

Reco-Boxx ZXR / ZXA / Flat

Operation and maintenance instructions



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1.0 Operation and maintenance instructions

Applicable for the following units with main board from software version DT 2.8.2 and DG 2.7.0

Exchanger	Sizes	Integrated pre-heating	Integrated post-heating	Handing	Fan
Reco-Boxx ZXR Counterflow	1000/1600/1800/2300/ 2700/2900/3200/4200/ 4700/6200/7000	Yes, electrical	Yes, electrical or water	Left / Right	Backward (BW)
Reco-Boxx ZXA Counterflow	900/1500/1900/ 2500/2800/3700	Yes, electrical	Yes, electrical or water	Left / Right	Backward (BW)
Reco-Boxx Flat-H / Flat-OUT Counterflow	550/650/1000/1400/1700/ 2100/2500/2700/3300/3700	Yes, electrical	Yes, electrical or water	Left / Right	Backward (BW)

2.0 Basic safety instructions

2.1 Intended use

This ventilation unit with heat recovery is used in centralised or decentralised ventilation systems. The unit provides controlled ventilation and air extraction in, for example, offices, school classrooms and other similar spaces. The units are intended for ceiling-mounted installation because they have outside air/outgoing air sockets on the sides and/or discharging upwards. Please note that the unit is very heavy, weighing approx. 210 kg. The unit may only be used if installed permanently, in dry indoor spaces and with connected ventilation ducts. DN 250 connection for geniovent.x 600 H and DN 315 connection for geniovent.x 900 H. The units do not have unit switches. Scope for completely disconnecting the unit from the power supply should be provided by the customer. These ventilation units are only intended for domestic use and similar purposes. No other or additional use is intended.

2.2 Specialist installer qualifications

The ventilation unit may only be installed, set up, retrofitted, started up, cleaned and maintained by a trained specialist in accordance with these instructions. You are deemed a trained specialist if your education, training or experience in ventilation technology mean that you can competently and safely undertake installation in accordance with the planning requirements and these instructions and are able to recognise and avoid risks resulting from incorrect installations and settings and the dangers resulting from them. Only a qualified electrician is permitted to work on the electrics. You are deemed a qualified electrician if you are familiar with the relevant standards and guidelines, can competently and safely create electrical connections in line with the attached wiring diagram and are able to recognise and avoid risks and dangers associated with electricity on the basis of your technical training and experience. Repair work may only be undertaken by an authorised AEREX specialist. After successful installation and commissioning, instruct users in the ventilation unit and associated control unit.

2.3 Non-intended use

The ventilation unit must not be used in the following situations under any circumstances. Read all the safety instructions.

Risk of combustion/fire from flammable materials, liquids or gases in the vicinity of the ventilation unit. Do not place any flammable materials, liquids or gases near the ventilation unit, which may ignite in the event of heat or sparks and catch fire.

Risk of death if an air-ventilated fireplace is connected to an exhaust gas system, which itself has multiple connections. The air-ventilated fireplace may result in exhaust fumes being transferred to other living units. Risk of death, for example from carbon monoxide. Never use the ventilation unit if there are air-ventilated fireplaces in the living unit that are connected to exhaust gas systems, which themselves have multiple connections.

Explosion hazard. Explosive gases and dust may ignite and cause serious explosions or fire. Never use ventilation unit in an explosive atmosphere.

Explosion hazard. Explosive substances in lab extraction units may ignite and cause serious explosions or fire. Aggressive substances may damage the ventilation unit. Never use ventilation unit in combination with a lab extraction unit.

Risk to health from chemicals or aggressive gases/vapours. Chemicals or aggressive gases/vapours may present a risk to health, especially if the ventilation unit distributes them into rooms. Never use the ventilation unit to convey chemicals or aggressive gases/vapours.

Damage to the unit.

- If operated during the build phase, potential damage to unit caused by contamination of the ventilation unit and ventilation ducts. Ventilation unit operation is not permitted during the build phase
- Grease and oil vapours from range hoods may contaminate the unit and ventilation ducts and reduce efficiency. Never use ventilation unit in combination with range hoods, that are connected directly to the controlled domestic ventilation exhaust air channel. In rooms with

greasy exhaust air, e.g. kitchens, only use ventilation valves with a grease filter. Recommendation: In terms of energy consumption, use range hoods in circulating air mode.

- Corrosion of metal parts inside the ventilation unit by additional components in the exhaust duct. Do not use components which affect temperature, humidity or air volumes on the exhaust duct, for example if a drying cabinet is connected to the exhaust duct.

2.4 Safety instructions

Read and observe all the safety instructions.

Risks for those who are not trained specialists, children and persons with reduced physical, sensory or mental capabilities or a lack of knowledge. Ventilation unit may only be installed, commissioned, cleaned and maintained by persons who can safely recognise and avoid the risks associated with this work.

Risk to health if filters are not replaced or if there are no air filters. Heavily soiled or moist air filters can accumulate harmful substances (mould, germs, etc.). This may also happen if the ventilation unit is shut down for an extended period. If there are no air filters, the ventilation unit and ventilation ducts become dirty. Unfiltered substances may enter the rooms.

- Never operate ventilation unit without air filters.
- Only use original filters.
- Recommendation: continuous operation.
- Observe filter change display. Change the air filter every 6 months.
- If the ventilation unit has not been used for a long time, always replace the air filters.

Risk to health if ventilation unit is not correctly cleaned/maintained.

Clean/service the ventilation unit regularly, at least every 2 years. This is the only way of ensuring that the ventilation unit is running hygienically.

Risk of death from toxic air and air containing pollutants (smoke, vapours) in the surrounding area – in the event of a fire or chemicals accident etc. Switch the entire ventilation system off immediately until the outside air is safe again.

Risk during transport from heavy or falling loads.

- Observe applicable safety and accident prevention requirements.
- Note permissible maximum loading capacity of lifting gear.
- Do not stand under a suspended load.
- Exercise caution when lifting. Note transport weight (ventilation unit 210 kg) and centre of gravity of ventilation unit (centre).
- Only transport ventilation unit to installation site using suitable means of transport (e.g. a lifting fixture) and with the help of several people.
- Check unit for transport damage. Do not commission a damaged unit.

Risk from inadequate load-bearing capacity of the base/ceiling construction. Only install ventilation unit on a base/ceiling construction with an installation/attachment surface with an adequate load-bearing capacity (at least 300 kg/m²).

Risk of injury from handling pointed housing parts or those with sharp edges, e.g. on housing panels, railings, mounting feet or pointed parts of front doors. Wear protective gloves.

Risk of injury if work is carried out by unqualified staff. Specialist knowledge is needed for the safe transport, installation, electrical connection and commissioning of the ventilation unit. Only have this work carried out by a specialist installer or qualified electrician.

Risk of injury when working at heights.

Risk of injury when working at heights. Use appropriate climbing aids (ladders). Stability should be ensured, if necessary have the ladders steadied by a 2nd person. Ensure that you are standing securely and cannot lose your balance and that there is no one under the ventilation unit.

Danger of injury from damaged ventilation unit. Switch the ventilation unit off immediately if you discover damage or faults that could endanger persons or property. Prevent further use until the issue has been fully rectified.

Intended operation not ensured if installed incorrectly. A ventilation unit not installed correctly may result in operation not as intended.

- Only install ventilation unit in accordance with the planning documents.
- In particular, note the information on insulating ventilation channels and sound deadening. Recommendation: Use tubular sound absorber for sound-deadened installation of ventilation unit.

Risks from parts which may affect the ventilation system which are added or modified at a later date.

- Parts (range hood, air-ventilated fireplace etc.) which are added or modified at a later date may result in health risks and operation which is not permitted.
- Parts may only be added or modified at a later date if system compatibility is established/ensured by a planning office. If using an exhaust air range hood or air-ventilated fireplace, this must be accepted by a regional master chimney sweep.

Risk from operating with ventilation unit not fully installed (open unit / without ventilation ducts).

- Running fans can be touched. Electric components are a potential source of electric shock. Danger of burning on units with a heat register.
- If the ventilation unit is open, all the supply circuits must be switched off (mains fuse off), secured against being accidentally switched back on and a visible warning sign must be attached.
- Only operate ventilation unit if fully installed, if all ventilation ducts are attached and the front doors are closed.
- Do not reach into running fans.
- The heat register and/or protective grilles of the heat register may be very hot. Before touching, check whether heat registers and/or protective grilles are still hot. Do not touch hot surfaces.

Risk of injury if unit components (heat register, heat exchanger etc.) fall down during removal. Sometimes these can be hard to pull out/slide in.

- Ensure that you are standing securely and cannot lose your balance and that there is no one under the unit.
- When removing and installing the components, support them from below with a hand.

Risk of injury and health risk when using accessory elements which have not been approved.

The ventilation unit is tested with original accessories and components (e.g. air filter, heat register, heat exchanger).

- The unit may only be operated with original components.
- Modifications and alterations to units are not permitted and release the manufacturer from any guarantee obligations and liability.

Danger of electric shock.

Before opening the front doors and installing the electrics, switch off all supply circuits and secure them against being accidentally switched back on again. Attach a warning sign in a clearly visible place.

Danger if the relevant regulations for electrical installations are not observed.

- Before removing the electronics cover and installing the electrics, switch off all supply circuits and secure them against being accidentally switched back on again. Attach a warning sign in a clearly visible place.
- Be sure to observe the relevant regulations for electrical installation; e.g. DIN EN 50110-1. In Germany, particularly observe VDE 0100, with the corresponding sections.
- A mains isolation device with contact openings of at least 3 mm at each pole is mandatory.
- Only connect the ventilation unit to a permanent electrical installation.
- Units may only be operated using the voltage and frequency shown on the rating plate.

Damage to unit in the event of moisture ingress.

The ventilation unit has IP 40 degree of protection.

- Do not install ventilation unit outdoors.
- Protect ventilation unit from moisture and wetness

Exercise caution when handling packaging materials.

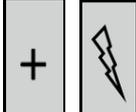
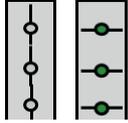
Store packaging material out of the reach of children.

Risk of death when operating with air-ventilated fireplaces. Ensure sufficient supply air intake during operation with air-ventilated fireplaces.

Note maximum permissible pressure difference per residential unit. The consent of a professional chimney sweep is needed in all cases. Ventilation units may only be installed in rooms, apartments or housing units of a comparable size, in which air-ventilated fireplaces are installed if:

- a parallel operation of air-ventilated fireplaces for liquid or gaseous fuels and the air-extracting equipment can be prevented via safety devices, or
- the extraction of exhaust gas from the air-ventilated fireplaces is monitored by a special safety device. In the case of air-ventilated fireplaces for liquid or gaseous fuels, the fireplace or the ventilation system must be switched off if the safety device is triggered. In the case of air-ventilated fireplaces for solid fuels, the ventilation system must be switched off if the safety device is triggered. In order to permit the intended operation of ventilation systems equipped with the central ventilation units with heat recovery, it must be possible to shut off any combustion air ducts or exhaust gas ducts from air-ventilated fireplaces. For exhaust gas ducts of fireplaces for solid fuels, the shut-off device may only be operated by hand. It must be possible to identify the position of the shut-off device from the setting of the operating handle. This is considered to be fulfilled if a soot blocking device is deployed.

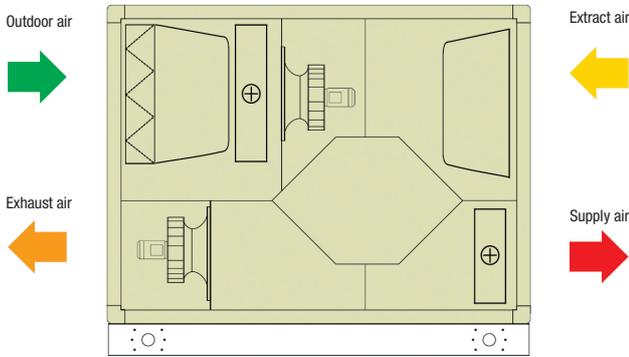
3.0 Symbols and abbreviations

	BW	BACKWARD CURVED FAN			
	BF	BAG FILTER		PF	PLEATED FILTER
	RX	RedARY HEAT EXCHANGER		PX	PLATE HEAT EXCHANGER
	WARNING			Electronic boards contains ESD sensitive components. Wear antistatic wrist strap connected to protective earth before to manipulate them. In alternative, discharge by touching the unit, handle boards at corners only and use antistatic gloves.	
	Must be connected by a qualified Electrician. Warning! Hazardous voltage.				
	OUTDOOR AIR		Air from outdoor to the AHU		
	SUPPLY AIR		Air from the AHU to the building		
	EXTRACT AIR		Air from the building to the AHU		
	EXHAUST AIR		Air from the AHU to outdoor		
	COOLING COIL	BA-		NV / KW	HEATING COIL (WATER/ELECTRICAL)
	SILENCER	GD		CTm	MOTORISED DAMPER
	PRESSURE SENSOR	P		Tx	TEMPERATURE SENSOR No = x (1,2,3...)
	SLIP CLAMP Sliding bar and screws are not included	SC		MS	FLEXIBLE CONNECTION
CIRCULAR DUCT CONNECTION		ER	For inlet	SR	For outlet

4.0 Product overview

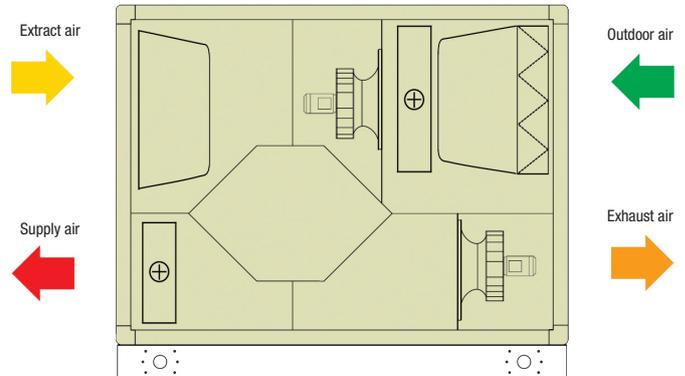
4.1 General overview

Right hand unit (supply air to the right)

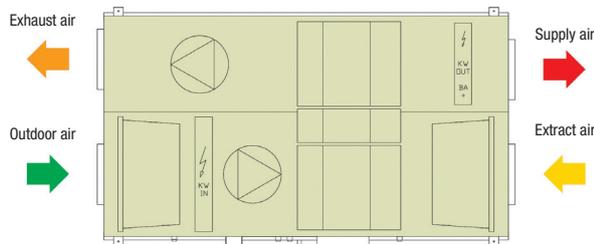


Reco-Boxx ZXR-R

Right hand unit (supply air to the right)

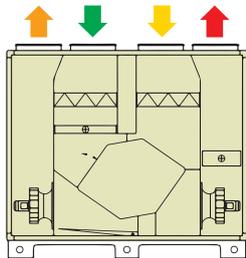


Reco-Boxx ZXR-L



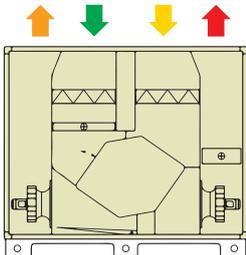
Reco-Boxx Flat-H-R (Top view)

Exhaust air Outdoor air Extract air Supply air

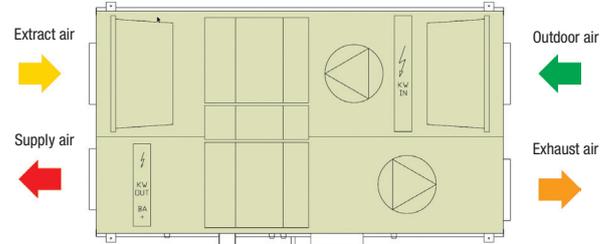


Reco-Boxx ZXA-R 900/1500/1900

Exhaust air Outdoor air Extract air Supply air

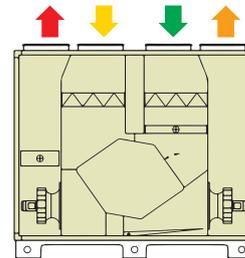


Reco-Boxx ZXA-R 2500/2800/3700



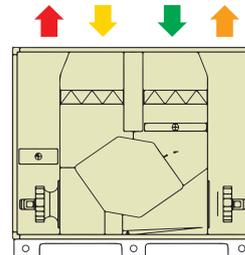
Reco-Boxx Flat-H-L (Top view)

Supply air Extract air Outdoor air Exhaust air



Reco-Boxx ZXA-L 900/1500/1900

Supply air Extract air Outdoor air Exhaust air



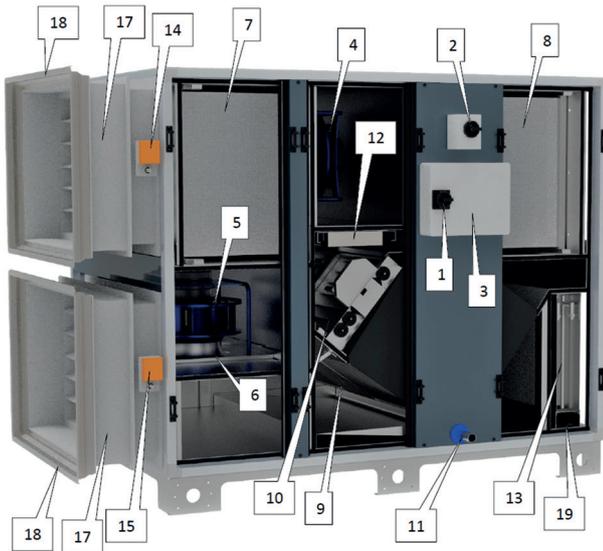
Reco-Boxx ZXA-L 2500/2800/3700

ATTENTION: The difference between left and right Flat units is the factory placement of the controls box on opposite sides.

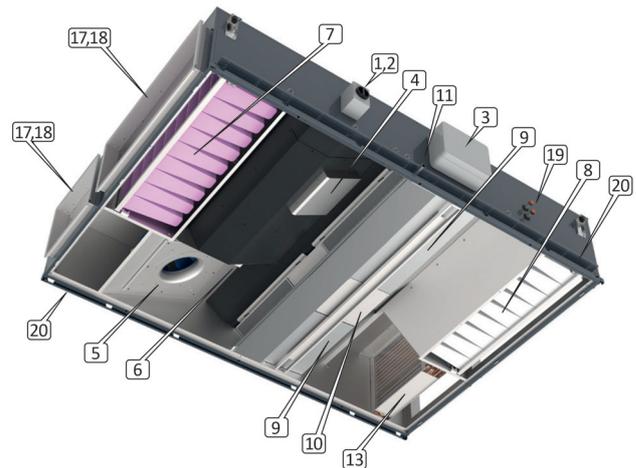


ATTENTION

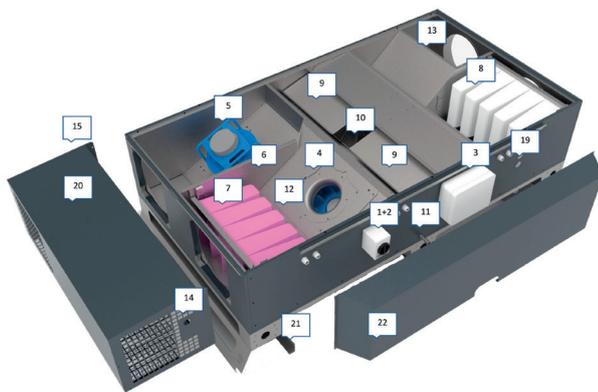
Right and left hand units have different article numbers and should be ordered accordingly. Main version described in the manuals is always the hand right version.



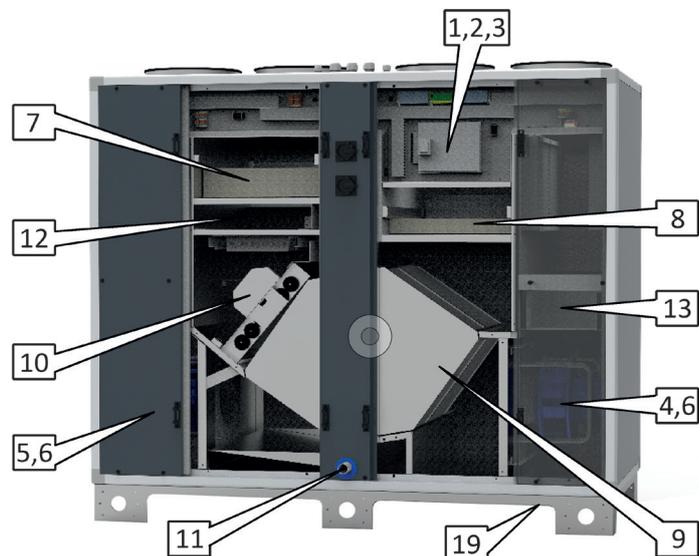
Reco-Boxx ZXR



Reco-Boxx Flat-H



Reco-Boxx Flat-OUT



Reco-Boxx ZXA

NOTE: Illustrations show right-hand version (-R); Left versions (-L) are mirror images.

1. Main switch for power supply AHU
2. Main switch for power supply electrical coils (both internal pre-heating and post-heating)
3. Electrical cabinet
4. Supply fan
5. Extract fan
6. DDM-Set for CA-airflow measurement (option)
7. Outdoor air filter (bag or pleated)
8. Extract air filter (bag or pleated)
9. Heat exchanger
10. Modulating 100% bypass
11. Drain pan and drain pipe

12. Preheating coil (accessory for Counterflow-equipments)
13. Internal post-heating water or electrical coil (accessory)
14. Motorised damper (accessory)
15. Motorised damper (accessory))
16. Access panel (Flat only)
17. Flexible sleeve (accessory)
18. Slip clamp (accessory)
19. Water connection for post-heating (accessory)
20. Box I/O (inlet / outlet)
21. Additional feet 205 mm (accessory)
22. Protection cover

1, 2 and 3 must be installed by a qualified electrician



Note: internal electrical coils, motorised dampers, internal fan-pressure sensors, flexible connections and slip-clamps must ordered and are all pre-installed and factory wired. The internal heating water-coil accessory is pre-installed, but must be connected, hydraulically and electrically, by the installer.

4.2 Air volumes and dimensions



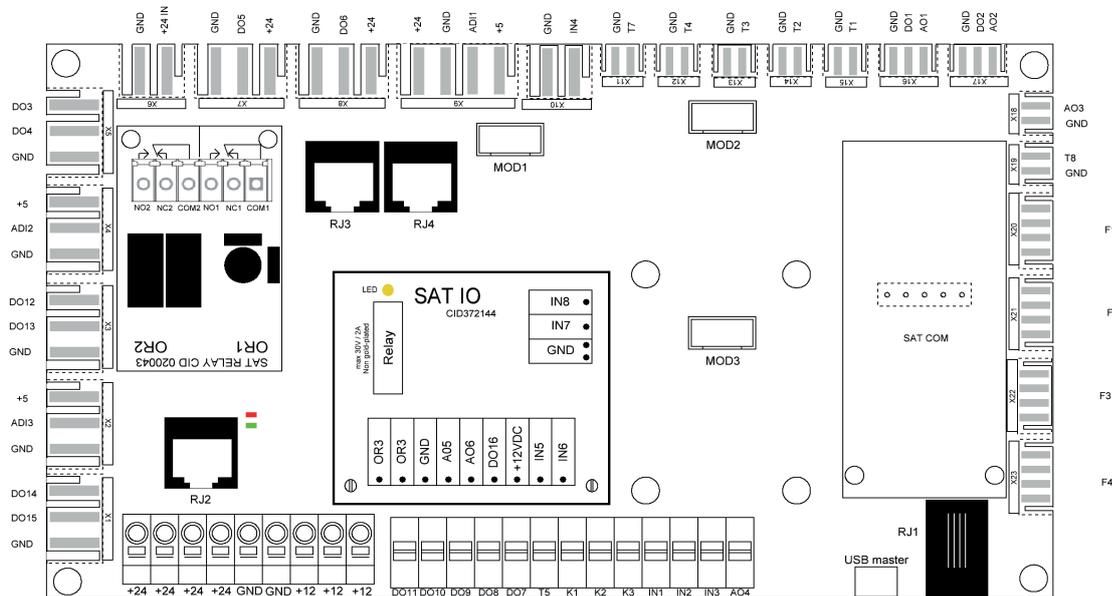
Exchanger	Volumetric flow [m³/h]	Pressure reserve [Pa]	Dimensions (B x H x T) [mm]	Duct connection [mm]	Automatic Bypass valve	Pre / post heating integrable	External, optional heating and / or cooling register controllable
Reco-Boxx 750 ZXR	200–800	800–190	1680x1465x610	DN 315	0–100% modulating	YES	YES
Reco-Boxx 1000 ZXR	200–1050	800–390	1680x1465x610	DN 315	0–100% modulating	YES	YES
Reco-Boxx 1300 ZXR	200–1380	830–420	1680x1465x815	DN 400	0–100% modulating	YES	YES
Reco-Boxx 1600 ZXR	200–1680	830–210	1680x1465x815	DN 400	0–100% modulating	YES	YES
Reco-Boxx 1800 ZXR	250–1860	690–200	1680x1465x995	DN 400	0–100% modulating	YES	YES
Reco-Boxx 2300 ZXR	400–2300	800–420	1680x1465x1182	1060x540	0–100% modulating	YES	YES
Reco-Boxx 2700 ZXR	400–2800	800–240	1680x1465x1182	1060x540	0–100% modulating	YES	YES
Reco-Boxx 2900 ZXR	300–3000	800–230	1680x1465x1382	1265x540	0–100% modulating	YES	YES
Reco-Boxx 3200 ZXR	300–3230	770–200	1680x1465x1640	1520x540	0–100% modulating	YES	YES
Reco-Boxx 4200 ZXR	300–4200	901–290	1880x1465x2015	1895x540	0–100% modulating	YES	YES
Reco-Boxx 4700 ZXR	600–4700	1000–210	2557x1825x1640	1520x670	0–100% modulating	YES	YES
Reco-Boxx 6200 ZXR	600–6260	890–300	2557x1825x2015	1895x670	0–100% modulating	YES	YES
Reco-Boxx 7000 ZXR	600–7000	880–220	2557x1825x2396	2275x670	0–100% modulating	YES	YES

Exchanger	Volumetric flow [m³/h]	Pressure reserve [Pa]	Dimensions (B x H x T) [mm]	Duct connection [mm]	Automatic Bypass valve	Pre / post heating integrable	External, optional heating and / or cooling register controllable
Reco-Boxx 900 ZXA	200–940	380–790	1680 x 1465 x 610	DN 250	0–100% modulating	YES	YES
Reco-Boxx 1500 ZXA	200–1500	300–840	1680 x 1465 x 815	DN 315	0–100% modulating	YES	YES
Reco-Boxx 1900 ZXA	300–1900	300–810	1960 x 1725 x 815	DN 315	0–100% modulating	YES	YES
Reco-Boxx 2500 ZXA	300–2550	280–800	1960 x 1725 x 995	500 x 300	0–100% modulating	YES	YES
Reco-Boxx 2800 ZXA	300–2850	250–850	1960 x 1725 x 1182	600 x 300	0–100% modulating	YES	YES
Reco-Boxx 3700 ZXA	400–3700	360–980	1960 x 1725 x 1382	800 x 300	0–100% modulating	YES	YES

Exchanger	Volumetric flow [m³/h]	Pressure reserve [Pa]	Dimensions (B x H x T) [mm]	Duct connection [mm]	Automatic Bypass valve	Pre / post heating integrable	External, optional heating and / or cooling register controllable
Reco-Boxx 550 Flat-H	100–550	1010–210	1300 x 350 x 890	DN 200	0–100% modulating	YES	YES
Reco-Boxx 650 Flat-H	100–650	1020–180	1300 x 350 x 1100	DN 250	0–100% modulating	YES	YES
Reco-Boxx 1000 Flat-H	200–1000	800–460	2100 x 435 x 1050	DN 315	0–100% modulating	YES	YES
Reco-Boxx 1400 Flat-H/ Flat OUT	400–1400	760–320	2100 x 435 x 1300	DN 315	0–100% modulating	YES	YES
Reco-Boxx 1700 Flat-H/ Flat OUT	400–1800	610–220	2100 x 435 x 1600	Connection on the suction side (AU/AB): 800 x 300 Connection on the pressure side (ZU/FO): 400 x 300	0–100% modulating	YES	YES
Reco-Boxx 2100 Flat-H	400–2200	610–180	2250 x 510 x 1700	Connection on the suction side (AU/AB): 800 x 400 Connection on the pressure side (ZU/FO): 500 x 400	0–100% modulating	YES	YES
Reco-Boxx 2500 Flat-H	400–2550	810–270	2250 x 510 x 1700	Connection on the suction side (AU/AB): 800 x 400 Connection on the pressure side (ZU/FO): 500 x 400	0–100% modulating	YES	YES
Reco-Boxx 2700 Flat-H	400–2850	810–200	2250 x 510 x 1940	Connection on the suction side (AU/AB): 1000 x 400 Connection on the pressure side (ZU/FO): 500 x 400	0–100% modulating	YES	YES
Reco-Boxx 3300 Flat-H	400–3300	770–230	2800 x 660 x 1935	Connection on the suction side (AU/AB): 700 x 500 Connection on the pressure side (ZU/FO): 700 x 500	0–100% modulating	YES	YES
Reco-Boxx 3700 Flat-H	400–3700	1020–360	2800 x 660 x 1935	Connection on the suction side (AU/AB): 700 x 500 Connection on the pressure side (ZU/FO): 700 x 500	0–100% modulating	YES	YES

5.0 Wiring overview

Main control board TAC6 DG [XLEM026006]



AO1 = output 0-10V for external hydraulic postheater (option)	T1 = Afron outdoors T° sensor (prewired)
DO1 = KWout = output PWM for KWout power regulation (option - prewired)	T2 = from indoors T° sensor (prewired)
DO2 = KWIn- PX: output PWM for KWIn power regulation (option - prewired) RX SPEED PWM - RX (prewired)	T3 = to outdoors T° sensor (prewired)
AO2 = RX SPEED 0-10V - RX (option)	T5 = Ssupply T° sensor for IBA/KWout coil (option)
AO3 = 00-10 V output to control cooling capacity	T7 = NV/IBA/EBA anti freeze protection T° sensor (option - prewired for IBA)
AO4 = output 0-10V for internal hydraulic postheater (option - prewired)	T8 = Cooling coil frost protection sensor
DO3 = BYPASS OPEN- PX (with rotary actuator) (prewired)	IN1 = FIRE ALARM
DO4 = BYPASS CLOSE - PX (with rotary actuator) (prewired)	IN2 = BOOST
DO5 = DAMPER 1 (with or without spring return, I _{max} = 0.5A DC) (option - prewired)	IN3 = BYPASS ACTIVATION OVERRIDE
DO6 = DAMPER 2 (with or without spring return, I _{max} = 0.5A DC) (option - prewired)	IN4 = Drain pan full contact (only for LP/OUT Unit - prewired)
DO7 = HEAT OUTPUT (open collector; V _{max} =24 VDC; I _{max} =0,1 A)	K1: Airflow MODE = m ³ /h K1 Demand/Pressure control = START/STOP
DO8 = COOL OUTPUT (open collector; V _{max} =24 VDC; I _{max} =0,1 A)	Torque MODE = %torque K1
DO9 = ALARM OUTPUT (open collector; V _{max} =24 VDC; I _{max} =0,1 A)	K2: Airflow control = m ³ /h K2 Demand/Pressure control = 0-10V INPUT
DO10 = AL dPA OUTPUT (open collector; V _{max} =24 VDC; I _{max} =0,1 A)	Torque control = %torque K2
AD11 = BYPASS POS - PX RX SPEED FEEDBACK - RX (prewired)	K3: Airflow control = m ³ /h K3 Demand/Pressure control = % BEI K3 oder 0-10-V-EINGANG
AD12 = SUPPLY FILTER dPa	Torque control = %torque K3
AD13 = EXTRACT FILTER dPa	
F1 = FAN 1 (SUPPLY)	RJ1 = RJ12 connector for Touchpanel TP Touch (option)
F3 = FAN 3 (EXHAUST)	RJ2 = RJ12 connector for Modbus Pressure CP mode (option)
	RJ3 = RJ12 connector for DDM-Set Modbus Pressure CA mode on supply flow (option - prewired)
SAT COM = SAT MODBUS or SAT KNX or SAT ETHERNET or SAT WIFI - (option)	RJ4 = RJ12 connector for DDM-Set Modbus Pressure CA mode on exhaust flow and defrost detecting (option - prewired)
SAT RELAY: only used for Reco-Boxx Flat, then premounted and prewired	
SAT RELAY OR1 – linear bypass actuator - forward	GREEN LED ON = POWERED ON
SAT RELAY OR2 – linear bypass actuator - backward	RED LED ON = ALARM
	+24 = +24V DC (min: +22V DC; max: +26V DC). 0,8 A max
	+12 = +112V DC (min: +11,49V DC; max: +12,81V DC). 0,3 A max

5.1 Digital outputs

The digital outputs DO7 to DO11 may be used to activate a relay (1 N/O contact. Input voltage: 24 V DC). See figure 1 for example with DO7.: output for heat circulator pump, figure 2 for DO9: output for alarm indication, figure 3 for DO10: pressure alarm indication. Same principle for DO8 and DO11.

Fig. 1

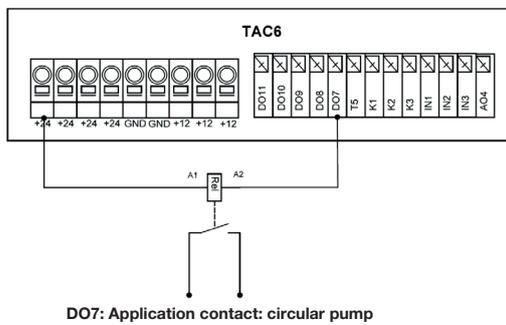


Fig. 2

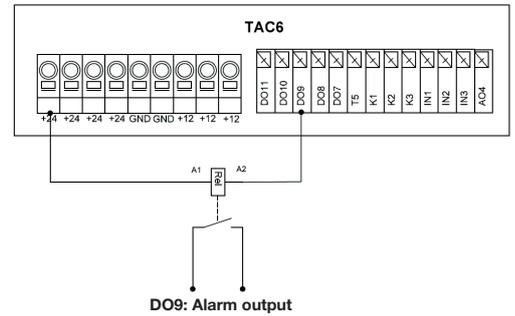
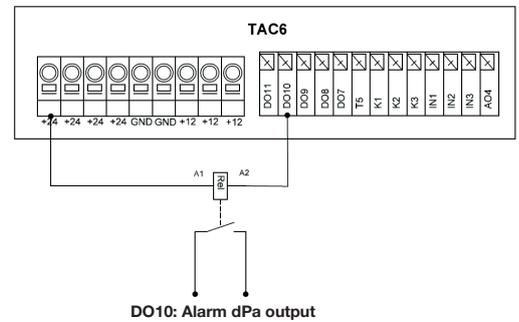


Fig. 3

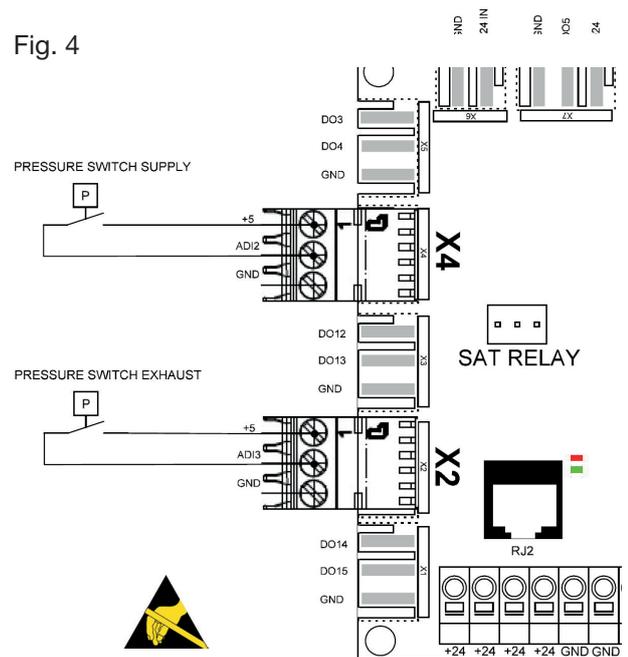


5.2 Pressure switches

In application where pressure switches are used, follow figure 4 wiring, with pressure switch for supply filter connected on X4 and the exhaust one on X2.

N.B.: connectors X2/X4 may be ordered separately (Art.-No. 0041.0164) if other pressure switches are used instead of the ones in the dedicated kit (Art.-No. 0043.0972).

Fig. 4



5.3 Circuit board SAT IO – (Art.-No. 0041.0161)

SAT IO is a satellite circuit designed to be fitted on the main control board. It permits to extend the number of inputs and outputs.

Installation

The SAT IO must be plugged onto the control board circuit (see Fig.5).



Attention: The SAT IO must be plugged in before the circuit is powered. SAT must be plugged in correctly, wrong positioning can damage both circuits permanently.

Fig. 5

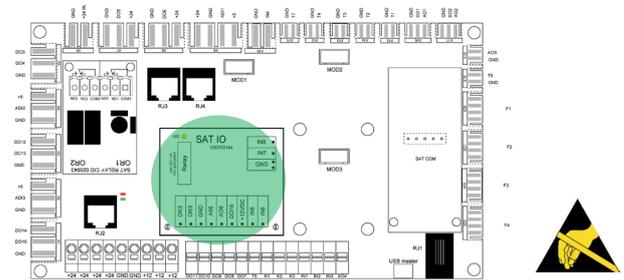
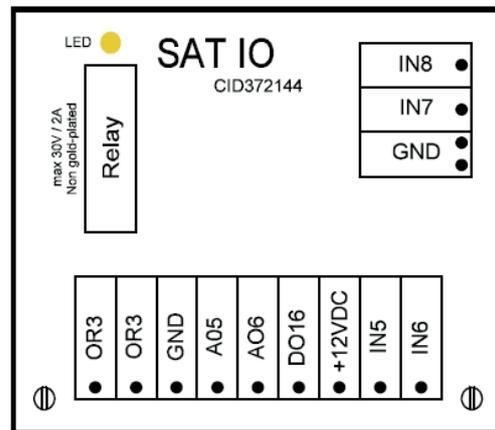


Fig. 5

Wiring

The terminals of the SAT IO are displayed in fig.6

- OR3 OR3** = BYPASS STATUS. Output relay:
30VDC/42VAC max, 2A
DC/2.8A AC max
- A05** = 0-10V OUTPUT (airflow / pressure)
- A06** = 0-10V OUTPUT (airflow / pressure)
- IN5** = MASTER SELECTION
- IN6** = HEAT (open)/COOL (closed)
- IN7** = SUPPLY RUN IN FIRE ALARM (open)
- IN8** = FEXHAUST RUN IN FIRE ALARM (open)



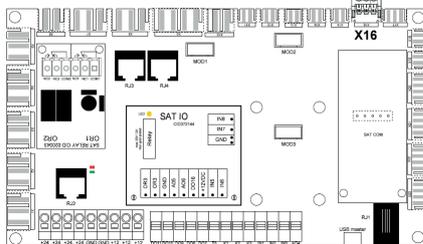
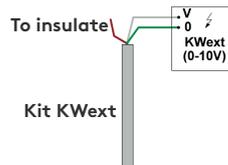
5.4 External coils control

In case of addition of external coil, the kit EBA or KWext will be necessary to connect respectively the EBA (external hydraulic/evaporation/condensation battery) or KWext (external electrical coil) to the control board TAC. Both kits consist simply in extender cable, anyway necessary to reach the external battery, connectorized at the control board side extremity.

Connection cable for external electrical coil (Art.-No. 0041.0163)

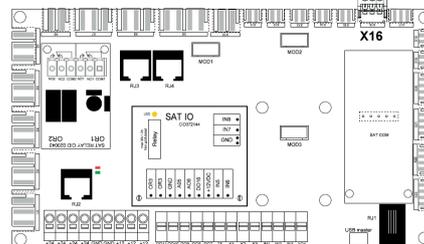
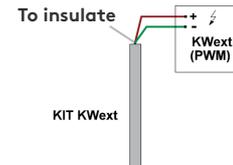
0–10-V-controlled

KIT KWEXT	KWEXT
WHITE	V
GREEN	0
BROWN TO INSULATE	



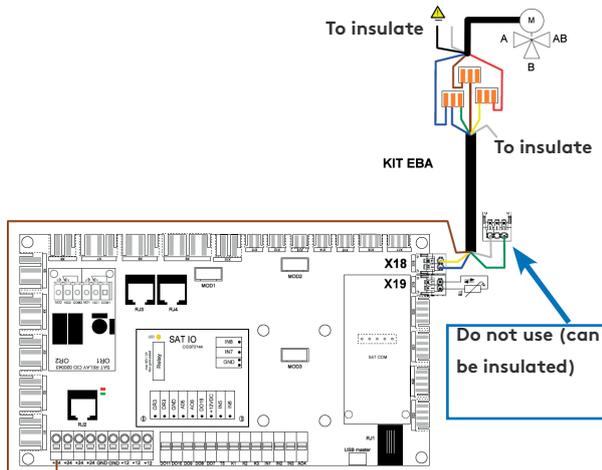
PWM-controlled

KIT KWEXT	KWEXT
BROWN	+
GREEN	-
WHITE TO INSULATE	

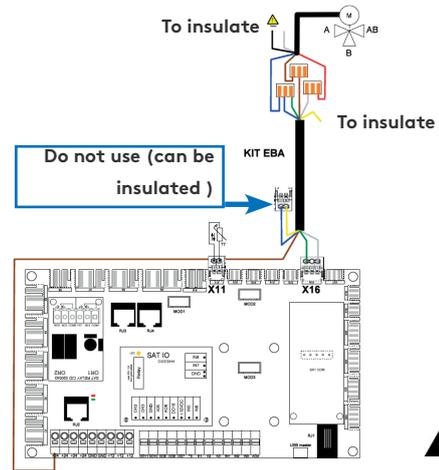


3 WV Connection cable (Art.-No. 0043.2004) for external coil NHKR with EBA (external hydraulic/evaporation/condensation coil)

Cooling / reversible



Heating



M: 3 ways valve servomotor

T8: temperature sensor for the frost protection of the battery.

3 WV Connection cable	M
YELLOW	RED (0–10 V)
BROWN	BROWN (+24 V)
BLUE & GREEN	BLUE (GND)
WHITE TO INSULATE	

M: 3 ways valve servomotor

T7: temperature sensor for the frost protection of the battery.

3 WV Connection cable	M
WHITE	RED (0–10 V)
BROWN	BROWN (+24 V)
BLUE & GREEN	BLUE (GND)
YELLOW TO INSULATE	



6.0 Functions

6.1 Operating mode

There are five main operating modes. The operating mode determines how the airflow or the fan torque is modulated. The default operating mode is Airflow control. Exceptions are units equipped with backwards fans without the Constant Air Kit or if Constant Torque mode has been selected in the product setup menu, in both cases it is the fan torque that will be controlled and modulated.

In all the operating modes, the supply fan(s) will operate as per the assigned mode and parameters. The exhaust fan(s) will operate according to the chosen percentage of the supply fan (%EXH/SUP ratio). The five main operating modes are:

- **1 – Airflow control:**

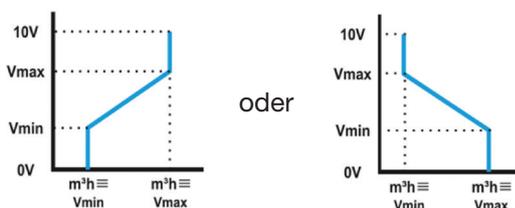
Flow control involves operating the air handling unit to keep the pre-set airflow constant. The speed of the fans is automatically regulated to provide correct airflow even if the filters begin to become clogged, air terminals are blocked, etc. Airflow control mode is advantageous, since the airflow always is exactly as it was from the beginning. It should however be noted that everything that increases the pressure drop in the ventilation system, such as blocking of air terminals and dust accumulating in filters, causes the fans to run at a higher speed. This results in higher power consumption and may also cause discomfort in the form of noise. There are three airflow setpoints to be configured by the user (m h K1, m h K2, m h K3).

- **2 – Torque control:**

3 torque setpoints to be configured by the user (%TQ K1, %TQ K2, %TQ K3). The setpoint is configured in % of the maximal torque.

- **3 – Demand control 0–10 V:**

The airflow is controlled by a 0-10 V signal. The control signal is connected to terminals K2&GND. The assigned supply airflow is set as a percentage of a linear 0-10 V signal. The user defines the link with 4 parameters: V_{min} , V_{max} , $m/h V_{min}$ and $m/h V_{max}$, applied to the following diagram. The demand control mode is also available for modulating fan torque instead of airflow (relevant for backwards fans units without Kit CA). The principle is identical to the demand control mode operation with the difference that V_{min} and V_{max} are connected to a %TQ instead of m/h .



- **4 – Pressure control:**

The airflow automatically varies to provide constant pressure in the ducting system. This type of control is also called VAV control (Variable Air Volume). Pressure on supply: the airflow of the supply fan(s) is modulated to maintain a certain pressure Setting constant. The pressure is measured by a pressure sensor located in the supply air duct. Pressure on exhaust: the airflow of the exhaust fan(s) is modulated to maintain a certain pressure Setting constant. The pressure is measured by a pressure sensor located in the extract air duct.

- **5 - MODE AUS:**

This stops the AHU.

6.2 Temperature control

There are several options available on GLOBAL units to ensure a comfortable temperature. The options are controlled either via supply or extract air temperature.

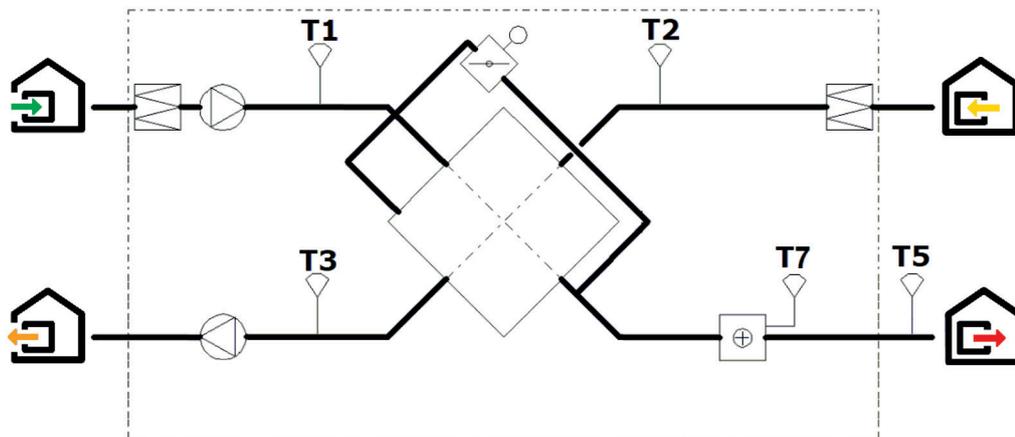
Supply Air Temperature T5

Supply temperature control is the default setting. This involves keeping a constant supply air temperature without consideration to the load in the premises. The supply air temperature is measured on sensor T5.

Extract Air Temperature T2

The default temperature control can be changed to Extract temperature control via the advanced setup. The extract air temperature is measured on sensor T2. Extract air control involves keeping a constant temperature in the extract air duct (premises), by controlling the supply air temperature. This provides a uniform temperature in the premises regardless of the load. The internal sensor T2 can be replaced with the optional external room temperature sensor (Art.-No. 0043.0974).

Temperature sensor positioning :



6.3 Free cooling

The free cooling function uses the lower temperature of the outside air to cool the building.

Free cooling is realized by means of the integrated 100% modulating bypass of the heat exchanger (PX) or the stepless motor control of the rotary heat exchanger (RX). The optional output OR3-OR3 on the SA-TIO relay indicates the position of the bypass. The contact will open if the bypass is fully closed, or close if the bypass is fully or partially open.

The bypass (PX) or the rotary heat exchanger (RX) can be configured as on/off or modulating. This is configured in ADVANCED SETUP. In modulating mode, the temperature is configured in the base setup and the position of the bypass/stepless motor will modulate in order to maintain the setpoint. The free cooling function is activated automatically. An on/off bypass / stepless motor operates according to the logic below:

Free cooling STARTS if the following conditions are TRUE:

- The outdoor temperature (sensor T1) is lower than the extract air temperature (sensor T2)
- The outdoor temperature (sensor T1) is higher than 10 C.
- The extract air temperature (sensor T2) is higher than 22 C.

Free cooling STOPS if one of the following conditions is TRUE:

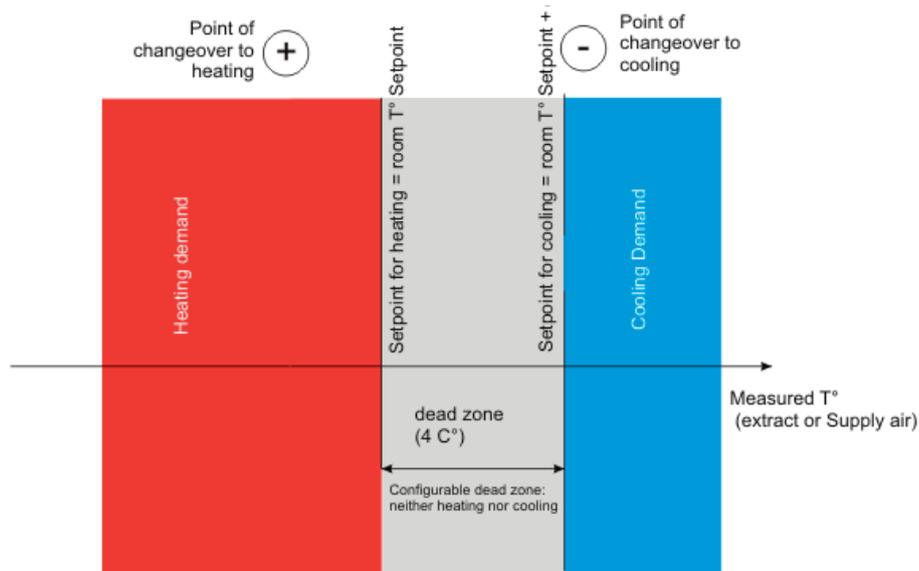
- The outdoor temperature (sensor T1) is higher than the extract air temperature (sensor T2) plus 1 C.
- The outdoor temperature (sensor T1) is lower than 9 C.
- The extract air temperature (sensor T2) is lower than 20 C.

These Settings can be configured in ADVANCED SETUP

6.4 Change over function

AUTOMATIC CHANGE OVER

The TAC controller allows for the control of reversible coil or both cooling and heating coil. The coils are equipped with their motorised 3-way valves. The offset between the measured temperature (supply air or extract air, to be configured) and the setpoint will determine if heating or cooling is automatically activated. When the unit is equipped with reversible coil or with both a cooling and a heating coil, only one setpoint has to be configured: Comfort temperature. The neutral band prevents the cooling and heating systems from counteracting each other. The neutral band is added to the comfort setpoint for the activation of the cooling function. The neutral bands has to be configured in the advanced setup.



6.5 Frost protection

HEATING COIL

The frost protection function is always active if the heating coil has been correctly configured in the product setup. The monitoring function uses the temperature sensor T7 for the integrated coil (IBA) or for the external coil (EBA). The function is activated when the temperature of the coil drops below 4 °C. Under these conditions the pump output is activated and the three-way valve output will be 100% and the unit will shut down and generate a frost alarm.

PLATE HEAT EXCHANGER (PX)

There are three strategies to protect the plate heat exchanger from freezing:

- **1 - Reduced supply air flow:**

The heat exchanger is supplied with a frost protection sensor on the exhaust air (T3). If the exhaust air temperature (T3) is $>1^{\circ}\text{C}$ and $<+5^{\circ}\text{C}$:

- In airflow control mode and demand control, the supply air flow will modulate between 100% and 33% (AFlow) of the setpoint (AFn)
- pressure control mode, the supply air pressure will modulate between 100% and 50% (AFlow) of the setpoint (AFn)

If the exhaust air temperature (T3) is $<1^{\circ}\text{C}$, the supply air fans will stop until the exhaust air temperature (T3) is $>2^{\circ}\text{C}$ for 5 minutes.

- **2 - Modulating bypass:**

The modulating bypass is controlled by the exhaust temperature sensor (T3). If:

- Exhaust temperature (T3) $>+1^{\circ}\text{C}$: bypass closed or controlled by free cooling function
- Exhaust temperature (T3) $\leq +1^{\circ}\text{C}$: bypass will modulate for the exhaust temperature (T3) to exceed $+1^{\circ}\text{C}$.

The corresponding supply air temperature will drop due to a lower airflow through the heat exchanger.

- **3 - Electrical preheating coil (accessory):**

If an electrical pre-heating coil EV (KWin) is installed and configured, the pre-heating coil (KWin) will modulate so the exhaust temperature is $+1^{\circ}\text{C}$.

- **4 - Differential pressure measurement (Cold climate option):**

For cold climate conditions ($\geq -20^{\circ}\text{C}$), the unit is equipped with a differential pressure sensor mounted on the heat exchanger. The pressure sensor detects when the pressure drop, due to frost, has become too high. In critical conditions, the supply air flow will be paused for a short time, to allow for defrosting.

The frost protection strategy (down regulation supply airflow, modulating bypass or electrical pre-heating) will still be used as a first step. The defrost function will only be active if the frost protection strategy is not sufficient.

These Settings can be configured in ADVANCED SETUP

6.6 Time schedule

The controller allows 6 time slots (channels) to be configured. For each day of the week, the operation mode can be either AUTO (operate according to time slots) or manual (selection of speed).

For each time slot select:

- start time
- Operating mode
- Speed selection: I, II, III for CA/TQ, normal/reduced for LS/CP and, for all modes, boost level
- Heating setpoint if postheater is present
- Cooling setpoint if postcooler is present

7.0 Commissioning

As a human machine interface (HMI), several options are available. The HMI will enable access to the control parameters in the integrated controller. The HMI as such does not contain any programming and therefore is not mandatory.

The possible HMIs are:



Touchpanel TP-Touch

This 4.3" touchscreen display is used when there is a need for a graphical HMI. The Touchscreen touch-screen is a complete graphic monitoring system where the screens are designed to be intuitive and complete, ensuring a userfriendly experience.

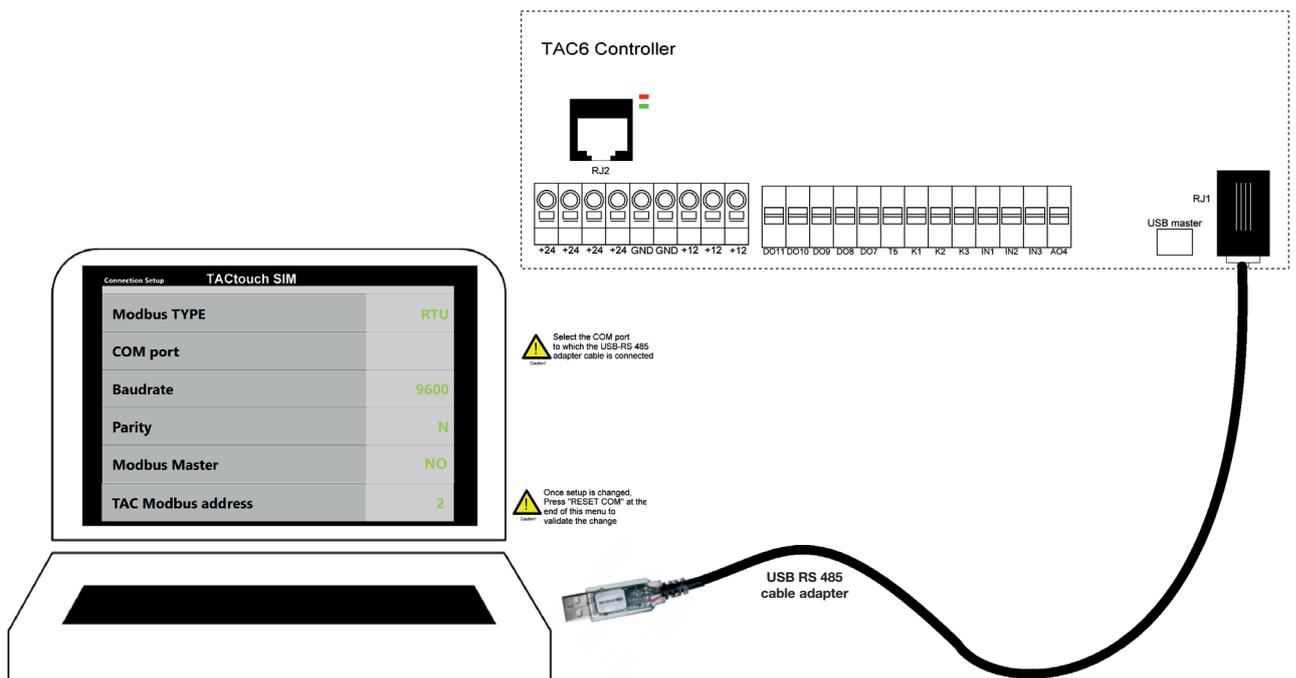


Position switch PCOM4

The most basic interface to control a Reco-Boxx air handling unit is the 4 position switch. This switch will allow to control the unit to its three configured airflow (low, medium and high) and as a fourth position, the unit is switched off.

SOFTWARE-TP-Touch-SIMULATOR

- Total control and configuration of the unit (under Windows 7-8-10).
- USB RS 485 cable adapter required (Art.-No. 0041.0166). Alternatively, can be used with SAT-Ethernet or SAT WIFI extra board.
- Same principle, navigation, menu and commissioning method as TACTouch.



7.1 Commissioning with Touchscreen TP-Touch

The hand-held terminal consists of a 4.3" touch screen with a 1,5 metre long cable for connection to the air handling unit's control circuit board.

If the hand-held terminal is not used for 20 minutes, it switches over to the sleep mode.

The Touchscreen controller can be used outdoors, but it must be kept at a weatherproof place.

Data:

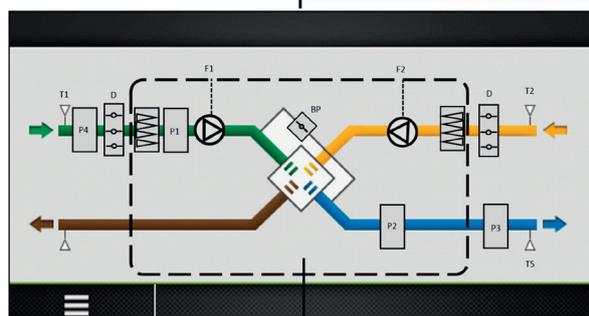
Operating temperature:	0... + 50 C
Maximum length of the cable:	<=100 metres
Protection class:	IP20
Dimensions [mm]:	144x97x20
Power consumption:	1,8 VA

Image management

Start-up image

At the first start up, the basic setup menu will be activated automatically. See section 7.1.3. With also advanced parameter for master selection "contacts K1-K2-K3 master" (see point 7.1.4): set no only if the AHU is to be controlled with TAC-touch control screen rather than with electrical contacts (see point 7.1.2).

After the commissioning, a message box will propose to set date and time and eventually switch automatically to the corresponding screen (see section "Time and Date" at point 7.1.2)



Home Screen. See Section 7.1.1.

By default, the home screen will be shown if no other menu is opened by the user or if selected in the main menu.

N.B.! The appearance of the image varies depending on the type of air handling unit and functions selected.



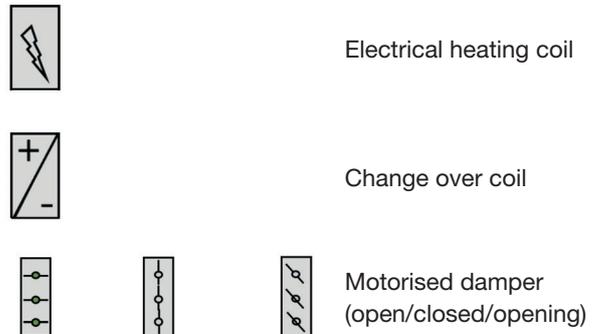
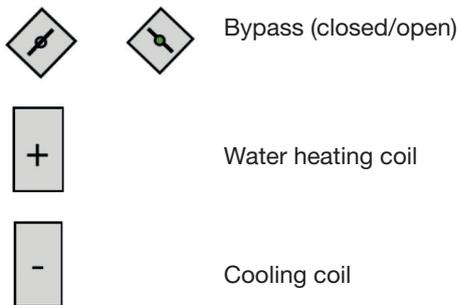
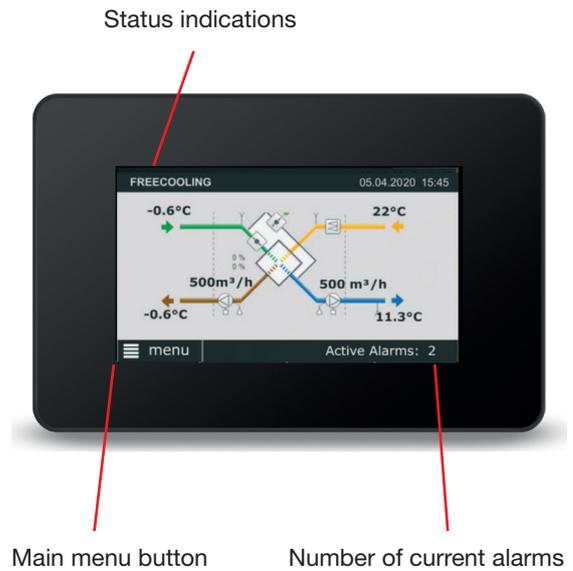
Main menu. See Section 7.1.2.

The main menu is presented as a rotary menu. After pressing the "menu"-button at the bottom left corner of the Home Screen, the rotary menu will be shown.

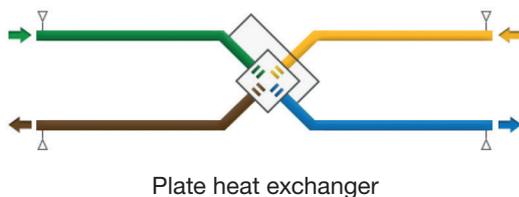
7.1.1 Home screen

The home screen displays the current key data for the air handling unit and is shown normally displayed if no other menu has been selected or if selected from the main menu. The touch screen switches to the sleep mode after 20 minutes. To leave the sleep mode, On the main screen, the fields are:

- **Status indication**
The indicated status are: Heating, Cooling, Post ventilation, Freecooling, Frost protection.
- **Current date and time**
- **Active alarms**
This fields shows the number of current alarms. By clicking on this field, more detailed information about the different alarms is available
- **Menu**
Accessing the main menu, see section 7.1.2
- **Flow Chart**
The flow chart is not editable by the user, the configuration of the activated options and functions is done through the product setup (menu). A code and a special training are desired for access to this menu. The appearance of the image varies depending on the type of air handling unit and its selected functions and/or options. Flow chart symbols:



Flow charts:



7.1.2 Main menu

The main menu consists of a rotary menu with 7 icons.

Control

The control menu will allow for the user to change basic parameters and operation status of the unit.

The unit can be switched on/off

The fan speed can be selected; three manual speeds + one auto speed

Post heating, post cooling and free cooling setpoints can be changed.



Alarm

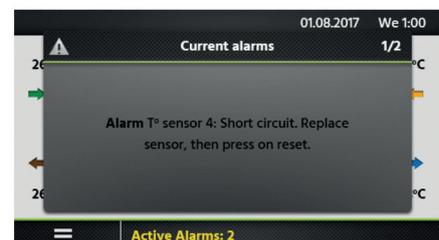
Alarms are displayed on the main screen of the HMI.

Active alarms can be viewed in this menu. All the alarms can be reset.

A fault can be traced by examining the function or functional component indicated in the alarm text. More information about the individual alarms, see section 9.0

If the fault cannot be immediately remedied:

Consider whether the air handling unit can continue to operate until the fault has been remedied.



Time schedule

The built-in timer enables you to control the AHU's operating mode/time. Certain other oversteering functions such as external timer, communication, etc. affect the preset operating modes. The controller allows 6 time slots (channels) to be configured.

Time and date

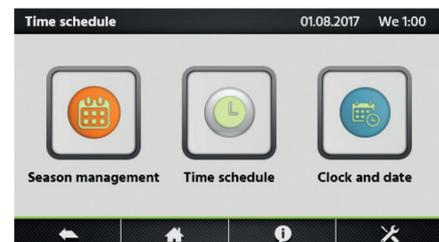
The current date and time must be set and adjusted after the commissioning and later on if needed. The timer automatically takes leap years into consideration.

Time schedule

Times and days can be set when the air handling unit is to run in the high speed mode, medium speed mode, low speed mode or be switched off. For each day (Monday - Sunday), six different time slots can be configured. The time slots are subsequent.

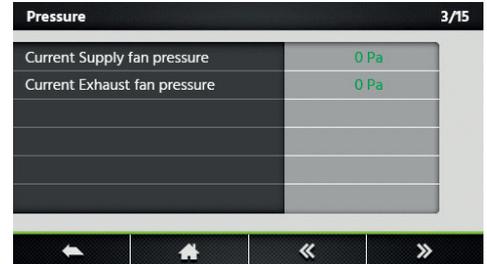
Seasonal management

The seasonal management menu allows for the deactivation of heating coils, cooling coils and bypass freecooling function based upon a year calendar. In between the programmed interval, the selected function is OFF.



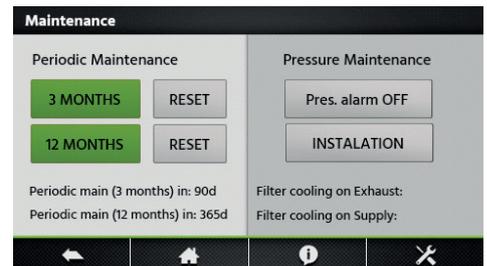
Readings

The operating status and the Settings can be read. Used for performance checks and for generally checking Settings, settings, power consumption, etc. No Settings can be altered in this menu group.



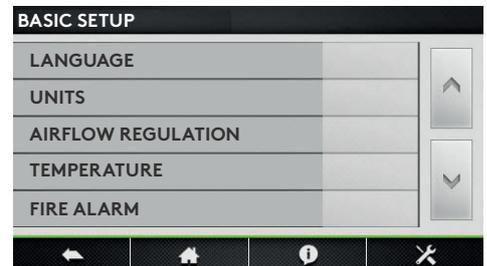
Maintenance

Configuration of service related settings. A maintenance warning interval can be configured as well as the filter clogging alarm.



Settings/Basic Setup

The basic setup menu will guide the user through the most critical settings of the air handling unit. This setup procedure is described in detail, section 7.1.3



Settings/Advanced setup

A code and a special training are desired for access to this menu.



7.1.3 Basic Setup

When the air handling unit is started up for the first time, the commissioning menu is automatically displayed. At the very end of the commissioning (menu) the commissioning of the unit has to be confirmed by the service technician. Once the commissioning has been confirmed, the commissioning menu will not be displayed as first menu any more. The commissioning menu, however, will remain accessible through the advanced setup. See Section 7.1.4.



Language

The language desired can be set here. The language setting can be changed at any time in the basic setup menu.

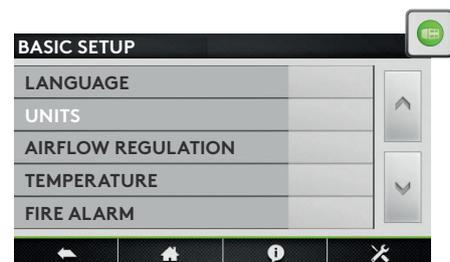
Setting	Settings range	Factory setting
Language	Languages as displayed	English



Units

The desired unit can be set here. The unit setting can be changed at any time in the basic setup menu.

Setting	Settings range	Factory setting
Unit	m ³ /h l/s	m ³ /h



Airflow regulation

The desired control mode can be set here. The setting can be changed at any time in the basic setup menu. Depending on the selected function, flows can be set as (l/s, m³/h), pressure (Pa), input signal strength (%) or torque (%). For both “Airflow control” and “Torque control”, three setpoints are available: Low, medium and high.

Setting	Settings range	Factory setting
Operating mode	OFF Airflow Demand control Pressure Torque	Airflow



Constant airflow

Flow control involves operating the air handling unit to keep the preset airflow constant. The speed of the fans is automatically regulated to provide correct airflow even if the filters become clogged, diffusers are blocked, etc. The exhaust air fan is controlled as a slave. A ratio between exhaust and supply pressure can be configured in order to create over, under or balanced pressure. For units with backward fans, constant airflow can only be selected if the “constant air kit” has been ordered as an option. The desired setpoint is preset in (l/s, m³/h).

Setting	Range	Factory setting
Airflow K1/K2/K3	0...max	
Ratio exhaust/supply	5...999 %	100 %
Enable pressure alarm	No Yes	Yes
ΔP Supply/Exhaust for pressure alarm	25...999 Pa	200 Pa
Initialisation airflow	(l/s, m ³ /h)	
Pressure alarm initialisation	No Yes	Yes

Torque control

3 torque setpoints to be configured by the user (%TQ K1, %TQ K2, %TQ K3). The setpoint is configured in % of the maximal torque. The exhaust air fan is controlled as a slave. A ratio between exhaust and supply pressure can be configured in order to create over, under or balanced pressure. The desired setpoint is preset in %. The Torque control mode can be deactivated in the advanced setup.

Setting	Range	Factory setting
Airflow K1/K2/K3	0...100 %	
Ratio exhaust/supply	5...999 %	100 %

Demand control

The airflow desired is regulated in response to 0-10 V input signals from an external sensor, such as a carbon dioxide or a humidity sensor. The function can be configured with a positive or a negative logic. A ratio between exhaust and supply pressure can be configured in order to create over, under or balanced pressure. The desired setpoint is preset in (l/s, m³/h). The “sleep factor” is a lower operating rate for the unit (due to e.g. low occupancy) that will be activated by speed “III”.

Setting	Range	Factory setting
Vmin	0...10 V	1,0 V
Vmax	0...10 V	10,0 V
m ³ /h ~Vmin	(l/s, m ³ /h)	
m ³ /h ~Vmax	(l/s, m ³ /h)	
Ratio exhaust/supply	5...999 %	100 %
Sleep factor on K3	10...100 %	100 %
Enable pressure alarm	No Yes	Yes
ΔP Supply/Exhaust for pressure alarm	10...999 Pa	200 Pa
Initialisation airflow	(l/s, m ³ /h)	
Pressure alarm initialisation	No Yes	Yes

Constant pressure

The airflow automatically varies to provide constant pressure in the ducting. The duct pressure is measured by an external in-duct pressure sensor which is connected to the control unit’s BUS communication or the an analogue 0...10V input. The function can be configured on supply air, extract air or supply and extract air. The first two configurations will have the second set of fans be controlled as a slave. A ratio between exhaust and supply pressure can be configured in order to create over, under or balanced pressure. The initialisation will allow for an automatic calculated pressure setpoint, determined by the nominal airflow. The “sleep factor” is a lower operating rate for the unit (due to e.g. low occupancy) that will be activated by speed “III”.

Setting	Range	Factory setting
Control	Supply Exhaust Supply+- Exhaust	Supply
Ratio exhaust/supply	5...999 %	100 %
Sleep factor on K3	10...100 %	100 %
Pressure initialisation	Via Airflow Via Pressure	Airflow
Start reference initialisation	Yes No	Yes

Temperature

The temperature control can be configured as a supply air control or an extract air control. By default, this function is configured as a supply air temperature control. Changes to this configuration are done in the advanced setup; see Section 7.1.4

Setting	Settings range	Factory setting
T° Heating	0...45 °C	20,0 °C
T° Cooling	0...99 °C	24,0 °C
T° Freecooling	0...99 °C	15,0 °C

Fire Alarm

An external fire detection system is used to control the air handling unit in case of emergency. The fire alarm function is activated by means of digital input IN1..

Setting	Settings range	Factory setting
Input	Normally open Normally closed	Normally closed
Supply airflow	0...max	
Extract airflow	0...max	

Periodic maintenance

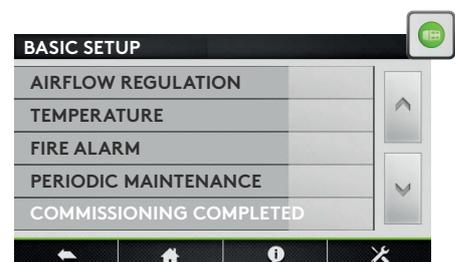
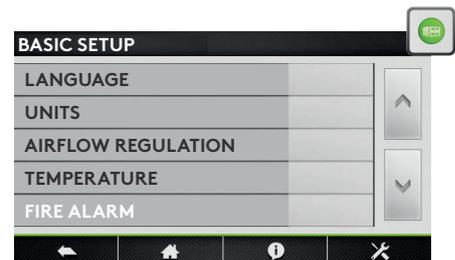
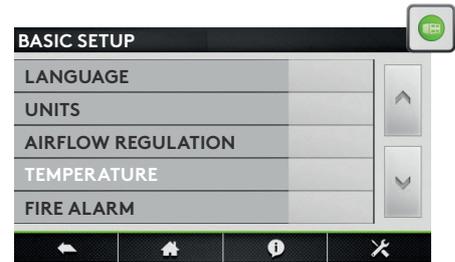
Built-in timer for maintenance warning; if the maintenance interval is exceeded, a maintenance reminder will be displayed.

Setting	Settings range	Factory setting
3 monthly warning	Yes No	No
12 monthly warning	Yes No	Yes

Commissioning completed

When the commissioning has been successful and this is confirmed in this menu, the commissioning menu will not be activated automatically anymore.

Setting	Settings range	Factory setting
Confirmation of successful commissioning	Yes No	No



7.1.4 Advanced setup

N.B.! The appearance and content of this menu varies depending on the type of air handling unit and functions and/or options selected. A code and a special training are needed to access this menu.



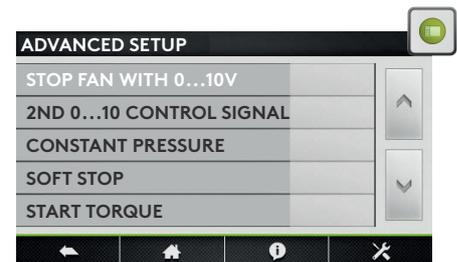
Attention: The settings range for most of the functions is defined for maximal flexibility. The factory setting is the advised setting, deviating from this setting requires careful consideration..



Stop fan with 0...10 V

Function only available if “demand control” function has been selected in basic setup. With this function, the fans can be stopped if the 0...10V control signal is below or above a specified setpoint. The control signal is connected to the analogue input K2.

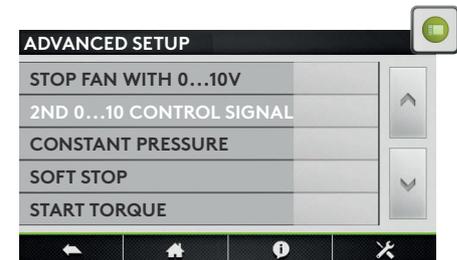
Setting	Settings range	Factory setting
Stop if <Vlow	No Yes	Yes
Vlow	0...10 V	0,8 V
Stop if >Vhigh	No Yes	Yes
Vhigh	0...10 V	10,0 V



Second 0...10V control signal

Function only available if “demand control” function has been selected in basic setup. With this function, a separate 0...10V control signal for the extract air can be activated. The control signal is connected to the analogue input K3.

Setting	Settings range	Factory setting
0...10 V on K3?	No Yes	No
Control	Exhaust Supply	Exhaust



Pressure control

Function only available if “pressure control” function has been selected in basic setup. The reaction speed of the fans for the balancing of the constant pressure system can be modified. A higher Setting will result in a faster reaction speed; a lower Setting will result in a slower reaction speed. The system can be defined as a negative or a positive logic. A negative logic airflow drops when analogue signal on K2 is > than the setpoint.

Setting	Settings range	Factory setting
Reaction speed	0...10	10
Logic	Positive Negative	Negative



Stop fan when pressure alarm

Possibility to stop the fans automatically in case of a pressure alarm.

Setting	Settings range	Factory setting
Stop fans	No Yes	No

Start torque

Possibility to change the fans's starting torque.

Setting	Settings range	Factory setting
Start Torque	0...100 %	2 %

Deactivate softstop

With this function, the "OFF" function is deactivated.

Setting	Settings range	Factory setting
Softstop	Yes No	No

Temperature

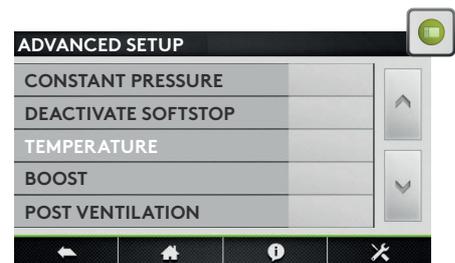
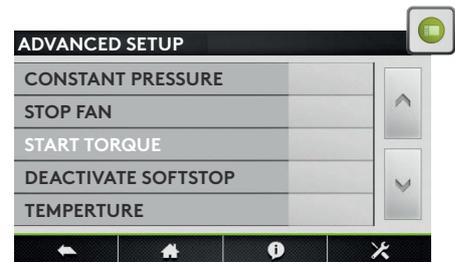
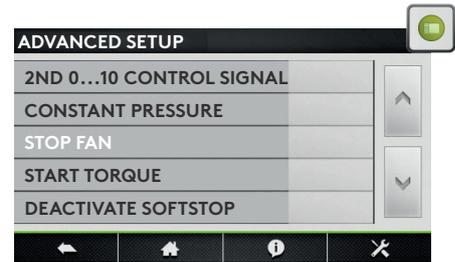
In this menu advanced temperature control parameters can be modified.

Supply air involves keeping a constant supply air temperature without consideration to the load in the premises.

Extract air involves keeping a constant temperature in the extract air duct (premises), by modulating the supply air temperature.

The reaction speed of capacity control signal can be modified. A higher Setting will result in a smoother control; a lower Setting will result in a faster reaction speed. but also greater risc of oscillations.

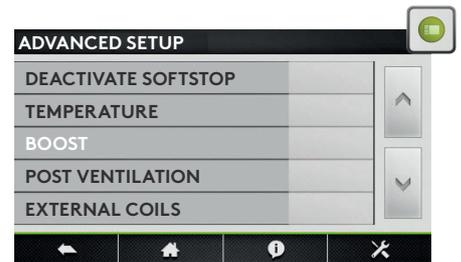
Setting	Settings range	Factory setting
Supply or Extract temperature control?	Supply Extract	Supply
Reaction speed	1...10	1
Supply air, min.	0...20 °C	15,0 °C
Supply air, max.	16...50 °C	28,0 °C
Stop fan if T°Supply <5°C	No Yes	No



Boost

The boost mode can be used to force the supply and extract airflow to a higher setpoint, when specific conditions are met. The boost mode can be activated with a contact connected to the digital input IN2 or by an analogue 0...10V control signal connected to input K3. The boost setpoint is preset in (l/s, m³/h).

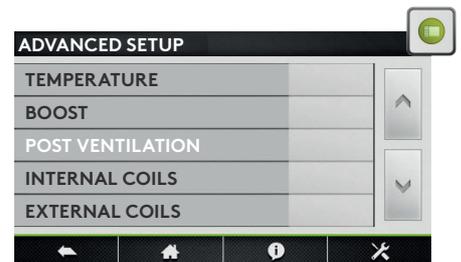
Setting	Settings range	Factory setting
Supply / Extract airflow	0...max	
Boost activation on	Contact RH	Contact
RH on / off	0...100 %	60 % / 40 %
Vmin/max RH on K3	0...10 V	2,0 V / 9,5 V
RH ~Vmin/max	0...100 %	2 % / 95 %



Post ventilation

The post ventilation function is used to keep the fans running during a specified laps of time. This function is activated automatically when an electrical heating coil is activated.

Setting	Settings range	Factory setting
Activation	No Yes	No
Time	0...9999 sec	90 sec



Internal coils

Water preheating coil

By preheating the outdoor air, it is possible to prevent moisture precipitation in the AHU's outdoor air filter, to reduce the risk of frosting in the heat exchanger and to eliminate the risk that pressure sensors and motor control systems are operating in too low ambient temperature. The setpoint is of the exhaust air temperature.

Setting	Settings range	Factory setting
Setpoint	-9,9...99,9 °C	1,0 °C

Electrical preheating coil

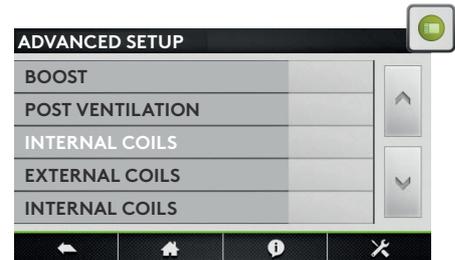
By preheating the outdoor air, it is possible to prevent moisture precipitation in the outdoor air filter of the air handling unit, to reduce the risk of frosting in the heat exchanger and to eliminate the risk that the ambient temperature will drop lower than minimum permissible. The electrical preheating coil is installed and configured in factory. The electrical preheating coil will always have its separate power supply and main switch.

Setting	Settings range	Factory setting
Setpoint	-9,9...99,9 °C	1,0 °C
PID - Proportional Band	0...100	5
PID - Integral	0...100	30
PID - Derivate	0...100	11

Electrical postheating coil

The electrical postheating coil is installed and configured in factory. The electrical postheating coil will always have its separate power supply and main switch. The capacity of the coil will be controlled proportionally in order to keep a temperature as defined by the selected operating mode.

Setting	Settings range	Factory setting
Control mode	Exhaust Supply	Supply
Setpoint	-9,9...99,9 °C	21,0 °C
PID - Proportional Band	0...100	5
PID - Integral	0...100	30
PID - Derivate	0...100	11



Water postheating coil

The water postheating coil is installed and configured in factory. The 3-way valve is not installed and will have to be installed and wired on site. The capacity of the coil will be controlled proportionally in order to keep a temperature as defined by the selected operating mode. The output DO7 is activated whenever heating is desired.

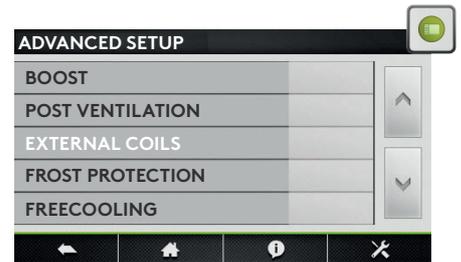
Setting	Settings range	Factory setting
Control mode	Exhaust Supply	Supply
Setpoint	-9,9...99,9 °C	21,0 °C
Reaction Speed	1...10	5

External coils

Configuration of the coils

This menu will allow for the configuration of any combination of external heating and or cooling coil(s).

Setting	Settings range	Factory setting
Type	None Hot water Cold water Hot & Cold water Reversible water Electric PWM Electric PWM + Cold water Water preheating Water preheating+postheating Water preheating+reversible Electric 0...10V Electric 0...10V + Cold water	None



Water post heating

The external post heating coil is delivered separately from the air handling unit and will not be pre configured in factory. Both the coil and the 3-way valve will have to be installed and wired on site. The capacity of the coil will be controlled proportionally in order to keep a temperature as defined by the selected operating mode. The reaction speed can be set. A higher Setting will result in a faster reaction speed; a lower Setting will result in a slower reaction speed.

Setting	Settings range	Factory setting
Control mode	Exhaust Supply	Supply
Setpoint	0...99,9 °C	21,0 °C
Reaction Speed	1...10	5

Water cooling coil

The external post cooling coil is delivered separately from the air handling unit and will not be pre configured in factory. Both the coil and the 3-way valve will have to be installed and wired on site. The capacity of the coil will be controlled proportionally in order to keep a temperature as defined by the selected operating mode.

Setting	Settings range	Factory setting
Control mode	Exhaust Supply	Supply
Setpoint	0...99 °C	17,0 °C
Reaction Speed	1...10	5

Electrical postheating coil

The external post heating coil is delivered separately from the air handling unit and will not be pre configured in factory. The coil will have to be installed and wired on site. The capacity of the coil will be controlled proportionally in order to keep a temperature as defined by the selected operating mode.

Setting	Settings range	Factory setting
Control mode	Exhaust Supply	Supply
Setpoint	0...+99 °C	21,0 °C
PID - Proportion-0...100 al Band		5
PID - Integral	0...100	30
PID - Derivate	0...100	11

Combi coil

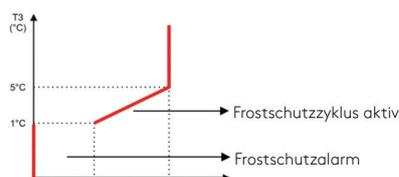
The external change over coil is delivered separately from the air handling unit and will not be pre configured in factory. The coil will have to be installed and wired on site. The capacity of the coil will be controlled proportionally in order to keep a temperature as defined by the selected operating mode.

Setting	Settings range	Factory setting
Activate change over	No Yes	No
Neutral band High	0...+50 °C	4K
Neutral band Low	0...+50 °C	2K

Frost protection

Frost protection plate heat exchangers (PX)

In environments where the extract air can occasionally be humid, the defrosting function can be activated to protect the heat exchanger from frosting. There are four strategies: down control of the supply air volume, modulating by-pass control, modulation of capacity of a preheating coil, differential pressure measurement (cold climate option). If non of these measures are effective, the air handling unit can be stopped by limiting the minimal supply air temperature. When the Frost protection cycle is active, it will be indicated on the HMI. The configurable temperatures are outdoor temperatures.



Setting	Settings range	Factory setting
T° Low	1...3 °C	+1,0 °C
T° High	1...5 °C	+5,0 °C
Stop supply airflow	No	Yes
	Yes	

Frost protection heating and cooling coils

The water coils are always protected against freezing by an anti-frost temperature sensor. This sensor is mounted on the surface of the water coil. When the anti-frost protection temperature of the hydraulic coil detects a temperature lower than 4°C (default), the pump contact is closed and the 3 way valve is opened 100% during 15 minutes. If the unit is running, the alarm is activated immediately. For a water preheating coil, the frost alarm is delayed by 2 minutes. If frost protection conditions occur when the air handling unit is OFF, the alarm is delayed by 5 minutes.

Setting	Settings range	Factory setting
Internal heating coil	-10...+10 °C	+4,0 °C
External heating coil	-10...+10 °C	+4,0 °C
External cooling coil	-10...+10 °C	+4,0 °C
Internal preheating coil	-10...+10 °C	+4,0 °C

Freecooling

The bypass on the Reco-Boxx product range, can be configured for freecooling. The main parameters to activate the free cooling function are the outside temperature (T1) and the extract (room) air temperature (T2). When there is maximal freecooling possibility the bypass will be 100% open. The 100% opened bypass can activate the configurable freecooling airflow.

Setting	Settings range	Factory setting
Outdoor T°	0...27 °C	0,0 °C
Extract/Room T°	6...28 °C	22,0 °C
Supply airflow	(l/s, m³/h)	
Extract airflow	(l/s, m³/h)	
Bypass control	Frost protection	Freecooling
	Freecooling	
	Frost protection & free cooling	

Modbus configuration

The MODBUS RTU communication requires an additional satellite circuit (Art.-No. 0041.0136) which is used as communication interface. The communication protocol used is MODBUS RTU, RS485.

Setting	Settings range	Factory setting
Adress	1...247	1
Baudrate	1200	9600
	4800	
	9600	
	19200	
Parity	No	No
	Yes	

LAN configuration (Modbus TCP/IP)

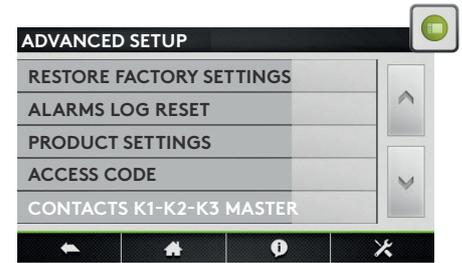
The MODBUS TCP/IP communication requires an additional satellite circuit (Art.-No. 0043.0398) which is used as communication interface. The communication protocol used is Modbus TCP/IP on Ethernet network over twisted pair 10 BASE T/100Base-TX IEEE 802.3.

Setting	Settings range	Factory setting
IP configuration	DHCP	Manual
	Manual	
IP adress		192.168.1.1
Netmask		255.255.255.0
Gatway		0.0.0.0

Operating time

For maintenance purposes, operating timers can be activated. If the “service alarm time” or the “Stop fan” timers are triggered, the according alarm will be shown and the unit will switch to “OFF”-mode.

Setting	Settings range	Factory setting
Reset timer	No	No
	Yes	
Fan run time activation	No	No
	Yes	
Display time	No	No
	Yes	
Service alarm time	0...999999 h	0 h
Stop fan	0...999999 h	0 h



Restore Factory settings

Allows to restore the factory settings.

Alarms log reset

Reset of the alarm log history.

Product Settings

Enables the product settings button in the settings menu.

Access Code

Management of the 4 digits numerical codes to access basic, advanced and product setup. If the basic code is set, then operation on control and time schedules screens will be limited too.

Contacts K1-K2-K3 Master

Set this parameter to control the unit with electrical contacts K1-K2-K3 instead of the speed selection buttons of the control screen.

Save Values on SD card

This parameter appears only if there is a micro SD card inserted into the slot of the TACtouch. If set, then status, control variables and parameters are saved on the micro SD card and appended in a CSV format file named “TAClog”.

8.0 Preventive maintenance



ATTENTION: before handling and/or opening the access panels it is compulsory to shut down the unit and disconnect the power supply using the general switch located on the front panel. Do not isolate the power supply whilst the unit is running. If EV (KWin) and/or EN (KWout) are installed, then isolate the corresponding power supplies.

Regular maintenance is essential to guarantee good operation of the air handling unit and a long service life. The maintenance frequency will depend on the application and on the actual environment conditions but the following are general guidelines:

8.1 Once the unit operates in normal condition

Replace the filters with a kit of replacement filters.

8.2 Every 3 months

- Check for any alarms indicated on the control device. In case of an alarm refer to troubleshooting section.
- Check the state of filter clogging. The control device allows a pre-defined 'filter alarm' threshold to be set.
Replace filters if necessary. Filters that are too clogged can generate the following problems:
 - Insufficient ventilation.
 - Excessive increase of fan rotation speed.
 - Excessive sound levels.
 - Excessive power consumption (power consumption will increase exponentially to an increase in pressure drop, for a constant airflow).
 - Unfiltered air passing through the heat exchanger (risk of clogging) and into ventilated rooms.

The list of replacement filter kits for each unit can be downloaded from our website.

- To locate the filter, refer to schemas on page 9 to 14.
- Inspection and cleaning of the inside of the unit:
 - Vacuum clean any accumulations of dust in the unit.
 - Inspect and gently vacuum clean the heat exchanger if necessary. Use a brush to protect the fins.
 - Clean any condensation stains.
 - For PX units, clean any accumulations in the drain pan.

8.3 Every 12 months

1. For plate heat exchanger (PX) units

- Clean the drain pan
- Clean the inside of the bypass. To access the interior of the bypass it is necessary to force it open, proceed as follows: place a jumper between terminals IN3 and +12V on the TAC circuit board. The bypass is now open, regardless of the temperature conditions.
- Remember to remove the jumper between terminals IN3 and +12V once cleaning of bypass is done.
- Always clean against the direction of the airflow.
- Cleaning must only be done by blowing with compressed air, vacuum cleaning with a soft nozzle or through wet cleaning with water and/or solvent. Before you begin cleaning, cover adjacent functional sections to protect them. If cleaning solvent is used, do not use solvent that will corrode aluminium or copper.

2. Fan maintenance:

Check again whether the power supply is shut down and fans are not running.

Inspect and clean the fan impellers to remove any dirt deposits, be careful not to alter the impeller balance (do not remove balancing clips). Check the impeller to make sure that it is not out of balance. Clean or brush off the fan motor. It can also be cleaned by carefully wiping it with a damp cloth that has been dipped in a solution of water and detergent. Clean the fan space, if needed. Remove the fans if necessary.

3. Check seals on the unit:

Ensure that the side access panels are fully closed and that the seals are intact. Replace if necessary.

9.0 Troubleshooting

The control board generates and reports 22 types of alarms.

The alarms are subdivided into auto resetting and non-auto resetting alarms. For the latter, a reset will be necessary once the problem has been resolved.

For each type of alarm, a full text description will be displayed on the user interface depending on the alarm type, together with a symbol indicating its level:



highest level 3: severe alarm



level 2: warning



information symbol for level 1 and 0: information. Lowest 0 level alarms may be hidden thanks to the parameter «Hide low level alarms» in Settings/TACtouch setup

- Activation of alarm output (see point 4.1, figure 2)
- Activation of pressure alarm output in case of pressure alarm (see point 4.1, figure 3).
- “Alarm” activated LED’s on control board
- Alarm on user interface
- Alarm communication with networking modules provided that an optional communication module (Modbus RTU, MODBUS TCP/IP, and KNX) is installed on the TAC control board.

9.1 Type 1: Alarm indicating a fan failure

- Conditions:
- Causes:
 - Failure of fan Fx. This problem is usually caused by the fan motor.
If not, the failure may be caused by an internal cable (control or power) or by the circuit.
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
B.11	Fan 1 failure	3
B.12	Fan 2 failure	3
B.13	Fan 3 failure	3
B.14	Fan 4 failure	3

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	stopped
Auto reset: no			

Diagnostic:

- If both fans are in alarms: check power supply on each fan.
- If only one fan is in alarm, invert the fans control cables on the control board and reset the board: if the alarm text indicates now the other fan, the problem is located at the fan level originally indicated as faulty, or at its control cable itself or the wiring of this last one at fan connector side. Otherwise, if the alarm text indicates the same fan, then the control board is probably faulty due to input or output failure.

9.2 Type 2: Alarm on the pressure variation

- Conditions:
 - Mode airflow control or demand control. Unit must have forward fans or backward fans with DDM kit.
 - External pressostat connected on ADI2 OR ADI3 input
- Causes:
 - Pressure alarm setup in airflow control or demand control mode
 - External pressostat connected on ADI2 OR ADI3 input has triggered
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
P.10	Pressure alarm - Supply air	2
P.15	Pressure alarm - Extract air	2
S.40	Pressure alarm from Pressure Switch*	2

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
/	Alarm Status	ON	Run*
Auto reset: yes			

* unless the status has been changed in advanced setup

9.3 Type 3: Alarm report during reference pressure initialization

- Conditions:
 - Mode Airflow control or Demand control: during the initialization of the pressure alarm. In this case, the unit must have forward fans or backward fans with DDM kit.
 - Mode Pressure control: during the initialization of the pressure reference via airflow
- Causes:

The reference pressure (Paref) cannot be identified and the fans are stopped. 4 possibilities:

 1. Actual airflow < requested airflow: The requested working point is 'too high' (too high pressure loss) for the maximal available pressure at the requested airflow for this fan.
 2. Actual airflow > requested airflow: the nominal airflow requested to initialize the pressure alarm cannot be reached because the lower limit of the fan's operating zone has been reached.
 3. Very unstable pressure (pumping).
 4. Assigned airflow not reached after 3 minutes.

If this occurs during initializing an alarm pressure, there are 2 options:

1. No action is taken: the control will operate without a pressure alarm.
2. Corrective action is taken (change the working point to one located in the working zone of the fan, by reducing the pressure system, modifying the nominal airflow...) and restart the setup operation.

If this occurs during initializing of the assignment pressure in pressure control mode: Corrective action must be taken (change the working point to one located in the working zone of the fan, by reducing the pressure system, modifying the nominal airflow ...) and restart the setup operation.

- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
P.20	Initialisation of the reference pressure – Unstable supply air pressure	2
P.21	Initialisation of the reference pressure – Unstable extract air pressure	2
P.22	Initialisation of the reference pressure – Supply air flow too low	2
P.23	Initialisation of the reference pressure – Extract air flow too low	2
P.24	Initialisation of the reference pressure – Supply air flow not reached	2
P.25	Initialisation of the reference pressure – Extract air flow not reached	2
P.26	Initialisation of the reference pressure – Supply air flow too high - Min. limit of the motor	2
P.27	Initialisation of the reference pressure – Extract air flow too high - Min. limit of the motor	2

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	stopped
Auto reset: no			

9.4 Type 4: Alarm indicating the system cannot fulfil the setpoint

- Conditions:
- Causes:
 - The setpoint cannot be fulfilled because the upper or lower limit of the fan’s working zone has been reached
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
S.11	“Constant Pressure” fan 1 – Measured pressure too high – Minimum air flow reached	2
S.12	“Constant Pressure” fan 1 – Measured pressure too low – Maximum air flow reached	2
S.13	“Constant Pressure” fan 3 – Measured pressure too high – Minimum air flow reached	2
S.14	“Constant Pressure” fan 3 – Measured pressure too low – Maximum air flow reached	2
S.20	„Demand control” fan 1 – Air flow too low – Reduce the pressure on this fan	2
S.21	“Demand control” fan 1 – Air flow too high – Minimum limit of the motor reached	2
S.22	“Demand control” fan 2 – Air flow too low – Reduce the pressure on this fan	2
S.23	“Demand control” fan 2 – Air flow too high – Minimum limit of the motor reached	2
S.24	“Demand control” fan 3 – Air flow too low – Reduce the pressure on this fan	2
S.25	“Demand control” fan 2 – Air flow too high – Minimum limit of the motor reached	2
S.34	“Constant Air Flow” fan 3 – Air flow too low – Reduce the pressure on this fan	2
S.35	“Constant Air Flow” fan 3 – Air flow too high – Minimum limit of the motor reached	2

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
/	/	ON	/
Auto reset: yes			

9.5 Type 5: Alarm indicating a data failure in the control circuit

- Conditions:
- Causes:
 - Crucial data from the circuit board has been lost
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
D.10	Programme Error	3
D.20	Data Error	3

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	stopped
Auto reset: no			

- Solutions:
 - Try a TOTAL RESET of the data using the advanced setup. If still not resolved, order a new circuit board.

9.6 Type 6: Fire alarm

- Conditions:
 - Fire alarm input must be connected to a fire detection system
- Causes:
 - Activation of fire alarm input, IN3, connected to a fire detection system.
IN3 can be configured to work as NO open contact by default or as NC if configured so in the advanced setup.
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
F.10	FIRE ALARM	3
F.11	End of the fire alarm	3

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	*
Auto reset: no			

* The fans are stopped by default in the event of a fire alarm but, via the advanced setup, it is possible to configure a fixed airflow for supply (contact IN7 needs to be closed) and for exhaust (contact IN8 needs to be closed).

9.7 Type 7: Maintenance alarm

- Conditions:
 - The running hours feature must be enabled in advanced setup.
- Causes:
 - SERVICE ALARM: the fan operating time (in hours) has exceeded the configurable threshold.
 - STOP FAN: the fan operating time (in hours) has exceeded the configurable threshold. This alarm stops the fans.
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
M.21	Operating hours	2
M.22	Operating hours - AHU off	3

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	Stopped if SERVICE STOP FAN*
Reset via "fan run time" in advanced settings			

* unless the status has been changed in advanced setup

9.8 Type 8: Alarm indicating a T° sensor T1/T2/T3/T4 failure

- Conditions:
- Causes:
 - One or more of the T° sensors T1/T2/T3/T4 connected to the TAC circuit and mounted on heat exchanger is defect or not connected. These sensors are needed for the bypass control and the anti-frost procedure.
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
T.10	Sensor T1 disconnected	3
T.11	Sensor T1 short circuit	3
T.20	Sensor T2 disconnected	3
T.21	Sensor T2 short circuit	3
T.30	Sensor T3 disconnected	3
T.31	Sensor T3 short circuit	3
T.40	Sensor T4 disconnected	3
T.41	Sensor T4 short circuit	3

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	Stopped
Manual reset mandatory.			

9.9 Type 9: Alarm indicating failure on T° sensor T7

- Conditions:
 - Only with water heating coil (IBA or EBA) option
- Causes:
 - T° sensor T7 located on the coil and connected to the TAC circuit is defective (open or short circuit) or not connected.
This is used to prevent frosting of the internal or external heating coil. In this case, as a safety measure, the 3-way valve is opened and the circulator contact is closed.
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
T.40	Sensor T4 disconnected	3
T.41	Sensor T4 short circuit	3

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	/
Manual reset mandatory.			

9.10 Type 10: Drain pump alarm

- Conditions:
 - Only for AEREX Flat- H / Flat OUT
- Causes:
 - The level of condensate is higher than a set Setting (approx. 1.5 cm).
It can also be activated if the pump is not present or defective
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
R.10	Condensate tray full	3

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	Stopped if SERVICE STOP FAN
Auto reset: yes			

When activated, the supply and exhaust fans are stopped. This alarm is automatically reset when the water level in the drain pan is lower than the setpoint, and the fans restart automatically.

9.11 Type 11: Alarm indicating failure on T° sensor T5

- Conditions:
 - Only with post-heating, post-cooling or free cooling with heat wheel or modulating bypass option.
- Causes:
 - T° sensor T5 located in the supply duct and connected to the TAC circuit is open, or short-circuited. This sensor is used to regulate the post-heating or post-cooling function in the case of comfort T° control on T5 or to control the high and low thresholds to limit the supply air temperature in the case of comfort T° control on T2.
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
T.50	Sensor T5 disconnected	3
T.51	Sensor T5 short circuit	3

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	/
Manual reset mandatory.			

9.12 Type 12: Alarm indicating that the comfort T° is too low relative to setpoint T°

- Conditions:
 - Only with post-heating option.
- Causes:
 - The comfort T° setpoint cannot be reached (actual T° lower than setpoint during 15 minutes, or 30 minutes if comfort on T2 instead of T5, while post heating is at maximum.)
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
S.50	Post-heating - T° of the supply air too low	0

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
/	/	ON	/

Auto reset: yes

9.13 Type 13: Alarm indicating heat exchanger frost protection alert

- Conditions:
 - Only with post-heating option.
- Causes:
 - Frost protection is only selected with electrical pre-heating coil (KWin) or water preheating coil (BAin) or modulating bypass. With KWin or BAin option: In certain air T conditions as measured on the exhaust airflow after heat recovery, indicating that the internal electrical KWin coil or external hydraulic coil (BAin) has reached its limit, the TAC control can take over to guarantee the anti-frost function.
 If T° < assignment T -1,5 C for more than 5 minutes: supply and exhaust airflow reduction of 33% if airflow control or demand control and of 25%.
 If pressure control mode, for 15 minutes.
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
A.10	Anti-freeze - Reduced air flows	2

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
/	/	ON	/

Auto reset: yes

9.14 Type 14: Alarm indicating frost protection alert – fans stopped T°

- Conditions:
 - Frost protection is only selected for PX units with electrical preheating (KWin) or water preheating (BAin) or if modulating bypass.
- Causes:
 - With KWin or BAin option: in certain air T° conditions as measured on the exhaust airflow after the heat recovery, indicating that the internal electrical KWin coil or external hydraulic coil (BAin) has reached its limit, the TAC control can take over to guarantee the anti-frost function.
If T° < -5 C during 5 minutes, fans are stopped.
 - With modulating bypass in frost protection (A-FREEZE or AF+FREECOOL in the advanced setup), this alarm indicates that the extracted air temperature at the exchanger output (T3 sensor) has not exceeded 1 C during 15 minutes after that the bypass has been opened at 100%.
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
A.11	Anti-freeze - Fans stopped	3

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	stopped
Manual reset mandatory.			

9.15 Type 15: Alarm indicating that the comfort T° is too high relative to setpoint T°

- Conditions:
 - Only with post cooling option.
- Causes:
 - The comfort T° setpoint cannot be reached (actual T° lower than setpoint during 15 minutes, or 30 minutes if comfort on T2 instead of T5, while post cooling is at maximum).
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
S.60	Post-cooling - T° of the supply air too high	0

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
/	/	ON	/
Auto reset: yes			

9.16 Type 16: Alarm indicating that the supply T° is too low

- Conditions:
 - Only with post heating or cooling option.
- Causes:
 - This alarm indicates that the supply temperature (T5) is lower than 5°C. The fans are stopped for 1 minute. The alarm is configurable through the advanced setup and is disabled by default.
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
S.50	Post-heating - T° of the supply air too low	0
S.65	Supply air T° too low - Fan stopped	3

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	stopped
Manual reset mandatory.			

9.17 Type 17: Alarm indicating hydraulic coils frost protection alert

- Conditions:
 - Only with internal hydraulic post heating coil (IBA), or external heating coil (EBA).
- Causes:
 - Indicates that the anti-frost protection temperature of the hydraulic coil is lower than 4°C (configurable through advanced setup, it is important to reduce this Setting for BAin coil if an antifreeze is in the fluid). The 3-way valve is automatically opened at 100% for 15 minutes and the heating demand contact is closed (output SAT3 O.R.3). If the AHU is running, the alarm is sent after 2 minutes for a preheating coil and immediately for the others; if the AHU is not running, the alarm is sent after 5 minutes.
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
A.40	Anti-freeze protection of the internal post-heater (IBA)	3
A.41	Anti-freeze protection of the waterborne post-heater (EBA+)	3
A.42	Anti-freeze protection of the waterborne post-cooler (EBA-)	3
A.43	Anti-freeze protection of the waterborne reversible coil (EBA+-)	3

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	stopped
Manual reset mandatory.			

9.18 Type 18: Alarm indicating an incorrect position of the modulating bypass relative to the ordered position

- Conditions:
 - PX units with modulating bypass.
- Causes:
 - This alarm indicates that the modulating bypass has not reached the ordered position within 10 seconds. The most common reason for this is a damaged position sensor on the bypass actuator, and this must be replaced. Other reasons may be that the control board output is damaged, implying the replacement of the board, or a mechanical blocking verified by a visual inspection of the bypass.
- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
B.20	Position of the modulating bypass incorrect	3

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm Status	/	ON	stopped
Manual reset mandatory.			

Diagnostic:

Stop the unit, do an alarm reset, check and eventually correct actuator wiring to the control board and then check that the bypass can move physically: connect IN3 to +12V to force the bypass to open.

- If the bypass stays in close position, check if there is some mechanical obstruction that makes the actuator stuck, otherwise:
 - Either the actuator must be replaced.
 - Or the control board must be replaced.
- If the bypass opens completely:
 - Do several Close/open cycle using IN3 to try to reproduce the alarm and check bypass position in info menu. If the problem cannot be reproduced, try with fans boosting.
 - Either the actuator must be replaced.
 - Or the control board must be replaced.

9.19 Type 19: Alarm indicating that the hours limit for the maintenance of the filters has been reached

- Conditions:
 - The hours limit must be configured with a value greater than 0..
- Causes:
 - The hours limit for the minor maintenance has been reached.

The instructions in this manual of the unit for the 3 months maintenance should be followed. Mainly, the filters should be cleaned or replaced.

Reset the hours for minor maintenance after this operation, this will reset automatically the alarm and give it again after the same period.

- Effects:

Displayed on Touchpanel			
Code	Text displayed	Level	
M.10	NOR MAINTENANCE ALARM	1	

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
/	/	ON	/

Auto reset: via dedicated reset

9.20 ype 20: Alarm indicating that the defrost process is active

- Conditions:
 - GUnit with counter flow heat exchanger.
- Causes:
 - The ice forming inside of the plate heat exchanger is generating a pressure drop that is too high for the current airflow. This detection requires a Modbus pressure sensor (Art.-No. 0043.1119 (Reco-Boxx ZXR/ZXA); (Art.-No. 0043.0967 Reco-Boxx Flat-H/-OUT) DDS placed on the heat exchanger and that the modulation of the fans speed is based on the airflow and not on torque.
 - When the previous detection is not available, the supply T° is checked and if it falls below 11 C, it is considered that is due to the ice that reduces the heat exchanger efficiency.
- Effects:

Displayed on Touchpanel			
Code	Text displayed	Level	
A.20	Defrost	1	

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
/	/	ON	/

Auto reset: yes

9.21 Type 21: alarm indicating communication error for one of the modbus pressure sensor

- Conditions:
 - Unit with at least one configured Modbus pressure sensor.
- Causes:
 - One or more of the Modbus pressure sensors give too much communication errors. This in turn can come from:
 - The physical absence of one of the configured sensor.
 - One of the sensors is not powered on: check “ON” led of all configured sensors. See installation manual of Modbus pressure sensor.
 - Faulty cable
 - One of the sensors address is not correctly set: check the setting wheel position for each configured sensor according to its function. See diagnostic here below.
- Effects:

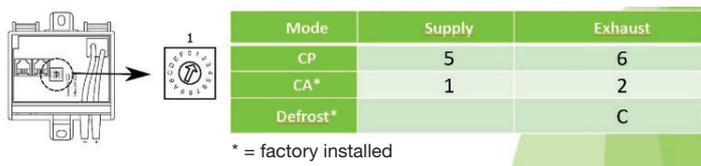
Displayed on Touchpanel		
Code	Text displayed	Level
D.30	MODBUS SENSOR COMMUNICATION ERROR	1

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
/	/	ON	/

Auto reset: yes

Diagnostic:

- Check in TP touch the screen with the communication sensor errors in menu/info: the Modbus pressure sensor which is in alarm will have its error counter that increases (if the screen doesn't appear, go first in menu settings / Factory setup). Once identify, check first of all that it is well present otherwise, it will be necessary to modify the configuration to tell the control board that it is not present.
- If the sensor is well present, check that the address of the wheel is correct.
- Finally, check it's status led: green led on, communication orange blinking. If status led are different, then it may be due to the cable or to sensor itself that is damaged. Wiring is in chain from connector RJ3 or RJ4 for sensors 1 (DDM-Set (kit CA supply), 2 DDM-Set kit CA exhaust) and C (defrost - Art.-No. 0043.1119 (Reco-Boxx ZXR/ZXA); (Art.-No. 0043.0967 Reco-Boxx Flat-H/-OUT) DDS from connector RJ2 for sensor 5 (Art.-No. 0043.0973, CP mode supply) and 6 (Art.-No. 0043.0973, (CP mode exhaust). See TAC wiring overview at point 4:



9.22 Type 22: alarm indicating that the hours limit for the major maintenance has been reached

- Conditions:
 - The hours limit must be configured with a value greater than 0.
- Causes:
 - The hours limit for the major maintenance has been reached.

The instructions in this manual for the 12 months maintenance should be followed.

Reset the hours for major maintenance after this operation, this will reset automatically the alarm and give it again after the same period. Reset also minor maintenance hours.

- Effects:

Displayed on Touchpanel		
Code	Text displayed	Level
M.11	MAJOR MAINTENANCE ALARM	1

TAC control board			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
/	/	ON	/
Auto reset: via dedicated reset			

9.23 REC Table

In the control board the “REC type” is used to define the type unit. When replacing the control board, the REC type needs to be configured in the product setup menu. The product setup menu is used to enable specific features or to modify factory settings. This must be done by an accredited technician. A code and special training is mandatory to access this menu group. The table below is valid for controllers generation TAC5.

Please ask Aerex for the REC CODE table: info@aerex.de

10.0 Parameters/Commissioning Sheet

Please enter all settings specific to your installation in this table. Please keep this document at hand when there is a need to contact us to report a problem.

10.1 Main parameters after commissioning

1	Reco-Boxx model:				
2	Operating mode:	<input type="radio"/> Constant Airflow <input type="radio"/> Demand control	<input type="radio"/> Constant Torque <input type="radio"/> Constant pressure		
3	Constant Airflow (CA):	K1 = _____ K2 = _____ K3 = _____	<input type="radio"/> [m ³ /h] <input type="radio"/> [m ³ /h] <input type="radio"/> [m ³ /h]	<input type="radio"/> [l/s] <input type="radio"/> [l/s] <input type="radio"/> [l/s]	
4	Constant Torque (TQ):	K1 = _____ K2 = _____ K3 = _____	% Torque % Torque % Torque		
5	Demand control 0-10 V (LS):	Vmin = _____ Vmax = _____ m ³ h / %TQ ≡ Vmin = _____ m ³ h / %TQ ≡ Vmax = _____ % on K3 = _____	V V <input type="radio"/> [m ³ /h] <input type="radio"/> [m ³ /h]	<input type="radio"/> [l/s] <input type="radio"/> [l/s]	
6	Constant pressure (CP):	Assignment Pa = _____ % on K3 = _____	<input type="radio"/> [V] %	<input type="radio"/> [Pa]	
7	Ratio exhaust / supply:		%		
8	Pressure alarm (not for pressure control mode)	Activated? Setup Initialisation:	<input type="radio"/> Yes <input type="radio"/> Automatic	<input type="radio"/> No <input type="radio"/> Manual	
		Supply: _____ Exhaust: _____	<input type="radio"/> [m ³ /h] <input type="radio"/> [m ³ /h]	<input type="radio"/> [l/s] <input type="radio"/> [l/s]	<input type="radio"/> [Pa] <input type="radio"/> [Pa]
9	If KWin option: (Electric preheater [EV])	T° KWin = _____	°C		
10	If KWout option: (Electric post-heater battery [EN])	T° KWout = _____	°C		
11	If NV option: (Water post-heater battery [WN])	T° NV = _____	°C		



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