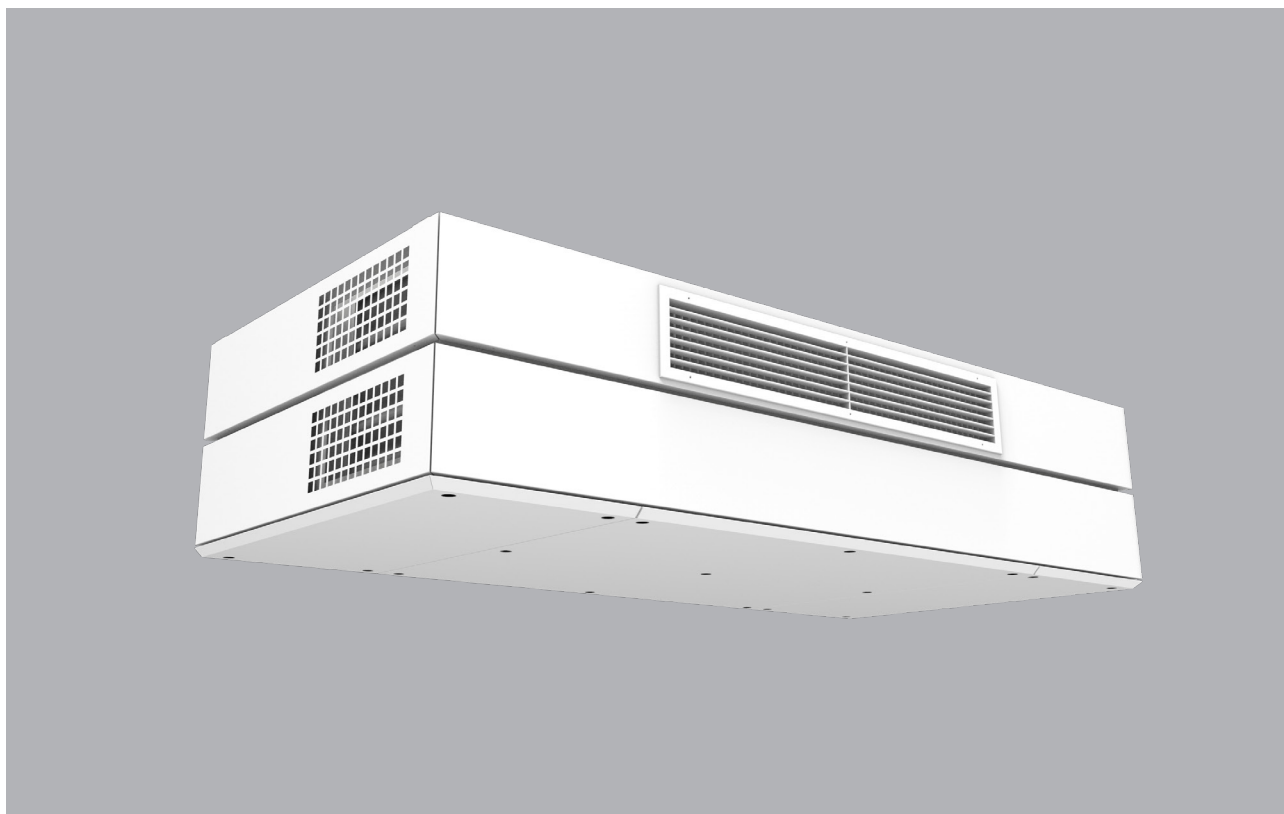# CLASS UNIT

Operation and maintenance instructions

Applicable to program versions TAC5

Swegon

CLASS UNIT
Table of content

Symbols and abbreviations

⚠️	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.		
🏠	Air from outdoor to the AHU (OA)		
🏠	Air from the AHU to the building (SA)		
🏠	Air from the building to the AHU (ETA)		
🏠	Air from the AHU to outdoor (EHA)		

⬡	PX	PLATE HEAT EXCHANGER	⚡	KW	HEATING COIL (ELECTRICAL)

1.0 Safety precautions
Danger/Warning/Caution

- All staff concerned shall acquaint themselves with these instructions before beginning any work on the unit. Any damages to the unit or its components caused by improper handling or misuse by the purchaser or the installer cannot be considered subject to guarantee if these instructions have not been followed correctly.

- 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.

- Although the mains supply to the unit has been disconnected there is still risk for injury due to rotating parts that have not come to a complete standstill.

- Beware of sharp edges during mounting and maintenance. Make sure that a proper lifting device is used. Use protective clothing.

- Unit should always be operated with closed doors and panels.

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

- Duct connections/duct ends should be covered during storage and installation, in order to avoid condensation inside of the unit.

- Check that there are no foreign objects in unit, ducting system or functional sections.

- The unit is packed to prevent damage of the external and internal parts of the unit, dust and moisture penetration. If the unit is not to be installed immediately, it should be stored in a clean, dry area. If stored externally, it should be adequately protected from the weather influence.

2.0 Product Overview

COMPONENTS CLASS UNIT
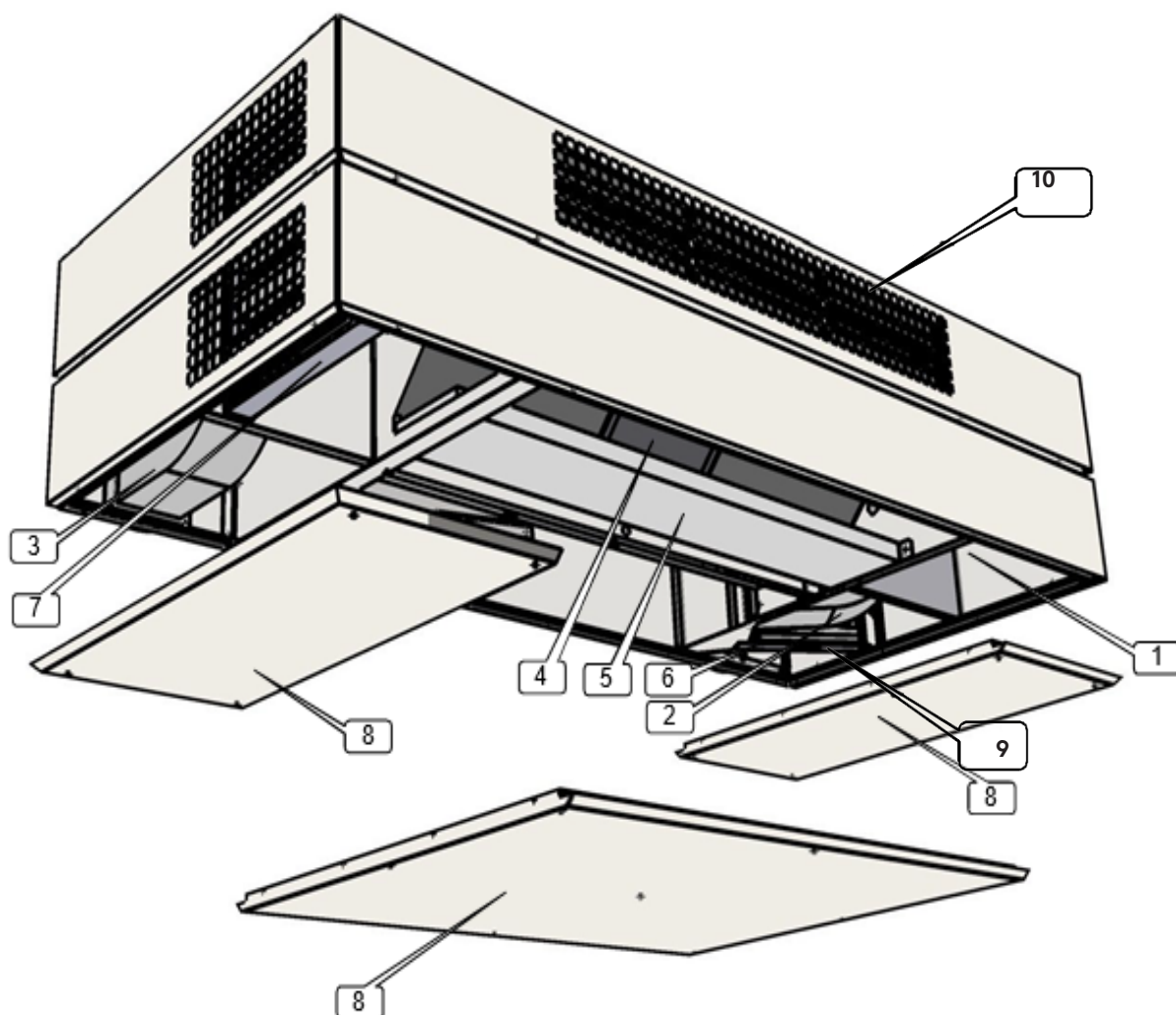
1. Centralized wiring box of the CB4 TAC5 DG circuit (factory pre-wired)
2. Supply fan
3. Exhaust fan
4. Air/Air heat exchanger (+ modulating 100% by-pass)
5. Drain pan
6. GF-ePM10 50% filter at fresh air inlet
7. GF-ePM10 50% filter on exhaust air
8. Access panels
9. Air inlet damper
10. Internal postheating electric coil (KWout)

AIR VOLUME AND DIMENSIONS
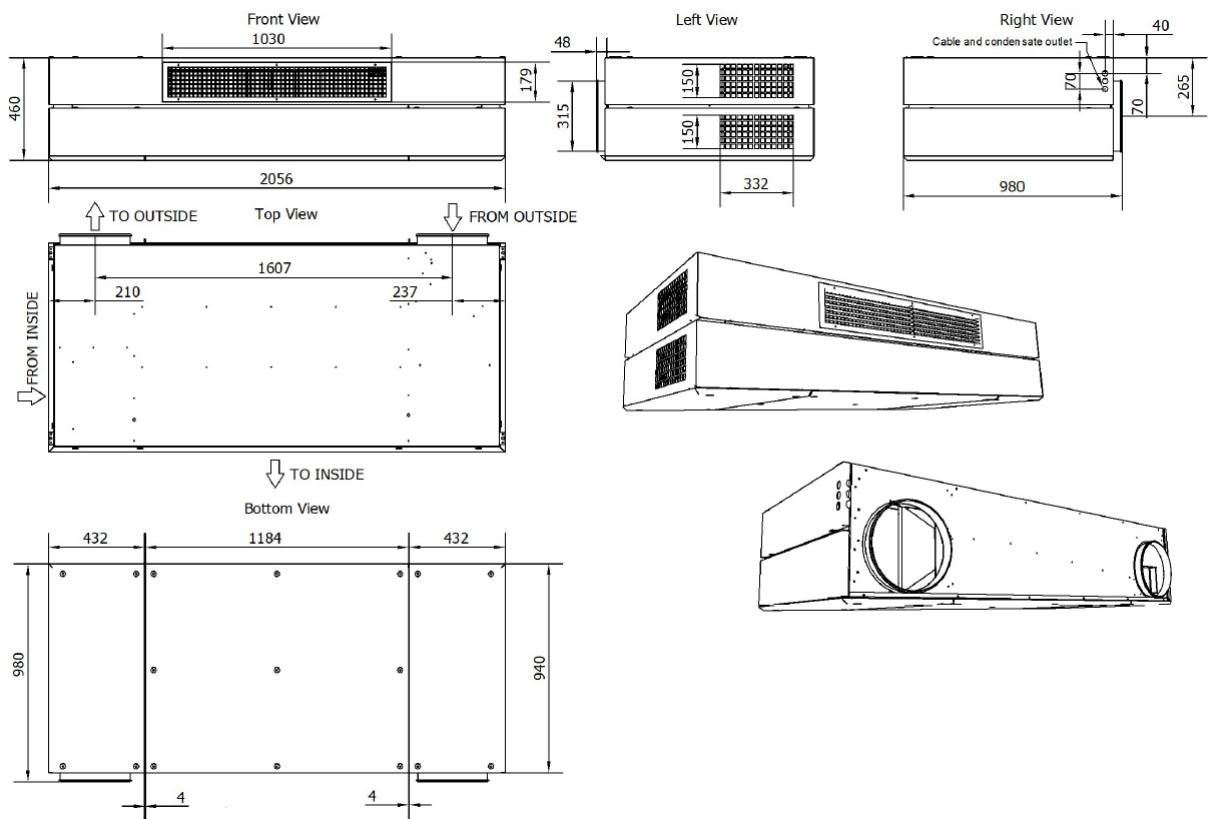
SIZE	AIR VOLUME	
CLASS UNIT 1000	1050 m³/h	291 l/s

3.0 Wiring Overview

MAIN CONTROL BOARD TAC DG - CID025000

BYPASS 4 3 2 1

L N ⏚

CT

+12V KWout KWin GND VI

IN12 GND T°4 T°3 GND T°2 T°1 GND

MOTOR CONTROL CABLES
F1 F2 F3 F4
OUT → IN
IN → OUT

RELAY RELAY

BYPASS CT

ON
Alarm
AF
RESET

SAT MODBUS
SAT KNX
SAT WIFI
SAT ETHERNET

SAT BA/KW

O.R.1 O.R.2 O.R.3 O.R.4

SAT3 SAT3 SAT...

RELAY RELAY RELAY RELAY

RELAY

Rx Tx

GND T°7 T°8

AL1

RELAY

Rx Tx

R2 R3 R2 R3

A+ B- GND A+ B- GND

WP WP GND OUT7 OUT8 OUT9 +12V IN10 IN11

SAT BA/KW

B- A+ GND +12V

AL1

K1 K2 K3 +12V

+12V IN1 IN2 IN3 IN4 IN5 IN6 IN7 IN8 IN9 +12V

GND T°5 GND OUT1 OUT2

GND OUT4 OUT5
NV VO

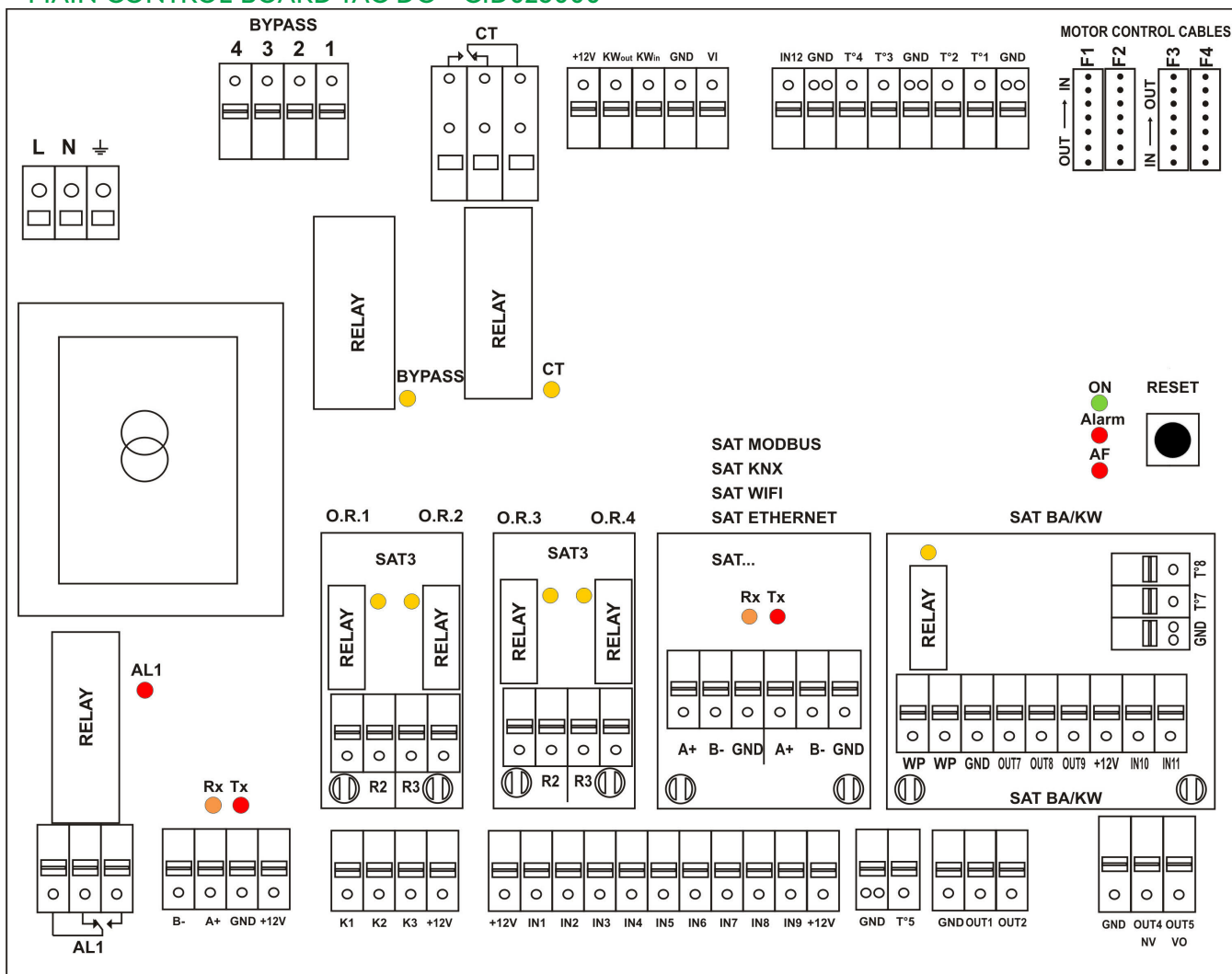|			
CT = output to inlet damper CT actuator (prewired)		**IN1** = Master selection	
BYPASS = output to bypass actuator (prewired)		**IN2** = dPa (pressostat digital input)	
AL1 = ALARM OUTPUT (230V/5A)		**IN3** = Fire alarm input	
B-/A+/GND/+12V = connection to HMI TACtouch		**IN4** = Bypass open / Stop heat recovery	
K1: Airflow MODE	= m³/h K1	**IN5** = Real time clock auto/manu	
Demand/Pressure control	= START/STOP	**IN6** = ON/OFF post heating (IBA/KWout)	
Torque MODE	= %torque K1	**IN7** = ON/OFF SUPPLY if fire alarm	
K2: Airflow control	= m³/h K2	**IN8** = ON/OFF EXHAUST if fire alarm	
Demand/Pressure control	= 0-10V INPUT	**IN9** = BOOST Airflow	
Torque control	= %torque K2	**IN12** = PWM input bypass position	
K3: Airflow control	= m³/h K3	**OUT1** = 0-10V OUTPUT (airflow/pressure)	
Demand/Pressure control	= % ON K3 or 0-10 V INPUT	**OUT2** = 0-10V OUTPUT (airflow/pressure)	
Torque control	= %torque K3		
T1 = from outdoors T° sensor (prewired)		**OUT5** = 24VDC/1A	
T2 = from indoors T° sensor (prewired)		**O.R.1** (output relay 1 - SAT3)	= PRESSURE ALARM
T3 = to outdoors T° sensor (prewired)		**O.R.2** (output relay 2 - SAT3)	= FAN ON
		O.R.3 (output relay 3 - SAT3)	= HEATING DEMAND OUTPUT
T5 = supply T° sensor for KWout coil (prewired)		**O.R.4** (output relay 4 - SAT3)	= BYPASS STATUS
		KWout = output for KWout capacity control (prewired)	

3.1 CIRCUIT BOARD SAT 3 - CID372005

The SAT3 circuit board is used for extra functions for which inputs and outputs are not included as standard in the control unit of the air handling unit. All outputs are normally open (N.O.). Maximal load: 230VAC – 4A. The circuit board SAT3 allows for signalling of the following by means of a potential-free contact:

- Fan status   -   O.R.1
- Differential pressure alarm -   O.R.2
- Heating demand   -   O.R.3
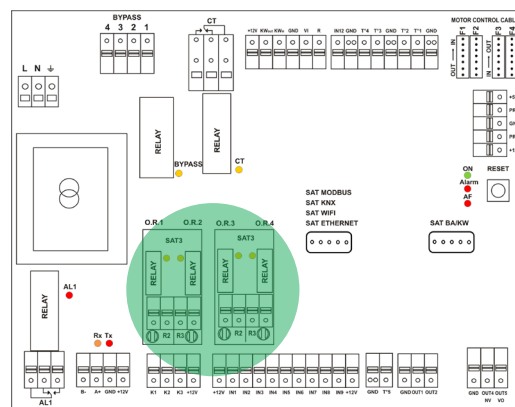- Bypass status   -   O.R.4

Installation

SAT3 must be plugged onto the control board circuit (see fig.1).

Attention: The SAT3 must be plugged in before the circuit is powered. SAT must be plugged in correctly, wrong positioning can damage both circuits permanently.

Fig. 1

4.0 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. Exceptions if Constant Torque mode has been selected in the product setup menu, in his 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 four 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 - 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 (relevant for backwards fans units without Kit CA). 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.

  A CO_2 sensor option is available for selection when ordering. Once this option is selected, the sensors are prewired and pre-configured to be ready for use.

- **3 - 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).
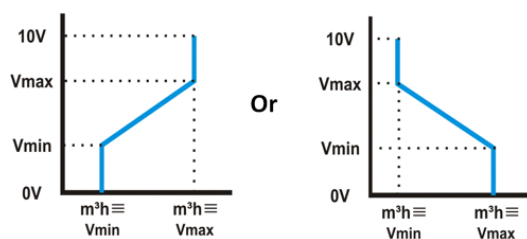
  Pressure on supply: the airflow of the supply fan(s) is modulated to maintain a certain pressure Setting constant. The pressure is measured by a pressure sensor located in the supply air duct.
  Pressure on exhaust: the airflow of the exhaust fan(s) is modulated to maintain a certain pressure Setting constant. The pressure is measured by a pressure sensor located in the extract air duct.

- **4 - Mode OFF :**
  This stops the AHU

4.2 TEMPERATURE CONTROL

There are several options available on CLASS UNIT 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 (CID370042).
Temperature sensor positioning :
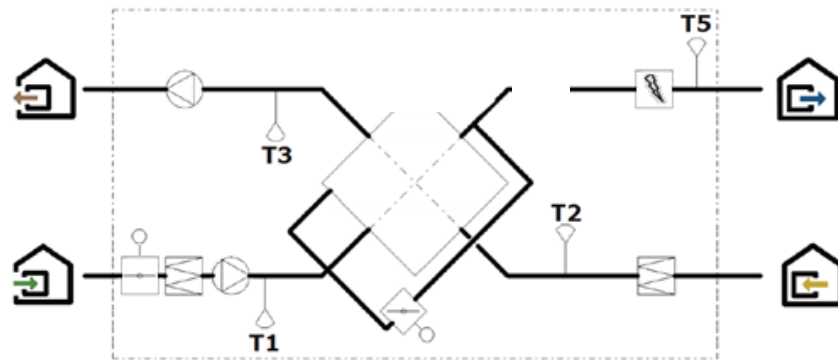
4.3 FREE COOLING

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. The optional output OR3 on the SAT3 OR3 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 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 will modulate in order to maintain the setpoint. The free cooling function is activated automatically. An on/off bypass 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 FROST PROTECTION

PLATE HEAT EXCHANGER

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°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

These Settings can be configured in ADVANCED SETUP

4.5 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 OFF.

For each time slot select :

- In airflow control mode: the airflow by selecting m³h K1 / m³h K2 / m³h K3 / OFF (stop)
- In demand control mode :
  • with only one 0-10 V signal (default) or with 2 signals to control the supply airflow: the link LS (percentage of the nominal link, cfr m³/h≡Vmin and m³/h≡Vmax in setup OR cfr %TQ≡Vmin and %TQ≡Vmax in setup) and the rate of the exhaust airflow by the supply airflow.
  • with one 0-10 V signal for supply and one 0-10 V signal for exhaust (via advanced setup): one link LS (percentage of the nominal link) for supply and one for exhaust.

5.0 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 therefor is not mandatory. The possible HMIs are:

TACtouch touchscreen - CID372096

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

Position switch (COM4) - CID010007

The most basic interface to control a CLASS UNIT air handling unit is the 4 position swich. This swith 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.

5.1 COMMISSIONING WITH TACtouch INTERFACE

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]:	96,8x148,8x14,5
Power consumption:	120mA

IMAGE MANAGEMENT

Start-up image

At the first start up, the basic setup menu will be activated automatically. See section 5.1.3
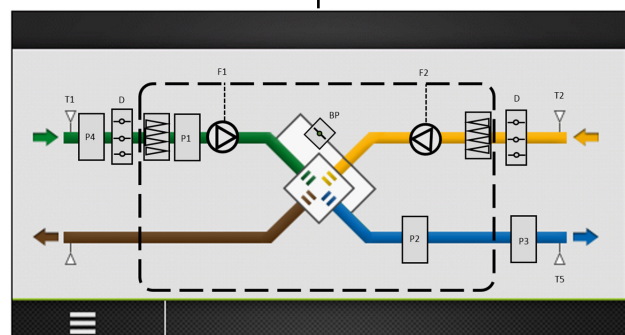
Home Screen. See Section 5.1.1.
By default, the home screen will be shown if no other menu is opened by the user or if selected in the main menu.
N.B.! The appearance of the image varies depending on the type of air handling unit and functions selected.
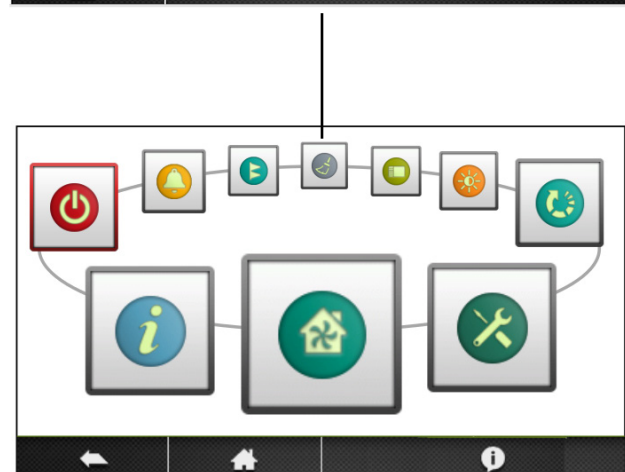
Main menu. See Section 5.1.2.
The main menu is presented as a rotary menu. After pressing the "menu"-button at the bottom left corner of the Home Screen, the rotary menu will be shown.

5.1.1 HOME SCREEN

The home screen displays the current key data for the air handling unit and is shown is 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, press on the touchscreen.

On the main screen, the fields are:

- Current operation mode

  The operation modes are: STOP, 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 5.1.2

- Flow Chart

  The flow chart is not editable by the user, the configuration of the activated options and functions is done throught the product setup (menu). A code and a special training are desired for access to this menu. The appearence of the image varies depending on the type of air handling unit and its selected functions and/or options. Flow chart symbols:
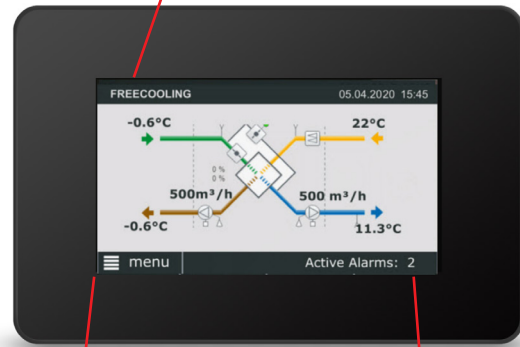
Current operation status

Main menu button

Number of current alarms

Bypass (closed/open)

Electrical heating coil

Motorised damper (open/closed/opening)

5.1.2 MAIN MENU

The main menu consists of a rotary menu with 6 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.
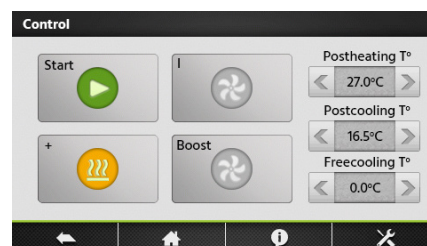
Alarm

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 7.0

If the fault cannot be immediately remidied:

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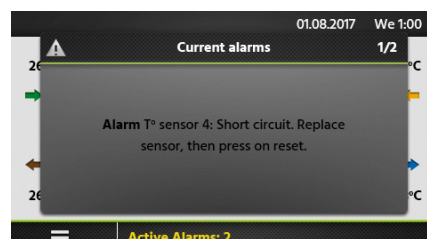
Time schedule

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.
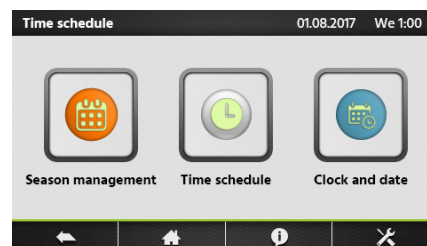
Time and date

The current date and time can be set and adjusted if needed. The timer automatically takes leap years into consideration. The system is preset for automatic changeover between summer time/winter time according to EU Standard.
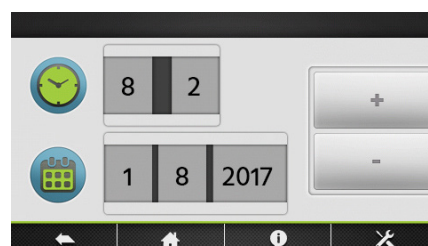
Time schedule

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.
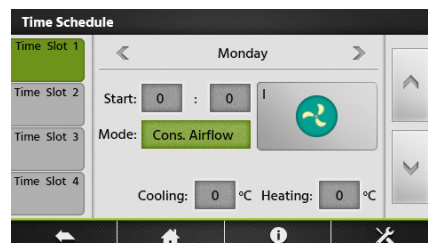
Seasonal management

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.
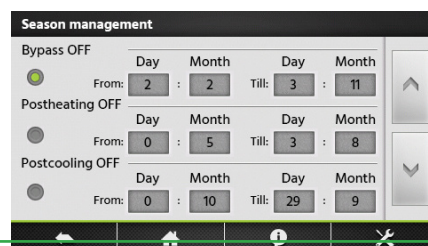
Setup

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 5.1.3

PARAMETRES		
LANGUAGE		
UNITS		
AIRFLOW REGULATION		
TEMPERATURE		
FIRE ALARM		
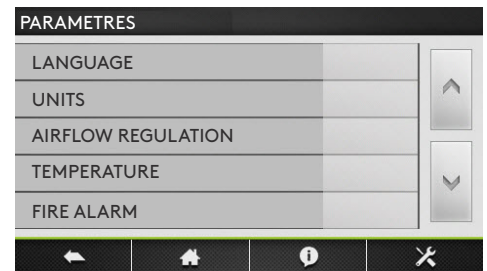
Advanced setup
A code and a special training are desired for access to this menu.

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.

Pressure	3/15
Current Supply fan pressure	0 Pa
Current Exhaust fan pressure	0 Pa
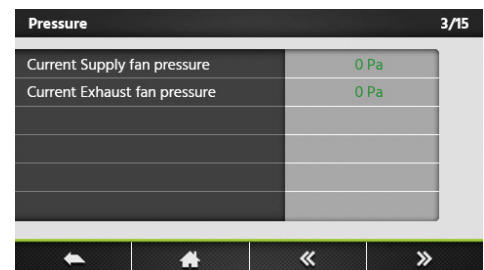
Maintenance
Configuration of service related settings. A maintenance warning interval can be configured as wel as the filter clogging alarm.

Maintenance

Periodic Maintenance		Pressure Maintenance
3 MONTHS	RESET	Pres. alarm OFF
12 MONTHS	RESET	INSTALATION

Periodic main (3 months) in: 90d
Periodic main (12 months) in: 365d

Filter cooling on Exhaust:
Filter cooling on Supply:
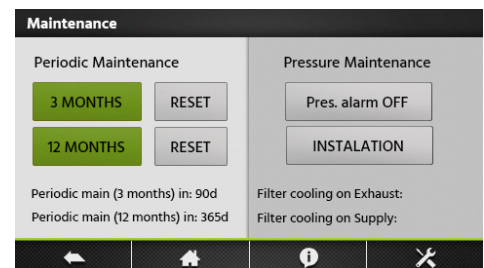
5.1.3 BASIC SETUP

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 5.1.4.
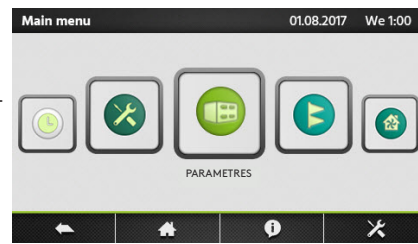
Language

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
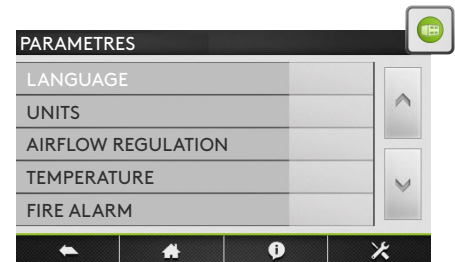
Units

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	m³/h l/s	m³/h
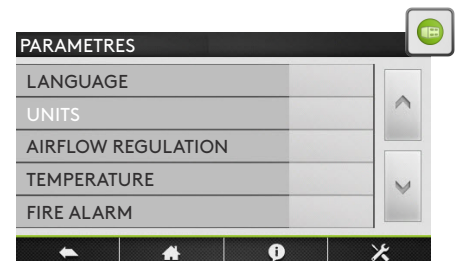
Airflow regulation

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 strenght (%) 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
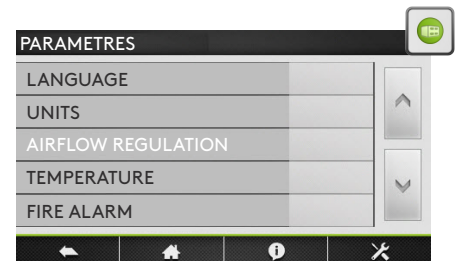
Constant airflow

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. 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
DP Supply/Exhaust for pressure alarm	25...999Pa	200Pa
Initialisation airflow	(l/s, m³/h)	
Pressure alarm initialisation	No Yes	Yes

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...10V	1,0V
Vmax	0...10V	10,0V
m³/h ~Vmin	(l/s, m³/h)	
m³/h ~Vmax	(l/s, m³/h)	
Ratio exhaust/supply	5...999%	100%
Sleep factor on K3	10...100%	100%
Enable pressure alarm	No Yes	Yes
DP Supply/Exhaust for pressure alarm	10...999Pa	200Pa
Initialisation airflow	(l/s, m³/h)	
Pressure alarm initialisation	No Yes	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 5.1.4

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°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 IN3.

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	No

Commissioning completed

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

Setting	Settings range	Factory setting
Confirmation of successfull commissioning	Yes No	No
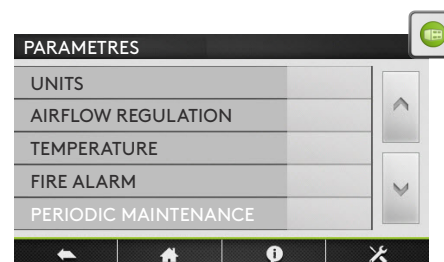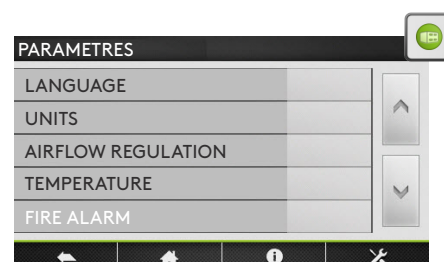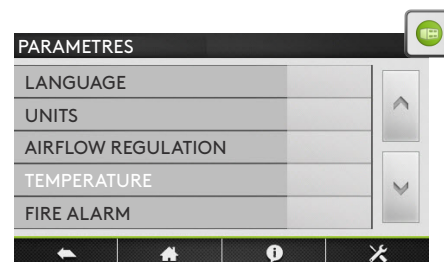
5.1.4 ADVANCED SETUP

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 carefull consideration.

Stop fan with 0…10V

Function only availalbe 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…10V	0,8V
Stop if >Vhigh	No Yes	Yes
Vhigh	0…10V	10,0V

Second 0…10V control signal

Function only availalbe 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…10V on K3?	No Yes	No
Control	Exhaust Supply	Exhaust
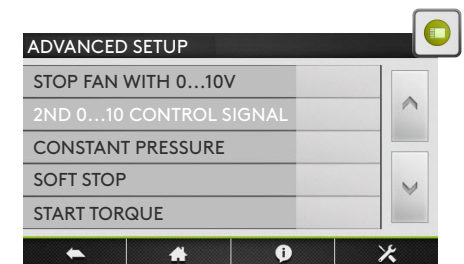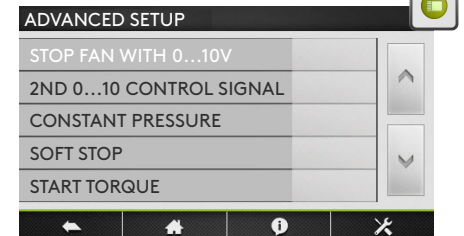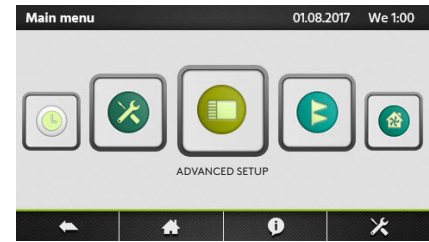
Stop fan when pressure alarm

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
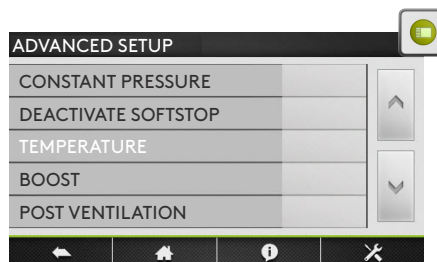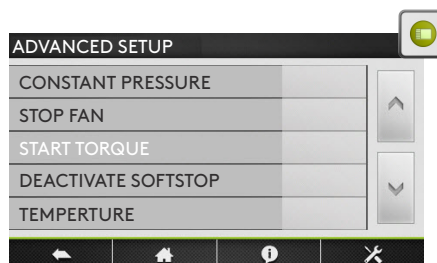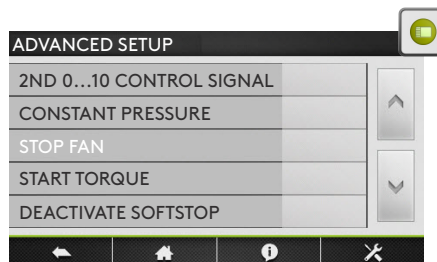
Boost

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 IN9 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...10V	2,0V/9,5V
RH ~Vmin/max	0...100%	2%/95%
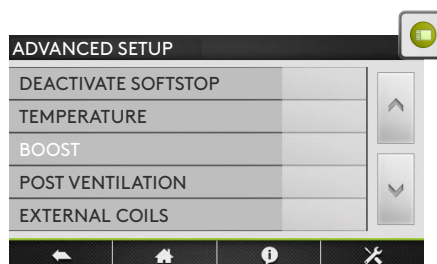
Post ventilation

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...9999sec	90sec
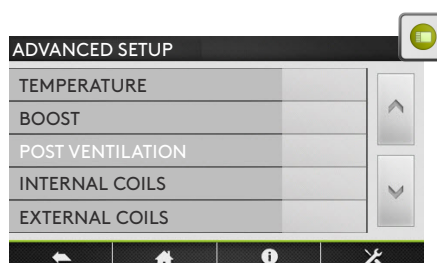
Internal coils

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

ADVANCED SETUP

BOOST
POST VENTILATION
INTERNAL COILS
EXTERNAL COILS
INTERNAL COILS
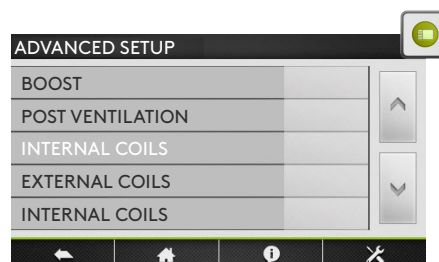
Frost protection

Frost protection plate heat exchangers

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 pre-heating coil, differential pressure measurement (cold climate option). If non of these measures are effective, the air handling unit can be stopped by limting the minimal supply air temperature. When the Frost protection cycle is active, it will be indicated on the HMI. The configurable temperatures are exhaust temperatures.

T3 (°C)

5°C
1°C

→ Frost protection cycle active
→ Frost protection alarm
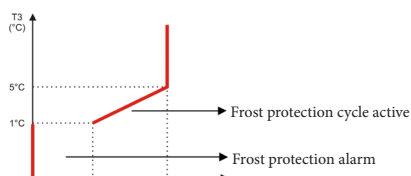
Setting	Settings range	Factory setting
T° Low	1...3°C	+1,0°C
T° High	1...5°C	+5,0°C
Stop supply airflow	No Yes	Yes

0-10V output

The controller has as a standard feature two configurable analogue 0...10V outputs. The outputs represent the actual airflow (or torque) or the actual pressure delivered by one of the selected fans.

Setting	Settings range	Factory setting
Output 1	Flow Fan 1 Pressure Fan 1 Flow Fan 2 Pressure Fan 2 Flow Fan 3 Pressure Fan 3 Flow Fan 4 Pressure Fan 4 Torque Fan 1 Torque Fan 2 Torque Fan 3 Torque Fan 4	Flow Fan 1
Output 2	Flow Fan 1 Pressure Fan 1 Flow Fan 2 Pressure Fan 2 Flow Fan 3 Pressure Fan 3 Flow Fan 4 Pressure Fan 4 Torque Fan 1 Torque Fan 2 Torque Fan 3 Torque Fan 4	Pressure Fan 1

Modbus configuration

The MODBUS RTU communication requires an additional satellite circuit (CID050043) 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 4800 9600 19200	9600
Parity	No Yes	No

LAN configuration

The MODBUS TCP/IP communication requires an additional satellite circuit (CID025072) 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		192.167.1.1
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 Yes	No
Fan run time activation	No Yes	No
Display time	No Yes	No
Service alarm time	0...999999h	0h
Stop fan	0...999999h	0h

6.0 Preventive maintenance

⚠️ **Attention :** before handling and/or opening the access panels it is compulsory to shut down the unit. 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:

6.1 ONCE THE UNIT OPERATES IN NORMAL CONDITION

Replace the filters with a kit of replacement filters.

6.2 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 point 2.0.
- 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
  - Clean any accumulations in the drain pan.

7.0 Troubleshooting

The TAC control board generates and reports 18 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:
- Activation of contact relay (NC or NO contact) - AL 1
- Activation of SAT3 OR1 in case of pressure alarm, provided that the optional module SAT 3 is installed on the control board.
- "Alarm", "Pa" and "AF" 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.

7.1 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			
Text displayed		LED ALARM	LED Pa
B.11	Fan 1 failure	RED	/
B.12	Fan 2 failure		
B.13	Fan 3 failure		
B.14	Fan 4 failure		

TAC control board				
AL1 relay	O.R.1	LED ALARM	LED AF	Fans
Alarm	/	ON	/	stopped
Auto reset: yes				

7.2 TYPE 2: ALARM ON THE PRESSURE VARIATION

- Conditions:
  - Mode airflow control or demand control.
  - External pressostat connected on IN2 input
- Causes:
  - Pressure alarm setup in airflow control or demand control mode
  - External pressostat connected on IN2 input has triggered
- Effects:

Displayed on HMI TACtouch			
	Text displayed	LED ALARM	LED Pa
P.10	Pressure alarm - Supply air		
P.20	Pressure alarm - Extract air	/	RED
S.40	Pressure alarm from Pressure Switch*		

TAC control board				
AL1 relay	O.R.1	LED ALARM	LED AF	Fans
/	Closed	ON	/	Run*
Auto reset: yes				

* unless the status has been changed in advanced setup

7.3 TYPE 3: ALARM REPORT DURING REFERENCE PRESSURE INITIALIZATION

- Conditions:
    - • Mode Airflow control or Demand control: during the initialization of the pressure alarm.
    - • 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			
Text displayed		**LED ALARM**	**LED Pa**
P.20	Initialisation of the reference pressure - Unstable supply air pressure		
P.21	Initialisation of the reference pressure - Unstable extract air pressure		
P.22	Initialisation of the reference pressure - Supply air flow too low		
P.23	Initialisation of the reference pressure - Extract air flow too low	RED	/
P.24	Initialisation of the reference pressure - Supply air flow not reached		
P.25	Initialisation of the reference pressure - Extract air flow not reached		
P.26	Initialisation of the reference pressure - Supply air flow too high - Min. limit of the motor		
P.27	Initialisation of the reference pressure - Extract air flow too high - Min. limit of the motor		

TAC control board				
AL1 relay	**O.R.1**	**LED ALARM**	**LED AF**	**Fans**
ALARM	/	ON	/	Stopped
Auto reset: no				

7.4 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			
Text displayed		**LED ALARM**	**LED Pa**
S.11	"Constant Pressure" fan 1 - Measured pressure too high - Minimum air flow reached	RED	/
S.12	"Constant Pressure" fan 1 - Measured pressure too low - Maximum air flow reached		
S.13	"Constant Pressure" fan 3 - Measured pressure too high - Minimum air flow reached		
S.14	"Constant Pressure" fan 3 - Measured pressure too low - Maximum air flow reached		
S.20	"Demand control" fan 1 - Air flow too low - Reduce the pressure on this fan		
S.21	"Demand control" fan 1 - Air flow too high - Minimum limit of the motor reached		
S.22	"Demand control" fan 2 - Air flow too low - Reduce the pressure on this fan		
S.23	"Demand control" fan 2 - Air flow too high - Minimum limit of the motor reached		
S.24	"Demand control" fan 3 - Air flow too low - Reduce the pressure on this fan		
S.25	"Demand control" fan 3 - Air flow too high - Minimum limit of the motor reached		
S.34	"Constant Air Flow" fan 3 - Air flow too low - Reduce the pressure on this fan		
S.35	"Constant Air Flow" fan 3 - Air flow too high - Minimum limit of the motor reached		

TAC control board				
AL1 relay	**O.R.1**	**LED ALARM**	**LED AF**	**Fans**
/	/	ON	/	/
Auto reset: yes				

7.5 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			
Text displayed		**LED ALARM**	**LED Pa**
D.10	Programme Error	RED	/
D.20	Data Error		

TAC control board				
AL1 relay	**O.R.1**	**LED ALARM**	**LED AF**	**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.

7.6 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 HMI TACtouch			
Text displayed		**LED ALARM**	**LED Pa**
F.10	FIRE ALARM	RED	/
F.11	End of the fire alarm		

TAC control board				
AL1 relay	**O.R.1**	**LED ALARM**	**LED AF**	**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).

7.7 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			
Text displayed		**LED ALARM**	**LED Pa**
M.10	Maintenance 3 months	RED	/
M.11	Maintenance 6 months		
M.21	Operating hours		
M.22	Operating hours - AHU off		

TAC control boards				
AL1 relay	**O.R.1**	**LED ALARM**	**LED AF**	**Fans**
Alarm status	/	ON	/	Stopped if SERVICE STOP FAN*****
Reset via "fan run time" (TACtouch) or "alarm menu" (App)				

* unless the status has been changed in advanced setup

7.8 TYPE 8: ALARM INDICATING A COMMUNICATION BREAKDOWN BETWEEN THE TAC CIRCUIT AND THE HMI

- Conditions:
  - User interface is connected
- Causes:
  - Communications failure between the TAC circuit and the HMI
- Effects:

Displayed on HMI TACtouch		
Text displayed	**LED ALARM**	**LED Pa**
CB COM ERROR	Red	/

TAC control board				
AL1 relay	**O.R.1**	**LED ALARM**	**LED AF**	**Fans**
Alarm status	/	/	/	/
Auto reset: yes				

7.9 TYPE 10 BIS: DRAIN PUMP ALARM

- Conditions:
    • Only for CLASS UNIT LP
- 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 HMI TACtouch			
Text displayed		LED ALARM	LED Pa
R.10	Condensate tray full	RED	/

TAC control board				
AL1 relay	**O.R.1**	**LED ALARM**	**LED AF**	**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.

7.10 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 unit 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			
Text displayed		LED ALARM	LED Pa
T.50	Sensor T5 disconnected	RED	/
T.51	Sensor T5 short circuit		

TAC control board				
AL1 relay	**O.R.1**	**LED ALARM**	**LED AF**	**Fans**
Alarm status	/	ON	/	/
Manual reset mandatory.				

7.11 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			
Text displayed		**LED ALARM**	**LED Pa**
S.50	Post-heating - T° of the supply air too low	RED	/

TAC control board				
AL1 relay	**O.R.1**	**LED ALARM**	**LED AF**	**Fans**
/	/	ON	/	/
Auto reset: yes				

7.4 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 HMI TACtouch		
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.			

7.13 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			
Text displayed		LED ALARM	LED Pa
S.50	Post-heating - T° of the supply air too low	RED	/
S.60	Supply air T° too low - Fan stopped		

TAC control board				
AL1 relay	**O.R.1**	**LED ALARM**	**LED AF**	**Fans**
Alarm Status	/	ON	/	Stopped
Manual reset mandatory.				

7.15 TYPE 18: ALARM INDICATING AN INCORRECT POSITION OF THE MODULATING BYPASS RELATIVE TO THE ORDERED POSITION

- Conditions:
  - 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			
Text displayed		**LED ALARM**	**LED Pa**
B.20	Position of the modulating bypass incorrect	RED	/

TAC control board				
AL1 relay	**O.R.1**	**LED ALARM**	**LED AF**	**Fans**
Alarm Status	/	ON	/	Stopped
Manual reset mandatory.				

7.16 TYPE 19: ALARM INDICATING THAT THE HOURS LIMIT FOR THE MAINTENANCE OF THE FILTERS HAS BEEN REACHED

- Conditions:
  - The basic setup parameter "Filters Resets" must be >0
- Causes:
  - Alarm indicating that the hours limit for the maintenance of the filters has been reached
- Effects:

Displayed on HMI TACtouch		
Text displayed	**LED ALARM**	**LED Pa**
FILTERS ALARM	Red	/

TAC control board				
AL1 relay	**O.R.1**	**LED ALARM**	**LED AF**	**Fans**
/	/	ON	/	/
Auto reset: via dedicated reset				

8.0 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.

8.1 MAIN PARAMETERS AFTER COMMISSIONING

1	CLASS UNIT 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	If KWin option:	T° KWin = _____	°C			
9	KWout	T° KWout = _____	°C			

8.2 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

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): GLOBAL PX (TOP) / GLOBAL RX (TOP) / GLOBAL LP (OUT)/
                             CLASS UNIT / MURAL

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)
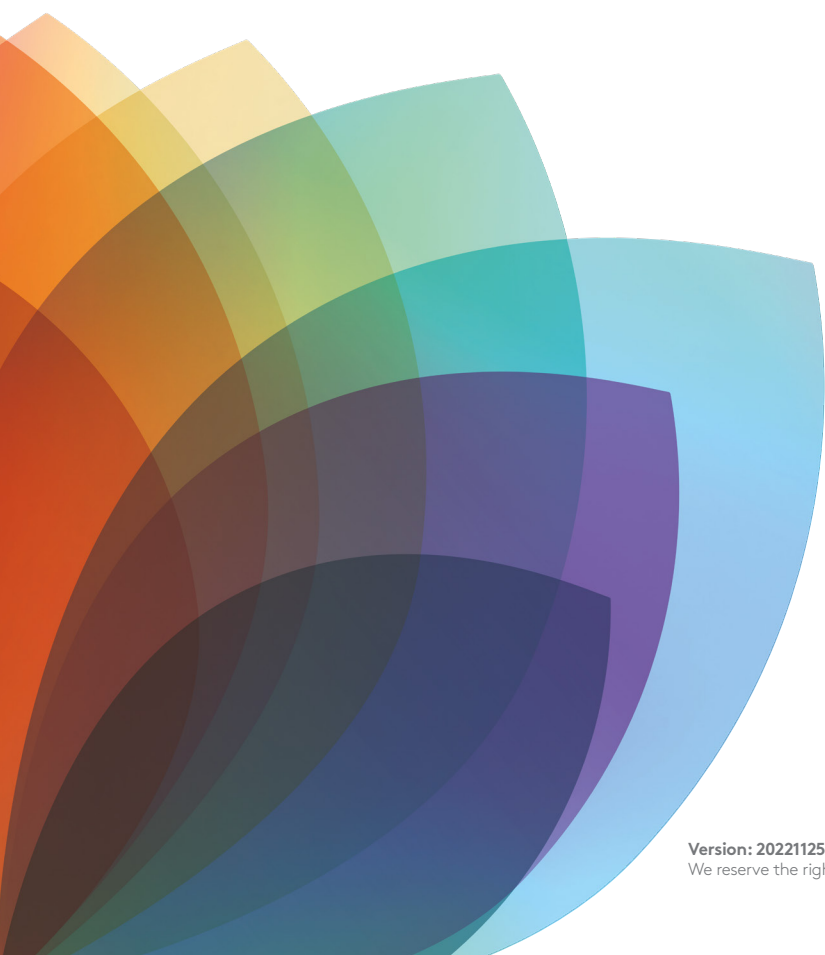
Authorized to compile the technical file:

Name: Nicolas Pary

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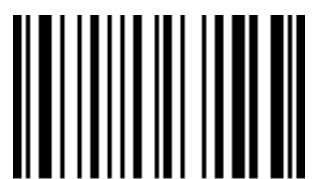   B5030 Gembloux

Signature:

Place and date: Gembloux 2021-05-17

Signature: Name: Jean-Yves Renard

         Position: R&D Director

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