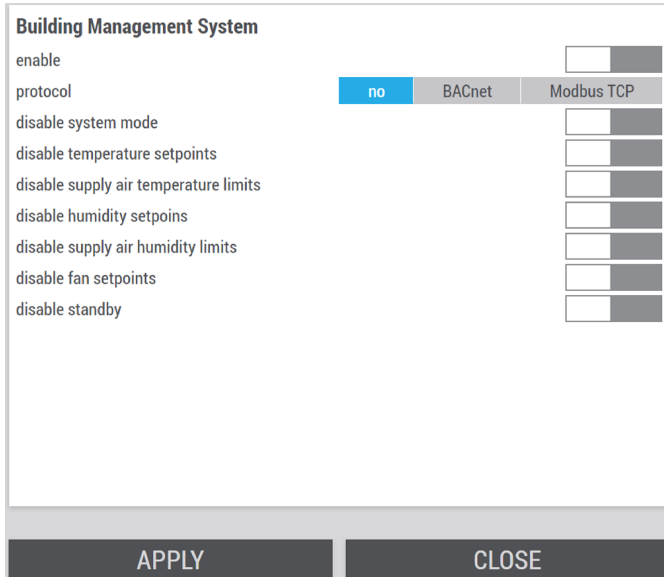
Fig. 24: Central BMS

Name	Description	
Enable	This toggle button allows you to prevent the central BMS from changing parameters. Displaying parameters using Modbus TCP is always possible. **Important:** This toggle button has top priority.	
	(grey)	Central BMS cannot make changes
	(blue)	Central BMS can make changes
Protocol	No:	Parameters will not be changed by the central BMS. Displaying parameters using Modbus TCP is always possible.
	BACnet:	Select one of these buttons to have parameter changes sent to X-CUBE Control via BACnet/IP or Modbus TCP.
	Modbus TCP:	
Disable system mode	This toggle button allows you to prevent the central BMS from changing the system mode.	
	(grey)	Central BMS can make changes
	(blue)	Central BMS cannot make changes
Disable temperature setpoints Disable supply air temperature limits Disable humidity setpoints Disable supply air humidity limits Disable fan setpoints	Use these toggle buttons to prevent the central BMS from changing the respective parameters.	
	(grey)	Central BMS can make changes
	(blue)	Central BMS cannot make changes
Disable standby	This toggle button allows you to prevent the central BMS from switching between standby and regular operation.	
	(grey)	Central BMS can make changes
	(blue)	Central BMS cannot make changes

Select *[APPLY]* to save your entries.

4.5   Room control unit

Go to the main menu ⚙ ➜ *'Room control unit'*.

You can use a room control unit (room control panel) to operate the X-CUBE or to change the temperature set-point.

room control unit	
step I	Standby ⌄
step II	Standby ⌄
step III	Standby ⌄
rotary switch position	auto
enable room control unit	
potentionmeter minimum	19,0 °C
potentiometer maximum	20,0 °C
potentionmeter position	0

| APPLY | CLOSE |
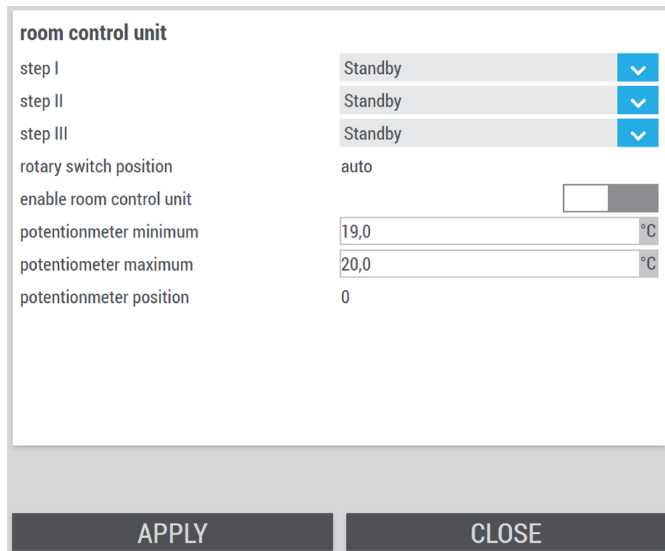
Fig. 25: Room control unit

Name	Description
Step I	Setpoint set to be used when the rotary switch is set to I.
Step II	Setpoint set to be used when the rotary switch is set to II.
Step III	Setpoint set to be used when the rotary switch is set to III.
Rotary switch position	Current setting of the rotary switch.
Enable room control unit	This toggle button allows you to change the temperature setpoint value on the room control unit (room control panel).
	(grey) Disabled
	(blue) Enabled
Potentiometer minimum	Enter the temperature range to be controlled by potentiometers.
Potentiometer maximum	Example: 19 °C min., 25 °C max. You can use the room control unit (room control panel) to change the room temperature within this range.
Potentiometer position	Current setting of the rotary switch.

Select *[APPLY]* to save your entries.

4.6   Setpoint adjustment

Go to the main menu ⚙ ➜ *'Setpoint adjustment'*.

In case of very low or very high temperatures it may be useful to have the temperature setpoint adjusted auto-matically (summer/winter compensation, see heating/cooling characteristic curves).

setpoint adjustment	heating		cooling	
enable				
start outdoor air temperature	10,0	°C	24,0	°C
end outdoor air temperature	-10,0	°C	32,0	°C
maximal setpoint correction	5,0	°K	2,0	°K

| APPLY | CLOSE |
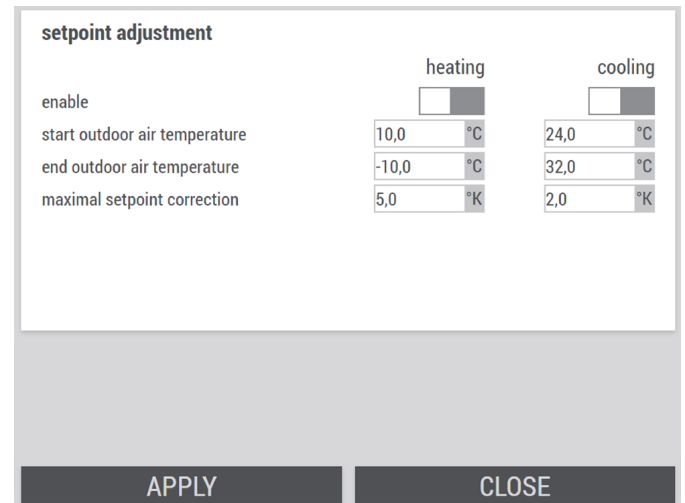
Fig. 26: Setpoint adjustment

Name	Description	
Enable	This toggle button allows you to enable temperature compensation for *'heating'* (winter) and *'cooling'* (summer).	
	(grey)	Temperature condensation off
	(blue)	Temperature compensation on
Start outdoor air temperature	Minimum temperature for setpoint adjustment.	
End outdoor air temperature	Maximum temperature for setpoint adjustment.	
Maximal setpoint correction	Maximum value by which the set-point can be adjusted.	

Select *[APPLY]* to save your entries.

4.7 Night purge

Go to the main menu ⚙ ➔ *'Night purge'*.

In case of very low or very high temperatures it may be useful to have the temperature setpoint adjusted automatically (summer/winter compensation, see heating/cooling characteristic curves).

NIGHT PURGE		
from	00:00	˅
to	05:00	˅
best start time	04:00	˅
maximal duration	55	min
minimum room temperature to start	22,0	°C
minimum deviation between room and outddor temperature to start	4,0	K
minimal allowed room temperatur	18,0	°C
offset fan control setpoint	100	m³/h

APPLY	CLOSE

Fig. 27: Night purge

Name	Description
From	Start time of night purge
To	End time of night purge
Best start time	Preferred start time
Maximal duration	Maximum period for night purge
Minimum room temperature to start	Room temperature at which night purge is activated
Minimum deviation between room and outdoor temperature to start	Minimum difference between room temperature and outdoor air temperature for night purge to be activated
Minimal allowed room temperature	If the room temperature falls below this value, night purge is switched off.
Offset fan control setpoint	During night purge the highest flow rate setpoint ('fan control setpoint') of the active daily profile applies. Setpoint value for flow rate increase ('additional airflow') during active night purge.

Select *[APPLY]* to save your entries.

4.8 External alarms

Go to the main menu ⚙ ➔ *'External alarms'*.

alarm 1		alarm 2		alarm 3	
enable		enable		enable	
contact	breaker maker	contact	breaker maker	contact	breaker maker
serverity	low ˅	serverity	low ˅	serverity	low ˅
acknowledge	hand auto	acknowledge	hand auto	acknowledge	hand auto
text	Meldung 1	text	Meldung 2	text	Meldung 3

APPLY	CLOSE

Fig. 28: External alarms

Name	Description		
Enable	This toggle button allows you to enable external alarms (1-10).		
	▭ (grey)	Disabled	
	▮ (blue)	Enabled	
Contact	Here you can select the type of contact of an external switch.		
	Maker: Normally open contact (NO); makes the electrical connection when the switch is actuated.		
	Breaker: Normally closed contact (NC); breaks the electrical connection when the switch is actuated.		
Severity	Set the alarm priority. ▪ low ▪ medium ▪ high ▪ top		
Acknowledge	Select how alarms should be acknowledged.		
	'Hand' (grey)	The alarm has to be acknowledged manually.	
	'Auto' (blue)	The alarm is deleted automatically when the error has been solved.	
Text	Enter a message text to be displayed with the alarm.		

Select *[APPLY]* to save your entries.

4.9 External devices

Go to the main menu ⚙ ➔ *'External devices'* .
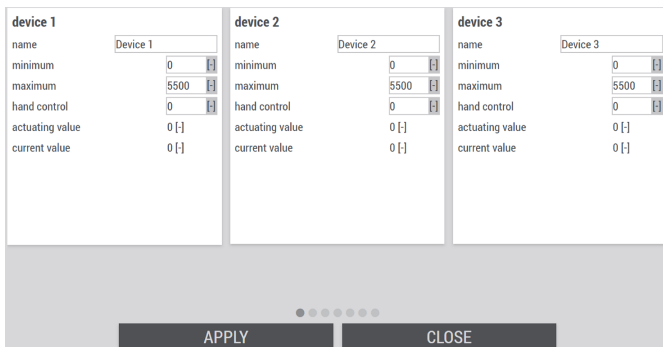
Fig. 29: External devices

Name	Description
Name	Name of the external device (1-20)
Minimum	Minimum value
Maximum	Maximum value
Hand control	–
Actuating value	Setpoint value
Actual value	Actual value

Select *[APPLY]* to save your entries.

TROX® TECHNIK

4.10 Guided operation

Go to the main menu ⚙ ➔ *'Guided operation'*.

To save energy you can set the unit to operation based on temperature or air quality. The air handling unit will then be switched off before the temperature or air quality setpoint is reached, and switched on again after an adjustable hysteresis (intermittent operation). You can also have the AHU start automatically to prevent unoccupied rooms from cooling down excessively. These functions require suitable room temperature and air quality sensors.

guided operation		
cooling protection		
lower temperature limit	16,0	°C
temperature guided operation		
air quality guided operation		
temperature hysteresis	0,0	K
air quality hysteresis	100,0	ppm
minimun execution time	60	min

APPLY	CLOSE

Fig. 30: Guided operation

Name	Description	
Cooling protection	This toggle button allows you to enable protection against excessive cooling down.	
	(grey)	Disabled
	(blue)	Enabled
Lower temperature limit	Minimum room temperature	
Temperature-guided operation	This toggle button allows you to enable operation based on temperature; setpoint values ♨ *19*	
	▪ The AHU switches to standby operation upon reaching the setpoint. ▪ If the temperature falls below the setpoint value, the AHU switches to regular operation.	
	(grey)	Disabled
	(blue)	Enabled
Air quality guided operation	This toggle button allows you to enable operation based on air quality; setpoint values ♨ *19*	
	▪ The AHU switches to standby operation upon reaching the setpoint. ▪ If the temperature falls below the setpoint value, the AHU switches to regular operation.	
	(grey)	Disabled
	(blue)	Enabled
Temperature hysteresis	Enter a hysteresis value for temperature-guided operation. During regular operation the AHU is set to achieve the temperature setpoint + hysteresis; once that value has been achieved, the AHU switches to standby operation.	

Name	Description
Air quality hysteresis	Enter a hysteresis value for air-quality guided operation. During regular operation the AHU is set to achieve the air quality setpoint + hysteresis; once that value has been achieved, the AHU switches to standby operation.
Minimum execution time	Enter the minimum number of minutes for guided operation. This prevents the system from constantly being switched on and off.

Select [APPLY] to save your entries.

4.11 Modbus RTU monitoring

Go to the main menu ⚙ ➜ 'Modbus RTU monitoring'.

Fig. 31: Modbus RTU monitoring – list of devices

Modbus RTU monitoring – window #2

Fig. 32: Modbus RTU monitoring – window #2

Name	Description
Card	Modbus card
Address	Modbus address of the Modbus card
Number of devices	Number of devices in the network
Prioritised devices	Number of prioritised devices

Select [APPLY] to save your entries.

4.12 X-AIRCONTROL

Go to the main menu ⚙ ➜ 'X-AIRCONTROL'.

Fig. 33: X-AIRCONTROL

Name	Description		
Enable	This toggle button allows you to make a connection to an X-AIRCONTROL zone master.		
	(grey)	Disabled	
	(blue)	Enabled	
IP address	Enter the IP address of the X-AIRCONTROL zone master.		
Port	Enter the port to which the X-AIRCONTROL zone master is connected.		
State	Go to X-AIRCONTROL zone master	Link to a web based visualisation of the X-AIRCONTROL zone master.	
	#Tx	Number of transmitted data packets	
	#TxErr	Number of data packets with errors	

Name	Description	
	Error rate	Percentage of communication (transmission) errors
	Supply fan command Extract fan command Temperature setpoint	Values that X-CUBE Control has received from the X-AIR-CONTROL zone master.

Select *[APPLY]* to save your entries.

4.13 Network adapter

Go to the main menu ⚙ ➔ *'Network adapter'*.

> **! NOTICE!**
>
> Important: When you change these settings, you may no longer be able to access to the visualisation software. Before you enter anything: Make sure that your terminal device (touch panel, PC, notebook or tablet) and the X-CUBE controller are on the same network.

NETWORK ADAPTER

name	(X001) EMAC1
DHCP	
IP address	10.5.84.86
subnet mask	255.255.252.0
default gateway	10.5.84.1
refresh network settings	

APPLY	CLOSE

Fig. 34: Network adapter

Name	Description		
Name	Name of the network connection.		
DHCP	The IP address is automatically retrieved from the DHCP server.		
		(grey)	Disabled
		(blue)	Enabled
	The system includes a battery powered real time clock with automatic switching between summer time and winter time		
IP address	Here you can enter your IP address. Factory setting: `192.168.0.180` or 192.168.0.200		
Subnet mask	Here you can enter your subnet mask. Factory setting: `255.255.255.0`		
Default Gateway	Here you can enter your default gateway. Factory setting: `0.0.0.0`		

Select *[APPLY]* to save your entries.

5 Component status and settings

5.1 Exhaust air damper / Outdoor air damper / Supply air damper / Extract air damper

Component status

Go to the system diagram ⌂ and select a damper ▱.

In the detail view you can use the arrows '<' and '>' to navigate between the dampers.
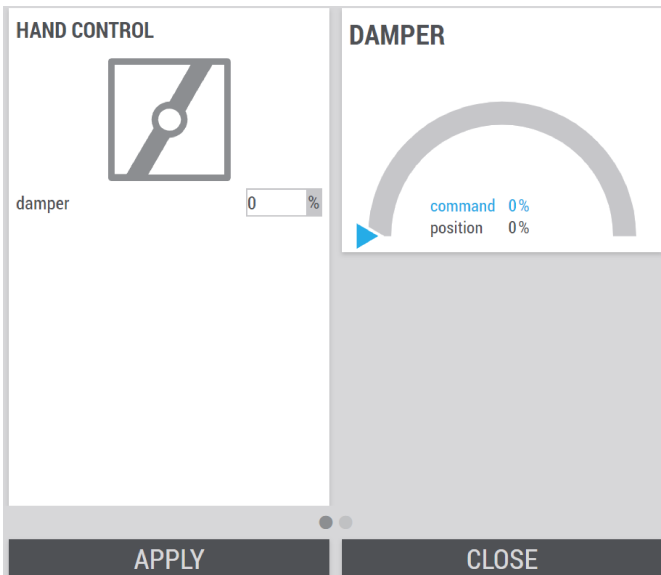
Fig. 35: Damper

Name	Description	
HAND CONTROL	Damper	Enter the damper blade position for operating mode *'Hand'*, ↳ *Table on page 25* . ▪ 0% = closed ▪ 100% = open
DAMPER		Damper blade position shown on the semi-circular display, ↳ *'Semi-circle display – explanation'* on page 13

Select *[APPLY]* to save your entries.

5.2 Outdoor air filter, supply air filter, extract air filter

Component status

Go to the system diagram △ and select a filter ◁.

In the detail view you can use the arrows '<' and '>' to navigate between the dampers.
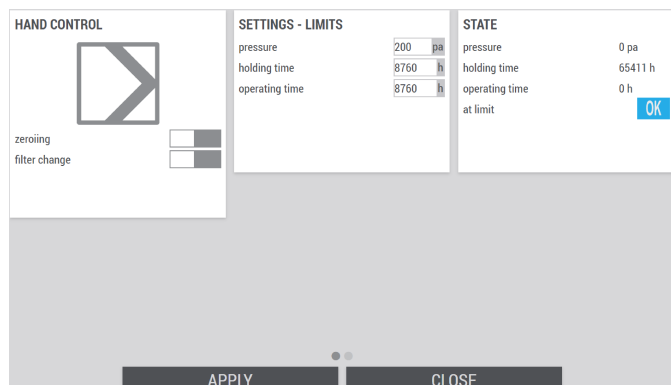
Fig. 36: Filter (status)

Name	Description		
HAND CONTROL	**Zeroing:** This toggle button allows you to carry out a zero point correction for the differential pressure sensor. **Important: Use zero point correction only while the fans are not moving as otherwise the measured values will not be correct.**		
	(grey)	Inactive	
	(blue)	Start zero point correction	
	Filter change: This toggle button allows you to 'inform' X-CUBE Control of a filter change.		
	(grey)	No filter change	
	(blue)	A filter has been changed. Holding time (filter life) and operating time (filter usage time) will be reset.	
SETTINGS – LIMITS	Enter the limits for filter monitoring.		
	Pressure	Enter the maximum differential pressure for the filter.	
	Holding time	Enter the filter life. You may enter the filter life given by the filter manufacturer, for example.	
	Operating time	Enter the maximum operating time (filter usage time). Use this field if the filter condition needs to be examined once in while, e.g. for hygiene purposes.	
STATE	Pressure Holding time Operating time	Filter monitoring actual values	
	At limit	Indicates whether a filter change is required (based on the limit values).	
	!	Filter change required.	
	OK	No filter change required.	

Select *[APPLY]* to save your entries.

5.3 Supply air fan / extract air fan

Component status

Go to the system diagram ⌂ and select a fan ▷.
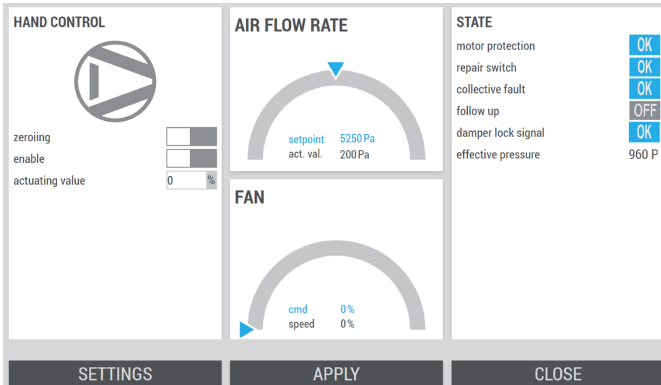
Fig. 37: Supply air fan / extract air fan (status)

Name	Description	
HAND CONTROL	**Zeroing:** This toggle button allows you to carry out a zero point correction for the differential pressure sensor.	
	Important: Use zero point correction only while the fans are not moving as otherwise the measured values will not be correct.	
	(grey)	Inactive
	(blue)	Start zero point correction
	For hand control (manual control) of the fan enter a percentage value and move the toggle button to *'Enable'*. *Available only with system mode 'Hand'.*	
	(grey)	Disabled
	(blue)	Enabled
PRESSURE/VOLUME FLOW RATE	Pressure and volume flow rate of the fan (depending on the selected control strategy) shown on the semi-circular display, ⮑ *'Semi-circle display – explanation' on page 13* .	
FAN	Request from X-CUBE Control (command) to fan and feedback from fan (speed) shown on the semi-circle display, ⮑ *'Semi-circle display – explanation' on page 13* .	
STATE	**Motor protection:** Shows the status of the corresponding digital input.	
	!	Triggered
	OK	OK
	Repair switch: Shows the status of the corresponding digital input.	
	!	Triggered
	OK	OK
	Collective fault: Indicates a general fault of the fan.	
	!	Error
	OK	OK
	Follow up: Indicates whether a run down time has been set for the fan.	
	OFF (grey)	Disabled
	ON (blue)	Enabled

Name	Description
	Damper lock signal: Indicates whether the fan is blocked because any dampers are closed.

	!	Locked
	OK	Release
	Effective pressure: Shows the effective pressure measured on the bellmouth inlet.	

Select *[APPLY]* to save your entries.

Settings

Select *[Settings]* to open the fan settings.

Fig. 38: Supply air fan / extract air fan settings

Name	Description	
BASIC CONTROLLER	Gain Integral time	Enter the values for PI control of the corresponding fan.
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value. The unit of measure depends on the control strategy (e.g. pascal [Pa]).
PRESSURE LIMITATION	Gain Integral time	Enter the values for PI control of the maximum pressure for the corresponding fan.
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value.
	Max. pressure	Enter the maximum duct pressure.
MISCELLANEOUS	Follow up	Enter the run down time ('follow up'). Here you can enter a run down time for the fan.
	Min actuating value Max. actuating value	Here you can enter percentage values to limit the fan operating range.
	Min. setpoint Allowed time setpoint min.	These values are used for fan monitoring. Enter the setpoint value and the maximum time allowed to achieve this setpoint. If the setpoint is not achieved, an alarm is generated.

Select *[APPLY]* to save your entries.

5.4 Heat recovery wheel

Component status

Go to the system diagram ⌂ and select the heat recovery wheel ‖.
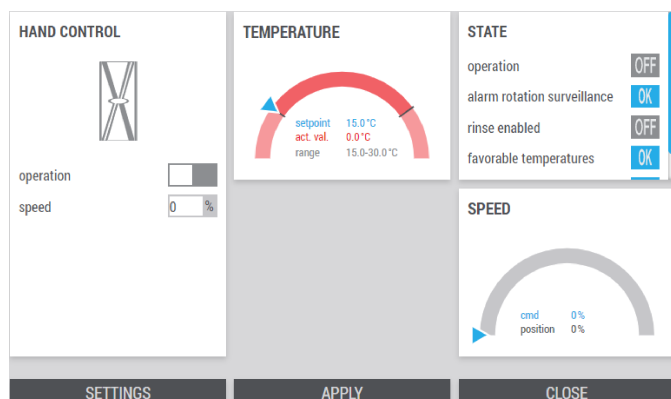
Fig. 39: Heat recovery wheel

Name	Description	
HAND CONTROL *Available only with system mode 'Hand'.*	Operation Speed	For hand control (manual control) of the heat recovery wheel (rotary heat exchanger) enter the speed as a percentage value and move the *'Operation'* toggle button to enable the function.
	(grey)	Disabled
	(blue)	Enabled
TEMPERATURE	Heat recovery wheel control shown on the semi-circular display.	
SPEED	Request from X-CUBE Control (command) to rotary heat exchanger and feedback from the rotary heat exchanger (position) shown on the semi-circle display.	
STATE	**Operation:** Shows the status of the corresponding digital output.	
	OFF (grey)	Off
	ON (blue)	On
	Alarm rotation surveillance: Indicates whether the heat recovery wheel (rotary heat exchanger) is working correctly.	
	!	Triggered
	OK	OK
	Rinse enabled: Shows the status of the cleaning process.	
	OFF (grey)	Disabled
	ON (blue)	Enabled
	Favourable temperatures, favourable enthalpy: Indicates whether heat recovery/enthalpy recovery is possible.	
	!	No
	OK	Yes

Select *[APPLY]* to save your entries.

Settings

Select *[Settings]* to open the heat recovery wheel settings (rotary heat exchanger settings).

Fig. 40: Heat recovery wheel settings

Name	Description	
AIR TEMPERATURE CONTROL	Gain Integral time	Enter the values for PI control of the heat recovery wheel (rotary heat exchanger).
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value. The unit of measure depends on the control strategy (e.g. pascal [Pa]).
AFTER START-UP BEHAVIOUR	Controller lock	Enter values to determine the period of time for which the heat recovery wheel is to rotate with a fixed speed after start up. PI control is disabled during this time.
ACTUATING VALUE LIMITS	Minimum Maximum	Here you can enter values to limit the heat recovery wheel operating range.
CLEANING Note: Be sure to take any regulations for the application into consideration when you make the cleaning settings.	Period	Enter the cleaning intervals.
	Duration	Enter the duration of the cleaning procedure.
	Speed	Enter the speed that applies during cleaning.

Select *[APPLY]* to save your entries.

TROX® TECHNIK

5.5 Plate heat exchanger

Component status

Go to the system diagram ⌂ and select the plate heat exchanger ‖.
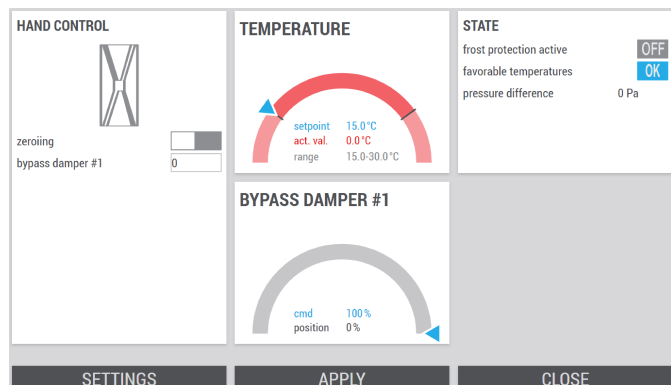
Fig. 41: Plate heat exchanger

Name	Description
HAND CONTROL	**Zeroing:** This toggle button allows you to carry out a zero point correction for the differential pressure sensor.
	Important: Use zero point correction only while the fans are not moving as otherwise the measured values will not be correct.

	(grey)	Inactive
	(blue)	Start zero point correction
Bypass damper #1 Bypass damper #2	Enter the position of the bypass damper for operating mode *'Hand'*, ↳ *Table on page 25* . ■ 0% = 100% heat recovery ■ 100% = 0% heat recovery	

Name	Description
TEMPERATURE	Plate heat exchanger control shown on the semi-circular display, ↳ *'Semi-circle display – explanation' on page 13* .
BYPASS DAMPER #1 BYPASS DAMPER #2	Request from X-CUBE Control (command) to the bypass damper and feedback from the bypass damper (position) shown on the semi-circle display, ↳ *'Semi-circle display – explanation' on page 13* .
STATE	**Frost protection active:** Shows the status of the frost protection (prevention of ice buildup).

OFF	(grey)	Disabled
ON	(blue)	Enabled
Favourable temperatures: Indicates whether heat recovery is possible.		
!		No
OK		Yes
Pressure difference: Shows the differential pressure of the plate heat exchanger.		

Select *[APPLY]* to save your entries.

Settings

Select *[Settings]* to open the plate heat exchanger settings.

AIR TEMPERATURE CONTROL			AFTER START UP BEHAVIOUR		
gain	6,0	%/K	bypass damper	100	%
integral time	60	s	controller lock	1500	s
dead band	0,0	K			

DEICING		
nominal pressure loss	200	Pa
pressure loss deicing	250	Pa
bypass damper	0	%

APPLY	CLOSE

Fig. 42: Plate heat exchanger settings

Name	Description	
AIR TEMPERATURE CONTROL	Gain Integral time	Enter the values for PI control of the plate heat exchanger.
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value. The unit of measure depends on the control strategy (e.g. pascal [Pa]).
AFTER START-UP BEHAVIOUR	Bypass damper Controller lock	Enter the bypass damper blade position and the period of time for which this position is to be maintained after start up. PI control is disabled during this time.
DE-ICING	Nominal pressure loss	Lowest value at which the system can detect whether the plate exchanger is free of ice.
	Pressure loss de-icing	Highest value at which the system can detect whether the plate exchanger has ice built up.
	Bypass damper	Enter the damper blade position to be taken and maintained in case of ice buildup.

Select *[APPLY]* to save your entries.

5.6 Recirculation damper

Component status

Go to the system diagram ⌂ and select the recirculation damper ▱.
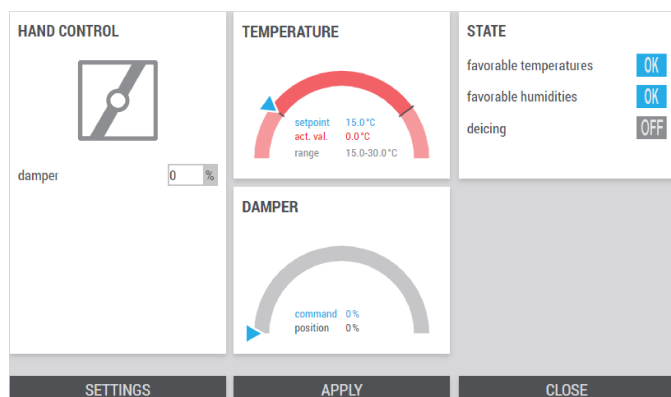
Fig. 43: Recirculation damper status

Name	Description	
HAND CONTROL	Damper	Enter the damper blade position for operating mode *'Hand'*, ↳ *Table on page 25* . ■ 0% = closed ■ 100% = open
TEMPERATURE	Temperature control of the recirculation damper shown on the semi-circular display, ↳ *'Semi-circle display – explanation'* on page 13	
DAMPER	Recirculation damper position shown on the semi-circular display, ↳ *'Semi-circle display – explanation'* on page 13	
STATE	**Favourable temperatures:** Indicates whether heat recovery is possible.	
	!	No
	OK	Yes
	Favourable humidity: Indicates whether moisture recovery is possible.	
	!	No
	OK	Yes
	De-icing: Shows the de-icing status.	
	OFF (grey)	Disabled
	ON (blue)	Enabled

Select *[APPLY]* to save your entries.

TROX TECHNIK

Settings

Select *[Settings]* to open the recirculation damper settings.

air temperature control

gain	0,5	%/K
integral time	30	s
dead band	0,0	K

damper positions

minimal position	0	%
maximal position	100	%

air quality control

enable		
setpoint	0	ppm
gain	1	%/ppm
integral time	30	s

filter temp. control

enable		
setpoint	0	°C
gain	1	%/K
integral time	30	s

APPLY   CLOSE

Fig. 44: Recirculation damper settings

Name	Description	
Air temperature control	Gain Integral time	Enter the values for PI control of the recirculation damper (air temperature).
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value.
Air quality control	**Enable:** This toggle button allows you to enable the recirculation damper for air quality control.	
	(grey)	No
	(blue)	Yes
	Gain Integral time	Enter the values for PI control of the recirculation damper (air quality).
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value.
ACTUATING VALUE LIMITS	Minimum Maximum	Here you can enter values to limit the recirculation damper operating range.
Filter temp. control	**Enable:** This toggle button allows you keep the prefilter at a constant temperature.	
	(grey)	No
	(blue)	Yes
	Setpoint value	Enter the temperature setpoint for the prefilter.
	Gain Integral time	Enter the values for PI control of the heater.
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value.

5.7 Run around coil

Component status

Go to the system diagram ⌂ and select the run around coil ⌀.
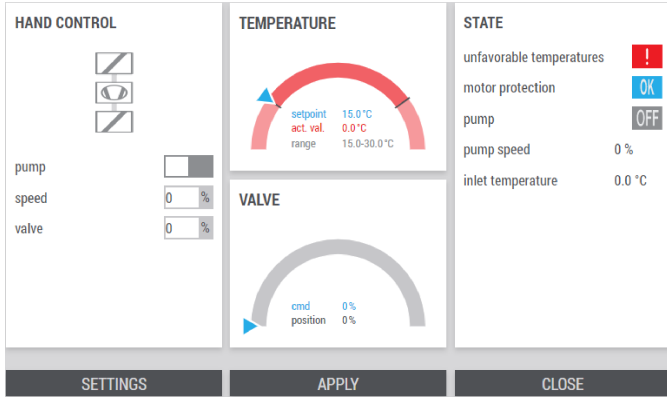
Fig. 45: Run around coil (status)

Name	Description	
HAND CONTROL *Available only with system mode 'Hand'.*	Pump Speed	For manual control ('hand control') of the pump enter the speed as a percentage value and move the *'Pump'* toggle button to enable the function.
	▭ (grey)	Disabled
	▭ (blue)	Enabled
	Valve	For manual control ('hand control') of the valve enter a percentage value.
TEMPERATURE	RAC system control shown on the semi-circular display, ⤷ *'Semi-circle display – explanation' on page 13* .	
SPEED	Request from X-CUBE Control (command) to the rotary heat exchanger and feedback from the rotary heat exchanger (position) shown on the semi-circle display, ⤷ *'Semi-circle display – explanation' on page 13* .	
STATE	**Operation:** Shows the status of the corresponding digital output.	
	OFF (grey)	Off
	ON (blue)	On
	Alarm rotation surveillance: Indicates whether the heat recovery wheel (rotary heat exchanger) is working correctly.	
	!	Triggered
	OK	OK
	Rinse enabled: Shows the status of the cleaning process.	
	OFF (grey)	Disabled
	ON (blue)	Enabled
	Favourable temperatures, favourable enthalpy: Indicates whether heat recovery/enthalpy recovery is possible.	
	!	No
	OK	Yes

Settings

Select *[Settings]* to open the settings for the run around coil.

Fig. 46: Run around coil settings

Name	Description	
AIR TEMPERATURE CONTROL	Gain Integral time	Enter the values for PI control of the external run around coil.
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value.
AFTER START-UP BEHAVIOUR	Actuating value Controller lock	Enter values to determine the period of time for which the RAC system is to run according to a fixed request after start up. PI control is disabled during this time.
INLET TEMPERATURE LIMITER	Gain Integral time	Enter the values for PI control.
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value.
	Lower limit	Enter the inlet temperature (flow temperature) below which ice buildup might occur.
MISCELLANEOUS	Valve type	Select the valve type.
	Minimal pump speed	Enter the minimum pump speed.
	Pump nominal speed	Enter the nominal pump speed.

Select *[APPLY]* to save your entries.

5.8 Preheater/reheater (hot water)

Go to the system diagram ⌂ and select a heater ▱.

Fig. 47: Heater (status)

Name	Description	
HAND CONTROL *Available only with system mode 'Hand'.*	Enable heat generator Pump	For manual control ('hand control') of the pump or heat generator move the 'Heat generator' toggle button to enable the function.
	▭ (grey)	Disabled
	▭ (blue)	Enabled
	Valve	For manual control ('hand control') of the valve enter a percentage value.
TEMPERATURE	Heater control shown on the semi-circular display, ↳ *'Semi-circle display – explanation' on page 13*.	
VALVE	Request from X-CUBE Control (command) to the valve and feedback from the valve (position) shown on the semi-circle display, ↳ *'Semi-circle display – explanation' on page 13*.	
STATE	**Pump:** Shows the status of the corresponding digital output.	
	OFF (grey)	Off
	ON (blue)	On
	Motor protection: Shows the status of the corresponding digital input.	
	!	Triggered
	OK	OK
	Frost protection thermostat: Shows the status for the corresponding heater.	
	!	Triggered
	OK	OK
	Preventive frost protection: Shows the status.	
	!	Enabled
	OK	Enable
	Return temperature Inlet temperature	Shows the inlet or return temperature on the heater.

Settings

Select *[Settings]* to open the settings for the respective heater.

Fig. 48: Heater settings

Name	Description	
AIR TEMPERATURE CONTROL	Gain Integral time	Enter the values for PI control of the heater.
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value.
RETURN CONTROL	Lower limit	Enter the minimum return temperature. If the return temperature falls below this value, the preventive frost protection function opens the valve slightly.
	Gain Integral time	Enter the values for return temperature PI control.
	Offset	Enter a correction factor for the return temperature sensor (see also: sensor correction).
STARTUP CIRCUITRY	Reference sensor	Select a reference sensor for start-up.
	Start month End month	Enter the period of time for which start-up operation should last after the system is switched on. The set outdoor air temperature will be ignored during that time.
	Minimal duration	Enter the minimum period of time for start-up operation. After this period of time the system returns to normal operation either upon reaching the return temperature setpont value or the *'maximal duration'* set for start-up.
	Maximal duration	Enter the maximum period of time for start-up operation.
	Return temperature	Enter the return temperature setpoint to be used for start-up operation ('startup circuitry').
	Outdoor temperature	Enter the outdoor air temperature limit. If the outdoor air temperature is lower than this value, start-up operation remains enabled. The outdoor air temperature will be ignored between *'Start month'* and *'End month'*.

Name	Description	
	Valve position at end Valve's ramp	Enter the end position for the valve and the valve's ramp time. After start-up operation the valve first moves to the end position you enter here, then during 'valve's ramp time' to the setpoint for control.
MISCELLANEOUS	Switchon delay heat prov.	Enter the period of time after which the heat generator should be switched on.
	Pump switch-off delay	Enter the period of time for which the pump should continue running after it has been switched off (run down time). This prevents the system from constantly being switched on and off.
	ODA temp. release pump	Enter the outdoor air temperature limit. If the outdoor air temperature is lower than this value, the pump remains enabled.
	ODA temp. prev. frost	Enter the outdoor air temperature limit. If the outdoor air temperature is lower than this value, 'return control' remains enabled.

Select *[APPLY]* to save your entries.

5.9 Electric preheater / electric reheater

Go to the system diagram ⌂ and select a heater ▱.
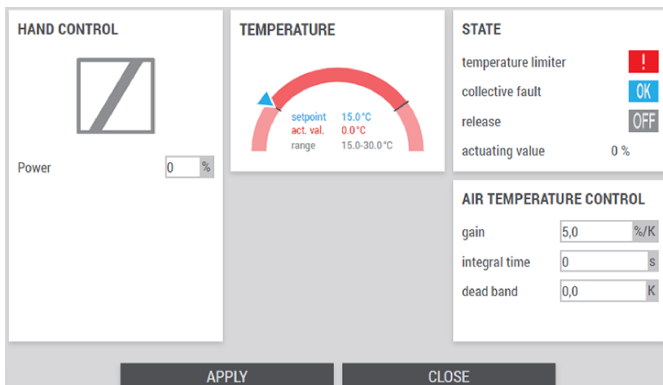
Fig. 49: Electric preheater / electric reheater (status)

Name	Description	
HAND CONTROL	Power	For manual control ('hand control') of the heater enter a percentage value.
		Available only with system mode 'Hand'.
TEMPERATURE	Heater control shown on the semi-circular display, ↳ *'Semi-circle display – explanation' on page 13* .	
AIR TEMPERATURE CONTROL This function requires *'Service'* access rights.	Gain Integral time	Enter the values for PI control of the heater.
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value.
STATE	**Temperature limiter:** Shows the status of the corresponding digital input.	
	!	Error
	OK	OK
	Collective fault: Shows the status of the corresponding digital input.	
	!	Error
	OK	OK
	Enabled: Shows the status of the corresponding digital output.	
	OFF (grey)	Disabled
	ON (blue)	Enabled
	Actuating value: Request from X-CUBE Control to heater.	

5.10   Cooler (chilled water)

Component status

Go to the system diagram ⌂ and select the cooler ⊠.
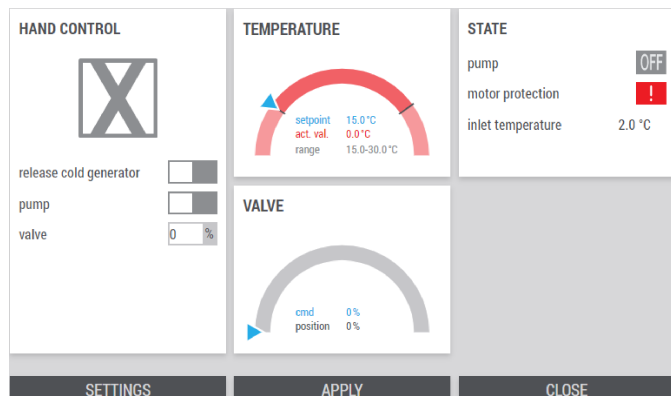
Fig. 50: Cooler (status)

Name	Description	
HAND CONTROL *Available only with system mode 'Hand'.*	Release cold generator Pump	For manual control ('hand control') of the pump or cold generator move the 'Release cold generator' toggle button to enable the function.
	▭ (grey)	Disabled
	▭ (blue)	Enabled
	Valve	For manual control ('hand control') of the valve enter a percentage value.
TEMPERATURE/ HUMIDITY	Cooler control shown on the semi-circular display, ↻ *'Semi-circle display – explanation' on page 13* .	
VALVE	Request from X-CUBE Control (command) to the valve and feedback from the valve (position) shown on the semi-circle display, ↻ *'Semi-circle display – explanation' on page 13* .	
STATE	**Pump:** Shows the status of the corresponding digital output.	
	`OFF` (grey)	Off
	`ON` (blue)	On
	Motor protection: Shows the status of the corresponding digital input.	
	`!`	Triggered
	`OK`	OK
	Return temperature Inlet temperature	Shows the inlet or return temperature on the cooler.

Settings

Select *[Settings]* to open the cooler settings.

Fig. 51: Cooler settings

Name	Description	
AIR TEMPERATURE CON-TROL AIR HUMIDITY CONTROL	Gain Integral time	Enter the values for PI control of the cooler.
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value.
INLET TEMPERATURE	Lower limit	Enter the inlet temperature (flow temperature) below which ice buildup might occur. If the return temperature falls below this value, the preventive frost protection function opens the valve slightly.
	Gain Integral time	Enter the values for flow temperature PI control.
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value.
MISCELLANEOUS	Pump switch-off delay	Enter the period of time for which the pump should continue running after it has been auto-matically switched off (run down time). This prevents the system from constantly being switched on and off.
	Switch-on delay cold	Enter the period of time after which the cold generator should be switched on.

Select *[APPLY]* to save your entries.

5.11 External chiller

Component status

Go to the system diagram ⌂ and select *'Chiller'*.
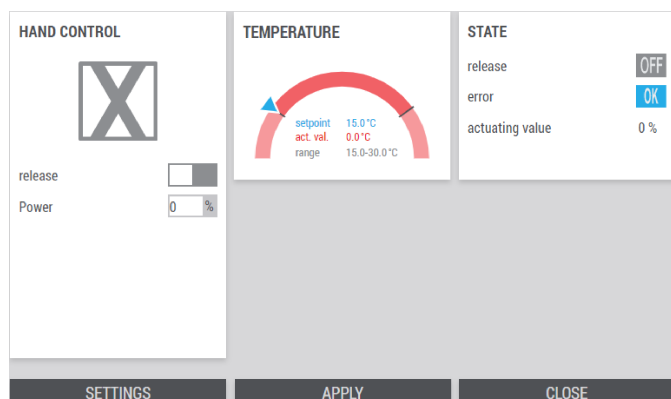
Fig. 52: External chiller (status)

Name	Description	
HAND CONTROL *Available only with system mode 'Hand'.*	Enable Power	For manual control ('hand control') of the pump enter a percentage value and move the *'Enable'* toggle button to enable the function.
	▭ (grey)	Disabled
	▭ (blue)	Enabled
TEMPERATURE	RAC system control shown on the semi-circular display, ↻ *'Semi-circle display – explanation' on page 13* .	
SPEED	Request from X-CUBE Control (command) to the rotary heat exchanger and feedback from the rotary heat exchanger (position) shown on the semi-circle display, ↻ *'Semi-circle display – explanation' on page 13* .	
STATE	**Enabled:** Shows the status of the corresponding digital output.	
	OFF (grey)	Locked
	ON (blue)	Release
	Error: Shows the status of the corresponding digital input.	
	!	Triggered
	OK	OK
	Actuating value: Request from X-CUBE Control to chiller.	

Settings

Select *[Settings]* to open the settings for the external chiller.

Fig. 53: External chiller settings

Name	Description	
AIR TEMPERATURE CON-TROL AIR HUMIDITY CONTROL	Gain Integral time	Enter the values for PI control of the cooler.
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value.

Select *[APPLY]* to save your entries.

5.12 Humidifier

Component status

Go to the system diagram ⌂ and select the humidifier 𝄃.
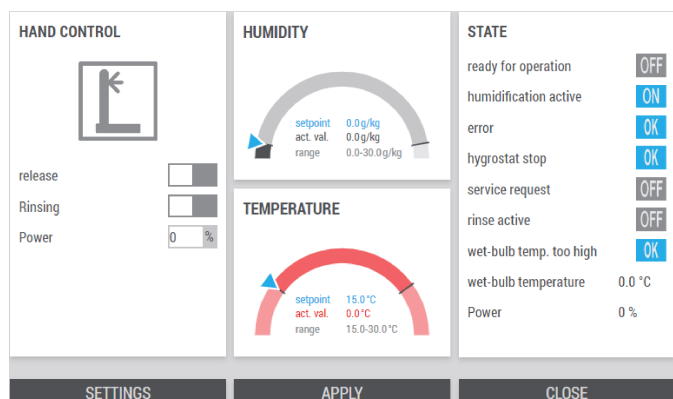
Fig. 54: Humidifier (status)

Name	Description	
HAND CONTROL *Available only with system mode 'Hand'.*	Enable / Rinsing	For manual release or rinsing of the humidifier move the corresponding toggle button to enable the function.
	▭ (grey)	Disabled
	▭ (blue)	Enabled
	Power	For manual control ('hand control') of the humidifier enter a percentage value.
HUMIDITY / TEMPERATURE	Humidifier control shown on the semi-circular display, ↻ *'Semi-circle display – explanation' on page 13*.	
STATE	Ready for operation / Humidification active / Service request / Rinse active	Shows the status of the corresponding digital input.
	OFF (grey)	Off
	ON (blue)	On
	Error / Hygrostat stop	Shows the monitoring status.
	!	Triggered
	OK	OK
	Wet bulb temp. too high / Wet bulb temperature	Shows the status and the calculated wet bulb temperature. **Important**: The wet bulb temperature is relevant only to evaporative cooling (adiabatic) of the extract air.
	!	Too high
	OK	OK
	Power	Request from X-CUBE Control to humidifier.

Settings

Select *[Settings]* to open the settings for the humidifier.

Fig. 55: Humidifier settings

Name	Description	
HUMIDITY CONTROL	Gain Integral time	Enter the values for PI control of the humidifier.
	Dead band	Enter the dead band. The start of PI control is delayed by the dead band value.
HUMIDITY LIMITATION	Lower limit	Enter the limit for the relative supply air humidity.
	Gain Integral time	Enter the values for PI control of the humidifier.
ACTUATING VALUE LIMITS	Minimum Maximum	Here you can enter values to limit the humidifier operating range.
RINSING	Duration	Enter a period of time.
	Period	Enter the rinsing intervals.

Select *[APPLY]* to save your entries.

5.13   Sensors

Component status

Go to the system diagram ⌂ and select a sensor ▲.

offset and zeroiing			
extract air temperature	19.9 °C	19.9	°C
extract duct pressure	180 Pa		

APPLY   CLOSE

Fig. 56: Sensors (status)

Name	Description	
Offset and zeroing	Supply air temperature Extract air temperature Exhaust air temperature Outdoor air temperature	If the sensor needs to be corrected, enter the deviation (offset). **Example:** The display shows 19.9 °C, but the actual value captured by the reference sensor is 20.5 °C. Enter 0.6 °C to correct the sensor value. Enter negative corrections with a minus sign.
	Supply air duct pressure Extract air duct pressure	This toggle button allows you to carry out a zero point correction for the differential pressure sensor. **Important: Use zero point correction only while the fans are not moving as otherwise the measured values will not be correct.**
	(grey)	Inactive
	(blue)	Start zero point correction

Select *[APPLY]* to save your entries.

5.14 Weather sensor

Component status

Go to the system diagram ⌂ and select the weather sensor 🌡.

Fig. 57: Weather sensor (status)

Name	Description	
Settings	Signal source	Select the signal source for the sensor.
	Modbus card	Select the Modbus card.
	Sensor model	Enter the sensor model.
	Modbus address	Enter the Modbus address of the sensor.
	Offset	If the sensor needs to be corrected, enter the deviation (offset).
		Example: The display shows 10.9 °C, but the actual value captured by the reference sensor is 11.5 °C. Enter 0.6 °C to correct the sensor value. Enter negative corrections with a minus sign.
	Outdoor temperature	Actual outdoor air temperature.

Select [APPLY] to save your entries.

5.15   Room sensor

Component status

Go to the system diagram ⌂ and select the room temperature sensor 🌡.

In the detail view you can use the arrows '<' and '>' to navigate between the sensors.
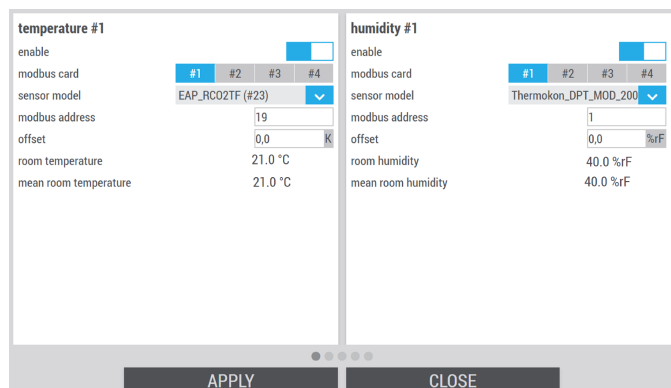
Fig. 58: Room sensor (status)

Name	Description	
Temperature #1...	**Enable:** This toggle button allows you to enable the temperature sensor.	
	(grey)	Disabled
	(blue)	Enabled
	Signal source	Select the signal source for the sensor.
	Modbus card	Select the Modbus card.
	Sensor model	Enter the sensor model.
	Modbus address	Enter the Modbus address of the sensor.
	Offset	If the sensor needs to be corrected, enter the deviation (offset).
		Example: The display shows 10.9 °C, but the actual value captured by the reference sensor is 11.5 °C. Enter 0.6 °C to correct the sensor value. Enter negative corrections with a minus sign.
	Room humidity	Displays the actual room temperature.
	Mean room humidity	Mean temperature of all room temperature sensors.
Humidity #1...	**Enable:** This toggle button allows you to enable the humidity sensor.	
	(grey)	Disabled
	(blue)	Enabled
	Signal source	Select the signal source for the sensor.
	Modbus card	Select the Modbus card.
	Sensor model	Enter the sensor model.
	Modbus address	Enter the Modbus address of the sensor.

Name	Description	
	Offset	If the sensor needs to be corrected, enter the deviation (offset).
		Example: The display shows 40.0% rh, but the actual value captured by the reference sensor is 41.5% rh. Enter 0.5% rh to correct the sensor value. Enter negative corrections with a minus sign.
	Room humidity	Actual room air humidity.
	Mean room humidity	Mean humidity of all humidity sensors.

Select *[APPLY]* to save your entries.

6 Fire protection

6.1 TROXNETCOM

Go to the main menu ⊚ ➜ *'TROXNETCOM'*.
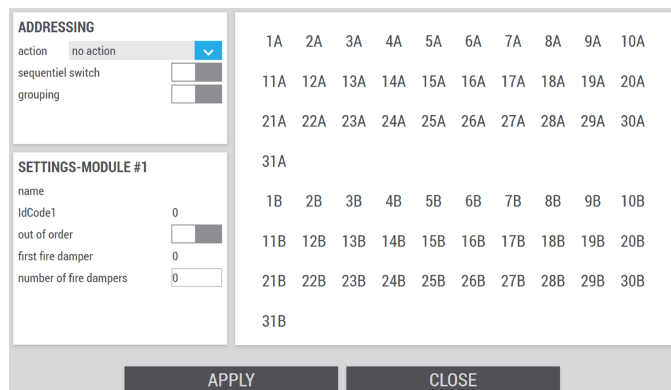
Fig. 59: TROXNETCOM

Name	Description	
Addressing	Action	
	Reset: Resets the address.	
	Addressing: The address will be used.	
	Sequential switch	
	▭▮ (grey)	Inactive
	▮▭ (blue)	
	Grouping	
	▭▮ (grey)	Inactive
	▮▭ (blue)	
Settings Module #	Name	Name of the fire damper.
	Idcode1	
	Out of order	
	▭▮ (grey)	The fire damper is in operation.
	▮▭ (blue)	The fire damper is out of order.
	First fire damper	
	Number of fire dampers	

6.2 Smoke detector

Status overview

Go to the main menu ⊚ ➜ *'Smoke detector'* .

Two digital inputs are available to connect two smoke detectors to the X-CUBE controller. If you want to connect more than two smoke detectors, you need more digital inputs (additional hardware).
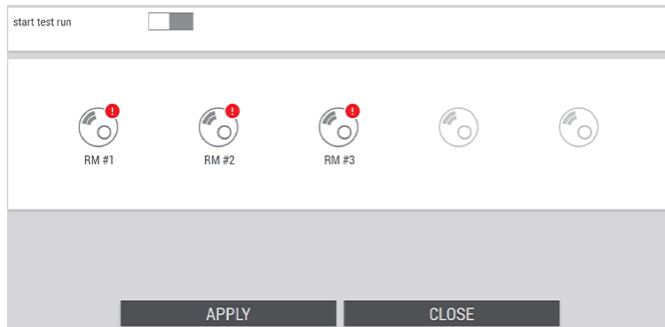
Fig. 60: Smoke detectors (overview)

Name	Description		
Start test run	To start a test run move the toggle button accordingly and select *[APPLY]*.		
	▭▬ (grey)		Inactive
	▬▭ (blue)		Start test run
Smoke detector status		RM #1	Smoke detector OK, not triggered.
			Smoke detector not available, but can be made available.
			Note: Displaying non-available duct smoke detectors requires *'Service'* access rights .
		RM #1	Alarm, smoke detector has been triggered.

Smoke detector (detail)

Fig. 61: Smoke detector (detail)

Name	Description	
STATE	Triggered	
	⚠ (red)	Alarm, smoke detector has been triggered.
	OK (blue)	Smoke detector OK, not triggered.
SETTINGS	Name	Enter the name of the smoke detector; the name will be displayed in the overview.
	Available	
	(grey)	Smoke detector not available.
	(blue)	Smoke detector available.
	Critical fault	
	(grey)	X-CUBE will not be switched off.
	(blue)	If the smoke detector is triggered (i.e. detects smoke), the X-CUBE will be switched off.
	Group	Use this field to group several smoke detectors.
		If a smoke detector or a fire damper in a group is triggered, all other devices in the group are also triggered.

Select *[APPLY]* to save your entries.

6.3 Fire dampers

Status overview

Go to the main menu ⊚ ➔ *'Fire dampers'*.

Two digital inputs are available to connect two smoke detectors to the X-CUBE controller. If you want to connect more than two smoke detectors, you need more digital inputs (additional hardware).
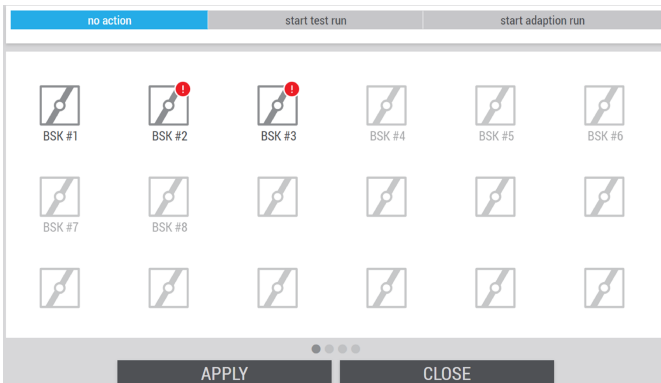
Fig. 62: Fire dampers (overview)

Name	Description	
Start test run Test runs and adaptation require *'Service'* access rights.	To start a test run first select *[Start test run]*, then *[APPLY]*.	
	To start an adaption run, first select *[Start adaption run]*, then *[APPLY]*.	
Fire dampers status	BSK 1.01:01	Fire damper OK, not triggered.
	BSK #4	Fire damper not available, but can be made available. Note: Displaying non-available fire dampers requires *'Service'* access rights .
	BSK 1.01:01	Alarm, fire damper has been triggered.

Fire damper (detail)
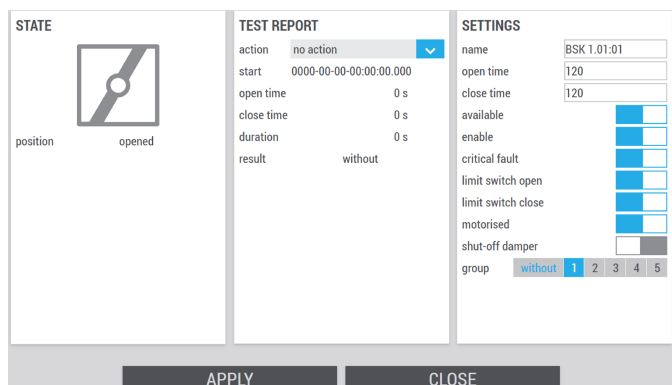
Fig. 63: Fire damper (detail)

Name	Description		
STATE	Position		
	Closed	Damper blade in safe position	
	Open	The damper blade is OPEN.	
	Intermediate	Damper blade in undefined position	
TEST REPORT	Action	**Start test run:** To start a test run first select *'Start test run'*, then *[APPLY]*.	
		Start adaption run: To start an adaption run first select *'Start adaption run'*, then *[APPLY]*.	
	Start	Time of the most recent test run.	
	Open time Close time	Measured run times of the most recent test run.	
	Duration	Duration of the most recent test run.	
	Result	Result of the most recent test run: ■ Without ■ Test runs ■ Test succeed ■ Test failed ■ Test aborted	
SETTINGS	Name	Enter the name of the fire damper; the name will be displayed in the overview.	
	Open time Close time	Enter the expected run time of the fire damper	
	Available		
	(grey)	Fire damper not available	
	(blue)	Fire damper available	
	Enable		
	(grey)	Fire damper disabled	
	(blue)	Fire damper enabled	
	Critical fault		
	(grey)	X-CUBE will not be switched off.	

Name	Description	
	⬛ (blue)	If the fire damper is triggered, the X-CUBE will be switched off.
	Limit switch OPEN / limit switch CLOSED	
	⬜ (grey)	Fire damper without limit switches
	⬛ (blue)	Fire with limit switches for OPEN / CLOSED
	Motorised	
	⬜ (grey)	Fire damper without spring return actuator (will not be opened by X-CUBE Control).
	⬛ (blue)	Fire damper with spring return actuator, will be opened by X-CUBE Control.
	Shut-off damper	
	⬜ (grey)	Fire damper remains open when there is no power.
	⬛ (blue)	Fire damper will be closed when there is no power.
	Group	Use this field to group several fire dampers.
		If a smoke detector or a fire damper in a group is triggered, all other devices in the group are also triggered.

Select *[APPLY]* to save your entries.

6.4 Assisted smoke extraction

Go to the main menu ⓥ ➔ *'Assisted smoke extraction'*.

FAN COMMAND IN CASE OF FIRE

supply fan command	0	%
extract fan command	0	%

APPLY   **CLOSE**

Fig. 64: Assisted smoke extraction (status)

❗ NOTICE!

IMPORTANT

Be sure to make these settings with regard to the fire and smoke extract system.

If a duct smoke detector or a fire damper is triggered, you can switch on the fans of the X-CUBE unit to support the smoke extract system.

Name	Description
Fan command in case of fire Setting this value requires *'Service'* access rights.	Supply fan command: Enter the supply air fan power to be applied in the event of a fire as a percentage value.
	Extract fan command: Enter the extract air fan power to be applied in the event of a fire as a percentage value.

Select *[APPLY]* to save your entries.

7 History

Go to the main menu 📈 ➜ *'Temperatures, humidities or fans'*.

The data of the past 7 days will be displayed.
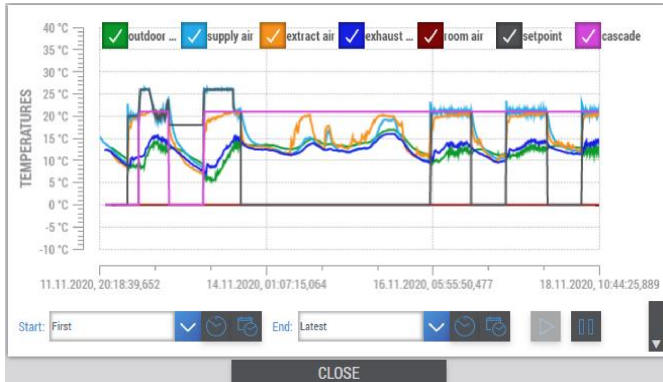
Fig. 65: Temperatures

Note: The values shown depend on the sensors used with the X-CUBE.

Trend	Value	Description
Temperatures	Outdoor air	Outdoor air actual temperature
Temperatures	Supply air	Supply air actual temperature
Temperatures	Extract air	Extract air actual temperature
Temperatures	Exhaust air	Exhaust air actual temperature
Temperatures	Room air	Room air actual temperature
Temperatures	Setpoint value	Supply air setpoint temperature
Temperatures	Cascade	Room air / extract air setpoint temperature with cascade control
Humidities	Actual value	Supply air actual humidity
Humidities	Setpoint value	Supply air setpoint humidity
Humidities	Cascade	Room air / extract air actual humidity
Humidities	Cascade setpoint	Room air / extract air setpoint humidity with cascade control
Fans	Supply air actual value	Supply air actual value depending on control strategy (Pa, m³/h)
Fans	Extract air actual value	Extract air actual value depending on control strategy (Pa, m³/h)
Fans	Supply air setpoint value	Supply air setpoint value depending on control strategy (Pa, m³/h)
Fans	Extract air setpoint value	Extract air setpoint value depending on control strategy (Pa, m³/h)
Fans	Supply fan command	Supply air fan command as percentage
Fans	Extract fan command	Extract air fan command as percentage
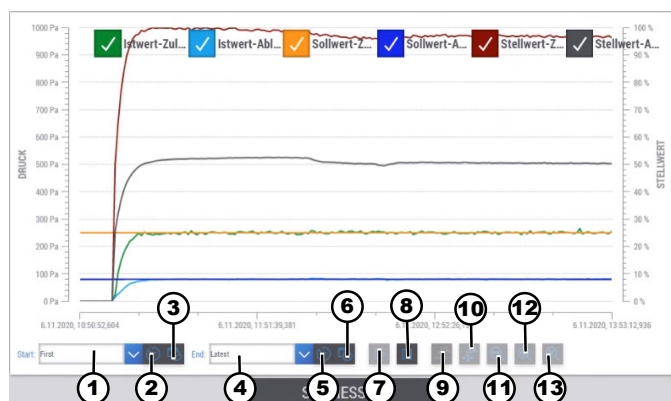
Fig. 66: Fan history (live)

No.	Description
1	Start time of displayed data
2	Select period of time
3	Select time
4	End time of displayed data
5	Select period of time
6	Select time
7	Start live view
8	Pause live view
9	Shift data on X-axis
10	Shift data on X-axis and Y-axis
11	X-axis zoom
12	Y-axis zoom
13	Reset zoom

8 Faults

8.1 Faults

Fault descrip-tion	Cause	Remedy
No visualisation	No visualisation on the touch panel	X-CUBE controller and touch panel are not in the same IP address space. ■ Set the correct target address for visualisation (see Chapter 3.1) on the touch panel. If the problem persists, use the mains isolator to switch the X-CUBE off and on again. If the problem persists even after you have switched the X-CUBE off and on again, please contact the TROX Technical Service.

8.2 Alarm list

ID	Error text
1	Supply filter service message #1
2	Extract filter service message #1
3	Outdoor filter service message #1
4	Frost protection activated
5	Preventive frost protection activated
6	Fire damper triggered - unit stopped
7	Fire damper triggered - unit still runs
8	AHU locked by fire alarm system
9	Voltage error 24 V
10	Error fuse control cabinet
11	Motor protection extract air fan #1
12	Motor protection extract air fan #2
13	Motor protection extract air fan #3
14	Motor protection extract air fan #4
15	Motor protection extract air fan #5
16	Motor protection extract air fan #6
17	Motor protection extract air fan #7
18	Motor protection extract air fan #8
19	Motor protection extract air fan #9
20	Motor protection extract air fan #10
21	Motor protection extract air fan #11
22	Motor protection extract air fan #12
23	Motor protection extract air fan #13
24	Motor protection extract air fan #14
25	Motor protection extract air fan #15
26	Motor protection extract air fan #16
27	Motor protection supply air fan #1

ID	Error text
28	Motor protection supply air fan #2
29	Motor protection supply air fan #3
30	Motor protection supply air fan #4
31	Motor protection supply air fan #5
32	Motor protection supply air fan #6
33	Motor protection supply air fan #7
34	Motor protection supply air fan #8
35	Motor protection supply air fan #9
36	Motor protection supply air fan #10
37	Motor protection supply air fan #11
38	Motor protection supply air fan #12
39	Motor protection supply air fan #13
40	Motor protection supply air fan #14
41	Motor protection supply air fan #15
42	Motor protection supply air fan #16
43	Motor protection preheater
44	Motor protection reheater
45	Motor protection cooler
46	External lock
47	Repair switch supply air fan #1
48	Repair switch supply air fan #2
49	Repair switch supply air fan #3
50	Repair switch supply air fan #4
51	Repair switch supply air fan #5
52	Repair switch supply air fan #6
53	Repair switch supply air fan #7
54	Repair switch supply air fan #8
55	Repair switch supply air fan #9
56	Repair switch supply air fan #10
57	Repair switch supply air fan #11
58	Repair switch supply air fan #12
59	Repair switch supply air fan #13
60	Repair switch supply air fan #14
61	Repair switch supply air fan #15
62	Repair switch supply air fan #16
63	Repair switch extract air fan #1
64	Repair switch extract air fan #2
65	Repair switch extract air fan #3
66	Repair switch extract air fan #4

ID	Error text
67	Repair switch extract air fan #5
68	Repair switch extract air fan #6
69	Repair switch extract air fan #7
70	Repair switch extract air fan #8
71	Repair switch extract air fan #9
72	Repair switch extract air fan #10
73	Repair switch extract air fan #11
74	Repair switch extract air fan #12
75	Repair switch extract air fan #13
76	Repair switch extract air fan #14
77	Repair switch extract air fan #15
78	Repair switch extract air fan #16
79	Alarm rotation guard rotary heat exchanger
80	Defective Modbus cable or missing terminating resistor
81	Modbus error – Cooler – Pump
82	Modbus error – Cooler – Valve
83	Modbus error – damper ODA #1
84	Modbus error – damper ODA #2
85	Modbus error – Damper Fan SUP #1
86	Modbus error – Damper Fan SUP #2
87	Modbus error – Damper SUP #1
88	Modbus error – Damper SUP #2
89	Modbus error – Damper ETA #1
90	Modbus error – Damper ETA #2
91	Modbus error – Damper Fan ETA #1
92	Modbus error – Damper Fan ETA #2
93	Modbus error – Damper EHA #1
94	Modbus error – Damper EHA #2
95	Modbus error – Damper RCA #1
96	Modbus error – Damper RCA #2
97	Modbus error – supply air fan #1
98	Modbus error – supply air fan #2
99	Modbus error – supply air fan #3
100	Modbus error – supply air fan #4
101	Modbus error – supply air fan #5
102	Modbus error – supply air fan #6
103	Modbus error – supply air fan #7
104	Modbus error – supply air fan #8
105	Modbus error – supply air fan #9

ID	Error text
106	Modbus error – supply air fan #10
107	Modbus error – supply air fan #11
108	Modbus error – supply air fan #12
109	Modbus error – supply air fan #13
110	Modbus error – supply air fan #14
111	Modbus error – supply air fan #15
112	Modbus error – supply air fan #16
113	Modbus error – extract air fan #1
114	Modbus error – extract air fan #2
115	Modbus error – extract air fan #3
116	Modbus error – extract air fan #4
117	Modbus error – extract air fan #5
118	Modbus error – extract air fan #6
119	Modbus error – extract air fan #7
120	Modbus error – extract air fan #8
121	Modbus error – extract air fan #9
122	Modbus error – extract air fan #10
123	Modbus error – extract air fan #11
124	Modbus error – extract air fan #12
125	Modbus error – extract air fan #13
126	Modbus error – extract air fan #14
127	Modbus error – extract air fan #15
128	Modbus error – extract air fan #16
129	Modbus error - differential pressure sensor outdoor filter #1
130	Modbus error – differential pressure sensor supply filter #1
131	Modbus error – differential pressure sensor extract filter #1
132	Modbus error – Preheater pump
133	Modbus error – Preheater valve
134	Modbus error – Reheater pump
135	Modbus error – Reheater valve
136	Modbus error – differential pressure sensor plate heat exchanger
137	Modbus error - thoroughfare damper plate heat exchanger #1
138	Modbus error - thoroughfare damper plate heat exchanger #2
139	Modbus error – bypass damper plate heat exchanger #1
140	Modbus error – bypass damper plate heat exchanger #2
141	Modbus error – heat recovery wheel speed
142	Modbus error – differential pressure sensor heat recovery wheel
143	Modbus error – internal error heat recovery wheel
144	Modbus error – humidity sensor – ODA

ID	Error text
145	Modbus error – humidity sensor – SUP
146	Modbus error – humidity sensor – ETA
147	Modbus error – humidity sensor – EHA
148	Modbus error – differential pressure sensor – SUP air duct
149	Modbus error – differential pressure sensor – ETA air duct
150	Modbus error – temperature sensor – ODA
151	Modbus error – temperature sensor – SUP
152	Modbus error – temperature sensor – ETA
153	Modbus error – temperature sensor – EHA
154	Modbus error – electric air preheater
155	Modbus error – electric air reheater
156	Modbus error – sensor room temperature #1
157	Modbus error – sensor room temperature #2
158	Modbus error – sensor room temperature #3
159	Modbus error – sensor room temperature #4
160	Modbus error – sensor room temperature #5
161	Modbus error – sensor room humidity #1
162	Modbus error – sensor room humidity #2
163	Modbus error – sensor room humidity #3
164	Modbus error – sensor room humidity #4
165	Modbus error – sensor room humidity #5
166	Modbus error - differential pressure sensor - fan SUP #1
167	Modbus error – differential pressure sensor – fan ETA #1
168	Modbus error - differential pressure sensor - fan SUP #2
169	Modbus error – differential pressure sensor – fan ETA #2
170	Modbus error – run around coil pump
171	Modbus error – run around coil valve
172	Modbus error - weather sensor
173	Modbus error – VOC sensor
174	Modbus error – CO2 sensor
175	Modbus error – cooler inlet temperature
176	Modbus error – preheater outlet temperature
177	Modbus error – reheater outlet temperature
178	Modbus error – run around coil
179	Modbus error – integrated cooling
180	Modbus error - differential pressure sensor outdoor filter #2
181	Modbus error – differential pressure sensor supply filter #2
182	Modbus error – differential pressure sensor extract filter #2
183	Modbus error - extract fan array group #1

ID	Error text
184	Modbus error - extract fan array group #2
185	Modbus error - extract fan array group #3
186	Modbus error - extract fan array group #4
187	Modbus error - extract fan array group #5
188	Modbus error - extract fan array group #6
189	Modbus error - extract fan array group #7
190	Modbus error - extract fan array group #8
191	Modbus error - extract fan array group #9
192	Modbus error - extract fan array group #10
193	Modbus error - supply fan array group #1
194	Modbus error - supply fan array group #2
195	Modbus error - supply fan array group #3
196	Modbus error - supply fan array group #4
197	Modbus error - supply fan array group #5
198	Modbus error - supply fan array group #6
199	Modbus error - supply fan array group #7
200	Modbus error - supply fan array group #8
201	Modbus error - supply fan array group #9
202	Modbus error - supply fan array group #10
203	External alarm #1
204	External alarm #2
205	External alarm #3
206	External alarm #4
207	External alarm #5
208	External alarm #6
209	External alarm #7
210	External alarm #8
211	External alarm #9
212	External alarm #10
213	Parameter loading error
214	Factory settings loading error
215	Internal error supply fan #1
216	Internal error supply fan #2
217	Internal error supply fan #3
218	Internal error supply fan #4
219	Internal error supply fan #5
220	Internal error supply fan #6
221	Internal error supply fan #7
222	Internal error supply fan #8

ID	Error text
223	Internal error supply fan #9
224	Internal error supply fan #10
225	Internal error supply fan #11
226	Internal error supply fan #12
227	Internal error supply fan #13
228	Internal error supply fan #14
229	Internal error supply fan #15
230	Internal error supply fan #16
231	Internal error extract fan #1
232	Internal error extract fan #2
233	Internal error extract fan #3
234	Internal error extract fan #4
235	Internal error extract fan #5
236	Internal error extract fan #6
237	Internal error extract fan #7
238	Internal error extract fan #8
239	Internal error extract fan #9
240	Internal error extract fan #10
241	Internal error extract fan #11
242	Internal error extract fan #12
243	Internal error extract fan #13
244	Internal error extract fan #14
245	Internal error extract fan #15
246	Internal error extract fan #16
247	Electrical preheater temperature limiter triggered
248	Electrical preheater flow detector triggerred
249	Electrical preheater aggregated error
250	Electrical reheater temperature limiter triggerred
251	Electrical reheater flow detector triggered
252	Electrical reheater aggregated error
253	Direct vaporiser error
254	Fire damper triggered #1
255	Fire damper end position switch error #1
256	Fire damper opening runtime error #1
257	Fire damper closing runtime error #1
258	Fire damper triggered #2
259	Fire damper end position switch error #2
260	Fire damper opening runtime error #2
261	Fire damper closing runtime error #2

ID	Error text
262	Fire damper triggered #3
263	Fire damper end position switch error #3
264	Fire damper opening runtime error #3
265	Fire damper closing runtime error #3
266	Fire damper triggered #4
267	Fire damper end position switch error #4
268	Fire damper opening runtime error #4
269	Fire damper closing runtime error #4
270	Fire damper triggered #5
271	Fire damper end position switch error #5
272	Fire damper opening runtime error #5
273	Fire damper closing runtime error #5
274	Fire damper triggered #6
275	Fire damper end position switch error #6
276	Fire damper opening runtime error #6
277	Fire damper closing runtime error #6
278	Fire damper triggered #7
279	Fire damper end position switch error #7
280	Fire damper opening runtime error #7
281	Fire damper closing runtime error #7
282	Fire damper triggered #8
283	Fire damper end position switch error #8
284	Fire damper opening runtime error #8
285	Fire damper closing runtime error #8
286	Fire damper triggered #9
287	Fire damper end position switch error #9
288	Fire damper opening runtime error #9
289	Fire damper closing runtime error #9
290	Fire damper triggered #10
291	Fire damper end position switch error #10
292	Fire damper opening runtime error #10
293	Fire damper closing runtime error #10
294	Fire damper triggered #11
295	Fire damper end position switch error #11
296	Fire damper opening runtime error #11
297	Fire damper closing runtime error #11
298	Fire damper triggered #12
299	Fire damper end position switch error #12
300	Fire damper opening runtime error #12

ID	Error text
301	Fire damper closing runtime error #12
302	Fire damper triggered #13
303	Fire damper end position switch error #13
304	Fire damper opening runtime error #13
305	Fire damper closing runtime error #13
306	Fire damper triggered #14
307	Fire damper end position switch error #14
308	Fire damper opening runtime error #14
309	Fire damper closing runtime error #14
310	Fire damper triggered #15
311	Fire damper end position switch error #15
312	Fire damper opening runtime error #15
313	Fire damper closing runtime error #15
314	Fire damper triggered #16
315	Fire damper end position switch error #16
316	Fire damper opening runtime error #16
317	Fire damper closing runtime error #16
318	Fire damper triggered #17
319	Fire damper end position switch error #17
320	Fire damper opening runtime error #17
321	Fire damper closing runtime error #17
322	Fire damper triggered #18
323	Fire damper end position switch error #18
324	Fire damper opening runtime error #18
325	Fire damper closing runtime error #18
326	Fire damper triggered #19
327	Fire damper end position switch error #19
328	Fire damper opening runtime error #19
329	Fire damper closing runtime error #19
330	Fire damper triggered #20
331	Fire damper end position switch error #20
332	Fire damper opening runtime error #20
333	Fire damper closing runtime error #20
334	Fire damper triggered #21
335	Fire damper end position switch error #21
336	Fire damper opening runtime error #21
337	Fire damper closing runtime error #21
338	Fire damper triggered #22
339	Fire damper end position switch error #22

ID	Error text
340	Fire damper opening runtime error #22
341	Fire damper closing runtime error #22
342	Fire damper triggered #23
343	Fire damper end position switch error #23
344	Fire damper opening runtime error #23
345	Fire damper closing runtime error #23
346	Fire damper triggered #24
347	Fire damper end position switch error #24
348	Fire damper opening runtime error #24
349	Fire damper closing runtime error #24
350	Fire damper triggered #25
351	Fire damper end position switch error #25
352	Fire damper opening runtime error #25
353	Fire damper closing runtime error #25
354	Fire damper triggered #26
355	Fire damper end position switch error #26
356	Fire damper opening runtime error #26
357	Fire damper closing runtime error #26
358	Fire damper triggered #27
359	Fire damper end position switch error #27
360	Fire damper opening runtime error #27
361	Fire damper closing runtime error #27
362	Fire damper triggered #28
363	Fire damper end position switch error #28
364	Fire damper opening runtime error #28
365	Fire damper closing runtime error #28
366	Fire damper triggered #29
367	Fire damper end position switch error #29
368	Fire damper opening runtime error #29
369	Fire damper closing runtime error #29
370	Fire damper triggered #30
371	Fire damper end position switch error #30
372	Fire damper opening runtime error #30
373	Fire damper closing runtime error #30
374	Fire damper triggered #31
375	Fire damper end position switch error #31
376	Fire damper opening runtime error #31
377	Fire damper closing runtime error #31
378	Fire damper triggered #32

ID	Error text
379	Fire damper end position switch error #32
380	Fire damper opening runtime error #32
381	Fire damper closing runtime error #32
382	Fire damper triggered #33
383	Fire damper end position switch error #33
384	Fire damper opening runtime error #33
385	Fire damper closing runtime error #33
386	Fire damper triggered #34
387	Fire damper end position switch error #34
388	Fire damper opening runtime error #34
389	Fire damper closing runtime error #34
390	Fire damper triggered #35
391	Fire damper end position switch error #35
392	Fire damper opening runtime error #35
393	Fire damper closing runtime error #35
394	Fire damper triggered #36
395	Fire damper end position switch error #36
396	Fire damper opening runtime error #36
397	Fire damper closing runtime error #36
398	Fire damper triggered #37
399	Fire damper end position switch error #37
400	Fire damper opening runtime error #37
401	Fire damper closing runtime error #37
402	Fire damper triggered #38
403	Fire damper end position switch error #38
404	Fire damper opening runtime error #38
405	Fire damper closing runtime error #38
406	Fire damper triggered #39
407	Fire damper end position switch error #39
408	Fire damper opening runtime error #39
409	Fire damper closing runtime error #39
410	Fire damper triggered #40
411	Fire damper end position switch error #40
412	Fire damper opening runtime error #40
413	Fire damper closing runtime error #40
414	Fire damper triggered #41
415	Fire damper end position switch error #41
416	Fire damper opening runtime error #41
417	Fire damper closing runtime error #41

ID	Error text
418	Fire damper triggered #42
419	Fire damper end position switch error #42
420	Fire damper opening runtime error #42
421	Fire damper closing runtime error #42
422	Fire damper triggered #43
423	Fire damper end position switch error #43
424	Fire damper opening runtime error #43
425	Fire damper closing runtime error #43
426	Fire damper triggered #44
427	Fire damper end position switch error #44
428	Fire damper opening runtime error #44
429	Fire damper closing runtime error #44
430	Fire damper triggered #45
431	Fire damper end position switch error #45
432	Fire damper opening runtime error #45
433	Fire damper closing runtime error #45
434	Fire damper triggered #46
435	Fire damper end position switch error #46
436	Fire damper opening runtime error #46
437	Fire damper closing runtime error #46
438	Fire damper triggered #47
439	Fire damper end position switch error #47
440	Fire damper opening runtime error #47
441	Fire damper closing runtime error #47
442	Fire damper triggered #48
443	Fire damper end position switch error #48
444	Fire damper opening runtime error #48
445	Fire damper closing runtime error #48
446	Fire damper triggered #49
447	Fire damper end position switch error #49
448	Fire damper opening runtime error #49
449	Fire damper closing runtime error #49
450	Fire damper triggered #50
451	Fire damper end position switch error #50
452	Fire damper opening runtime error #50
453	Fire damper closing runtime error #50
454	Fire damper triggered #51
455	Fire damper end position switch error #51
456	Fire damper opening runtime error #51

ID	Error text
457	Fire damper closing runtime error #51
458	Fire damper triggered #52
459	Fire damper end position switch error #52
460	Fire damper opening runtime error #52
461	Fire damper closing runtime error #52
462	Fire damper triggered #53
463	Fire damper end position switch error #53
464	Fire damper opening runtime error #53
465	Fire damper closing runtime error #53
466	Fire damper triggered #54
467	Fire damper end position switch error #54
468	Fire damper opening runtime error #54
469	Fire damper closing runtime error #54
470	Fire damper triggered #55
471	Fire damper end position switch error #55
472	Fire damper opening runtime error #55
473	Fire damper closing runtime error #55
474	Fire damper triggered #56
475	Fire damper end position switch error #56
476	Fire damper opening runtime error #56
477	Fire damper closing runtime error #56
478	Fire damper triggered #57
479	Fire damper end position switch error #57
480	Fire damper opening runtime error #57
481	Fire damper closing runtime error #57
482	Fire damper triggered #58
483	Fire damper end position switch error #58
484	Fire damper opening runtime error #58
485	Fire damper closing runtime error #58
486	Fire damper triggered #59
487	Fire damper end position switch error #59
488	Fire damper opening runtime error #59
489	Fire damper closing runtime error #59
490	Fire damper triggered #60
491	Fire damper end position switch error #60
492	Fire damper opening runtime error #60
493	Fire damper closing runtime error #60
494	Fire damper triggered #61
495	Fire damper end position switch error #61

ID	Error text
496	Fire damper opening runtime error #61
497	Fire damper closing runtime error #61
498	Fire damper triggered #62
499	Fire damper end position switch error #62
500	Fire damper opening runtime error #62
501	Fire damper closing runtime error #62
502	Netcom - module error #1
503	Netcom - module error #2
504	Netcom - module error #3
505	Netcom - module error #4
506	Netcom - module error #5
507	Netcom - module error #6
508	Netcom - module error #7
509	Netcom - module error #8
510	Netcom - module error #9
511	Netcom - module error #10
512	Netcom - module error #11
513	Netcom - module error #12
514	Netcom - module error #13
515	Netcom - module error #14
516	Netcom - module error #15
517	Netcom - module error #16
518	Netcom - module error #17
519	Netcom - module error #18
520	Netcom - module error #19
521	Netcom - module error #20
522	Netcom - module error #21
523	Netcom - module error #22
524	Netcom - module error #23
525	Netcom - module error #24
526	Netcom - module error #25
527	Netcom - module error #26
528	Netcom - module error #27
529	Netcom - module error #28
530	Netcom - module error #29
531	Netcom - module error #30
532	Netcom - module error #31
533	Netcom - module error #32
534	Netcom - module error #33

ID	Error text
535	Netcom - module error #34
536	Netcom - module error #35
537	Netcom - module error #36
538	Netcom - module error #37
539	Netcom - module error #38
540	Netcom - module error #39
541	Netcom - module error #40
542	Netcom - module error #41
543	Netcom - module error #42
544	Netcom - module error #43
545	Netcom - module error #44
546	Netcom - module error #45
547	Netcom - module error #46
548	Netcom - module error #47
549	Netcom - module error #48
550	Netcom - module error #49
551	Netcom - module error #50
552	Netcom - module error #51
553	Netcom - module error #52
554	Netcom - module error #53
555	Netcom - module error #54
556	Netcom - module error #55
557	Netcom - module error #56
558	Netcom - module error #57
559	Netcom - module error #58
560	Netcom - module error #59
561	Netcom - module error #60
562	Netcom - module error #61
563	Netcom - module error #62
564	Run around coil pump error
565	Motor protection humidifier
566	Error external heat pump #1
567	Blocking protection preheater valve
568	Blocking protection reheater valve
569	Blocking protection cooling valve
570	Blocking protection run around coil valve
571	Hygrostat triggered
572	Humidifier maintenance required
573	Smoke detector triggered #1

ID	Error text
574	Smoke detector triggered #2
575	Smoke detector triggered #3
576	Smoke detector triggered #4
577	Smoke detector triggered #5
578	Smoke detector dirty #1
579	Smoke detector dirty #2
580	Smoke detector dirty #3
581	Smoke detector dirty #4
582	Smoke detector dirty #5
583	Error external heat pump #2
584	Run around coil pump error
585	Check run around coil brine pressure
586	Critical run around coil brine pressure
587	Temperature before feeding is too low
588	Low brine volume flow
589	Freezing of extract air coil
590	Frost feed coil
591	Recovery temporarily not possible
592	No feed power
593	No power demand, RAC pump deactivated
594	One of the RAC pumps is faulty
595	Cooling feed pump fault
596	Heating feed pump fault
597	Integrated cooling: high refrigerant pressure
598	Integrated cooling: low refrigerant pressure
599	Integrated cooling: critical refrigerant temperature
600	Integrated cooling: out of operating envelop
601	Integrated cooling: error oil management compressor #1
602	Integrated cooling: error super heating controller
603	Integrated cooling: power limitation activ
604	Integrated cooling: general compressor error
605	Integrated cooling: crank case heater
606	Supply filter service message #2
607	Extract filter service message #2
608	Outdoor filter service message #2
609	Error external heat pump #3
610	Error external heat pump #4
611	Supply air fan not able to perform minimal setpoint
612	Extract air fan not able to perform minimal setpoint

ID	Error text
613	Outdoor air damper blocked #1
614	Outdoor air damper blocked #2
615	Supply fan damper blocked #1
616	Supply fan damper blocked #2
617	Supply air damper blocked #1
618	Supply air damper blocked #2
619	Extract air damper blocked #1
620	Extract air damper blocked #2
621	Extract fan damper blocked #1
622	Extract fan damper blocked #2
623	Exhaust air damper blocked #1
624	Exhaust air damper blocked #2
625	Temperature warning electrical preheater
626	Integrated cooling: error oil management compressor #2
627	Integrated cooling: critical refrigerant temperature, compressor #2
628	Integrated cooling: warning high refrigerant temperature, compressor #1
629	Integrated cooling: warning high refrigerant temperature, compressor #2
630	No connection to X-AIRCONTROL master
631	Modbus error – sensor room temperature #6
632	Modbus error – sensor room temperature #7
633	Modbus error – sensor room temperature #8
634	Adiabatic cooling currently not possible
635	Not enough heating feed power
636	Not enough cooling feed power
637	Error Mitsubishi heat pump #1
638	Error Mitsubishi heat pump #2
639	Error Mitsubishi heat pump #3
640	Error Mitsubishi heat pump #4
641	Error Mitsubishi heat pump #5
642	Error Mitsubishi heat pump #6
643	Overvoltage

9 Change history

The table shows all changes made to this document.

Version no.	Date	Author	Comment / change
1	2022-04-26	Cs	Update, saved to CMS/authoring system
0	2020-10-26	As	Internal document

10 Configuration checklist

Building:	Floor:	Unit:
Commissioning: ☐		Date: __ . __ . 20__

Job	See operating manual	Done Yes	No
X-CUBE Controller IP address set		☐	☐
Visualisation IP address set		☐	☐
Own IP address set		☐	☐
Access via other terminal device set up			
Users and passwords created			
User 1: **Password:**			
User 2: **Password:**			
User 3: **Password:**			
User 4: **Password:**			
User 5: **Password:**			

Signature: (Technician)	
Company: (Stamp)	

11 Index

Air handling units X-CUBE CONTROL 2

TROX TECHNIK

The art of handling air