FLOWAIR
intelligent air flow

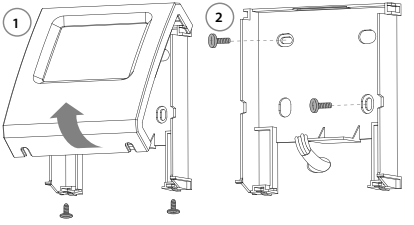
T-box Zone

user manual

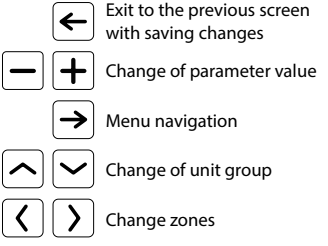
TABLE OF CONTENTS

INSTALLATION

T-box Zone controller has a built-in sensor for measuring air temperature in the room. To ensure proper measurements, the controller should be installed at a height of approx. 1.5 m above the ground in a place with good air circulation. Do not place it near heat sources, lighting, air inlets, windows and door openings, etc. If temperature sensor was chosen in a T-Box menu as „installed in unit", T-box Zone controller can be mounted out of area i.e. technical room.



NAVIGATION

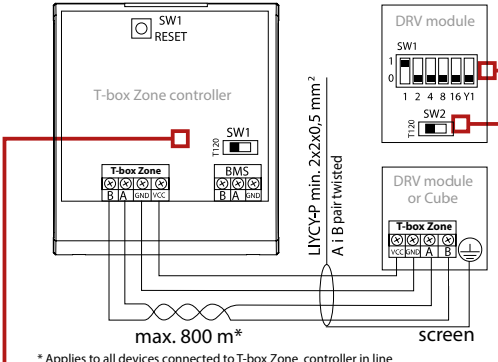


TECHNICAL DATA

Name	Description
Power supply	24 VDC
Way of control	touch screen
Temperature adjustment range	+5 ÷ +45°C
Operating temperature range	0 ÷ +60°C
Temperature sensor	built-in
Protection degree	IP20
Installation	on the wall
Casing	plastic ABS, RAL 7024
Max. number of connected units/ zones	31/31
Dimensions (HxWxD)	130 x 115 x 35 mm

T-box Zone controller connection to DRV module or Cube

DRV module addressing**

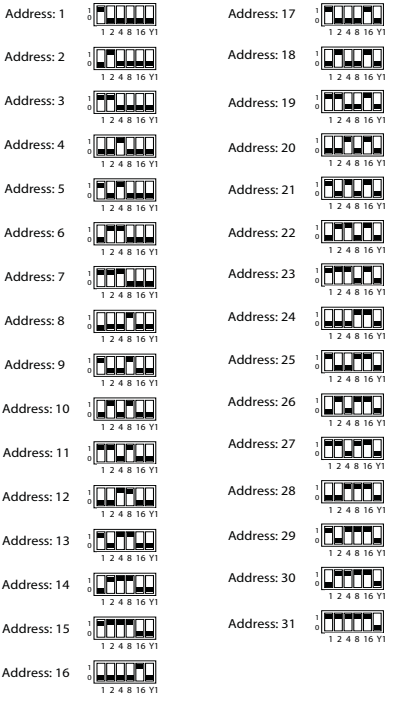


* Applies to all devices connected to T-box Zone controller in line

** In case of Cube devices addressing is beeing done by service during first startup

In the case, when T-box in BMS network is the last device, SW1 switch should be set in T120 position.

DRV - SW1 ADDRESS SETTING



DRV - SW2 ADDRESS SETTING

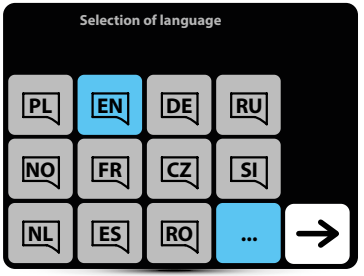
Last DRV in line: SW2 T120

Others DRV in line SW2 T120

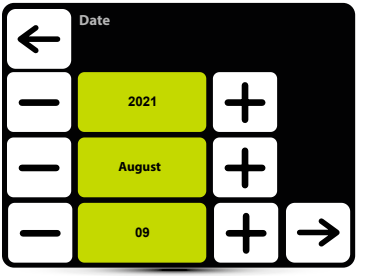
Cube address - set during the first start up

Luna address - check the device documentation

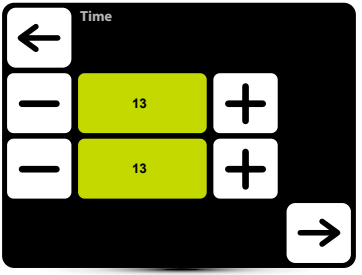
FIRST RUN



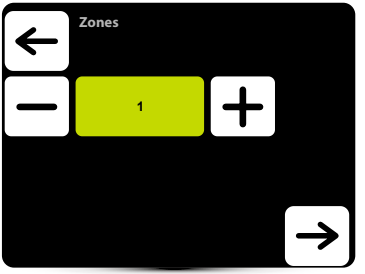
Selection of language



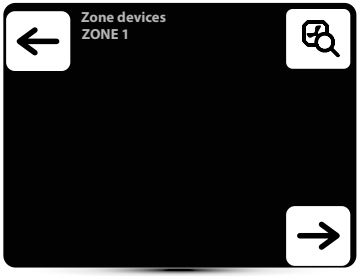
Setting of date



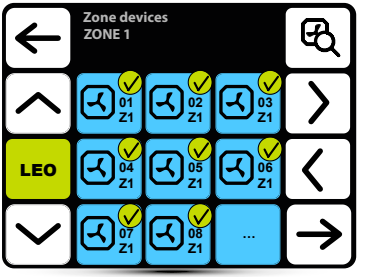
Setting of time



Setting the number of zones
A maximum of 31 zones can be set

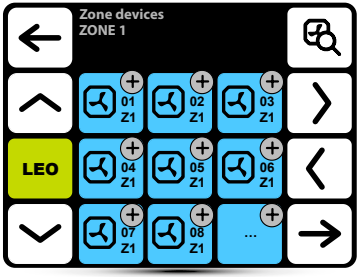


Searching for connected devices



LEO	Water heater	ROBUR KM	Gas heater with mixing chamber
LEO M	Water heater	DUO	Air curtain- fan heater combo unit
ROBUR	Gas heater	ELiS	Air curtain
LEO EL	Electric heater	Slim	Air curtain
LEO COOL	Fan cooler/heater	OXeN	Ventilation unit
LEO D	Destratificator	Cube	Rooftop
KM	Water heater with mixing chamber	AX	Air curtain
LUNA	Heating and cooling device		

Check that all devices have been found. If not, check:
- correctness of connection of the A-A, B-B communication signal,
- power connection of the device,
- if address have been set correctly; each device must have a different address set, (in Cube devices the address is set by the service during the first start-up)
- if the SW2 dipswitch on the last device in line is set to T120 position (in Cube devices, the dipswitch is set by the service during the first start-up).



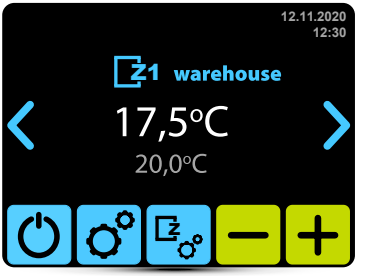
LEO

Navigation between groups of devices

Navigation between zones

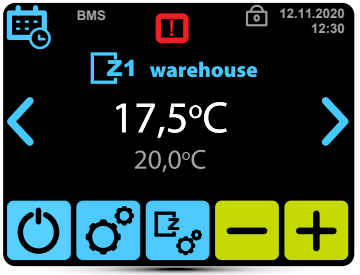
By default, all devices are assigned to Zone 1. Go to the next zone to assign devices to it.

Press to assign the device to the zone



Remote temperature setting

MAIN SCREEN



Change of zones

Long press on/off of the controller
Short press on/off curent zone

Long press controller menu
Short press device menu for the zone

Short press zones menu

Setting of desired temperature

Weekly programer active

Settings lock active

BMS mode active

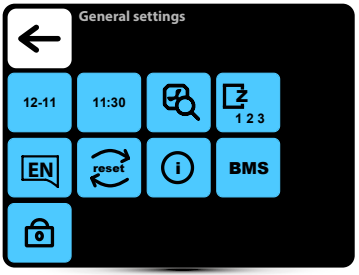
17,5°C Measured temperature

20,0°C Set temperature

Alarms

Z1 warehouse Zone names Z1

long press MAIN MENU



Enter to the menu after entering the password: 2014

12-11 Date setting

11:30 Time setting

Searching for units

1 2 3 Number of zones

EN Language selection

External potential-free contact function settings

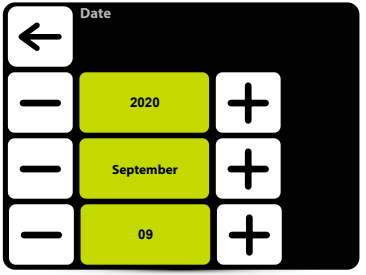
reset Restore factory settings

Information about controller

Controller lock

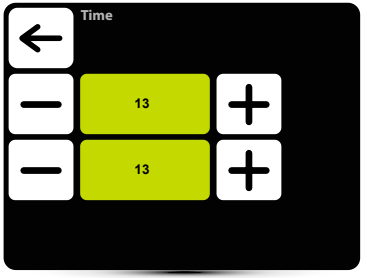
BMS BMS settings

04-01 Date



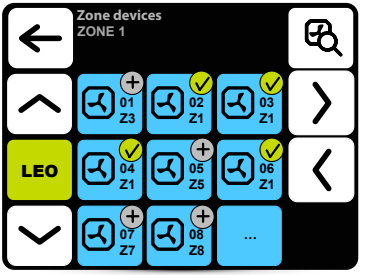
Setting of date

16:05 Time



Setting of time

Integrated units



Searching for units integrated with system

LEO Navigation between groups of devices

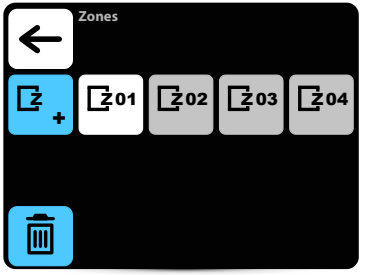
Navigation between zones

02 Z1 Device assigned to a given zone

01 Z3 Device assigned to another zone
Press the button to assign to a given zone

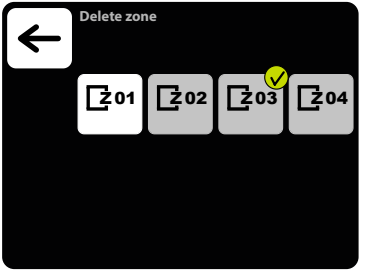
01 Z3 Long press displays information about the DRV software version of the device

Zones



- Additional zones - max 31 zones
- Delete zones
- Zone with devices assigned
- Zone without devices assigned

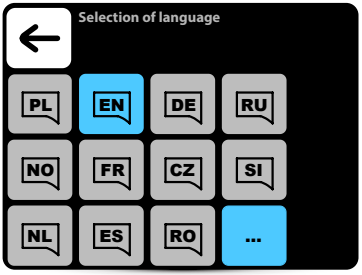
Delete zones



- Zone with devices assigned
- Zone without devices assigned
- Zone marked for deletion

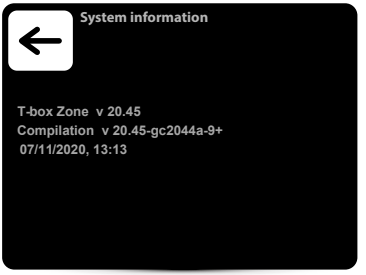
NOTE: Only zones without assigned devices can be deleted.

Language



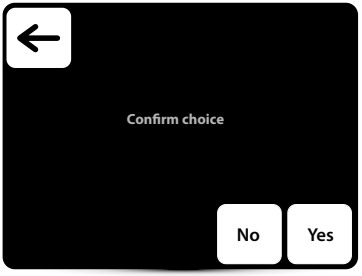
Active language

System information



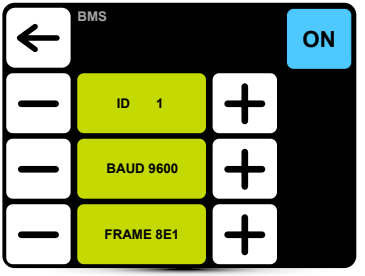
Basic information about software and hardware version

Reset



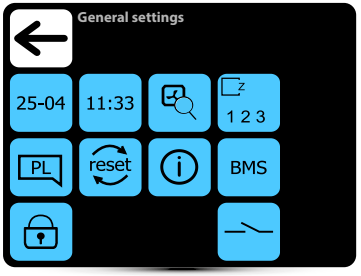
Restore default settings

BMS



ID – setting unit adress: from 1 to 247
BAUD – setting data transmission speed: from 9600 to 230400 bit/s
FRAME: setting the data format 8N1, 8N2, 8O1, 8O2, 8E1, 8E2
Protocol: Modbus RTU
Physical layer: RS485

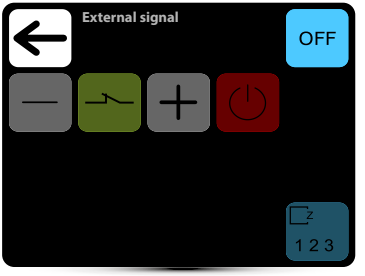
Potential-free contact



To enter the menu, enter the password: 2014

- Date setting
- Time setting
- Searching for units
- Number of zones
- Language selection
- External potential-free contact function settings
- Restore factory settings
- Information about controller
- Controller lock
- BMS settings

External signal

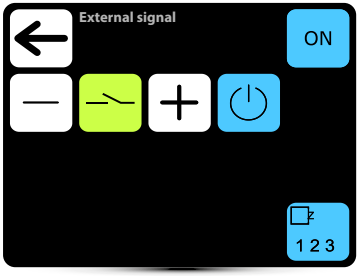


Deactivation of the external signal function. To activate the operation of the external NO or NC contact:

1. Press 'OFF' to activate the contact (it will turn to „ON")
2. Set the − + type of contact connected to the T box controller.
3. Use the [Power] button to select the operating logic
4. Select the zone that performs the function

NOTE:
When switched off, the devices will first execute their purging and calibration algorithms. When switched on, the devices will only start to operate once the conditions for normal operation have been met (e.g. Set Temp > Ambient Temp).

External signal



OFF — The external contact function is inactive, when pressed it will change to ON and the function will be active.

ON — The external contact function is active, when pressed it will change to OFF and the function will be inactive.

NC - normally closed contact - shorting the contact with potential-free signal activates the selected function (zone on or off)

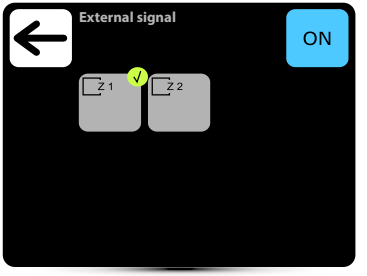
NO - normally open contact - opening the contact with a potential-free signal activates the selected function (zone on or off)

Forcing zone activation

Forcing zone deactivation

1 2 3 — Selection of zone for external contact function

Zone selection



To activate the zones performing the external contact function:

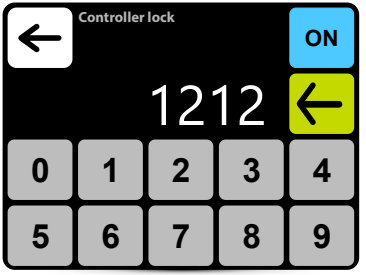
1. press „OFF" to activate the selection of zones (it will turn to „ON")
2. Mark the zones you wish to operate based on an external signal.

one does not perform the external contact

active zone

grey icon - zone selection inactive

Controller lock



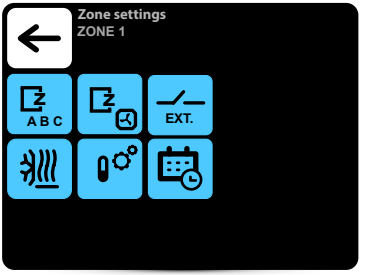
To activate the lock:

1. Set ON
2. Set password
3. Confirm the selection

Free 4-digit password can be set.

After returning to main screen and 30 s of inactivity, controller will be locked automatically

short press ZONES MENU

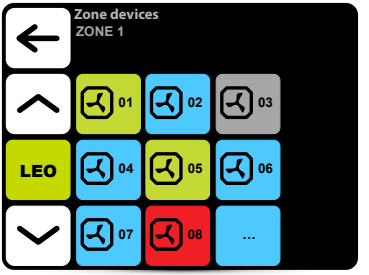


- Zones - change name
- Zones - assigning devices
- Work schedule of devices in a given zone
- Antifreeze function in a given zone
- Leading sensor in a given zone
- Settings for external potential-free input

Change name

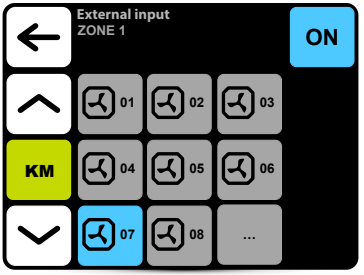
Zone rename

Zone devices



- Device activated - working
- Device activated - not working
- Device activated - failure
- Device deactivated - not working

Setting the external input



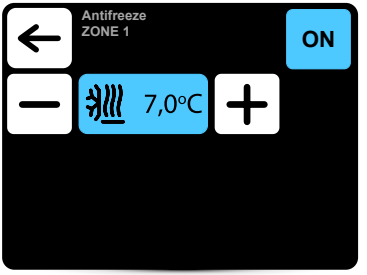
The SYSTEM enables the connection of an external 2-stage potential-free signal. The OXeN and KM airflow setting and the KM damper opening degree will be automatically changed depending on which input the external signal is applied to.

The signal must be connected to either DRV KM or DRV OXeN control module. In the menu, indicate to which DRV the signal has been connected to.

In the given example, the signal was connected to DRV KM No. 7.

ATTENTION: The settings apply only to a given zone. Each zone should be set separately.

Antifreeze



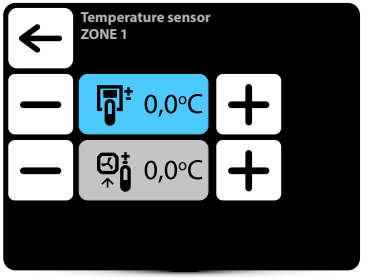
Automatic protection against too low temperature in the room. When temperature in the room drops below desired temperature, LEO and KM units are turned on:

- valves (if installed) opens,
- fan is turned on at 100% of airflow,
- KM dampers are closed, unit operates using recirculating air.

Units operate until the temperature in the room is higher of 1°C than antifreeze temperature, protecting the hall against too low temperature inside and freeze of heating medium in the exchanger.

ATTENTION: The settings apply only to a given zone. Each zone should be set separately

Leading sensor



Active temperature sensor

Leading sensor is the sensor built in T-box controller

Leading sensor is the local sensor. When it is selected, operation of each unit is regulated locally

The correction of sensor measurements is also possible.

ATTENTION: The settings apply only to a given zone. Each zone should be set separately

Weekly programer

- For each day you can set up to 18 on/off events,
- Start time of new event is also the end time of previous event,
- For each event you can set any temperature for units, in the range of 5 – 45°C,
- For each event you can set for KM and Cube an airflow and dampers opening degree, for OXeN an airflow,
- Events for each day can be set individually or they can be copied from day, which was already set.

Activation of weekly programer is signalized on main screen via following icons:

Weekly programer active – SYSTEM ON

Weekly programer active – SYSTEM OFF

Weekly programer active – settings forced. There were ad hoc set other parameters than the settings programmed in the weekly programer:

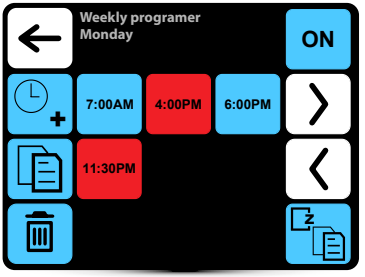
- desired temperature,
- airflow for OXeN,
- the airflow or degree of opening of the KM and Cube dampers
- system were OFF and was turned on (to turn on the system press and hold for 2 s the calendar icon on main screen),
- system were ON and was turned off (to turn off the system press and hold for 2 s the calendar icon on main screen).

The ad hoc settings only apply to a given zone and will be reset on transition

weekly programer for the next zone.

ATTENTION: The settings apply only to a given zone. Each zone should be set separately

Weekly programer



ON Activation/deactivation of Weekly programer

Adding the event

Copying events on the following days

Removing the events

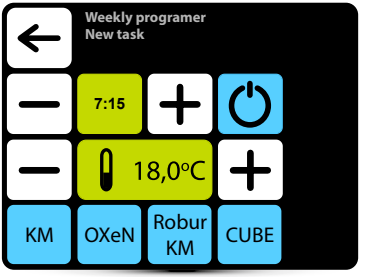
Copying events on the another zones

7.00 Event – system On

9.00 Event – system Off

Moving to the next day

Weekly programer – Adding the ON event



In given example SYSTEM will be turned on at 7:15 and the units will maintain temp. 18°C.
SYSTEM WILL OPERATE USING CURRENT SETTINGS UNTIL NEW EVENT WILL BE SET.

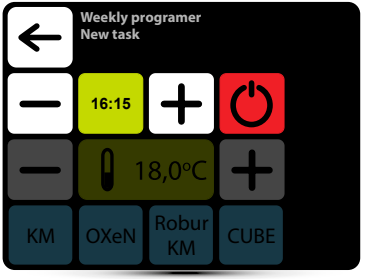
KM - additional KM group settings

OXeN - additional OXeN group settings

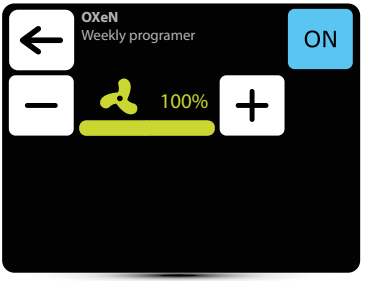
Robur KM - additional ROBUR with mixing chamber group settings

Cube - additional Cube group settings

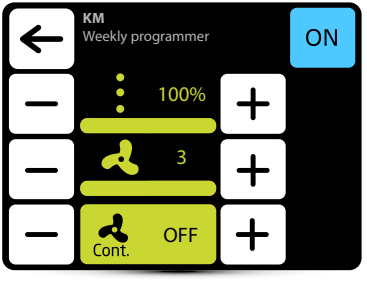
Weekly programer – Adding the OFF event



In given example units will be turned off at 16:15. SYSTEM WILL BE TURNED OFF UNTIL THE NEXT EVENT, ACCORDING TO WEEKLY PROGRAMER SETTINGS.

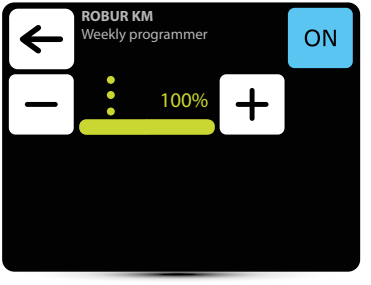


For OXeN it is possible to set the airflow with which the device will work in a given zone.

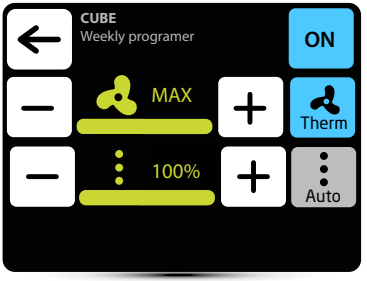


For KM it is possible to set the airflow and the degree of damper opening with which the device will work in a given zone.

Cont. When the dampers are closed (no ventilation), it is possible to select the operating mode of the fan after reaching desired temperature. Fan can operate continuously or be turned off.



For the Robur group with mixing chamber it is possible to set the degree of opening of the dampers with which the device will work in a given zone.



For Cube, it is possible to set the airflow and the degree of damper opening with which the device will work in a given zone.

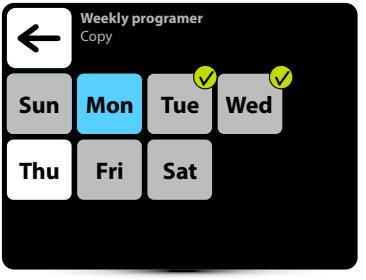
Therm

When the therm mode is activated, the Cube fans will work in thermostatic mode - they will turn off after reaching the preset temperature in the room

Auto

When Auto mode is activated, the Cube's dampers will be adjusted automatically until the set temperature is economically reached.

Weekly programer - Copying events



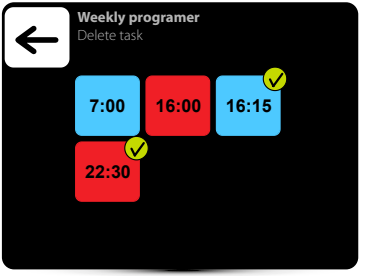
Mon — The day from which the events will be copied

Tue — A day marked to copy the settings from Mon.

Thu — The day it is already programmed work schedule, you can also copy the settings from Mon.

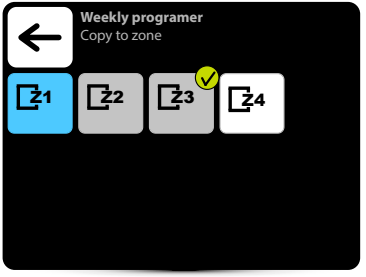
Sat — A day on which no work schedule has yet been programmed

Weekly programer - Delete task



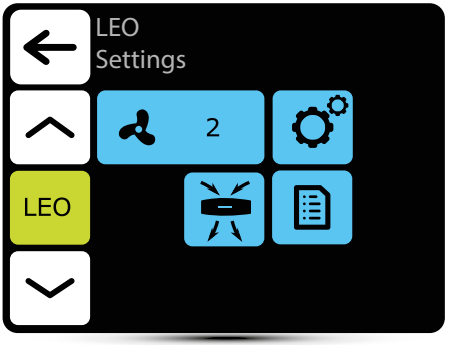
16:15 22:30 Events marked for deletion

Weekly programer - Copy to zone



- The zone from which the work schedule will be copied
- Selected zones to which the work schedule from zone Z1 will be copied
- A zone in which a work schedule is already programmed, you can also copy the settings from zone Z1 to it
- A zone in which no work schedule has been programmed yet

short press LEO-TYPE FAN HEATERS



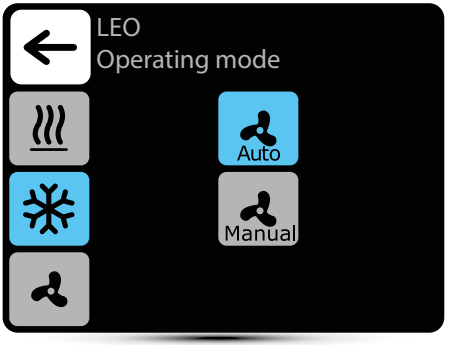
2 Airflow setting – 3-steps

Selection of operating mode

Destratification

Readings

Operating modes



Active operating mode

Heating – heating medium valve is opened when measured temperature is lower than desired temperature

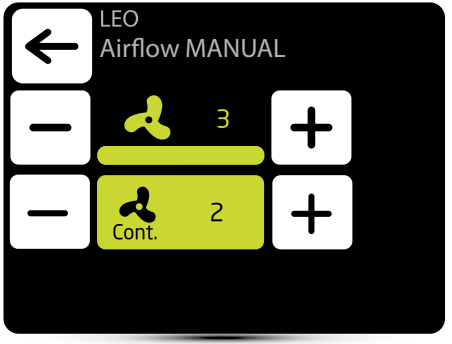
Cooling – cooling medium valve is opened when measured temperature is higher than desired temperature

Ventilation – valve is constantly closed, fan operates continuously at selected speed

Auto – automatic fan regulation depending on desired and measured temperature

Manual – fan operates with constant, selected speed

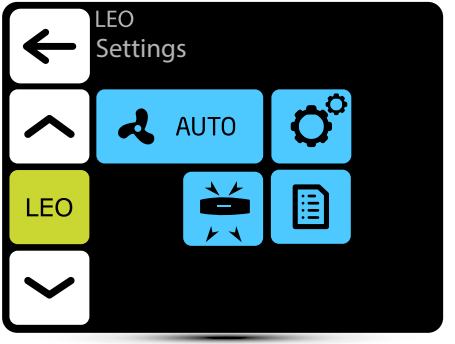
Airflow setting



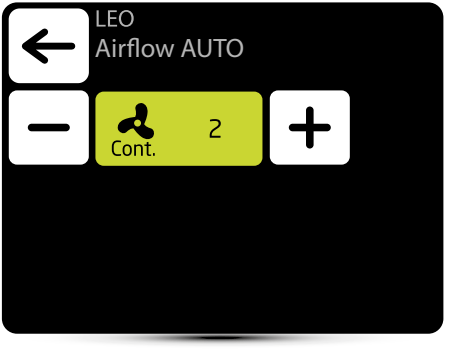
Airflow setting during operation in manual mode

Cont.

In MANUAL mode after reaching desired temperature fan can operate continously on selected step: 1, 2, 3 or be turned off - select OFF.



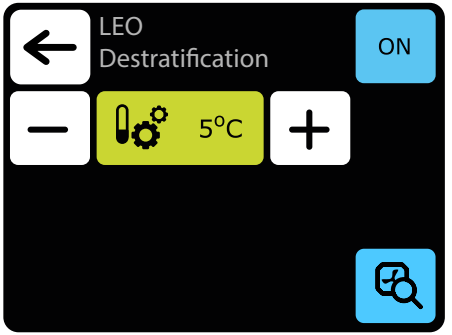
Automatic airflow regulation according to desired and measured temperature, manual airflow regulation is not possible - inactive menu.



Cont.

In AUTO mode after reaching desired temperature fan can operate continously on selected step: 1, 2, 3 or be turned off - select OFF.

Destratification



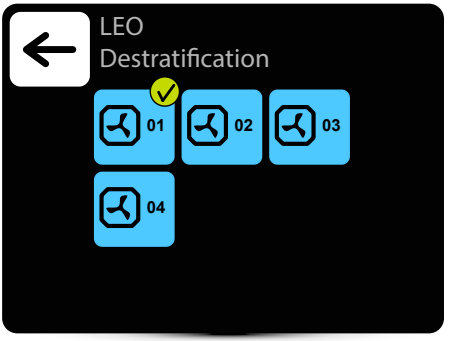
LEO heaters can optionally operate in destratification mode (only heaters installed under the ceiling). When the measured temperature drops to the set temperature only fan starts. When the heat under the ceiling is not enough, and the temperature continues to decline (-1°C from the setpoint) valve will open.

The heater must be equipped with T3 sensor (optional equipment).

ON — Activation of destratification mode

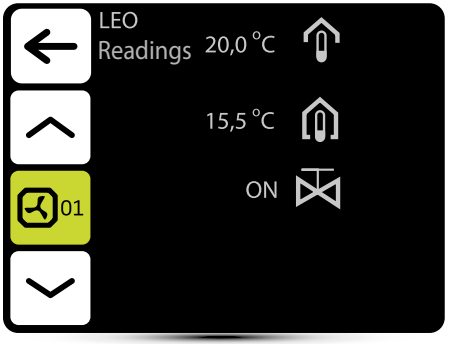
5°C — Setting of temperature difference (difference between temperature under the ceiling and temperature in the occupied zone), at which LEO heaters will be turned on

LEO — Selection of heaters, which should operate in destratification mode



Heater activated for operation in destratification mode

Readings



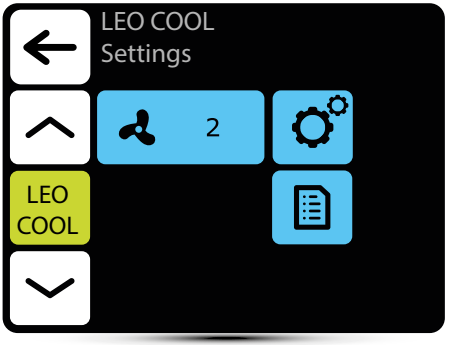
Temperature under the ceiling

Temperature in the room

ON/OFF valve

To read temperatures near the unit, external temperature sensors PT-1000 must be connected to DRV control module.

short press LEO COOL FAN COOLER / HEATER

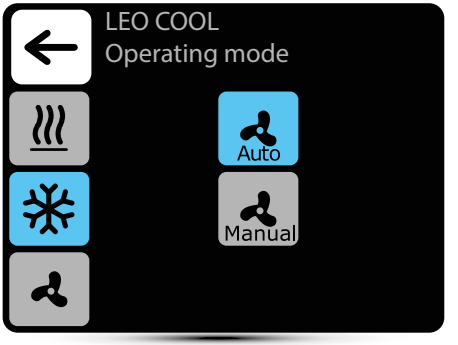


2 Airflow setting – 3-steps

Selection of operating mode

Readings

Tryby pracy



Active operating mode

Heating – heating medium valve is opened when measured temperature is lower than desired temperature

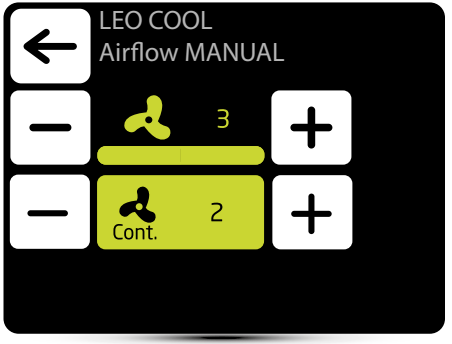
Cooling – cooling medium valve is opened when measured temperature is higher than desired temperature

Ventilation – valve is constantly closed, fan operates continuously at selected speed

Auto – automatic fan regulation depending on desired and measured temperature

Manual – fan operates with constant, selected speed

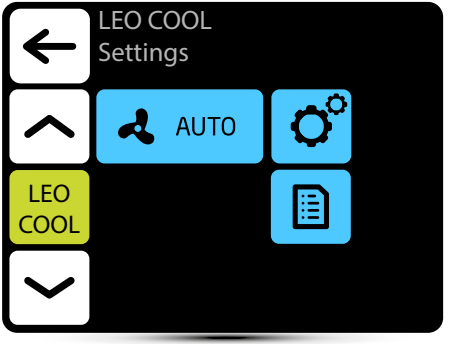
Airflow setting



Airflow setting during operation in MANUAL mode

Cont.

In MANUAL mode after reaching desired temperature fan can operate continously on selected step: 1, 2, 3 or be turned off - select OFF.

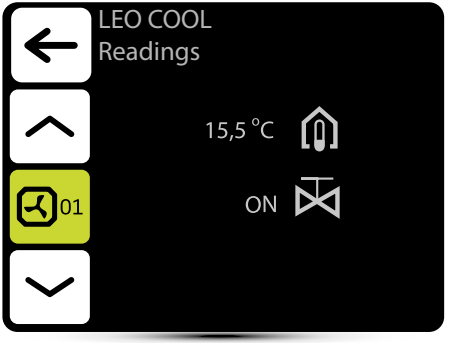


Automatic airflow regulation according to desired and measured temperature, manual airflow regulation is not possible - inactive menu.

Cont.

In AUTO mode after reaching desired temperature fan can operate continously on selected step: 1, 2, 3 or be turned off - select OFF.

Readings



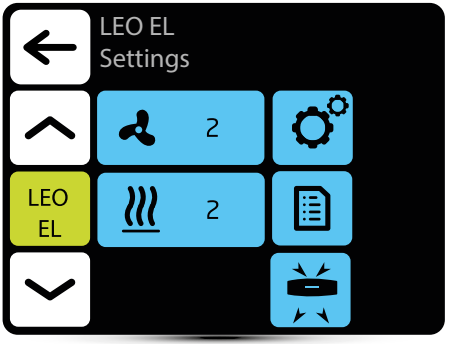
Temperature in the room

ON/OFF valve

To read temperatures near the unit, external temperature sensors PT-1000 must be connected to DRV control module.

short press

ELECTRIC HEATERS LEO EL



2 Airflow setting – 3-steps

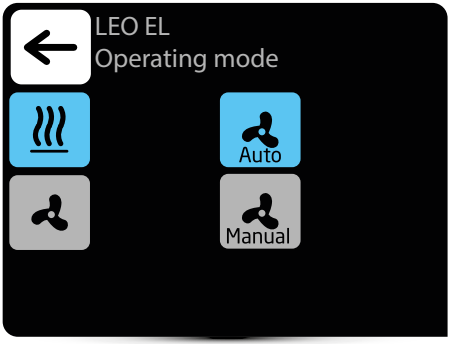
2 Heating power setting

Selection of operating mode

Destratification

Readings

Operating mode



Active operating mode

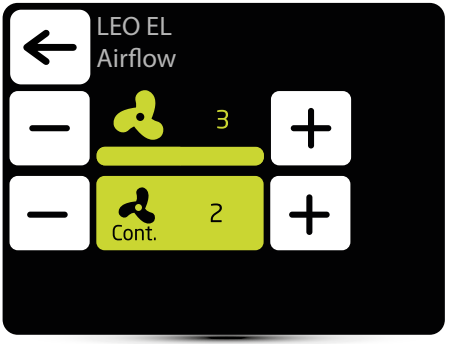
Heating

Auto Automatic fan and heaters power regulation depending on desired and measured temperature

Manual Manual regulation of airflow and heaters power

Ventilation – heaters are off, fan operates at selected speed continuously

Airflow

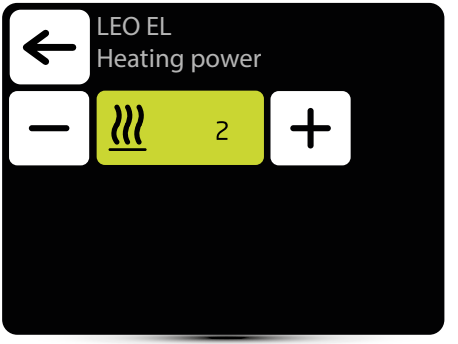


Airflow setting during operation in manual mode

Cont.

In MANUAL mode after reaching desired temperature fan can operate continously on selected step: 1, 2, 3 or be turned off - select OFF.

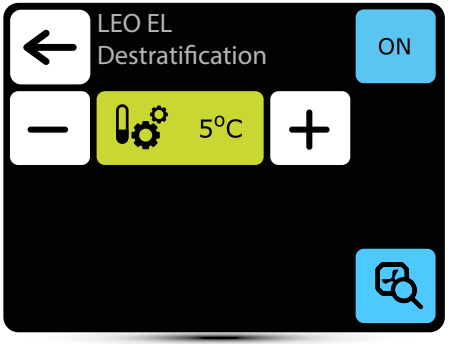
Heating power



EL L Heating power setting - 3 steps

EL S Heating power setting - 2 steps

Destratification



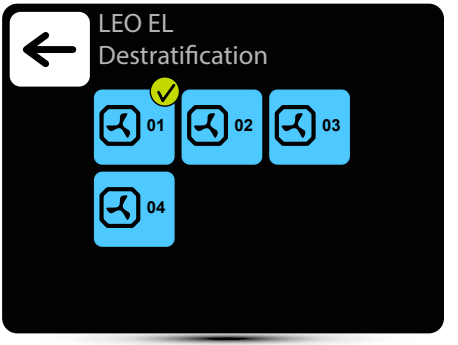
LEO heaters can optionally operate in destratification mode (only heaters installed under the ceiling). When the measured temperature drops to the set temperature only fan starts. When the heat under the ceiling is note nough, and the temperature continues to decline (-1°C from the setpoint) heaters are ON.

The heater must be equipped with T3 sensor (optiona-lequipment).

ON — Activation of destratification mode

5°C — Setting of temperature difference (difference between temperature under the ceiling and temperature in the occupied zone), at which LEO heaters will be turned on

LEO EL — Selection of heaters, which should operate in destratification mode



02 — Heater activated for operation in destratification mode

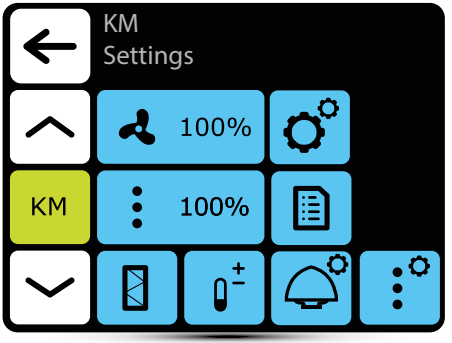
Readings

Temperature under the ceiling

Temperature in the room

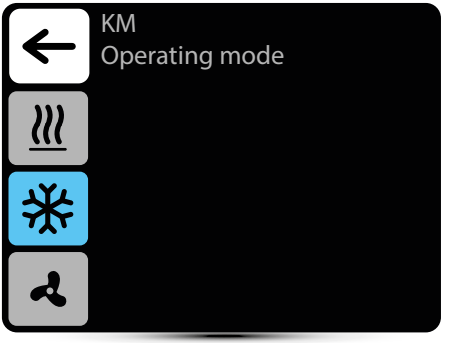
To read temperatures near the unit, external temperature sensors PT-1000 must be connected to DRV control module.

short press KM MIXING CHAMBERS



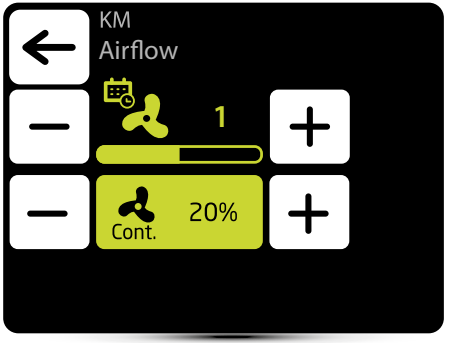
- 100% — Airflow setting – depending on LEO model Stepless or 3-steps
- Operating modes
- 100% — Dampers setting - stepless, 100% means a maximum opening level of fresh air dampers
- Readings
- Filters operating status
- Selection of leading sensor
- Roof fan setting
- Dampers setting according to external temperature

Operating modes



- Active operating mode
- **Heating** – valve is opened when measured temperature is lower than desired temperature
- **Cooling** – valve is opened when measured temperature is higher than desired temperature
- **Ventilation** – valve is constantly closed, fan operates continuously at selected step

Airflow setting



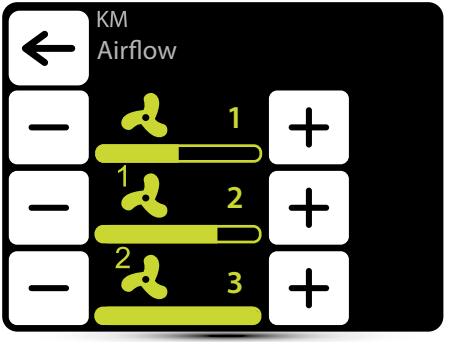
Airflow setting – 3-steps

Appearance of this icon informs that the airflow setting has been defined in the weekly programer. It is possible to change it ad hoc only. Change will only be active in given weekly programer zone.

Cont.

When the dampers are closed (no ventilation), it is possible to select the operating mode of the fan after reaching desired temperature. Fan can operate continuously or be turned off.

Airflow setting relative to external potential-free input

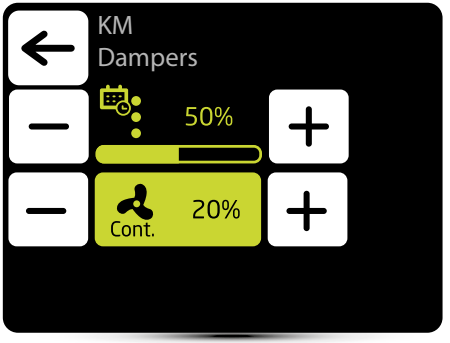


Operation in relation to an external potential-free input – see point "EXTERNAL INPUT SETTING" p. 13.

Three values of airflow should be definied:

- normal operation status
- 1 - first level of control
- 2 - second level of control

Dampers setting

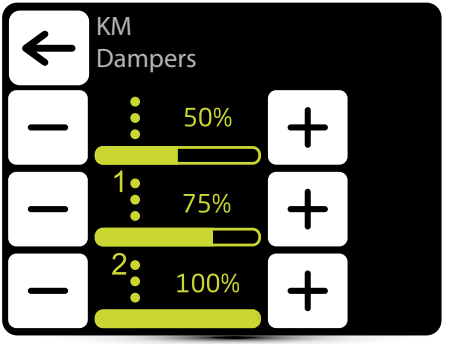


Appearance of this icon informs that the airflow setting has been defined in the weekly programer. It is possible to change it ad hoc only. Change will only be active in given weekly programer event.

Cont.

When the dampers are closed (no ventilation), it is possible to select the operating mode of the fan after reaching desired temperature. Fan can operate continuously or be turned off.

Dampers setting relative to external potential-free input

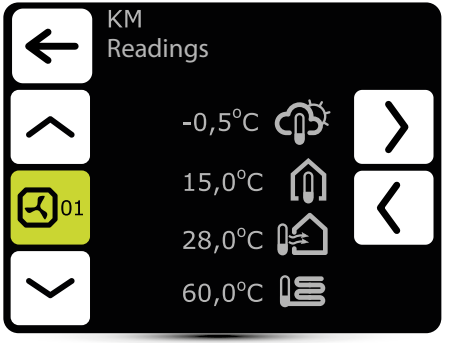


Operation with an external potential-free input should be activated – see point "EXTERNAL INPUT SETTING" p. 13.

Three values of air flow should be defined (100% means a maximum opening level of fresh air dampers):

- normal operation status
- 1 - first level of control
- 2 - second level of control

Readings

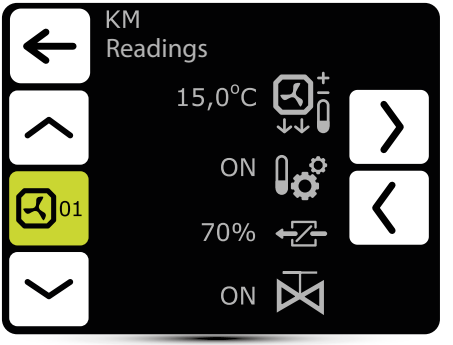


External temperature

Temperature in the room

Temperature of air supplied into the room

Temperature of heating medium on return pipe



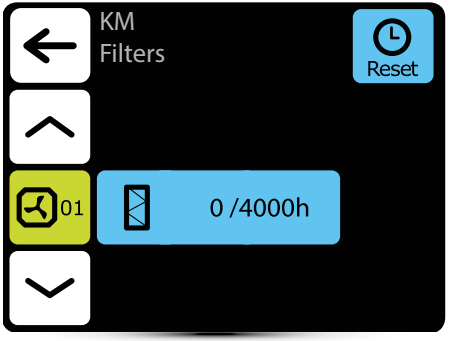
Desired temperature of supply air

ON – automatic setting of dampers according to external temperature is active – see p. 37

Dampers opening degree

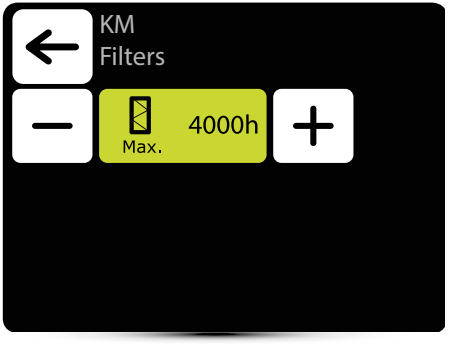
ON/OFF valve

Filters operating time counter



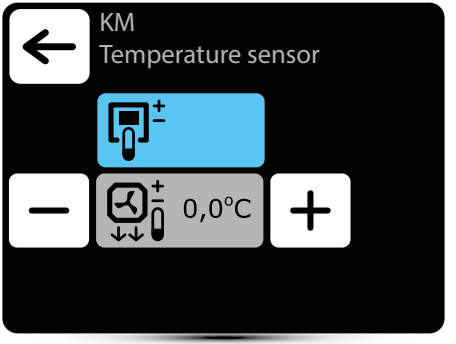
After reaching the limit of working hours, there will be displayed an indication in alarm menu. Value must be reset. Alarm does not affect the operation of the unit.

Filters operating time limit



The value should be set depending on the degree of dirtiness/ contamination of the facility.

Temperature sensor



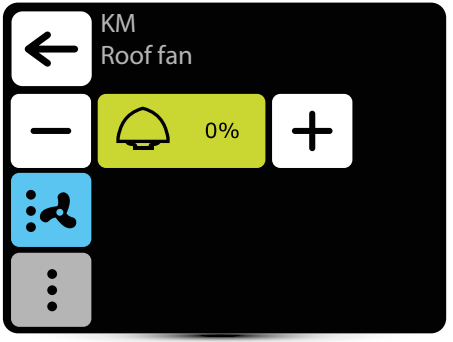
Active temperature sensor

Leading sensor is the ambient air temperature sensor (built in T-box or local, near the unit). When temperature in the room is not reached, SRX3d valve is open in 100%. When temperature in the room is reached, flow of heating medium is regulated in such way, that the supply air temperature is equal to set temperature.

Leading sensor is the supply air temperature sensor. Controller will maintain supply air temperature set on the main screen, thanks to regulation of the flow of heating medium by SRX3d valve opening degree.

Correction of air temperature set on main screen

Roof fan setting



Active setting

Roof fan change airflow according to present dampers opening level and airflow of LEO heater

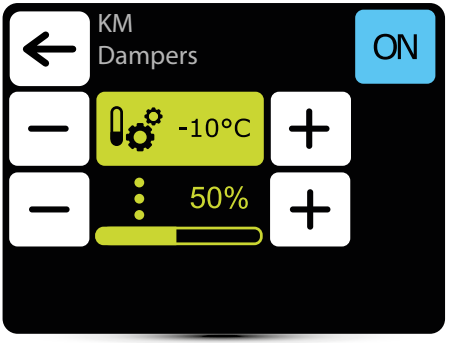
Roof fan change airflow according to present dampers opening level

Setting „0%" means balance between air removed by roof fan and supplied by KM heater.

Positive value means that the roof fan removes more air than the KM supplies (under-pressure). Setting „+100%" means continuous operation of the roof fan.

Negative value means that the roof fan removes less air than the KM supplies (overpressure). Setting „-100%" means operation of the KM only.

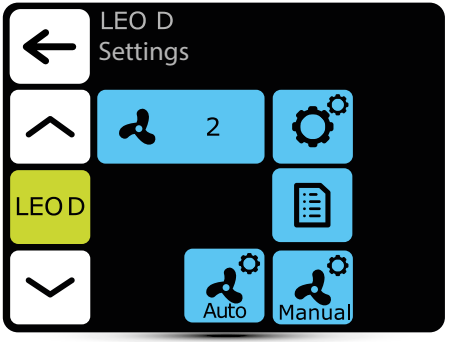
Dampers setting according to external temperature



Automatic setting of dampers opening level according to external air temperature (100% means a maximum opening level of fresh air dampers).

Value set here is overriding normal damper setting and setting in weekly programer.

short press LEO D DESTRATIFICATORS



2 Airflow setting – 3-steps

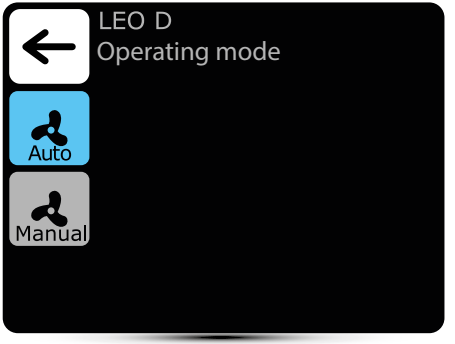
Selection of operating mode

Readings

Manual Settings of manual operating mode

Auto Settings of auto operating mode

Operating modes

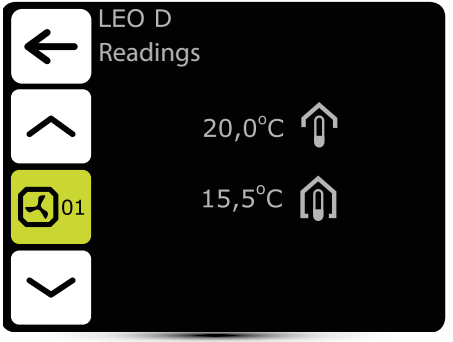


Active operating mode

Auto **Auto** – integration of operation of destratificators with LEO heaters and effective use of heat from upper zones of the room. Destratificators are turned on automatically, when there is suitable amount of heat accumulated in the upper zones of the room. Units press of warm air down to occupied zone. When amount of heat is insufficient, LEO heaters are turned on automatically.

Manual **Manual** – destratificator operates in ON/OFF mode. It is turned on when temperature under the ceiling is higher than set temperature.

Readings

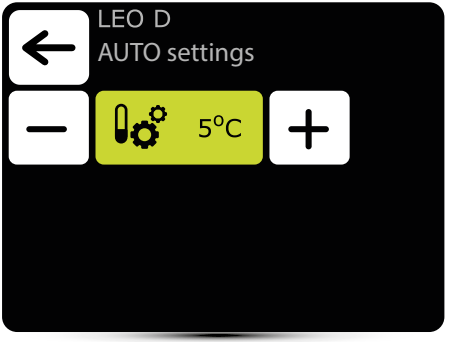


Temperature under the ceiling

Temperature in the room

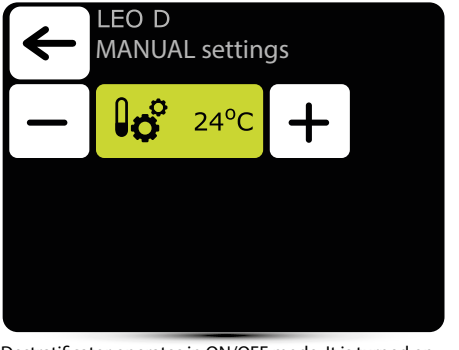
To read temperatures near the unit, external temperature sensors PT-1000 must be connected to DRV control module.

Settings of auto operating mode



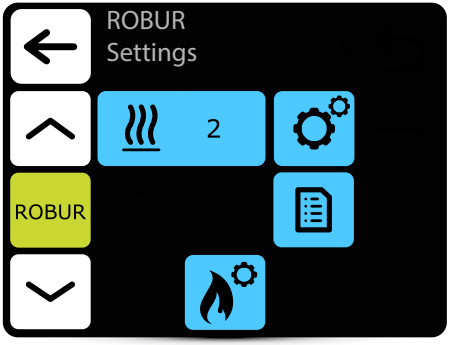
Setting of temperature difference (difference between temperature under the ceiling and temperature in the occupied zone), at which LEO D units will be turned on.

Settings of manual operating mode



Destratificator operates in ON/OFF mode. It is turned on when temperature under the ceiling is higher than set temperature.

short press ROBUR GAS HEATERS



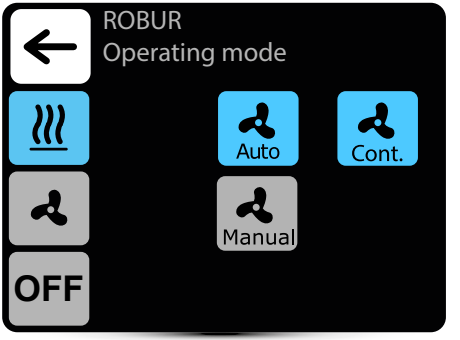
2 Burner power settings

Operating modes

Readings

Thermal protection settings

Operating modes



Active operating mode

Heating mode – burner and fan is working according to the measured and set temperature

Auto Heating-auto – automatic selection of the burner power depending on the measured temperature

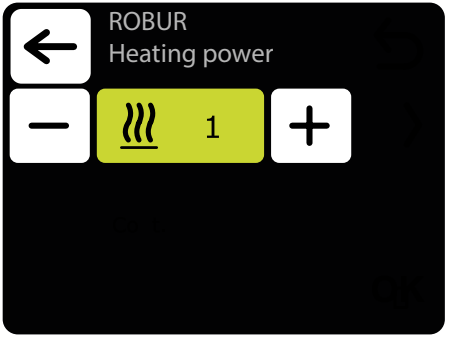
Cont. Heating-continuous - after reaching the set temperature, the fan works continuously

Manual Heating-manual – manual selection of the burner power

Ventilation mode - fan is working continuously, burner is off

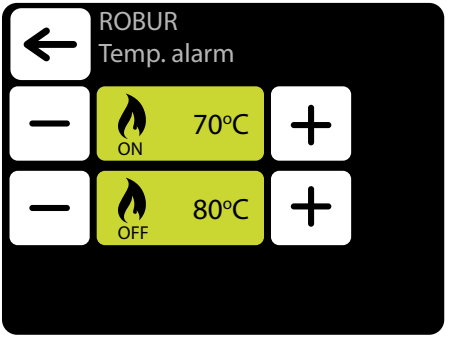
OFF Unit is off

Heating power



Burner power setting in heating-manual mode

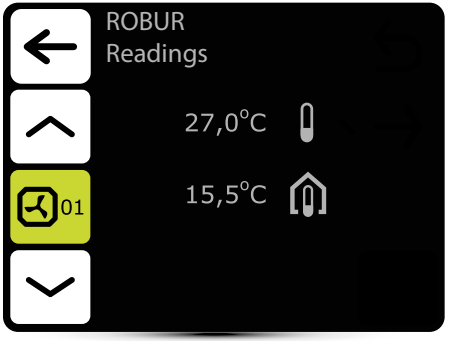
Thermal protection



Max. operating temperature
OFF

Temperature ready for restart
ON

Readings

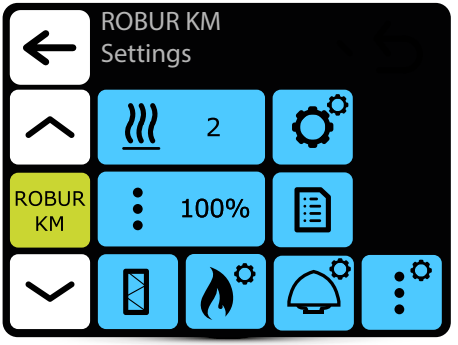


Outlet air temp.

Temperature in the room

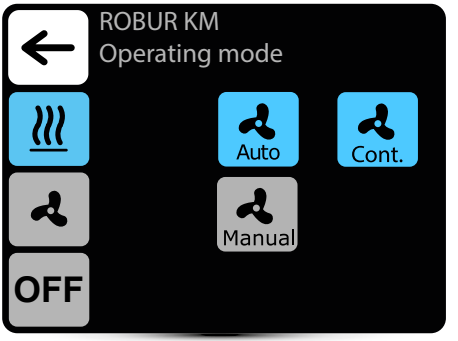
short press

ROBUR KM MIXING CHAMBERS



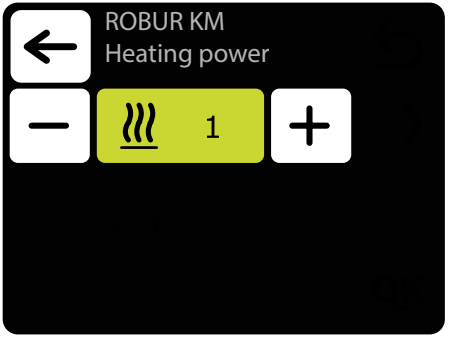
- 100% — Dampers setting - stepless, 100% means a maximum opening level of fresh air dampers
- 2 — Burner power settings
- Operating modes
- Dampers setting according to external temperature
- Readings
- Thermal protection settings
- Filters operating status
- Roof fan setting

Operating modes



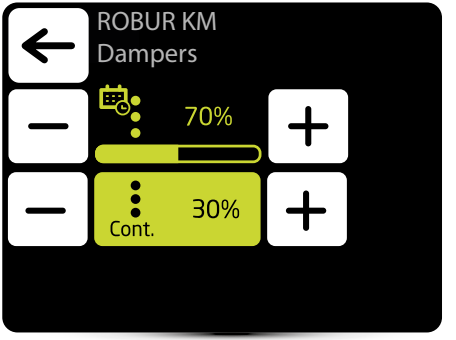
- Active operating mode
- Heating mode – burner and fan is working According to temperature
- Auto — Heating-auto – automatic selection of the burner power depending on the measured temperature
- Cont. — Heating-continuous - after reaching the set temperature, the fan works continuously
- Manual — Heating-manual – manual selection of the burner power
- Ventilation mode – fan is working continuously, burner is off
- OFF — Unit is off

Heating power



Burner power setting in heating-manual mode

Dampers setting

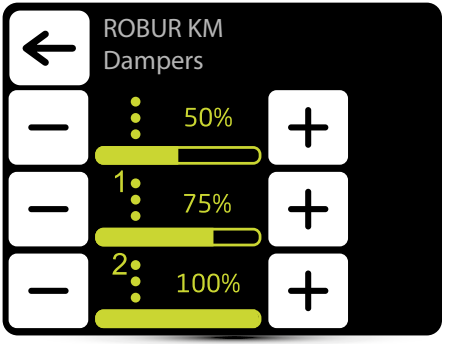


Appearance of this icon informs that the airflow setting has been defined in the weekly programer. It is possible to change it ad hoc only. Change will only be active in given weekly programer zone.

Dampers setting in heating and ventilation mode

Dampers setting in heating-continues mode

Damper setting in relation to an external potential free input

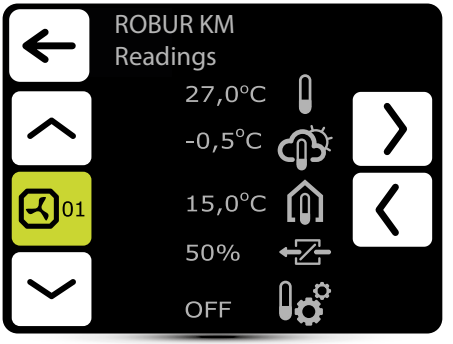


Operation with an external potential-free input should be activated – see point "EXTERNAL INPUT SETTING" p. 13.

Three values of air flow should be defined (100% means a maximum opening level of fresh air dampers):

- normal operation status
- 1 - first level of control
- 2 - second level of control

Readings



Outlet air temp.

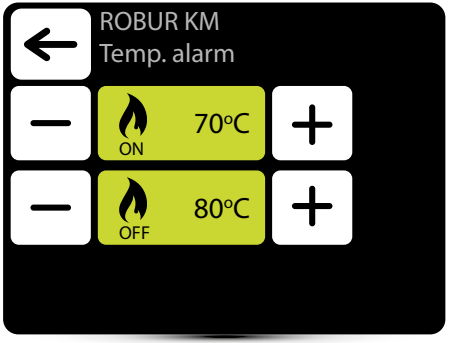
External temperature

Temperature in the room

Dampers opening degree

On – automatic setting of dampers according to external temperature is active.

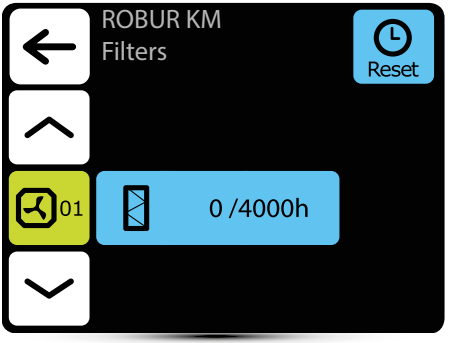
Thermal protection



Max. operating temperature
OFF

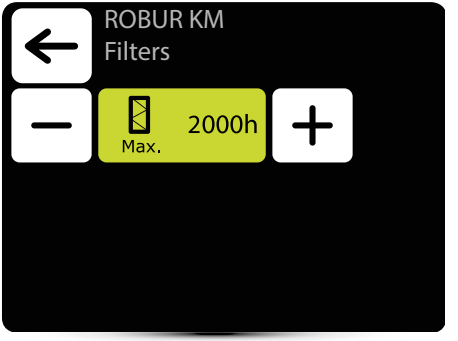
Temperature ready for restart
ON

Filters operating time counter



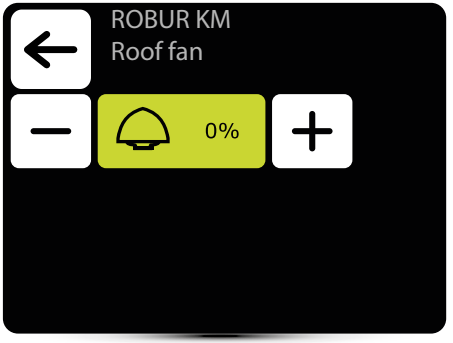
After reaching the limit of working hours, there will be displayed an indication in alarm menu. Value must be reset. Alarm does not affect the operation of the unit.

Filters operating time limit



The value should be set depending on the degree of dirtiness/ contamination of the facility.

Roof fan setting

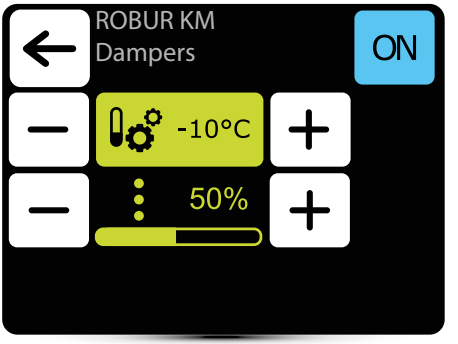


Setting „0%" means balance between air removed by roof fan and supplied by ROBUR KM heater.

Positive value means that the roof fan removes more air than the ROBUR KM supplies (under-pressure). Setting „+100%" means continuous operation of the roof fan.

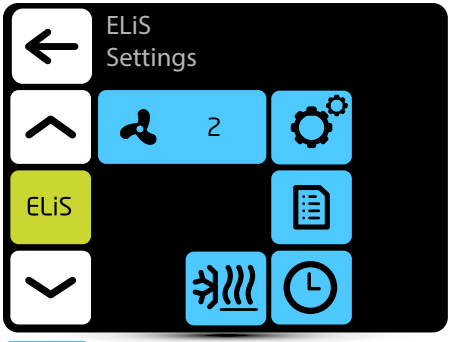
Negative value means that the roof fan removes less air than the ROBUR KM supplies (overpressure). Setting „-100%" means operation of the ROBUR KM only.

Dampers setting according to external temperature



Automatic setting of dampers opening level according to external air temperature (100% means a maximum opening level of fresh air dampers). Value set here is overriding normal damper setting and setting in weekly programer.

short press ELiS AIR CURTAINS



2 Airflow setting – 3-steps

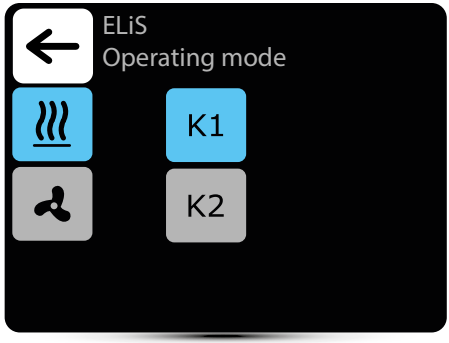
Selection of operating mode

Readings

Setting of delay times

Antifreeze

Operating modes



Active operating mode

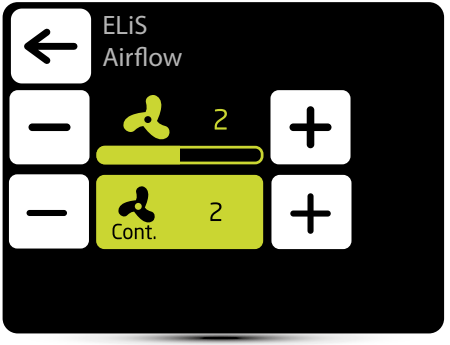
K1 Air curtain operates according to door sensor and thermostat, whose priority is equivalent

K2 Air curtain operates according to door sensor and thermostat. Door sensor has a priority. Without it's signal unit will not run

Heating – valve is opened when measured temperature is lower than desired temperature

Ventilation – valve is constantly closed, fan operates continuously at selected step

Airflow setting

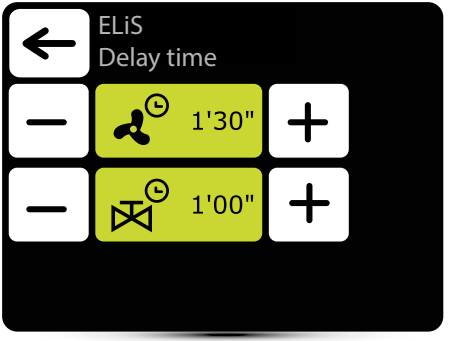


Airflow setting

Cont.

After the disappearance of signal from the door sensor and/or thermostat (dependingon the K1/ K2 work program) the curtain fan can operate at the selected speed for a specified time or be turned off - select OFF.

Setting of delay time

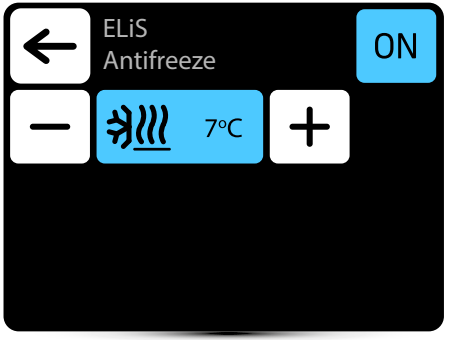


Fan switch off delay time – it can be set in the range 0:00 - 10:00 minutes, every 0:30 s. It is possible to set ∞ value, then fan operates continuously.

Valve switch off delay time - it can be set in the range 0:00 - 10:00 minutes, every 0:30 s. It is possible to set ∞ value, then valve is constantly open.

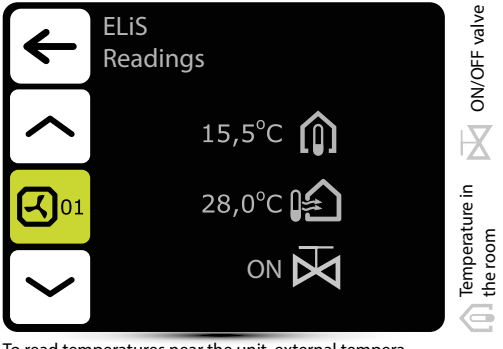
Valve delay time must be shorter than fan delay time.

Antifreeze



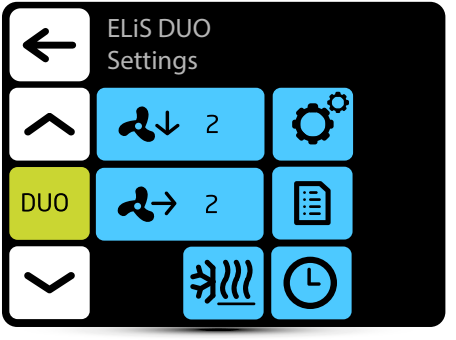
Antifreeze protection of the heat exchanger. When temperature in the room drops below desired temperature fans stops and valve is open to 100%. The unit must be equipped with T3 sensor (optional equipment).

Readings



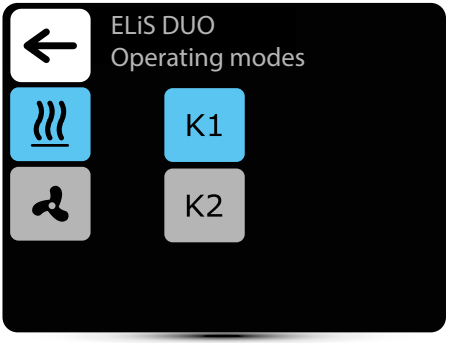
To read temperatures near the unit, external temperature sensors PT-1000 must be connected to DRV control module.

short press ELiS DUO AIR CURTAIN-FAN HEATER COMBO UNITS



- 2 — Airflow setting for air curtain part – 3-steps
- 2 — Airflow setting for fan heater part – 3-steps
- Selection of operating mode
- Setting of delay times
- Readings
- Antifreeze

Operating modes



Active operating mode

K1 Air curtain operates according to door sensor and thermostat, whose priority is equivalent

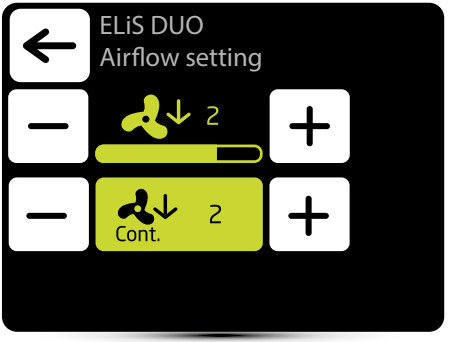
K2 Air curtain operates according to door sensor and thermostat. Door sensor has a priority. Without it's signal unit will not run

Heating – valve is opened when measured temperature is lower than desired temperature

Ventilation – valve is constantly closed, fan operates continuously at selected step

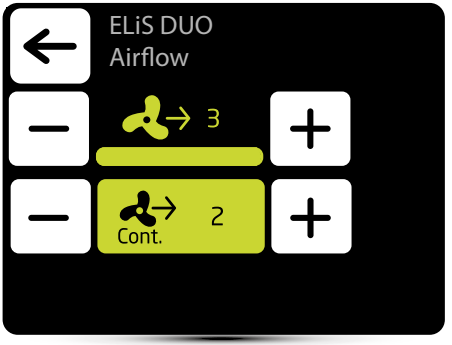
Fan heater operates always according to temperature set on the controller, regardless K1/K2 mode.

Airflow setting



Air flow setting

Cont. After the disappearance of signal from the door sensor and/or thermostat (dependingon the K1/K2 work program) the curtain fan can operate at the selected speed for a specified time or be turned off - select OFF.

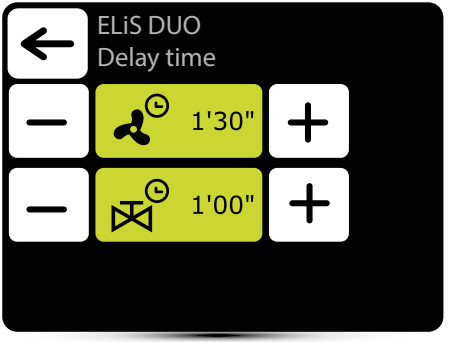


Airflow setting

Cont.

After reaching desired temperature fan of the heater can operate continously on selected step: 1, 2, 3 or be turned off - select OFF.

Setting of delay time

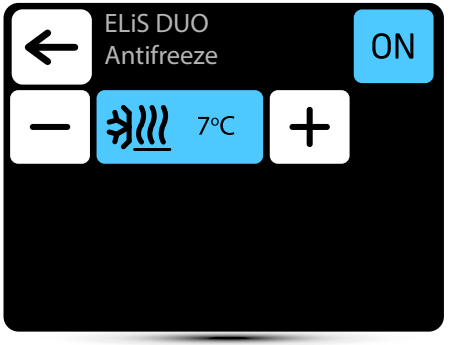


Fan switch off delay time can be set in the range 0:00 - 10:00 minutes, every 0:30 s. Value ∞ - fan operates continuously

Valve switch off delay time can be set in the range 0:00 - 10:00 minutes, every 0:30 s. Value ∞ - valve is constantly open.

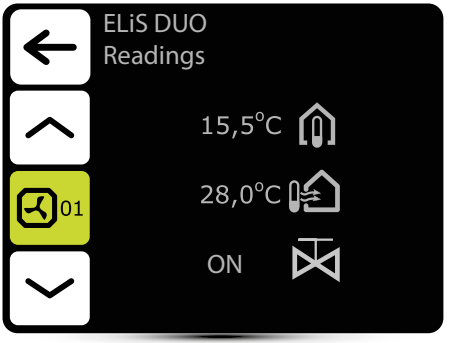
Valve delay time must be shorter than fan delay time

Antifreeze



Antifreeze protection of the heat exchanger. When temperature in the room drops below desired temperature fans stops and valve is open to 100%. The unit must be equipped with T3 sensor (optional equipment).

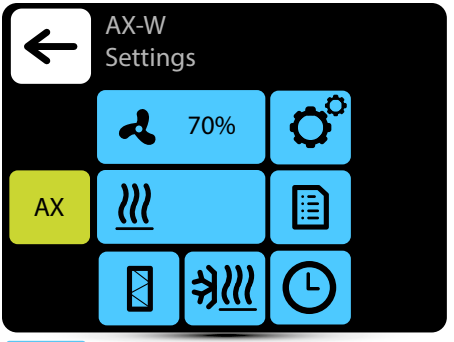
Readings



Temperature in the room

ON/OFF valve

To read temperatures near the unit, external temperature sensors PT-1000 must be connected to DRV control module.



70% capacity setting - manual (stepless)

AUTO capacity setting - auto (stepless)

temperature settings

Selection of operating mode

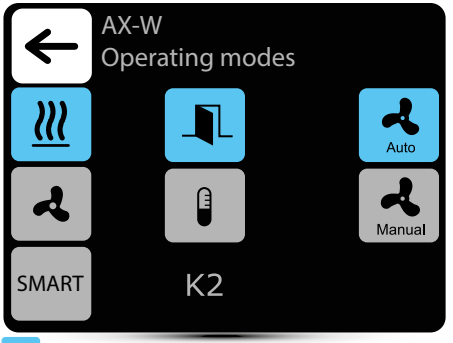
Readings

Setting of delay times

antifreeze

filters operating status

Operating modes



Active operating mode

auto – utomatic change of capacity in the range of maximum and minimum capacity setting depending on the temperature difference (external temperature sensor T1 required)

manual – fan operates at a fixed, selected capacity

air curtain operation based on door sensor signal

air curtain operation based on temperature sensor signal

heating – the heating medium valve is open when the measured temperature is lower than the set temperature or according to the programme and settings of the device (reheating, preheating)

ventilation – valve is permanently closed, fan operates on the basis of the selected programme and user settings

SMART operating mode. Selecting this mode disables the selection of other options

K1 air curtain works in relation to the door sensor and the temperature sensor, which have equal priority

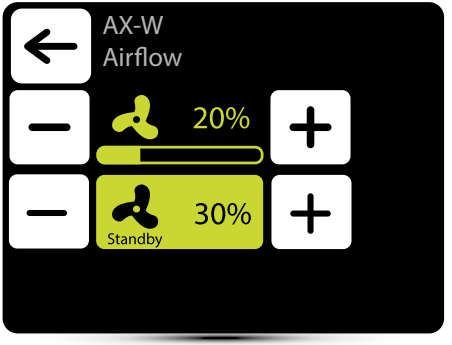
K2 air curtain operates in relation to the door sensor

K3 air curtain operates in relation to the temperature sensor

SMART operating mode - automatic change of the unit's operating mode depending on the outside temperature:
- heating (winter mode) - when the outside temperature is below 17°C for 24 h,
- ventilation (summer mode) - when the outside temperature is 22°C or higher for 3 hours.

and door opening time.
T1 external temperature sensor required.

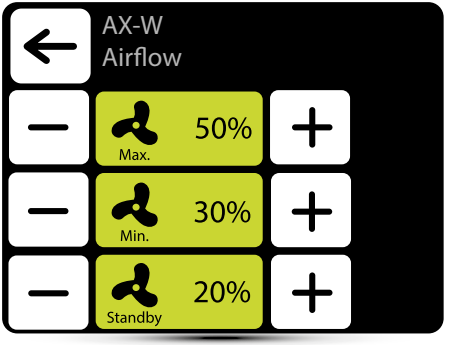
Airflow setting (manual)



fan airflow setting in manual mode

fan airflow setting in standby mode. Possible deactivation - select OFF

Airflow setting(auto)



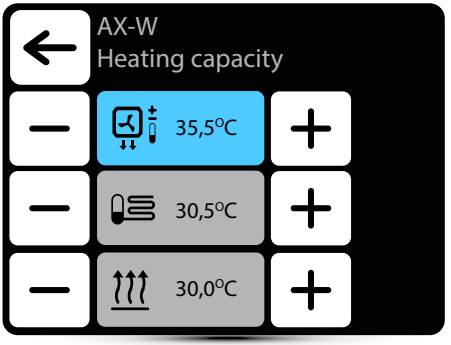
aximum fan airflow setting in automatic mode

minimum fan airflow setting in automatic mode. Possible deactivation - select OFF

fan airflow setting in standby mode. Possible deactivation - select OFF

The icon will turn red when the user tries to make an unauthorised change (e.g. setting the minimum speed higher than the maximum speed)

Heating capacity

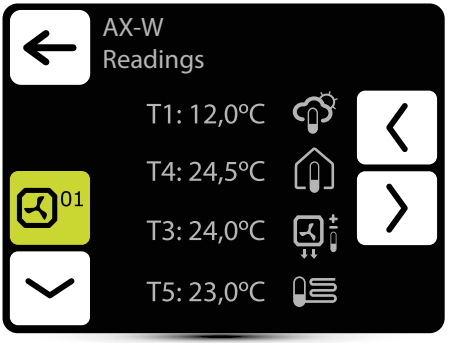


35,5°C — room supply air temperature setting

30,5°C — setting the temperature of the medium in the heat exchanger return flow

30,0°C — preheating - setting the temperature of the medium flowing through the exchanger when the fans are not in operation

Readings



T1 - outdoor temperature read from the PT-1000 sensor. The sensor comes as an optional equipment. In the absence of the sensor, the air curtain can only operate in manual mode.

T4 - room temperature is read by a PT-1000 sensor. The sensor comes as an optional equipment. In the absence of a sensor, the temperature is measured by the sensor built into the T-box Zone controller (if this option is selected) or the air curtain operates according to the average temperature from the sensors connected to the other units.

T3 - room supply air temperature

T5 - temperature of the medium returning from the heat exchanger

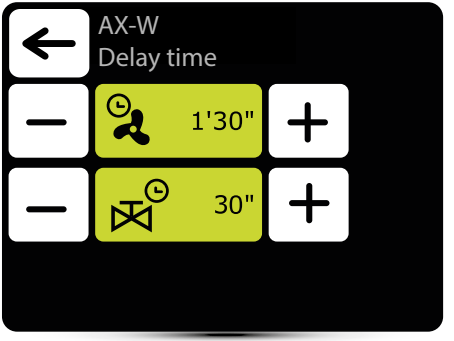
Readings

OPEN — Door status

75% — valve opening value in % (option only available for 0-10V valves)

HEAT — Operating mode: HEAT/ ADDHEAT / PREHEAT / STANDBY / OFF / VENT

Delay time setting (standby)

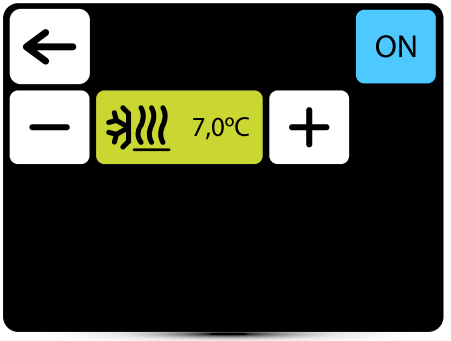


1'30" — The shutdown delay can be set in the range of 0:00 to 10:00 minutes in 0:30 second increments. It is also possible to set a value of ∞, in which case the fan runs continuously.

30" — The shutdown delay can be set in the range 0:00 to 10:00 minutes in 0:30 second increments. It is also possible to set a value of ∞, in which case the valve is continuously open.

1'30" — The icon will turn red when the user tries to make an unauthorised change (e.g.: set the valve closing delay longer than the fan delay).

Antifreeze

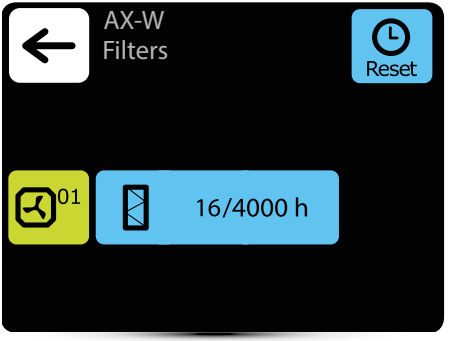


7,0°C — Antifreeze protection of the heat exchanger. When the temperature falls below the setpoint, the fans are switched off and the valve is fully opened.

ON — antifreeze function is on

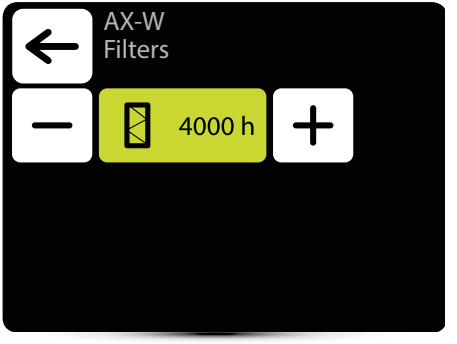
OFF — antifreeze function is off

Filters operating time counter



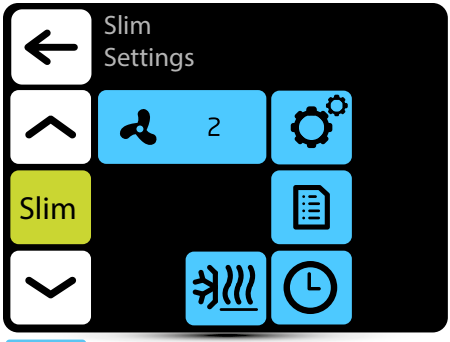
Reset — When the operating time limit is reached, a message will be displayed in the alarm menu. The value must be reset. The alarm does not affect the operation of the unit.

Filters operating time limit



4000 h — The value should be set according to the extent to which the item is dirty.

short press Slim AIR CURTAINS



2 Airflow setting – 3-steps

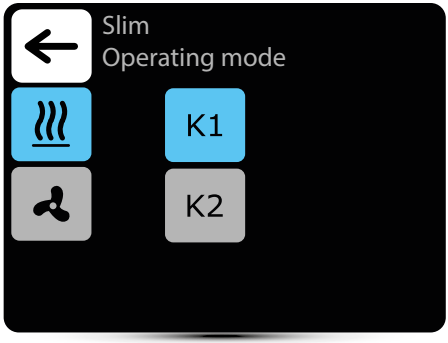
Selection of operating mode

Readings

Setting of delay times

Antifreeze

Operating modes



Active operating mode

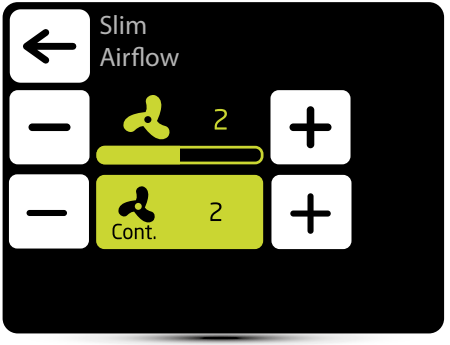
K1 Air curtain operates according to door sensor and thermostat, whose priority is equivalent

K2 Air curtain operates according to door sensor and thermostat. Door sensor has a priority. Without it's signal unit will not run

Heating – valve is opened when measured temperature is lower than desired temperature

Ventilation – valve is constantly closed, fan operates continuously at selected step

Airflow setting

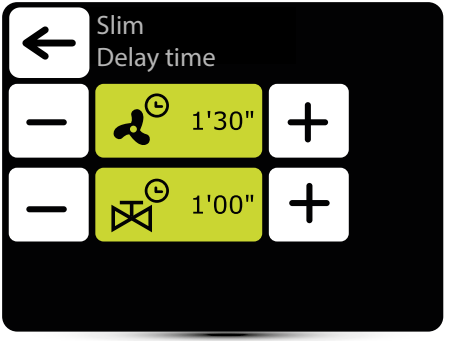


Airflow setting

Cont.

After the disappearance of signal from the door sensor and/or thermostat (dependingon the K1/ K2 work program) the curtain fan can operate at the selected speed for a specified time or be turned off - select OFF.

Setting of delay time

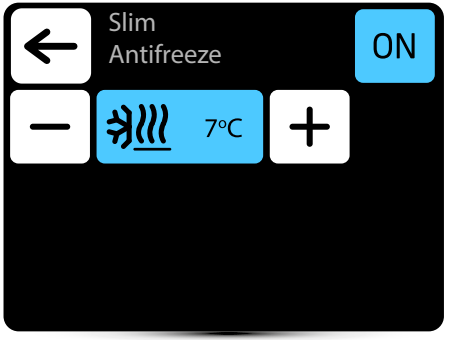


Fan switch off delay time – it can be set in the range 0:00 - 10:00 minutes, every 0:30 s. It is possible to set ∞ value, then fan operates continuously.

Valve switch off delay time - it can be set in the range 0:00 - 10:00 minutes, every 0:30 s. It is possible to set ∞ value, then valve is constantly open.

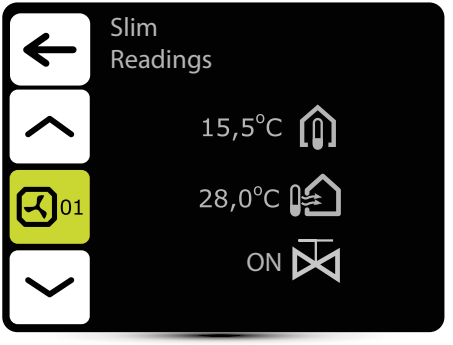
Valve delay time must be shorter than fan delay time.

Antifreeze



Antifreeze protection of the heat exchanger. When temperature in the room drops below desired temperature fans stops and valve is open to 100%. The unit must be equipped with T3 sensor (optional equipment).

Readings



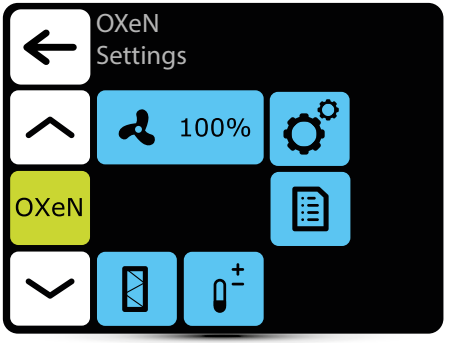
To read temperatures near the unit, external temperature sensors PT-1000 must be connected to DRV control module.

Temperature in the room

ON/OFF valve

short press

OXeN HEAT RECOVERY UNITS



100% Airflow setting – stepless

Operating modes

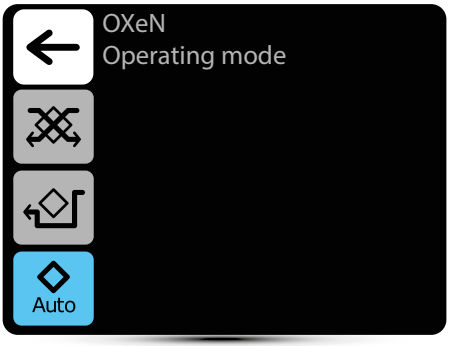
Readings

Filters operating status

Selection of leading sensor

This icon informs that dampers are during change of position, fans are stopped

Operating modes



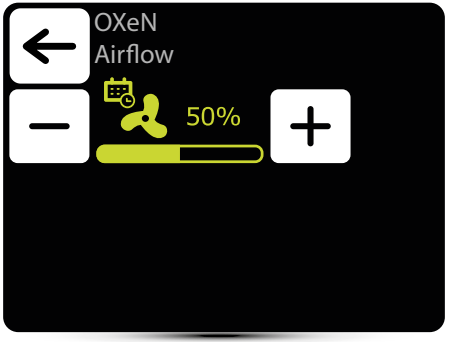
Active operating mode

Operation with heat recovery – operation in this mode ensures heat or cool recovery from removed air

Operation without heat recovery – supply air is directed via by-pass without heat recovery („freecooling"/„free-heating").

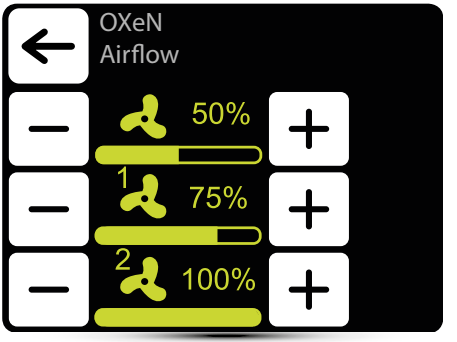
Auto Automatic change of operating mode with or without heat recovery, depending on temperature

Airflow setting



Appearance of this icon informs that the airflow setting has been defined in the weekly programer. It is possible to change it ad hoc only. Change will only be active in given weekly programer event.

Airflow setting in relation to an external potential free input

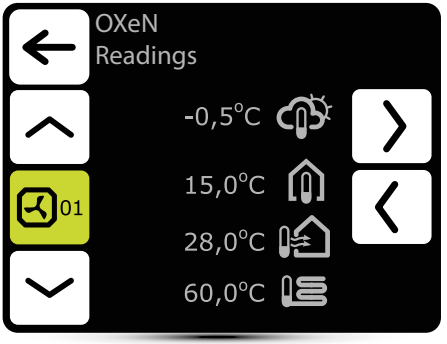


Operation with an external potential-free input should be activated - see point "EXTERNAL INPUT SETTING" p. 13.

Three values of airflow should be definied:

- normal operation status
- 1 - first level of control
- 2 - second level of control

Readings

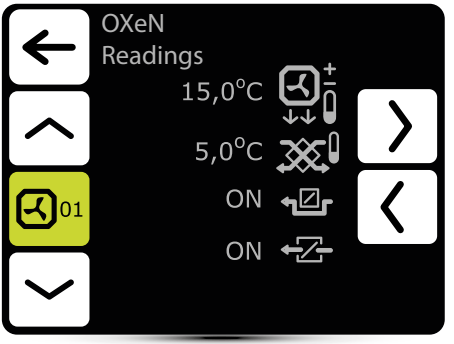


External temperature

Temperature in the room

Temperature of air supplied into the room

Temperature of heating medium
on return pipe



Desired temperature of supply air

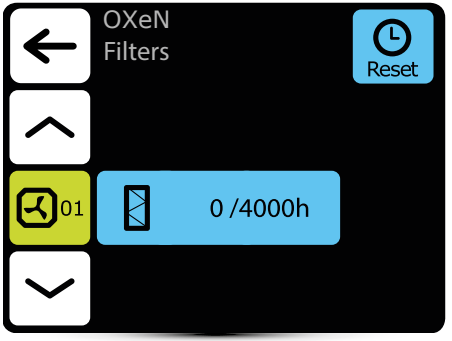
Temperature of removed air

ON – status of by-pass dampers

ON – status of external dampers

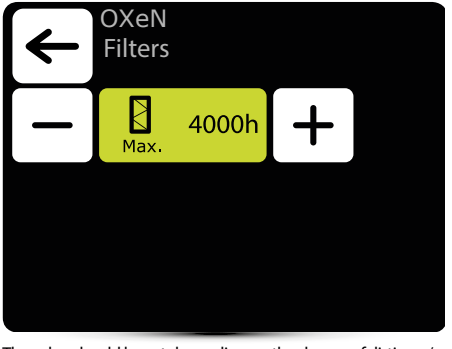
ON/OFF valve

Filters operating time counter



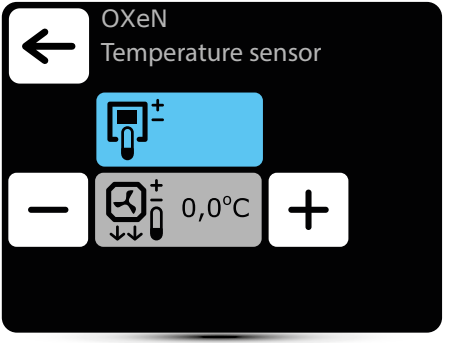
After reaching the limit of working hours, there will be displayed an indication in alarm menu. Value must be reset. Alarm does not affect the operation of the unit.

Filters operating time limit



The value should be set depending on the degree of dirtiness/ contamination of the facility.

Temperature sensor



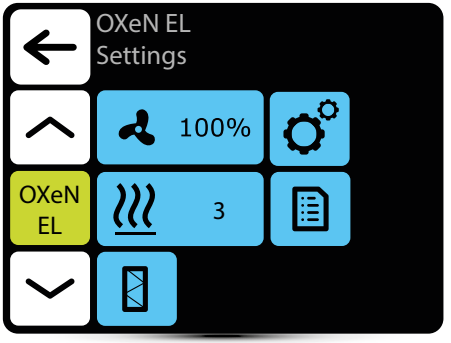
Active temperature sensor

Leading sensor is the ambient air temperature sensor (built in T-box or local, near the unit). When temperature in the room is not reached, SRX3d valve is open in 100%. When temperature in the room is reached, flow of heating medium is regulated in such way, that the supply air temperature is equal to set temperature.

Leading sensor is the supply air temperature sensor. Controller will maintain supply air temperature set on the main screen, thanks to regulation of the flow of heating medium by SRX3d valve opening degree.

Correction of air temperature set on main screen

short press OXeN EL HEAT RECOVERY UNITS



100% Airflow setting - only 100%

3 Heating power setting

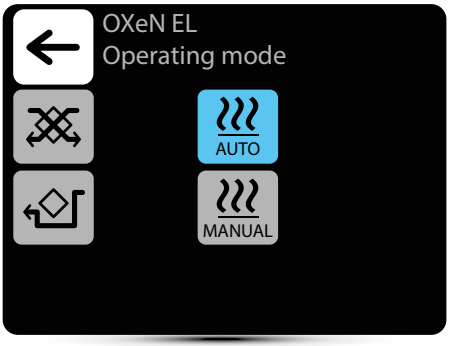
Operaing modes

Readings

Filters operating status

This icon informs that dampers are during change of position, fans are stopped this icon informs also that fans are cooling the heater

Operating modes



Activ operating mode

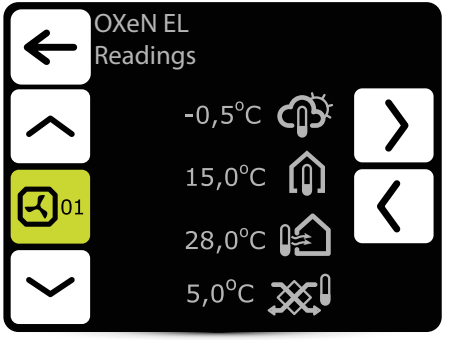
Operation with heat recovery – operation in this mode ensures heat or cool recovery from removed air

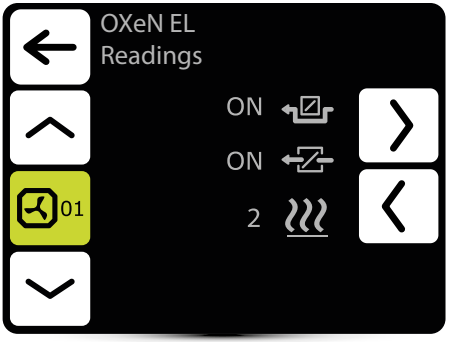
Operation without heat recovery – supply air is directed via by-pass without heat recovery(„freecooling"/„free-heating")

AUTO Automatic setting of heating power

MANUAL Manual setting of heating power

Readings





External temperature

Temperature in the room

Temperature of air supplied into the room

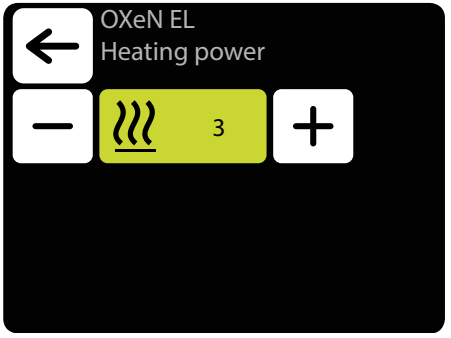
Temperature of removed air

ON – status of by-pass damper

ON – status of external dampers

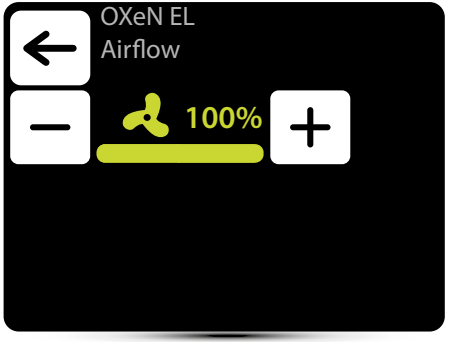
Chosed of heating power

Heating power



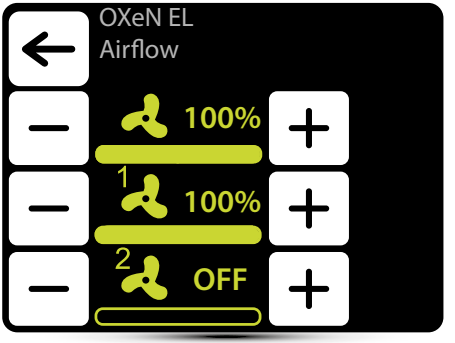
Heating power setting:
3 – 8,5 kW, 2 – 5,5 kW, 1 – 3,5 kW

Airflow setting



Appearance of this icon informs that the airflow setting has been defined in the weekly programer. It is possible to change it ad hoc only. Change will only be active in given weekly programer event.

Airflow setting in relation to an external potential free input

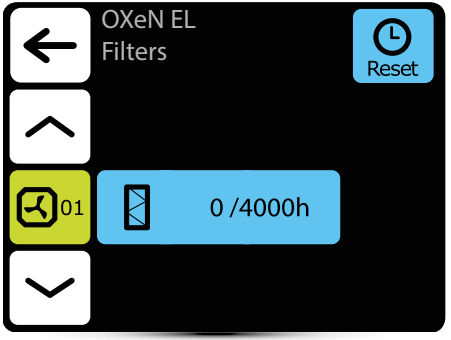


Operation with an external potential-free input should be activated - see point "EXTERNAL INPUT SETTING" p. 13.

Three values of airflow should be definied:

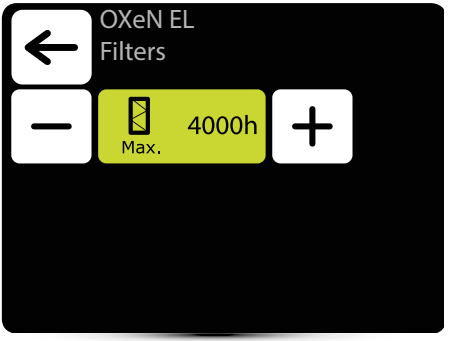
- normal operation status
- 1 - first level of control
- 2 - second level of control

Filters operating time counter



After reaching the limit of working hours, there will be-displayed an indication in alarm menu. Value must be reset. Alarm does not affect the operation of the unit.

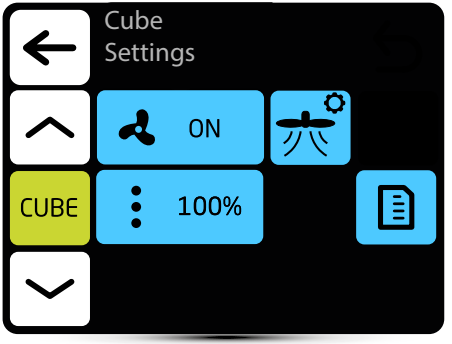
Filters operating time limit

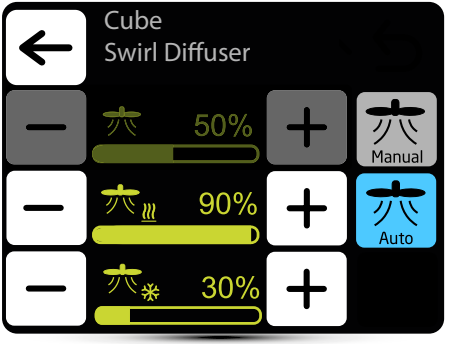


The value should be set depending on the degree of dirtiness/contamination of the facility.

short press

Cube ROOFTOP UNITS





ON — Airflow setting

100% — Dampers setting - 100% means a maximum opening level of fresh air dampers

Operation modes

Readings

Active operating mode

Swirl diffuser setting for manual mode

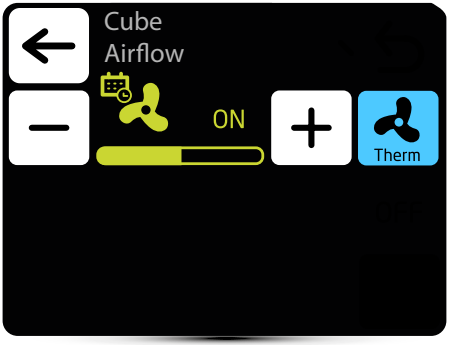
Swirl diffuser setting for heating in automatic mode

Swirl diffuser setting for cooling in automatic mode

Auto — Automatic mode - the swirl diffuser setting changes automatically between the setpoint for cooling or heating depending on the active operating mode of the Cube. For cooling, optimal airflow is horizontal and for heating it is vertical

Manual — manual mode - fixed swirl diffuser setting

Airflow setting



Active operating mode

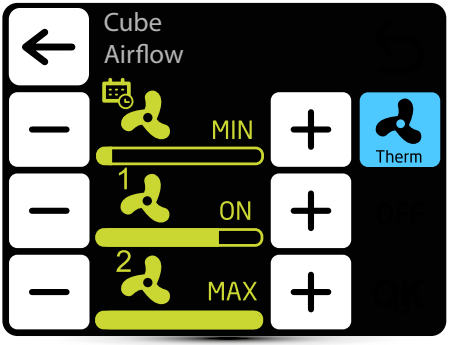
Airflow setting

The icon informs that the parameter has been defined in the weekly programer. It is possible to change the parameter temporarily. The change will only be active in a given weekly programer zone

Therm

Thermostatic mode - Fans turn OFF after reaching the set temperature. The option is not available when the device is operating in according to the supply air temperature sensor as a leading sensor. The selection of the leading/master sensor from: supply air, exhaust air and wall temperature sensors is made during first startup. It is also possible to define built in sensor in T-box sensor he leading sensor

Airflow setting in relation to an external potential free input



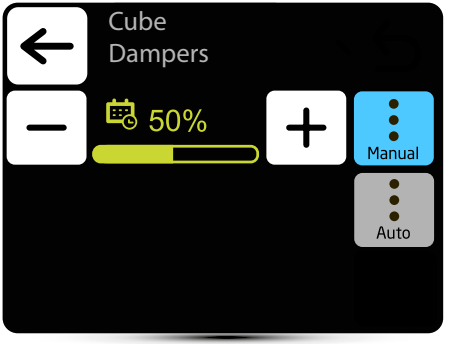
Active operating mode

Operation with an external potential-free input should be activated - see point "EXTERNAL INPUT SETTING" p. 13.

Three values of airflow should be definied:

- normal operation status
- 1 - first level of control
- 2 - second level of control

Dampers setting



Active operating mode

Airflow setting

The icon informs that the parameter has been defined in the weekly programer. It is possible to change the parameter temporarily. The change will only be active in a given weekly programer zone

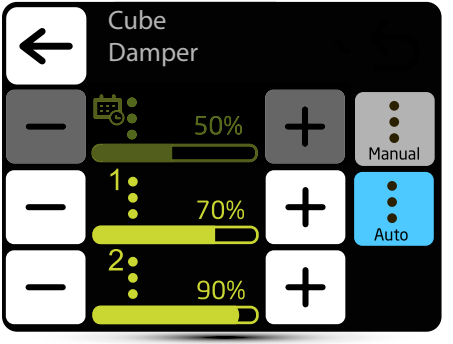
Manual

manual setting of the recirculation damper position

Auto

position of the recirculation damper is changed automatically depending on air temperatures

Dampers setting in relation to an external potential free input

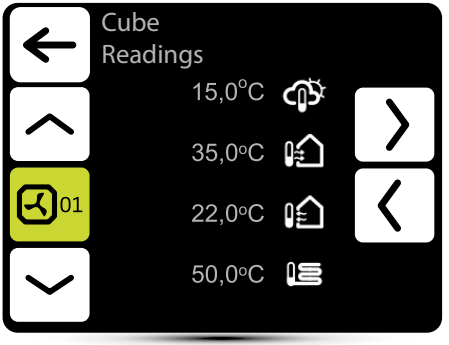


Active operating mode

Operation with an external potential-free input should be activated - see point "EXTERNAL INPUT SETTING" p. 13.
Three values of air flow should be defined (100% means a maximum opening level of fresh air dampers):

- normal operation status
- 1 - first level of control
- 2 - second level of control

Readings



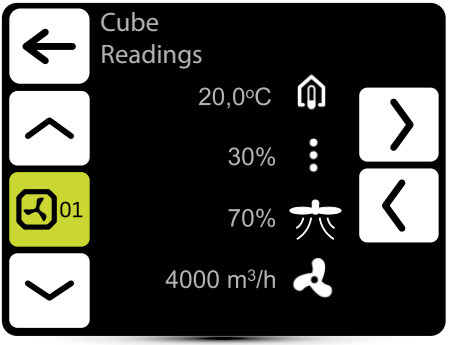
Outside temperature

Temperature of the air supplied to the room

Temperature of the air exhausted from the room

Temperature at the return of the medium

Room temperature reading from the T-box controller's built-in sensor or from the optional NTC wall-mounted sensor, connected to the Cube control box/enclosure

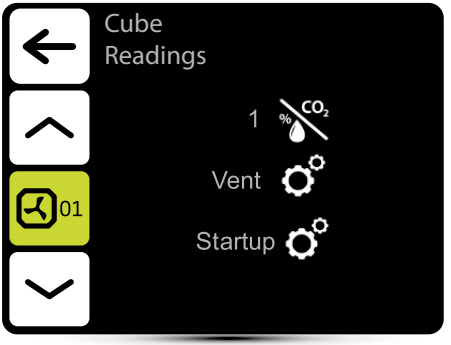


Room temperature (optionl NTC wall-mounted sensor)

Current setting of the recirculation damper

Current swirl diffuser setting

Airflow

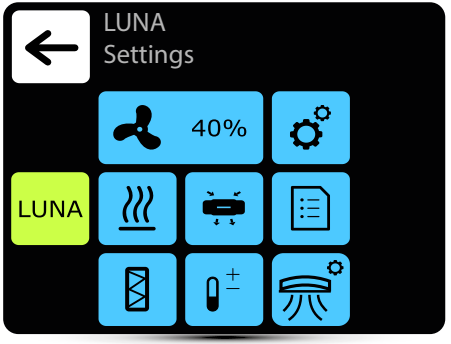


the current state of the gas detector

current general operating mode:
Vent - ventilation
Heat - heating
HeatRec- heat recovery
Cool - cooling
CoolRec - cool recovery

Current operating mode:
Stop - device stopped
Freeze - frost alarm
Off - device turned off
Startup - starting
ECO mode - economic mode (applies to Climatix regulation)
COMF mode - comfort mode
Forcing - active signal from an external detector (option)
Thermostat - the device works in thermostatic mode
NightCool - the device works in the night cooling mode (applies to Climatix regulation)
Overrun - cooling down process
Defrosting - defrosting the heat pump (optional)

LUNA HEATING AND COOLING DEVICE



AUTO capacity setting - manual (stepless)

40% capacity setting - auto (stepless)

Selection of operating mode

preheating

destratification

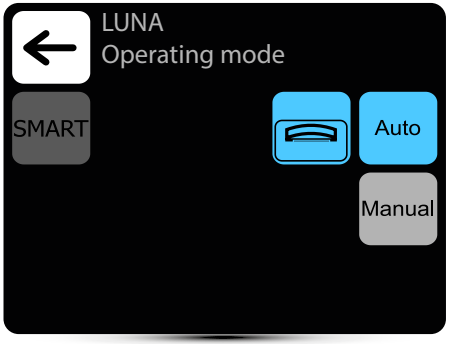
readings

filters operating status

leading sensor selection

360° nozzle position

Operating mode



Active operating mode

Auto

automatic operation

based on the difference between the temperature of the leading sensor and the setpoint temperature, the following occurs:

- 1. automatic selection of operating mode: heating/cooling/ventilation
- 2. automatic activation of the EC fan and 3-way valve

Deactivates the „360° nozzle position" function

Low ceiling - mode designed for low rooms (not higher than 4m). EC fan and 3-way valve operating ranges factory limited to 60%

Operated in Auto mode only

Deactivates „destratification" and „360° nozzle position" functions.

Manual

User settings.

fan operates at a constant user-selected capacity (20-100%, 10% increments)

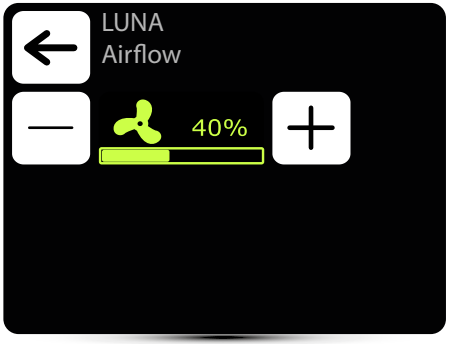
SMART

SMART mode non-selectable (external contact inactive)

SMART

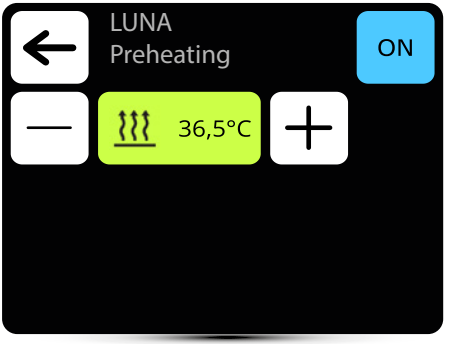
SMART mode active (external contact active), activation via MODBUS registers

Airflow setting (manual)



Fan airflow setting in manual mode
(20-100%, 10% increments)

Preheating



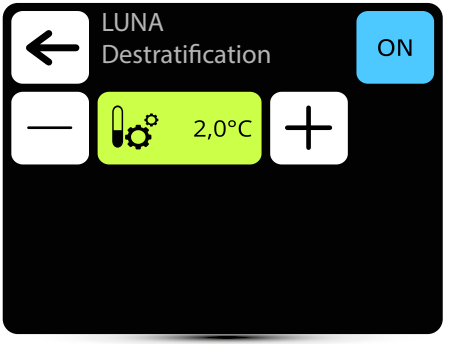
Range: 28-37°C, activated by pressing the ON button

ON Activates preheating

OFF Deactivates preheating

36,5°C Preheating setting

Destratification



ON Activates destratificationę

ctivating this function in „MANUAL" mode deactivates „Leading sensor selection".

Activating this function in „AUTO" mode deactivates „Leading sensor selection" and „360° nozzle position"

OFF Deactivates destratification

2,0°C Temperature difference setting (difference between the temperature under the ceiling from the sensor built in the unit's air intake vent and in the occupied zone) at which the LUNA should be switched on

The destratification function is activated as follows:

1. activation of the function with the ON button

2. setpoint temp. > room temp. (T4 or T-box)

3. air intake vent temp. (T2)-room temp. (T4)>delta temp. set in T-box

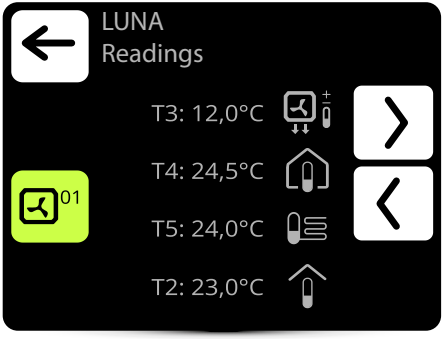
Temperature delta setting range from 2-6 °C

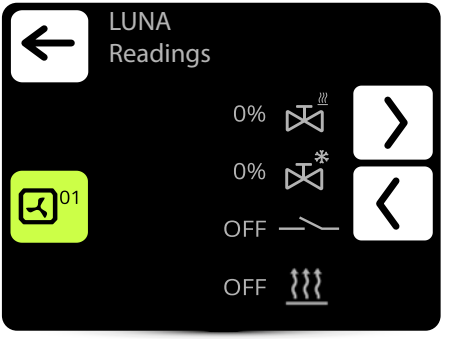
NOTE: When the DESTRATIFICATION mode is active, the programme checks for a change in the room temperature. If the temperature has not changed by +0.5[°C] within 120[s], a countdown of 240[s] is started, after which, if there is no change in the room temperature value, the function is deactivated.

AUTO MODE AND DESTRATIFICATION (ON) deactivate the nozzle adjustment and leading sensor selection icons.

It is deactivated when the „Low ceiling" function is activated.

The unit must be equipped with a T3 sensor (optional equipment).





T3 - room supply air temperature

T4 - room temperature is read by a PT-100 sensor. The sensor comes as an optional equipment. In the absence of a sensor, the temperature is measured by the sensor built into the T-box

T5 - temperature at the return of the

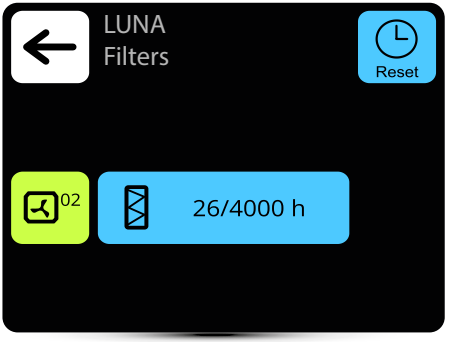
T2 - temperature at the unit's air intake vent

Status of HEATING valve opening

Status of COOLING valve opening

Potential-free contact status

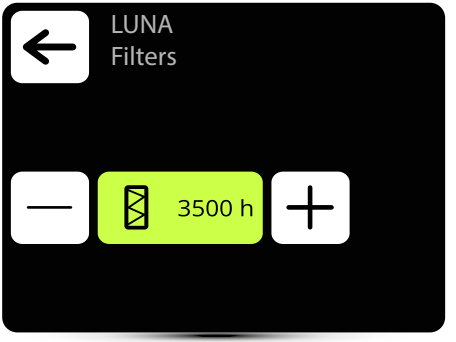
Preheating status



When the operating time limit is reached, a message will be displayed in the alarm menu. The value must be reset. The alarm does not affect the operation of the unit. Default setting: 4000h (range 100-4000h)

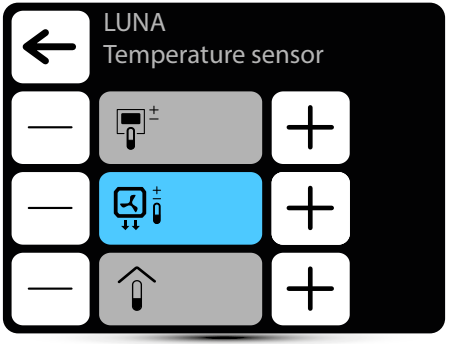
Click to go to the filter operating time limit setting menu.

Filter operating time reset



The value should be set according to the extent to which the item is dirty.

Temperature sensor



The leading sensor selection is deactivated if the „Destratification" function is activated.

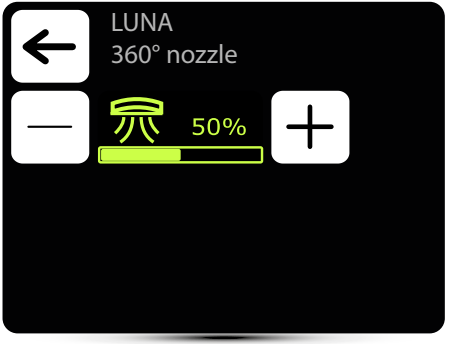
active temperature sensor

Integrated in T-box or T4
The leading sensor is the room air temperature sensor (integrated in the T-box or local at the unit). When the room temperature is not reached, the valve is fully open.

The leading sensor is the room supply air sensor. The controller will maintain a constant supply air temperature set in the main screen by adjusting the level of opening of the valve supplying the heating medium to the unit.

The leading sensor is the sensor in the unit's air intake vent.

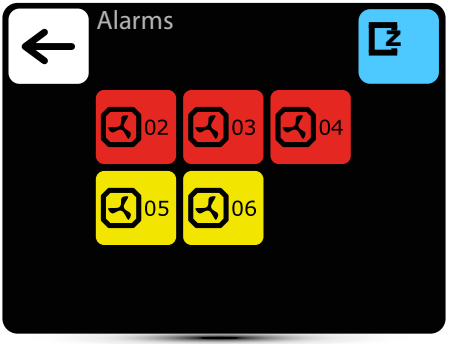
360° nozzle



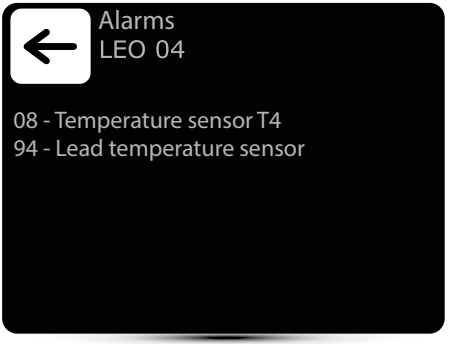
The leading sensor selection is deactivated if the „Destratification" function is activated.

360° nozzle position adjustment (range 0-100%, 25% increments)
Inactive in AUTO mode

ALARMS



List of alarms and information messages



05 Warning and information messages

02 Alarms

Zone alarms

error code	Name	Description
1	Connection error	no communication between DRV and T-box, check connection and DRV power supply
2	Communication error	no communication between DRV and T-box, check connection and DRV power supply, software compatibility
3	Antifreeze	antifreeze mode is activated
4	DRV group error	Addressing failure. Check binary address set in DRV and use search button again

error code	Name	Description
5	Temperature sensor T1	check the temperature sensor T1
6	Temperature sensor T2	check the temperature sensor T2
7	Temperature sensor T3	check the temperature sensor T3
8	Temperature sensor T4	check the temperature sensor T4
9	Temperature sensor T5	check the temperature sensor T5
10	Roof fan fuse	check the fuse of the roof fan on theDRV board

error code	Name	Description
11	Fan EC fuse	check EC fan fuse on DRV board
12	Fan 3V fuse	check the LEO heater fan fuse on the DRV
13	Roof fan TK	roof fan thermal protection alarm
14	Fan EC not connected	check the connection of the EC fan
15	Antifreeze heat recover exchanger ON	antifreeze mode of heat recovery exchanger is on
16	Antifreeze water exchanger ON	water exchanger antifreeze mode is activated
17	Heater TK (LEO EL)	the TK protection of the electric heater was triggered; the heaters have been turned off, the fan is running; the alarm resets automatically after the heaters have cooled down
	Drain Pump	exceeding the liquid level in the tray, alarm controlled automatically
18	Filter work time	check filters contamination level
	Input DI	DI connector open - device startup not allowed
19	Filter pressure	dirty filter of KM, change the filter, if pressure switch is not applied make a bridge (jumper) between PRDN IN and GND
20	Forcing damper ON	forcing damper settings depending on the outside temperature

error code	Name	Description
21	DUO heater not connected	no communication between DRV of fan heater part of ELiS DUO, check connection between DRV of air curtain part and DRV of fan heater part
22	Robur alarm	internal protection of the gas heater; to reset the alarm press and hold down the alarm icon
23	STB alarm	thermal protection of the gas heater; to reset the alarm press and hold down the alarm icon
24	STB short circuit	STB sensor error; check the STB sensor
25	Rooftop maintenance alarm	Maintenance works necessary
26	Rooftop warning alarm	alarm with device operation support
27	Rooftop fault alarm	alarm that prevents further operation of the device
28	Rooftop danger alarm	alarm that immediately disconnects all device functions
90	Time error	reset the T-box clock
91	Internal temperature sensor error	faulty/damaged internal temperature sensor in the T-box controller
92	External input: level 1	signal from external potential-free contact, 1st stage
93	External input: level 2	signal from external potential-free contact, 2st stage
94	Lead temperature sensor	check the leading temperature sensor
95	External input: HMI	initialisation of external T-box contact

FLOWAIR
intelligent air flow

CE

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Declaration Of Conformity UE

FLOWAIR hereby declare that the T-box controller were produced in accordance to the following Europeans Directives:

2014/30/UE – Electromagnetic Compatibility (EMC)

2014/35/UE – Low Voltage Electrical Equipment (LVD)

and harmonized norms ,with above directives:

PN-EN IEC 61000-3-2:2019-04 – Electromagnetic compatibility (EMC) — Part 3-2: Limits — Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

PN-EN 61000-3-3:2013-10 – Electromagnetic compatibility (EMC) — Part 3-3: Limits — Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection

PN-EN IEC 61000-6-2:2019-04 – Electromagnetic compatibility (EMC). Generic standards. Immunity for industrial environments

PN-EN 61000-6-3:2008/A1:2012 – Electromagnetic compatibility (EMC) — Part 6-3: Generic standards — Emission standard for residential, commercial and light-industrial environments

PN-EN 60065:2015-08 – Audio, video and similar electronic apparatus — Safety requirements

PN-EN 55022:2010 – Information technology equipment — Radio disturbance characteristics — Limits and methods of measurement

PN-EN 60068-2-1:2009 – Environmental testing

PN-EN 60068-2- 2:2009 – Environmental testing

Gdynia, 01.09.2021
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