enervent®

Ventilation unit with twin heat recovery wheels

Installation and Operation manual

Before installing and operating this unit,
please read this manual thoroughly, and retain it for further reference.

TwT

Enervent Twin Tropic

www.enervent.fi

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WARNING

- Isolate power to the unit before removing the access hatch or performing any electrical/ maintenance work. Wait 2 minutes before commencing any work on the unit. Note that fans continue to rotate after power is isolated and heater modules retain heat for some time post isolation. ensure it is safe to commence work. There are no serviceable parts contained within the control panel or within the electrical cabinet. Work on these items must be performed by a trained professional only. Power should not be isolated fro the unit until the troubleshooting has been completed.
- The unit must be disconnected from the electric network if voltage tests, insulation resistance measuring or other measurings/electrical work, which can harm sensitive electronic equipment are done.
- The regulation and control equipment of the unit can cause leakage current. Therefore the fault current protection doesn't always work correctly with the unit. The electrical connections must be made according to prevailing local directives.
- All ventilation devices with EDA-control are to be equipped with overvoltage protection.
- Heat Pump must be installed by a qualified installer to ensure product warranty is maintained. Failure to do so will result in the warranty being void.

TYPE MARKING

Inside the ventilation unit is a product ID plate. When the product is first installed please use this time to fill in the details onto the data section below for ease should replacement filters be required.

This manual covers the following units:

Enervent® Pegasos Twin Tropic CW
Enervent® Pegasos Twin Tropic CW-E
Enervent® Pegasos Twin Tropic CX
Enervent® Pegasos Twin Tropic CX-E

powered by enervent®	ilmastointilaite ventilation unit
TYYPPI/TYPE: SRJ.NRO/SERIAL NO: W/ V/ HZ / A:	
CE	ENERVENT OY KIPINÄTIE 1 06150 PORVOO TEL +358 (0)207 528800 FAX +358 (0) 207 528844

TYPE DESCRIPTION

Twin Tropic	Double heat recovery wheels.
CW	Water cooling coil.
CX	Evaporator coil and inverter controlled heat pump.
E	Electrical heater.

FOREWORD

The Twintropic ventilation units are designed and manufactured for use all year round. In Finland the ventilation units have been installed in houses and other spaces for over 25 years and their popularity is increasing each year. Because of the knowledge and experience we have amassed during these years, we can now manufacture more energy efficient and user friendly ventilation units.
The Enervent Twintropic unit series is the result of a long product development.

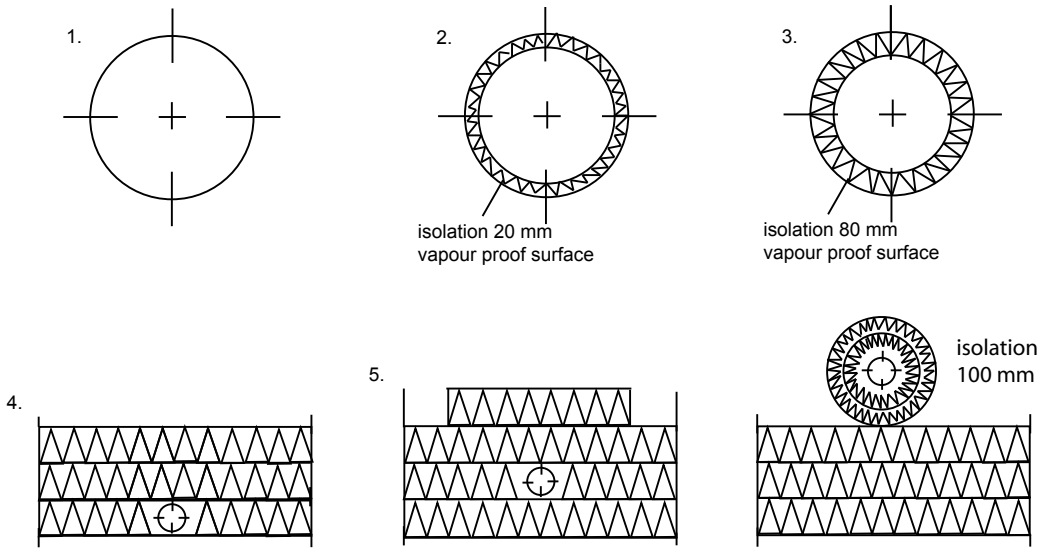
OPERATING PRINCIPLE

The Enervent Twin Tropic ventilation unit is a combination of regenerative heat recovery and an inverter controlled heat pump or water cooling coil. A characteristic of the regenerative heat exchanger is its high rate of heat recovery (or efficiency). The system uses rotating heat exchangers (HRW) through which the supply and extract air flow in opposite directions. The outside air temperature is first cooled and partly dehumidified in the first rotating heat exchanger and the further cooled and dried in the supply air coil. The second HRW preheats the supply air so that we prevent condensation problems in the ventilation ducts and draught in the supply air valves. It also acts as a pre-cooler for the outgoing extract air before entering the first HRW.

In CX-models heat is transferred from the supply air coil to the outdoor unit by the compressor, benefitting from the change in the refrigerant's state. The refrigerant effectively binds heat when it changes from fluid to vapour. The heat is released when the refrigerant condensates back to fluid.

The Twin Tropic-system is completely automated. The fans are energy efficient direct current fans.

DUCT HEAT INSULATION



Examples of different insulation alternatives:

1. Extract air duct in warm spacing (indoors, no insulation).
2. Supply air duct between ventilation unit and terminal equipment.
3. Exhaust air and outside air duct in warm spacing (indoors).
4. Extract air duct in the ceiling insulation.
5. All ducts in a cold attic. Outside air and exhaust air ducts must not be assembled directly above the steam barrier. Both ducts require an insulation layer of 100 mm thick mineral wool.

LIST OF COMONENTS

THE TWIN TROPIC CW INCLUDES:
1. Enervent ventilation unit
2. Control panel
3. Control panel cable RJ4P4C, length 20 m (installation in a min 16 mm conduit)

NOTE! The water cooler is not included in the delivery.

THE TWIN TROPIC CX INCLUDES:
1. Enervent ventilation unit
2. Control panel
3. Control panel cable RJ4P4C, length 20 m (installation in a min 16 mm conduit)
4. Outdoor unit Mitsubishi PUHZ-RP
5. Control unit Mitsubishi PAC-IF011/12B-E
6. Sensors 3 pcs

INSTALLATION

Unit should be installed in an internal location such as a utility or cupboard area. Enervent do not recommend installation into a cold space such as a garage or external area.

INSTALLATION PROCEDURE:

N.B.! To reduce the weight of the unit you can remove the heat recovery wheels before mounting.

1. Install the unit on the floor or on a level plinth so that it stands on its own rubber pads. Leave at least a 10 mm gap between the back of the unit and the wall and at least a 15 mm gap along both sides. Also take into account the space needed for drainage below the unit.
2. Make sure that there is at least 950 mm of free space in front of the unit's maintenance hatch and remember to leave access to the electrical connections.
3. Connect the ducts to the unit with flexible connectors. Silencers are recommended for the supply air and extract air ducts.
4. Read the drainage instruction. Both drainages are situated in the bottom of the ventilation unit.

CX-models:

The external unit should be located outside of the property at a maximum distance from the coil (AHU) of 20 m and with a max height difference of 10 m. The unit should be protected from direct sunlight for maximum performance. The outside air unit should be mounted carefully to avoid resonance during operation. For example if the outside unit is mounted on a boarded wall it should be equipped with noise absorption rubber pads to avoid resonance. The unit should not be mounted on a wall outside a bedroom so avoiding possible noise ingress. We recommend that a suitable wall mounting rack be constructed for the unit so it doesn't have to lie close to the wall. An open cover for the unit can be utilised as long as it doesn't restrict the air flow. The unit is not to be mounted in a enclosed space.

Piping and electrical wiring:

Enervent eco Twin Tropic is a combination of a ventilation unit and a heat pump. The heat pump is a cooling apparatus and must be installed by a suitably qualified individual to comply with the regulations and standards prevailing at the time of installation. The pipes between the outside air unit and the supply air coil are not included in the standard delivery.

The outside air unit also requires an electrical supply to operate. The heat pump must have its own output on the consumer unit. The electrical connections must be installed by a suitably qualified individual to comply with the regulations and standards prevailing at the time of installation. The cable between the outside unit and ventilation unit is not included in the delivery.

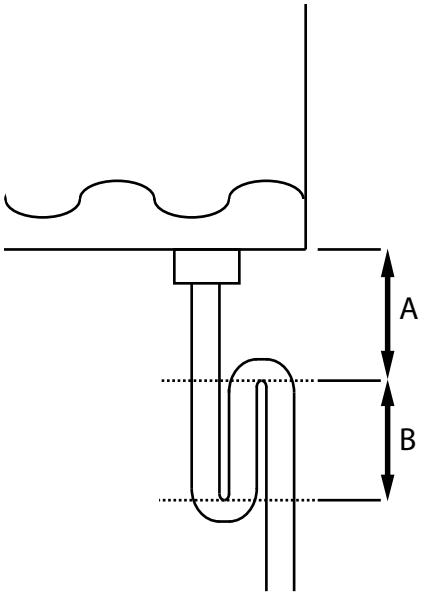
DRAINING THE VENTILATION UNIT

All Enervent Twin Tropic units must be drained of condensate via a plumbed connection. When air cools down below the dew point, condensed water forms. The condense water drain must not be directly connected to a sewer and should be trapped prior to connection to any waste water outlet in a property or otherwise! the minimum dia for the condense drain should be 32 mm dia. The pipe must at all times lie lower than the bottom of the ventilation unit. There must not be any longer horizontal sections on the pipe and there mustn't be more than one water lock. Each condensate drain must have a water lock of its own.

A Hep2O water seal can be used in place of a trap where necessary.

There is a negative pressure in the ventilation unit. We recommend a height difference of (A) 75 mm, or at least the negative pressure divided by 10 (answer in millimeters) so (i.e. 500 Pa under pressure -> 50 mm), between the unit drain and the trap. We recommend that the height of the trap water (B) is 50 mm, or at least the negative pressure divided by 20 (answer in millimeters) so (i.e. 500 Pa under pressure -> 25 mm height of trap water).

Note the water level in the trap should be self leveling and must be filled prior to operation of the unit. Should the water level drop a bubbling noise could be heard. In this instance fill the trap with water again.



USER GUIDE

STARTING THE UNIT

The unit should be started when the outside air humidity is lowest and the building should be dehumidified during the building process in order to give the unit an optimal start and reduce the initial startup run. The dehumidification process will be slow and the closer the humidity level in the building is to the set point for the unit, the sooner it will be achieved. When starting the unit the absolute humidity level of the property should be checked. The unit will supply the building with dryer air and by that we can maintain a low absolute humidity level in the building despite the leakage from doors, windows etc.

The Enervent Twin Tropic system can be started when the following steps have been completed:

- The ventilation unit is installed as stated in the chapter Installation in this manual.

- CX-models;
  - The outdoor unit is mounted.
  - The piping between the outdoor unit and the coil is completed.
  - The refrigerant circuit is filled and certified as correct.
- CW models;
  - Water circulation of the CW model coil is connected.

- The condense drain is connected as stated in the chapter "Draining the ventilation unit" in this manual.
- All ducts and silencers are connected to the ventilation unit.
- All external terminals are installed. NOTE! Enervent do not recommend an insect net on the fresh air intake due to possible blockages.
- All ducts have been insulated as instructed.
- The ventilation unit and the outside unit have been provided with the appropriate power supply and any control cables have been connected.
- The control panel has been connected to the unit with the RJ4P4C cable provided (to the connector OP1 on the main unit PCB).
- The air flows have been balanced at the diffusers.

On completion of the above checks the unit should have a final check by the installer to ensure the ducts and internal area of the unit are clear of debris and the filters are clean.

NB! The unit should not be run whit the hatch open. The unit can be started by applying power via the switched fused spur local supply. it is recommended that the supply be fused and identified for the purpose of isolating the unit when maintenance is required.

SUPPLY AND EXTRACT AIR CALIBRATION

After the unit has been switched on its airflows must be calibrated. When completing the calibration process all filters should be clean, all supply and extract air valves including any roof terminals and external terminals should be installed. We do not recommend the use of an insect net on external terminals. The extract air flow should be circa 5 - 10 % lower than the supply air flow. To achieve optimal values during calibration the airflows should be measured at each duct opening.

A suitable measuring instrument would be a Thermo Anemometer. With the registered values the airflow can be regulated to achieve the projected values. A correctly calibrated ventilation unit is quiet and gives a good heat return and it should provide a small positive pressure in the house during warm periods and a small negative pressure during cold periods. The pressure difference stops humidity from entering the walls and ceiling.

OVERVIEW

The ventilation unit should never be switched off. Always keep the ventilation at suitable power! If the ventilation is insufficient, the humidity indoors becomes too high. A relative humidity of 45 - 55 % indoors is recommended (room temperature of 22 - 25°C). At these levels temperature and humidity will be at a healthy level. Check the indoors humidity levels regularly. This can be done with a hygrometer. Regularly check the filters. At each filter inspection, check that the heat exchangers are rotating freely. Cover both the outside air intake and the exhaust air outtake if the unit is not to be used for a longer period. This way you stop moisture from condensing on e.g. the fans' electric motors.

OPERATING NOTES

This operational report describes the operations of two heat recovery wheels and a cooling coil in a dehumidifying ventilation unit.

1. USE
The ventilation unit is designed for countries where the control of humidity is paramount. In order to maintain the desired conditions in the building, the unit runs constantly with sensors and can not be controlled with timers.

2. INTERLOCKS
The heat recovery wheels rotate as the unit runs.

3. AIR REQUIREMENTS
The air flow should be balanced to provide a positive pressure to the property. The motors are variable to control the duct pressure and airflow velocity.

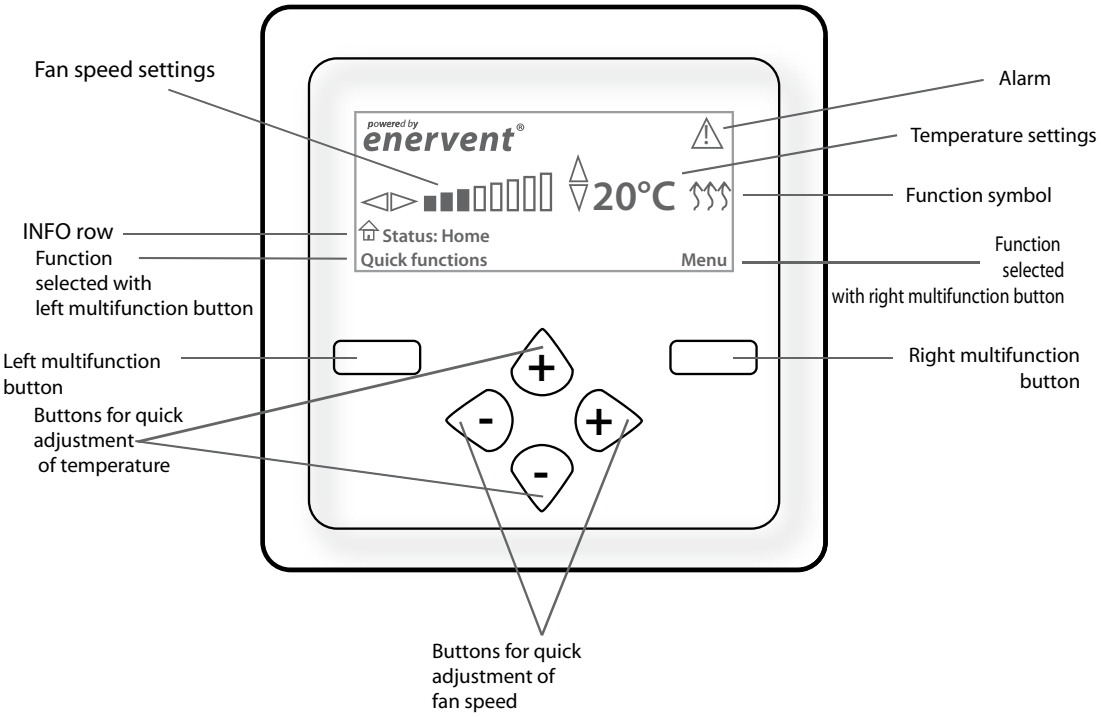
4. HUMIDITY CONTROL FUNCTIONS
The desired humidity and temperature is set on the control panel. The control calculates the desired absolute humidity (kg water/cubic air). The supply air is kept 1-2 g/kg dryer than the set value. The supply air water content is regulated by controlling the cooling coil and the desired humidity conditions are achieved.

5. COOL RECOVERY
The cooling coil dries the supply air creating temperature too low for the air to be introduced into the building. The air is therefore warmed with the second rotating heat exchanger. At the same time the extract air is cooled allowing the supply air to be pre cooled reducing the cooling coil power demand by 50%.

6. HEATING
The control activates the after heating coil if the air temperature is below the set value. Note this is an optional extra and not found on all units

7. PRECAUTIONARY MEASURES
A Fire Hazard Alarm will sound if the supply air temperature rises over a preset limit.
A Sub Temperature Alarm will sound if the supply air temperature drops below a preset limit.
An External Emergency stop message will stop the unit.
If the electrical after heater coil (additional equipment) overheats, an alarm will sound and the unit will stop. The alarm for failure must be reset from the coil.
The filter guard will trigger an alarm when the set value is gone over.
A Pressure Control Switch will trigger an alarm if the fan doesn't reach the set holding pressure in the duct.

THE CONTROL SYSTEM AND OPERATING PANEL



CONTROL PANEL BUTTONS

Buttons for quick adjustment of fan speed
Press the right arrow to increase fan speed.
Press the left arrow to decrease fan speed.

Buttons for quick adjustment of temperature
Press the up arrow to increase temperature.
Press the down arrow to decrease temperature.

Left multifunction button
By pressing the left multifunction button while the display is in its initial starting mode, you get to the list of "quick functions". From the list you can choose which functions you immediately want to activate. The selection of functions available on this list is made in Main Menu / Settings / Quick Choice.
The following quick choice functions are available:

- Overpressure
- Boost
- Maximum heating or cooling
- Night cooling allowed or prevented

Right multifunction button
By pressing the right multifunction button while the display is in its initial starting mode you get to the "Main Menu". In the Main Menu the following options are available:

- Reading and Resetting an alarm.
- Setting time and date.
- Measured temperature and humidity.
- Set timer programs for both week and year level.
- Technical information.
- Password access to advanced settings menu.

Keypad lock

The keypad lock is activated by pressing the left multifunction button (Quick functions) and directly pressing the "arrow up" . To unlock repeat this process.

DISPLAY

Fan speed settings on direct current models

(unit with direct current fans)
Coloured bars on the display show which ventilation effect is active:
1 = 20 - 29 %, 2 = 30 - 39 %, 3 = 40 - 49 %, 4 = 50 - 59 %, 5 = 60 - 69 %, 6 = 70 - 79 %, 7 = 80 - 89 %, 8 = 90 - 100 %. The exact value is shown on the display, with an accuracy of one percent, for a short while when the buttons + and - for fan speed adjustment are pressed. The ventilation effect which is active is shown under boosting, if the fans are in boost mode, otherwise the initial setting is show. If a difference in the fans' speeds has been set in the "settings" menu, then the number of bars on the display is reduced depending on the difference in speed. If a speed difference has not been set, the maximum number of bars is eight.
Example:
The extract air fan's normal speed is 50 % and the supply air fan's normal speed is 40 %. The difference in speed is 1, so on the display are shown 8 - 1 = 7 bars.

Temperature Settings

The chosen temperature setting is shown in numbers. It is the extract air temperature or the room temperature if a room temperature sensor has been installed.

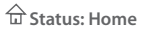
Function symbols

The symbol shows which function is active

Normal operation.

The after heating is active.

INFO row



This row shows which mode the ventilation unit is in. The unit can display any one of the following modes depending on what it is set to do at that point in time.
Home / Away / Long away / Boosting (°C or %RH or CO2) / Overpressure / Max heat or cooling / Stove / Ce Va Cl / Night cooling

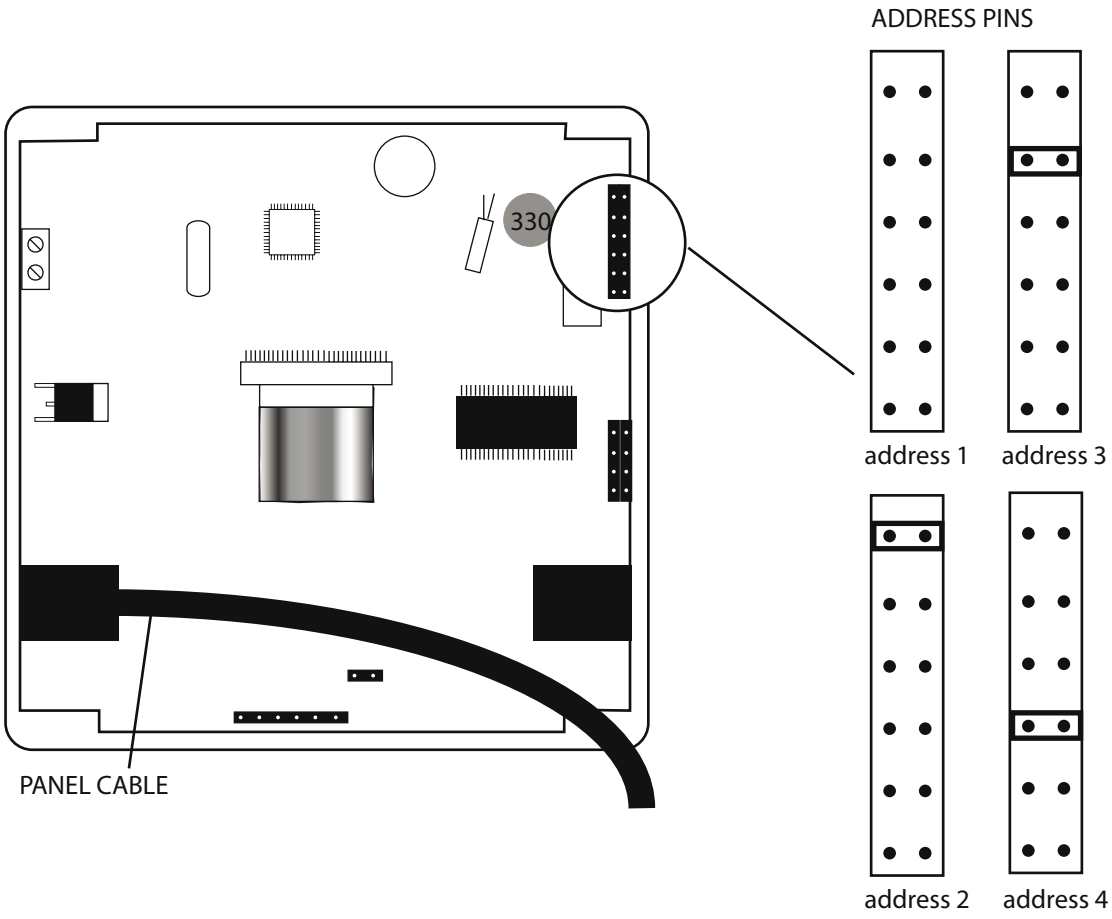
Service and alarm messages

The symbol for Service and Alarm messages appear on the display if an error occurs with the unit or if the unit is in need of servicing

DEFINING ADDRESSES FOR OPERATING PANELS

Four (4) operating panels can be connected to an ventilation unit with EDA-control. If an unit is controlled with more than one panel, Modbus-addresses have to be defined for the panels in order for them to work in parallel. The address is defined with the short-circuit plugs delivered with the panel.

1. Remove the cover plate from the back of the panel.
2. Release the panel cable, if it is connected or shut off the ventilation unit.
3. Choose a different address for each operating panel by short-circuiting the corresponding pins with the plugs as shown below.

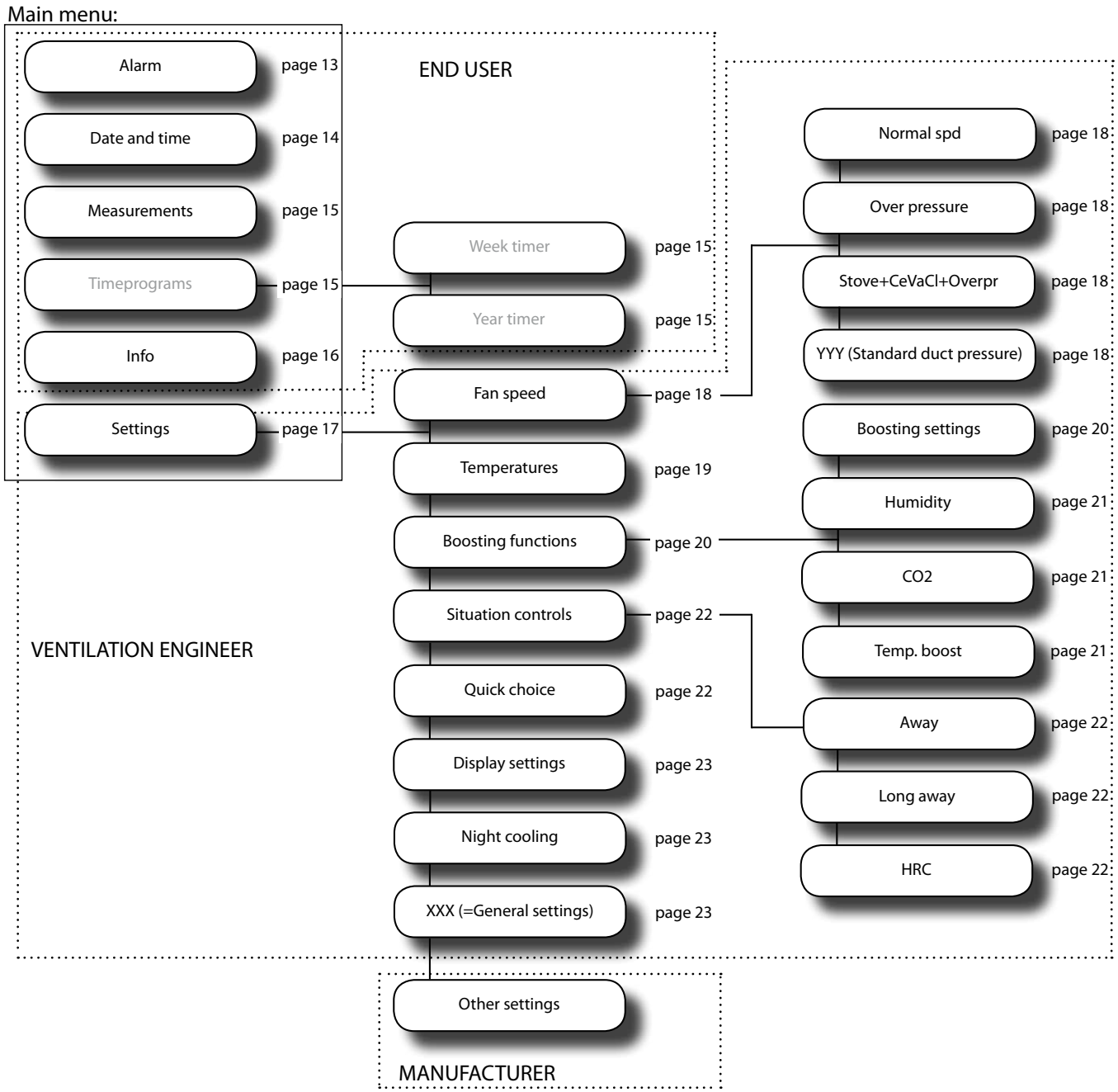


CONTROL OVERVIEW

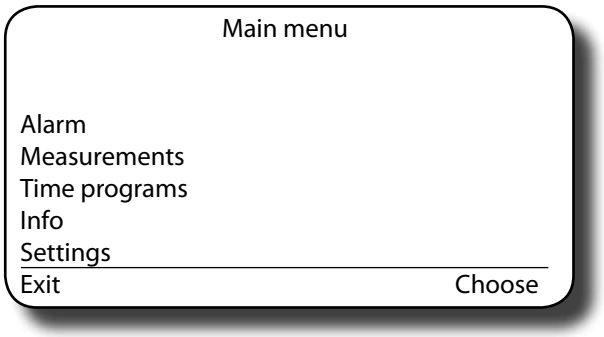
The EDA control is an all-round control that suits many types of unit. All functions are not suited for the Twintropic. The functions usable for Twintropic are written in black. The functions in grey should be left alone.

In the menu, you can navigate by using the up or down arrow. When you are in the menu the options are: ”Exit”; ”Reset”; ”Choose” and ”Change”, shown on the bottom edge of the display. You can select these options by pressing the multi-choice button on the corresponding side to the option.

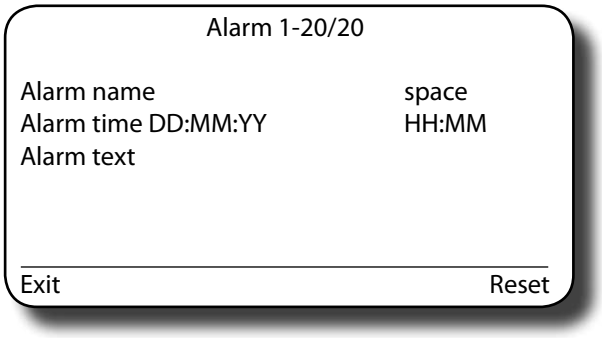
MENU STRUCTURE



MAIN MENU



ALARM



All alarm and service messages are visible in the unit's Alarm menu. It lists the last 20 last events. An alarm can have three different events:
The alarm is activated (ON)
The alarm is reset but is still active (RES)
The alarm is off (OFF).

If an alarm is given e.g. for extract air min. limit, i.e. because the extract air's temperature has gone below the alarm limit, a so-called ON alarm is given, when the alarm is reset, but still active, a so-called reset is made and when the temperature rises above the limit value (+hysteresis) a so-called OFF alarm occurs.

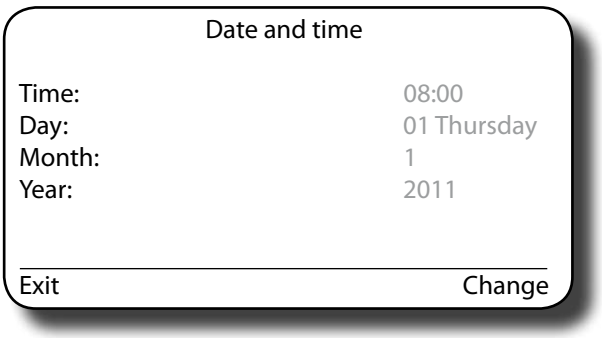
The alarms are divided into two categories, class A and class B.
Class A alarms shut down the unit and give off an external A alarm.
Class B alarms give a type B alarm, but do not shut down the unit.
Depending on the alarm the unit can however go
into a failsafe mode, i.e. the exhaust air fan works at minimum effect and the supply air fan stops. Weekday and times can be programmed into the output for class B alarms, if this is done B alarms are only given out at set times. If an alarm is triggered outside of the set time, it is not sounded until the set time. In the headline for the alarm menu is a field # / # where the alarm type and ID will be displayed. The latest alarm is shown first on the list and the last alarm is erased when the number of alarms exceeds 20. The display for alarms shows the name of the alarm and its status on the first row, the time the alarm was given on the second row and the explanatory text on the third and fourth row. The alarm's status can only be ON, OFF or RES. When the status is ON, the alarm is active and the alarm-output is on. When the alarm is active it can be read and reset by pressing the right multi-choice button. The ON text is then changed to RES and the alarm-output turns off for that alarm. If the alarm is a class A alarm the unit will not start up again until the alarm has been reset. In the OFF status the alarm is no longer active but can be seen on the displaystart up again until the alarm has been reset. In the OFF status the alarm is no longer active but can be seen on the display.

List of alarms

Alarm name	Class	Explanatory text row 1	Explanatory text row 2	Alarm limit	Delay	NOTE!
TE5 min	B	After HRC	Supply air cold	5°C	10 min	
TE10 min	B	Supply air cold		10°C	10 min	Unit in failsafe mode;supply air off / extract air minimal
TE10 max	A	Fire risk	Sply temp high	55°C	2 sec	Alarm off only after reset.
TE20 max	A	Fire risk	Room temp high	55°C	2 sec	Same set-point for all room-sensors.
TE30 min	B	Extract air cold		15°C	10 min	Unit in failsafe mode; supply air off / extract air minimal.
TE30 max	A	Fire risk	Extract temp high	55°C	2 sec	Alarm off only after reset.
ELH-problem	A	Electrical coil	Overheating		2 sec	Alarm info from booster unit ELH . Only EDE units. DI10 income, false information or contradiction. Alarm off only after reset.
TE45 min	A	Water cooler	Freeze risk	+8°C	0 sec	Only EDW-units. Alarm off only after reset.
Freeze problem	B	Freeze problem info			2 sec	If to DI income freeze problem information has been installed. Contradiction alarm.
E-stop	A	External emergency stop	E-stop		0 sec	If ext. emergency stop DI* on. Alarm off only after reset.
Fire risk	A	External	Fire risk		0 sec	If ext. emergency stop DI* on. Alarm off only after reset.
Service reminder	B	Service reminders			6 mnths	Service reminder
Sply fltr	B	Dirty	Supply filter		10 min	Extra equipment.
Exhst fltr	B	Dirty	extract filter		10 min	Extra equipment.

* DI = Digital Input

DATE AND TIME



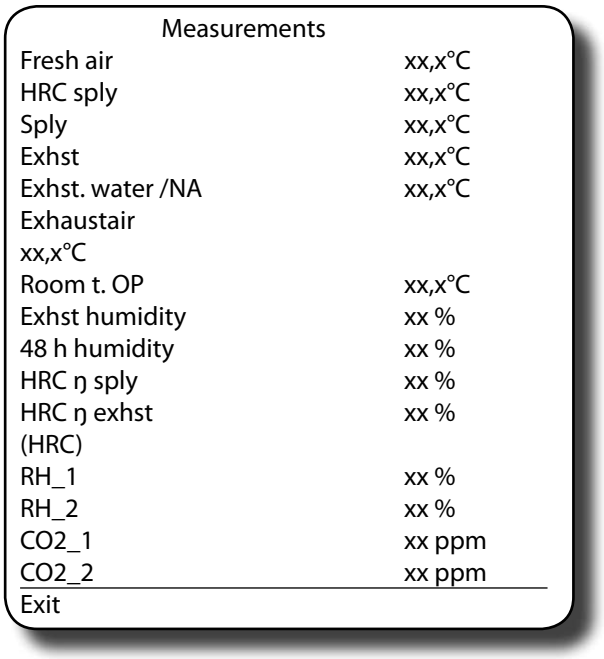
Setting up time, month and year. Weekday displayed automatically.

MEASUREMENTS

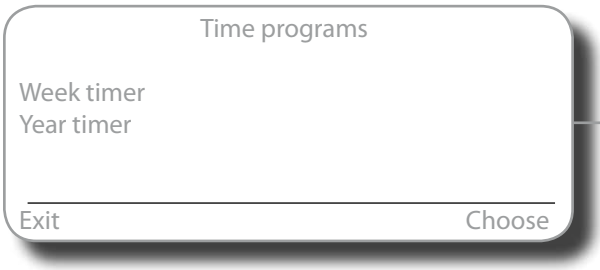
The Measurements menu is an informative menu where you can read the different measurement results. Also measurements from extra equipment like CO_2 and RH% sensors can be read here. Explanations of the measurements:

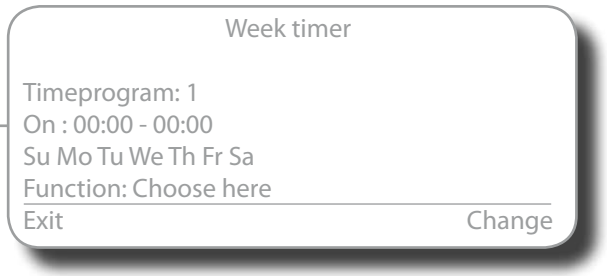
Fresh air	Outside air temperature
HRC sply	Supply air temperature after the heat recovery
Sply	Supply air temperature
Exhst	Extract air temperature
Exhst water	Return water temperature (EDW models)
NA	No sensor connected
Exhaustair	Exhaust air temperature
Room t. OP	Room temperature, control panel measure result*
Exhst humidity	Extract air humidity level
48 h humidity	The average extract air humidity level during the last 48 hours
HRC ŋ sply	Supply air heat recovery rate
HRC ŋ exhst	Extract air heat recovery rate
HRC	-100...0 the unit is asking for cooling 0...+100 (only) heat recovery in use +100...+200 the unit is asking for heating
RH_1	Measurement of separate humidity sensor*
RH_2	Measurement of separate humidity sensor*
CO2_1	Measurement of carbon dioxide sensor*
CO2_2	Measurement of carbon dioxide sensor*

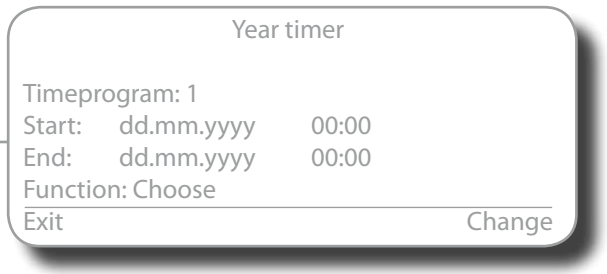
* sensor extra equipment



TIME PROGRAMS







In the Time Program menu you can program the week and year timers. For the **week timer there are 20 program slots** which can be set up when to activate the program (hh:mm – hh:mm + day) and what function the unit is to perform during this time program.
For the **year timer there are 5 program slots** which can be set up when to activate the program (hh:mm – hh:mm + day) and what function the unit is to perform during this time program.

Time program events:

Ventilation effect (20-100%) for ventilation units with eco direct current fans. The maximum available ventilation effect depends on the fan effect's initial settings. If the speed of the supply air and extract air fan is the same, the maximum effect available is 100%. If the difference in speed is 10% then the available effect is 90% etc.

Away: The unit is set to the Away state.
Long away: The unit is set to the Long away state.
Max heat: Maximum heat is turned on. Event continues until the timer runs out or the limit value is reached.
Max cooling: Maximum cooling is turned on. Event continues until the timer runs out or the limit value is reached.
No heating: Heating prohibited.
No cooling: Cooling prohibited.
Temp. drop: The temperatures set point is lowered to the level set in settings mode.
Timerly: Timed relay (DO2) is connected to activate at set time.

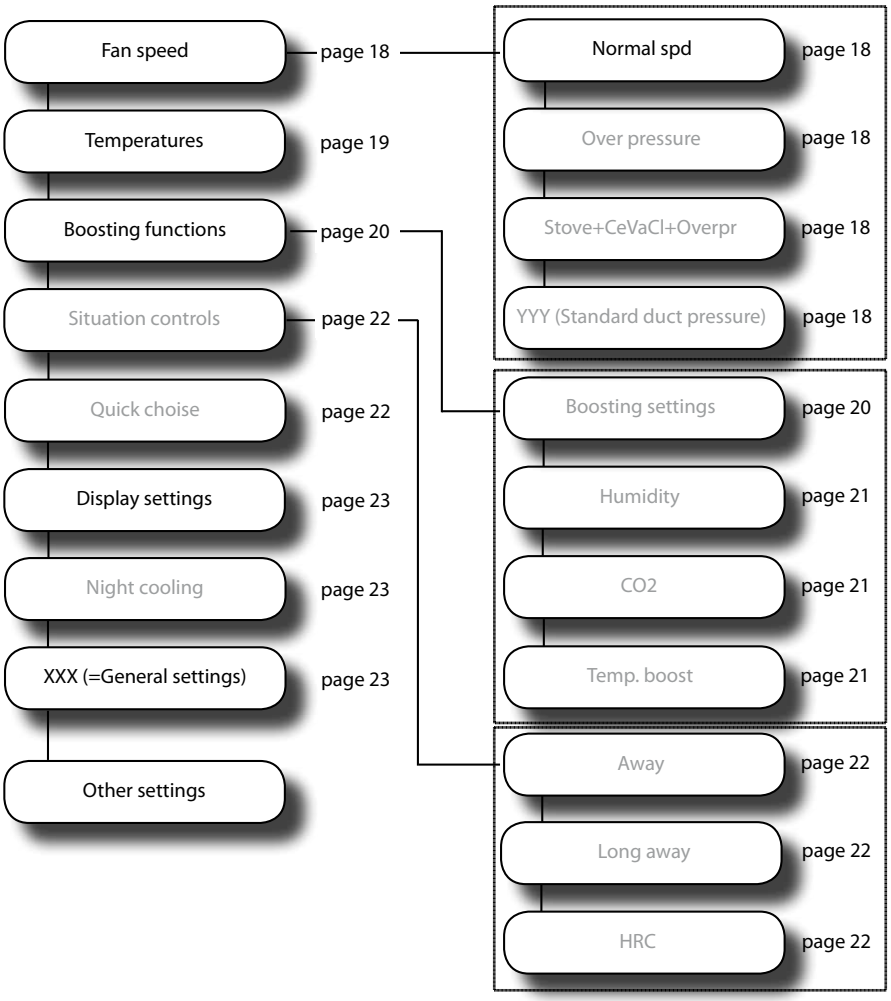
INFO

Informative menu that displays the unit's technical details and program versions.

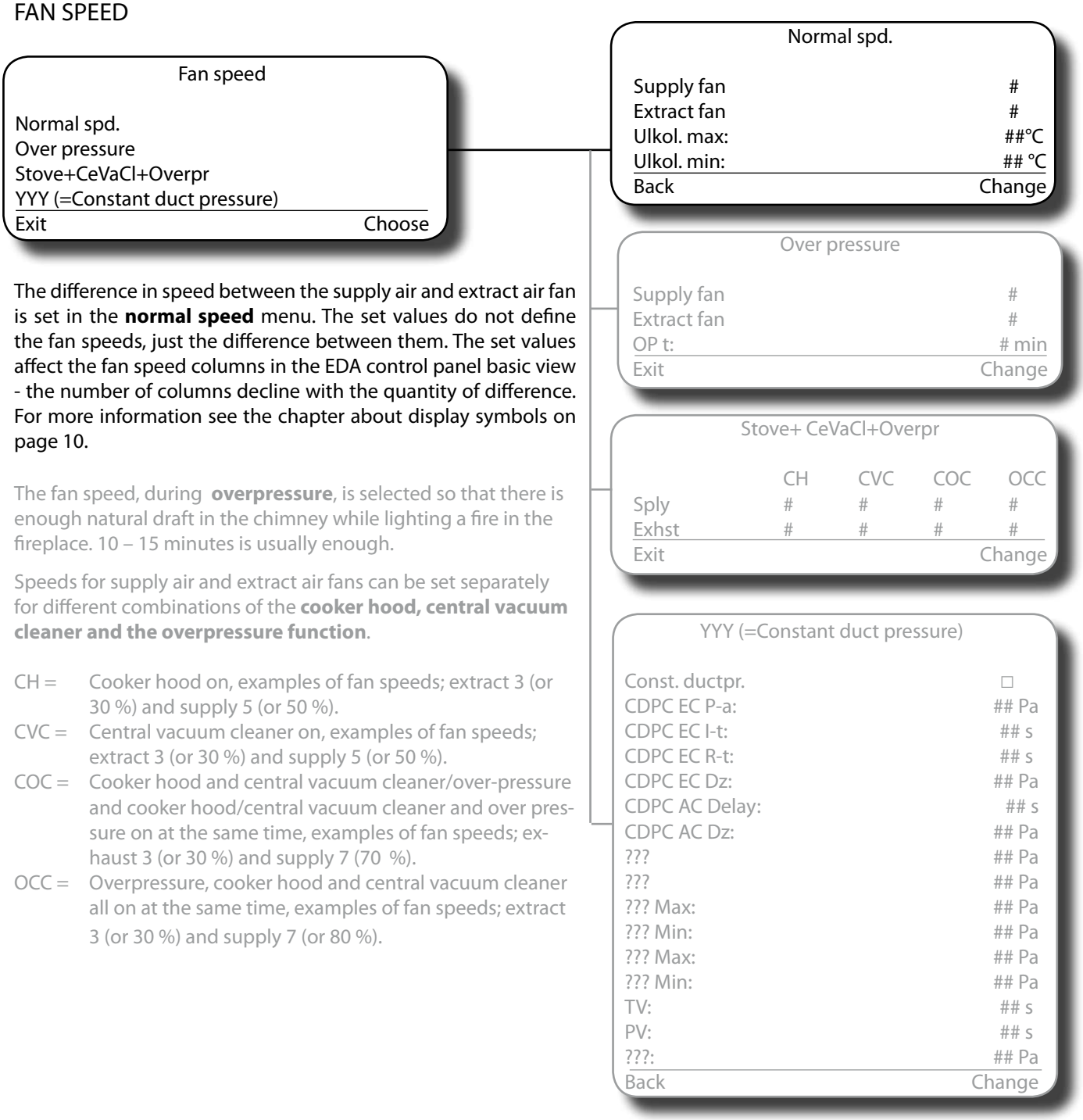
SETTINGS

In this menu, you enter the settings needed for taking the unit into use. ***The code is 6143.***

Settings:



FAN SPEED



The difference in speed between the supply air and extract air fan is set in the **normal speed** menu. The set values do not define the fan speeds, just the difference between them. The set values affect the fan speed columns in the EDA control panel basic view - the number of columns decline with the quantity of difference. For more information see the chapter about display symbols on page 10.

The fan speed, during **overpressure**, is selected so that there is enough natural draft in the chimney while lighting a fire in the fireplace. 10 – 15 minutes is usually enough.

Speeds for supply air and extract air fans can be set separately for different combinations of the **cooker hood, central vacuum cleaner and the overpressure function**.

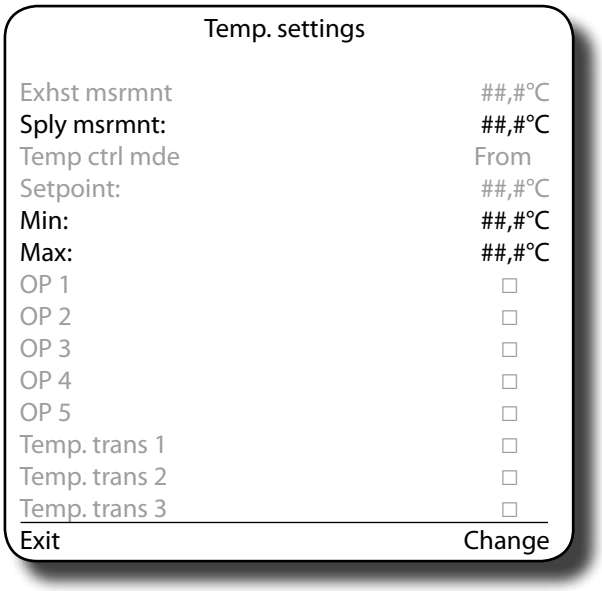
CH = Cooker hood on, examples of fan speeds; extract 3 (or 30 %) and supply 5 (or 50 %).

CVC = Central vacuum cleaner on, examples of fan speeds; extract 3 (or 30 %) and supply 5 (or 50 %).

COC = Cooker hood and central vacuum cleaner/over-pressure and cooker hood/central vacuum cleaner and over pressure on at the same time, examples of fan speeds; exhaust 3 (or 30 %) and supply 7 (70 %).

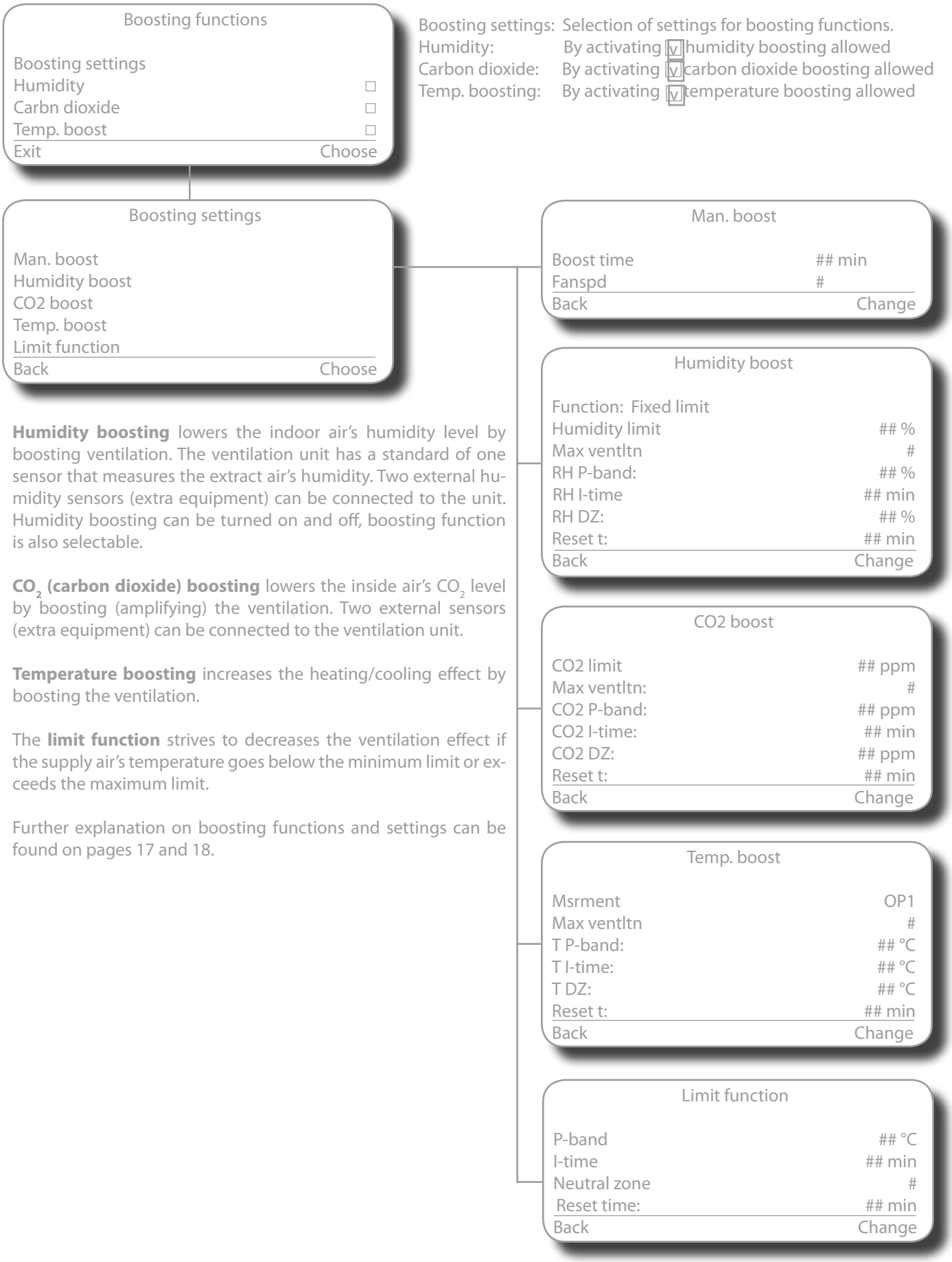
OCC = Overpressure, cooker hood and central vacuum cleaner all on at the same time, examples of fan speeds; extract 3 (or 30 %) and supply 7 (or 80 %).

TEMPERATURES



Extract msrmnts:	Displays the extract air or room temperature (depending on selected temperature regulation) with one decimal accuracy.
Supply msrmnts:	Displays the supply air temperature with one decimal accurancy.
Temp ctrl mode:	Selection of temperature regulation. Options are constant extract air regulation or constant room temperature regulation.
Setpoint:	Selection of extract air or room temperature setpoint with 1/10 degree accuracy. Fast setup with one degree accuracy with + and - on the control panel.
Min:	Set lowest allowed supply air temperature.
Max:	Set highest allowed supply air temperature.
OP1-OP5:	Selection of control panels that control room temperature regulation. If several panels are selected the room temperature is shown as an average value of the selected panels' measure ments. One panel is included in the standard delivery.
Temp.trans 1-3:	Selection of temperature sensor (extra equipment) that control room temperature regulation. If several panels are selected the temperature is shown as an average value of the selected panels measurements.

BOOSTING FUNCTIONS



Humidity boosting lowers the indoor air's humidity level by boosting ventilation. The ventilation unit has a standard of one sensor that measures the extract air's humidity. Two external humidity sensors (extra equipment) can be connected to the unit. Humidity boosting can be turned on and off, boosting function is also selectable.

CO_2 (carbon dioxide) boosting lowers the inside air's CO_2 level by boosting (amplifying) the ventilation. Two external sensors (extra equipment) can be connected to the ventilation unit.

Temperature boosting increases the heating/cooling effect by boosting the ventilation.

The **limit function** strives to decreases the ventilation effect if the supply air's temperature goes below the minimum limit or exceeds the maximum limit.

Further explanation on boosting functions and settings can be found on pages 17 and 18.

Humidity boosting:

Function: Alternatives are **Fixed limit** and **48 h average humidity.**
Fixed Limit works best during the heating-period when the air is dry or is dried mechanically. If Fixed Limit is used during the summer the humidity outside can increase the humidity inside and affect the boosting of the system. **48h Average Humidity** works well during summertime in place of the Fixed Limit.

Humidty limt: When the humidity exceeds this limit boosting is turned on.

Max ventltn: The ventilations max effect, i.e. max fan speed during boosting.

RH P-band: Area for amplifying the humidity boosting (P-band). The P-band defines the limit value which, if exceeded, causes maximum boosting. If the P-band is 10 %, an increase in humidity of 10 % over the limit value causes a maximum (100 %) boosting. This means that the fan speeds e.g. switch three steps (30 %) if the selected effect is 2 (40 %) and max effect is 5 (70 %).

RH I-time: The humidity boosting integration time. The I-term amplifies the boosting effect during the integration time at a set pace (minutes). If the P-band is 10 % the I-term causes an amplification of the ventilation to maximum (100 %) effect during the integration time when the humidity boost's limit value is exceeded by 10 %.

RH DZ: A deviation from the humidity boost area (a so-called dead zone) where no boosting happens.

Reset t: The control is equipped with a function (anti-windup) that directs the I-time to the right direction if the regulator is saturated. The function can be controlled with the reset time (reset t). Increasing the quanti ty of minutes reduces the anti-windups activity. NOTE! Reset time (reset t) should be superior to the integration time (RH I-time) otherwise the I- term's value will increase when the control is at max.

Carbon dioxide boosting:

CO2 limit: When the CO_2 level exceeds this limit the boosting is turned on.

Max ventltn: The ventilation's max effect, i.e. max fan speed during boosting.

CO2 P-band: Area for amplifying the CO_2 boosting (P-band). The P-band defines the limit value which, if exceeded, causes maximum boosting. If the P-band is 300 ppm, an increase in the CO_2 level of 300 ppm over the limit value causes a maximum (100 %) boosting. This means that the fan speeds e.g. switch three steps (30 %) if the selected effect is 2 (40 %) and max effect is 5 (70 %).

CO2 I-time: The CO_2 boosting integration time. I-term amplifies the boosting effect during the integration time at a set pace (minutes). If the P-band is 300 ppm,the I-term causes an amplification of the ventila tion to maximum(100 %) effect during the integration time when the CO_2 boosts limit value is exceeded by 300 ppm.

CO2 DZ: A deviation from the CO_2 boost area (a so-called dead zone) where no boosting happens.

Reset t: The control is equipped with a function (anti-windup) that directs the I-time to the right direction if the regulator is saturated. The function can be controlled with the reset time (reset t). Increasing the quantity of minutes reduces the anti-windups activity. NOTE! Reset time (reset t) should be superior to the integration time (CO2 I-time) otherwise the I- term's value will increase when the control is at max.

Temperature boosting:

Msrement: Selection of measuring sensor for temperature boosting. Alternatives: extract air sensor, room temperature sensor or 1…5 OP-sensor (sensor in the control panel).

Max ventltn: The ventilation's max effect, i.e. max fan speed during boosting.

T P-band: Area for amplifying the temperature boosting (P-band). The P-band defines the limit value which, if exceeded, causes maximum boosting. If the P-band is 3°C an increase in the temperature of 3°C over the limit value causes a maximum (100 %) boosting. This means that the fan speeds e.g. switch three steps (30 %) if the selected effect is 2 (40 %) and max effect is 5 (70%). A corresponding boost occurs if the temperature is 3°C below the limit value.

T I-time: The temperature boosting integration time. I-term amplifies the boosting effect during the integration time at a set pace (minutes). If the P-band is 3°C the I-term causes an amplification of the ventilation to maximum (100 %) effect during the integration time when the temperature boost's limit value is exceeded by 3°C.

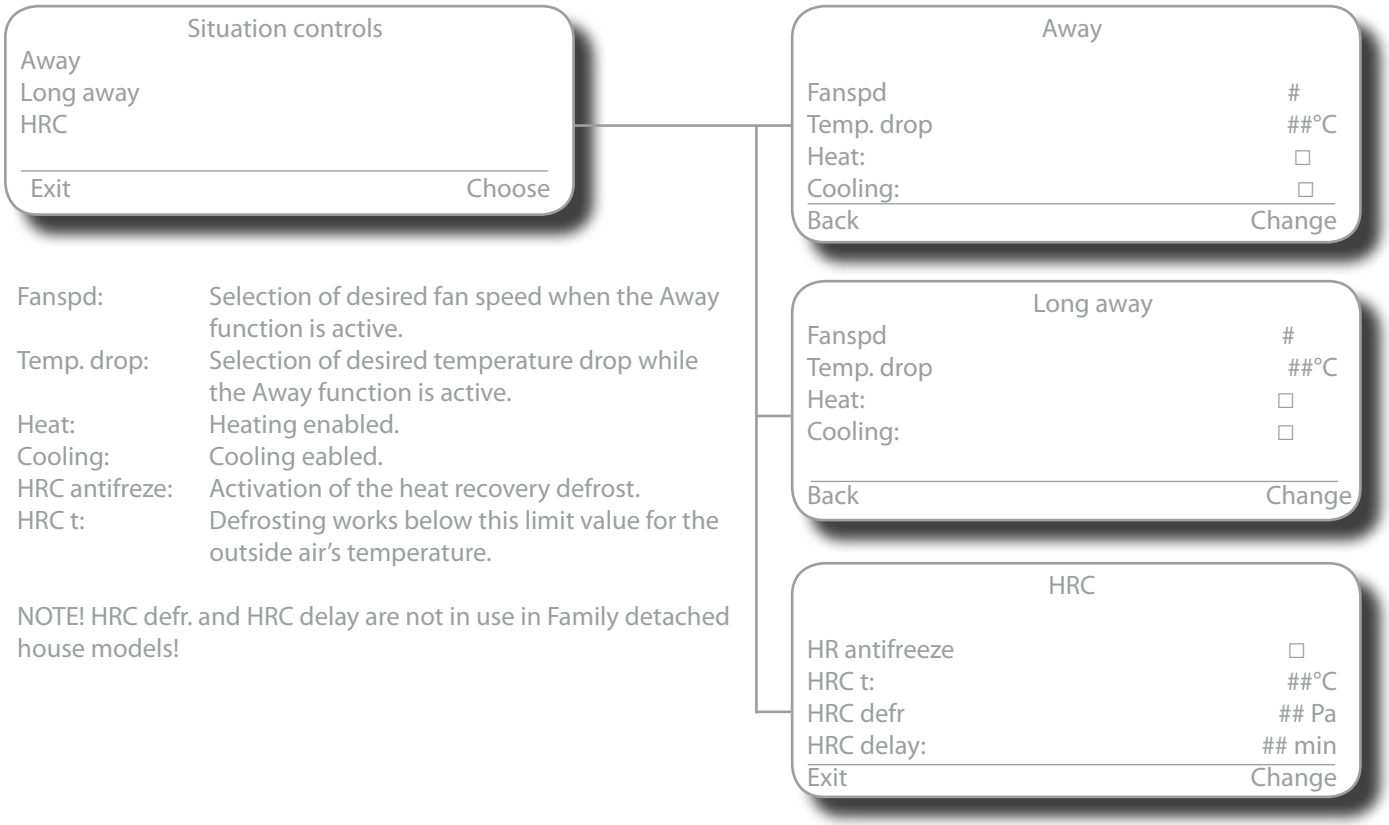
T DZ: A deviation from the temperature boost area (a so-called dead zone) where no boosting happens.

Reset t: The control is equipped with a function (anti-windup) that directs the I-time to the right direction if the regulator is saturated. The function can be controlled with the reset time (reset t). Increasing the quantity of minutes reduces the anti-windups activity. NOTE! Reset time (reset t) should be superior to the integration time (T I-time) otherwise the I- term's value will increase when the control is at max.

Limit function:

P-band: The P-band defines the temperature difference that causes total decline in ventilation effect.
I-time: Limit function's integration time. During the given I-time the I-term integrates the event that is equivalent to the P-band and the difference in temperature into itself.
Neutral zone: Deviation from the limit function's area (so-called Dead Zone), where limitations are not set.
Reset t: The control is equipped with a function (anti-windup) that directs the I-time to the right direction if the regulator is saturated. The function can be controlled with the reset time (reset t). Increasing the quanti ty of minutes reduces the anti-windups activity. NOTE! Reset time (reset t) should be superior to the integration time (I-time) otherwise the I- term's value will increase when the control is at max.

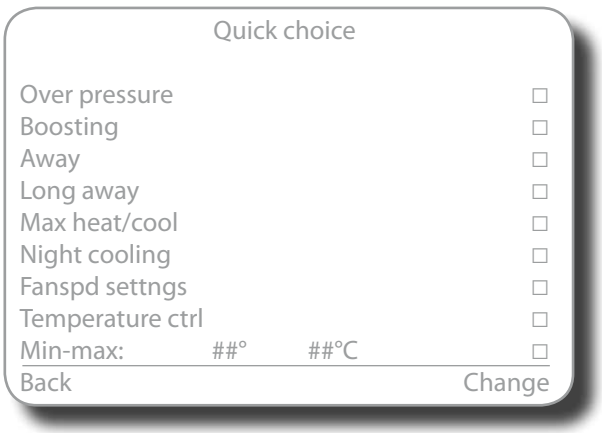
SITUATION CONTROLS



Fanspd: Selection of desired fan speed when the Away function is active.
Temp. drop: Selection of desired temperature drop while the Away function is active.
Heat: Heating enabled.
Cooling: Cooling eabled.
HRC antifreze: Activation of the heat recovery defrost.
HRC t: Defrosting works below this limit value for the outside air's temperature.

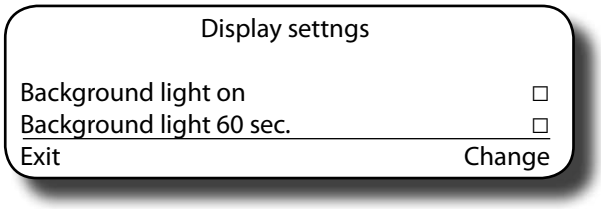
NOTE! HRC defr. and HRC delay are not in use in Family detached house models!

QUICK CHOICE



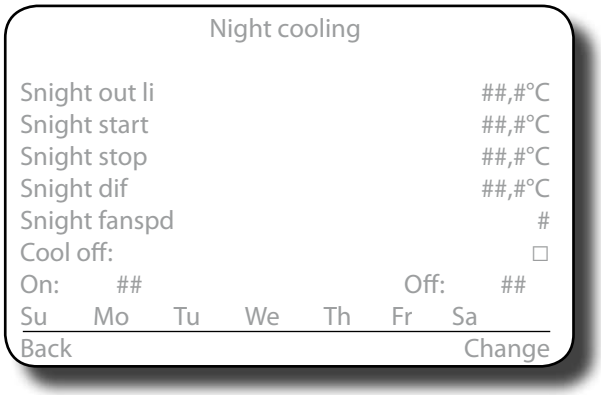
Selection of quick choice functions from the control panel's left multifunction button. The functions Away and Long away do not work as quick choices if they are configured as DI.
Fanspd settngs and temperature ctrl affect the control panels + and – buttons
Min-Max: setup of minimum and maximum value for the panel's temperature regulation.

DISPLAY SETTINGS



Background light on: Background light is on.
Background light 60 s: Background light is on for 60 sec after pressing a button.

NIGHT COOLING



N.B.! Summer night cooling must be checked in the menu Quick ufnctions in order to be activated.

Snight out li: Limit value for night cooling. Night cooling is allowed when the outside temperature exceeds the set value.

Snight start: The night cooling function is activated when the extract air or room temperature is higher than Snight start.

Snight stop: The night cooling function stops when the exhaust air or room temperature is lower than Snight stop. Snight stop must always be 1°C less than Snight start.

Snight dif: The night cooling function is activated when the difference between extract air or room temperature and the outside air temperature is higher than the Snight dif -value.

Snight fanspeed: Selection of fan effect that is active during night cooling.

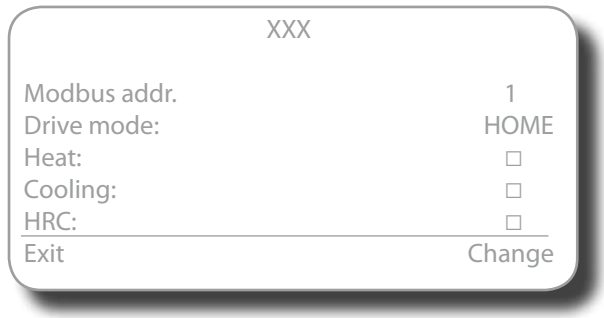
Cool off: Night cooling on / off.

Start: Time when night cooling is activated.

Stop: Time when night cooling is deactivated.

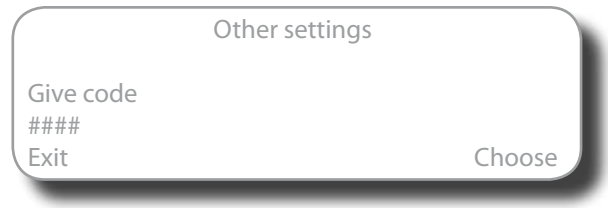
Su-Sa: Selection of weekdays when night cooling is allowed.

XXX (= General settings)



Modbus addr. Mother card Modbus address. Elective 1-10.
Drive mode: Alternatives HOME and OFFICE.
Heat: Enables or disables heating. X=enabled.
Cooling: Enables or disables cooling. X=enabled.
HRC: Enables or disables heat recovery. X=enabled.

OTHER SETTINGS



This menu is for factory setting and is not accessible by the end user or installer.

MAINTENANCE

The unit requires only limited maintenance. The maintenance is limited to filter changes and periodic fan and rotor cleaning. Before any maintenance occurs the power to the unit must be isolated across all poles from the main power switch. Wait for approximately two (2) minutes before starting the maintenance work! Although the unit's power is isolated the fans will rotate for a while after the hatch is opened.

Cleaning the heat exchangers
When changing the filters, check the heat exchanger to see if it also needs cleaning. If cleaning is required remove it from the unit and carefully wash through the air channels with warm water and a mild detergent. Take care not to get the motor wet. The heat exchanger can also be cleaned by blowing compressed air through the air channels . Do not use a pressure washer and do not submerge the heat exchanger into water. When restarting the unit after cleaning check that the heat exchanger wheel can turn freely in the housing.

Cleaning the fans
When changing filters, also check the condition of the fans. If cleaning is required the fans can be removed from the unit and cleaned with a toothbrush or compressed air.

Changing of filters
We recommend that the filters are checked once a month. The recommended interval for filter changes is very much dependent on the environmental conditions. It might be necessary to change the filters every second month. Changing bag filters; open the lock and remove the old filter and put in a new one.Remember to lock it afterwards. Not all models have filter locks. Vacuum cleaning the inside of the device is recommended at this point. N.B! Make sure to close the service hatch carefully!

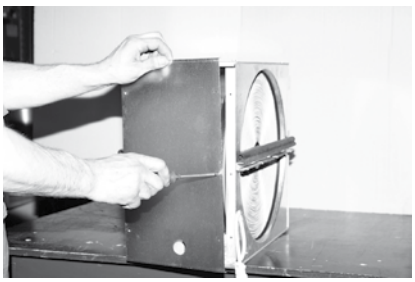
FAULT ALARMS

Alarm list

Alarm name	Class	Explanatory text row 1	Explanatory text row 2	Alarm limit	Delay	NOTE!
TE5 min	B	After HRC	Supply air cold	5°C	10 min	
TE10 min	B	Supply air cold		10°C	10 min	Unit in failsafe mode; supply air off / extract air minimal.
TE10 max	A	Fire risk	Sply temp high	55°C	2 sec	Alarm off only after reset.
TE20 max	A	Fire risk	Room temp high	55°C	2 sec	Same set-point for all room-sensors.
TE30 min	B	Extract air cold		15°C	10 min	Unit in failsafe mode; supply air off / extract air minimal.
TE30 max	A	Fire risk	Extract air hot	55°C	2 sec	Alarm off only after reset.
ELH-problem	A	Electrical coil	Overheating		2 sec	Alarm info from ELH- booster unit. Only EDE units. DI10 income, false information or contradiction. Alarm off only after reset.
TE45 min	A	Water cooler	Freeze risk	+8°C	0 sec	Only EDW- units. Alarm off only after reset.
Freeze problem	B	Freeze problem info			2 sec	If to DI income freeze problem information has been installed. Contradiction alarm.
E-stop	A	External emergency stop	E-stop		0 sec	If external E-stop DI income is on. Alarm off only after reset.
Fire risk	A	External	Fire risk		0 sec	If external fire risk DI income is on. Alarm off only after reset.
Service reminder	B	Service reminder			6 months	Service reminder.
Sply filter	B	Dirty	Supply filter		10 min	Extra equipment.
Exhst filter	B	Dirty	Supply filter		10 min	Extra equipment.

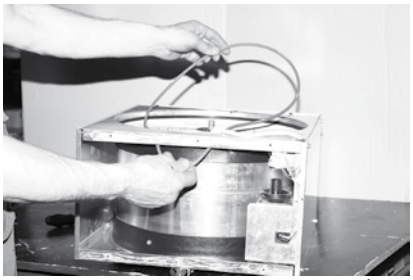
* DI = Digital Input

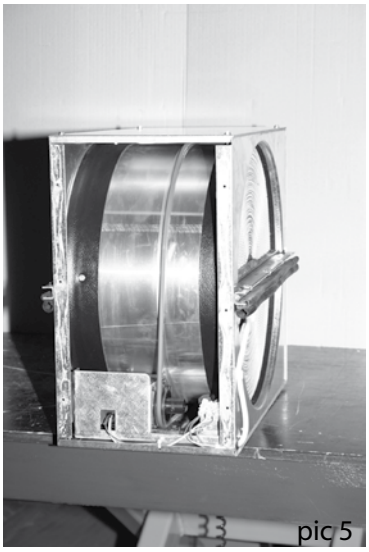
HEAT EXCHANGER BELT REPLACEMENT


pic 1


pic 2


pic 3


pic 4


pic 5

There is a spare belt attached to all heat exchangers. In order to take use of the spare belt the heat exchager needs to be removed from the ventilation unit. Loosen the bayonet socket before removing the heat exchanger from the unit. Open the maintenance hatch (see below) and release the spare belt from the holders. Leave the holders on the heat exchanger. Pull the belt on to the belt wheel. Close the maintenance hatch. Place the heat exchanger back into the unit and connect the bayonet socket.

Follow the instructions below if there is no spare belt in the heat exchanger.

Turn of the ventilation unit by switching off the main power supply, removing the fuse or disconnecting the wall plug.

Open the maintenance hatch.

Unplug the heat exchanger.
Pull out the heat exchanger from the ventilation unit.

Remove the lid by detaching the screws (pic 1).

Turn the heat exchanger on to its side so that the axle is in a vertical position. Remove the sealing strip (pic 2).

Detach the hexagonal screw and the screws in the u-beam.

Remove the u-beam.

Remove the old belt.

Remove any possible dirt from the rotors surface and carefully place the new belt inside the heat exchanger through outer shell and the gasket (pic 3 and 4).

Carefully pull the belt past the gasket and rotate the rotor at the same time. Assemble the u-beam.

Attach the beams screws and the hexagonal screw of the axle.

Put the belt on to the belt wheel and rotate the rotor away from the motor a couple of times (pic 5).

Clean the inside of the heat exchanger.

Close the lid.

Re-assemble the heat exchanger in to the ventilation unit and plug it in.

Turn on the ventilation unit and check that the heat exchanger is rotating.

Close the maintenance hatch.

MAINTENANCE

TROUBLESHOOTING

SUPPLY AIR COLD AFTER HEAT RECOVERY (TE05 min)

Reason	Action
Belt of the heat exchanger is broken.	Replace the belt.
Belt greasy, causing slippage.	Contact a service representative. *
The extract fan has stopped.	Contact a service representative. *
The extract air filter is blocked.	Change the filters.
Extract air valve settings incorrect.	Contact a service representative. *
Heat insulation of ducts insufficient.	Check the insulation thickness of the supply and extract air ducts and add insulation if needed.

SUPPLY AIR COLD AFTER AFTER-HEATING (TE10 min)

Reason	Action
Belt of heat exchanger is broken.	Replace the belt.
Belt greasy, causing slippage.	Contact a service representative. *
The extract fan has stopped.	Contact a service representative. *
The extract air filter is blocked.	Change the filters.
Extract air valves settings incorrect.	Contact a service representative. *
Heat insulation of ducts insufficient.	Check the insulation thickness of the supply and extract air ducts and add insulation if needed.
The after heater over heating protection (EDE).	Check what the reason to the problem is and reset the over heating protection.

SUPPLY AIR AFTER AFTER-HEATING (TE10 max)

Reason	Action
Electrical after heater defective.	Contact a service representative.
Actuator of water cooler defective.	Contact a service representative.
TE10 temperature sensor defective.	Contact a service representative.

ROOM TEMPERATURE HOT (TE20 max)

Reason	Action
Fire risk.	A-alarm activates.
TE20 temperature sensor defective.	Contact a service representative.

Extract AIR COLD (TE30 min)

Reason	Action
Insufficient duct insulation.	Add insulation thickness.
Hatch open.	Close hatch.
Low room temperature.	Increase room temperature.
TE30 temperature sensor defective.	Contact a service representative.

Extract AIR HOT (TE30 max)

Reason	Action
Fire risk.	A-alarm activates.
TE30 temperature sensor defective.	Contact a service representative.

* NOTE! Check the unit model and serial number on the type shield before contacting a service representative. Please contact your installer or a local representative / qualified person.

ELECTRICAL AFTER-HEATER OVERHEATING (ELH problem)

Reason	Action
The supply fan has stopped.	Contact a service representative. *
The supply filter is blocked.	Change the filter.
Outdoor grille is blocked.	Clean the grille.

FREEZE RISK OF WATER COOLER (E45 min)

Reason	Action
The circulation water pump has stopped.	Activate the pump. If the problem persists, contact a service representative. *
Belt of the heat exchanger is broken.	Replace the belt.
Adjustor of water cooler's valve defective.	Contact a service representative.
The extract fan has stopped.	Contact a service representative.

COOLER PROBLEM INFORMATION (Cooler problem)

Reason	Action
The outer unit of the cooler has stopped.	Activate the outer unit. If the problem persists, contact a service representative.

EXTERNAL EMERGENCY STOP (E-stop)

Reason	Action
Ventilation stopped from E-stop button.	Check the cause before resetting.

EXTERNAL FIRE RISK (Fire risk)

Reason	Action
Ventilation stopped with an external fire risk steering.	Check the cause before resetting.

MAINTENANCE REMINDER (Maintenance reminder)

Reason	Action
Normal reminder every 4 or 6 months (depending on the model of the unit).	Change the filters and clean the unit from inside. Check that the unit functions.

FILTER ALARM, SUPPLY AIR FILTER (Supply filters)

Reason	Action
The supply filter is dirty.	Change the filter.

NOTE! Alarm demands filter's pressure difference transmitter. (Extra equipment).

FILTER ALARM, Extract AIR FILTER (Extract filter)

Reason	Action
The extract filter is dirty.	Change the filter.

NOTE! Alarm demands filter's pressure difference transmitter. (extra equipment).

REDUCED AIR FLOWS

Reason	Action
The filters of the input are blocked.	Change the filters.
Chosen fan speed is insufficient.	Choose a faster speed.
The outdoor grille is blocked.	Clean the outer grille.
The fan wings are dirty.	Clean the fans.

INCREASED NOISE LEVELS

Reason	Action
The filters of the input are blocked.	Change the filters.
Faulty fan bearings.	Change the bearings or contact a service representative.
Blockage in the outdoor grille.	Clean the outdoor grille.
Wings of the fan are dirty.	Clean the fan.
Faulty heat exchanger motor / gear.	Contact a service representative.

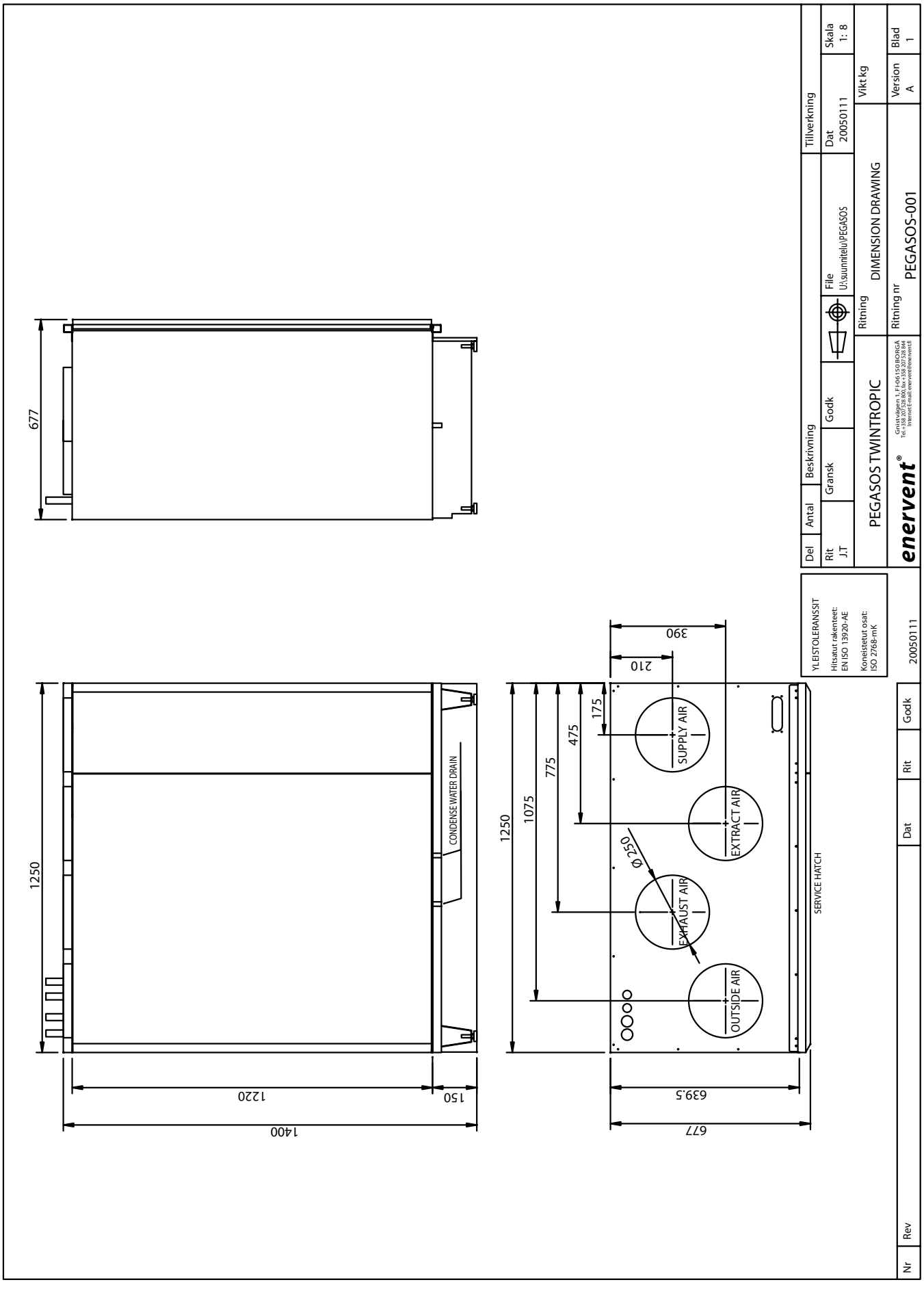
* NOTE! Check the unit model and serial number on the type shield before contacting a service representative. Please contact your installer or a local representative / qualified person.

TECHNICAL INFORMATION

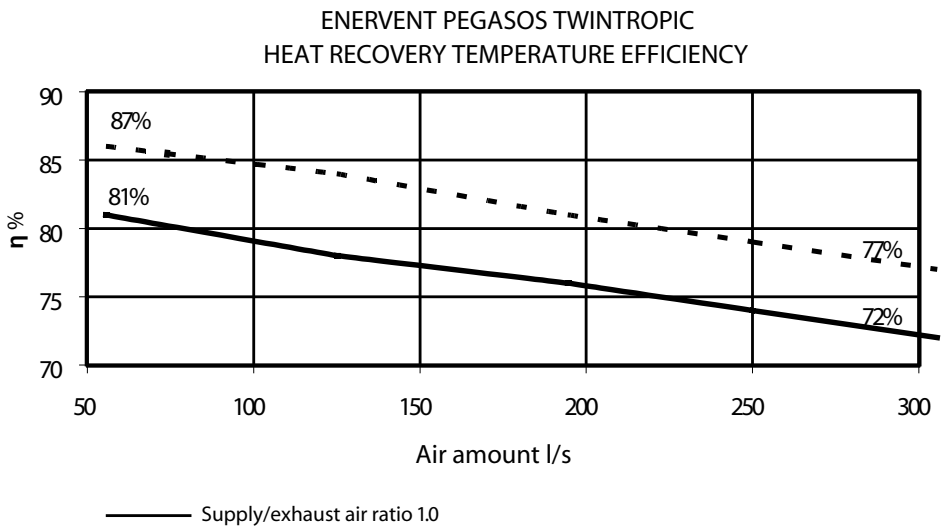
VENTILATION UNIT:	PEGASOS Twin Tropic
Width Depth Hight	1 250 mm 677 mm 1 400 mm
Weight	220 kg
Duct connections	Ø 250 mm
DC fans supply / extract	520 W 3,15 A
Current Fuse Main board glass pipe fuse 5x20 mm	CW, CX: 230 V~, 50 Hz 10 A quick CW-E, CX-E: 400 V 3~, 50 Hz 3x16 A quick F1 T250 mA F2 T8 A F3 T160 mA
Heat exchanger motor rating with heat protection	5 W, 0.04 A

CX-MODELS OUTSIDE AIR UNIT:		COMP 3 (RP-60)
Compressor	Type	Rotation
	Brand	Mitsubishi
Outdoor unit	Size H-W-D (mm)	943-950-330 (+30)
	Net weight (kg)	75
	Nominal heating efficiency (kW)	7.0 (2.8-8.2)
	Nominal cooling efficiency (kW)	6.0 (2.7-6.7)
	Sound level (dBA) heating/cooling	48/47
	Refrigerant	R410A
	Refrigerant amount (g)	3 500
Piping	Pipe size fluid	Ø 9,52/0,8 mm (3/8")
	Pipe size gas	Ø 15,88/0,8 mm (5/8")
	Max. length (m)	20
	Max. hight difference (m)	10
Surrounding temp.	(°C)	-25°C ... +43°C
Outdoor unit supply	(Ph/V/A)	1~ / 230 VAC / 20 A

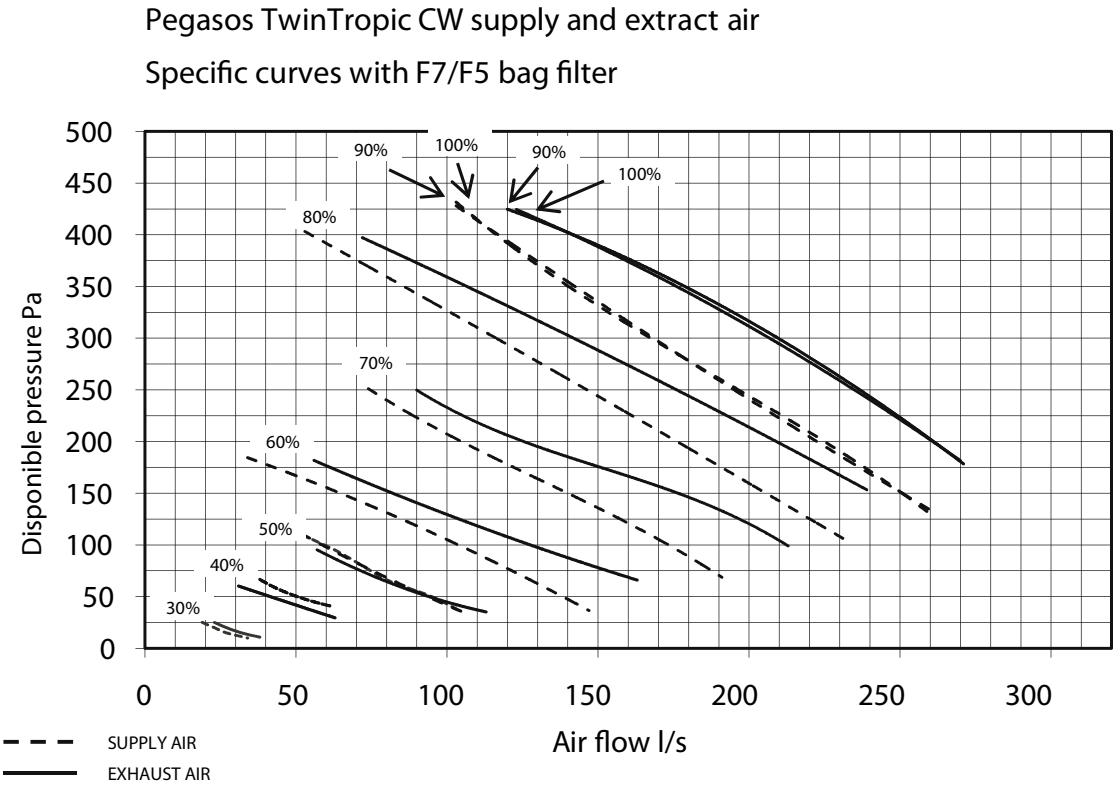
DIMENSION DRAWINGS



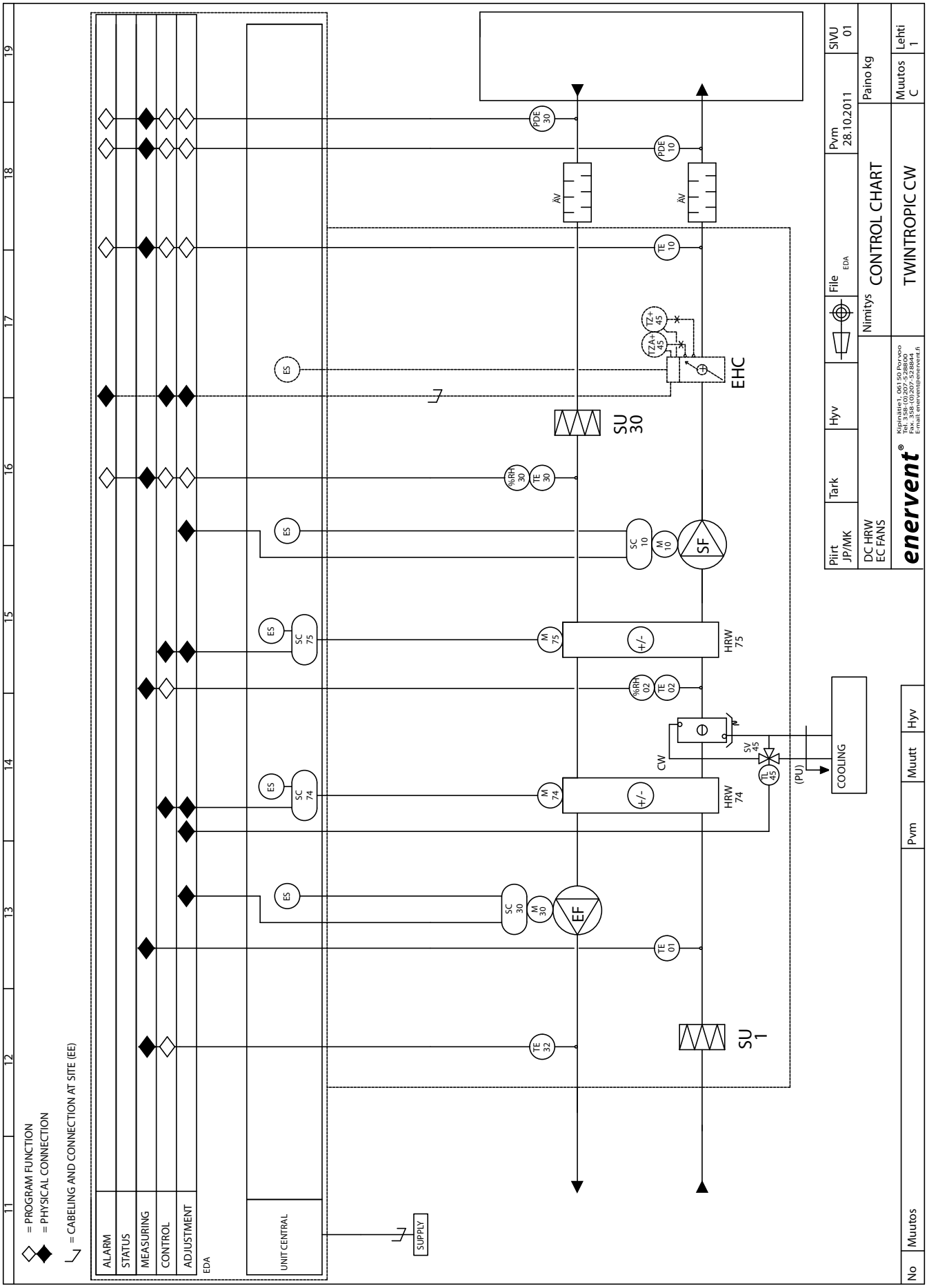
HEAT RECOVERY EFFICIENCY



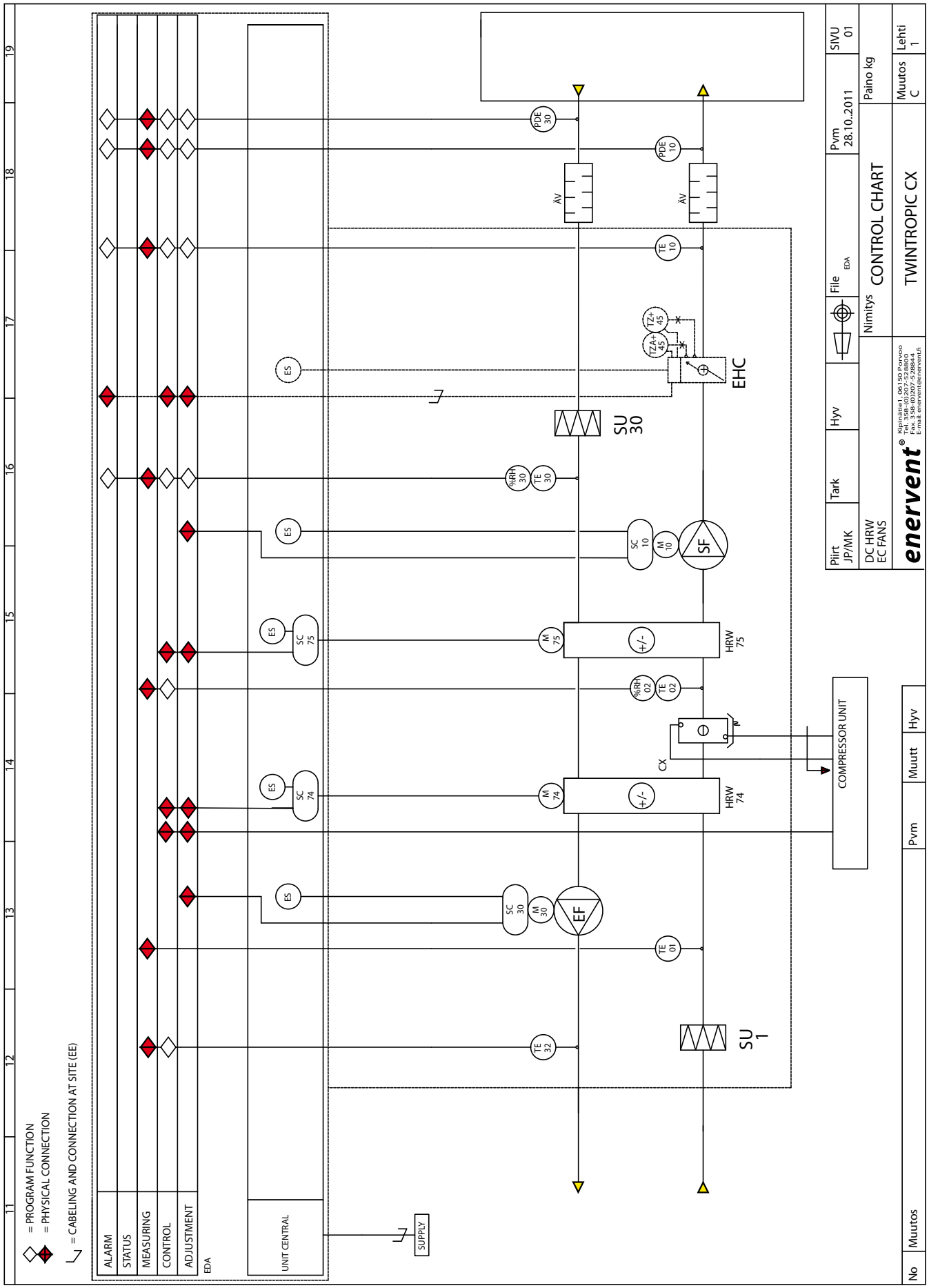
CHARACTERISTIC CURVES



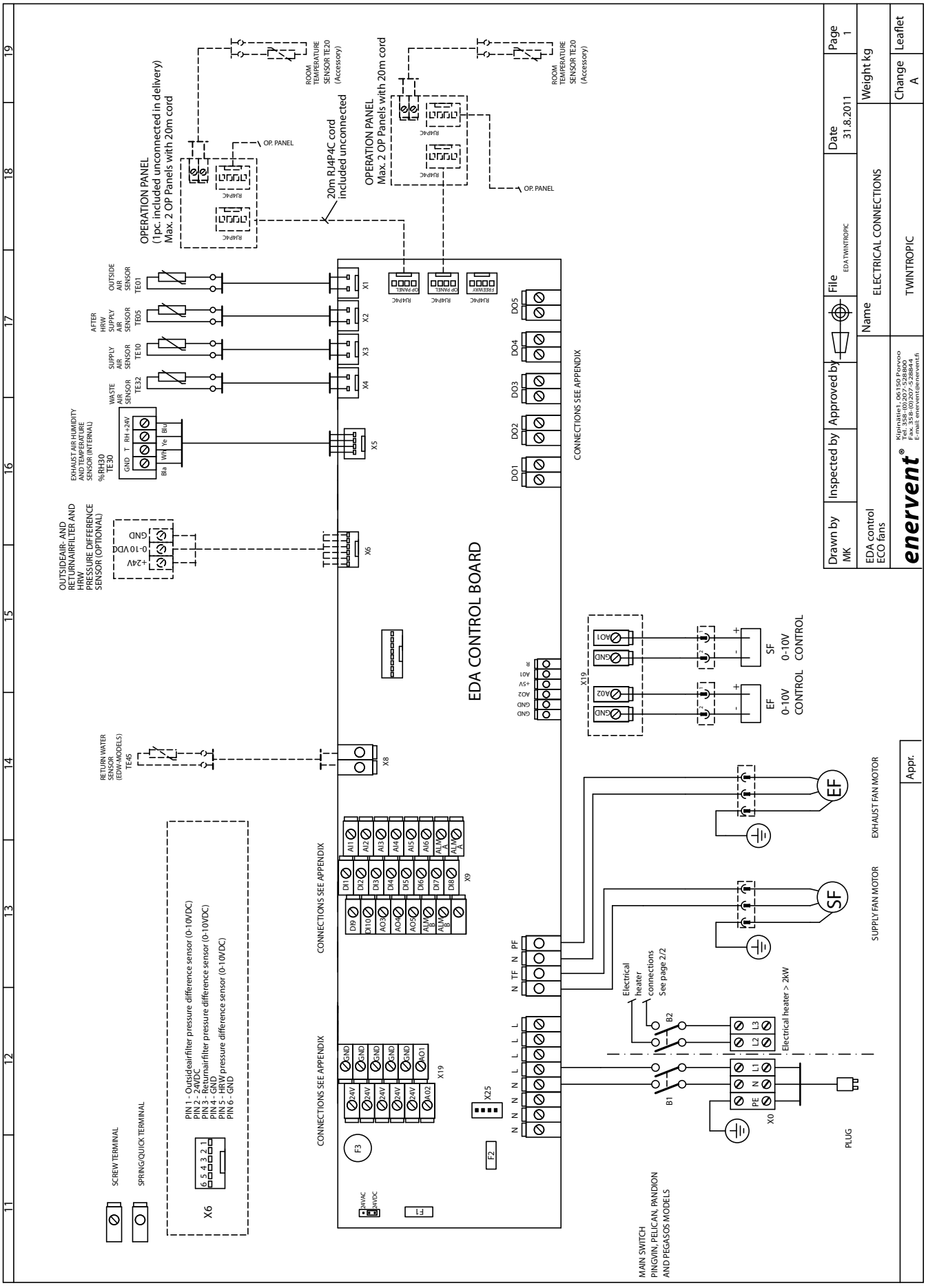
CONTROL CHART TWIN TROPIC CW(-E)



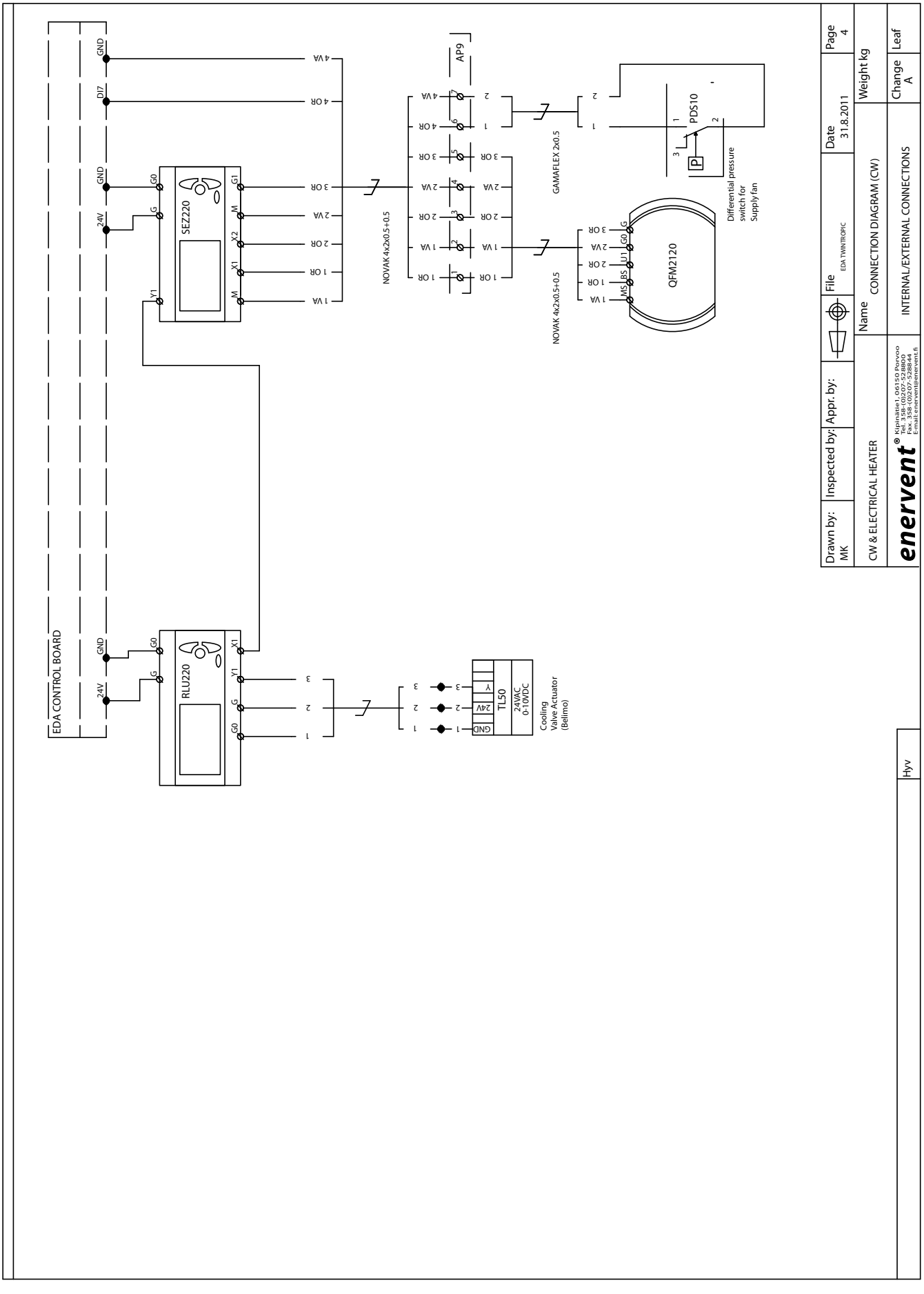
CONTROL CHART TWIN TROPIC CX(-E)

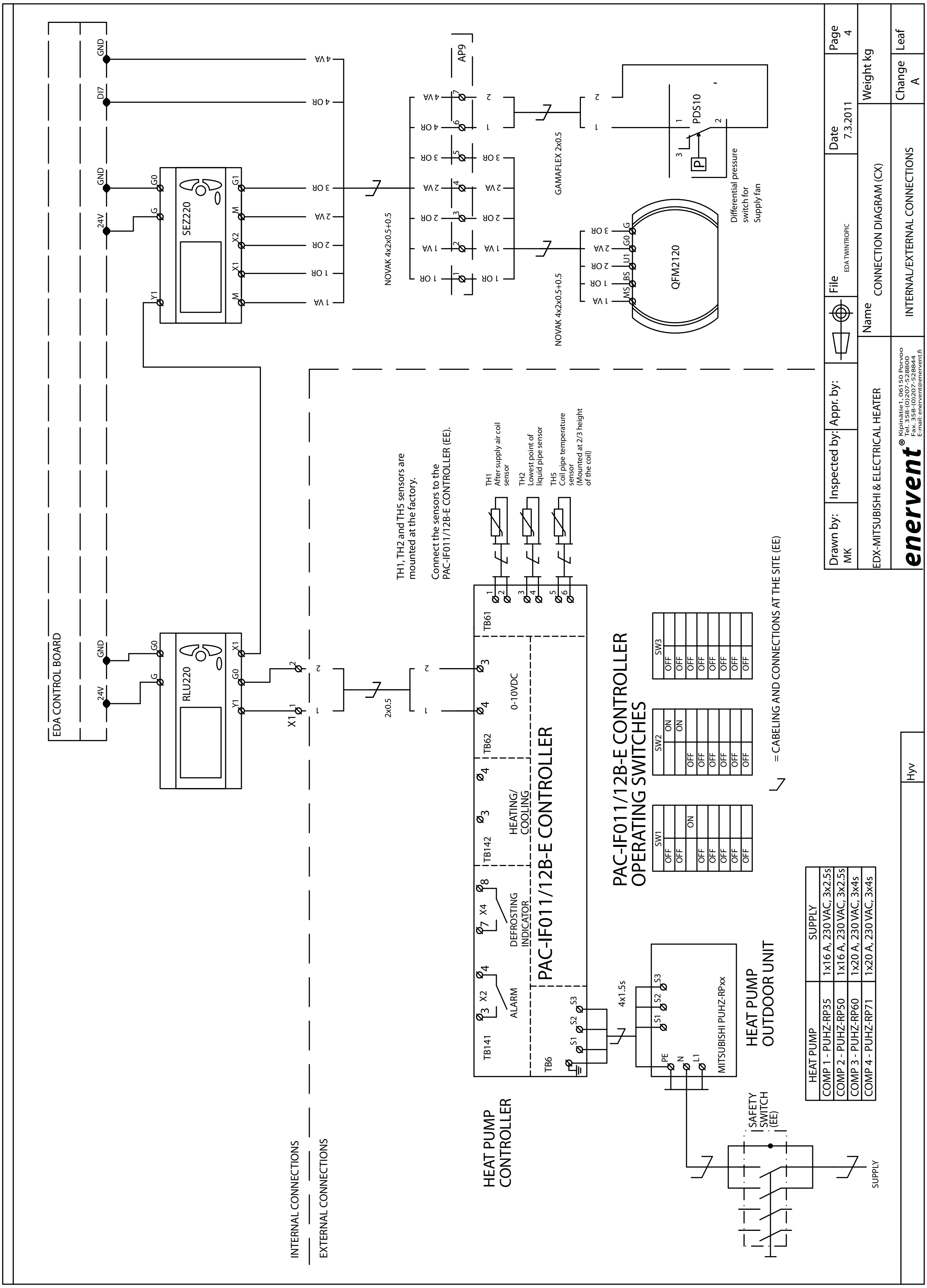


WIRING DIAGRAM Twintropic



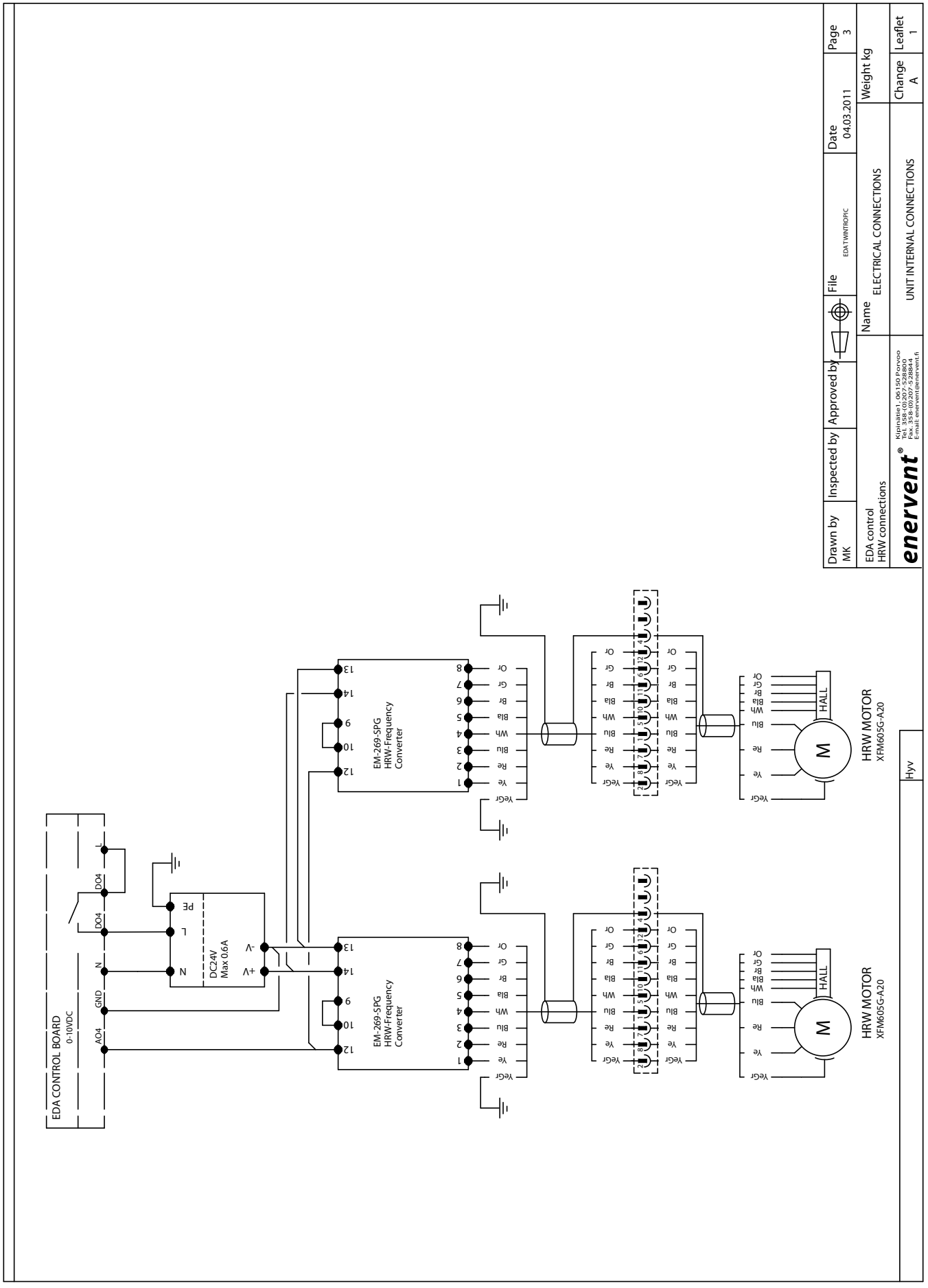
TWINTROPIC CW WIRING DIAGRAM UNIT INTERNAL AND EXTERNAL CONNECTIONS

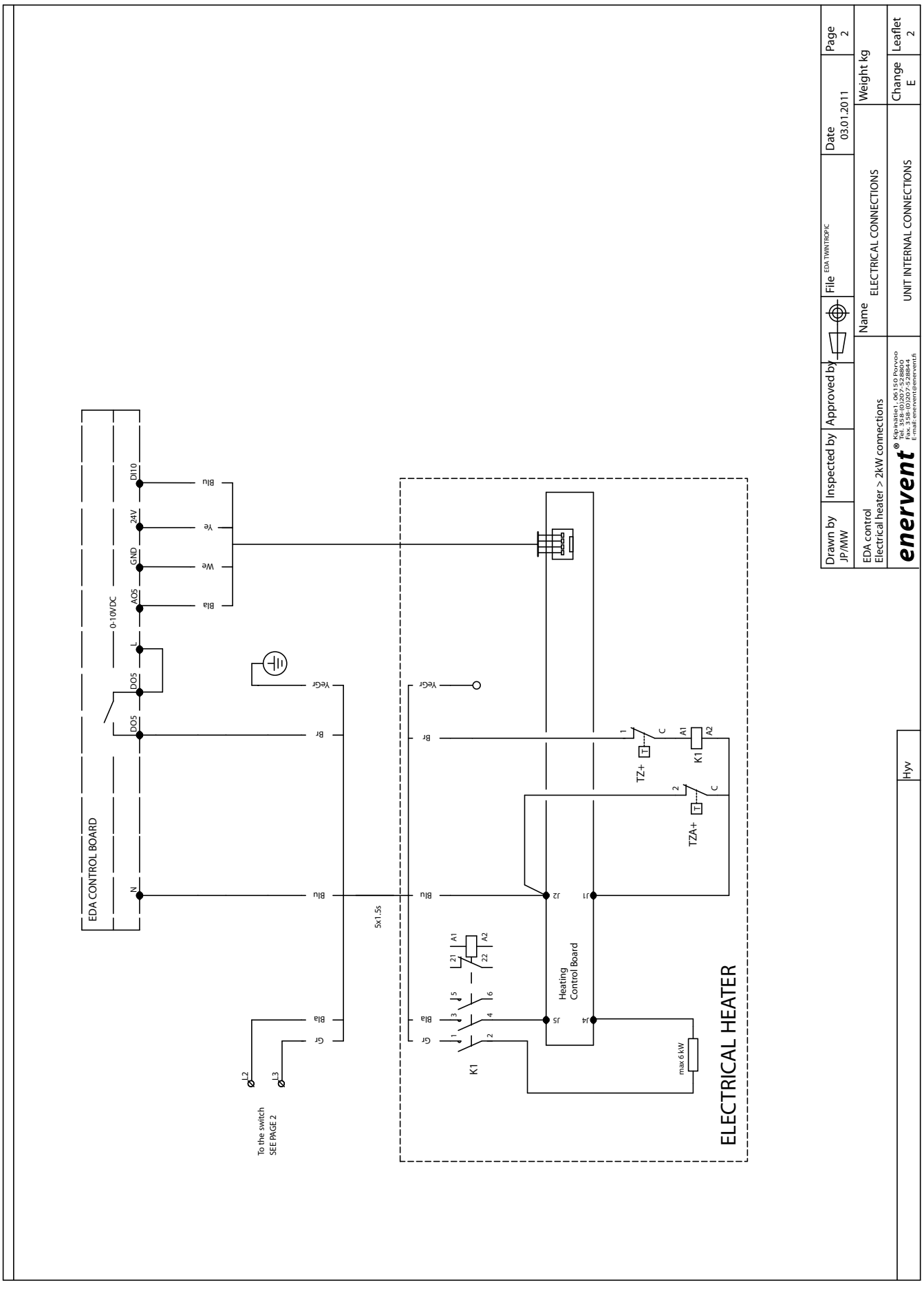




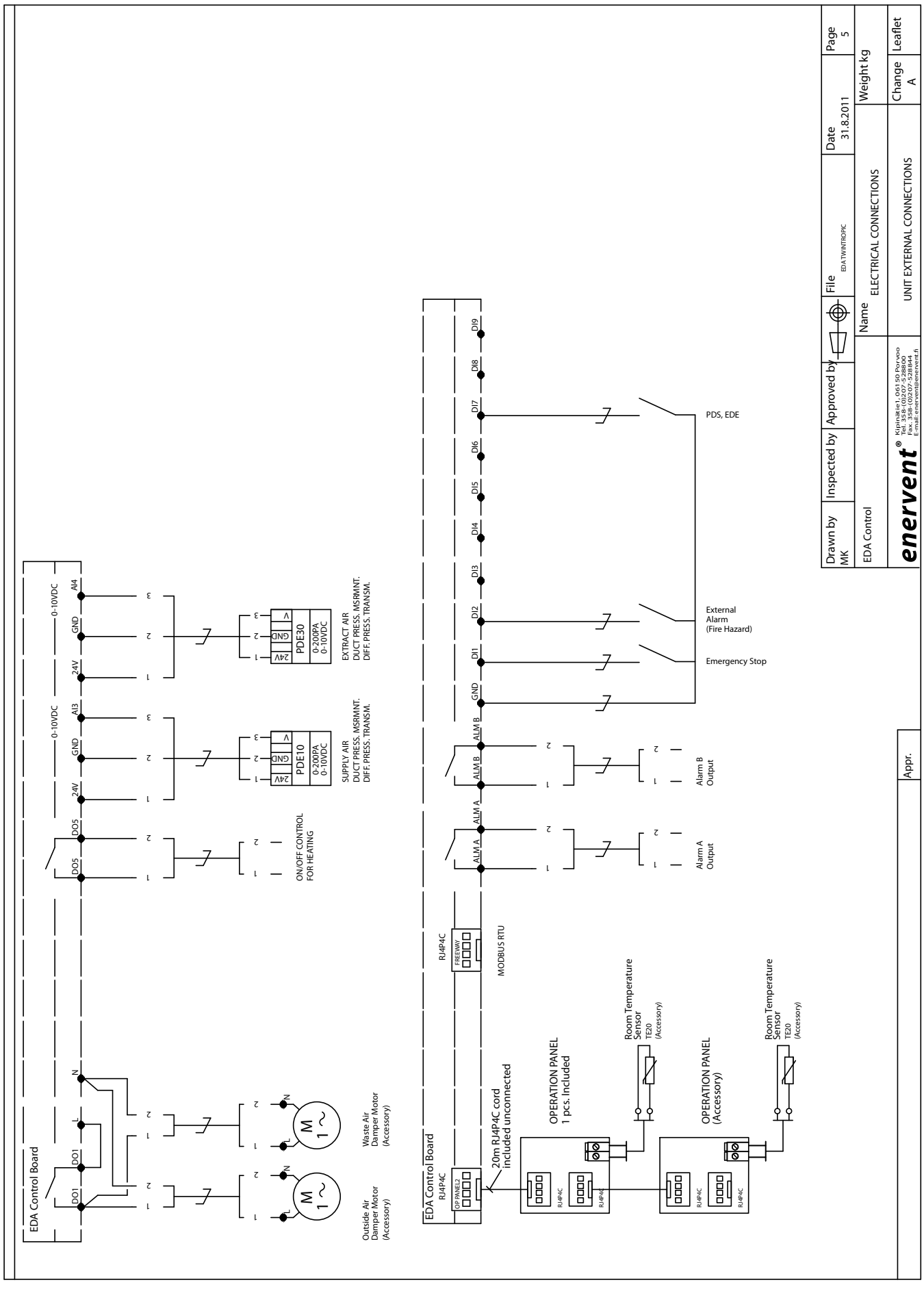
HEAT PUMP	SUPPLY
COMP 1 - PUHZ-RP35	1x16 A, 230 VAC, 3x2.5s
COMP 2 - PUHZ-RP50	1x16 A, 230 VAC, 3x2.5s
COMP 3 - PUHZ-RP60	1x20 A, 230 VAC, 3x4s
COMP 4 - PUHZ-RP71	1x20 A, 230 VAC, 3x4s

WIRING DIAGRAM UNIT INTERNAL CONNECTIONS




EDA CONTROL BOARD
0-10V/DC
DI10
24V
GND
AO5
L
DO5
DO5
N
Blu
Ye
We
Bla
YeGr
Br
Blu
Bla
Gr
5x1.5s
L2
L3
To the switch
SEE PAGE 2
ELECTRICAL HEATER
Heating
Control Board
K1
TZ+
TZA+
max 6 kW
Drawn by JP/MW
Inspected by
Approved by
File EDA TWINTROPIC
Date 03.01.2011
Page 2
EDA control
Electrical heater > 2kW connections
Name
ELECTRICAL CONNECTIONS
Weight kg
UNIT INTERNAL CONNECTIONS
Change E
Leaflet 2
Hyv

WIRING DIAGRAM EXTERNAL CONENCTIONS



OUTER WIRING

Location	Explanation	Delivery	Current	Example of cable type
OP panel 1	Control panel	1 in every standard delivery	RS-485 / Modbus RTU	20 m RJ11 4P4C cable included in standard delivery
OP panel 2	Control panel	Extra equipment, max 2 st can be connected	RS-485 / Modbus RTU	20 m RJ114P4C cable included in standard delivery
TE20	TE20 room temperature sensor (connected to control panel)	Extra equipment	max. 2 V	3 m cable
X3	TE10 supply air temperature sensor	EDW model	max 2 V	bayonnet socket
X8	TE45 water return water temperature sensor	EDW model	max 2 V	KLM 2x0.8
AO5	TL45 water cooler control valve actuator	EDW model	0-10 V / 24 V	KLM 4x0.8
DO1	Outside air damper, damper motor	Extra equipment	230 VAC	MMJ 3x1.5
DO1	Exhaust air damper, damper motor	Extra equipment	230 VAC	MMJ 3x1.5
DO2	Time controlled relay output	Standard	230 VAC	MMJ 3x1,5
AI1, AI2	Humidity transmitter max 2 pcs	Extra equipment	0-10 V / 24 V	KLM 4x0.8
AI5, AI6	CO_2 transmitter, max 2 pcs	Extra equipment	0-10 V / 24 V	KLM 4x0.8
ALM A	A alarm output	Requires cabling	max 24 V	KLM 2x0.8
ALM B	B alarm output	Requires cabling	max 24 V	KLM 2x0.8
DI1	Emergency stop	Requires cabling	max.24 V	KLM 2x0.8
DI2	External alarm (fire hazard)	Requires cabling	max 24 V	KLM 2x 0.8
DI3	Push button for overtime	Extra equipment	max 24 V	KLM 2x0.8
DI4	Push button for boosting	Extra equipment	max 24 V	KLM 2x0.8
DI6	Push button for over pressure	Extra equipment	max 24 V	KLM 2x0.8
DI8	Cooker hood indication	Requires cabling	max 24 V	KLM 2x0.8
DI9	Central vacuum cleaner indication	Requires cabling	max 24 V	KLM 2x0.8

Weak current labels must be kept separate from strong current labels!

The control panel to all our units is delivered uninstalled. The control panel IP20 should be installed in a dry space.

INFORMATION ABOUT MODBUS

- The default Modbus address is 1
- Form of communication: RS485
- The Modbus traffic goes through the Freeway adapter on the mother board
- Speed 19200 bps
- 8 bits
- No parity

The order of the Freeway connectors:
1=+5V
2=L1 RxD Receive
3=L2 TxD Transmit
4=GND

DECLARATION OF CONFORMITY

We declare that our products follow the provisions of low voltage directive (LVD) 2006/95/EEC, electro magnetic compatibility directive (EMC) 2004/108/EEC and machine directive (MD) 98/37/EEC.

Manufacturer:	Enervent Oy
Manufacturer's contact:	Kipinätie 1, 06150 PORVOO FINLAND phone +358 (0)207 528 800, fax +358 (0)207 528 844 enervent@enervent.fi, www.enervent.fi
Description of the product:	Ventilation unit with heat recovery
Trade name of the products:	Enervent® series: Twintropic

Representatives for the products in the region of the ETA:

Sweden:	Ventener Ab, Örelidsvägen 10, 517 71 OLSFORS, SVERIGE, tel +46 735-62 00 62 Ventilair AB, Ulvsjövägen 68, 79699 ÄLVDALEN, SVERIGE, tel +46 70 326 0759 Climatprodukter AB, Box 366, 184 24 ÅKERSBERGA, SVERIGE, tel +46 8 540 87515 DeliVent Ab, Markvägen 6, 43091 HÖNÖ, SVERIGE, tel +46 70 204 0809
Norway:	Noram Produkter AS, Grini Næringspark 4 A, 1361 ØSTERÅS, NORGE, tel +47 33471245
Denmark:	Covent EMJ, Donsvej 55, 6052 VIUF, DANMARK, tel + 45 7556 1534
Estonia:	As Comfort Ae, Jaama 1, 72712 PAIDE, EESTI, tel +372 38 49 430
Ireland:	Entropic Ltd., Unit 3, Block F, Maynooth Business Campus, Maynooth, Co. Kildare, IRELAND tel +353 64 34920
Germany:	e4 energietechnik gmbh, Burgunderweg 2, 79232 MARCH, GERMANY, tel +49 7665 947 25 33
Austria:	Inocal Wärmetechnik Gesselschaft m.b.H, Friedhofstrasse 4, 4020 LINZ, AUSTRIA, tel +43 732 65 03 910 M-Tec Mittermayr GmbH, 4122 ARNREIT, AUSTRIA,tel +43 7282 7009-0
Poland:	Iglotech, ul. Toruńska 41, 82-500 KWIDZYN, POLAND, tel +48 55 279 33 43

The products are in conformity with the following standards

LVD	EN 60 335-1 (2002) +A1 (2004), +A2 (2006), +A11 (2004), +A12 (2006)
MD	EN ISO 12100-1 + A1 (2009), EN ISO 12100-2 +A1 (2009), EN ISO 14121-1 (2007)
EMC	EN 55014-1 (2006), EN 61 000-3-2 (2006) ja EN 61 000-3-3 (1995) EN 55014-2 (1997)+A1 (2001)

The conformity of each of our manufactured products is taken care according to our quality descriptions.
This product was CE- marked in the year 2010.

Enervent Oy

Tom Palmgren
Technology manager

AIR FLOW REGULATION OF UNIT WITH EDA CONTROL

How to perform air flow regulation on a unit with EDA control :

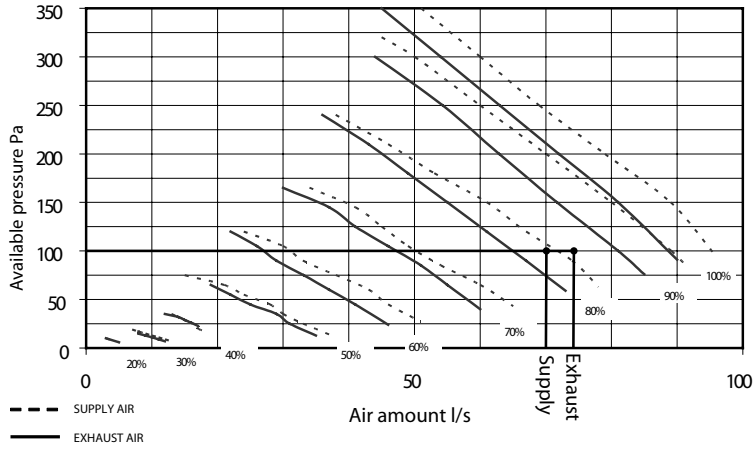
1) Determine which air amount and duct pressure values have been defined for the taget by the ventilation planner.

2) Pre-install the vents according to the installation instruction.

3) The characteristic curves for each unit is found in this operating manual. Choose the fan speeds with the help of them or the dimensioning program "Air Designer" on our web site www.enervent.fi. For example:

   LTR-3 eco EC ventilation unit with F7 bag filters
   supply air amount 70 l/s, 100 Pa = 79 % fan speed
   extract air amount 75 l/s, 100 Pa = 86 % fan speed

LTR-3 eco EDA supply and exhaust air charactersistic curves with F7 filters



4) Choose the smaller fan speed as fan speed in the control panel basic view. According to the example above the fan speed to set would be 79 %.

5) The following step is to set the difference between the supply and the extract air:
   Go to "Menu " -> "Settings" -> give the password 6143 -> "Fan speed" -> "Normal speed" on the operating panel. Set the values read from the characteristic curves. In the example supply air fan 79 %, extract air fan 86 %.
   NOTE! In this menu you only set the speed difference between supply air and extract air - not the actual fan speeds.

6) Measure the air flows and change the air flow settings if needed.

7) Finally make sure the building is over pressured by measuring the pressure difference between the inside air and the outside air. This can for instance be done over the front door gasket. A suitable over pressure varies between 5 and10 Pa.

THE PARAMETERS OF EDA CONTROL

ID	MENU	SUB MENU	PARAMETER	FACTORY SETTING	NOTE	FIELD SETTING
	Settings					
4x51	Fan speed	Normal spd	Supply fan	3 (30)		
4x52			Extract fan	3 (30)		
4x641			Ulkol.max	-10,0°C	Only PRO series units	
4x642			Ulkol.min	-0,1°C	Only PRO series units	
4x54		Over pressure	Supply fan	4 (50)		
4x55			Extract fan	2 (30)		
4x57			OP t	10 min		
4x58		Stove+CeVaCl+Overpr	CH Sply	4 (50)		
4x59			CH Exhst	2 (30)		
4x60			CVC Sply	4 (50)		
4x61			CVC Exhst	2 (30)		
4x62			COC Sply	6 (70)		
4x63			COC Exhst	2 (30)		
4x64			OCC Sply	8 (100)		
4x65			OCC Exhst	2 (30)		
1x23		YYY (Constant pressure)	Const. ductpr.			
4x645			CDPC EC P-a	2500 Pa		
4x646			CDPC EC I-t	5 s		
4x647			CDPC EC R-t	5 s		
4x648			CDPC EC Dz	2 Pa		
4x649			CDPC AC Delay	20 s		
4x650			CDPC AC Dz	10 Pa		
4x637			???	## Pa		
4x638			???	## Pa		
4x633			??? Max	0 Pa		
4x635			??? Min	200 Pa		
4x634			??? Max	0 Pa		
4x636			??? Min	200 Pa		
4x544			TV	600 s		
4x545			PV	600 s		
4x632			???	10 Pa		
4x10	Temperatures		Supply / Extract / Room measrmn	##°C	Depends on temeprature regulation mode	
4x8			Sply msrmnt	##°C		
4x136			Temp ctrl mde	Supply	Extract control factory setting if the unit is equipped with cooling	
4x135			Setpoint	##°C		
4x140			Min	13,0°C		
4x141			Max	40,0°C		
1x56			OP 1	√		
1x57			OP 2			
1x58			OP 3			
1x59			OP 4			
1x60			OP 5			
1x61			Temp.trans 1			
1x62			Temp.trans 2			
1x63			Temp.trans 3			
	Boosting functions	Boosting settings				
4x66		Man. boost	Boost time	30 min		
4x67			Fanspd	7 (90)		
1x17		Humidity boost	Function	Fixed limit		
4x69			Humidity limit	50 %		
4x74			Max ventltn	8 (100)		
4x71			RH P-band	20 %		
4x73			RH I-time	1 min		

4x75			RH DZ	3 %		
4x72			Reset t	2 min		
4x76		CO2 boost	CO2 limit	1000 ppm		
4x77			Max ventltn	8 (100)		
4x78			CO2 P-band	200 ppm		
4x80			CO2 I-time	1 min		
4x81			CO2 DZ	50 ppm		
4x79			Reset t	1 min		
4x82		Temp. boost	Msrment	Extract temp		
4x83			Max ventltn	8 (100)		
4x84			T P-band	5,0°C		
4x86			T I-time	1 min		
4x87			T DZ	0,5°C		
4x85			Reset t	2 min		
4x88		Limit function	P-band	5,0°C		
4x90			I-time	1 min		
4x91			Neutral zone	0,5°C		
4x89			Reset t	2 min		
1x9	Boosting functions		Humidity			
1x8			Carbn dioxide			
1x11			Temp. boost			
4x100	Situation controls	Away	Fanspd	2 (30)		
4x101			Temp. drop	2,0°C		
1x18			Heat	√		
1x19			Cooling	√		
4x102		Long away	Fanspd	1 (20)		
4x103			Temp. drop	3,0°C		
1x20			Heat			
1x21			Cooling			
1x55		HRC	HR antifreez			
4x170			HRC t	-5,0°C		
4x168			HRC defr	30 Pa		
4x169			HRC delay	12 min		
1x64	Quick choice		Over pressure	√		
1x65			Boosting	√		
1x66			Away	√		
1x67			Long away	√		
1x68			Max heat	√		
1x69			Night cooling	√		
1x70			Fanspd settngs	√		
1x71			Temperature ctrl	√		
4x140 - 4x141			Min-max	15°C - 30°C		
	Display settngs		Backgrnd light on			
			Backgnd light 60 s	√		
4x93	Night cooling		Snight out li	10,0°C		
4x94			Snight start	25,0°C		
4x95			Snight stop	21,0°C		
4x96			Snight dif	1,0°C		
4x92			Snight Fanspd	6 (80)		
1x15			Cool off	√		
4x98			Star	22		
4x99			Off	7		
4x97				Su Mo Tu We Th Fr Sa		
4x640	XXX (=General settings)		Modbus addr.	1		
4x199			Drive mode	HOME	To be defined on order	
1x54			Heat	√		
1x52			Cooling	√		
1x53			HRC	√		

VENTILATION UNIT MAINTENANCE

TThe unit requires only limited maintenance. The maintenance is limited to filter changes and periodic fan and rotor cleaning. Before any maintenance occurs the power to the unit must be isolated across all poles from the main power switch. Wait for approximately two (2) minutes before starting the maintenance work! Although the unit's power is isolated the fans will rotate for a while after the hatch is opened.

CLEANING THE HEAT EXCHANGER

When changing the filters, check if the heat exchanger is dirty. If cleaning is required, remove it from the When changing the filters, check the heat exchanger to see if it also needs cleaning. If cleaning is required remove it from the unit and carefully
wash through the air channels with warm water and a mild detergent. Take care not to get the motor wet. The heat exchanger can also be cleaned by blowing compressed air through the air channels . Do not use a pressure washer and
do not submerge the heat exchanger into water. When restarting the unit after cleaning check that the heat exchanger wheel can turn freely in the housing.

CLEANING THE FANS

When changing filters, also check the condition of the fans. If cleaning is required the fans can be removed from the unit and cleaned with a toothbrush or compressed air.

CHANGING OF FILTERS

We recommend that the filters are checked once a month. The recommended interval for filter changes is very much dependent on the environmental conditions. It might be necessary to change the filters every second month. Changing bag filters; open the lock and remove the old filter and put in a new one.Remember to lock it afterwards. Not all models have filter locks. Vacuum cleaning the inside of the device is recommended at this point. N.B! Make sure to close the service hatch carefully!

You can buy filters as well as other equipment for your Enervent ventilation unit from your local Enervent dealer. Please remember to check what model your ventilation unit is before you order equipment.

QUICK GUIDE TO THE VENTILATION UNIT

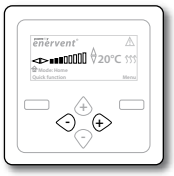
GENERAL INFORMATION ABOUT VENTILATION

The basic function of the ventilation unit is to maintain good indoor air quality. When the ventilation is planned the engineer calculates how big the air amounts need to be in order to get sufficient ventilation. The installer specifies the normal fan speed for the unit when he installes the unit and calibrates the air flows at every terminal.

USING THE VENTILATION UNIT

It is very simple to use the ventilation unit. Most of the time it needs no attention. The most important functions are:

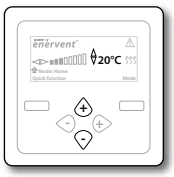
Fan speed



The fan speed can be chosen from the control panel 20-100 % (or 8 speeds). Simplified three of these speeds are used; ***normal speed,*** which is specified by the installer and on which the unit runs most of the time; ***boosting speed*** which is bigger than the normal speed and is used for temporary airing and ***away speed***, which is used when nobody is at home. The columns in the control panel basic view shows which speed is active. Fan speed is changed by pressing the horizontal + and - buttons.

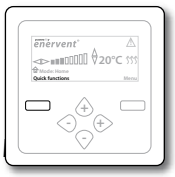
NEVER TURN OFF THE VENTILATION UNIT!
THE NORMAL SPEED , SPECIFIED BY THE VENTILATION INSTALLER, IS _____ FOR THIS UNIT.

After heating



Temperature can be chosen between +15°C and +30°C. Depending on chosen temperature control mode the temperature in question is the supply air, extract air or room temperature. The desired temperature is shown on the control panel. The set value for the temperature can be changed with the vertical + and - buttons.

Quick functions



The ***over pressure*** and ***boosting functions*** are easily and quickly found in the quick functions menu. The functions are activated by pushing the left multi choise button (Quick functions), selecting the right line with the + and - (up/down) buttons and pushing the right multi choise button (Set).

The alarm sign lights up on the control panel when the control system reminds of filter changes or when it alerts of a fault situation. For more information on alarms se page 13 in this instruction.

Key lock

The keys of the control panel can be locked by pressing the left multi choise button and the arrow up. The lock is opened in the same way.

VENTILATION DICTIONARY

Outside air — The fresh air flow from the outside to the ventilation unit is called outside air.

Supply air — The air flow from the ventilation unit to the rooms is called supply air.

Extract air — The air flow from the rooms to the ventilation unit is called extract air.

Exhaust air — The air flow that blows out from the ventilation unit is called exhaust air.

Heat exchanger — The heat exchanger is a component of the ventilation unit that carries heat energy from the extract air flow to the supply air flow. Enervent ventilation units are equipped with a rotating heat exchanger. The rotating heat exchanger is a wheel made of thin metal foil, which stores the heat from the extract air and carries it to the supply air. The heat exchanger prevents the warmth from the rooms from escaping with the exhaust air flow.

After heating — The after heating heats the supply air before it is blown into the rooms. In ECC-units the after heating is realized with an electrical heater. All units are not equipped with after heating.

EDA — EDA is the ventilation unit's control. EDA is an abbreviation of Enervent Digital Automation.