Operation & maintenance instructions for the product range

ESENSA

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Swegon

Table of content

GB.ESENSA.MO.20240328

Symbols and abbreviations

RX ROTARY EXCHANGER

PF PLEATED FILTER

PX PLATE HEAT EXCHANGER

BW BACKWARD CURVED FAN

WARNING !

Must be connected by a qualified electrician. Warning! Hazardous voltage.

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.

OUTDOOR AIR (1)

EXHAUST AIR (3)

EXTRACT AIR (2)

SUPPLY AIR (4)

Glossary

CT	Motorised damper (circular, rectangular)
DX	Direct expansion
EBA	Non-isolated external water coil
ECA	Insulated integrated casing
GF	Filter
IBA	Built-in water coil - postheating
IRS	Circular/rectangular adapter

Kit CA	Kit Constant Airflow
Kwin	Built-in electrical coil - preheating
Kwout	Built-in electrical coil - postheating
MS	Flexible connection
OUT	Roof for outdoor installation
SC	Slip-clamp connection
VEX	Roof for outdoor installation

1. General

1.1 General information

All staff must consult the instructions before starting any work on the unit. Any damages to the unit (or parts of it) due to a misuse cannot be considered subject to guarantee.

The product identification can be found on the silver label that is always stuck to the bottom of a panel on the unit. Refer to this label when you contact the supplier.

If the unit is installed in a cold place make sure that all joints are covered with insulation and are well taped.

Ordered optional accessories are not factory installed and must be ordered in advance (for example internal and exter-nat coils, motorised dampers, defrost kit and flexible sleeve. They are supplied separately from the unit. Therefore the con-nections to the unit is under the responsability of the installer.

Make sure that the power supply to the unit is disconnected before performing any maintenance or electrical work.

All electrical connections must be carried out by an autho-rized installer and in accordance with local rules and controls

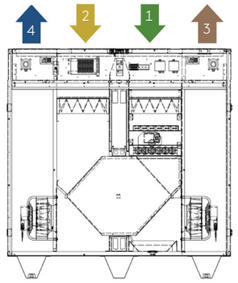
Before switching off the unit using the main switch, we recommend first to switch off the fans function using the control system, so that post-ventilation cools the electrical coils and prevents the internal components from overhea-ting.

Unit should always be operated with closed doors and panels. Check that there are no foreign objects in unit, ducting system or functional sections.

2. Product overview

2.1 General information

ESENSA PX Top



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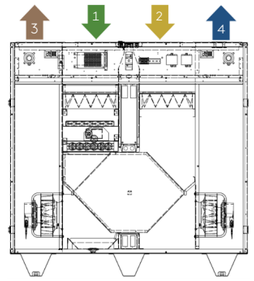

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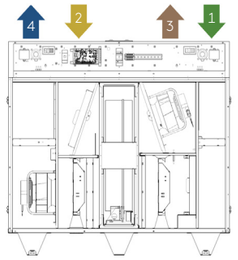
ESENSA RX Top



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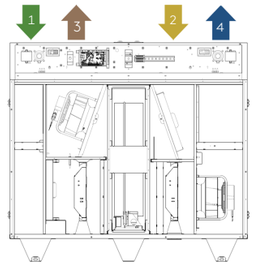
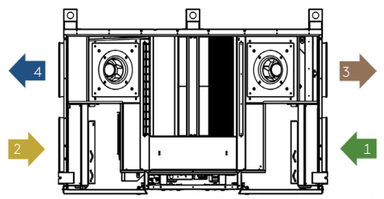


Right connection version

ESENSA PX Flex



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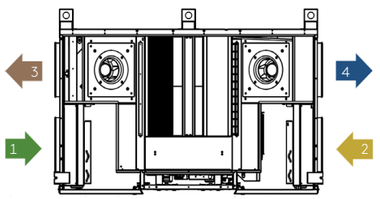

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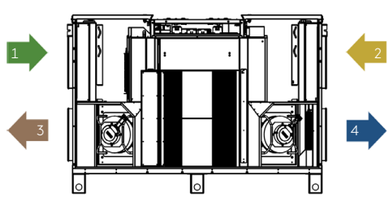

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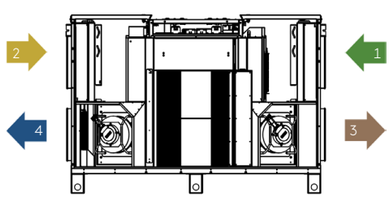


Vertical left version (VL)

1. Outdoor air 2. Extract air 3. Exhaust air 4. Supply air

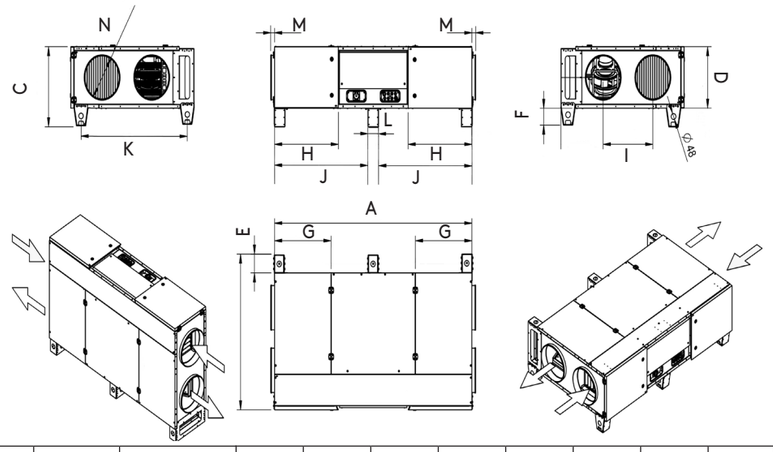
ESENSA PX Top

Unit	Model size	Weight [kg]	Aeraulic connection [mm]	Airflow [m³/h]	Airflow [l/s]
ESENSA PX Top	05	245	Ø 315	250-900	70-250
	09	320	Ø 355	300-1660	83-465
	12	340	600 x 300	300-2100	83-584
	13	395	800 x 300	350-2680	97-745

ESENSA RX Top

Unit	Model size	Weight [kg]	Aeraulic connection [mm]	Airflow [m³/h]	Airflow [l/s]
ESENSA RX Top	04	190	Ø 25	100-660	28-183
	05	225	Ø 315	200-1200	56-334
	12	320	500 x 300	300-2200	83-612
	16	365	700 x 300	400-3250	111-904

ESENSA PX Flex

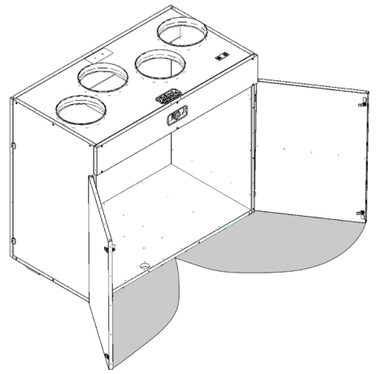


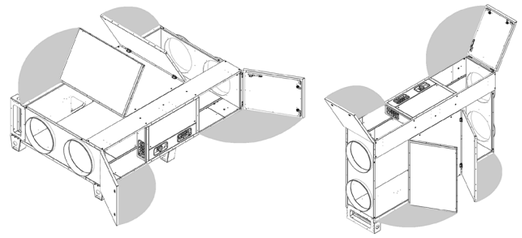
Model size	Weight [kg]	Aeraulics connections [mm]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	J [mm]	K [mm]	L [mm]
05	215	Ø 355	2000	1250	644	494	150	150	572	647	503	1900	1070	100
10	290	Ø 500	2150	1445	784	634	150	150	572	652	593	2050	1265	100
13	360	Ø 500	2150	1870	784	634	150	150	570	652	827	2050	1690	100
20 H*	700	500 x 700	2800	2003	1106	956	50	150	910	1094	932	2430	1745	126
20 V*	680	500 x 700	2800	2103	1106	956	150	-	910	1094	932	2430	690	126

* H = Horizontal / V = Vertical

GB.ESENSA.MO.20240328

2.2 Maintenance area





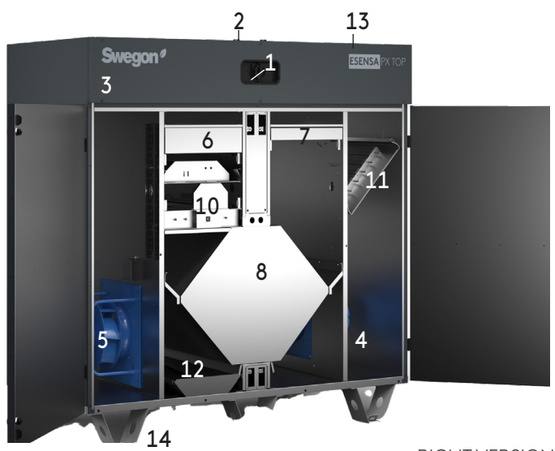
Unit	Model size	Front unit (without coil) [mm]	Front unit (with coil) [mm]
ESENSA PX Top	05	700	700
	09	820	820
	12	820	1040
	13	820	1260
ESENSA RX Top	04	620	630
	05	770	770
	12	820	1040
	16	820	1260

Unit	Model size	Behind unit (recommended) [mm]	Front unit [mm]	Above unit [mm]
ESENSA PX Flex Horizontal	05	600	700	600
	10	600	700	600
	13	600	700 1000*	600
	20	600	1100	950
ESENSA PX Flex Vertical	05	600	600	700
	10	600	600	700
	13	600	600	700 1000*
	20	600	1000	450

* This dimension is recommended if the unit is equipped with a preheating coil.

2.3 Components

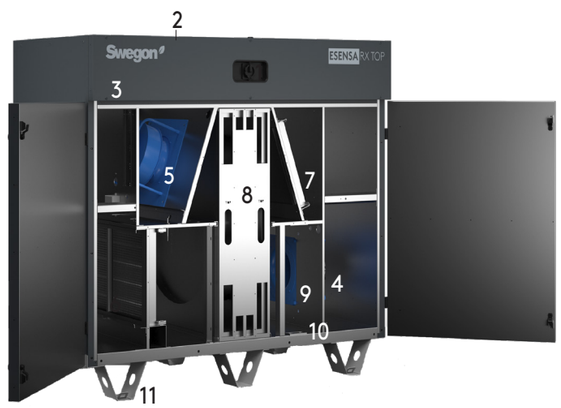
ESENSA PX Top



RIGHT VERSION

1. Main switch
2. Cable inlet
3. Integrated electrical cabinet
4. Fan
5. Fan
6. Filter (mini-pleated)
7. Filter (mini-pleated)
8. High efficiency plate heat exchanger
9. Integrated preheating | electrical (option)
10. Bypass
11. Integrated postheating electrical/water (option)
12. Drain pan
13. Hydraulic connection for postheating (option)
14. Base frame

ESENSA RX Top

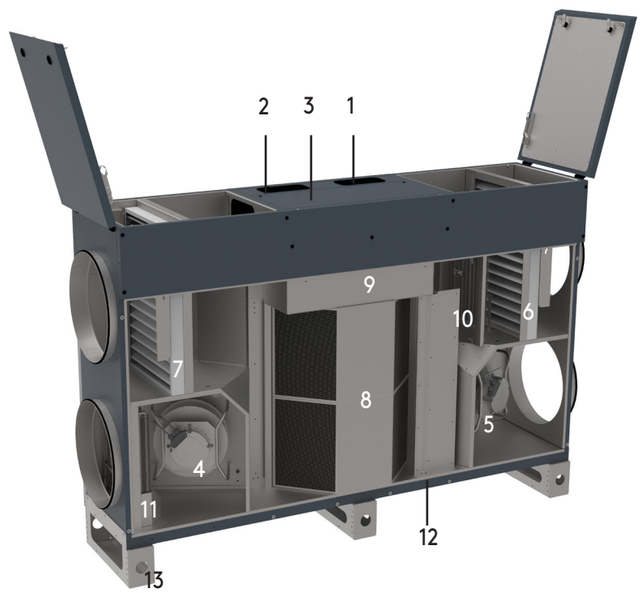


RIGHT VERSION

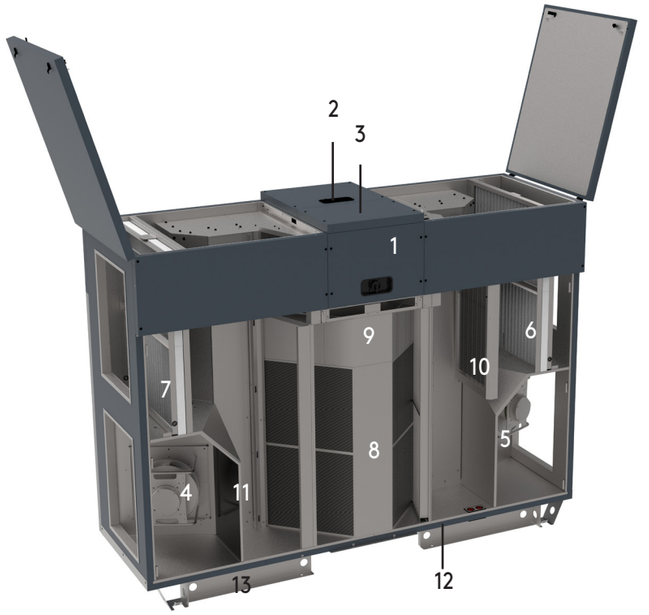
1. Main switch
2. Cable inlet
3. Intergrated Electrical cabinet
4. Fan
5. Fan
6. Filter(mini-pleated)
7. Filter (mini-pleated)
8. High efficiency rotary heat exchanger
9. Integrated postheating | water/electrical (option)
10. Hydraulic connection for postheating (option)
11. Base frame

GB.ESENSA.MO.20240328

ESENSA PX Flex 05 - 10 - 13

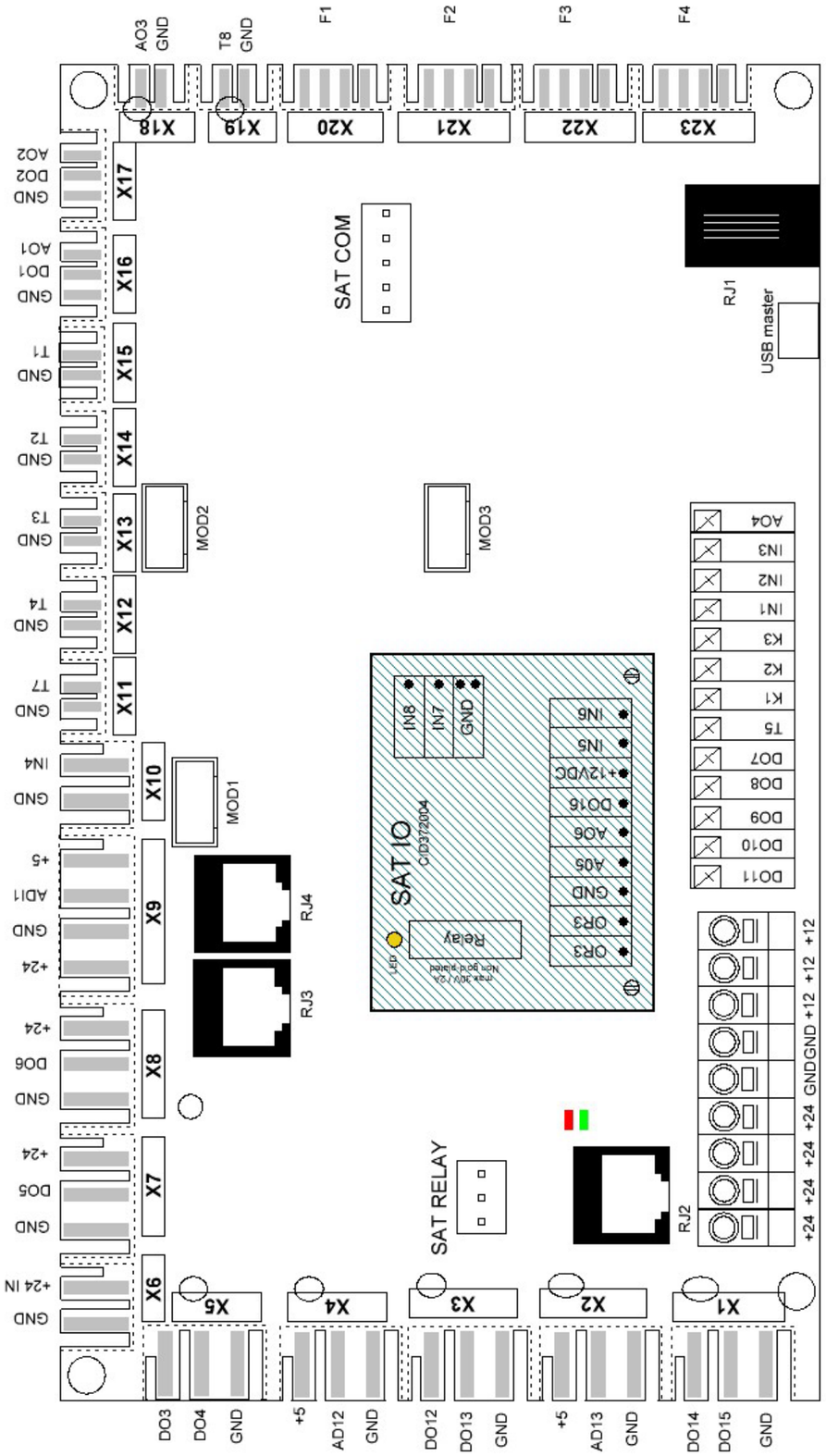


ESENSA PX Flex 20



1. Main switch
2. Cable inlet
3. Integrated electrical cabinet
4. Fan
5. Fan
6. Filter(mini-pleated)
7. Filter (mini-pleated)
8. High efficiency plate heat exchanger (+ drain-pan & pipe connection at the back)
9. Modulating bypass
10. Integrated preheating | electrical (option)
11. Integrated postheating electrical/water (option)
12. Drain pan
13. Base frame

3. Main board



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4. Functions

4.1 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.

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 (m³h K1, m³h K2, m³h K3).

2 - Torque control:

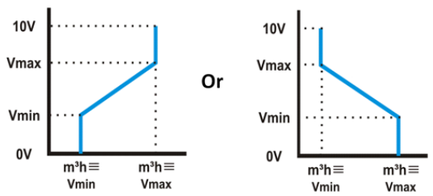
3 torque setpoints to be configured by the user (%TQ K1, %TQ K2, %TQ K3). The setpoint is configured in % of the maximal torque.

3 - Demand control 0-10V:

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: Vmin, Vmax, m³h≡Vmin and m³h≡Vmax, applied to the following diagram. The demand control mode is also available for modulating fan torque instead of airflow.
The principle is identical to the demand control mode operation with the difference that Vmin and Vmax are connected to a %TQ instead of m³/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 off :

This stops the AHU

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4.2 Temperature control

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

Supply Air Temperature

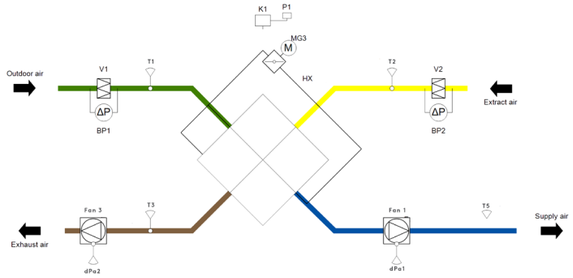
Supply temperature control is the default setting. This involves keeping a constant supply air temperature without consideration to the load in the premises. The supply air temperature is measured on sensor T5.

Extract Air Temperature

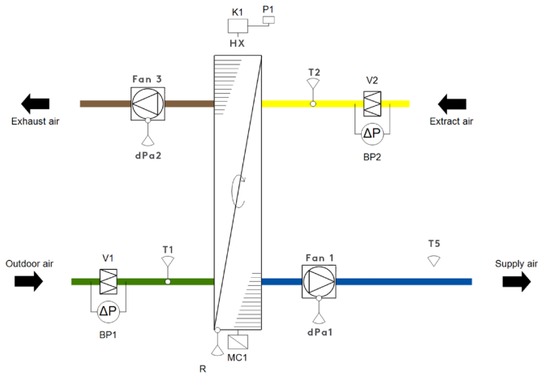
The default temperature control can be changed to Extract temperature control via the advanced setup.
The extract air temperature is measured on sensor T2. Extract air control involves keeping a constant temperature in the extract air duct (premises), by controlling the supply air temperature. This provides a uniform temperature in the premises regardless of the load. The internal sensor T2 can be replaced with the optional external room temperature sensor.

Temperature sensor positioning :

ESENSA PX Top/Flex



ESENSA RX Top



BP1	Filter pressure sensor
BP2	Filter pressure sensor
dPa1	Supply airflow pressure sensor
dPa2	Extract airflow pressure sensor
Fan 1	Supply fan
Fan 3	Extract fan
HX	Counter flow heat exchanger Rotary heat exchanger
K1	Control box TAC
MC1	Heat exchanger control
MG3	Damper actuator
P1	Hand terminal
R	Rotation monitor sensor
T1	Temperature sensor Outdoor air
T2	Temperature sensor Extract air
T3	Temperature sensor Exhaust air
T5	Temperature sensor Supply air
V1	Supply air filter
V2	Extract air filter

4.3 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 SATIO 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 ther 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 control screen 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 :

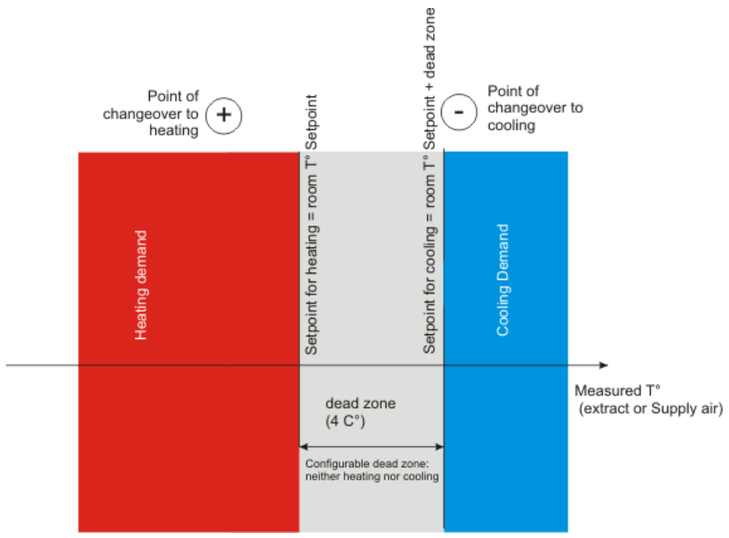
- The outdoor temperature (sensor T1) is higher than the extract air temperature (sensor T2) plus 1°C.
- The outdoor temperature (sensor T1) is lower than 9°C.
- The extract air temperature (sensor T2) is lower than 20°C.

These Settings can be configured in ADVANCED SETUP

4.4 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.



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4.5 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 four 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°C and <+5°C :

- In airflow control mode and demand control, the supply air flow will modulate between 100% and 33% (AFlow)of the setpoint (AFn).
- In 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°C, the supply air fans will stop until the exhaust air temperature (T3) is >2°C for 5 minutes.

2 - Modulating bypass :

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

- Exhaust temperature (T3) >+1°C: bypass closed or controlled by free cooling function.
- Exhaust temperature (T3) ≤ +1°C: bypass will modulate for the exhaust temperature (T3) to exceed +1°C.

The corresponding supply air temperature will drop due to a lower airflow through the heat exchanger.
Requires a post-heating coil (IBA, KWout, EBA or 3rd part delivered)

3 - Electrical preheating coil (accessory) :

If an electrical pre-heating coil (KWin) is installed and configured, the pre-heating coil (KWin)will modulate so the exhaust temperature is +1°C.

4 - Differential pressure measurement (Cold climate option) :

For cold climate conditions (>=-20ºC), 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

ROTARY HEAT EXCHANGER (RX)

In order to protect the rotary heat exchanger from freezing, the strategy for frost protection consists of modulating the speed of the rotating heat exchanger, which is linked to the outdoor air temperature (sensor T1).

If the outdoor air temperature < T°AF (default -9°C): the rotation speed of the heat exchanger is reduced to avoid the risk of icing. To exit this anti-frost protection: T°(T1) ≥ T°AF for 5 minutes.
These Settings can be configured in ADVANCED SETUP.

4.6 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

5. 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 KWin and\or 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:

5.1 Once the unit operates in normal condition

Replace the filters with a kit of replacement filters.

5.2 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.

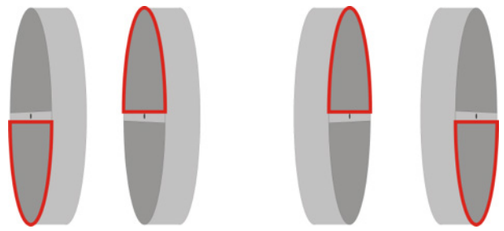
  • Inspect and gently vacuum clean the heat exchanger if necessary. Use a brush to protect the fins.

  • Clean any condensation stains.

  • For PX units, clean any accumulations in the drain pan.

5.3 Every 12 months

1.For rotary heat exchanger (RX) units, check the brush seals on the rotary heat exchanger along the perimeter in contact with the frame:



If necessary, bring the brush seals closer to the exchanger to ensure good sealing.

2. For RX units, check the tension of the driving belt on the rotating heat exchanger. If there is no tension or if the belt is damaged, please, contact the service department for a belt replacement.

Ideally the heat exchanger should be cleaned using vacuum cleaner with a soft nozzle to prevent damaging the air passages in the rotor. Turn the rotor by hand to enable you to vacuum clean its entire surface. If the heat exchanger is substantially fouled, it can be blown clean with compressed air.

3 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.

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4. Fan maintenance:

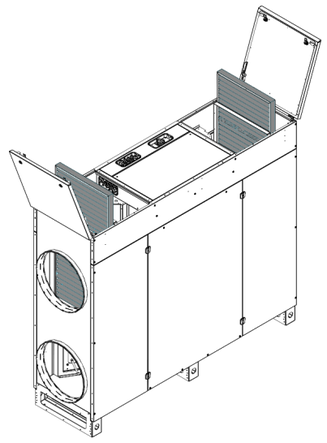
Check again whether the power supply is shut down and fans are not running.

Check and, if necessary, clean the fan blades to remove any deposits, taking care not to unbalance the blades (do not remove the balancing clips).

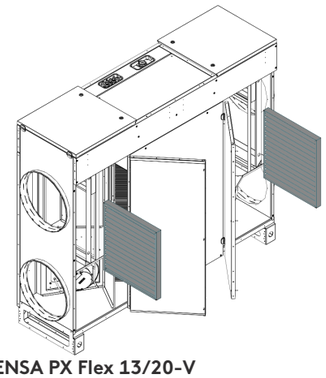
5.Check seals on the unit:

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

5.4 Filter access



ESENSA PX Flex 05/10/13/20-H



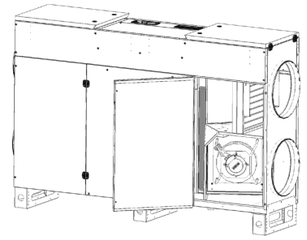
ESENSA PX Flex 13/20-V

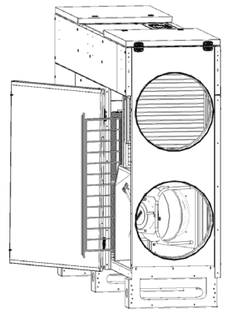
Outdoor version will automatically be in the horizontal version.

5.5 Droplet eliminator

A droplet eliminator media is installed above the condensate tray (not applicable for ESENSA PX Flex 20). This media is necessary when the unit is installed in a vertical position.

In the horizontal position, the media is not required and can therefore be removed (see diagrams below).





5.6 Filter kit

Model	Code	Size [mm]/(qty)	Classe Supply/ Exhaust
PX Top 05	510154	470 x 287 x 47 (2)	ePM1 60%/ ePM10 50%
PX Top 09	510155	400 x 380 x 47(4)	
PX Top 12	510156	400 x 380 x 47 (2) 600 x 380 x 47 (2)	
PX Top 13	510157	600 x 380 x 47 (4)	
RX Top 04	510158	400 x 380 x 47 (2)	
RX Top 05	510158	400 x 380 x 47 (2)	
RX Top 12	510155	400 x 380 x 47 (4)	
RX Top 16	510160	600 x 510 x 47 (2) 400 x 510 x 47 (2)	
PX Flex 05	510161	455 x 426 x 47 (2)	ePM1 60%/ ePM10 50%
PX Flex 10	510162	630 x 566 x 47 (2)	
PX Flex 13	510163	630 x 566 x 47 (2) 425 x 566 x 47 (2)	
PX Flex 20	510164	848 x 500 x 47 (4)	

6. Troubleshooting

The TAC 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. Level 0 information have not associated type, so they will not appear in the description here below.

- 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.
- In addition, beside the alarms generated by the TAC controller, the TACtouch gives also its own alarm in case of communication error: "No communication with TAC".
  In this case, follow these steps to diagnose the problem until that the communication has been recovered:
  - The cable is well connected to TAC board on connector RJ1.
  - If an extender cable is used, try to invert the 2 communication wires A+ and B- , and, if there is still no communication, eventually try with the original cable.
  - Upgrade to last version (instruction manual and last version are available on Swegon web site).
  - Configuration check: Go in menu Settings/TACtouch and check that Parameter "TACtouch master" = "No" and Parameter "Slave Address" = "2". This is the default configuration, however, for installation where the TACtouch is master for the communication or where it has to use a specific address as slave, then enter the correct values for the corresponding parameters.
  - Check that the contacts of the green connector at TACtouch back cover are well screwed.
  - Replace the TACtouch or the control board TAC6: test the communication if possible with another TACtouch, or, in alternative, with TACsimulator software and adapter cable connected to RJ1 (see dedicated sheet in user wiring diagram on web site). Check that the communication is correct, if yes, the problem was linked to the original TACtouch which would need to be replaced, otherwise, so still no communication, then the control board TAC6 has to be replaced.

GB.ESENSA.MO.20240328

6.1 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 TAC circuit.

- Effects:

Displayed on HMI TACtouch		
Code	Text displayed	Level
B.11	Fan 1 failure (Supply)	3
B.13	Fan 3 failure (Extract)	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.

6.2 TYPE 2: ALARM ON THE PRESSURE VARIATION

- Conditions:
  - Mode airflow control or demand control. Unit must have forward fans or backward fans with kit CA
  - 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 HMI TACtouch		
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

6.3 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 kit CA.
  - 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 HMI TACtouch		
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			

GB.ESENSA.MO.20240328

6.4 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 HMI TACtouch		
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.24	"Demand control" fan 3 - Air flow too low - Reduce the pressure on this fan	2
S.25	"Demand control" fan 3 - Air flow too high - Minimum limit of the motor reached	2
S.30	"Constant Air Flow" fan 1 - Air flow too low - Reduce the pressure on this fan	2
S.31	"Constant Air Flow" fan 1 - 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			

6.5 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 HMI TACtouch		
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.

6.6 TYPE 6: FIRE ALARM

- Conditions:
  - Fire alarm input must be connected to a fire detection system.
- Causes:
  - Activation of fire alarm input, IN1, connected to a fire detection system.
    IN1 can be configured to work as NO open contact by default or as NC if configured so in the advanced setup.
- Effects:

Displayed on HMI TACtouch		
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 run by default in the event of a fire alarm at the configured fixed airflows in the advanced setup. The fans may be forced to stop in case of fire alarm thanks to contact IN7 and IN8 for supply and exhaust respectivelly (need to be closed). These contacts are available on optional satellite board SAT IO (see point 4.1).

GB.ESENSA.MO.20240328

6.7 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 HMI TACtouch		
Code	Text displayed	Level
M.21	Operating hours	2
M.22	Operating hours - AHU off	3

TAC control boards			
ALARM OUTPUT	AL dPa OUTPUT	LED ALARM	Fans
Alarm status	/	ON	Stopped if SERVICE STOP FAN*
Reset via “fan run time” in advanced settings			

6.8 TYPE 9: ALARM INDICATING A T° SENSOR T1/T2/T3 FAILURE

- Conditions:
- Causes:
  - One or more of the T° sensors T1/T2/T3 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 HMI TACtouch		
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

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

6.9 TYPE 10: ALARM INDICATING FAILURE ON T° SENSOR T4/T7/T8

- Conditions:
  - External hydraulic coil option (IBA or EBA/EBA-/EBA+-/EBAin)
- Causes:
  - T° sensor located on the coil and connected to the TAC circuit is defective (open or short circuit) or not connected. T° sensor to consider is T7 for postheating IBA or EBA, T8 for postcooling or reversible, T4 for preheating .This is used to prevent frosting of the hydraulic coil. In this case, as a safety measure, the 3-way valve is opened and the circulator contact is closed.
- Effects:

Displayed on HMI TACtouch		
Code	Text displayed	Level
T.40	Sensor T4 disconnected	3
T.41	Sensor T4 short circuit	3
T.70	Sensor T7 disconnected	3
T.71	Sensor T7 short circuit	3
T.80	Sensor T8 disconnected	3
T.81	Sensor T8 short circuit	3

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

GB.ESENSA.MO.20240328

6.11 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 HMI TACtouch		
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.			

6.12 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 HMI TACtouch		
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			

6.13 TYPE 13: ALARM INDICATING HEAT EXCHANGER FROST PROTECTION ALERT

- Conditions:

- Causes:

  • For unit wih counter flow heat exchanger:

  - With antifrost protection of the heat exchanger by supply airflow reduction - associated alarm code: A.21: after the temperature of exhaust air at the exchanger output (T3) becomes lower than 5°C for 5 minutes, the setpoint for the supply airflow is reduced in a linear way from 100% to, at 1°C, 33% (CA, TQ, LS mode) or 50% (CP mode) respect to the current setpoint. High and low temperatures of 5°C and 1°C are configurable in advanced settings.

  -With preheating option (KWin or BAin) - associated alarm code: A.10:
  Once 100% of the power is output to the preheater and T3 (exhaust temperature) is lower than anti-frost temperature (T°AF, 1°C by default), then both flows will be reduced by steps every same intervals until that T3 will exceed T° AF or that 33% of the airflows before reduction are reached. In this last case, a defrost process is entered for 30 minutes: preheater and Supply will be stopped while exhaust will be at its level before reduction. After the defrost period, the antifrost process will restart with preheater at 100% and both flows at 33%. During airflow reduction, if T3 becomes higher than T° AF, the flows will increase at same rate than for reduction.

  • For unit with heat wheel exchanger - associated alarm code: A.23:
  When external temperature (T1 sensor) is lower than the anti-frost temperature (T°AF, -9°C by default), the rotation speed of the heat exchanger will decrease (2RPM by default, configurable in advanced setup) to avoid any risk of frosting on it.

After that T1 ≥ T°AF during 5 minutes, then the wheel will turn back at nominal rotation speed.

- Effects:

Displayed on HMI TACtouch		
Code	Text displayed	Level
A.10	Pre-heating - Reduction (PX + KWin/BAin)	2
A.21	Anti-freeze - Reduced supply air flow (PX)	1
A.23	Anti-freeze - Reduced rotor speed (RX)	1

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

* A.10: reduction on both fans by steps see description here above
A.21: reduction of supply fan linearly see description here above
A.23: no effect on fans

GB.ESENSA.MO.20240328

6.14 TYPE 14: ALARM INDICATING FROST PROTECTION ALERT – FANS STOPPED T°

- Conditions:

  • PX units with

  - electrical preheating (KWin) or hydraulic preheating (BAin)

  - or modulating bypass configured in antifrost modality.

  - or antifrost protection with supply air flow reduction

- Causes:

  • With KWin or BAin option - associated alarm code: A.11 : 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 - associated alarm code: A.11: in frost protection (« A-FREEZE » or « AF+FREECOOL » in the advanced setup), this alarm indicates that the exhaust 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%.

  • With antifrost protection with supply air flow reduction - associated alarm code: A.22: when the exhaust air temperature at the exchanger output (T3 sensor) falls under 1°C (configurable advanced parameter), the supply fan is stopped and it will turn again if T3 becomes greater than 2°C for more than 5 minutes. This additional protection can be disabled in the advanced setup.

- Effects:

Displayed on HMI TACtouch		
Code	Text displayed	Level
A.11	Pre-heating - Off	3
A.22	Anti-freeze - Fans stopped	3

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

* A.22: only supply fan is stopped

6.15 TYPE 14 BIS: ALARM INDICATING AN ERROR ON THE HEAT EXCHANGER ROTATION SPEED

- Conditions:

  • Only for RX units

- Causes:

  • This alarm indicates that the rotation speed of the wheel has been lower or greater than 15% of the setpoint speed for more than 5 minutes

- Effects:

Displayed on HMI TACtouch		
Code	Text displayed	Level
B.30	Speed of rotation of the exchanger incorrect	3

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

- Diagnostic:

A – Visual mechanical check :

1. Check good tension of the green rubber belt in the central part of the unit. Eventually replaced if broken.
2. Check the good coupling between motor shaft and pulley: eventually screw the 2 screws.
3. Check that the wires of the motor are not damaged (8 wires: red, red-white, black, black-white, green, green-white, yellow, yellow-white).

B – Further diagnostic

1. Ensure that the control board TAC is at last version available on web site.
2. Check the current RPM of the rotor respect to the setpoint which is in normal condition (no freecooling and no antifrost protection), 10 RPM.
3. If the actual speed is lower than 9,8 RPM (but >0), then decrease parameter "rotor speed at 10V" in product settings until that the actual speed is between 9,8 and 10,2 RPM.
4. If the actual speed is higher than 10,2 RPM, then increase parameter "rotor speed at 10V" in product settings until that the actual speed is between 9,8 and 10,2 RPM.
5. Feedback of rotor: check input for rotor speed (see wiring diagram at point 4): closed when magnet on the rotor in front of magnetic switch. Otherwise, open.

   5.1. If not, check directly the impedance at the sensor output: if 0 Ohm when magnet in front and infinite when far, then the sensor is correct and the control board has to be replaced. Otherwise, replace magnetic sensor.
6. Output rotor speed control from TAC main board: check that the wire from DO2 goes well to stepper driver PWM1 input (see following point).

7. check the stepper driver:

7.1 Check previous wire from control board DO2 is well connected to «PWM1» input.

7.2 Check +24V DC at GND +24V connectors of stepper driver. If not, check the 24V DC power supply and the cable between it and the driver.

7.3 check electrical connection between driver and motor.

7.4 if the red led is blinking on stepper driver, that means that there is an alarm.

Check first of all that the support of the stepper motor is well connected to the rotor frame with a yellow green protective earth cable.

7.4.1 If not, it must be connected, and it is safer to replace the stepper driver and the control board.

7.4.2 If yes, try with another driver. If it still blink, try with another motor.

N.B.: when the stepper driver is replaced, dip switch have to be placed on same position than before. Only DIP SWITCH 1 has effect and it is used for the direction of rotation.

GB.ESENSA.MO.20240328

6.16 TYPE 15 BIS: 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 HMI TACtouch		
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			

6.17 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 HMI TACtouch		
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.			

6.18 TYPE 17: ALARM INDICATING HYDRAULIC COILS FROST PROTECTION ALERT

- Conditions:

  Only with internal hydraulic post heating coil (IBA), or external 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 DO7, see point 4.1, figure 1). 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 HMI TACtouch		
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.			

GB.ESENSA.MO.20240328

6.19 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 HMI TACtouch		
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.

6.20 TYPE 19: ALARM INDICATING THAT THE HOURS LIMIT FOR THE MINOR MAINTENANCE 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 HMI TACtouch		
Code	Text displayed	Level
M.10	MINOR MAINTENANCE ALARM	1

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

6.21 TYPE 20: ALARM INDICATING THAT THE DEFROST PROCESS IS ACTIVE

- Conditions:
  - Unit with counter flow heat exchanger.
- Causes:
  - The ice forming inside of the plate heat exchanger is genrating a pressure drop that is too high for the current airflow. This detection requires a Modbus pressure sensor 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 HMI TACtouch		
Code	Text displayed	Level
A.20	Defrost	1

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

GB.ESENSA.MO.20240328

6.22 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.

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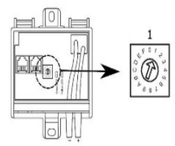
- Effects:

Displayed on HMI TACtouch		
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 TACtouch 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 (kit CA supply), 2 (kit CA exhaust) and C (defrost), from connector RJ2 for sensor 5 (CP mode supply) and 6 (CP mode exhaust). See TAC wiring overview at point 4:



Mode	Supply	Exhaust
CP	5	6
CA*	1	2
Defrost*		C

* = factory installed

6.23 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 HMI TACtouch		
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			

GB.ESENSA.MO.20240328

7. 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.

7.1 Main Parameters after Commissioning

1	ESENSA model:		
2	Operating mode:	O Constant Airflow	O Constant Torque
		O Demand control	O Constant pressure
3	Constant Airflow:	K1 =	O [m³/h] O [l/s]
		K2 =	O [m³/h] O [l/s]
		K3 =	O [m³/h] O [l/s]
4	Constant Torque:	K1 =	% Torque
		K2 =	% Torque
		K3 =	% Torque
5	Demand control:	Vmin =	V
		Vmax =	V
		m³h / %TQ ≡ Vmin =	O [m³/h] O [l/s]
		m³h / %TQ ≡ Vmax =	O [m³/h] O [l/s]
		% on K3 =	%
6	Constant pressure:	Assignment Pa =	O [V] O [Pa]
		% on K3 =	%
7	Ratio exhaust / supply:		%
8	Pressure alarm (not for pressure control mode)	Activated?	O Yes O No
			O Automatic O Manual
		Setup Initialisation:	
		Supply:	O [m³/h] O [l/s] O [Pa]
		Exhaust:	O [m³/h] O [l/s] O [Pa]
9	If KWin option:	T° KWin =	°C
10	If KWout option	T° KWout =	°C
11	If IBA option:	T° IBA =	°C
12	Antifrost protection:	T° IBA =	°C

7.2 Track Changes

Enter details when the Setting of a parameter has been changed (use only one row per parameter):

Parameter Name	Setting before change	Setting of change #1	Date of change #1	Setting of change #2	Date of change #2

GB.ESENSA.MO.20240328

8. Certification

EC DECLARATION OF CONFORMITY

Manufacturer (and where appropriate his authorized representative):

Company: Swegon Operations Belgium

Address: Parc-industriel de Sauvenière 102 Chaussée de Tirlemont B5030 Gembloux

Hereby declares that:

Following product range(s): ESENSA PX TOP / ESENSA RX TOP / ESENSA PX FLEX

Complies with the requirements of Machinery Directive 2006/42/EC (LVD included)

Complies also with applicable requirements of the following EC directives:

2014/30/EU	EMC
2009/125/EC	Ecodesign (Regulation nr 1253/2014 – LOT 6)
2011/65/EU	RoHS 2 (including amendment 2015/863/EU – RoHS 3)

Authorized to compile the technical file:

Name: Nicolas Pary

Address: Parc-industriel de Sauvenière 102 Chaussée de Tirlemont B5030 Gembloux

Signature:

Place and date: Gembloux 2024-02-19

Signature: Name: Jean-Yves Renard

Position: R&D Director

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