

# LTR-3-EC

# LTR-3-ECE

PLANNING, INSTALLATION AND  
OPERATION INSTRUCTIONS



Unit F3, Maynooth Business Campus, Maynooth, County Kildare  
Phone 01-6290621, fax 01-6290623  
[www.enervent.ie](http://www.enervent.ie)

© Enervent OY; rev. 2006-3

# OVERVIEW

## MODEL

Before you begin reading, confirm the model number of your appliance.  
These instructions cover the following models:

---

LTR-3-85 EC  
LTR-3-85 ECE

LTR-3-120 EC  
LTR-3-120 ECE

---




## EXPLANATION OF THE MARKS AND NUMBERS

85            Fan efficiency 130 W  
120          Fan efficiency 185 W  
EC            Digital ECC-05 control.  
ECE          Digital ECC-05E control. Electrical heater 400 W (built-in), with temperature regulator, over heating protection and supply air temperature sensor.

On all models the duct connections are Ø 160 mm.

---

Inside the air handling unit there is a sticker with the model details . Fill in below this data to have it for future reference e.g when you require spare filters.

	<b>ilmastointilaite ventilation unit</b>
TYYPPI/TYPE: SRJ. NRO/SERIAL NO: W/ V/ HZ/ A:	
 	<b>ENERVENT OY AB</b> PAJATIE 9 06150 PORVOO PUH. *358 (0)19 529700 FAX. *358 (0)19 667814

## INTRODUCTION

All LTR-3 EC ventilation units have been designed for continuous year round use. In Finland the Enervent appliances have been installed in small premises and detached houses for over 20 years. The popularity of the appliances is increasing year by year. Using knowledge gained over the years, it has been possible to make the LTR-3 EC range more and more user-friendly.

The LTR-3 EC range is the result of long-term product development. It is extremely versatile and variable.

With the help of this manual it is possible to install the LTR unit with common functions yourself. We recommend that installation of ventilation units with special functions and extra equipment be carried out by a qualified electrician.

If in doubt, we recommend that a qualified ventilation engineer performs the installation work.

Before any maintenance on the appliance is carried out, please read the warning on the next page!



## GUARANTEE

Enervent Oy Ab provides a two (2) year product guarantee on the LTR-3 range. The guarantee covers the repair work with the necessary spare parts. Repair work will be carried out at the factory premises in Porvoo, Finland or as agreed.

The guarantee is not valid if the unit has been incorrectly installed, poorly maintained or mechanical damage has resulted from improper use. This guarantee does not compensate for losses indirectly caused by the use of the appliance, troubleshooting, reinstallation after the repair or transportation.

Retain the receipt as proof of purchase, and for the start date of the guarantee period.

# TABLE OF CONTENTS

<b>O V E R V I E W</b> .....	<b>2</b>
<b>MODEL</b> .....	<b>2</b>
<b>EXPLANATION OF THE MARKS AND NUMBERS</b> .....	<b>2</b>
<b>INTRODUCTION</b> .....	<b>3</b>
<b>GUARANTEE</b> .....	<b>3</b>
<b>TABLE OF CONTENTS</b> .....	<b>4</b>
<b>WARNING</b> .....	<b>5</b>
<b>OPERATING PRINCIPLE</b> .....	<b>5</b>
<b>P L A N N I N G</b> .....	<b>6</b>
<b>PLANNING OF THE DUCT SYSTEM</b> .....	<b>6</b>
<b>EXHAUST AIR CLASSIFICATION OF LIVING AREAS</b> .....	<b>8</b>
<b>TARGET VALUES FOR AIR FLOWS</b> .....	<b>9</b>
<b>KITCHEN VENTILATION</b> .....	<b>9</b>
<b>I N S T A L L A T I O N</b> .....	<b>10</b>
<b>INSTALLATION PARTS</b> .....	<b>10</b>
STANDARD PARTS .....	10
OPTIONAL EQUIPMENT.....	11
ADDITIONAL EQUIPMENT .....	11
<b>INSTALLATION</b> .....	<b>12</b>
<b>HEAT INSULATION OF THE DUCT SYSTEM</b> .....	<b>13</b>
<b>O P E R A T I O N</b> .....	<b>14</b>
CONTROL PANEL ECC-05 / ECC-05E.....	14
EXTERNAL CONTROLS .....	15
<b>ADJUSTING THE PROPORTION OF SUPPLY AIR AND EXHAUST AIR</b> .....	<b>16</b>
<b>M A I N T E N A N C E</b> .....	<b>17</b>
<b>HEAT EXCHANGER BELT REPLACEMENT</b> .....	<b>18</b>
<b>TO BE OBSERVED DURING OPERATION</b> .....	<b>19</b>
<b>HEAT RECOVERY EFFICIENCY</b> .....	<b>19</b>
<b>SERVICE / ALARM INDICATION</b> .....	<b>20</b>
<b>TROUBLE SHOOTING</b> .....	<b>21</b>
<b>T E C H N I C A L D A T A</b> .....	<b>22</b>
<b>CHARACTERISTICS</b> .....	<b>22</b>
<b>TECHNICAL DATA LTR-3-EC AND LTR-3-ECE</b> .....	<b>24</b>
<b>W I R I N G D I A G R A M S</b> .....	<b>25</b>
<b>WIRING, MAX. 35V</b> .....	<b>25</b>
<b>WIRING, MAX. 250V</b> .....	<b>26</b>
<b>WIRING DIAGRAM</b> .....	<b>27</b>
<b>EU DECLARATION OF CONFORMITY</b> .....	<b>29</b>

## **WARNING**

After opening the service hatch, wait for two (2) minutes before starting any maintenance work! Although the unit's power supply is cut when the hatch is opened, the fans still rotate and the electrical heater in ECE-models is still hot for a while.

There are no user-serviceable parts within the control panel, contact a service technician for service and repairs of this part of the unit.

Check the cause of any fault before restarting the unit!

## **OPERATING PRINCIPLE**

The LTR-3 EC ventilation unit is based on regenerative heat recovery. This is achieved with a rotating heat exchanger through which incoming air and exhaust air flow in opposite directions. Aluminium foils within the heat exchanger transfer heat from the exhaust 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 exhaust air (the heat from the supply air fan is taken into account).

Thanks to its high efficiency, the LTR-3 EC saves heating energy at the same time as it provides excellent indoor air quality; therefore it pays for itself in a relatively short time.

# PLANNING

## PLANNING OF THE DUCT SYSTEM

It is recommended that the task of dimensioning the duct system is given to a professional engineer.

The ducts must be large enough, min. Ø 100 mm diameter (approx 4") to allow a sufficiently low air speed. In particular the outside feed and the waste air ducts need to be large. The size of the outside air duct, waste air duct and the outside air grille must be Ø 160 mm diameter (approx 6½"). Do not fit an insect net behind the grille.

Use only approved materials, such as galvanised spiral-weld or plastic pipe, for the duct system. Air valves which are suitable for mechanical ventilation must be used. Air valves with a diameter of 100 mm or larger are to be used for supply and exhaust air.

**The outside air** should be taken, if possible, from the north side of the building or from a shady place where temperature variations are moderately small.

**The waste air** should be led out about 90 cm above the roof ridge. Use insulated factory made fittings. A cover or cowl must be installed on the end of the waste air duct to prevent rain water from entering the duct system.

To enable duct cleaning, a sufficient number of access hatches should be placed in the duct system. The access hatch locations should be marked, for example on the roof trusses, to make finding them easier.

**The exhaust air** valves should be placed in the following locations: Toilet, kitchen, washroom, bathroom, en-suite, clothing storage room, cleaning cupboard and utility room.

**The supply air** valves should be placed in the following locations: bedroom, living room, separate dining recess, hobby room, dressing room and sauna. We recommend that a supply air valve is installed in the innermost corner of the sauna. The air flow from the valve should be directed above the stove.

The air from a room with supply air will flow through gaps under the doors or "free flow" door grilles to areas with exhaust air. Normally a 20 mm gap under the door is sufficient, except in the sauna where a 100 mm gap is required. Additional supply air can be ducted directly to wood-burning fireplaces (in the sauna) from the outside. The duct must be closable.

Garages or workshops must not be connected into the ventilation equipment of the house; they should have their own extractor system or independent heat recovery unit.

The cooker extractor hood should not be connected into the house ventilation system. (Excess steam and grease will cause blockage of the heat exchanger).

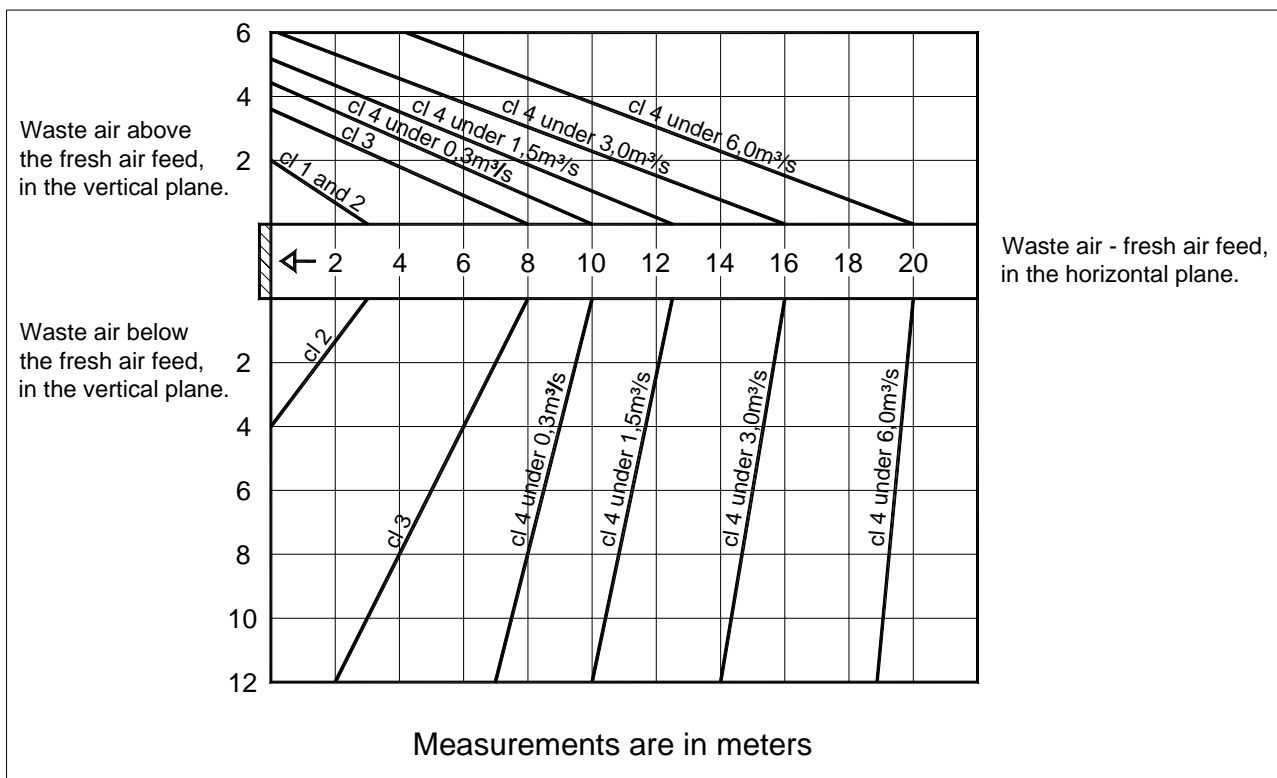
A fan assisted drying cabinet can be connected indirectly to the exhaust valve (drying cabinet - valve attachment) which allows air from both the room and the cabinet to exhaust from the same valve. The volume through the exhaust air valve has to be at least 12 l/s.

**Silencers.** A silencer 900mm long is recommended for the exhaust duct, a silencer 600 or 900mm long is recommended for the supply air duct.

**Distances between waste air and fresh air openings.** Usually fresh air is taken from a north facing wall and the waste air is led out from the roof or opposite wall.

Other methods are acceptable, so long as they fall within the guidelines laid out by the Building Regulations (Example: D2: Finland 2003, extract shown below), or in accordance with your local directives and regulations governing indoor climate and building ventilation.

The diagram shows how to determine the distance between the outside feed into the house and the waste from the house.



# EXHAUST AIR CLASSIFICATION OF LIVING AREAS

The leading of waste air from a building is based on the following, exhaust air classification

- Class 1** Exhaust air which contains few impurities. The impurities are mainly from people or structures. Air is suitable for return air and transfer air.
- Class 2** Exhaust air which contains some impurities. The air is not used as return air of other premises but can be lead for example to the toilet and washing room as transfer air.
- Class 3** Exhaust air from premises where high humidity, processes, chemicals and smells essentially lower the quality of exhaust air. The air is not used as return air or transfer air.
- Class 4** Exhaust air which contains ill-smelling or unhealthy impurities considerably more than the acceptable contents of the indoor air. The air is not used as return air or transfer air.

## Examples of exhaust air class of living areas

- Class 1** Office rooms and small adjoining storage spaces, customer service and teaching premises, meeting and business premises which are non-odorous.
- Class 2** Living rooms, dining recesses, coffee kitchens, shops, warehouses of office buildings, dressing rooms and restaurant premises where smoking is forbidden.
- Class 3** Toilets, washing rooms, saunas, apartment kitchens, distribution and teaching kitchens, copying premises of drawings.
- Class 4** Professionally used fume cupboards, grilles and target exhaust air from kitchens, car garages and driving tunnels, handling rooms of paints and solvent, dirty wash laundries, store rooms of waste food, chemical laboratories, smoking rooms, hotel and restaurant premises where smoking is permitted.

(Finland's building regulations D2 2003)



# TARGET VALUES FOR AIR FLOWS

Target values for air flows in the living areas.

## EXTRACT AIR

Kitchen	20	l/s (litres per second)
Bathroom	15 –17	l/s
Toilet	10 –12	l/s
Clothing room	3 –4	l/s
Hobby room	0,7	l/s, m <sup>2</sup> (litres per second per square metre)
Dressing room	2,0	l/s, m <sup>2</sup>
Washroom	15 –17	l/s
Cleaning cupboard	4,0	l/s, m <sup>2</sup>
Utility room	15 –17	l/s

## SUPPLY AIR

Living room	8 –17 l/s	0,5 l/s, m <sup>2</sup>
Bedroom	5 –8 l/s	0,7 l/s, m <sup>2</sup>
Sauna	8 –17 l/s	2,0 l/s, m <sup>2</sup>
Separate dining recess		0,5 l/s, m <sup>2</sup>
Hobby room		0,7 l/s, m <sup>2</sup>
Dressing room		2,0 l/s, m <sup>2</sup>

## KITCHEN VENTILATION

A normal cooker hood is installed over the kitchen stove. The hood should be used only when cooking. It is still necessary to install an extract air valve in the kitchen, connected into the general ventilation system. The extract air volume should be 20 l/s and located away from the kitchen stove / cooker.

The cooker hood should not be connected to the LTR-3 EC ventilation unit.

# INSTALLATION

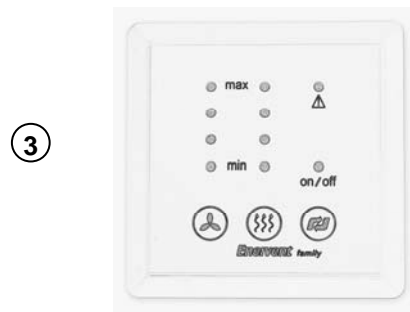
## INSTALLATION PARTS

### STANDARD PARTS

1. LTR-3 EC and ECE ventilation unit (supplied with EU5 plain filters)
2. ECC-05 control panel (EC-models)
3. ECC-05E control panel (ECE-models)
4. Control panel cable RJ11, length 20m



ECC-05 control panel



ECC-05E control panel



Control panel cable RJ11  
(to be installed in at least 16mm conduit)

## OPTIONAL EQUIPMENT

- 2, 3 Extra control panels (max. 4 pcs / unit)
- 4. Control panel cable RJ11, length 20m
- 5. Push button for over pressure control
- 6. EU5 bag filter, inside the unit
- 7. Micro filter (EU 7 bag filter)
- 8. Micro filter (EU 7 cassette filter, Ø160mm diameter duct installation)



Micro filter EU 7 cassette filter  
Ø160 duct installation



EU5 bag filter

## ADDITIONAL EQUIPMENT

- 9. Spare filter (EU 5 plain filter)



## INSTALLATION

The unit can be installed in a warm or cold room. If the unit is to be installed in a cold room it is supplied with 100 mm thick insulation. The regular unit can be installed in a storage room or on an attic without any problems.

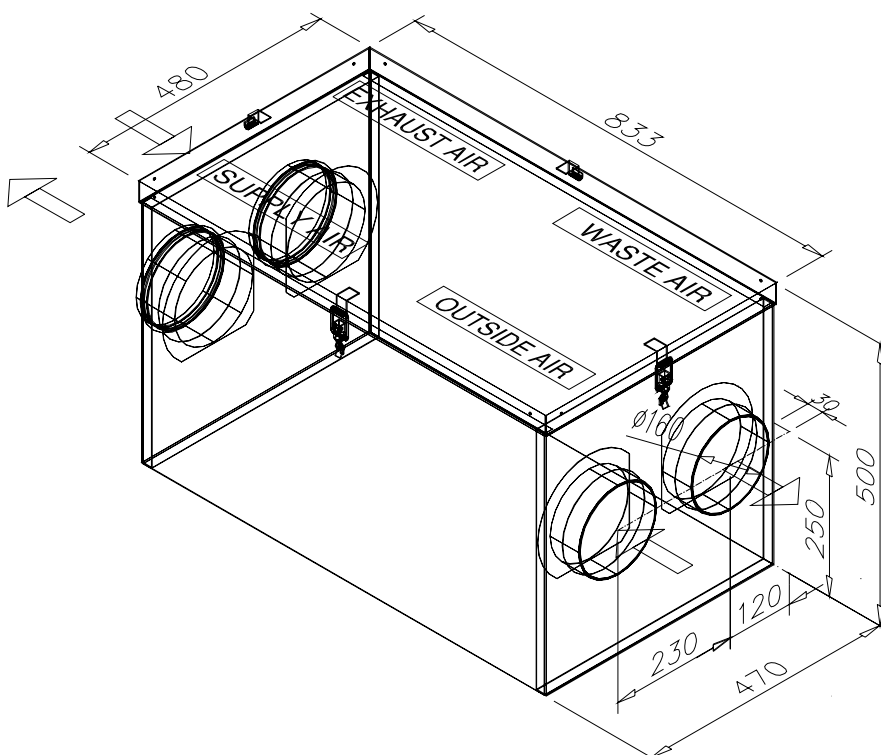
The unit should be placed on a plain surface on a elastic material that absorb sound. For example, a 100 mm thick insulation plate is suitable as bedding

If the unit is used to ventilate an area with a swimming pool, the unit must be drained. There are two (2) drain outlets (1/4" inner thread), one of which should be used, depending of the position of the unit. At the time of delivery, both outlets are plugged.

Phases of installation:

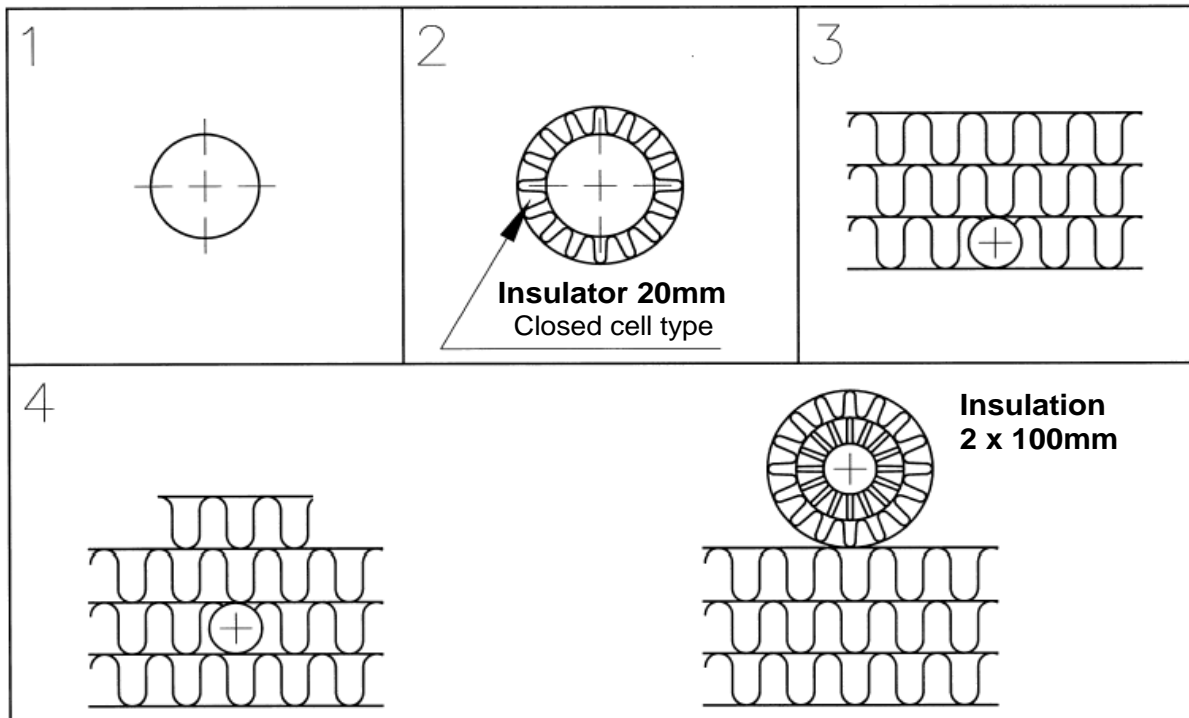
- A. Place the unit on the insulation plate (i.e. 100 mm insulation covered with chipboard) in a storage room or in the attic on a custom made shelf. Take into consideration the possible need for a drain.
- B. Check that there is at least 60 cm of free space on top (above the service hatch) and that the electrical inlets are accessible. Take into consideration that opening the latches requires a certain amount of space.
- C. Connect the ducts to the spigots on the unit. It is recommended that silencers be installed to the exhaust air and supply air ducts. For more details, see page 7.
- D. If the unit's condensation drain is to be used, connect a pipe between the drain outlet and the nearest floor drain or water trap of a sink. Connecting the unit directly into the sewerage system is not allowed. If the unit is installed in a cold room the drain pipe must be insulated so that it doesn't freeze.

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



All LTR-3 EC models

## HEAT INSULATION OF THE DUCT SYSTEM



The above figures show different examples of ductwork insulation.

1. Exhaust air duct in warm area (indoor, no insulation).
2. Waste air duct and fresh air duct in warm area (indoor).  
Insulation, for example Armaflex™
3. Exhaust air duct in attic under the insulation but above the vapor barrier.
4. All air ducts on a cold attic. The waste or fresh air ducts must not be installed immediately above the vapour barrier; there should be a mineral wool insulating layer of at least 100 mm between them.

# OPERATION

## CONTROL PANEL ECC-05 / ECC-05E

LTR-3 EC and LTR-3 ECE ventilation unit must run continuously and is regulated from the control panel. Up to 5 control panels can be connected to one unit simultaneously.

### **Fan speed**

There are 4 green LED lights for fan speed indication (minimum speed at bottom and maximum speed at top). Below the green LED's there is a button (1) for cycling through the fan speeds (see diagram on next page).

The lights will turn on one at a time and they flash if in 'over pressure' mode.

### **Heat recovery**

On the control panel there is a button and green LED light (3) for heat recovery. The heat recovery wheel is rotating and operational when the light is on. It is possible to turn off the heat recovery e.g. in summertime when the outside air temperature is the same as inside the house or when you want to take cool outside air into the house. If the heat recovery is turned on on a hot summer day it will work as a cooling recovery unit.

It is possible to turn off the heat recovery unit only when the outside air temperature is above +15°C (setpoint can be adjusted between +10...+20°C from the main board potentiometer, see electrical connections). The heat recovery will start automatically when the outside air temperature drops below this setpoint.

### **Service / alarm**

Service / alarm is indicated with a red LED light (4).

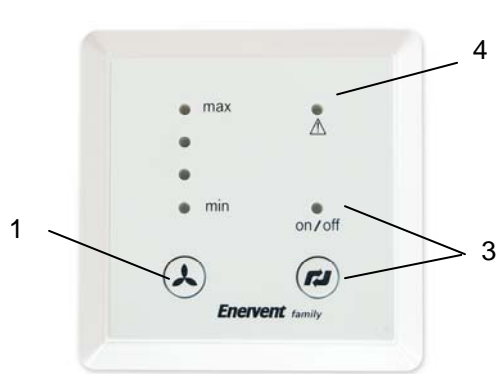
It illuminates automatically every three months as a reminder to check the condition of the filters. The alarm is de-activated by switching off the electricity supply to the ventilation unit.

The red LED will flash if supply air temperature drops below +5°C. It will also flash if the electrical heater's over heating protection has tripped, emergency stop is activated (if one is connected) or an external alarm is active (if connected).

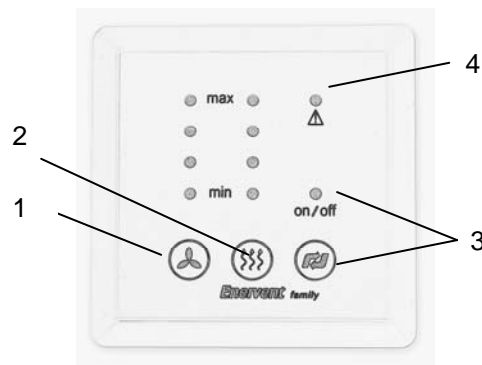
### **Supply air heating**

LTR-3 ECE model's control panel has also a button (2) to turn on the electrical boost heater and to choose the supply air temperature. The four green LED lights show the supply air temperature as follows: +17°C, +19°C, +21°C, +23°C.

The higher temperatures may can be difficult to reach with fan speeds three and four.



Control panel ECC-05



Control panel ECC-05E

1. Fan speed button with 4 LED lights (4 fan speeds)
2. Button for supply air temperature with 4 LED lights (ECE –models)
3. Button for heat recovery with LED light
4. Service / Alarm LED light

## EXTERNAL CONTROLS

LTR-3 EC units can be controlled externally with digital inputs i.e from a building automation or management system.

The external commands will be updated to each of the control panels in the ventilation unit. The unit can be controlled either from the panels or externally and the last command will stay active.

### Push button for over pressure

A push button can be wired to the ventilation unit's main board that will activate the over pressure function.

During the over pressure cycle the supply air fan speed switches to speed 3 and exhaust air fan speed switches to speed 1. The over pressure run time is set at 15 minutes. Over pressure can be switched off by turning off and then on the main electricity supply to the ventilation unit.

### External speed control

It is possible to choose any fan speed, or to turn off fans, with external digital inputs.

Where external stop is activated the fans can started again either from the control panel fan button (1) or with an external digital input.

### Emergency stop

On the main board there are terminals (STOP) for external digital input for a emergency stop switch. Emergency stop will turn off the ventilation unit. The restart is done by deactivating the emergency stop switch.

### **Cooling recovery**

The rotating heat recovery wheel can be turned on and off (terminal LTOC) with an external temperature difference thermostat or from a building automation system. During the cooling recovery cycle the heat recovery LED light flashes. Heat recovery can not be stopped manually from the control panel during the cooling recovery cycle.

### **External alarm input**

An external alarm input can be connected to the main board ALARM terminals i.e from a fire detection control or heating coil freezing protection. The unit can be restarted by deactivating the external alarm and by switching on and off main electricity supply to the ventilation unit.

## **ADJUSTING THE PROPORTION OF SUPPLY AIR AND EXHAUST AIR (after starting the ventilation unit)**

When adjusting the air flows the filters must be clean and the entire duct system must be completed.

It is not allowed to have an insect net in the out side air grilles.

The exhaust air flow should be 5-10 % greater than the supply air flow.

In EC- and ECE –models it is possible for the supply air fan to run one speed slower than the exhaust air fan. This is done by connecting pins -1 (TFC) on the main board.

A thermoanemometer and manometer is required to adjust the air flows to the specified values in each supply and exhaust air valve. Properly adjusted ventilation units are quiet and have good heat recovery efficiency. A slight under pressure is also maintained in the building. In this way the unit gives savings in heating costs and avoids humidity getting into the building structure.



# MAINTENANCE

The LTR-3 EC does not require any mechanical maintenance, only changing of the filters periodically and cleaning of the heat exchanger and fans (when needed). The power supply to the unit is automatically cut when the service hatch is opened. 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. The hatch is opened by releasing the latches.

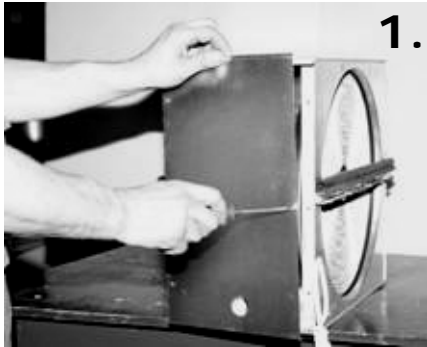
**Cleaning the heat exchanger.** When changing the filters, check if the heat exchanger is dirty. If cleaning is required, remove it from the unit and carefully wash through the air channels with a hand shower using a mild detergent, taking care not to get the motor wet. The heat exchanger can also be 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. 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. Vacuum cleaning the inside of the device is recommended at this point.

# HEAT EXCHANGER BELT REPLACEMENT



**1.**

- ✓ Stop the heat recovery unit by switching off main supply from service switch, fuse or by disconnecting wall plug. Wait two minutes. Open the service hatch.
- ✓ Disconnect the heat recovery wheel plug.
- ✓ Pull the heat exchanger out from the ventilation unit.
- ✓ Open the screws on one side of the heat exchanger and lift off the hatch. Lay down the heat exchanger on it's side. (Picture 1)



**2.**

- ✓ Turn the heat exchanger on the table so that the rotor shaft is in a vertical position. Pull off the sealing rubber. (Picture 2)
- ✓ Open the hexagonal screw from the end of the shaft and the two screws from the u-profile.
- ✓ Lift off the u-profile.



**3.**

- ✓ Clean the outside of the heat exchanger and thread the belt carefully inside the heat exchanger through the gasket. Rotate simultaneously the heat exchanger carefully. (Pictures 3 and 4)

- ✓ Fasten the u-profile with the two screws and the hexagonal screw.
- ✓ Push the sealing rubber on it's place.



**4.**

- ✓ Turn the heat exchanger upwards and put the belt on the belt wheel. (Picture 5)

- ✓ Rotate the heat exchanger a couple revolutions upwards (seen from the motor).

- ✓ Clean the inside of the heat exchanger.
- ✓ Fasten the hatch with the screws.



**5.**

- ✓ Replace the heat exchanger back to the ventilation unit and connect the plug.

- ✓ Switch on the main supply.
- ✓ Check visually that the heat exchanger rotates.
- ✓ Shut the service hatch.

## TO BE OBSERVED DURING OPERATION

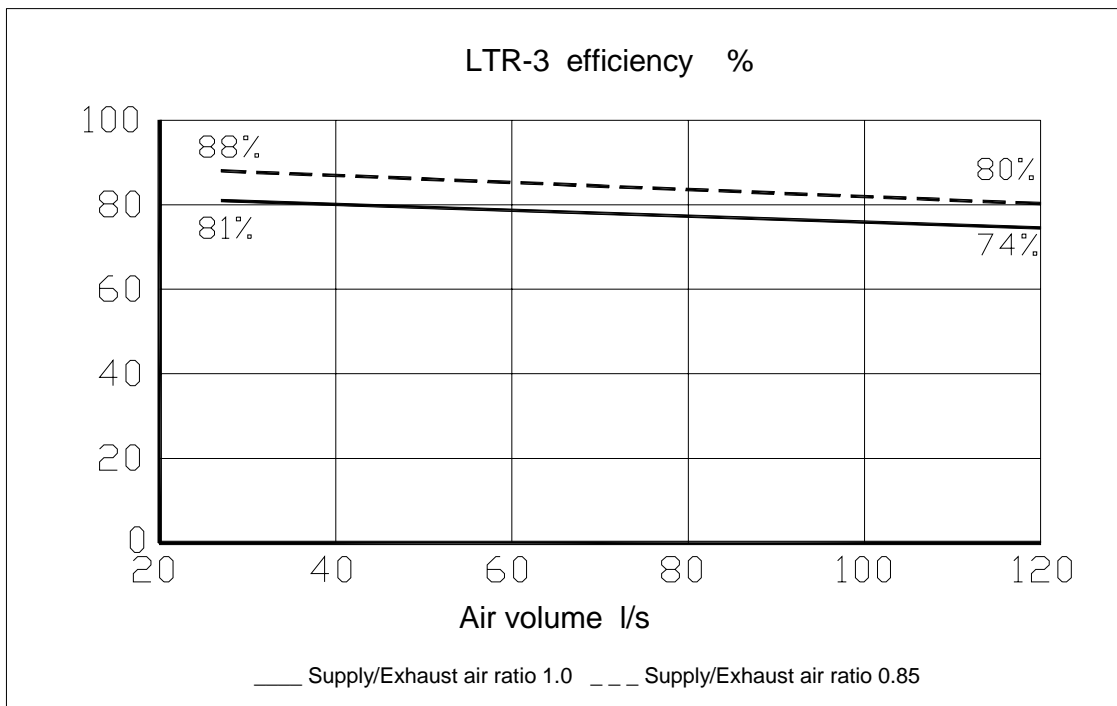
**Always ventilate with a high enough efficiency!** Otherwise the indoor humidity will rise too high and condensation will form on cold surfaces, for instance windows.

The recommended relative humidity for indoor air is 40 - 45 % (at a room temperature of 20 - 22 °C). At these levels condensation will not form and the humidity is at a healthy level. By monitoring the humidity of the indoor air with a humidity sensor, the ventilation rate can be increased when the humidity rises over 45%. Alternatively the ventilation can be reduced if the humidity of the indoor air falls below 40%.

**Change the filters often enough!** During the winter time the extract air filter becomes dirty more quickly than the fresh air filter. In this case the extract air flow will decrease, which then leads to a rise in the humidity, and also reduces the incoming air temperature. With every filter inspection / change, check that the heat exchanger functions correctly.

**If the ventilation unit is not used for a long period** the outside air intake should be covered to avoid cold air getting into the ventilation system and causing condensation damage.

## HEAT RECOVERY EFFICIENCY



## SERVICE / ALARM INDICATION



### RED LED LIGHT

	Ventilation unit:	Switch off the alarm:
<b>LED IS ON:</b> - filter change reminder	works normally	ventilation unit door switch
<b>LED IS FLASHING:</b> - supply air temperature after HRW is below +5 °C - el. heater overheating protection has went off - external emergency stop is on - external alarm is on	exhaust fan is on speed 1, supply fan / HRW are off  exhaust fan is on speed 1, supply fan / HRW are off  ventilation unit is off  ventilation unit is off	automatically, when temperature is above +5 °C  ventilation unit door switch / el. heater RESET button  emergency stop switch  fix the external alarm / ventilation unit door switch

# TROUBLE SHOOTING

## SUPPLY AIR TOO COLD

### **Reason**

- \* The heat exchanger switch is turned off
- \* Belt of the heat exchanger broken
- \* Belt greasy, causing slippage
- \* The exhaust fan has stopped
- \* The exhaust air filter is blocked
- \* Exhaust air valve settings incorrect
- \* Heat insulation of ducts inadequate

### **Action**

- ☛ Switch it on
  - ☛ Replace the belt
  - ☛ Contact a service representative
  - ☛ Contact a service representative
  - ☛ Change the exhaust air filter
  - ☛ Contact a service representative
  - ☛ Check the insulation thickness of the supply and exhaust air ducts and add insulation if needed
- 

## REDUCED AIR FLOW

### **Reason**

- \* Filters are blocked
- \* Speed selector switch for the fans has been turned down
- \* Blockage in the fresh air grille
- \* Fan wings dirty

### **Action**

- ☛ Change the filters
  - ☛ Select higher speed
  - ☛ Clean the outer grille
  - ☛ Clean the fans
- 

## INCREASED OPERATING SOUND LEVEL

### **Reason**

- \* Filters blocked
- \* Outer grilles are blocked
- \* Fan bearings faulty
- \* Problem with gear/motor of the heat exchanger
- \* Fan wings dirty

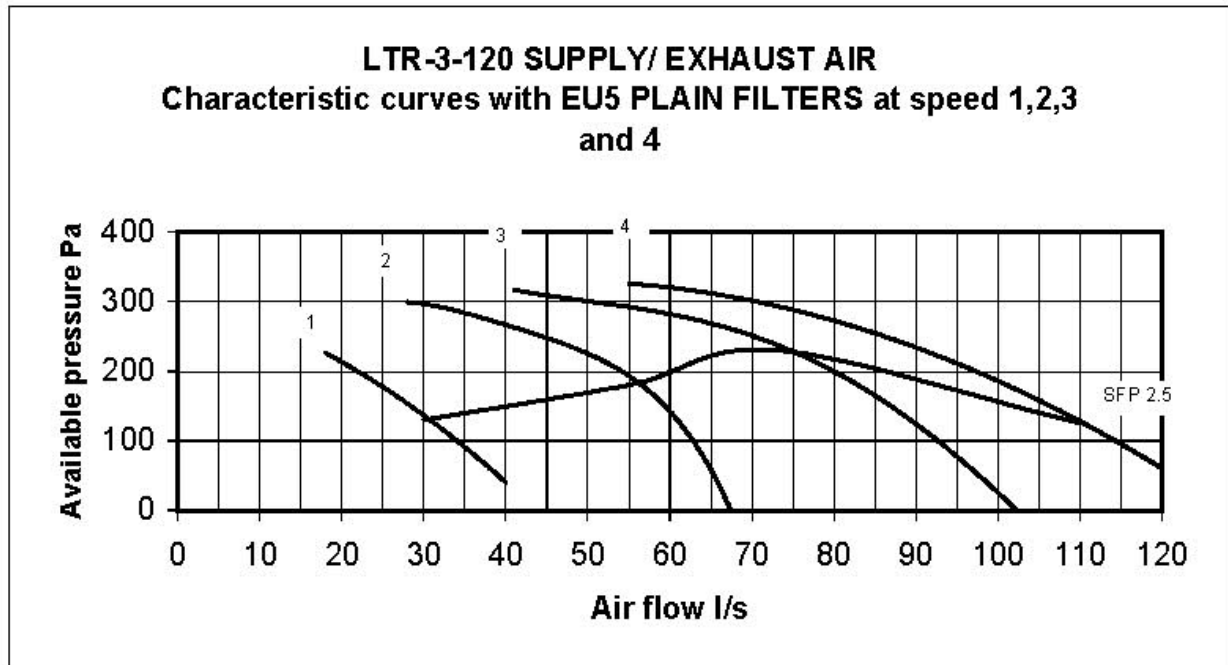
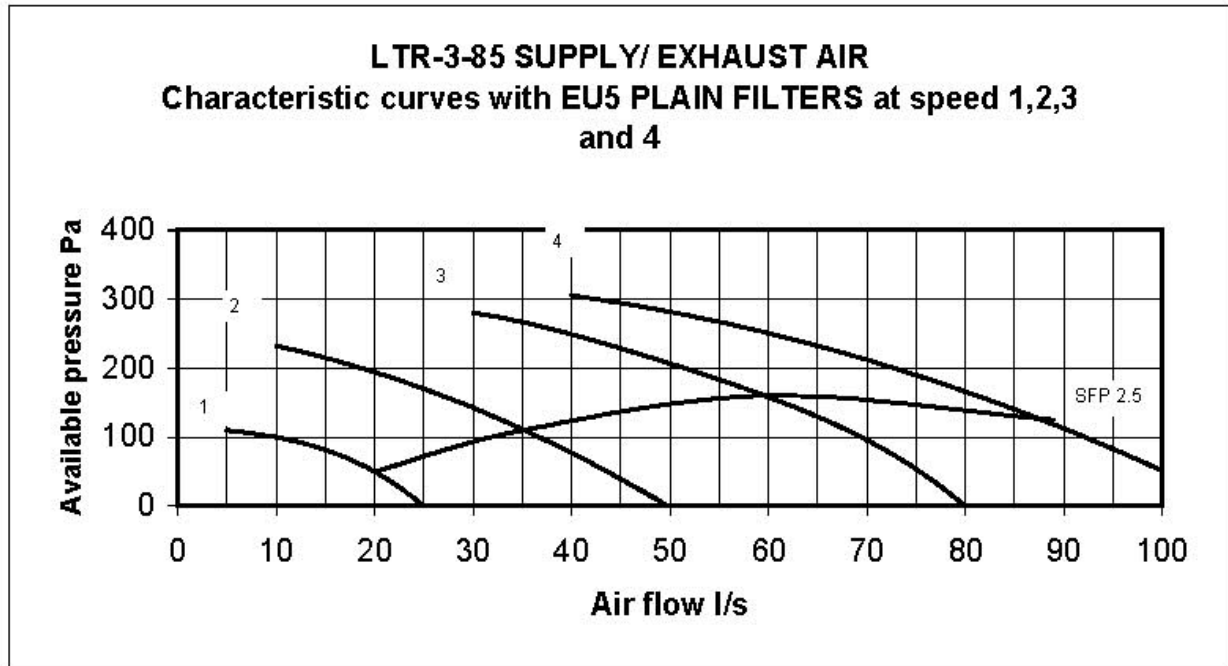
### **Action**

- ☛ Change the filters
- ☛ Clean the outer grille
- ☛ Change bearings / contact service
- ☛ Contact a service representative
- ☛ Clean the fans

# TECHNICAL DATA

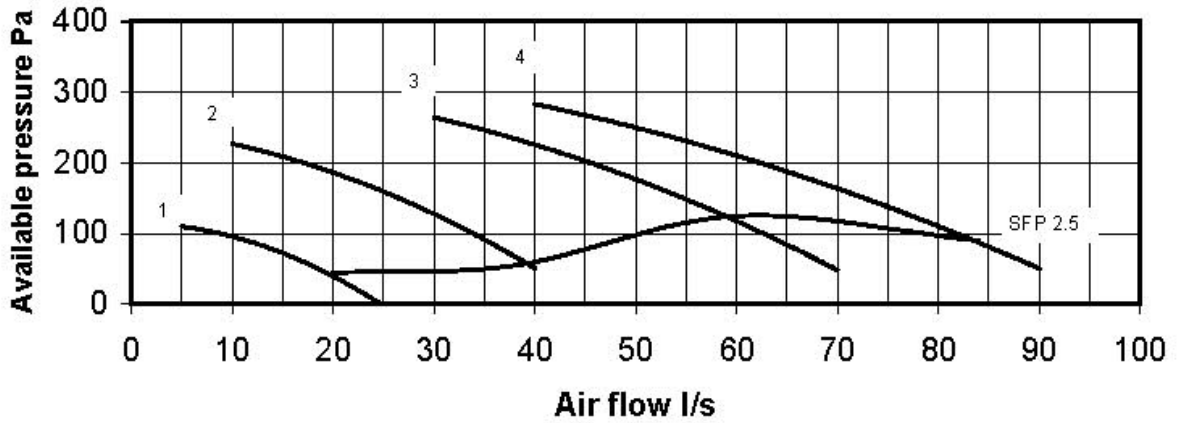
## CHARACTERISTICS

WITH EU4/5 PLAIN FILTERS

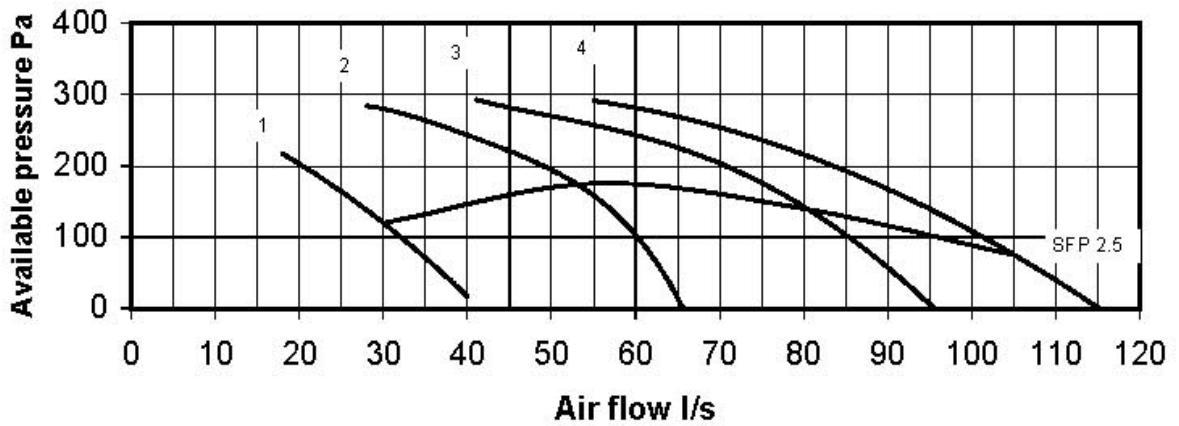


WITH EU7 BAGFILTERS

**LTR-3-85 SUPPLY/ EXHAUST AIR**  
Characteristic curves with EU7 BAG FILTERS at speed  
1,2,3 and 4



**LTR-3-120 SUPPLY/ EXHAUST AIR**  
Characterisitic curves with EU7 BAG FILTERS at speed  
1,2,3 and 4



# TECHNICAL DATA LTR-3-EC and LTR-3-ECE

## Dimensions

Length	833 + 50 mm
Width	470 mm
Height	500 mm

## Current

230 V / 50 Hz 1 phase, fuse 10 A, fast  
F1 T1,6A (main board glass tube 5x20mm)

## Fans

Exhaust	<b>Model</b>	<b>85</b>	<b>120</b>
	Rating	130	185 W max.
	Current	0,57	0,80 A
	Heat protection		
Supply	<b>Model</b>	<b>85</b>	<b>120</b>
	Rating	130	185 W max.
	Current	0,57	0,80 A
	Heat protection		

## Heat exchanger motor

Rating 25 W 0,09 A  
Heat protection

## Electrical supply air heater

400W (ECE –models)

## Duct diameter

All models: Ø 160 mm

## Weight

52 kg

## Sound level

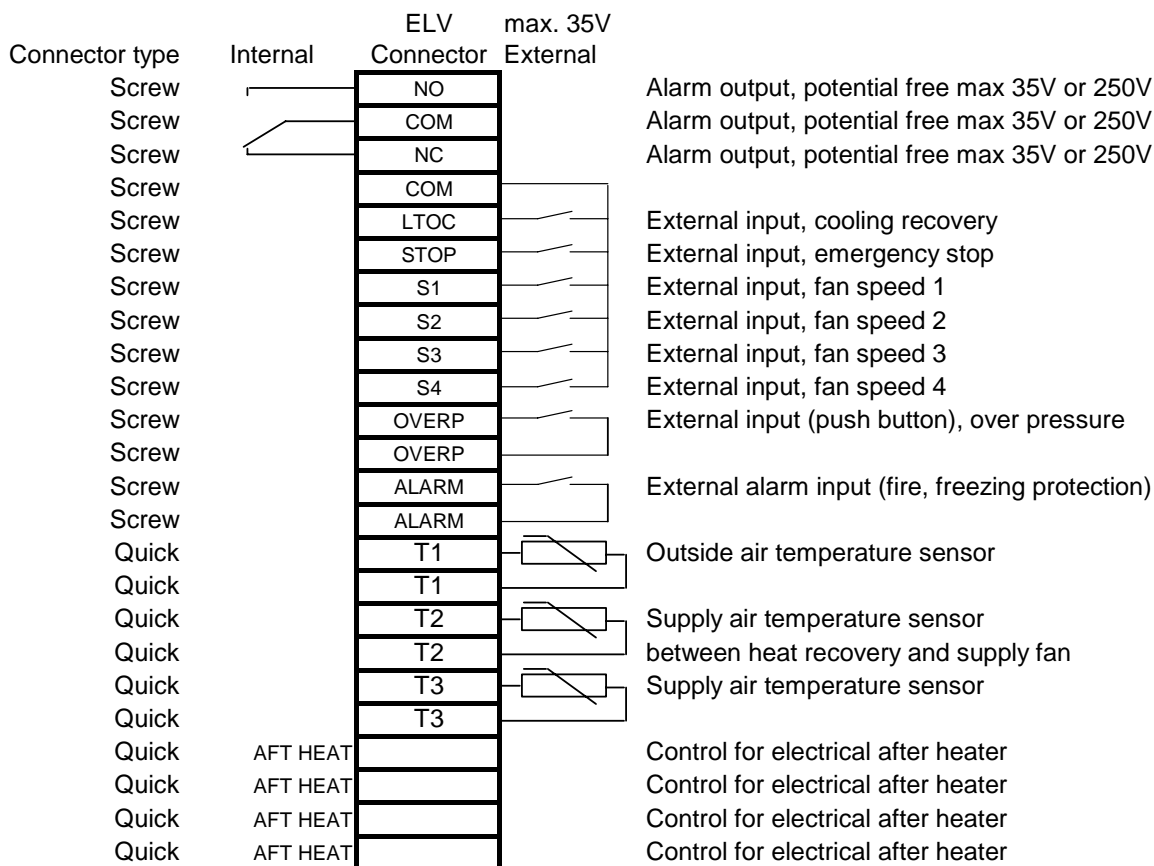
Sound levels from the unit in a room where it is installed. Voice absorption of 10 m<sup>2</sup>.  
(Without attenuation)

Fan speed	Model	LTR-3-85-EC	LTR-3-120-EC	
Position 1		24	28	dB(A)
Position 2		33	36	dB(A)
Position 3		38	42	dB(A)
Position 4		43	47	dB(A)



# WIRING DIAGRAMS

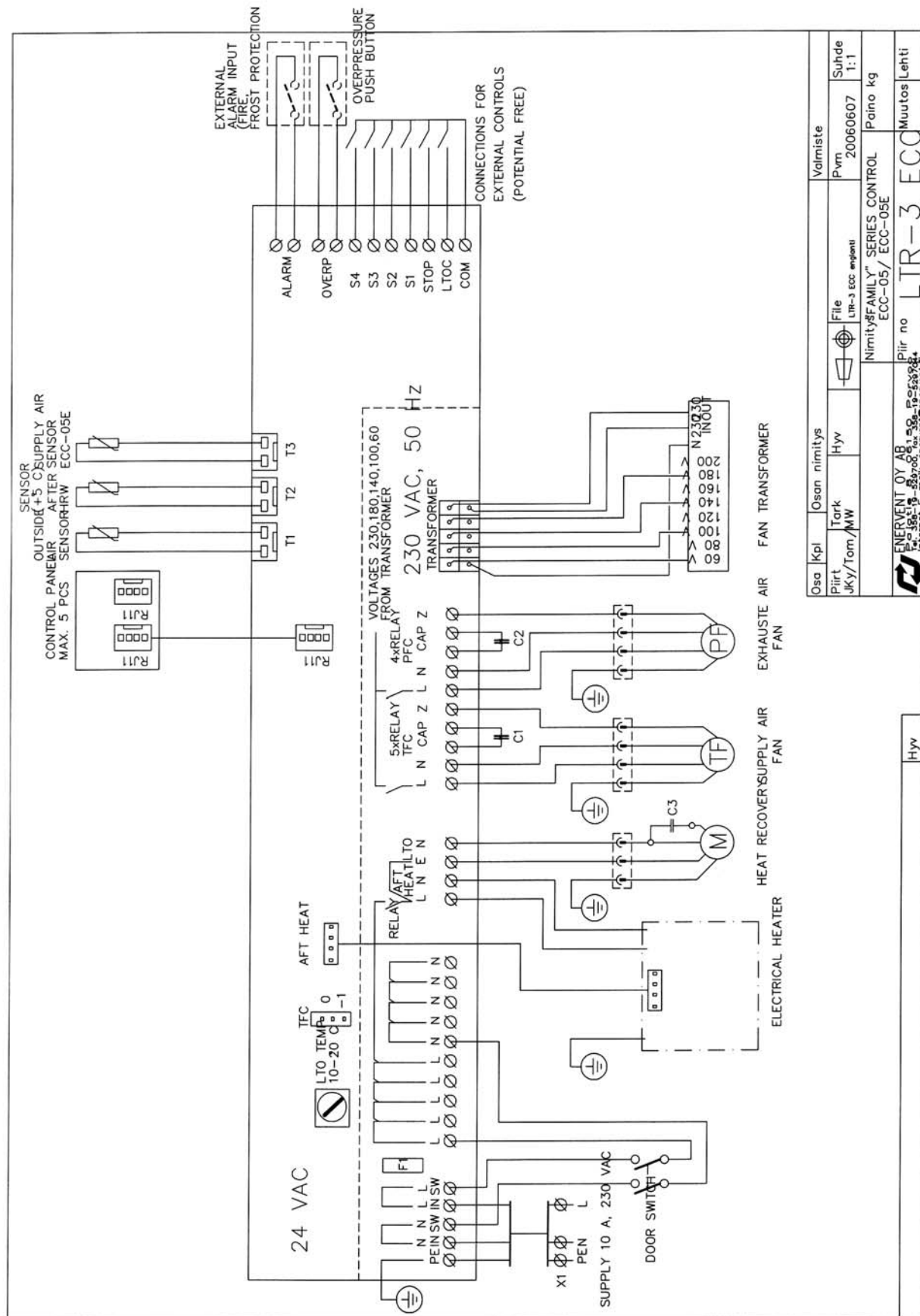
## WIRING, max. 35V



# WIRING, max. 250V

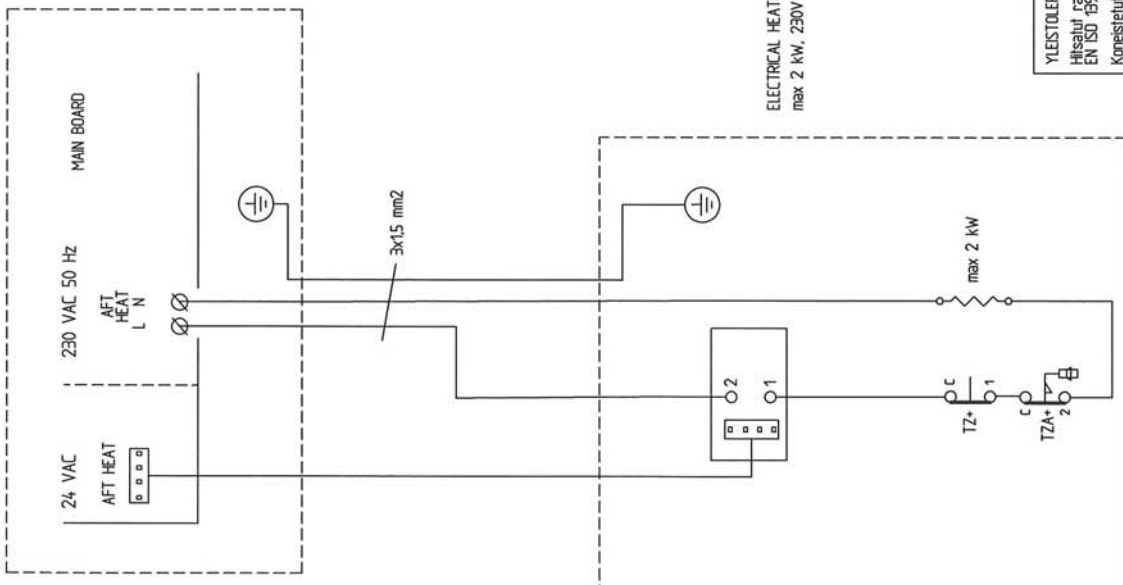
Connector type	Internal	Connector	External	max. 250V
Screw		PE	←	<b>Earth to the AHU</b>
Screw	N	IN	←	<b>Neutral to the AHU</b>
Screw	N	SW	→	To Door switch / Main switch
Screw	L	IN	←	<b>230VAC, 50Hz supply to the AHU</b>
Screw	L	SW	→	To Door switch / Main switch
Screw		L	←	From Door switch / Main switch
Screw		L	→	230VAC, 50Hz after main switch / door switch
Screw		L	→	230VAC, 50Hz after main switch / door switch
Screw		L	→	230VAC, 50Hz after main switch / door switch
Screw		L	→	230VAC, 50Hz after main switch / door switch
Screw		N	←	From door switch / main switch
Screw		N	→	Neutral after main switch / door switch
Screw		N	→	Neutral after main switch / door switch
Screw		N	→	Neutral after main switch / door switch
Screw		N	→	Neutral after main switch / door switch
Screw	LTO	N	→	Neutral for heat recovery motor
Screw	LTO	E	→	230VAC for heat recover motor
Screw	AFT HEAT	N	→	Neutral for electrical heater
Screw	AFT HEAT	L	→	230VAC for electrical heater
Screw	PFC	Z	→	Capasitor for exhaust air fan
Screw	PFC	CAP	→	Capasitor for exhaust air fan
Screw	PFC	CAP	→	Capasitor for exhaust air fan
Screw	PFC	N	→	Neutral for exhaust air fan
Screw	PFC	L	→	100..230VAC for exhaust air fan
Screw	TFC	Z	→	Capasitor for supply air fan
Screw	TFC	CAP	→	Capasitor for supply air fan
Screw	TFC	CAP	→	Capasitor for supply air fan
Screw	TFC	N	→	Neutral for supply air fan
Screw	TFC	L	→	60..230VAC for supply air fan
Quick	TRANSFORMER		→	N for fan transformer
Quick	TRANSFORMER		→	230VAC for fan transformer
Quick	TRANSFORMER		←	230VAC from fan transformer
Quick	TRANSFORMER		←	180VAC from fan transformer
Quick	TRANSFORMER		←	140VAC from fan transformer
Quick	TRANSFORMER		←	100VAC from fan transformer
Quick	TRANSFORMER		←	60VAC from fan transformer

# WIRING DIAGRAM



Osa	kpl	Osan	nimitys	Valmistaja	
Piirt	Jky/Tom/MW	Tark	Hyy	File	Ltr-3 ecc englanti
					Nimitysfamily" SERIES CONTROL ECC-05/ ECC-05E
				Piir no	LTR-3 ECC
					Muutos Lehti

ENERVENT OY AB  
 P.O. Box 366  
 FIN-00561 VANTAA  
 Finland  
 Tel: +358-9-2539700  
 Fax: +358-9-2539704  
 E-mail: energent@enervent.fi



YLEISTOLERANSSIT		Dosa		Kpl		Osan nimitys		Valmisie	
Hissitul rakenteel: EN ISO 15920-AE		Pirt MW		Tark		Hyv		Pvm	
Konsistitut gsal: ISO 2768-nik		ECC -MODELS max 2 kW ELECTRICAL HEATER		Nimitys		File		20060607	
		ENERVENT OY AB		WRING DIAGRAM		Paino kg		Suhte t1	
		Puhelin: 08-55050000		Pii- no		Muuos		Lehti	
		Internet: E-mail: www.enervent.fi							

Hyv

## EU DECLARATION OF CONFORMITY

We declare that our products follows the provisions of low voltage directive (LVD) 73/23/EEC, 93/68/EEC, electro magnetic compatibility directive (EMC) 89/336/EEC and machine directive (MD) 98/37/EEC.

Manufacturer: Enervent Oy Ab  
Manufacturer's contact: Kipinätie 1, 06150 PORVOO, Finland  
Tel +358 207 528 800, fax +358 207 528 844  
[enervent@enervent.fi](mailto:enervent@enervent.fi), [www.enervent.fi](http://www.enervent.fi)

Description of the product: Ventilation unit with heat recovery

Trade name of the product: Enervent LTR-3-EC, LTR-3-ECE

Representatives for the products in the region of EU:

Enervent Ireland  
Unit 3 Block F  
Maynooth Business Campus  
Maynooth Co. Kildare  
Ireland  
tel +353 (0)1 6290621

The products are in conformity with the following standards:

LVD EN 60 335-1 (1994) +A1 (1996), +A11 (1995), +A12 (1996), +A13 (1998), +A14 (1998)

MD EN 292-1 (1991), EN 292-2 (1991) +A1 (1995)

EMC EN 55014-1 (1997), EN 61 000-3-2 (1995) ja EN 61 000-3-3 (1995)  
EN 55014-2 (1997)

The conformity of each manufactured product is taken care according our ISO 9001 quality descriptions.

Product is CE-marked year 2006.

Porvoo 1st January 2006

Enervent Oy Ab

Tom Palmgren / R&D manager