

Operation & maintenance instructions for the product range

# ESENSA



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[www.swegon.com](http://www.swegon.com)

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## Symbols and abbreviations



RX ROTARY EXCHANGER



PF PLEATED FILTER



PX PLATE HEAT EXCHANGER



BW BACKWARD CURVED FAN



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 (1)



EXTRACT AIR (2)



EXHAUST AIR (3)



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 external coils, motorised dampers, defrost kit and flexible sleeve. They are supplied separately from the unit. Therefore the connections to the unit is under the responsibility 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 authorized installer and in accordance with local rules and controls

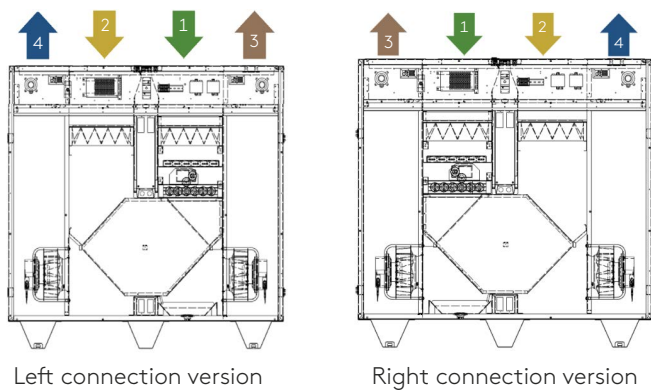
Before switching off the unit using the main switch, we recommend first to switch off the fans function using the control system, so that post-ventilation cools the electrical coils and prevents the internal components from overheating.

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

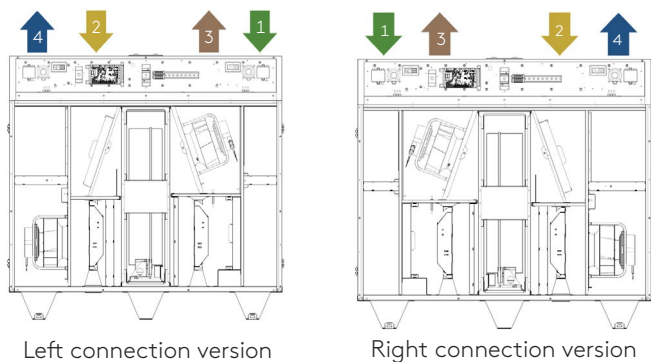
## 2. Product overview

### 2.1 General information

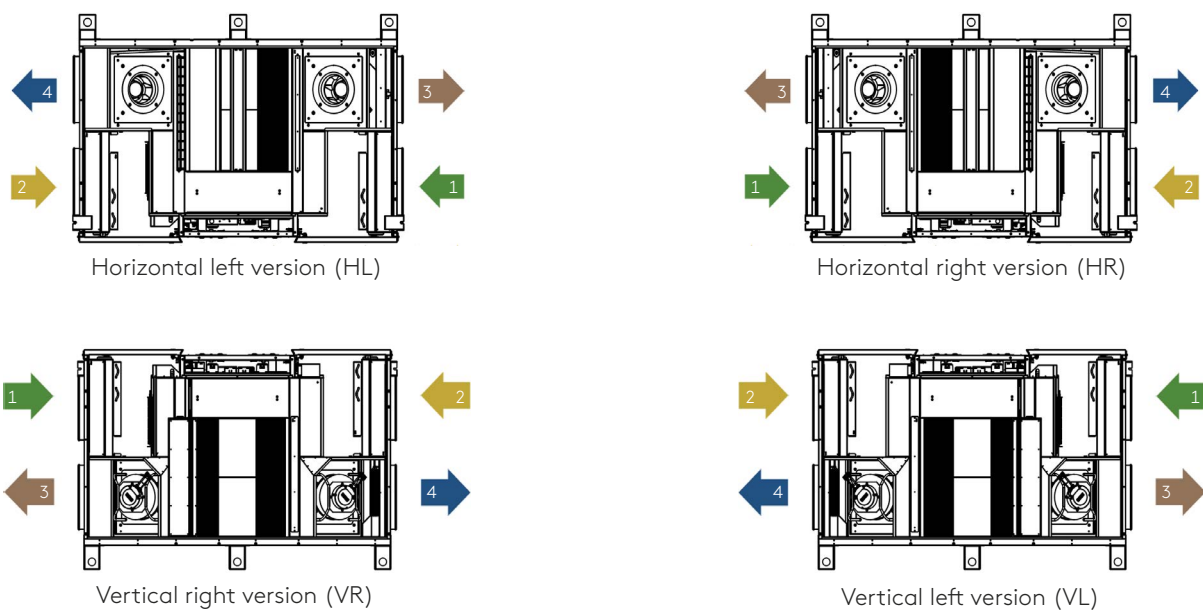
#### ESENSA PX Top



#### ESENSA RX Top



#### ESENSA PX Flex



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

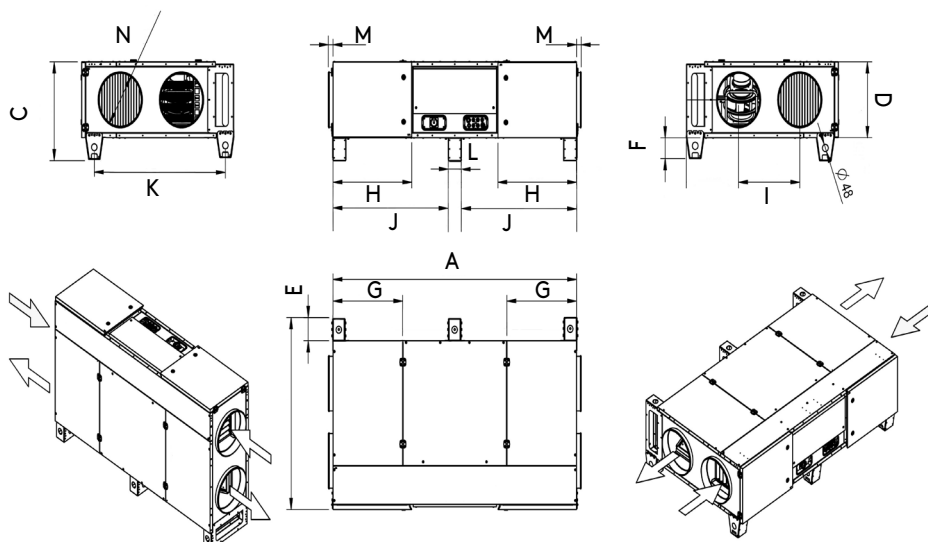
### ESENSA PX Top

| 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 250                    | 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       |

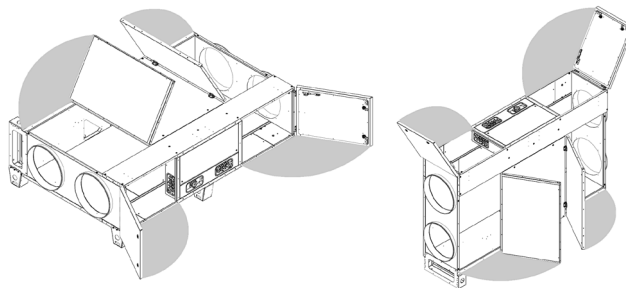
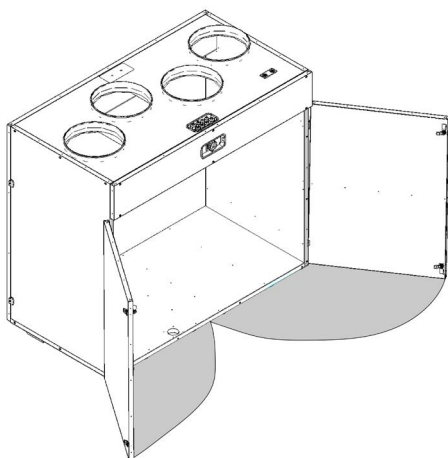
### ESENSA PX Flex



| 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

## 2.2 Maintenance area



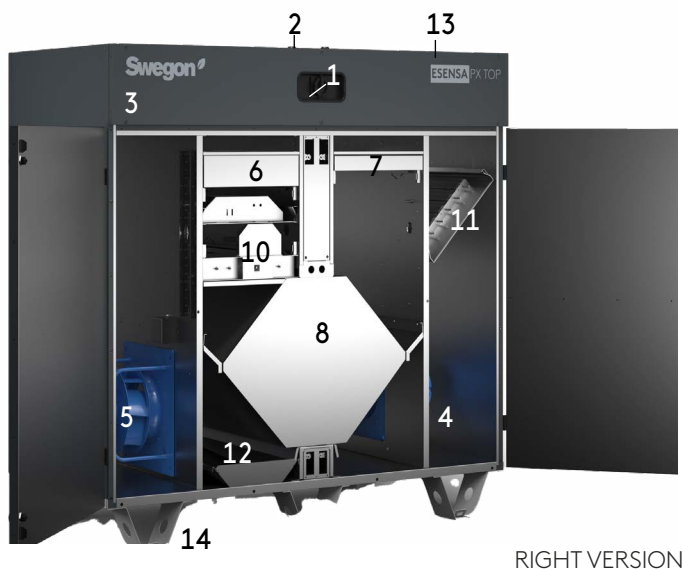
| Unit          | Model size | Front unit (without coil) [mm] | Front unit (with coil) [mm] |
|---------------|------------|--------------------------------|-----------------------------|
| ESENSA PX Top | 05         | 700                            | 700                         |
|               | 09         | 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<br>1000*    | 600             |
|                           | 20         | 600                            | 1100            | 950             |
|                           | 05         | 600                            | 600             | 700             |
| ESENSA PX Flex Vertical   | 10         | 600                            | 600             | 700             |
|                           | 13         | 600                            | 600             | 700<br>1000*    |
|                           | 20         | 600                            | 1000            | 450             |

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

## 2.3 Components

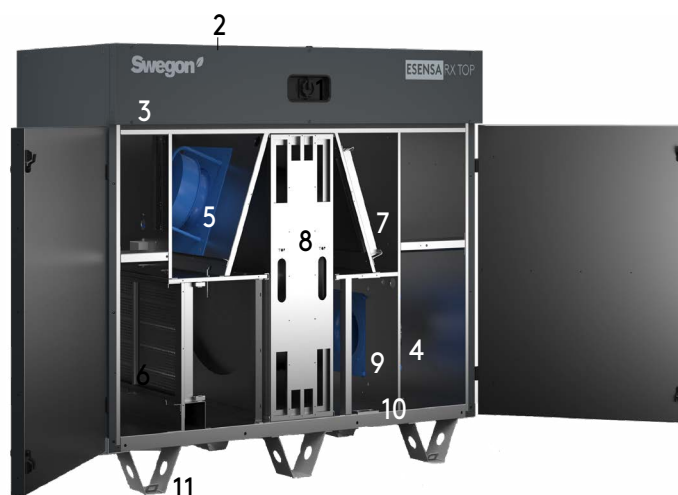
### ESENSA PX Top



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

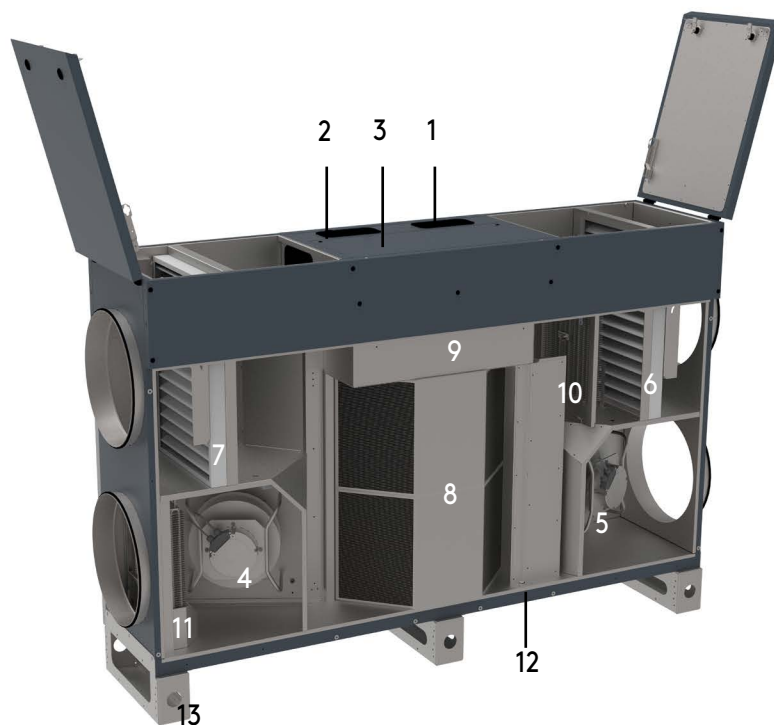
1. Main switch
2. Cable inlet
- ⚠ 3. Intergrated Electrical cabinet
4. Fan
5. Fan
6. Filter (mini-pleated)
7. Filter (mini-pleated)
8. High efficiency rotary heat exchanger
- ⚠ 9. Integrated postheating | water/electrical (option)
10. Hydraulic connection for postheating (option)
11. Base frame



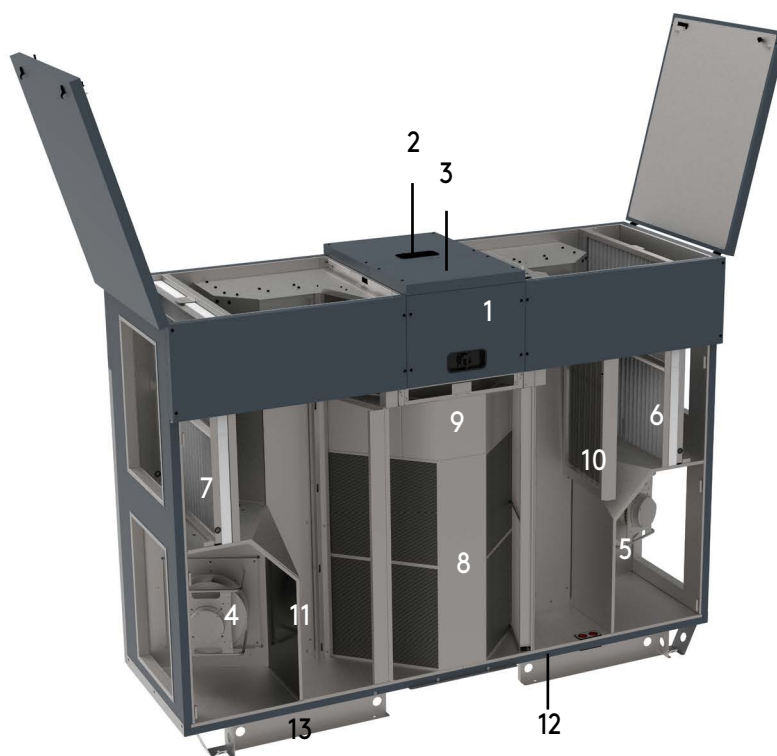
RIGHT VERSION



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)



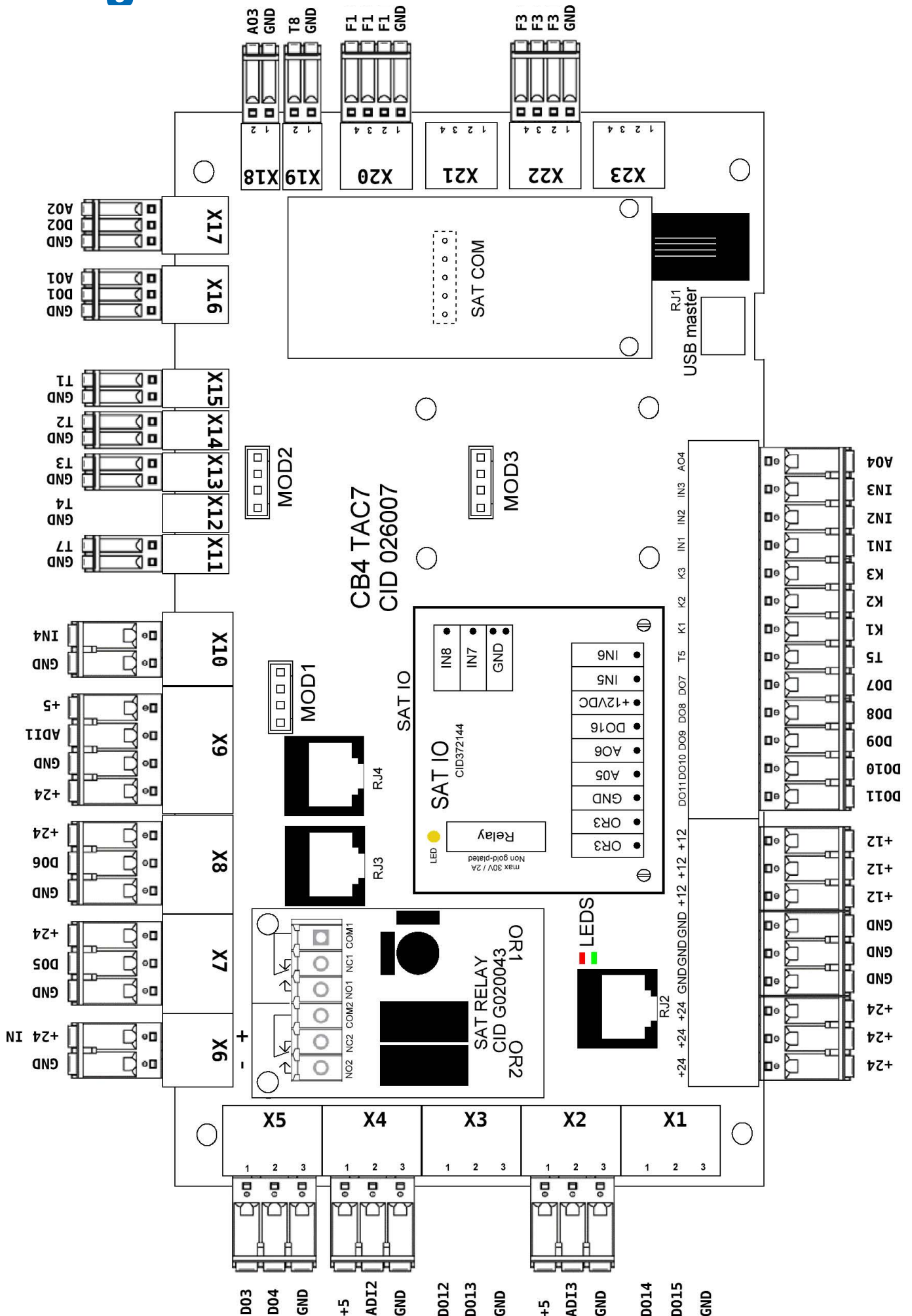
8. High efficiency plate heat exchanger (+ drain-pan & pipe connection at the back)
9. Modulating bypass
10. Integrated preheating | electrical (option)
11. Integrated postheating electrical/water (option)
12. Drain pan
13. Base frame

### 3. Main board

|  |  |                          |
|--|--|--------------------------|
| AO1 = output 0-10V for external waterborne reheater (Prewired or option)                                     | T1 = from outdoor T° sensor (prewired)   |                          |
| DO1 = KWout = output PWM for electric reheater power control (Prewired or option)                            | T2 = from indoor T° sensor (prewired)  |                          |
| DO2 = KWin- PX: output PWM for electric pre-heater power control (Prewired or option)<br>  RX SPEED PWM - RX | T3 = to outdoor T° sensor (prewired)   |                          |
|  | T4 = Waterborne pre-heater (EBAin) T° sensor (option)  |                          |
| AO2 = RX SPEED 0-10V - RX (option)   | T5 = supply T° sensor for waterborne reheater (IBA)/electric reheater coil (KWout) (option)  |                          |
| AO3 = 0-10V output to control cooling capacity or reversible heat/cool                                       | T7 = Waterborne reheater (IBA)/waterborne pre-heater (EBA) anti freeze protection T° sensor (option)   |                          |
| AO4 = output 0-10V for internal waterborne reheater (option)   | T8 = Cooling coil frost protection sensor  |                          |
| DO3 = BYPASS OPEN- PX (with rotary actuator) (prewired)  | IN1 + 12/24V = FIRE ALARM  |                          |
| DO4 = BYPASS CLOSE - PX (with rotary actuator) (prewired)  | IN2 + 12/24V = BOOST   |                          |
| DO5 = DAMPER 1 (with or without spring return, I <sub>max</sub> = 0.5A DC) (Prewired or option)              | IN3 + 12/24V = BYPASS ACTIVATION OVERRIDE  |                          |
| DO6 = DAMPER 2 (with or without spring return, I <sub>max</sub> = 0.5A DC) (Prewired or option)              | IN4 + GND = Drain pan full contact (only for LP Unit - prewired)   |                          |
| DO7 = HEAT OUTPUT (open collector; V <sub>max</sub> =24 VDC; I <sub>max</sub> =0,1 A)                        | K1 + 12/24V: Airflow MODE  | = m³/h or l/s K1         |
| DO8 = COOL OUTPUT (open collector; V <sub>max</sub> =24 VDC; I <sub>max</sub> =0,1 A)                        | Demand/Pressure control  | = START/STOP             |
| DO9 = ALARM OUTPUT (open collector; V <sub>max</sub> =24 VDC; I <sub>max</sub> =0,1 A)                       | K2 + 12/24V: Airflow control   | = m³/h or l/s K2         |
| DO10 = AL dPA OUTPUT (open collector; V <sub>max</sub> =24 VDC; I <sub>max</sub> =0,1 A)                     | Demand/Pressure control  | = 0-10V INPUT            |
| DO11 = FAN ON OUTPUT (open collector; V <sub>max</sub> =24 VDC; I <sub>max</sub> =0,1 A)                     | K3 + 12/24V: Airflow control   | = m³/h or l/s K3         |
| ADI1 = BYPASS POS - PX   RX SPEED FEEDBACK - RX (prewired)   | Demand/Pressure control  | = % ON K3 or 0-10V INPUT |
| ADI2 = SUPPLY FILTER dPa   | RJ1 = RJ12 connector for TACtouch (option)   |                          |
| ADI3 = EXTRACT FILTER dPa  | RJ2 = RJ12 connector for Modbus Pressure CP mode (option);<br>Modbus Air quality sensors for demand control mode (option);<br>Modbus Air quality sensors for BOOST in all modes (option)                               |                          |
| F1 = FAN 1 (SUPPLY)  | RJ3 = RJ12 connector for ESENSA or GLOBAL PX LP: free; for GLOBAL PX/RX: Modbus Pressure sensors kit CA (prewired) and/or filters monitoring (option - prewired), on supply flow                                       |                          |
| F3 = FAN 3 (EXHAUST)   | RJ4 = RJ12 connector for Modbus Pressure sensors kit CA (prewired) and/or defrost detecting (option - prewired) and/or filters monitoring (option - prewired); NB: for GLOBAL PX/RX: sensor used for extract flow only |                          |
| SAT COM = SAT MODBUS or SAT KNX or SAT WIFI-ETHERNET - (option)  |  |                          |
| GREEN LED ON = POWERED ON<br>RED LED ON = ALARM  |  |                          |



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.



## 4. 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:

### 4.1 Once the unit operates in normal condition

Replace the filters with a kit of replacement filters.

### 4.2 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:

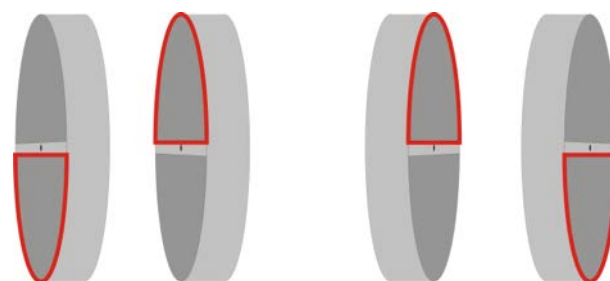
- Insufficient ventilation.
- Excessive increase of fan rotation speed.
- Excessive sound levels.
- Excessive power consumption (power consumption will increase exponentially to an increase in pressure drop, for a constant airflow).
- Unfiltered air passing through the heat exchanger (risk of clogging) 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.

### 4.3 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.

#### 4. Fan maintenance:

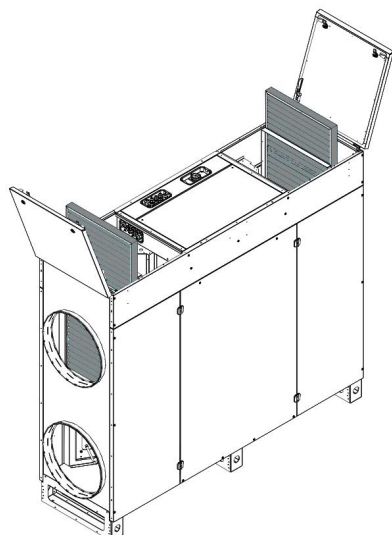
Check again whether the power supply is shut down and fans are not running.

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).

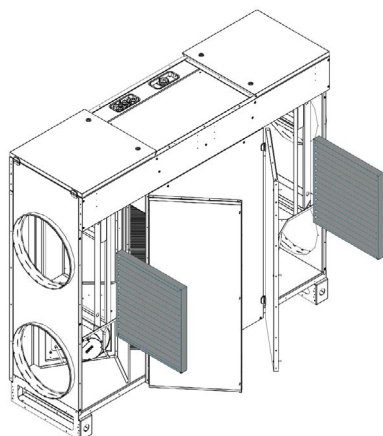
#### 5. Check seals on the unit:

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

### 4.4 Filter access



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



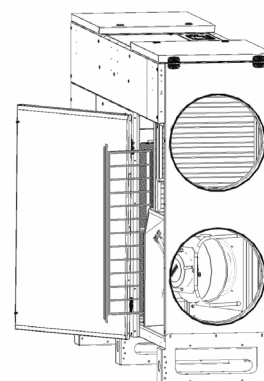
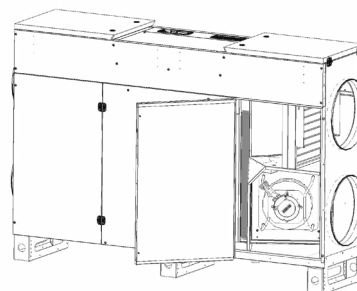
ESENSA PX Flex 13/20-V

Outdoor version will automatically be in the horizontal version.

### 4.5 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).



### 4.6 Filter kit

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

## 5. 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.

### 5.1 Main Parameters after Commissioning

|    |   |  |  |
|----|---|--|--|
| 1  | ESENSA model:                                     |  |  |
| 2  | Operating mode:                                   | <input type="radio"/> Constant Airflow<br><input type="radio"/> Demand control | <input type="radio"/> Constant Torque<br><input type="radio"/> Constant pressure                                   |
| 3  | Constant Airflow:                                 | K1 =   | <input type="radio"/> [m³/h] <input type="radio"/> [l/s]   |
|    |   | K2 =   | <input type="radio"/> [m³/h] <input type="radio"/> [l/s]   |
|    |   | K3 =   | <input type="radio"/> [m³/h] <input type="radio"/> [l/s]   |
| 4  | Constant Torque:                                  | K1 =   | % Torque   |
|    |   | K2 =   | % Torque   |
|    |   | K3 =   | % Torque   |
| 5  | Demand control:                                   | Vmin =   | V  |
|    |   | Vmax =   | V  |
|    |   | m³h/%TQ ≡ Vmin =   | <input type="radio"/> [m³/h] <input type="radio"/> [l/s]   |
|    |   | m³h/%TQ ≡ Vmax =   | <input type="radio"/> [m³/h] <input type="radio"/> [l/s]   |
|    |   | % on K3 =  | %  |
| 6  | Constant pressure:                                | Assignment Pa =  | <input type="radio"/> [V] <input type="radio"/> [Pa]   |
|    |   | % on K3 =  | %  |
| 7  | Ratio exhaust/supply:                             | %  |  |
| 8  | Pressure alarm<br>(not for pressure control mode) | Activated?   | <input type="radio"/> Yes <input type="radio"/> No<br><input type="radio"/> Automatic <input type="radio"/> Manual |
|    |   | Setup Initialisation:  |  |
|    |   | Supply:  | <input type="radio"/> [m³/h] <input type="radio"/> [l/s] <input type="radio"/> [Pa]                                |
|    |   | Exhaust:   | <input type="radio"/> [m³/h] <input type="radio"/> [l/s] <input type="radio"/> [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   |

## 5.2 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 |
|----------------|-----------------------|----------------------|-------------------|----------------------|-------------------|
|                |                       |                      |                   |                      |                   |
|                |                       |                      |                   |                      |                   |
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|                |                       |                      |                   |                      |                   |
|                |                       |                      |                   |                      |                   |
|                |                       |                      |                   |                      |                   |



## 8. Certification



### UK 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

**Conform with Supply of Machinery (Safety) Regulations 2008 including Electrical Equipment (Safety) Regulations 2016****Also conform to the following directives:**

Electromagnetic Compatibility Regulations 2016

The Ecodesign for Energy-Related Products Regulations 2010 (Commission regulation (EU) No. 1253/2014)

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

**Authorized to compile the technical file:**

Name: Nicolas Pary  
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B5030 Gembloux

**Signature:**

Place and date: Gembloux 2024-02-19

Signature: Name: Jean-Yves Renard  
Position: R&D Director





## 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) |

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The document was originally written in English.