



Saves Your Energy

enervent[®]

Ventilation unit with heat recovery

Planning, installation and operational instructions manual

This instruction covers all ventilation units with EDA-control.

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

Enervent Digital Automation

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VENTILATION UNIT QUICK GUIDE	
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WARNING

- Cut the power to the unit before opening the maintenance hatch!
After opening the maintenance hatch wait for two (2) minutes before starting the maintenance work! The fans rotate for a while even after the power is cut and the after heater in EDE-models can be hot. There are no user-serviceable parts inside the control panel or inside the electrical cabinet, leave the service of these parts to a professional. It is important during troubleshooting not to turn on the power to the unit before being assured what the problem is.
- The unit must be disconnected from the electric network if voltage tests, insulation resistance measuring or other measurements/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.
- Ventilation systems with water coils have to be equipped with dampers in order to prevent freezing of the coil during power cuts.



TYPE MARKING

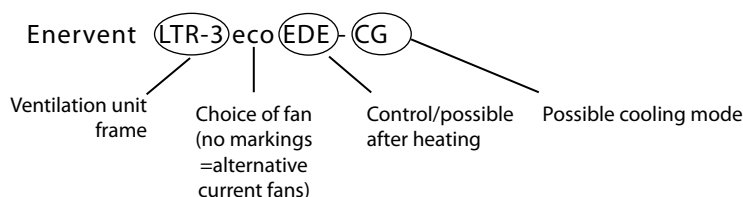
Inside the ventilation unit is a type shield. Fill in the type shields data here to have it easily available when it is needed, e.g. when buying new filters. Before you start reading, please check the type marking of the unit.

This manual covers the following units:

Enervent Plaza eco EDA
 Enervent Pingvin eco EDA
 Enervent Pingvin eco XL EDA
 Enervent Pandion eco EDA
 Enervent Pelican eco EDA
 Enervent Pegasos eco EDA
 Enervent Pegasos Cooler
 Enervent Pegasos eco XL EDA
 Enervent Pegasos XL Cooler
 Enervent LTR-2 eco EDA
 Enervent LTR-3 eco EDA
 Enervent LTR-6 eco EDA
 Enervent LTR-7 eco EDA
 Enervent LTR-7 eco XL EDA

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

TYPE DESCRIPTION



eco	Ventilation unit with direct current fans.
ED	Ventilation unit with EDA control, without after heater.
EDE	Ventilation unit with EDA control, with after heater.
EDW	Ventilation unit with EDA control and water after heater. Delivery includes cooling coil and freeze protection, 2-way valve, valve actuator, duct temperature sensor and a temperature controller.
CG	Cooling Geo (groundcooling) cooling equipment. Delivery includes water cooler, 3-way valve, valve actuator and relay control for pump. Also read the separate CG-instruction.
CW	Cooling Water water cooler. Delivery includes water cooler, 3-way valve and valve actuator.
CX	Cooling Expansion evaporator. Delivery includes evaporator coil and control which prevents the compressor from starting too often (the outside unit is not included). Also read the separate CX-instruction.
EDX	Combination of ventilation unit and heat pump. Delivery includes evaporator coil, electrical duct heater and outside unit. The refrigerant piping is not included. Also read the separate EDX-instruction.
Cooler (CO)	Ventilation unit with built-in cooling apparatus.

FOREWORD

All Enervent 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 20 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 unit series is the result of a long product development. All units in the series are very versatile and flexible.

OPERATING PRINCIPLE

The ventilation units are based on a regenerative heat recovery. This is achieved with a rotating heat exchanger through which incoming air and extract air flow in opposite direction. Aluminium foils within the heat exchanger transfer heat from the extract air to the supply air. A characteristic of the regenerative heat exchanger is its high rate of heat recovery (or efficiency).

The efficiency varies from 75% to 85%, depending on the proportion of supply air and extract air (the heat from the supply air fan is taken into account). Thanks to their high efficiency, the units save heating energy at the same time as they provide excellent indoor air quality; therefore they pay themselves back in a relatively short time.

DUCT HEAT INSULATION

Ventilation ducts must be thermally insulated to prevent water from condensing to the inner or external duct surfaces in any circumstances. Additionally, the air temperature must not decrease or increase excessively in the ducts because of external factors. The ventilation engineer calculates the insulation requirements depending on the placement of the ducts and the air temperatures. When the insulation materials are designed, it must be taken into account that the extract air temperature may decrease significantly below zero degrees. The Optimizer software, which is available from Ensto Enervent's website, can be used to calculate the extract air temperature with different outside air temperatures. Calculation software available from insulation material manufacturers can also be used when designing the insulation material thickness.

Table 1: Ventilation duct thermal insulation in **heating use**

Supply air duct from the ventilation unit to the supply valve	The insulation must be designed and implemented so that the maximum air temperature change in the duct is less than 1°C.
Extract air duct from the supply valve to the ventilation unit	The insulation must be designed and implemented so that the maximum air temperature change in the duct is less than 1°C.

Table 2: Ventilation duct thermal insulation in **cooling use**

Supply air duct from the ventilation unit to the supply valve	The insulation must be designed and implemented so that the maximum air temperature change in the duct is less than 1°C. At least 18 mm of cellular rubber insulation on the duct surface and sufficient additional insulation.
Extract air duct from the supply valve to the ventilation unit	The insulation must be designed and implemented so that the maximum air temperature change in the duct is less than 1°C.

Ventilation Duct Insulation Examples:

Outside air duct (fresh air duct)

Cold spaces: 100 mm of sheet, mat, or pipe-covering insulation (plus the blown wool, when used).

Warm/semi-warm spaces*:

Option 1: 80 mm insulation with vapour-proof external surface

Option 2: 20 mm of cellular rubber insulation on the duct surface and 50 mm insulation with vapour-proof external surface.

The insulation must prevent water vapour from condensing to the external duct surface and excessive air temperature rise during summer.

Supply air duct

Cold/semi-warm spaces*:

In standard ventilation the insulation must be designed and implemented so that the maximum air temperature change in the duct is less than 1°C. For example, 100 mm of sheet, mat, or pipe-covering insulation can be used (plus the blown wool, when used).

Warm spaces: Insulation is not required in standard ventilation.

In heating and cooling use see tables 1 and 2.

Extract air duct

Warm spaces: Insulation is not required in standard ventilation.

Cold/semi-warm spaces*:

In standard ventilation the insulation must be designed and implemented so that the maximum air temperature change in the duct is less than 1°C. For example, 100 mm of sheet, mat, or pipe-covering insulation can be used (plus the blown wool, when used).

In heating and cooling use see tables 1 and 2.

Exhaust air duct

Cold spaces: 100 mm of sheet, mat, or pipe-covering insulation

Warm/semi-warm spaces:

Option 1: 80 mm insulation with vapour-proof external surface

Option 2: 20 mm of cellular rubber insulation on the duct surface and 50 mm insulation with vapour-proof external surface.

The insulation must prevent water vapour from condensing to the external and internal duct surfaces.

Circulation air duct

The insulation must be designed and implemented so that the maximum air temperature change in the duct is less than 1°C.**

*) A semi-warm space refers also to dropped ceilings, sub-floors, and casings.

**) When Kotilämpö systems are renewed, the recycling air duct can be left as it is.

Sound insulation is not taken into account in these insulation instructions and examples.

EQUIPMENT

INCLUDED IN THE DELIVERY OF THE UNIT:

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

SEPARATELY SOLD EXTRA EQUIPMENT:

4. Extra control panels max. 4/unit
5. Control panel cable RJ4P4C, length 20 m
6. Fine filter F7 inside the device
7. Fine filter cassette F7 in duct casing
8. Push button for over pressure function
9. CO₂ carbon dioxide sensor (max. 2 can be connected)
10. %RH humidity sensor (max. 2 can be connected)
11. Room temperature sensor
12. Pressure-difference transmitter for the filters (filter guard)
13. Outside air and exhaust air dampers
14. Damper motor s with spring or electrical return
15. Duct silencers
16. HRW pressure-difference transmitter (HRW defrosting)
17. CO carbon monoxide sensors (relay controlled)
18. Push button for boosting function
19. Button LAP 5 for extended duty function in office mode
20. Pressure-difference switch (cooker hood/central vacuum cleaner indication)
21. Presence sensor LA14
22. KNX gateway
23. Freeway WEB

INSTALLATION

Install the Plaza, Pingvin, Pandion, Pelican and Pegasos units in a warm space (over +5°C) such as an utility or a laundry room but not a garage (separate fire area). Avoid installing the units in humid spaces or close to humid spaces. Likewise spaces with poor ventilation such as closets and cabinets are not suited as installation spaces. The unit is installed hanging on the wall (Plaza, Pingvin, Pingvin XL, Pandion) or standing on the floor (Pandion, Pelican, Pegasos). A partition wall is to be preferred to an exterior wall for the units installed on a wall.

The LTR-2, LTR-3, LTR-6 and LTR-7 units can be installed in either a warm or cold space. The unit must be equipped with 100 mm extra insulation, if it is installed in a cold space. Suitable places for installation are for instance store rooms or the attic. The unit should be placed on a plain surface on an elastic material that absorbs sound. For example, a 100 mm thick insulation plate is suitable as bedding

If the unit is used to ventilate an area with a swimming pool, the unit must be drained. For more information see the drainage instruction on the next spread.

PHASES OF INSTALLATION:

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

Plaza, Pingvin Pingvin XL and Pandion on the wall

1. Mark and cut the holes into the ceiling.
2. Draw the ducts through the holes to the required height. The gaps between duct and steam barrier are then sealed, with for instance ventilation tape.
3. Place a piece of insulation material behind the unit to reduce the transfer of machine noise or vibration. We recommend that soft cellular plastic is used (not included in delivery). The unit surface should be equipped with extra insulation (i.e. cellular plastic) if the unit is placed with one side towards an exterior wall or there is risk that condense might develop on the exterior of the unit.
4. Pingvin and Pandion units: Install the rear attachment bracket directly to the wall at required height. Place the unit onto the rear bracket and fasten it to the wall with the two top brackets. Attach the rear bracket with plate screws to the bottom of the unit. It is crucial for Pingvin unit drainage that the unit is slightly tilted back .
Plaza: Place the unit on the wall and fasten it to the wall with the two top brackets.
4. Connect the unit to the ductsystem. It is recommended that silencers be installed to the extract and supply air ducts.
5. Drain the unit. Read the drainage instruction.

Pandion on the floor, Pelican and Pegasos

1. Install the unit on the floor or on a level built for the unit so that it stands on its own rubber pads. Leave at least a 10 mm opening between the back of the unit and the wall and at least a 15 mm opening to the sides. Also take into account the space needed for drainage below the unit.
2. Make sure that there is at least 95 cm of free space in front of the unit's maintenance hatch and remember to leave the electric wirings easily accessible. The unit has a connecting plug. The connecting cable is located in the front corner above the smaller door. The length of the cable is 120 cm.
3. Connect the ducts to the unit with flexible connectors. Silencers are recommended for the supply air and extract air ducts.
4. Drain the unit. Read the drainage instruction.

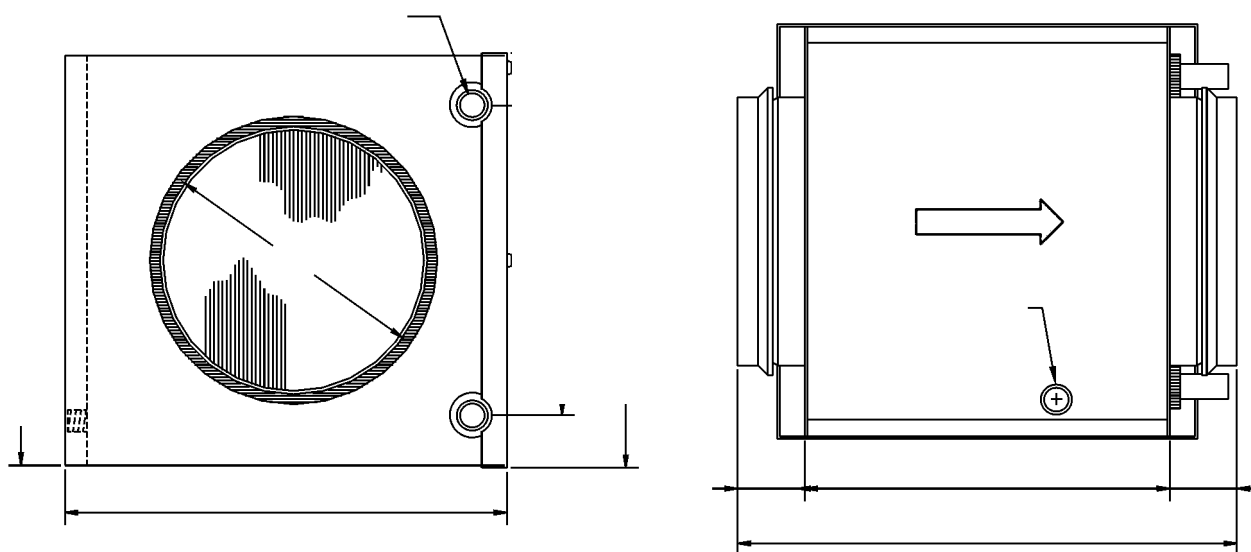
LTR-2, LTR-3, LTR-6 and LTR-7

1. Place the unit on the insulation plate (i.e. 100 mm insulation covered with chipboard) in a storage room or in the attic on a custom made shelf. Take into consideration the potential need for a drain.
2. Check that there is enough free space on top (above the service hatch) (LTR-2 and LTR-3 min. 50 cm, LTR-6 min 60 cm, LTR-7 min. 70 cm) and that the electrical inlets are accessible. Take into consideration that opening the hatches requires a certain amount of space.
3. Connect the ducts to the spigots on the unit. It is recommended that silencers be installed to the extract and supply air ducts.
4. Drain the unit. Read the drainage instruction.

N.B! Detailed dimension drawings can be found in the Chapter Technical information at the end of this manual.

Installation of duct coil

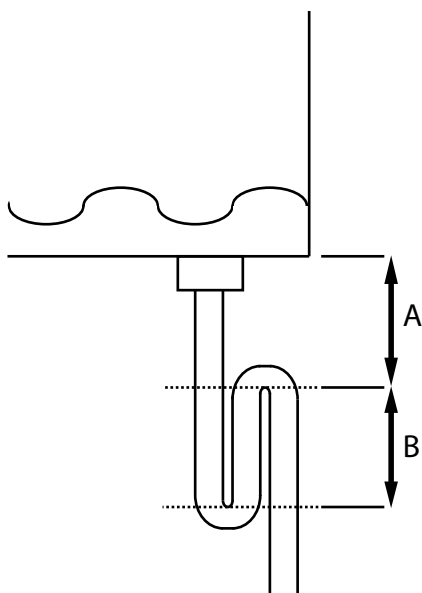
Some of the models have the after heating/cooling water coils in the duct. The duct coil is placed in the supply air duct after the ventilation unit. The supply air temperature sensor is placed in the duct after the coil. The water coil return water sensor is placed on the return water pipe of the coil. VEAB CWK duct coolers are manufactured only in one handedness. Make sure the service hatch can be opened at need. The air flow direction is marked on the coil. The coil must not be turned the opposite way, because the condensate water drain will not work properly. Tilt the coil a little towards the condensate water drain to ensure effective draining.



DRAINING THE VENTILATION UNIT

All Enervent-units with cooling must be drained. We recommend that also other units are drained. When air cools down (condenses) condense water forms i.e. in winter time when the humid inside air meets the cold heat recovery wheel or if the unit is equipped with cooling. The condense water drain must not be directly connected to a sewer! The condense water should be led in a falling, at least Ø15 mm pipe, through a water lock to a floor drain or such. 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. If the unit is equipped with more than one condense water drains, each one must have a water lock of its own.

There is under pressure in the ventilation unit. We recommend a hight difference of (A) 75 mm, or at least the under pressure divided with 10 in millimeters (i.e. 500 Pa under pressure -> 50 mm), between the unit drain and the water lock drain. We recommend that the hight of backwater in the water lock (B) is 50 mm, or at least the under pressure divided with 20 in millimeters (i.e. 500 Pa under pressure -> 25 mm hight of backwater). Over pressure is prevailing in a duct coil. We recommend the hight difference (A) between the duct coil drain and the water lock drain is 25 mm. The water lock hight of backwater (B) must be 75 mm, or at least the under pressure divided wit 10 in millimeters (i.e. 500 Pa under pressure -> 50 mm). The water lock must be filled with water before starting up the unit. The water lock might dry up if water is not accumulated in it. If this happens, ait might get into the pipe and hinder water from entering the water lock, which might result in an irritating "bubbling" sound.



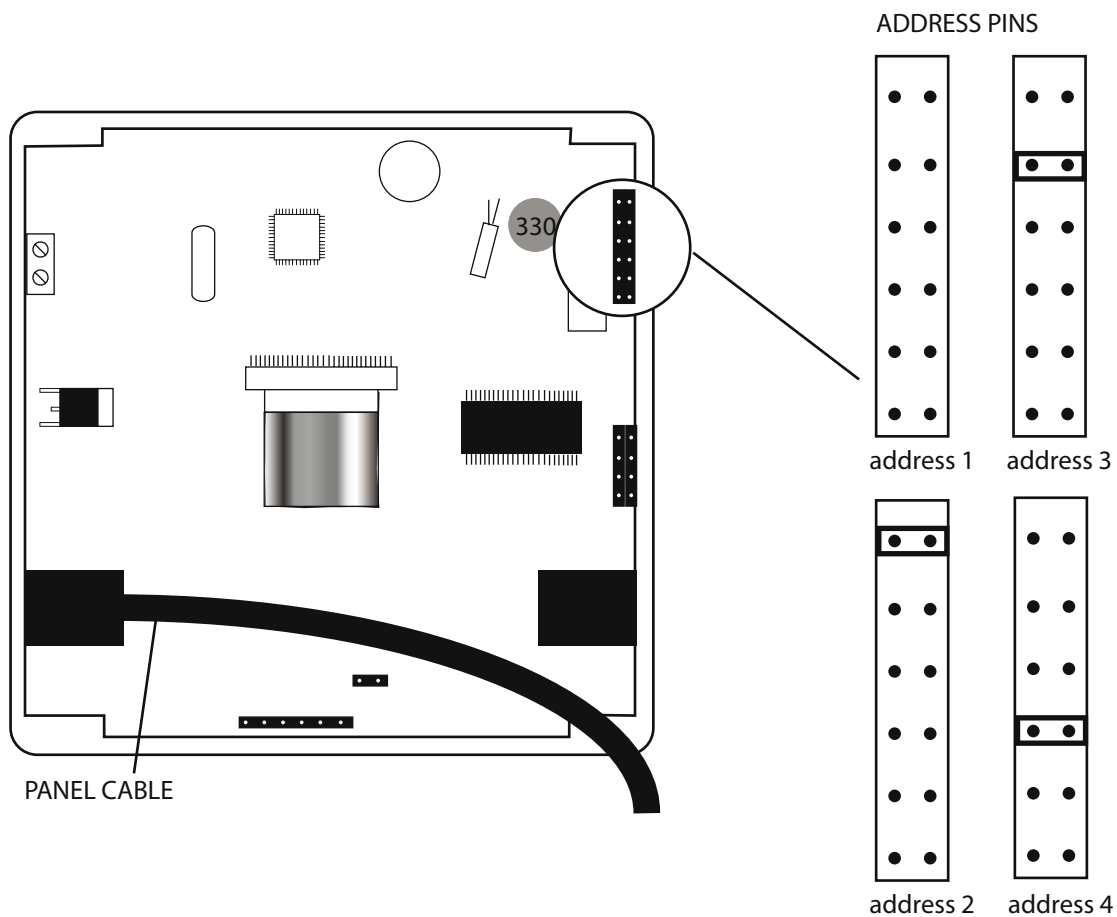
		1/4" (inner thread)	DN32	1/2" (VEAB, outer thread)	DN32 (duct case)
Piccolo	- EC	•			
Plaza	- EC	•			
Pingvin	- EC	•			
	- EDE/-EDW	•			
	- EDE/-EDW-CG	•		•	
	- EDX-E	•			•
Pandion	- EC	••			
	- EDE/-EDW	••			
	- EDE-CG	•	•	•	
	- EDW-CG	•		•	
	- EDX-E	•	•		•
Pelican	- PRO greenair HP	••			
	- EC	••			
	- EDE/-EDW	••			
	- EDE/-EDW-CG	•	•	•	
	- EDX-E	•	•		
Pegasos	- EC	••			
	- EDE/-EDW	••			
	- EDE/-EDW-CG	•	•		
	- EDE/-EDW-Co		••		
	- EDX-E	•	•		•
Pegasos XL	- EC	••			
	- EDE/-EDW	••			
	- EDE/-EDW-CG	•			•
	- EDE/-EDW-Co		••		
	- EDX-E	•			•
LTR-2	- EC	•			
	- EDE/-EDW	•			
	- EDE/-EDW-CG	•		•	
	- EDX-E	•			•
LTR-3	- EC	•			
	- EDE/-EDW	•			
	- EDE/-EDW-CG	•		•	
	- EDX-E	•			•
LTR-6	- EC	•			
	- EDE/-EDW	•			
	- EDE/-EDW-CG	•	•	•	
	- EDX-E	•	•		•
LTR-7	- EC	•			
	- EDE/-EDW	•			
	- EDE/-EDW-CG	•		•	•
	- EDX-E	•	•		•
LTR-7 XL	- EC	•			
	- EDE/-EDW	•			
	- EDE/-EDW-CG	•			•
	- EDX	•			•
EMB	- W-CG		•		
	- X-E		•		

- condense drain
- two condense drain of the same size
- ' option

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.



USER GUIDE

STARTING THE UNIT

Before the unit is ready for use the following installations should take place:

- Assemble the unit as stated in the chapter Installation in this manual.
- Connect the drainage outlet with its own hose to an outflow supplied with a water lock (if the unit ventilates a space with swimming pool or if it is equipped with cooling).
- Install the duct and the silencers.
- EDW model coil, valve, valve actuator, return water temperature sensor and supply air duct sensor are installed and connected.
- Water circulation of the EDW model coil is connected.
- Assemble the terminals onto the ducts.
- Provide the outside air duct with an outside air grating. N.B! the grating must not be provided with an insect net because it is difficult to keep clean.
- Make the roof pass-through. We recommend the use of a factory made, insulated roof pass-through.
- Insulate the ducts as instructed.
- Provide the unit with the appropriate power supply.
- Connect the control panel to the unit with the RJ4P4C cable provided (to the connector OP1 of mother board). The unit's mother board is in the electrical connection box. In vertical units the connection box is behind the smaller door under a cover plate fastened with screws. In horizontal units the connection box is under the service hatch in the upper part of the unit.
- Program the external bus. NOTE! The programming must be finished before the RJ45-bus connector is connected to the mother board.
- Fill out the warranty and all possible changes in the parameter list (field settings) at the end of this instruction.

Open the unit's maintenance hatch when all the above mentioned installation work is done. Check that the unit is clean on the inside, that there are no extra articles inside the unit and that the filters are clean. Close the maintenance hatch carefully.

NB! The device is not to be started or used when the hatch is open!

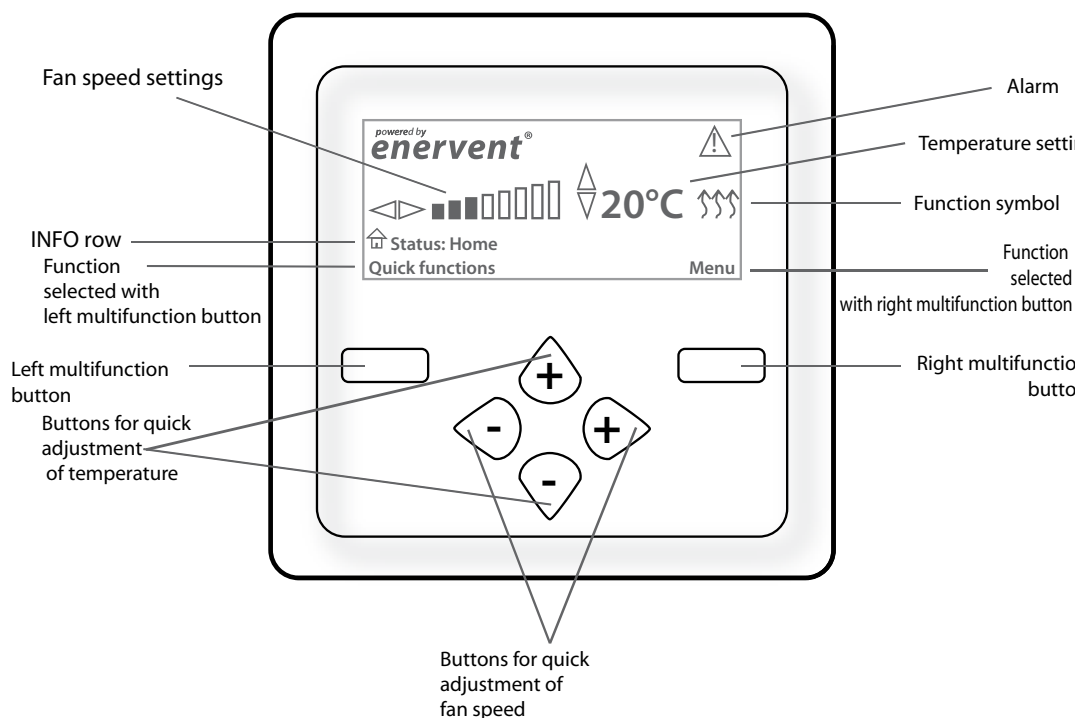
SUPPLY AND EXTRACT AIR CALIBRATION

After the unit has been switched on its airflows must be calibrated to its planned values. When making the calibration all filters should be clean, all supply and extract air valves, the roof pass-through and the outside air grating should be in place. The outside air grating must not be provided with an insect net. The extract air flow should be ca. 5 - 10 % higher 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 help of 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 also upholds a small under-pressure in the house. The under-pressure stops humidity from entering the walls and ceiling.

OVERVIEW ON VENTILATION

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 and can result in the formation of condensation on cold window surfaces. A relative humidity of 40 - 45 % indoors is recommended (room temperature of 20 - 22°C). At these levels condensation will not form and the humidity will be at a healthy level. Check the indoors humidity levels regularly. This can be done with a hygrometer. When the humidity rises above 45 % one should increase the ventilation and when the humidity goes lower than 40 % one should lower the ventilation. Check regularly that the filters are not dirty! During winter the extract air filter becomes dirtier more quickly than the supply air filter. As a result of this the airflow lessens, which leads to a lower humidity indoors. This also leads to lower temperatures. Check the filters each month! At each filter inspection, check that the heat exchanger is functioning correctly, meaning that it is rotating. 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.

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 multi-choice button

By pressing the left multi-choice 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 or switch for the fireplace
- Boosting
- Maximum heating or cooling
- Night cooling allowed or prevented

Right multi-choice button

By pressing the right multi-choice 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. NOTE! The year has to be set.
- Reading of measured temperature and humidity.
- Setting of time program at both week and year level.
- Inspection of the ventilation unit's technical information.
- With a password you can go to the "Settings" menu (only for experts).

Keypad lock

The keypad lock is activated by pressing the left multi-choice button (Quick functions) and directly pressing the "arrow up". You unlock in the same way.

DISPLAY

Setting the fan speed

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 shown. 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 is showing which temperature control is active



The unit is cooling.



The unit is only using heat recovery to heat up / cool down the supply air.



The unit is heating.

INFO row



This row shows which mode the ventilation unit is in. The unit can be in one of the following statuses:

Home / Away / Long away / Boosting (°C or %RH or CO2) / Overpressure / Max heat or cooling / Stove / Ce Va CI / Night cooling

Service and alarm messages



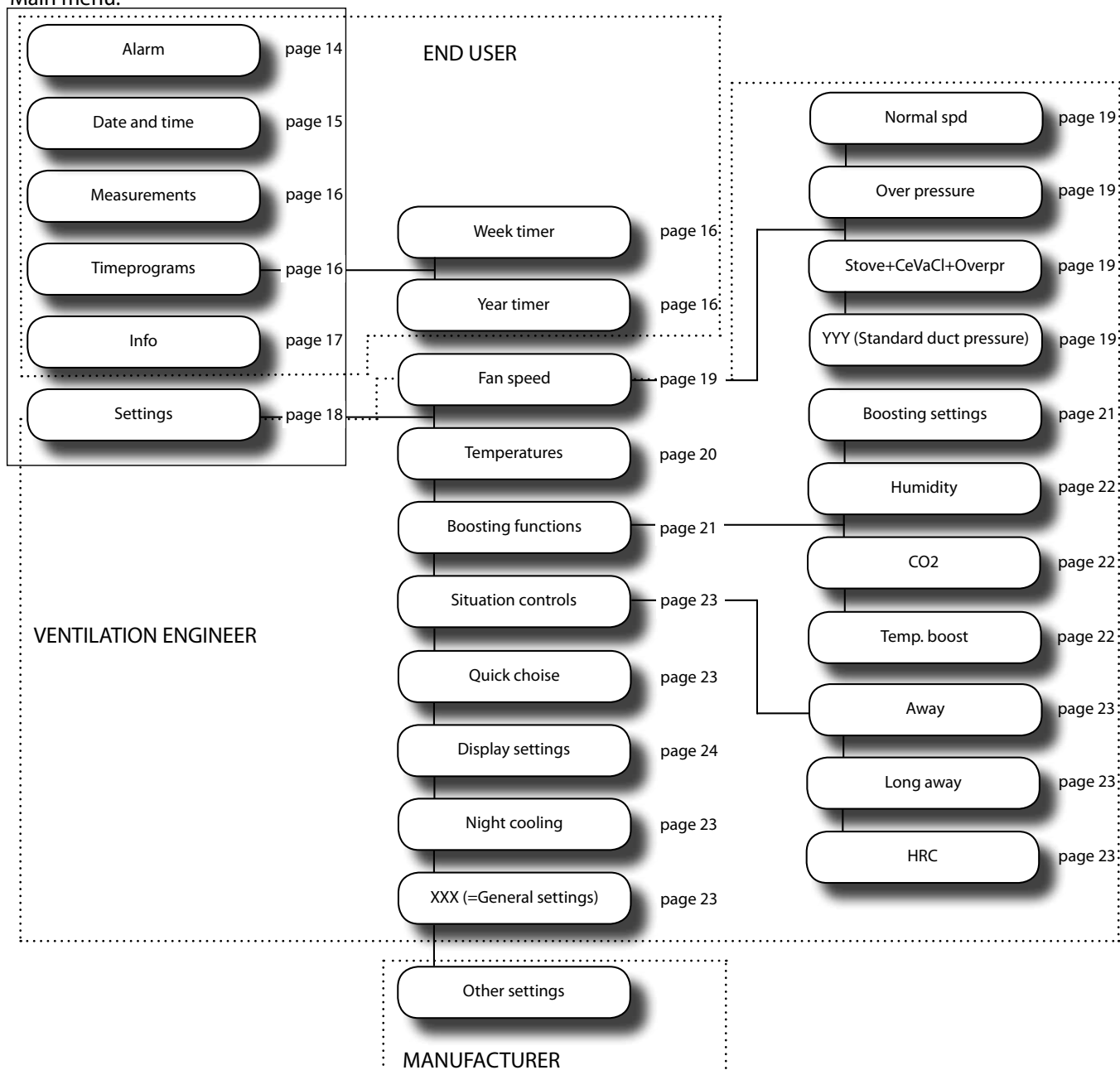
The symbol for Service and alarm messages appears on the display if some error occurs with the unit or if the unit is in need of service.

CONTROL OVERVIEW

To get to the main menu of the control panel, press the right multi-choice button. In the menu, you navigate by using the up or down arrow. When you are in the menu the function alternatives, which are: "Exit"; "Reset"; "Choose" and "Change", are shown on the bottom edge of the display. You can select these options by pressing the multi-choice button on the corresponding side.

MENU STRUCTURE

Main menu:



MAIN MENU

Main menu

Alarm
Measurements
Time programs
Info
Settings
Exit

Choose

ALARM

Alarm 1-20/20

Alarm name space
Alarm time DD:MM:YY HH:MM
Alarm text

Exit Reset

All alarm and service messages are visible in the unit's Alarm menu. 20 alarms are shown in the list. An alarm can have one of the following three statuses; ON, RES reset, but still active or OFF.

The alarms are divided into three classes, class A, class AB and class B. Class A alarms shut down the unit. Class AB-alarms set the unit in failsafe mode. In failsafe mode the extract air fan runs on smallest efficiency and the supply air fan stands still¹. Class B alarms do not affect the unit's function. An alarm symbol is flashing in the display when class A and class AB alarms are active. The light is not shown at class B alarms.

The unit doesn't start before a class A alarm has been reset. Class AB-alarms reset automatically and the unit automatically starts when the alarm no longer is valid.

For example TE30 min. alarm: If the extract air temperature has dropped below the set value for more than 10 min an alarm is activated (ON) and the unit goes into failsafe mode (AB-alarm). If the alarm is reset the alarm changes to RES mode, but the failsafe situation continues. The unit does not start before the temperature rises over the set value and the alarm goes into OFF mode.

There are two relay outputs for alarms on the EDA motherboard: **ALM A** and **ALM B**. Output ALM A conducts when a class A alarm is active. Output ALM B conducts when an A- or AB-alarm is active and the time is within the alarm B output validity. The alarm B output can conduct weekdays between 9 am and 10 pm.

¹ In passive house models also the extract air fan stops.

List of alarms

Alarm name	Class	Explanatory text row --	Alarm limit	Delay	NOTE!
TE5 min	AB or B	After HRC supply air cold	+5°C	10 min	Unit in failsafe mode.
TE10 min	AB	Supply air cold	+10°C	10 min	Unit in failsafe mode.
TE10 max	A	Fire risk supply temp high	+55°C	2 sec	Unit starts only after reset.
TE20 max	A	Fire risk room temp high	+55°C	10 sec	Highest measured room temperature is higher than the set value. Unit starts only after reset.
TE45 min	A	Water cooler freeze risk	+8°C	2 sec	Only EDW-units. Unit starts only after reset.
TE30 min	AB or B	Extract air cold	+15°C	10 min	Unit in failsafe mode.
TE30 max	A	Fire risk extract temp high	+55°C	2 sec	Unit starts only after reset.
ELH-problem	A	Electrical coil overheating		2 sec	Alarm information from ELH power to input DI10. Unit starts only after reset.
Freeze problem	B	Freeze problem info		2 sec	Only Cooler-units.
E-stop	A	External emergency stop		0 sec	The loop is connected to input DI1 (closing)
Fire risk	A	External		0 sec	The loop is connected to input DI2 (closing)
Service reminder	B			6 mnths	
PDS10	B	Pressure switch		2 sec	Use of electrical heater is prohibited until pressure difference recovered.
SF	A	Deviation alarm	10 Pa	200 s	Standard duct pressure control, the deviation for the alarm can be set
EF	A	Deviation alarm	10 Pa	200 s	Standard duct pressure control, the deviation for the alarm can be set

DATE AND TIME

Date and time

Time: 08:00

Day: 01 Thursday

Month: 1

Year: 2011

Exit

Change

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 CO₂ 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 η sply	Supply air heat recovery rate
HRC η 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 +200...+300 the unit is asking for heating of the additional heating unit (only EDX-E)
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

Measurements	
Fresh air	xx,x°C
HRC sply	xx,x°C
Sply	xx,x°C
Exhst	xx,x°C
Exhst. water /NA	xx,x°C
Exhaustair	xx,x°C
Room t. OP	xx,x°C
Exhst humidity	xx %
48 h humidity	xx %
HRC η sply	xx %
HRC η exhst	xx %
(HRC)	
RH_1	xx %
RH_2	xx %
CO2_1	xx ppm
CO2_2	xx ppm
Exit	

TIME PROGRAMS

Time programs

Week timer
 Year timer

Exit Choose

Week timer

Timeprogram: 1
 On : 00:00 - 00:00
 Su Mo Tu We Th Fr Sa
 Function: Choose here

Exit Change

Year timer

Timeprogram: 1
 Start: dd.mm.yyyy 00:00
 End: dd.mm.yyyy 00:00
 Function: Choose

Exit Change

In the Timeprogram menu you program the week and year timers. For the **week timer there are 20 program slots** in which you set up when the program is on (hh:mm – hh:mm + day) and what function the unit is to perform during the time program. For the **year timer there are 5 program slots** in which you set up the time programs on and off time (dd.mm.yyyy, hh:mm) and what function the unit is to perform during the time program.

If the end time for the time program is smaller than the start time, the control interprets that the time program continues over the day limit. In this case the next day also needs to be an allowed day. Example: Start: 16:00, End: 08:00, Allowed days: Mo, Tu, We. This time programming means that the program start on Monday at 16:00, ends on Tuesday at 08:00, starts again on Tuesday at 16:00 and ends on Wednesday at 08:00. After that the program is active again next Monday at 16:00.

Time program events:

Ventilation effect (1-8) for ventilation units with alternating current fans. The number of available ventilation effects depend on the fan effect's initial settings. If the speed of the supply air and extract air fan is the same, the number of available effects are 8. If the difference in speed is of 1, then the available number of effects are 7, if the difference is of 3, then the number is 5 etc.

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. Functions in the same way as max heat.

No heating: heating prohibited.

No cooling: Cooling prohibited.

Temp. drop: The temperatures set point is lowered according to the amount set in settings.

Timely: Timed relay (DO2) is connected to activate at set time.

INFO

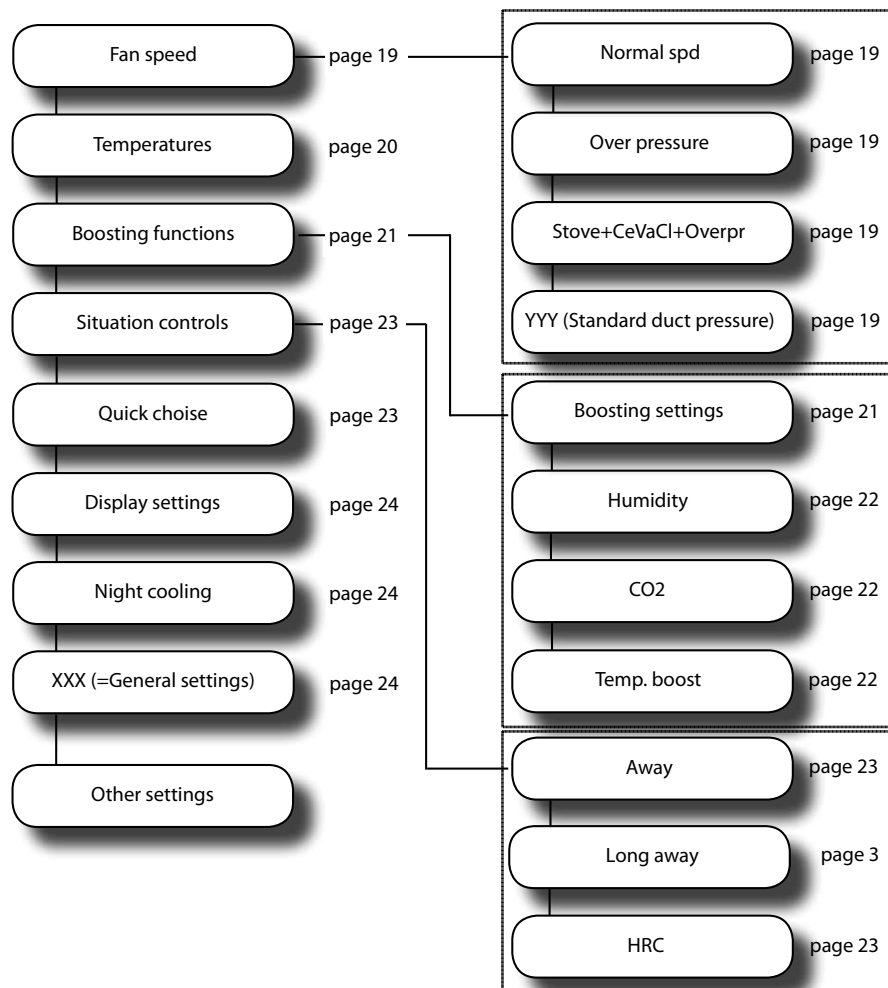
Info	
Enervent	
Pingvin eco EDE	
Mother v.	2.11
Display v..	2.01
SN	60387
Exit	

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

Fan speed	
Normal spd.	
Over pressure	
Stove+CeVaCl+Overpr	
YYY (=Constant duct pressure)	
Exit	Choose

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 %).

Normal spd.	
Supply fan	#
Extract fan	#
Ulkol. max:	##°C
Ulkol. min:	## °C
Back	Change

Over pressure	
Supply fan	#
Extract fan	#
OP t:	# min
Exit	Change

Stove+ CeVaCl+Overpr				
	CH	CVC	COC	OCC
Sply	#	#	#	#
Exhst	#	#	#	#
Exit	Change			

YYY (=Constant duct pressure)	
Const. ductpr.	☐
CDPC EC P-a:	## Pa
CDPC EC I-t:	## s
CDPC EC R-t:	## s
CDPC EC Dz:	## Pa
CDPC AC Delay:	## s
CDPC AC Dz:	## Pa
???	## Pa
???	## Pa
??? Max:	## Pa
??? Min:	## Pa
??? Max:	## Pa
??? Min:	## Pa
TV:	## s
PV:	## s
???:	## Pa
Back	Change

TEMPERATURES

Temp. settings	
Exhst msrmnt	##,##°C
Sply msrmnt:	##,##°C
Temp ctrl mde	From
Setpoint:	##,##°C
Min:	##,##°C
Max:	##,##°C
OP 1	☐
OP 2	☐
OP 3	☐
OP 4	☐
OP 5	☐
Temp. trans 1	☐
Temp. trans 2	☐
Temp. trans 3	☐
Exit	Change

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 accuracy.

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 participate in room temperature regulation. If several panels are selected the room temperature is shown as an average value of the selected panels' measurements. One panel is included in the standard delivery.

Temp.trans 1-3:

Selection of temperature sensor (extra equipment) that participate in room temperature regulation. If several panels are selected the temperature is shown as an average value of the selected panels measurements.

BOOSTING FUNCTIONS

Boosting functions

Boosting settings

Humidity ☐

Carbn dioxide ☐

Temp. boost ☐

Exit Choose

Boosting settings

Man. boost

Humidity boost

CO2 boost

Temp. boost

Limit function

Back Choose

Boosting settings: Selection of settings for boosting functions.

Humidity: By activating ☒ humidity boosting allowed

Carbon dioxide: By activating ☒ carbon dioxide boosting allowed

Temp. boosting: By activating ☒ temperature boosting allowed

Man. boost

Boost time ## min

Fanspd #

Back Change

Humidity boost

Function: Fixed limit

Humidity limit ## %

Max ventltn #

RH P-band: ## %

RH I-time ## min

RH DZ: ## %

Reset t: ## min

Back Change

CO2 boost

CO2 limit ## ppm

Max ventltn: #

CO2 P-band: ## ppm

CO2 I-time: ## min

CO2 DZ: ## ppm

Reset t: ## min

Back Change

Temp. boost

Msrment OP1

Max ventltn #

T P-band: ## °C

T I-time: ## °C

T DZ: ## °C

Reset t: ## min

Back Change

Limit function

P-band ## °C

I-time ## min

Neutral zone #

Reset time: ## min

Back Change

Humidity boosting strives to lower 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.

CO₂ (carbon dioxide) boosting strives to lower the inside air's CO₂ level by boosting (amplifying) the ventilation. Two external sensors (extra equipment) can be connected to the ventilation unit.

Temperature boosting strives to increase the heating/cooling effect by boosting (amplifying) the ventilation.

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

Further explanation on boosting functions' settings 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 a situation can appear where the humidity outside can raise the humidity inside and turn on boosting. 48 h average humidity also works well during summertime.
Humidity limit:	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:	The P-coefficient of the humidity boosting. A big value causes a stronger boosting in relation to the humidity limit and the humidity difference.
RH I-time:	The I-time of the humidity boosting. A big value means that the need for boosting is evaluated infrequently, i.e. the boosting is increasing slower.
RH DZ:	A deviation zone from the humidity limit (dead zone) where boosting doesn't happen.

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:	The P-coefficient of the carbon dioxide boosting. A big value causes a stronger boosting in relation to the carbon dioxide limit and the carbon dioxide difference.
CO2 I-time:	The I-time of the carbon dioxide boosting. A big value means that the need for boosting is evaluated infrequently, i.e. the boosting is increasing slower.
CO2 DZ:	A deviation zone from the carbon dioxide limit (dead zone) where boosting doesn't happen.

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:	The P-coefficient of the temperature boosting. A big value causes a stronger boosting in relation to the temperature limit and the carbon dioxide difference.
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.

SITUATION CONTROLS

Situation controls	
Away	
Long away	
HRC	
Exit	Choose

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 enabled.

HRC antifreeze: Activation of the heat recovery defrost.

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

Away	
Fanspd	#
Temp. drop	##°C
Heat:	☐
Cooling:	☐
Back	Change

Long away	
Fanspd	#
Temp. drop	##°C
Heat:	☐
Cooling:	☐
Back	Change

HRC	
HR antifreeze	☐
HRC t:	##°C
HRC defr	## Pa
HRC delay:	## min
Exit	Change

QUICK CHOICE

Quick choice	
Over pressure	☐
Boosting	☐
Away	☐
Long away	☐
Max heat/cool	☐
Night cooling	☐
Fanspd settings	☐
Temperature ctrl	☐
Min-max: ##° ##°C	☐
Back	Change

Selection of quick choice functions from the control panel's left multi-choice button. The functions Away and Long away do not work as quick choices if they are configured as DI.

Fanspd settings 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

Display settings	
Background light on	☐
Background light 60 sec.	☐
Exit	Change

Background light on: Background light is on.

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

NIGHT COOLING

Night cooling

Snight out li	##, #°C
Snight start	##, #°C
Snight stop	##, #°C
Snight dif	##, #°C
Snight fanspd	#
Cool off:	☐
On: ##	Off: ##
Su Mo Tu We Th Fr Sa	
Back	Change

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)

XXX

Modbus addr.	1
Drive mode:	HOME
Heat:	☐
Cooling:	☐
HRC:	☐
Exit	Change

- 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

Other settings

Give code
####

Exit Choose

The menu Other settings is not intended for the end-customer and the information in this menu is not needed by the user. The parameters are set at the factory.

The unit needs almost no maintenance. The maintenance is mostly limited to changing filters and cleaning the fans and rotor. During maintenance, cut the power from the main power switch or from the LTR-series unit by removing the service hatch. Wait for approximatively two (2) minutes before starting the maintenance work! Although the unit's power supply is cut when the hatch is opened, the fans will rotate and the electrical coil in the ECE-model will be hot for a while.

Cleaning the heat exchanger

When changing the filters, check if the heat exchanger is dirty. If cleaning is required, remove it from the unit and carefully wash through the air channels with a hand shower using a mild detergent, taking 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.

Cleaning the fans

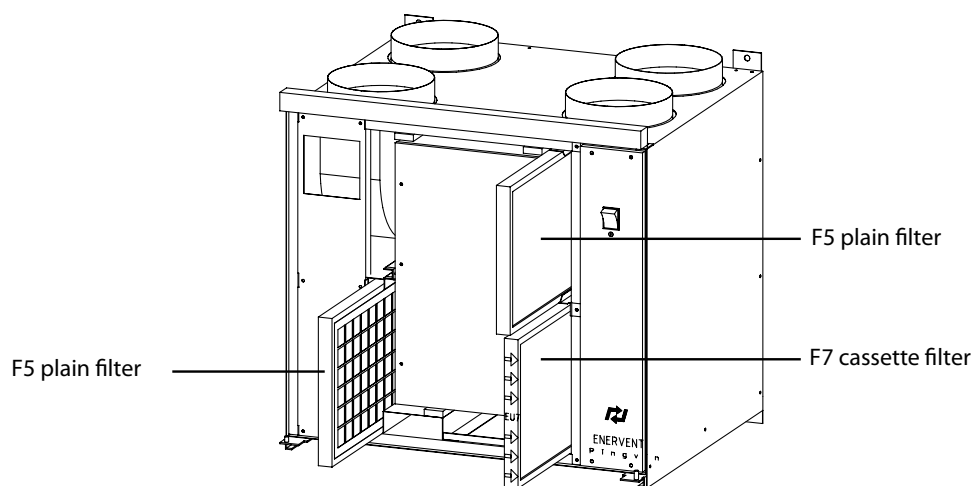
When changing filters, also check the condition of the fans. If cleaning is required the fans can be removed from the unit and cleaned with a toothbrush or compressed air.

Changing of filters

The recommended time between filter changes is max. four (4) months for plain filters and max. six (6) months for bag filters. If class F5 bagfilters are used the time between filter changes can be prolonged to one (1) year, by vacuuming the filters on the inside. Changing plain filters; remove the filter cassettes from the device and loosen the filter fabric from the frame. Replace new filter fabric back into the frame. Replace the filter cassette back into the unit so that the support mesh faces towards the heat exchanger. 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!

Ventilation units and filters

UNIT	STANDARD FILTERS	CHANGE INTERVAL	ALTERNATIVE FILTERS	CHANGE INTERVAL
Plaza	F7 cassette filter / F5 bag filter	6 months	-	
Pingvin	F5 plain filter / F5 plain filter	4 months	F7 cassette filter in the supply air in addition to F5 filters	6 months
Pingvin XL	F5 cassette filter / F5 cassette filter	6 months	F7 cassette filter in supply and/or extract air	
Pandion	F5 bag filter / F5 bag filter	6/12* months	F7 bag filter in supply and/or extract air	6 months
Pelican	F5 bag filter / F5 bag filter	6/12* months	F7 bag filter in supply and/or extract air	6 months
Pegasos	F5 bag filter / F5 bag filter	6/12* months	F7 bag filter in supply and/or extract air	6 months
LTR-2	F5 plain filter / F5 plain filter	4 months	-	
LTR-3	F5 plain filter / F5 plain filter	4 months	F5 and F7 bagfilters in supply and/or extract air	6/12* months
LTR-6	F5 bag filter / F5 bag filter	6/12* months	F7 bag filter in supply and/or extract air	6 months
LTR-7	F5 bag filter / F5 bag filter	6/12* months	F7 bag filter in supply and/or extract air	6 months



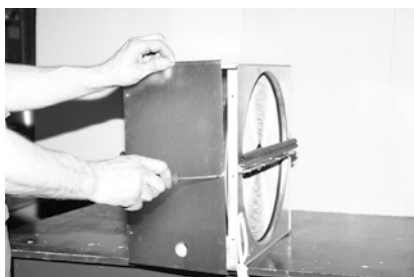
Usually a ventilation unit has one supply air filter and one extract air filter.

The Pingvin ventilation unit is an exception. The picture above shows how the filters are placed if Pingvin is equipped with a F7 cassette filter.

FAULT ALARMS

List of alarms

Alarm name	Class	Explanatory text row --	Alarm limit	Delay	NOTE!
TE5 min	AB or B	After HRC supply air cold	+5°C	10 min	Unit in failsafe mode.
TE10 min	AB	Supply air cold	+10°C	10 min	Unit in failsafe mode.
TE10 max	A	Fire risk supply temp high	+55°C	2 sec	Unit starts only after reset.
TE20 max	A	Fire risk room temp high	+55°C	10 sec	Highest measured room temperature is higher than the set value. Unit starts only after reset.
TE45 min	A	Water cooler freeze risk	+8°C	2 sec	Only EDW-units. Unit starts only after reset.
TE30 min	AB or B	Extract air cold	+15°C	10 min	Unit in failsafe mode.
TE30 max	A	Fire risk extract temp high	+55°C	2 sec	Unit starts only after reset.
ELH-problem	A	Electrical coil overheating		2 sec	Alarm information from ELH power to input DI10. Unit starts only after reset.
Freeze problem	B	Freeze problem info		2 sec	Only Cooler-units.
E-stop	A	External emergency stop		0 sec	The loop is connected to input DI1 (closing)
Fire risk	A	External		0 sec	The loop is connected to input DI2 (closing)
Service reminder	B			6 mnths	
PDS10	B	Pressure switch		2 sec	Use of electrical heater is prohibited until pressure difference recovered.
SF	A	Deviation alarm	10 Pa	200 s	Standard duct pressure control, the deviation for the alarm can be set
EF	A	Deviation alarm	10 Pa	200 s	Standard duct pressure control, the deviation for the alarm can be set



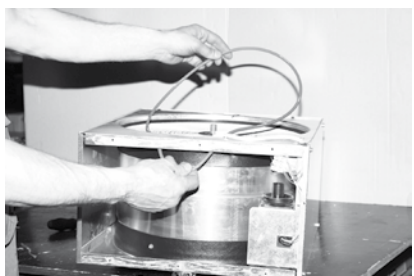
pic 1



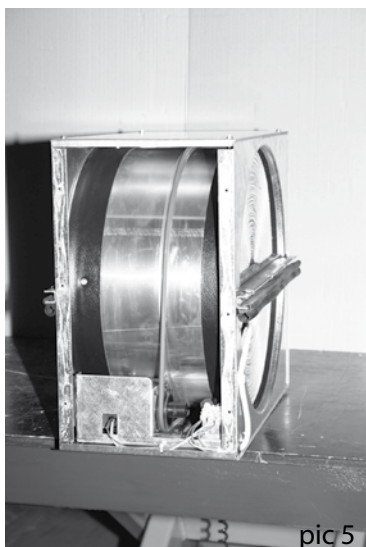
pic 2



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 exchanger 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.

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.

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.

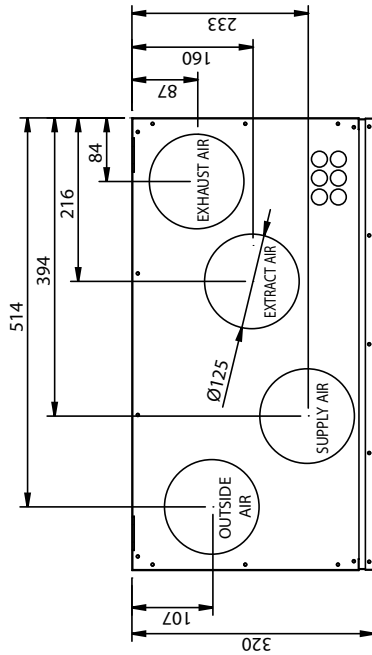
* NOTE! Check the unit model and serial number on the type shield before contacting a service representative.

TECHNICAL INFORMATION

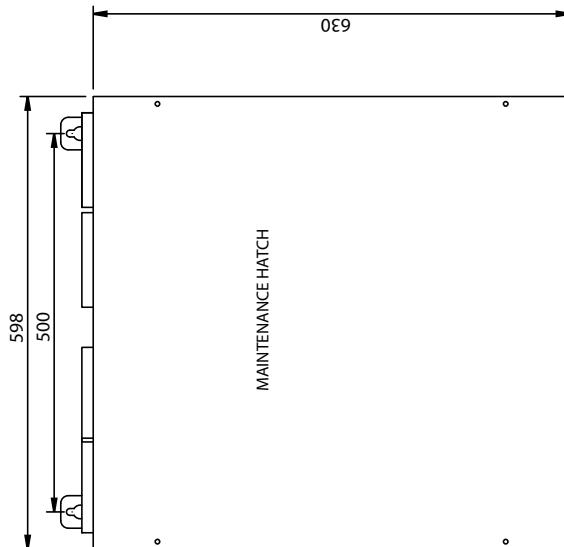
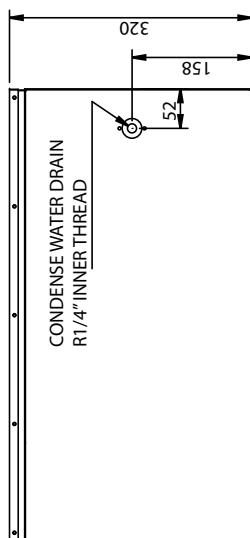
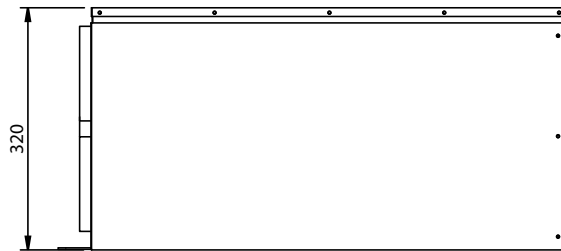
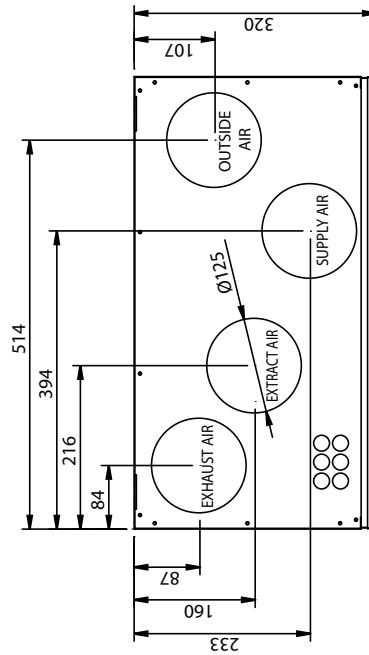
UNIT:		PLAZA	PINGVIN	PINGVIN XL	PANDION	PELICAN	PEGASOS	PEGASOS XL	PEGASOS COOLER	PEGASOS XL COOLER	LTR-2	LTR-3	LTR-6	LTR-7	LTR-7-XL
Width		589 mm	580 mm	780 mm	785 mm	998 mm	1 250 mm	1 250 mm	1 250 mm	1 250 mm	972 mm	833 mm	1 190 mm	1 510 mm	1 510 mm
Depth		320 mm	500 mm	555 mm	543 mm	590 mm	677 mm	677 mm	677 mm	677 mm	393 mm	480 mm	660 mm	707 mm	707 mm
Height		630 mm	540 mm	540 mm	895 mm	1 270 mm	1 400 mm	1 400 mm	1 400 mm	1 400 mm	362 mm	510 mm	660 mm	720 mm	720 mm
Weight		45 kg	50 kg	63 kg	90 kg	125 kg	203 kg	203 kg	240 kg	240 kg	41 kg	52 kg	96 kg	130 kg	130 kg
Duct connections		Ø 125 mm	Ø 160 mm	Ø 160 mm	Ø 160 mm	Ø 200 mm	Ø 250 mm	Ø 250 mm	Ø 250 mm	Ø 250 mm	Ø 125 mm	Ø 160 mm	Ø 200 mm	Ø 250 mm	Ø 250 mm
Direct current fans supply and extract air		119 W, 0,9 A	119 W, 0,9 A	230 W	230 W, 1,4 A	170 W, 1,2 A	520 W, 3,15 A	545 W, 3,5 A	520 W, 3,15 A	545 W, 3,5 A	119 W, 0,9 A	119 W, 0,9 A	170 W, 1,22 A	520 W, 3,3 A	545 W, 3,5 A
Mother board 5x20 mm glass pipe fuse		F1: T250 mA F2: T2,0 A F3: T160 mA	F1: T250 mA F2: T2,0 A (F2: T6,3 A*) F3: T160 mA	F1: T250 mA F2: T3,15 A F3: T160 mA	F1: T250 mA F2: T3,15 A F3: T160 mA	F1: T250 mA F2: T3,15 A F3: T160 mA	F1: T250 mA F2: T8 A F3: T160 mA	F1: T250 mA F2: T8 A F3: T160 mA	F1: T250 mA F2: T8 A F3: T160 mA	F1: T250 mA F2: T8 A F3: T160 mA	F1: T250 mA F2: T2,0 A F3: T160 mA	F1: T250 mA F2: T3,15 A F3: T160 mA	F1: T250 mA F2: T3,15 A F3: T160 mA	F1: T250 mA F2: T8,0 A F3: T160 mA	3x16 A nopea F1: T250 mA F2: T8,0 A F3: T160 mA F3: T160 mA
Heat recovery wheel motor with over heating protection		5 W, 0,04 A	5 W, 0,04 A	5 W, 0,04 A	5 W, 0,04 A	5 W, 0,04 A	5 W, 0,04 A	5 W, 0,04 A	5 W, 0,04 A	5 W, 0,04 A	6 W, 0,11 A	5 W, 0,04 A	5 W, 0,04 A	5 W, 0,04 A	5 W, 0,04 A
Standard electrical after heater		400 W	400 W	800 W	800 W	2 000 W	4 000 W	4 000 W	4 000 W	4 000 W	400 W	500 W	2 000 W	4 000 W	4 000 W
Alternative electrical after heater		-	800 W	-	-	4 000 W	6 000 W	6 000 W	6 000 W	6 000 W	-	800 W	4 000 W	6 000	6 000 W
Current and fuse		230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	230 V~/50 Hz 16 A quick	400 V 3~/50 Hz 3x16 A quick	400 V 3~/50 Hz 3x16 A quick	400 V 3~/50 Hz 3x16 A slow	400 V 3~/50 Hz 3x16 A slow	230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	230 V~/50 Hz 16 A quick	400 V 3~/50 Hz 3x16 A quick	400 V 3~/50 Hz 3x16 A quick
Cooling coil (CG) placement		-	In duct	In duct	Built-in	Built-in	Built-in	Built-in	-	-	-	In duct	Built-in	Built-in	In duct
Water coil placement (after heater)		In duct	In duct	In duct	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in	In duct	In duct	Built-in	Built-in	Built-in
35/25°C coil efficiency		1,3 kW*	1,5 kW*	2,5 kW*	2,6 kW	-	6,4 kW*	7,7 kW*	6,4 kW*	7,7 kW*	1,6 kW*	1,8 kW*	3,7 kW*	5,3 kW*	7,4 kW*
30/20°C coil efficiency		-	1,3 kW	-	2,8 kW*	3,2 kW*	-	-	-	-	-	-	4,3 kW	6,3 kW	7,3 kW
60/40°C coil efficiency		-	2,0 kW	2,7 kW	3,0 kW	3,5 kW	6,2 kW	6,7 kW	6,2 kW	6,7 kW	1,7 kW	2,3 kW	3,8 kW	7,1 kW	7,7 kW
Current and fuse		230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	400 V 3~/50 Hz 2x16 A slow	400 V 3~/50 Hz 2x16 A slow	230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick	230 V~/50 Hz 10 A quick
Pipe connection		10 mm	10 mm	10 mm	15 mm	15 mm	28 mm	28 mm	28 mm	28 mm	10 mm	10 mm	22 mm	22 mm	28 mm
Fluid flow		0,03 l/s	0,04 l/s	0,03 l/s	0,07 l/s	0,08 l/s	0,15 l/s	0,19 l/s	0,15 l/s	0,19 l/s	-	0,04 l/s	0,09 l/s	0,13 l/s	0,18 l/s
Pressure drop on water side		8,2 kPa	10,3 kPa	5,0 kPa	6,6 kPa	9,2 kPa	2,3 kPa	3,3 kPa	2,3 kPa	3,3 kPa	-	13,7 kPa	3,5 kPa	7,0 kPa	4,2 kPa
Valve Kvs-value		0,63	0,63	0,63	1,0	1,6	1,6	4,0	1,6	4,0	0,63	0,63	1,6	2,5	4,0
Valve connection DN		15	15	15	15	15	15	15	15	15	15	15	15	15	15
Duct coil measurements (WXHXL) mm		313x255x356	313x255x356	313 x 255 x 356	-	-	-	-	-	-	313x255x356	313x255x356	-	-	-
Cooling coil (CG) placement		-	In duct	In duct	In duct	In duct	Built-in	In duct	-	-	-	In duct	Built-in	Built-in	In duct
Total efficiency		-	0,9 kW	1,2 kW	1,5 kW (built-in) 1,2 kW (in duct)	1,7 kW	3,2 kW	4,4 kW	-	-	-	1,0 kW	2,4 kW	2,9 kW	4,5 kW
Pipe connection		-	22 mm	22 mm	15 mm (built-in) 22 mm (in duct)	15 mm	28 mm	22 mm	-	-	-	22 mm	22 mm	22 mm	22 mm
Fluid flow		-	0,05 l/s	0,06 l/s	0,08 l/s (built-in) 0,07 l/s (in duct)	0,09 l/s	0,16 l/s	0,23 l/s	-	-	-	0,05 l/s	0,12 l/s	0,15 l/s	0,23 l/s
Pressure drop on water side		-	5,7 kPa	7,9 kPa	1,5 kPa (built-in) 7,7 kPa (in duct)	2,0 kPa	3,4 kPa	4,4 kPa	-	-	-	6,3 kPa	2,8 kPa	4,0 kPa	4,0 kPa
Valve Kvs-value		-	1,6	2,6	1,6	4,0	4,0	6,3	-	-	-	1,6	4,0	4,0	4,0
Valve connection DN		-	15	15	15	15	20	25	-	-	-	15	15	15	15
Duct coil measurements (WXHXL) mm		-	411x330x356	411 x 330 x 356	411 x 330x356	-	-	600x550x890	-	-	-	411x330x356	-	-	600x550x890

* Standard batteri
Standard batteriets uppgifter

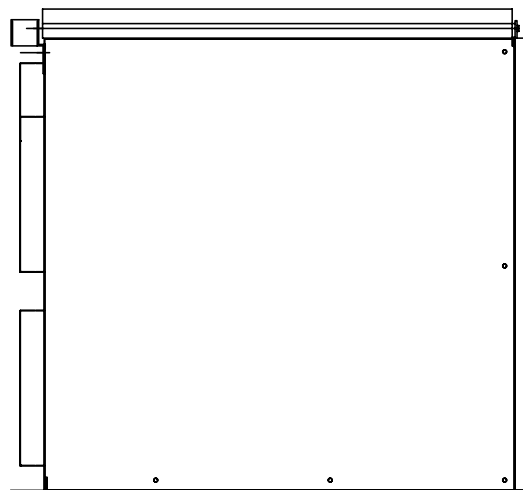
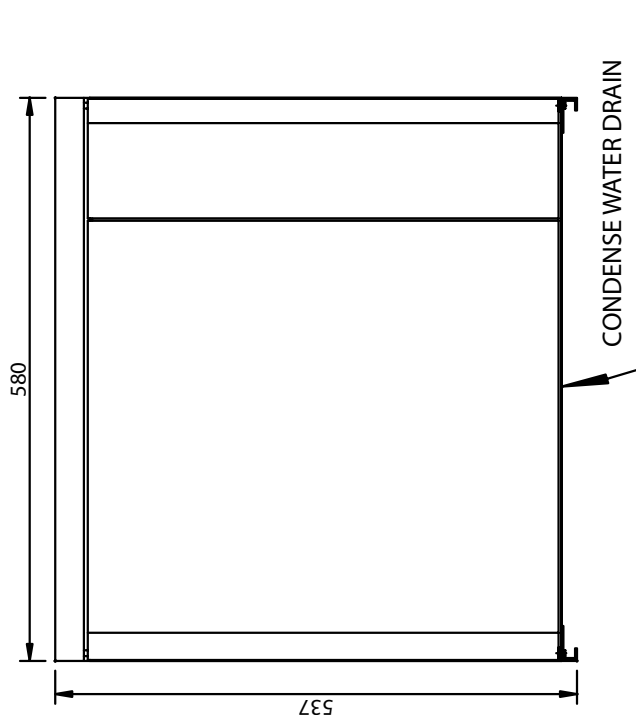
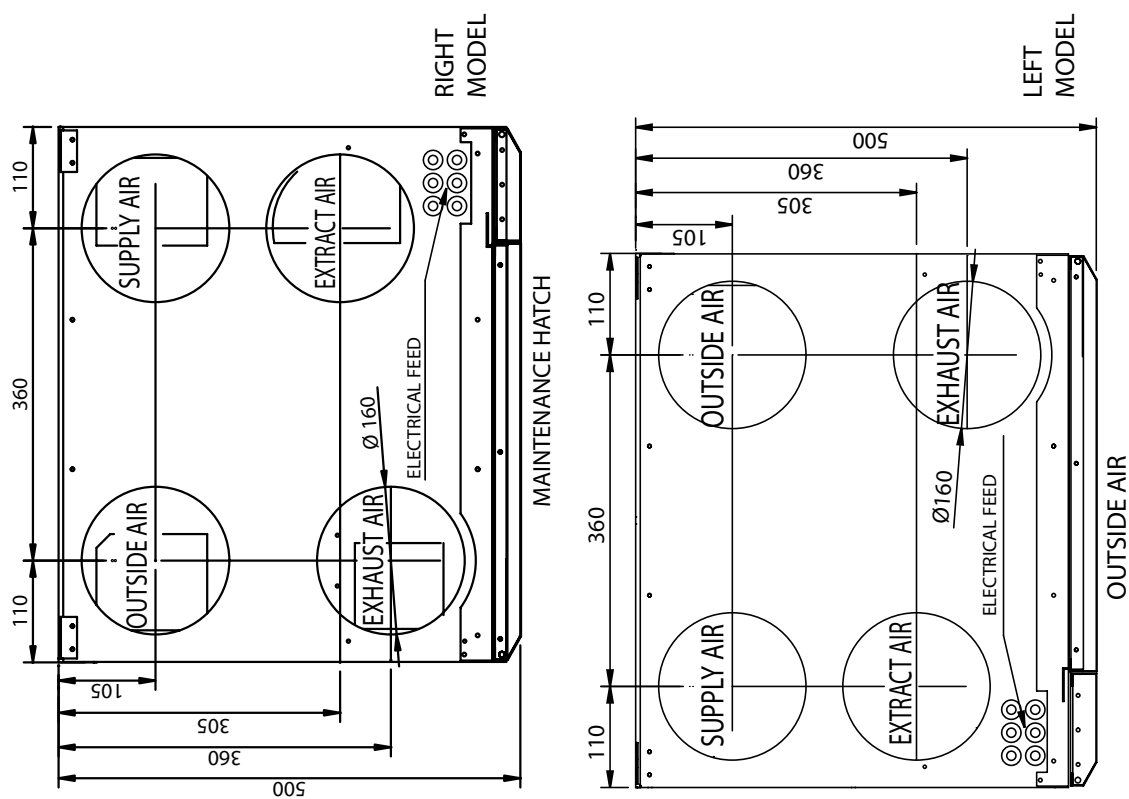
LEFT MODEL



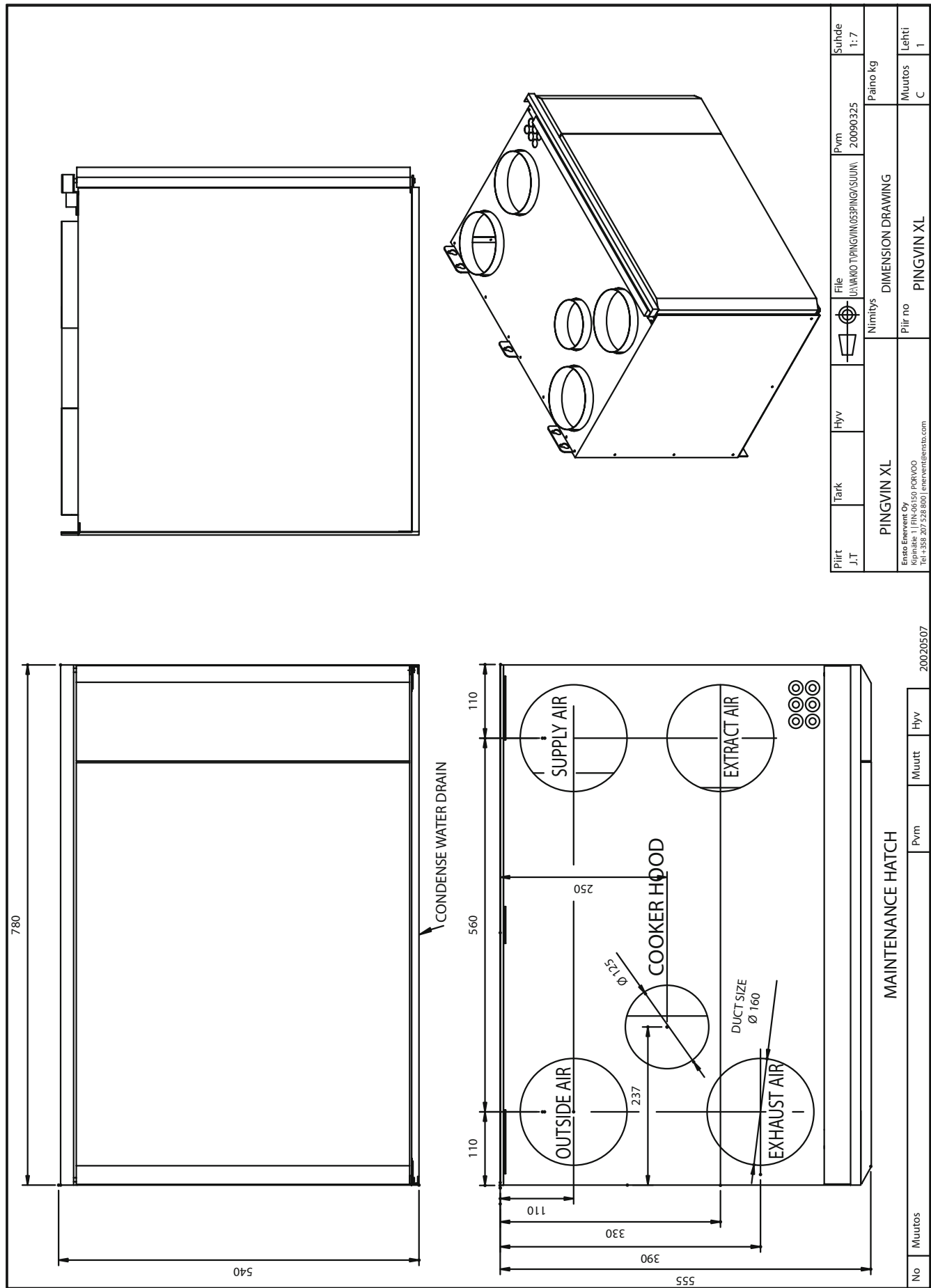
RIGHT MODEL

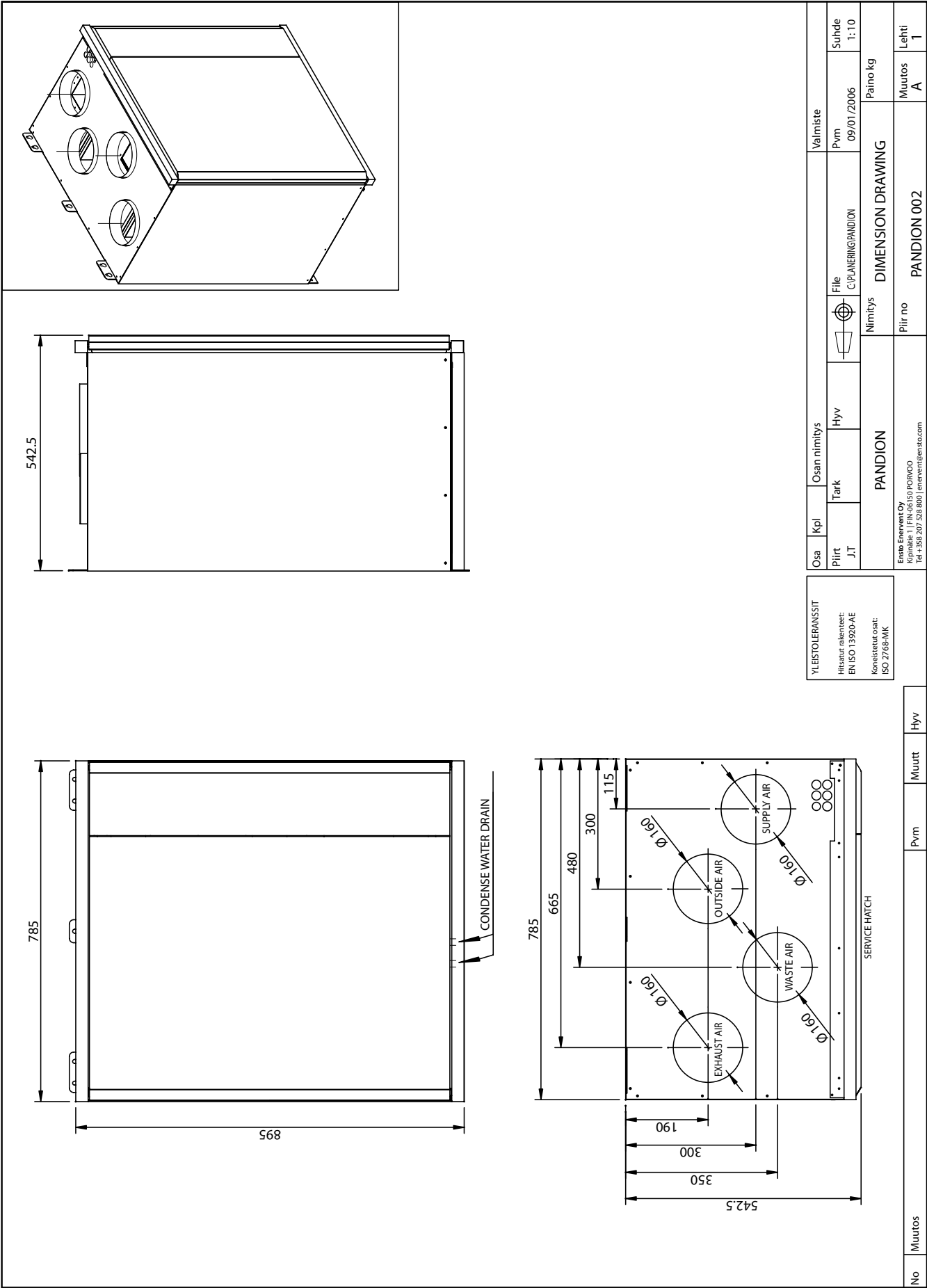


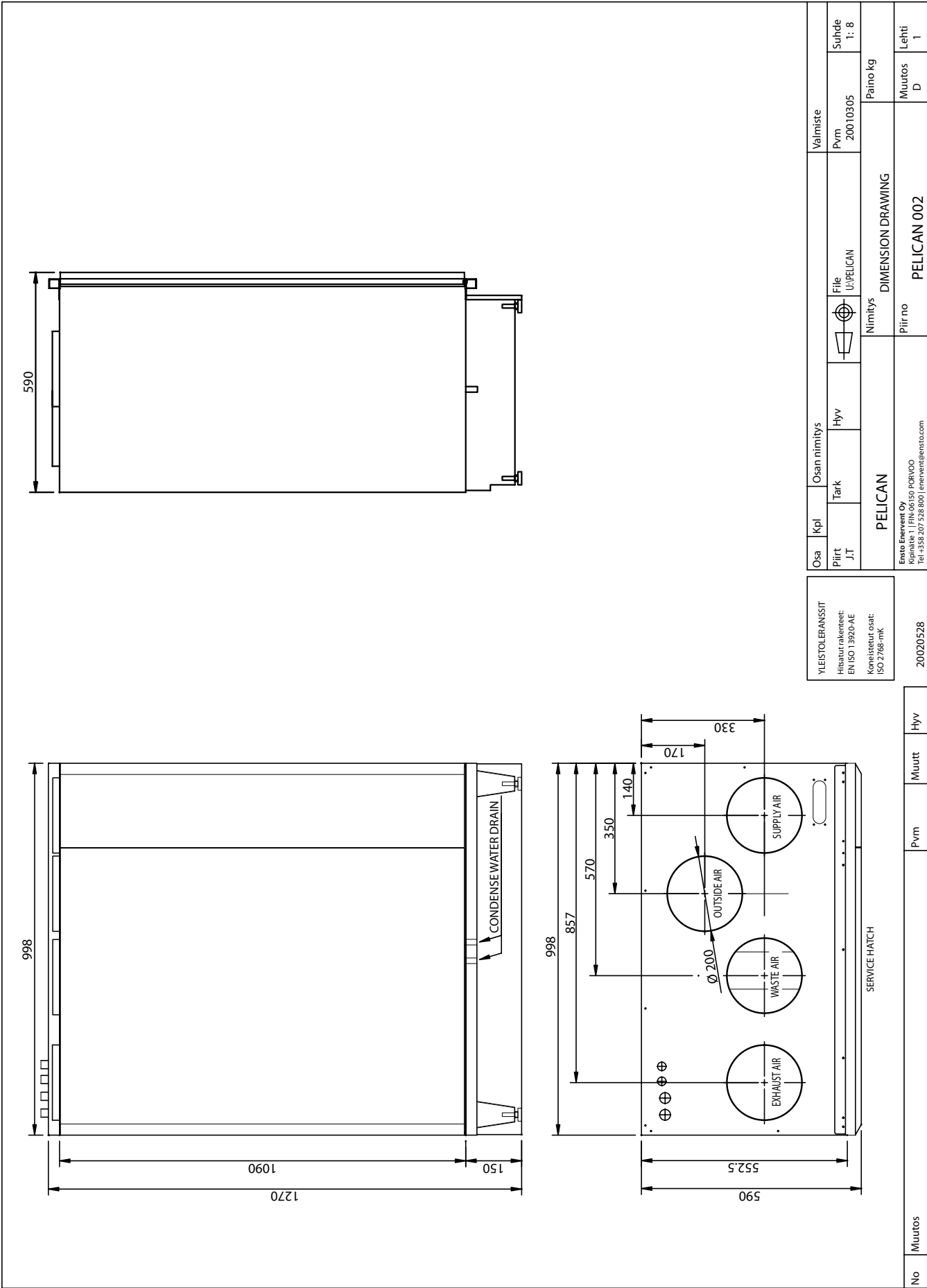
Osa	kpl	Osan nimitys		Valmistus		Suhde
		Piirt	Tark	Hyv	Pvm	
J.T					28/04/2008	1:7
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		C:\MH				
		Nimitys		Paino kg		
		PLAZA				
		Plir no		Muutos		
		Ensto Enervent Oy Kipilätie 1 FIN-06150 PORVOO Tel +358 207 528 800 enervent@ensto.com		PLAZA-001		
		YLEISTÖLERANSIT Hissaut rakenteet: EN ISO 13920-AE Koneistutus osat: ISO 2768-MK		Lehti		
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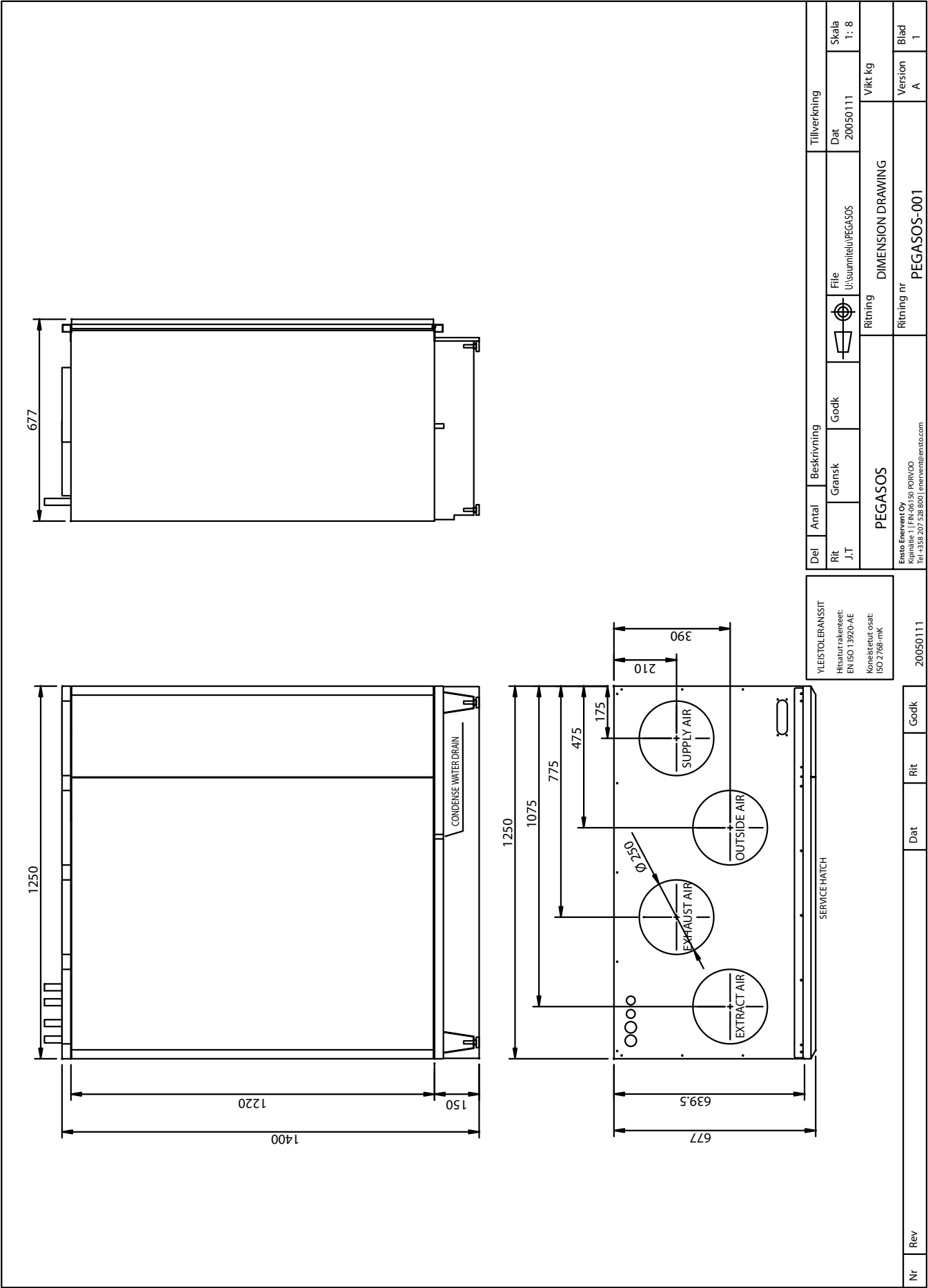


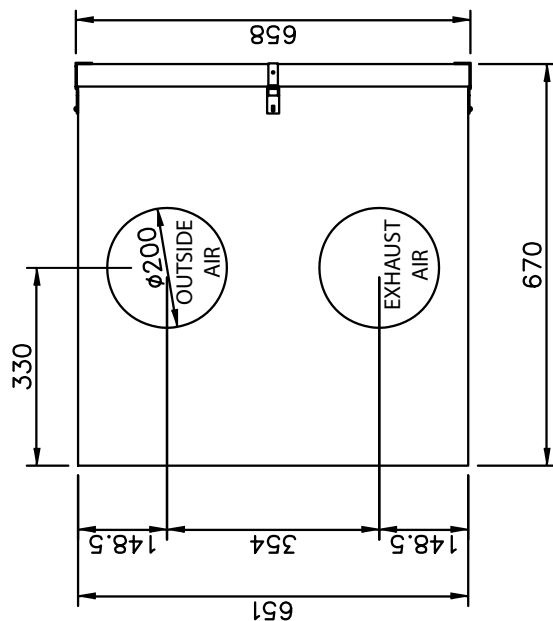
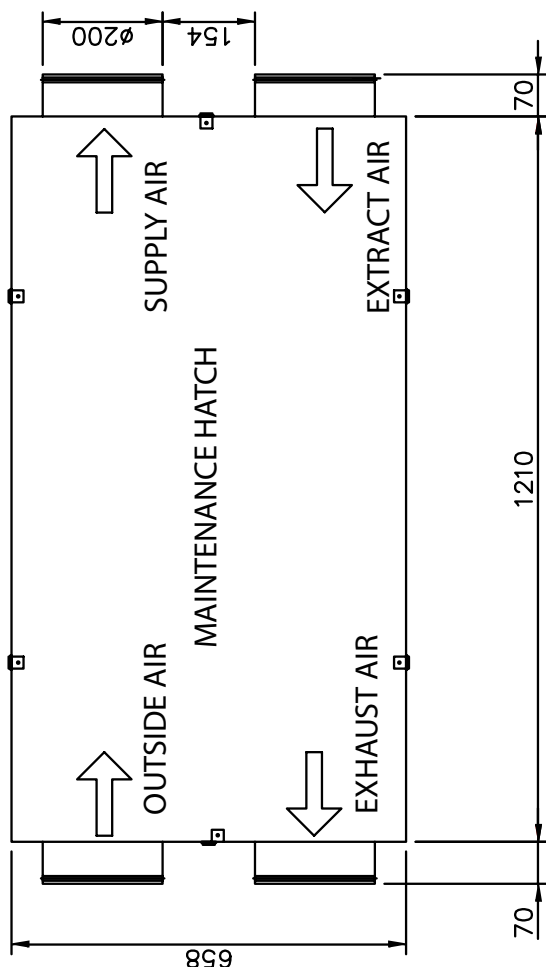
No	Muutos	Pvm	Muutt	Hyv	20020528	YLEISTOLERANSSIT Hitsatut rakenteet: EN ISO 13920-AE Konsoliditut osat: ISO 2768-mK	<table><tr><td>Osa</td><td>Kpl</td><td colspan="2">Osan nimitys</td><td colspan="2">Valmiste</td></tr><tr><td>Piirt</td><td>J.T</td><td>Tark</td><td>Hyv</td><td>File</td><td>USP/INGVIN</td></tr><tr><td colspan="4"></td><td></td><td></td><td>Pvm</td><td>20010305</td><td>Suhde</td><td>1:5</td></tr><tr><td colspan="5">PINGVIN</td><td>Nimitys</td><td colspan="4">Paino kg</td></tr><tr><td colspan="5"></td><td colspan="6">DIMENSION DRAWING</td></tr></table>						Osa	Kpl	Osan nimitys		Valmiste		Piirt	J.T	Tark	Hyv	File	USP/INGVIN							Pvm	20010305	Suhde	1:5	PINGVIN					Nimitys	Paino kg									DIMENSION DRAWING					
							Osa	Kpl	Osan nimitys		Valmiste																																												
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Ensta Engineering Oy Kumpulie 1 FIN-04500 PORVOO Tel: +358 207 528 800 info@ensta.com																																																							
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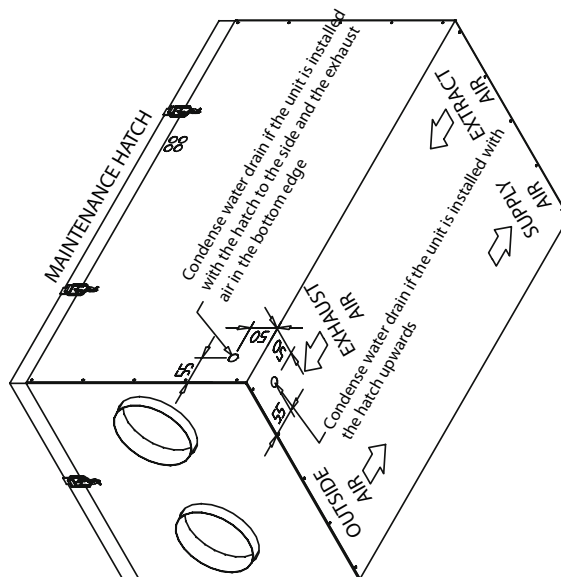




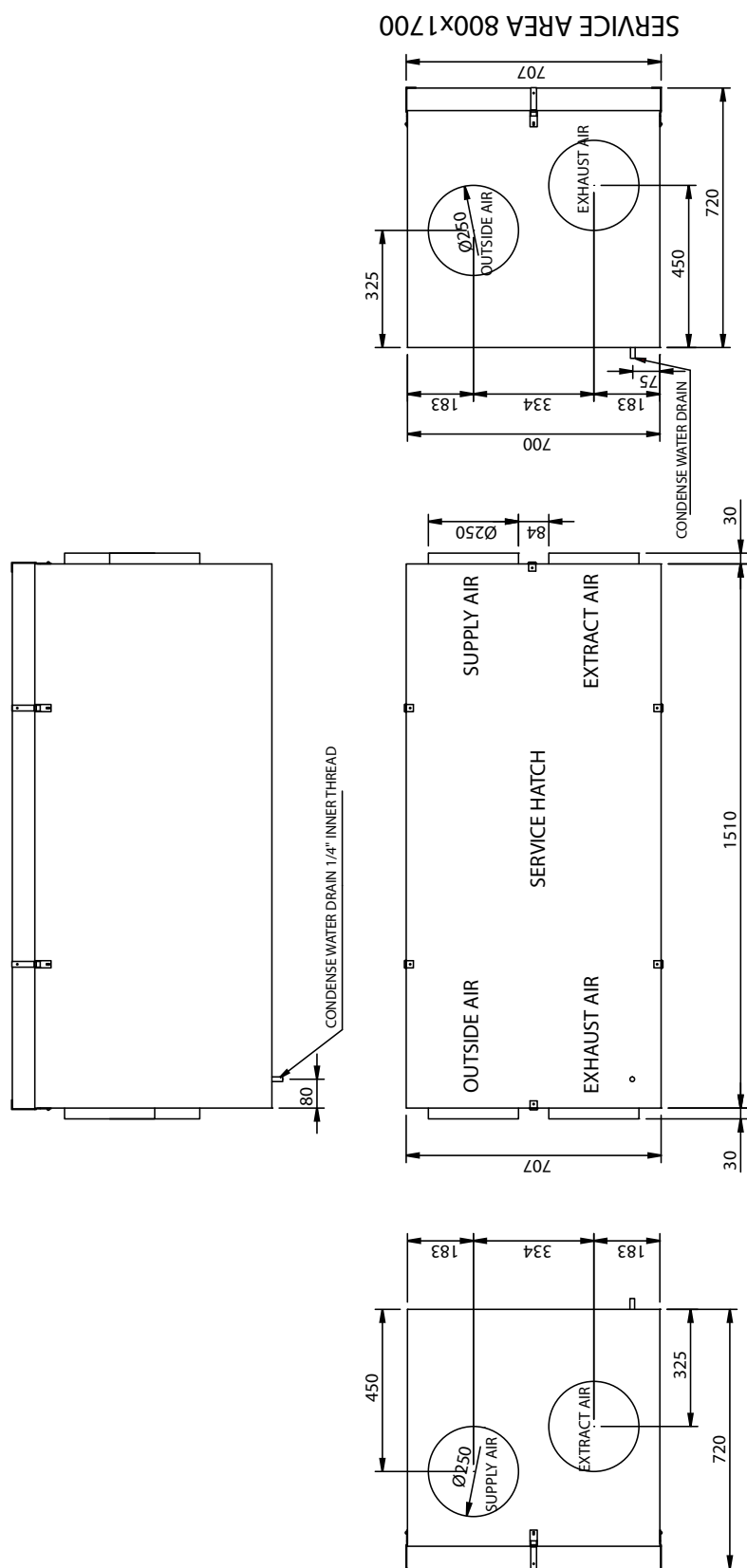


ISOLATION: 25 mm pv-ipl (mineral wool)

INSTALLATION WITH THE HACH UPWARDS OR TO THE SIDE

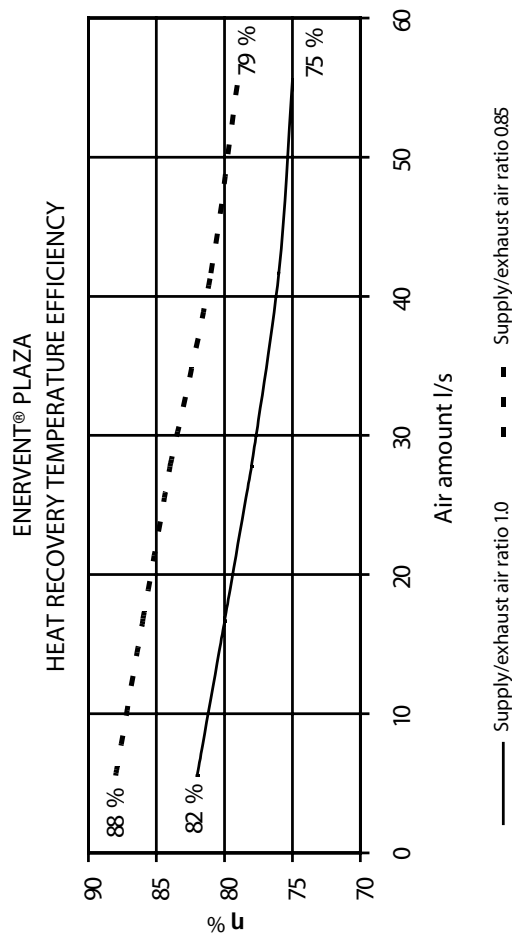
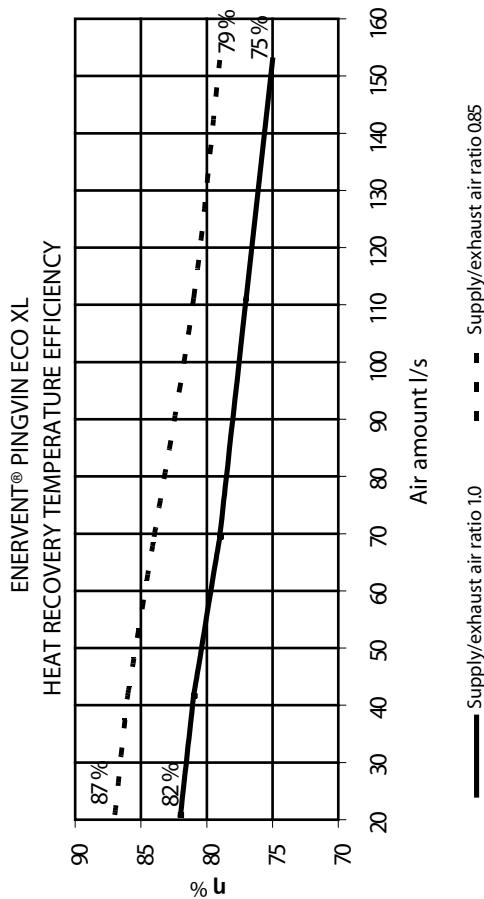


YLEISTOLERANSSIT		Osa		Osan nimitys		Valmiste		Suhde	
Hitsaut rakenteet		Kpl		Tark		Pvm		1:8	
EN ISO 13920-AE		Pirt		Hyv		File		t: \2\Pienkone\007LTR-6\0970526	
Koneistutus osat:		DG		Nimitys		Paino kg			
ISO 2768-mK		LTR-6		DIMENSION DRAWING		Muutos		Lehti	
				Pirt no		R		1	
				Ensto Enervent Oy		2 007 037			
				Kipinäte 1 FIN-06150 PORVOO					
				Tel +358 207 528 800 enervent@ensto.com					



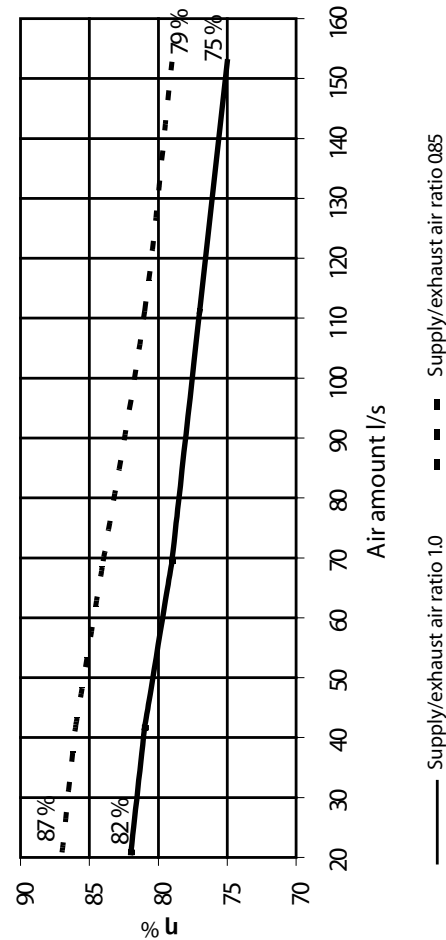
ALL DUCT CONNECTIONS Ø 250 mm
50 mm WOOL INSULATION PV-IPL
INSTALLATION WITH THE SERVICE HATCH UPWARDS

[illegible]



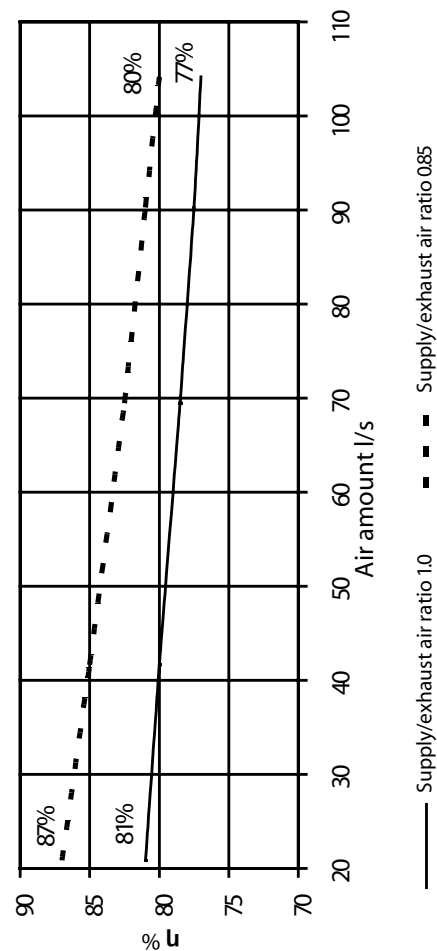
ENERVENT® PANDION

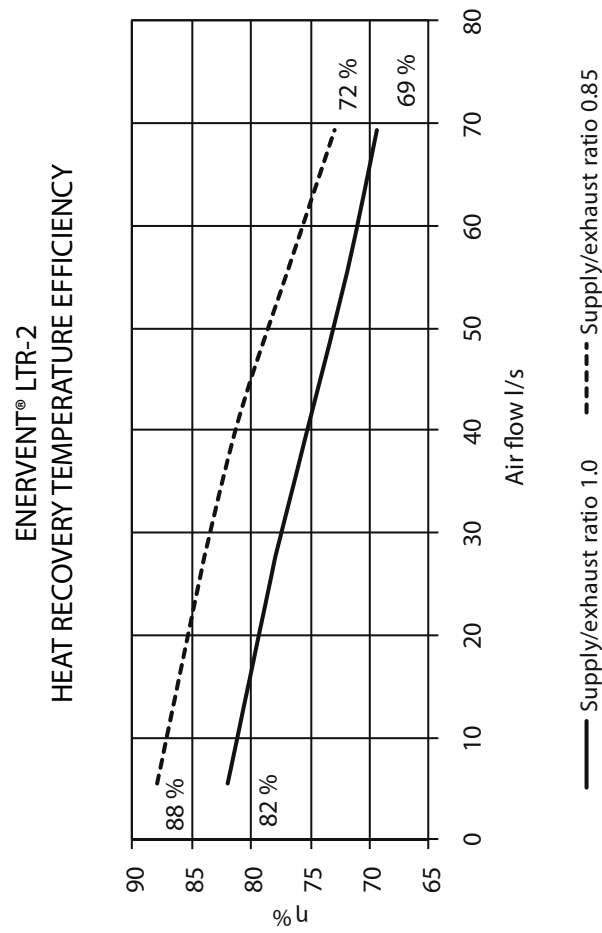
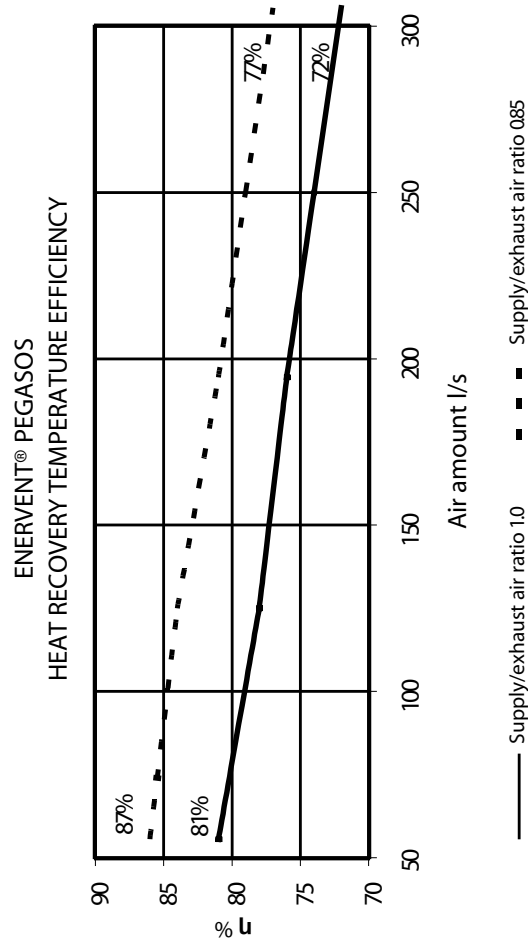
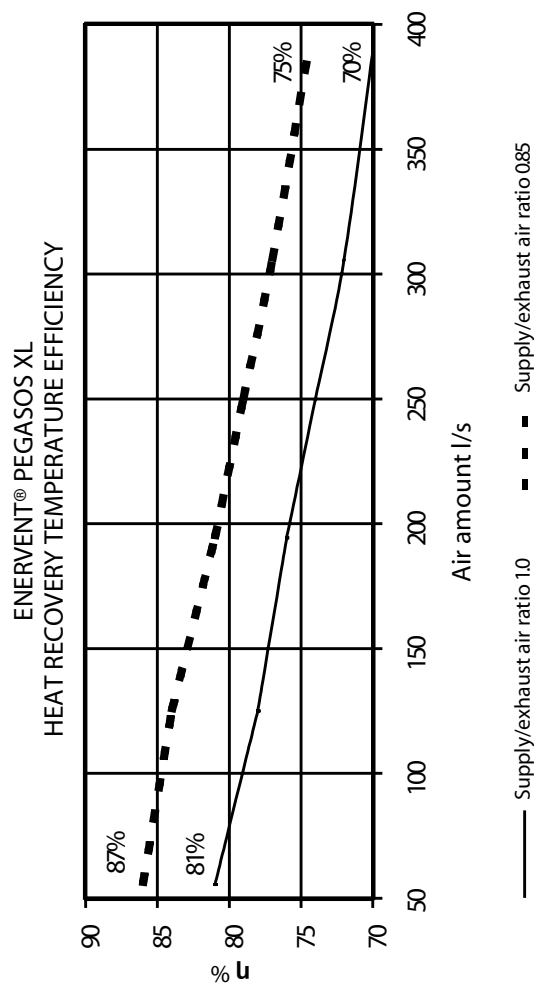
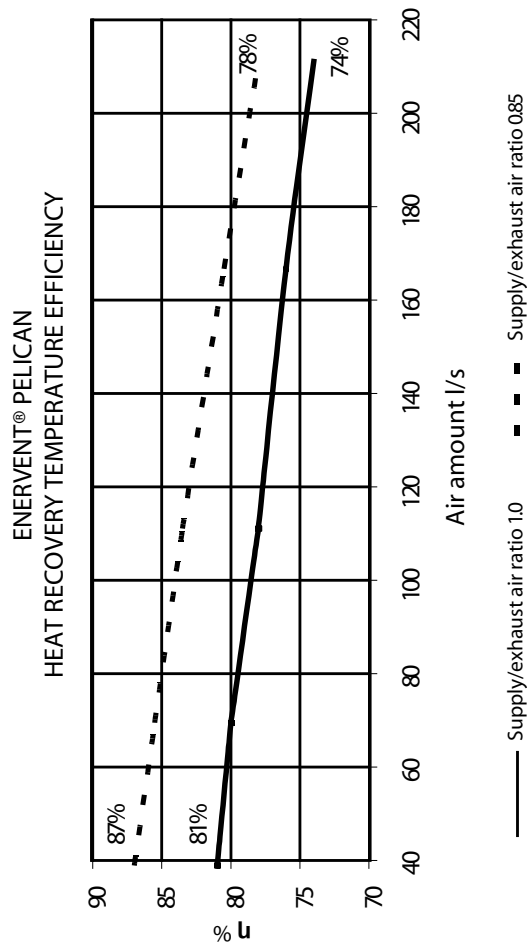
HEAT RECOVERY TEMPERATURE EFFICIENCY

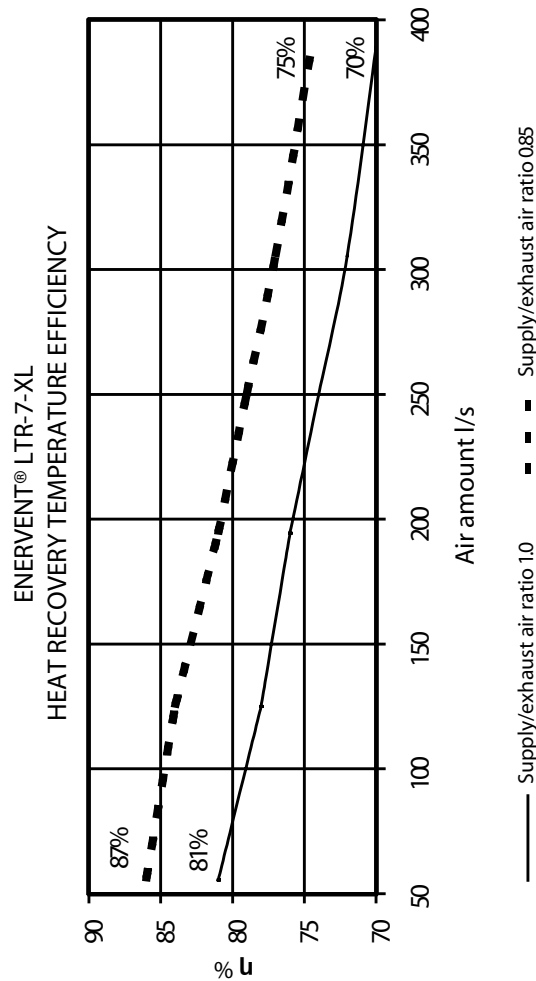
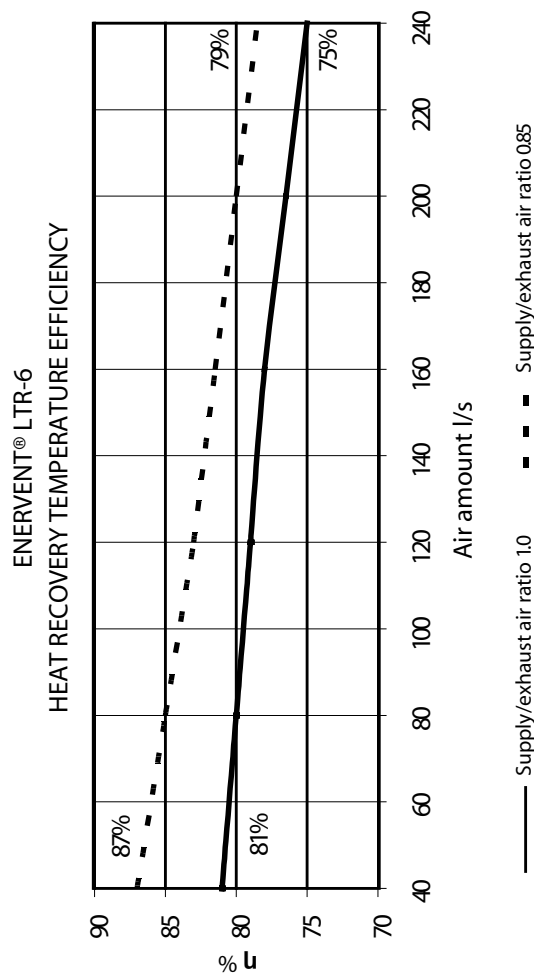
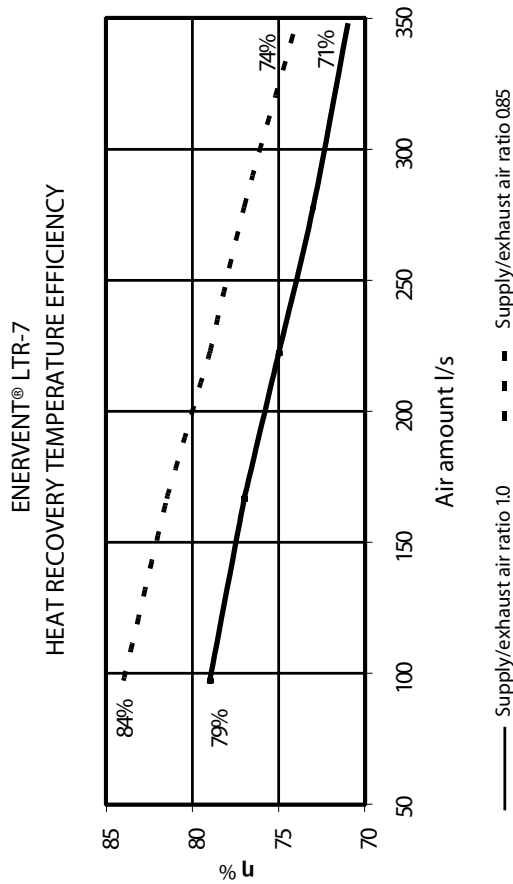
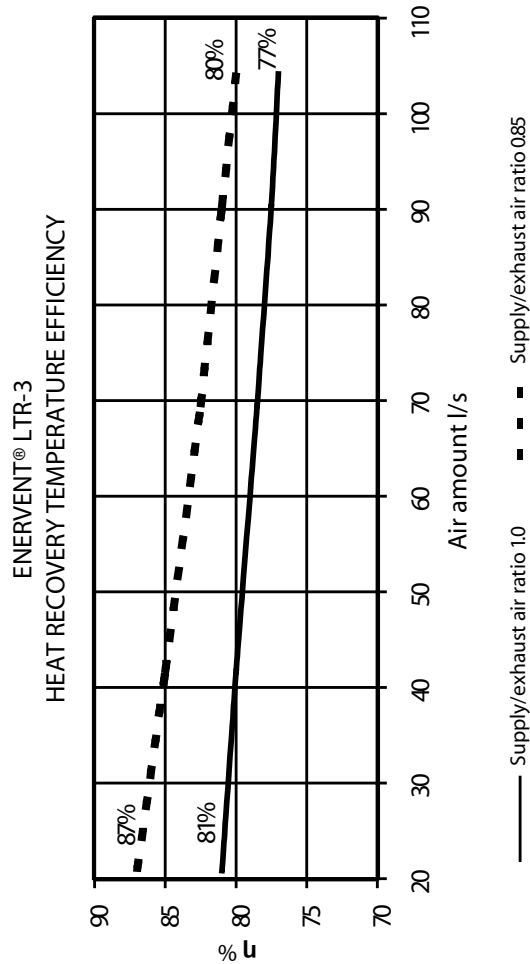


ENERVENT® PINGVIN

HEAT RECOVERY TEMPERATURE EFFICIENCY

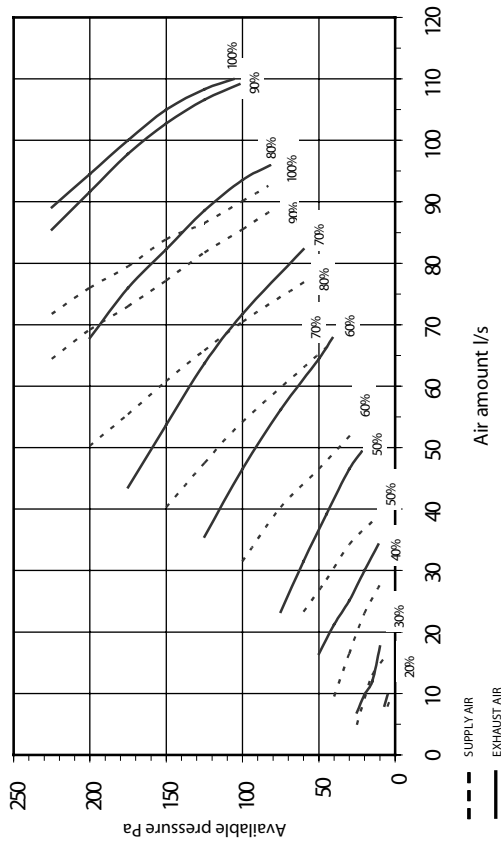




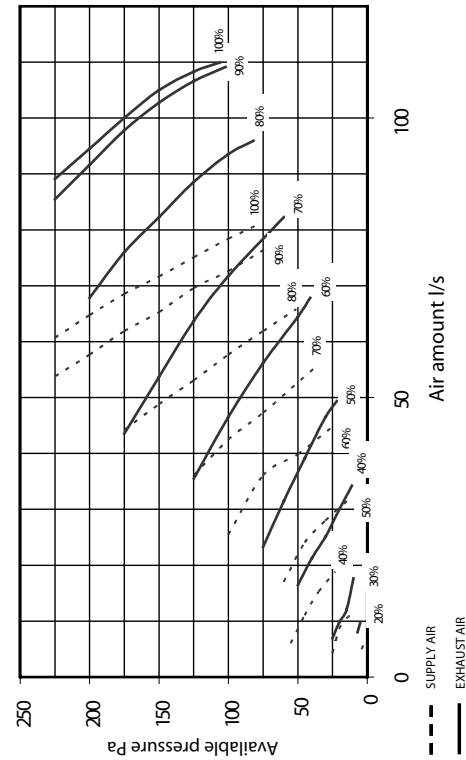


CHARACTERISTIC CURVES

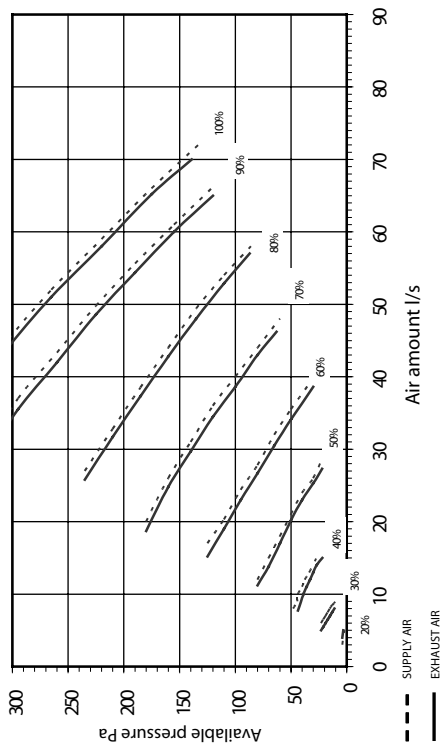
Pingvin eco supply and extract air characteristic curves with F5/F5 filters



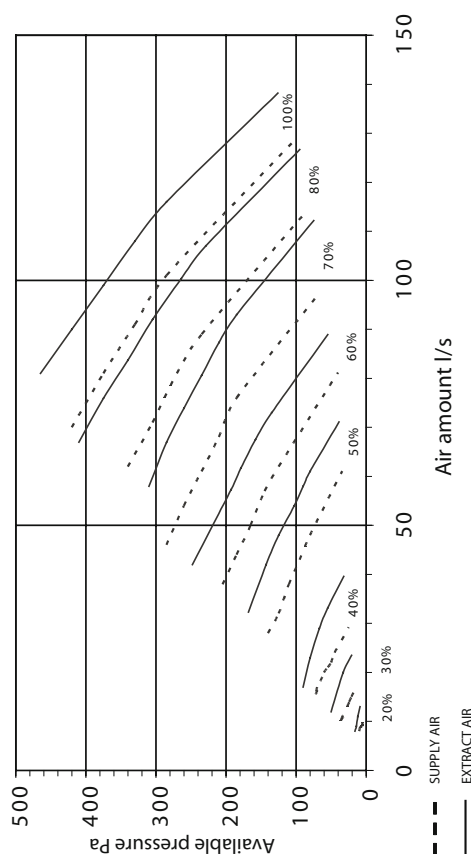
Pingvin eco supply and extract air characteristic curves with F7/F5 filters



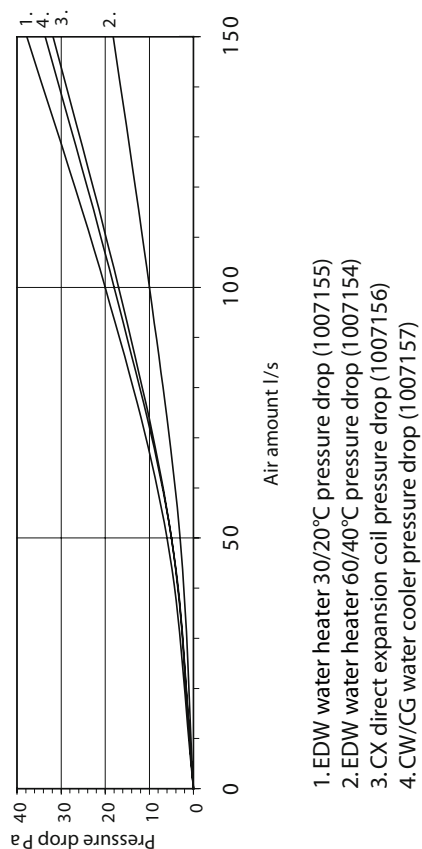
Plaza eco supply and extract air characteristic curves with F7/F5 filters



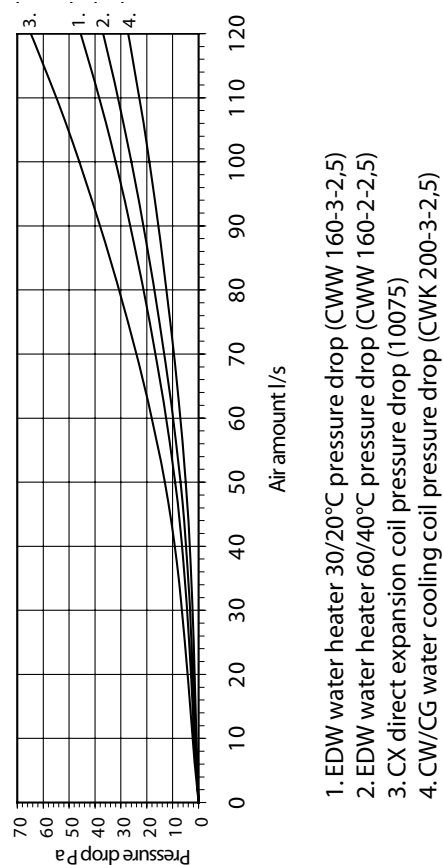
The characteristic curve for Pingvin XL eco supply and extract fans with F5/F5 filters



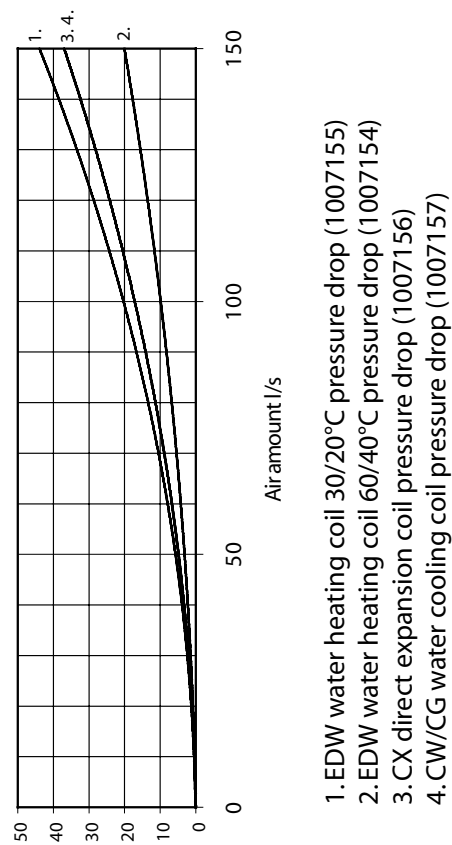
Pingvin eco XL coils' pressure drops



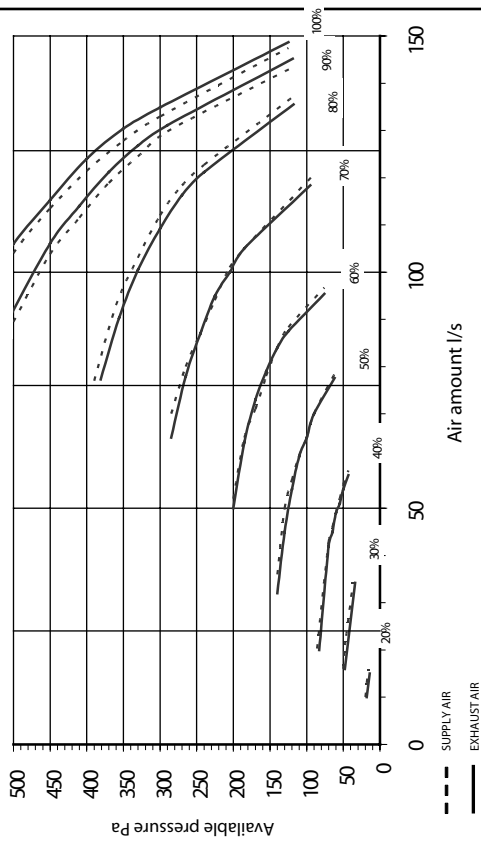
Pingvin coils' pressure drops



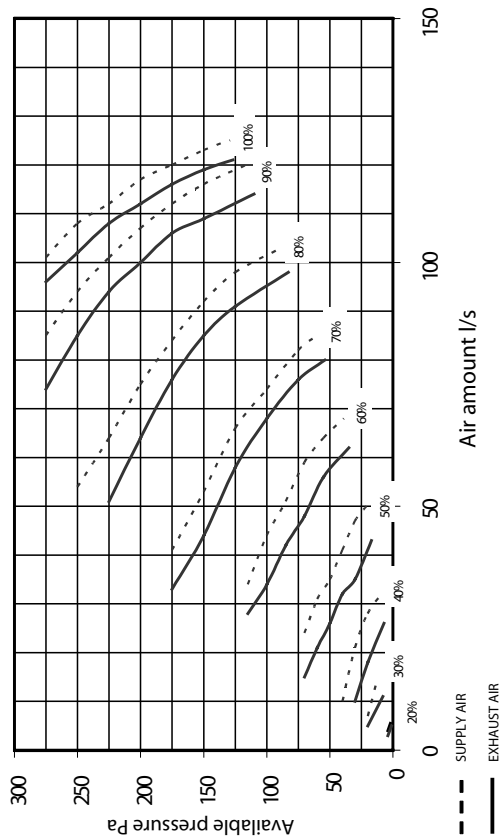
Pandion coils' pressure drops



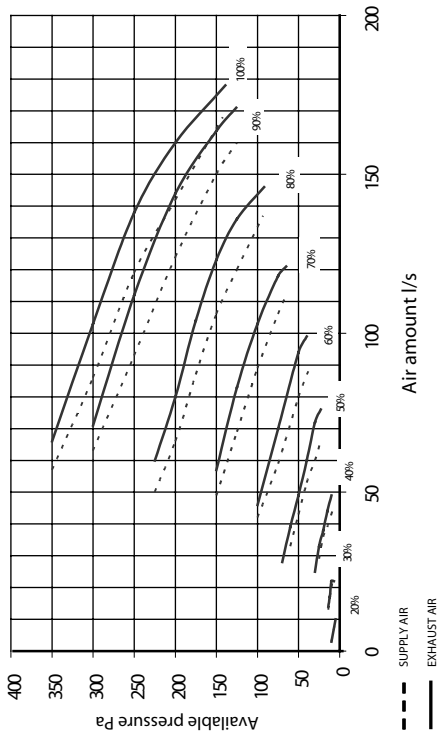
Pandion eco supply and extract air characteristic curves with F5/F5 filters



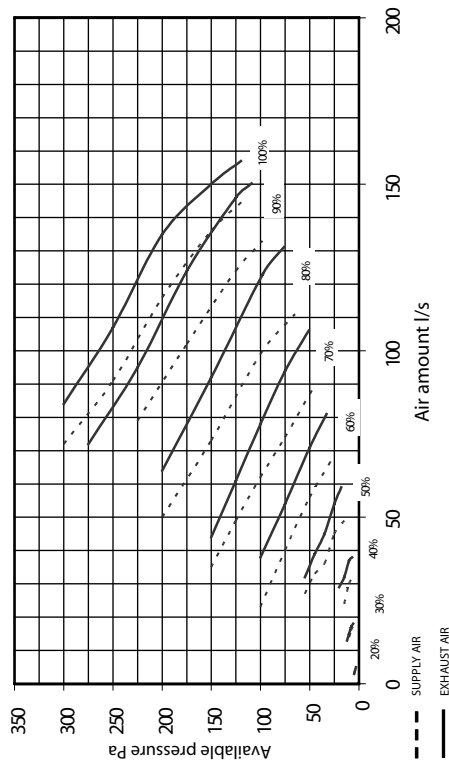
Pandion eco supply and extract air characteristic curves with F7/F7 filters



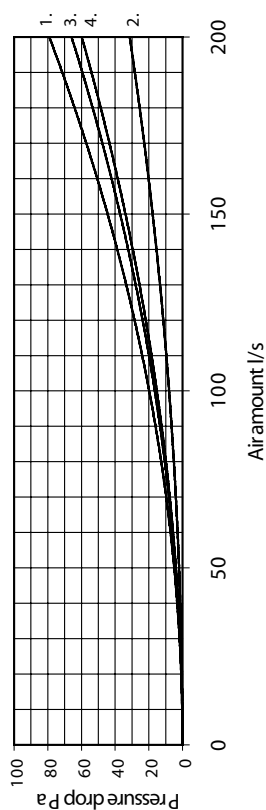
Pelican eco supply and extract air characteristic curves with F5/F5 filters



Pelican eco supply and extract air characteristic curves with F7/F7 filters

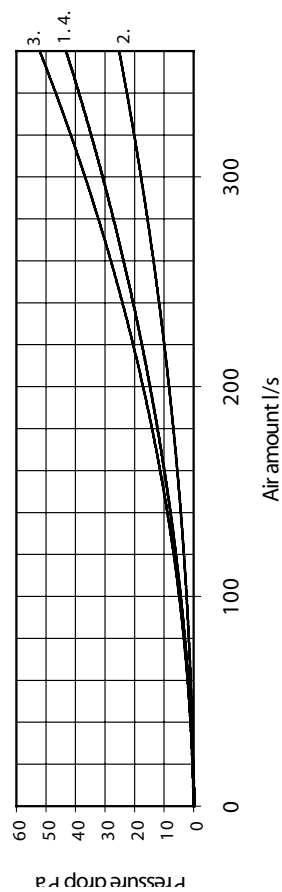


Pelican coils' pressure drops



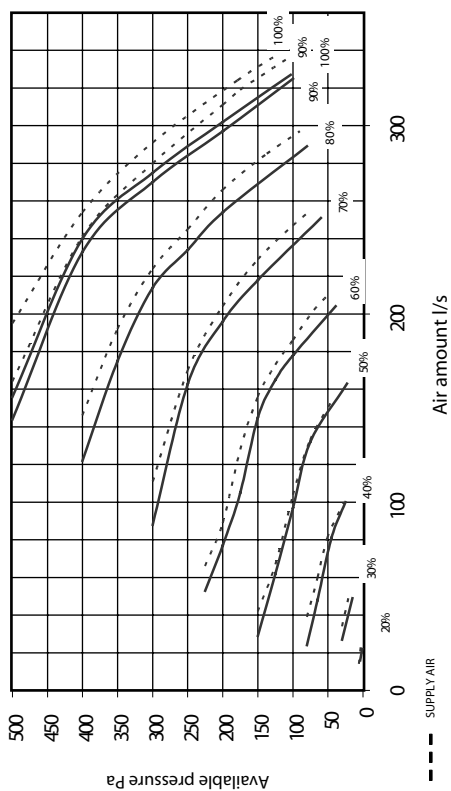
1. EDW water heating coil 30/20°C pressure drop (100793)
2. EDW water heating coil 60/40°C pressure drop (100794)
3. CX direct expansion coil pressure drop (100796)
4. CW/CG water cooling coil pressure drop (100795)

Pegasos coils' pressure drops

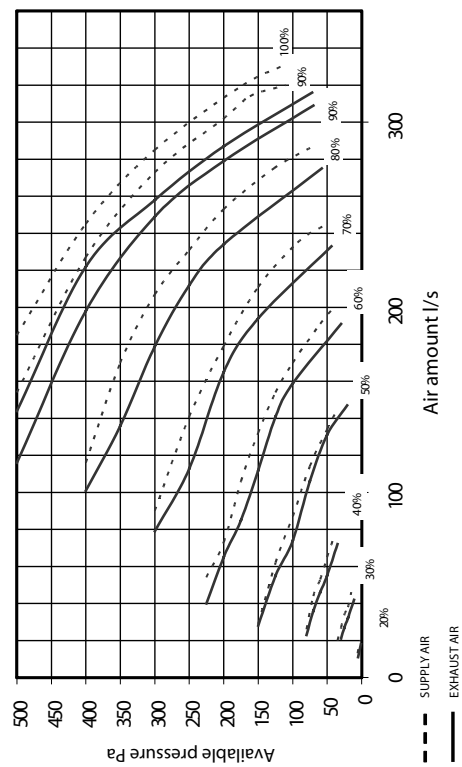


1. EDW water heating coil 35/25°C pressure drop (1007134)
2. EDW water heating coil 60/40°C pressure drop (10071)
3. CX direct expansion coil pressure drop (1007133)
4. CW/CG water cooling coil pressure drop (1007134)

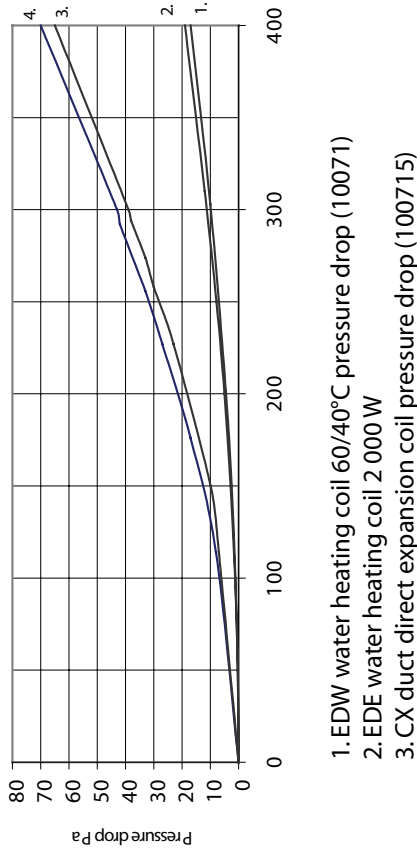
Pegasos eco supply and extract air characteristic curves with F5/F5 filters



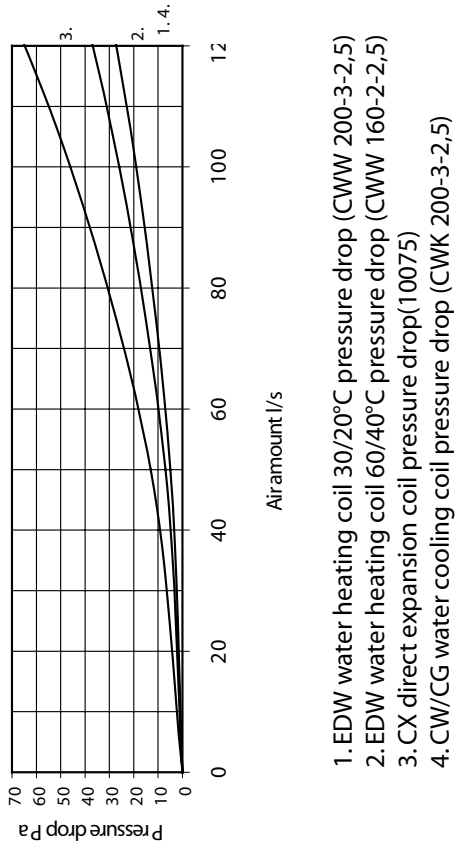
Pegasos eco supply and extract air characteristic curves with F7/F7 filters



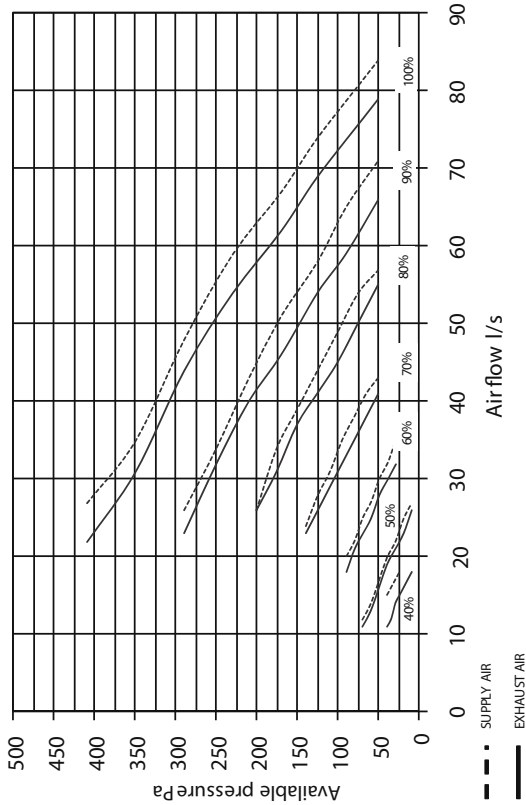
Pegasos XL coils' pressure drops



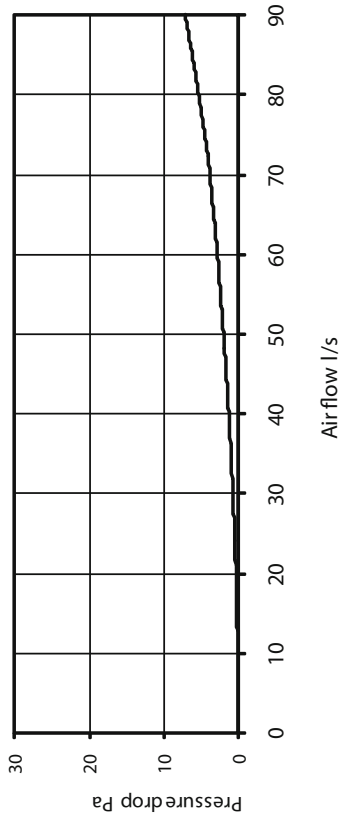
LTR-3 coils' pressure drops



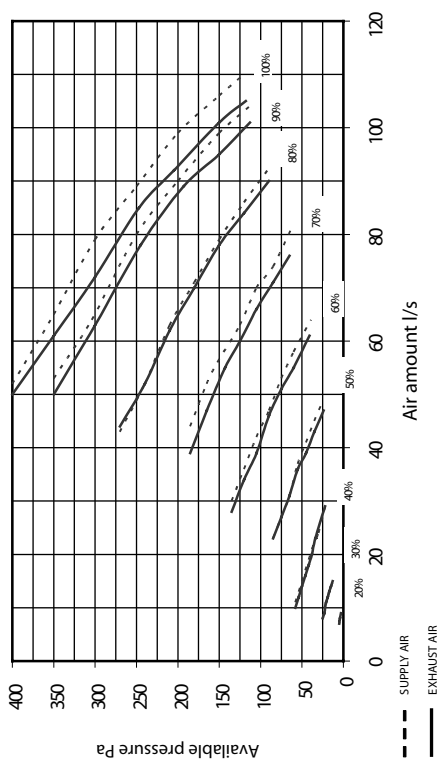
LTR-2 eco supply and extract air characteristic curves F5/F5 filters



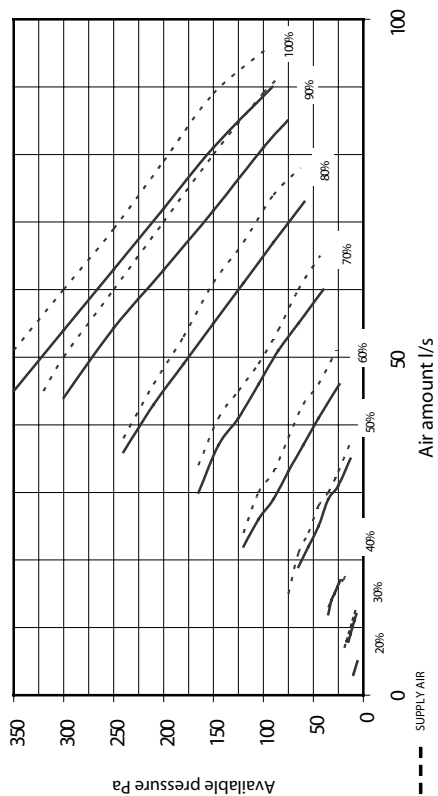
LTR-2 Electrical heating pressure drop



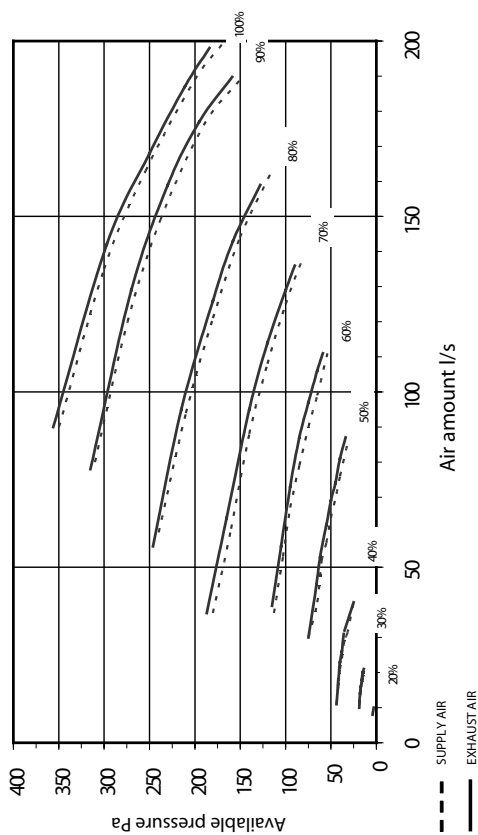
LTR-3 eco supply and extract air characteristic curves with F5/F5 filters



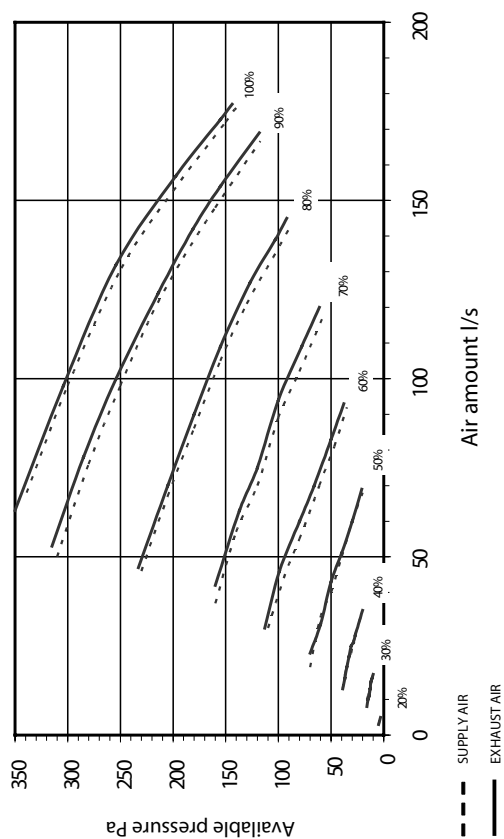
LTR-3 eco supply and extract air characteristic curves with F7/F7 filters



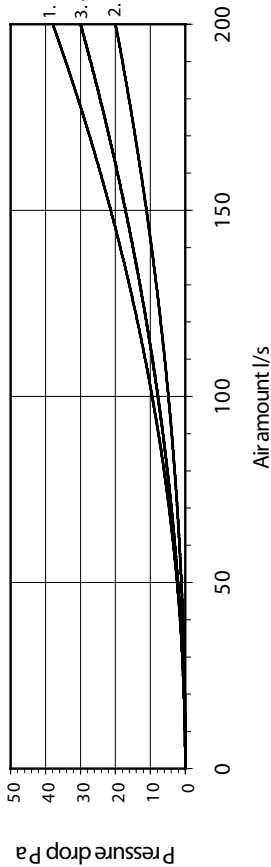
LTR-6 eco supply and extract air characteristic curves with F5/F5 filters



LTR-6 eco supply and extract air characteristic curves with F7/F7 filters

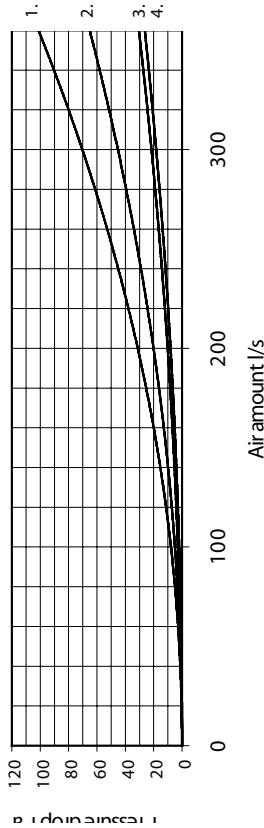


LTR-6 coils' pressure drops



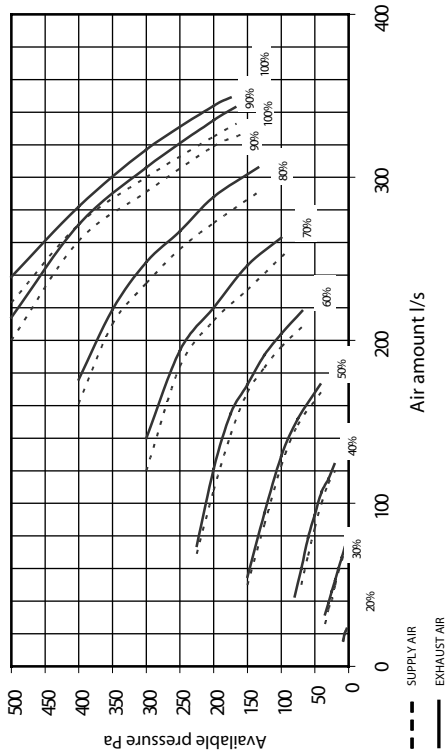
1. EDW water heating coil 30/20°C pressure drop (10079)
2. EDW water heating coil 60/40°C pressure drop (10078)
3. CX direct expansion coil pressure drop (100711)
4. CW/CG water cooling coil pressure drop (100710)

LTR-7 coils' pressure drops

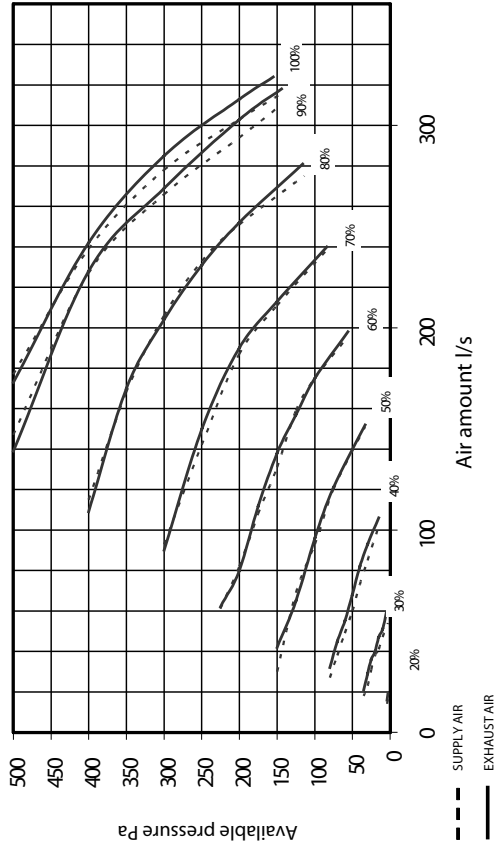


1. EDW water heating coil 35/25°C pressure drop (1007164)
2. EDW water heating coil 60/40°C pressure drop (10076)
3. CX direct expansion coil pressure drop (100715)
4. CW/CG water cooling coil pressure drop (100714)

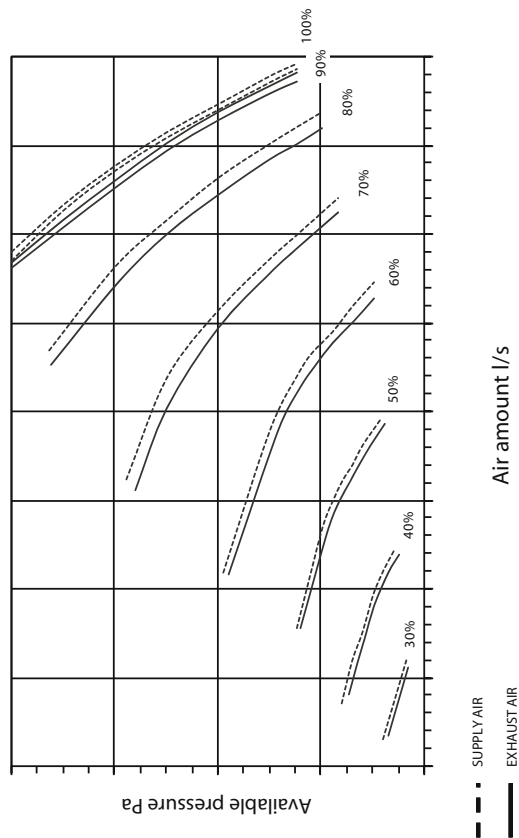
LTR-7 eco supply and extract air characteristic curves with F5/F5 filters



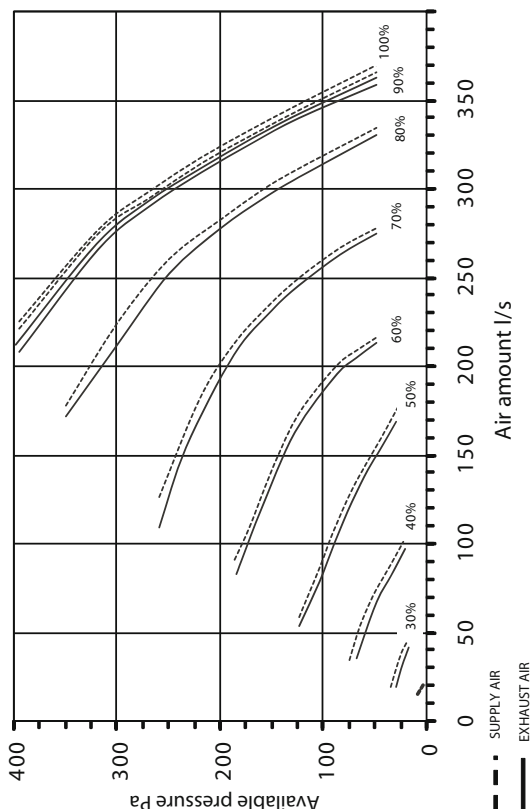
LTR-7 eco supply and extract air characteristic curves with F7/F7 filters



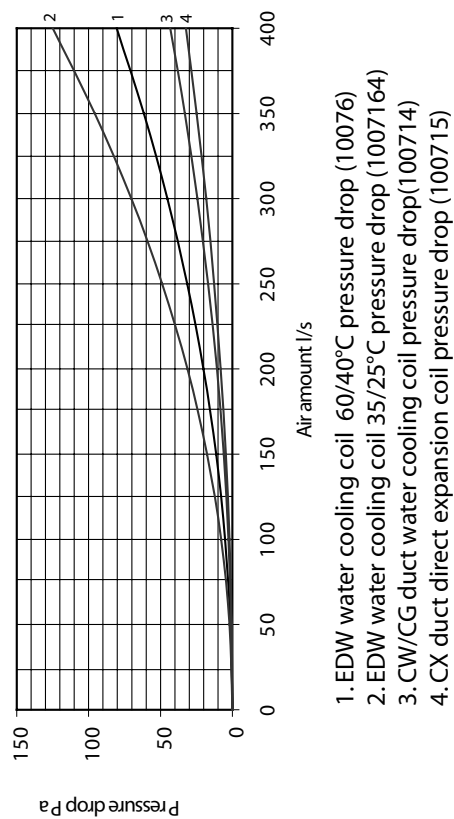
LTR-7 eco XL supply and extract air characteristic curves with F5/F5 filters



LTR-7 eco XL supply and extract air characteristic curves F7/F7 filters



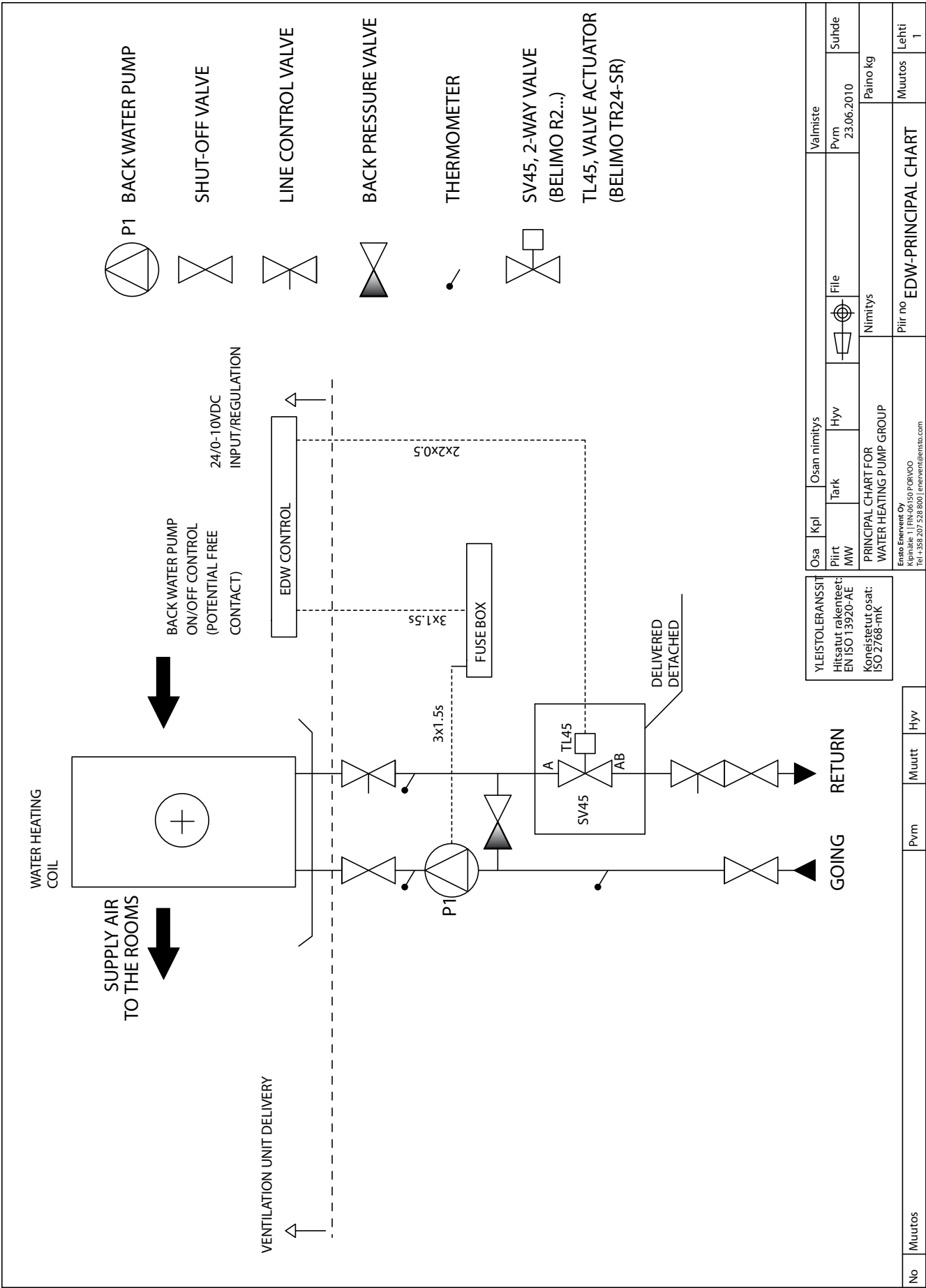
LTR-7-XL coils' pressure drops



CONTROL CHARTS AND WIRING DIAGRAMS

This table shows which charts apply to each unit model. The numbers refer to the chart number.

Ventilation unit	Chart number										Additional instruction	EDW principle chart
All EDX-models											EDX	
Pingvin / LTR-2 eco EDE / LTR-3 eco EDE	2		6	7	8		10					
Pingvin / LTR-3 eco EDE-CG (CW)	2		6	7	8		10				CG/CW	
Pingvin / LTR-3 eco EDW		4	6	7			10					X
Pingvin / LTR-3 eco EDW-CG (CW)		4	6	7			10				CG/CW	X
Pandion eco EDE	2		6	7	8		10					
Pandion eco EDE-CG (CW)	2		6	7	8		10				CG/CW	
Pandion eco EDW		4	6	7			10					X
Pandion eco EDW-CG (CW)		4	6	7			10				CG/CW	X
Pelican / LTR-6-190 eco EDE	2		6	7	8		10					
Pelican / LTR-6-190 eco EDE-CG (CW)	2		6	7	8		10				CG/CW	
Pelican / LTR-6-190 eco EDW		4	6	7			10					X
Pelican / LTR-6-190 eco EDW-CG (CW)		4	6	7			10				CG/CW	X
Pegasos / LTR-7 (XL) eco EDE	2		6	7		9	10					
Pegasos / LTR-7 (XL) eco EDE-CG (CW)	2		6	7		9	10				CG/CW	
Pegasos / LTR-7 (XL) eco EDW		4	6	7			10					X
Pegasos / LTR-7 (XL) eco EDW-CG (CW)		4	6	7			10				CG/CW	X
Pegasos eco EDE-CO	2 a		6 a	7		9	10	11				
Pegasos eco EDW-CO		4 a	6 b	7			10	11				X



Legend:

- ◇ = PROGRAM FUNCTION
- ◼ = PHYSICAL CONNECTION
- └─┘ = CABLING AND CONNECTION AT SITE (EE)

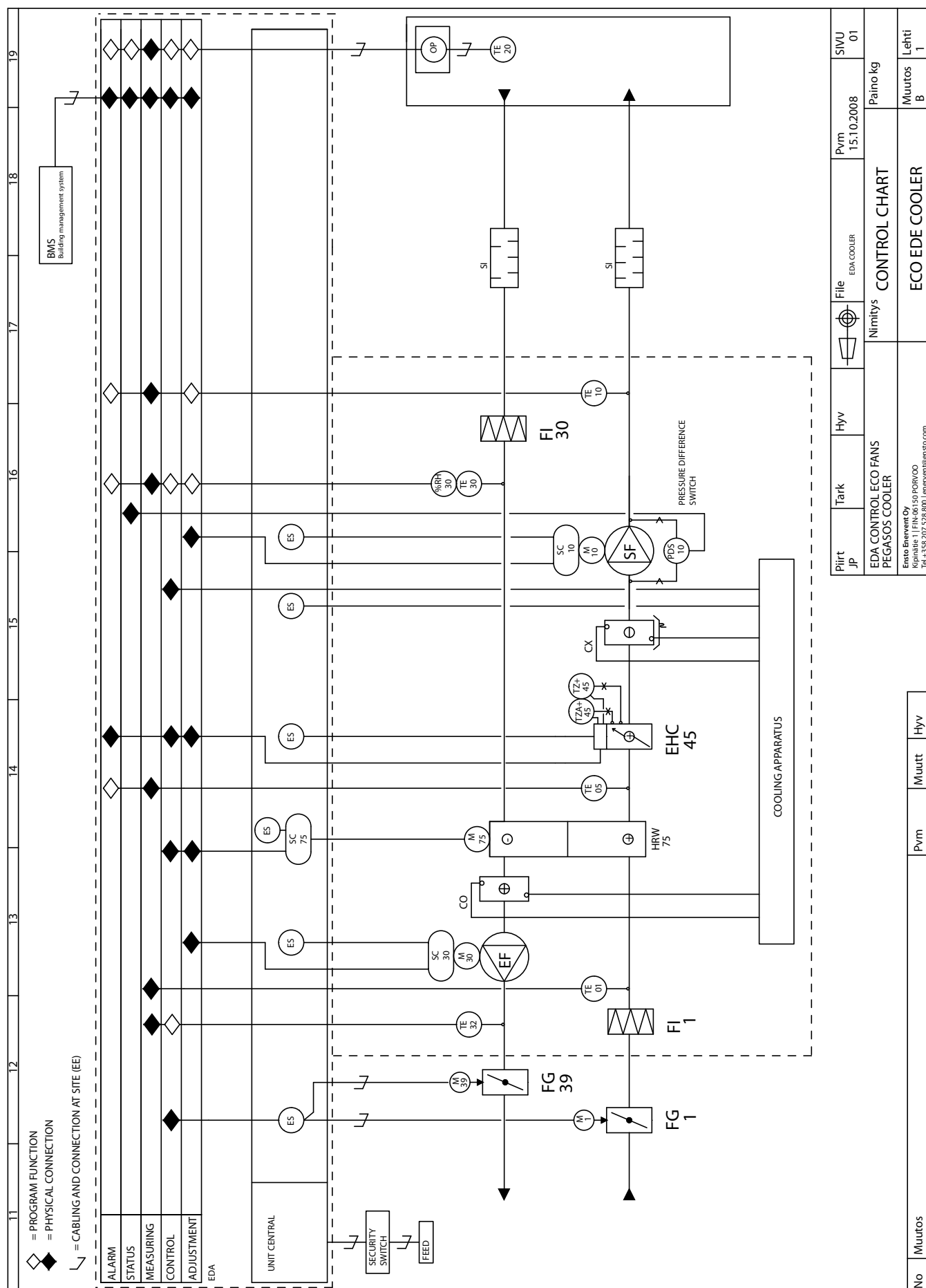
Units and Components:

- UNIT CENTRAL**: The main control unit.
- ES**: Emergency Stop button.
- SC**: Safety Control switch.
- TE**: Temperature sensor.
- HRW**: Heat Recovery Wheel.
- SU**: Supply Fan.
- EF**: Exhaust Fan.
- FG**: Fan Guard.
- EHC**: Exhaust Heat Exchanger.
- PDS**: Pressure Differential Switch.
- SF**: Supply Fan.
- SA**: Safety Air sensor.
- TE**: Temperature sensor.
- OP**: Operator.
- TE**: Temperature sensor.
- PE**: Pressure sensor.
- PIPING ENTREPRENEUR**: Piping contractor.

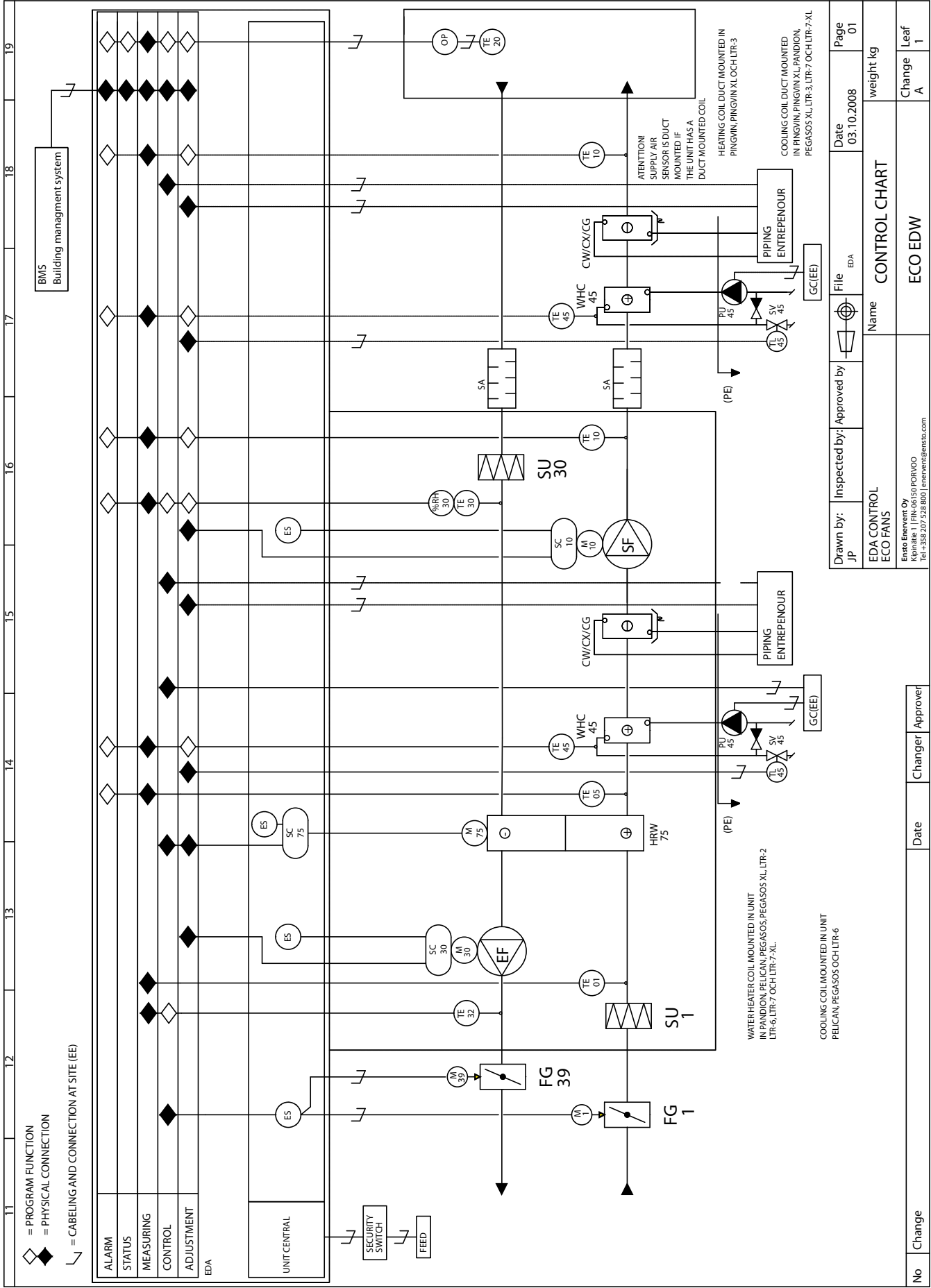
Notes:

- THE FOLLOWING UNITS HAS THE SAME CONNECTIONS TO THE DUCT: PANDION eco EDW/PEGASOS XL, LTR-3, LTR-7 OCH LTR-7-XL.
- COOLING COILS ARE MOUNTED IN THE FOLLOWING UNITS: PANDION eco EDE, PELICAN, PEGASOS AND LTR-6.

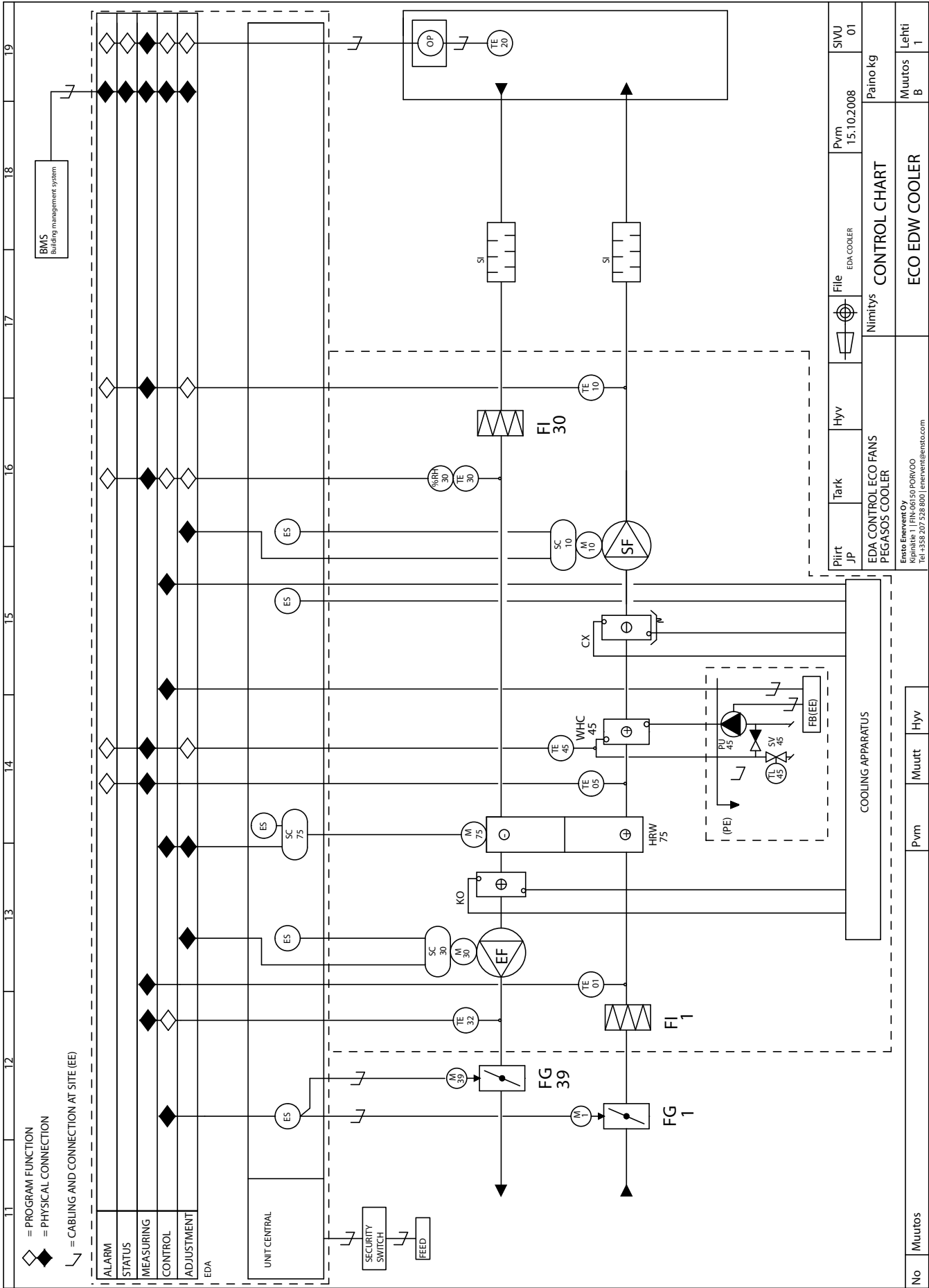
2a. CONTROL CHART EDE Cooler



4. CONTROL CHART eco EDW

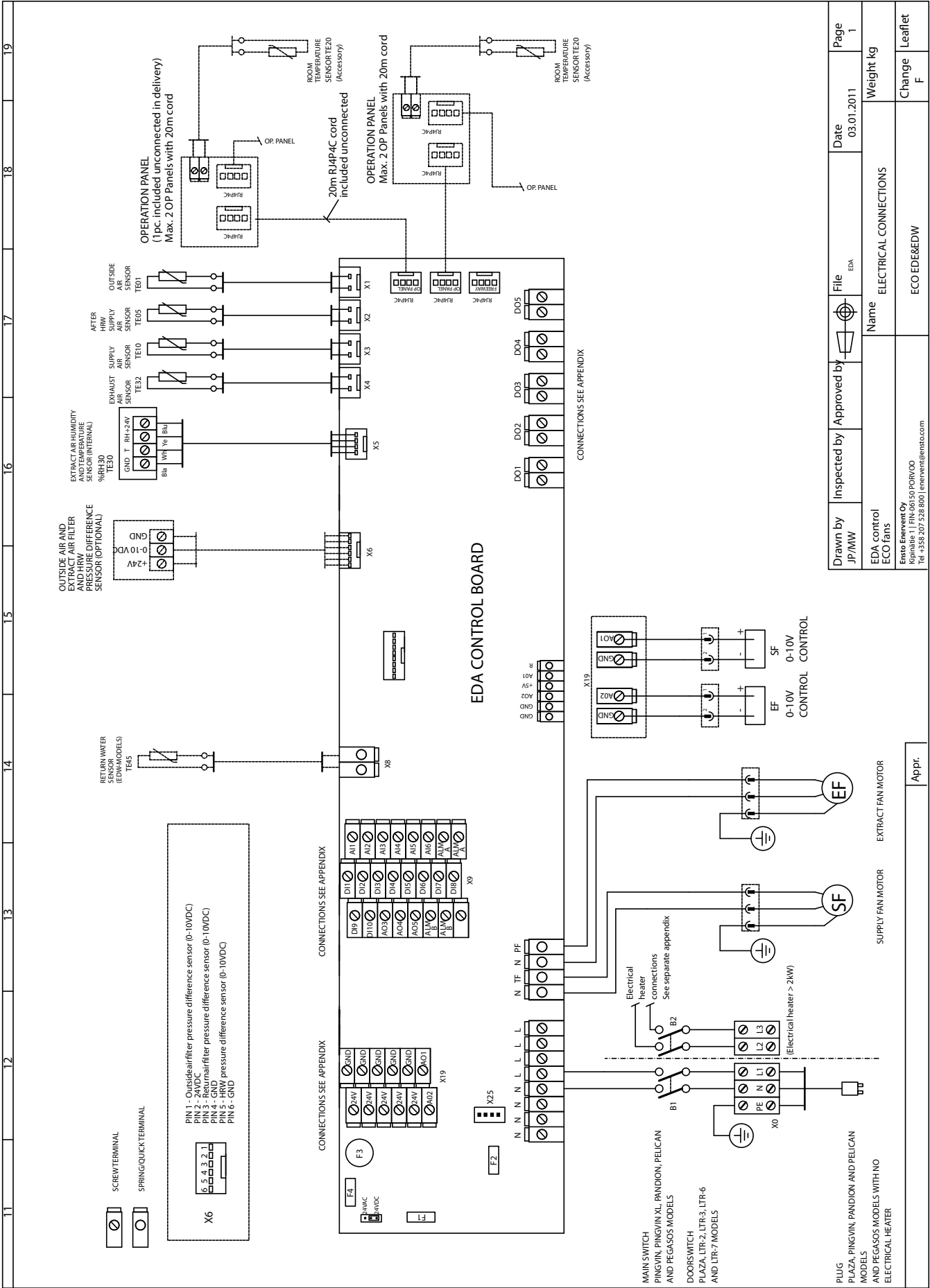


4a. CONTROL CHART EDW Cooler

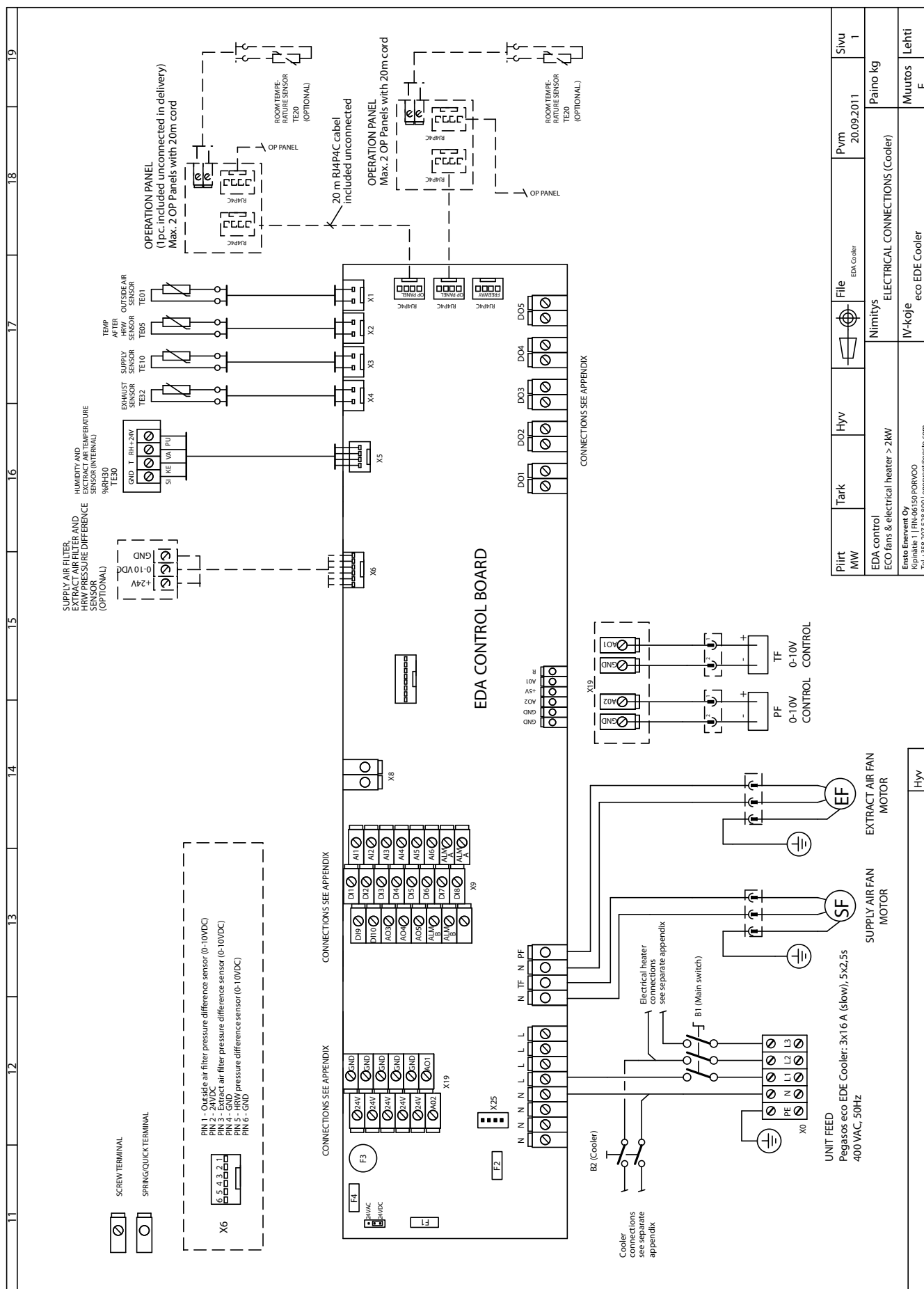


WIRING DIAGRAMS

6. WIRING DIAGRAM eco ED, eco EDE, ecoEDW

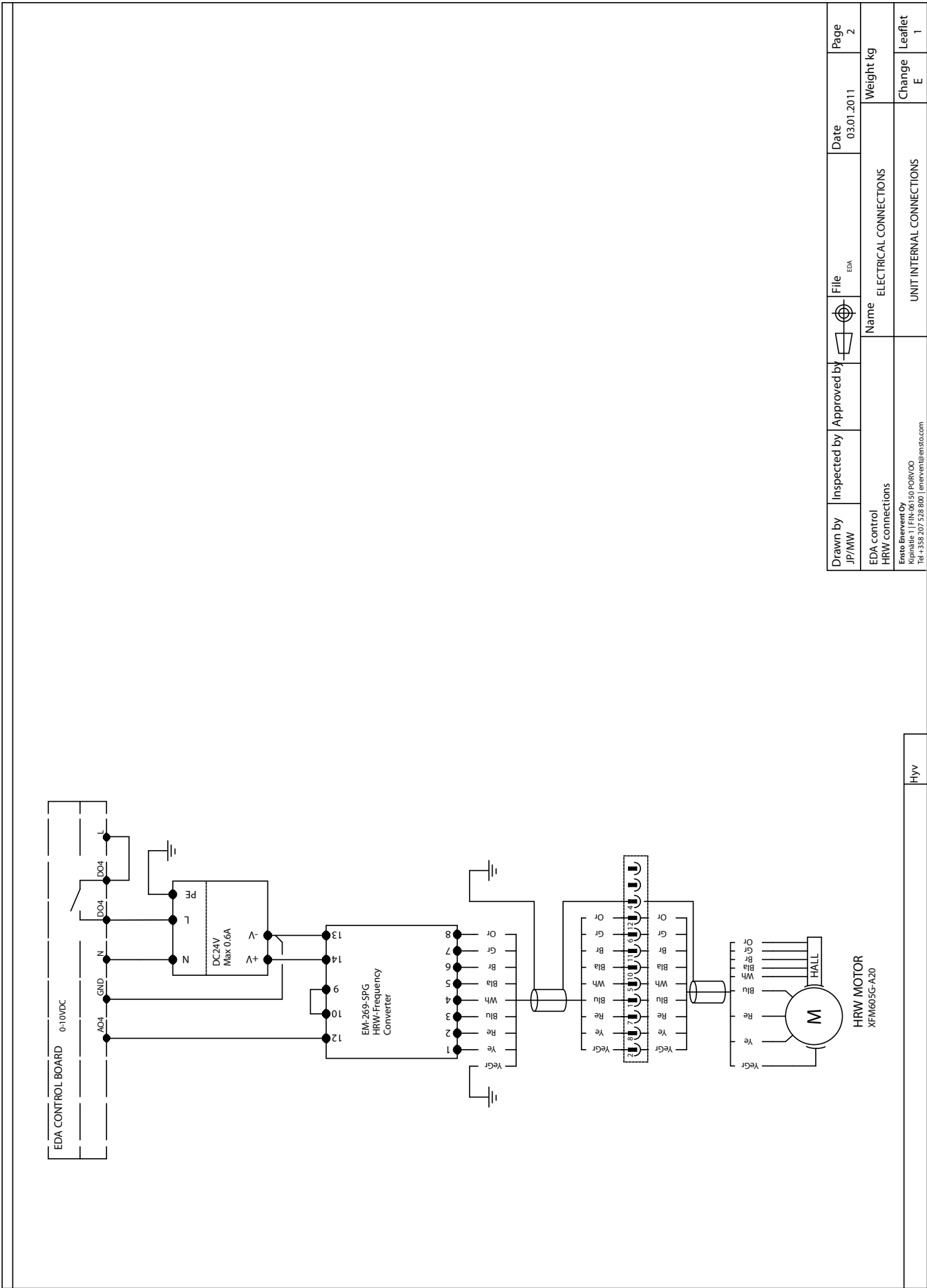


6a. WIRING DIAGRAM eco EDE Cooler

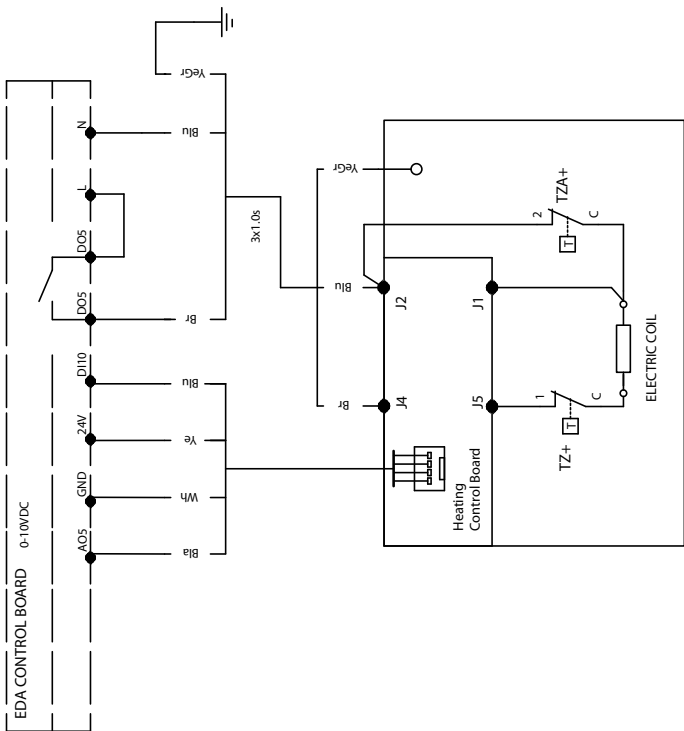




7. WIRING DIAGRAM UNIT INTERNAL CONNECTIONS



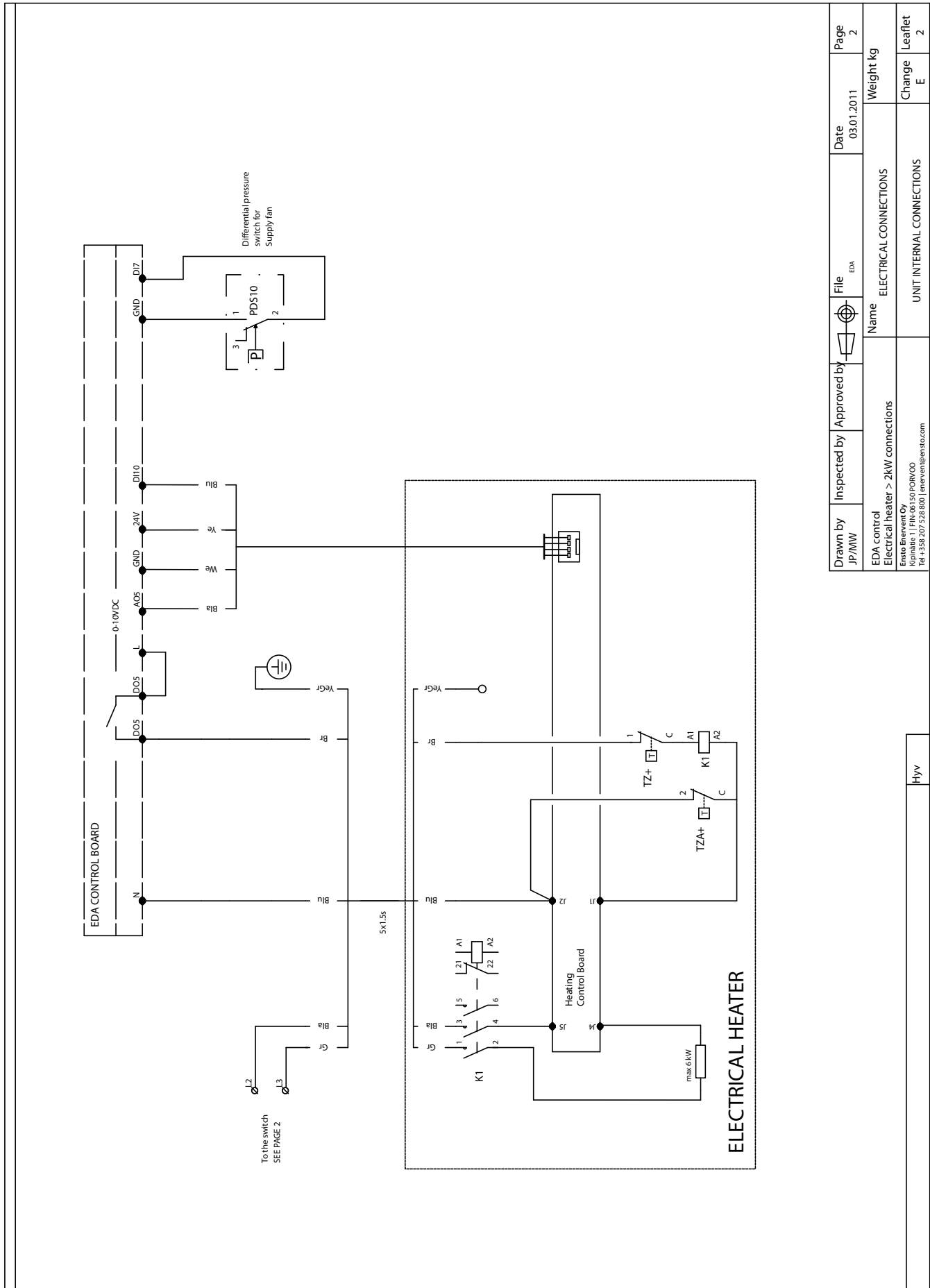
8. WIRING DIAGRAM INTERNAL CONNECTIONS eco EDE models (electr. heating ≤ 2 kW)



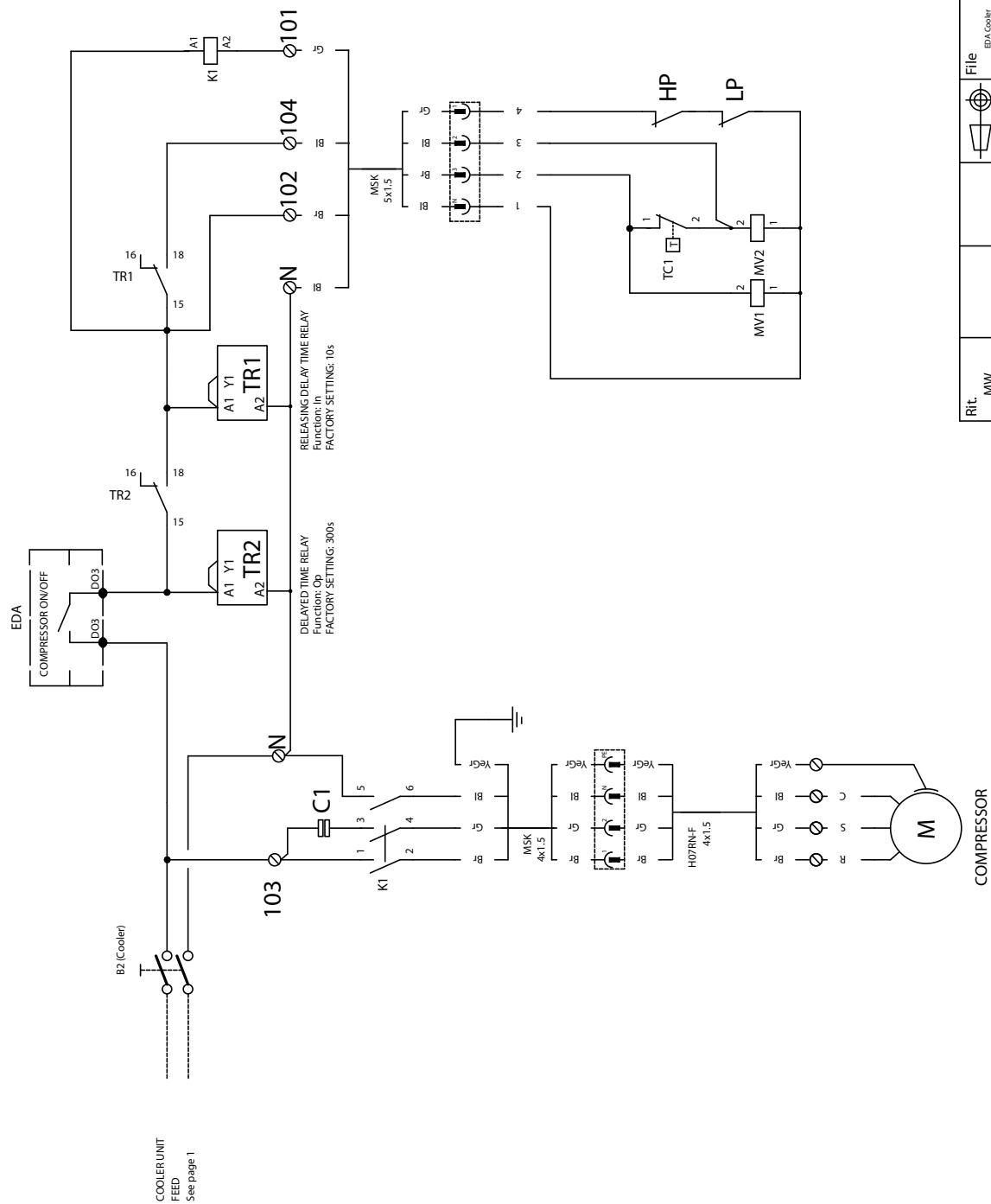
Drawn by JP/MW	Inspected by	Approved by	File EDA	Date 03.01.2011	Page 2
EDA control Electrical heater < 2kW connections			Name ELECTRICAL CONNECTIONS	Weight kg	
Ensto Enervent Oy Kipinätie 1 FIN-06150 PORVOO Tel +358 207 528 800 enervent@ensto.com			UNIT INTERNAL CONNECTIONS	Change E	Leaflet 2

Hyv

9. WIRING DIAGRAM INTERNAL CONNECTIONS 3~ eco EDE models (electr. heating > 2 kW)



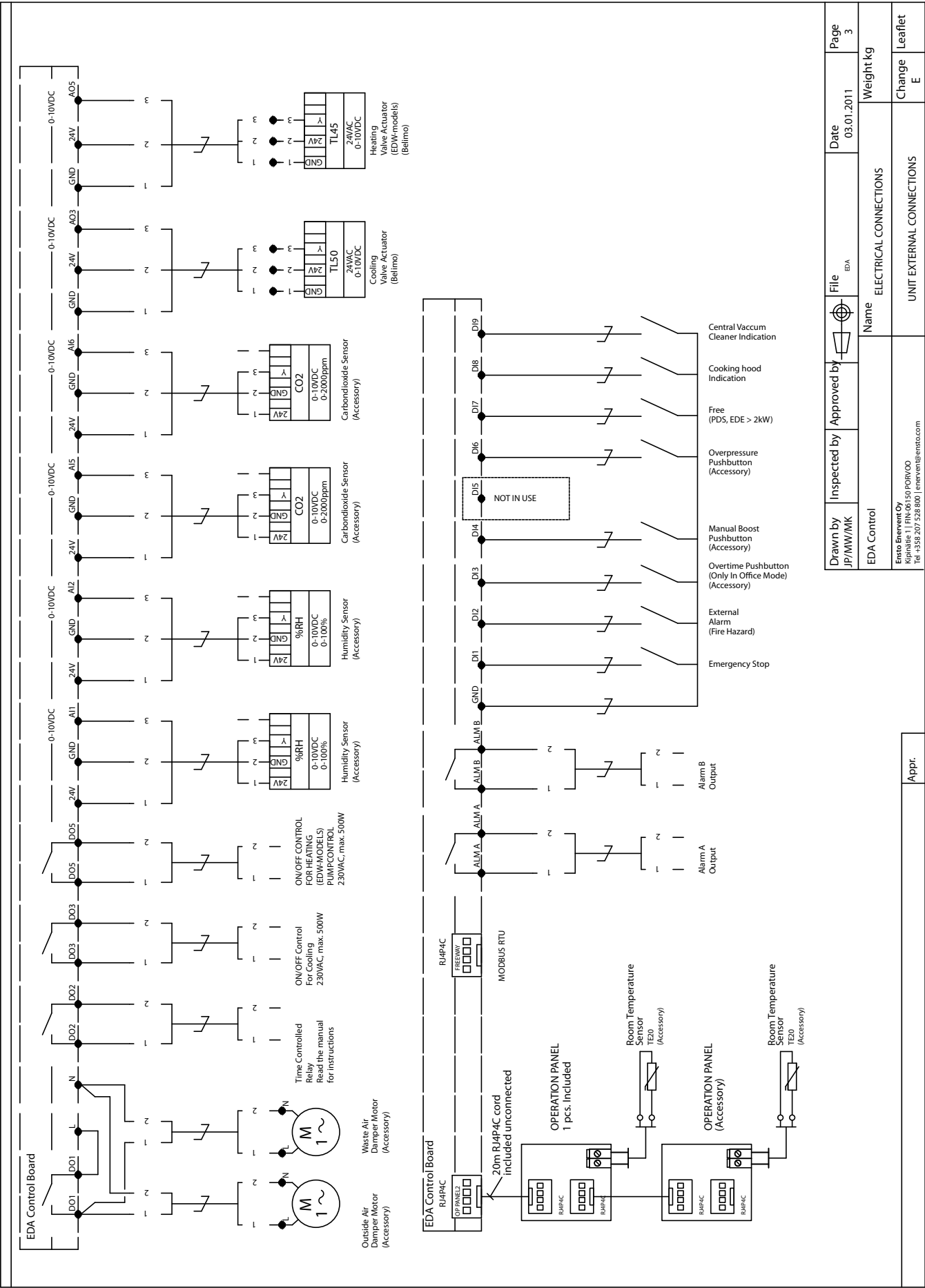
Drawn by JP/MW	Inspected by	Approved by	File EDA	Date 03.01.2011	Page 2
EDA control Electrical heater > 2kW connections			Name ELECTRICAL CONNECTIONS	Weight kg	
Envent Enevent Oy Kipinätie 1 FIN-06150 PORVOO Tel +358 207 528 800 envent@envent.com			UNIT INTERNAL CONNECTIONS	Change E	Leaflet 2



Rit.	MW			File	EDA Cooler	Datum	07.09.2011	Sida	3
EDA Control Cooler						Benämning			
						ELECTRICAL CONNECTIONS (Cooler)			
Ensto Enervent Oy Kipinätie 1 FIN-06 500 PORVOO Tel +358 207 528 800 enervent@ensto.com						UNIT INTERNAL CONNECTIONS			
						Ändring			
						E			
						Blad			

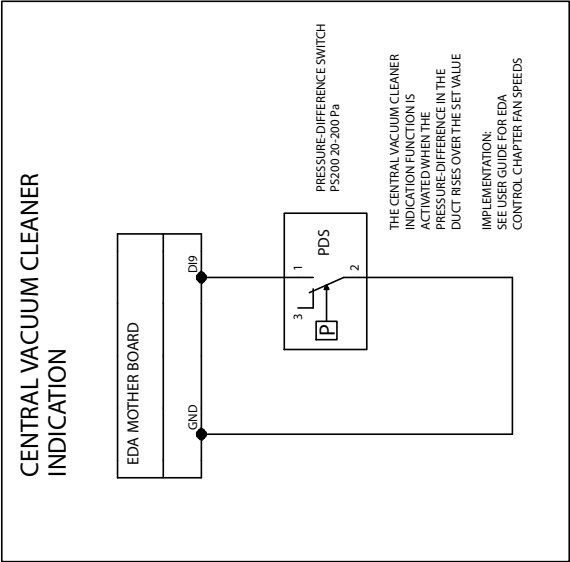
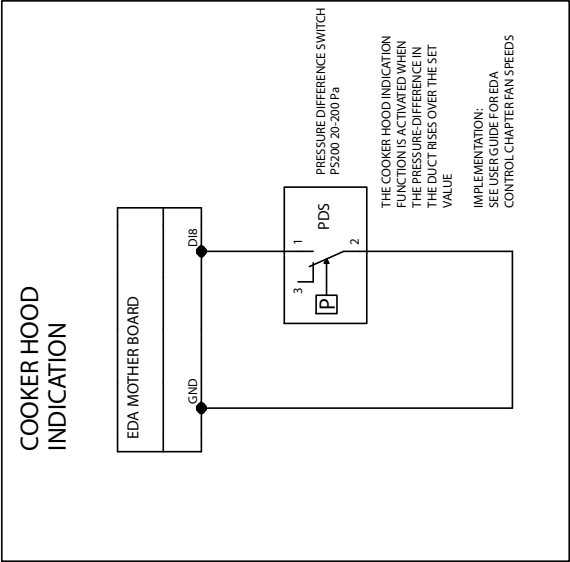
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10. WIRING DIAGRAM EXTERNAL CONENCTIONS



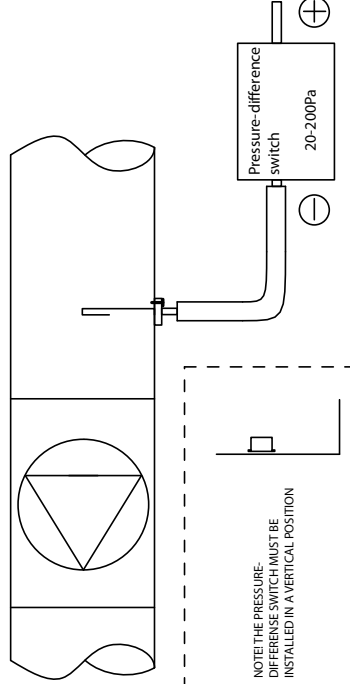
Drawn by JP/MW/MK	Inspected by	Approved by	 File EDA	Date 03.01.2011	Page 3
EDA Control			Name	Weight kg	
Ensto Enervent Oy Keskustie 1 FIN-06150 PORVOO Tel +358 207 528 800 enervent@ensto.com			ELECTRICAL CONNECTIONS		
			UNIT EXTERNAL CONNECTIONS		
			Change	Leaflet	
			E		

WIRING DIAGRAM EXTERNAL CONNECTIONS
Indication of cooker hood and central vacuum cleaner



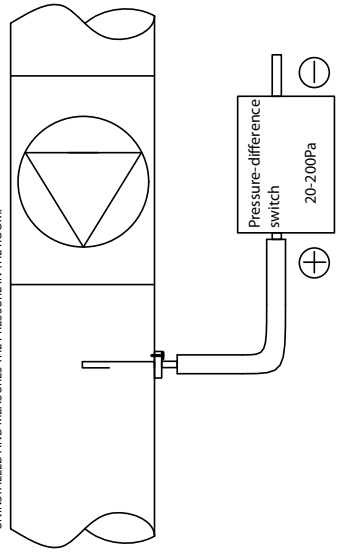
INSTALLING THE PRESSURE-DIFFERENCE SWITCH:

ALTERNATIVE 1:
THE PRESSURE-DIFFERENCE SWITCH MINUS (-) SENSOR IS PLACED IN THE DUCT, IF THE PRESSURE-DIFFERENCE IS MEASURED ON THE INTAKE SIDE (BEFORE THE FAN). THE PLUS (+) SENSOR IS LEFT UNINSTALLED AND MEASURES THE PRESSURE IN THE ROOM.



NOTE! THE PRESSURE-DIFFERENCE SWITCH MUST BE INSTALLED IN A VERTICAL POSITION

ALTERNATIVE 2:
THE PRESSURE-DIFFERENCE SWITCH PLUS (+) SENSOR IS PLACED IN THE DUCT, IF THE PRESSURE-DIFFERENCE IS MEASURED ON THE PRESSURE SIDE (AFTER THE FAN). THE MINUS (-) SENSOR IS LEFT UNINSTALLED AND MEASURES THE PRESSURE IN THE ROOM.



Piirt MW	Tark	Hyv	File LEISTÄJÄN KESKUSKONE (NIMITYS)	Pvm 27.10.2009	Sivu 1
EDA control Cooker hood and central vacuum cleaner indication			Nimitys WIRING DIAGRAM	Paino kg	
Enso Enevent Oy Kärsämäki FIN-06150 PORVOO Tel +358 207 328 600 envent@ensto.com			UNIT EXTERNAL CONNECTIONS		
Hyv			Muutos A	Lehti	

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 RJ11 4P4C 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	bayonet 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 Recive
- 3=L2 TxD Transmit
- 4=GND

Do not connect the external bus to the mother board before the bus is programmed and compatible with the unit control parameters.

AIR FLOW REGULATION OF UNIT WITH EDA CONTROL

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

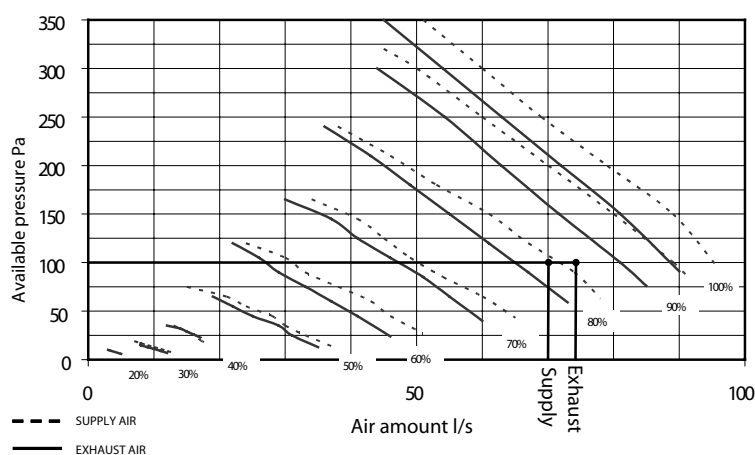
- 1) Determine which air amount and duct pressure values have been defined for the target by the ventilation planner.
- 2) Pre-install the vents according to the installation instruction.
- 3) The characteristic curves for each unit is found in this operating manual. Choose the fan speeds with the help 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 characteristics 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 under 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 under pressure varies between 5 and 10 Pa.

DECLARATION OF CONFORMITY

We declare that our products follows the provisions of low voltage directive (LVD) 2006/95/EEC, electromagnetic compatibility directive (EMC) 2004/108/EEC, machine directive (MD) 2006/42/EEC and ROHS II directive 2011/65/EEC.

Manufacturer: Ensto Enervent Oy
Manufacturer's contact: Kipinätie 1, 06150 PORVOO FINLAND
phone +358 (0)207 528 800, fax +358 (0)207 528 844
enervent@ensto.com, www.enervent.fi

Description of the product: Ventilation unit with heat recovery

Trade name of the products: Enervent series:
Piccolo eco, Plaza eco, Pingvin eco, Pingvin eco XL, Pandion eco, Pelican eco, Pelican eco PRO Greenair HP, Pegasos eco, Pegasos eco XL, Pegasos eco PRO Greenair HP, Liggolo eco, LTR-2 eco, LTR-3 eco, LTR-6 eco, LTR-7 eco

Representatives for the products in the region of the ETA:

Sweden: Ensto Sweden Ab, Västberga Allé 5, 126 30 Hägersten, SVERIGE tel. +46 8 556 309 00
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 Ab, Gml. Ringeriksvei 125, 1356 BEKKESTUA, NORGE, tel +47 95 49 67 43
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 Gessellschaft 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 S.J., ul. Toruńska 4, 82-500 KWIDZYN, PUOLA, 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)
EMC EN 61 000-3-2 (2006) + A1 (2009) + A2 (2009) ja EN 61 000-3-3 (2008)
EN 61 000-6-1 (2007) ja EN 61 000-6-3 (2007)
MD EN ISO 12100

The conformity of each manufactured product is taken care according our quality descriptions.
Product is CE-marked year 2013.

Porvoo 1. of January 2013

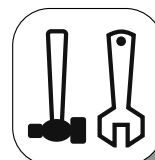
Ensto Enervent Oy

Tom Palmgren
Technology manager

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			Ukol.max	-10,0°C	Only PRO series units	
4x642			Ukol.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 measrnm	##°C	Depends on temeprature regulation mode	
4x8			Sply msrmt	##°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 settings	√		
1x71			Temperature ctrl	√		
4x140 - 4x141			Min-max	15°C - 30°C		
	Display settings		Backgrnd light on			
			Backgrnd 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

The ventilation unit does not require any mechanical maintenance, only changing of the filters periodically and cleaning of the heat exchanger and fans (when needed). Cut the power supply to the unit before starting any service work (from the main switch or by removing the service hatch of the LTR-series units). Wait for two (2) minutes before starting the maintenance work! Although the unit's power supply is cut when the hatch is opened, the fans still rotate and the electrical coil in ECE-model is still hot for a while.

CLEANING THE HEAT EXCHANGER

When changing the filters, check if the heat exchanger is dirty. If cleaning is required, remove it from the unit and carefully wash through the air channels with a hand shower using a mild detergent, taking care not to get the motor wet. The heat exchanger can also be cleaned by blowing through the air channels using compressed air. 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.

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

The recommended time between filters changes is max. four (4) months for plain filters and max. six (6) months for bag filters. If class EU5 bagfilters are used the time between filter changes can be prolonged to one (1) year, by vacuuming the filters on the inside. Changing plain filters; Remove the filter cassettes from the device and loosen the filter fabric from the frame. Replace new filter fabric back into the frame. Replace the filter cassette back into the unit so that the support mesh faces towards the heat exchanger. Changing bag filters; Open the lock and remove the old filter and put in a new one. Remember to lock it afterwards.

Vacuum cleaning the inside of the device is recommended at this point. NB! Make sure to close the service hatch carefully!

Ventilation units and filters

UNIT	STANDARD FILTERS	CHANGE INTERVAL	ALTERNATIVE FILTERS	CHANGE INTERVAL
Plaza	F7 cassette filter / F5 bag filter	6 months	-	
Pingvin	F5 plain filter / F5 plain filter	4 months	F7 cassette filter in the supply air in addition to F5 filters	6 months
Pandion	F5 bag filter / F5 bag filter	6/12* months	F7 bag filter in supply and/or extract air	6 months
Pelican	F5 bag filter / F5 bag filter	6/12* months	F7 bag filter in supply and/or extract air	6 months
Pegasos	F5 bag filter / F5 bag filter	6/12* months	F7 bag filter in supply and/or extract air	6 months
LTR-2	F5 plain filter / F5 plain filter	4 months	-	
LTR-3	F5 plain filter / F5 plain filter	4 months	F5 and F7 bagfilters in supply and/or extract air	6/12* months
LTR-6	F5 bag filter / F5 bag filter	6/12* months	F7 bag filter in supply and/or extract air	6 months
LTR-7	F5 bag filter / F5 bag filter	6/12* months	F7 bag filter in supply and/or extract air	6 months

* The life of the filters can be pro-longed by vacuuming the filter bags on the inside. NOTE! F7 filters do not sustain vacuuming.



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 installs the unit and calibrates the air flows at every terminal.

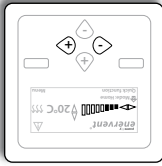


USING THE VENTILATION UNIT

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.

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 choose button (Quick functions), selecting the right line with the + and - (up/down) buttons and pushing the right multi choose 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 see page 13 in this instruction.

Key lock

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

VENTILATION DICTIONARY



Outside air

Supply air

Extract air

Exhaust air

Heat exchanger

The fresh air flow from the outside to the ventilation unit is called outside air. The air flow from the rooms to the ventilation unit is called supply air. The air flow that blows out from the ventilation unit is called exhaust air. 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

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.