



# **HEAT RECOVERY AIR HANDLING UNIT**



**KOMFORT L**



**EN**

**OPERATION MANUAL**

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BLAUBERG Ventilatoren GmbH Company is happy to offer your attention a heat recovery air handling unit KOMFORT L.

## INTRODUCTION

The present operation manual contains a technical description, technical data sheets, operation and mounting guidelines, safety precautions and warnings for safe and correct operation of the unit. Read carefully and understand the operation manual, especially the safety requirements, before the unit mounting and start up. Keep the operation manual available as long as you use the unit.

## GENERAL

The heat recovery air handling unit KOMFORT L is designed for efficient and energy saving ventilation of domestic and public premises. The unit is not a ready to use product but a component part of central air conditioning and ventilation network.

The unit is available for Ø 125 or 315 mm air ducts depending on the model. The unit is designed for indoor application with the ambient temperature ranging from +1 °C up to +50 °C and relative humidity up to 80 %.

Hazardous parts access and water ingress protection rating:

- unit motors – IP44;
- assembled unit connected to air ducts – IP22.

The unit design is regularly improved, so some models can slightly differ from those ones described in this operation manual.

## SAFETY REGULATIONS

All operations related to the unit electrical connections, servicing and repair works are allowed only after the unit is disconnected from power supply. The unit is rated as a Class I electrical appliance.

All mounting and servicing operations are allowed by duly qualified personnel.

Please, follow the safety regulations and working instructions (DIN EN 50 110, IEC 364).

Make sure the impeller and the casing are not damaged before connecting the unit to power supply. The casing internals must be free of any foreign objects which can damage the impeller blades or the motor.

The unit maintenance and repair is allowed only after power cut-off and full stop of the rotating parts.

Misuse of the unit or any unauthorized modifications are not allowed.

The unit is designed for connection to AC single-phase power mains in compliance with the „Technical data“ section.

The unit is rated for continuous operation.

Take steps to prevent ingress of smoke, carbon monoxide and other combustion products into the room through open chimney flues or other fire-protection devices. Sufficient air supply must be provided for proper combustion and exhaust of gases through the chimney of fuel burning equipment to prevent back drafting. The maximum permitted pressure difference per living units is 4 Pa.

The transported air must not contain any dust or other solid impurities, sticky substances or fibrous materials.

The unit is not rated for operation in a flammable or explosive medium.

Fulfil the operation manual requirements to ensure a trouble-free and long service life of the unit.

## TRANSPORTATION AND STORAGE REGULATIONS



### WARNING

*The unit is not allowed for use by children and persons with reduced physical, mental or sensory capacities, without proper practical experience or expertise, unless they are controlled or instructed on the product operation by the person(s) responsible for their safety. Supervise the children and do not let them play with the unit.*



### WARNING

*Do not dispose in domestic waste. The unit contains in part materials that can be recycled and in part substances that should not end up as domestic waste. Dispose of the unit once it has reached the end of its working life according to the regulations valid in your country.*

The unit complies with the requirements according to the EU norms and directives, to the relevant EU-Low Voltage Equipment Directives, EU-Directives on Electromagnetic Compatibility.

We hereby declare that the unit complies with the essential protection requirements of Electromagnetic Council Directive 2004/108/EC, 89/336/EEC and Low Voltage Directive 2006/95/EC, 73/23/EEC and CE-marking Directive 93/68/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility, which relate to electrical appliances used in set voltage classes.

The Manufacturer hereby warrants normal operation of the unit over the period of two years from the retail purchase date provided observance of the installation and operation regulations.

In case of a failure due to a manufacturing fault during the warranty period the consumer has the right to exchange it.

The replacement is offered by the Seller.

In case of no confirmation of the purchase date, the warranty period shall be calculated from the manufacturing date.

The MANUFACTURER is not responsible for any damage resulting from any misuse of or gross mechanical interference with the unit.

The MANUFACTURER is not responsible for the damages resulted due to the use of third party equipment or to third party equipment.

## MANUFACTURER'S WARRANTY

The unit complies with the requirements according to the EU norms and directives, to the relevant EU-Low Voltage Equipment Directives, EU-Directives on Electromagnetic Compatibility.

We hereby declare that the unit complies with the essential protection requirements of Electromagnetic Council Directive 2004/108/EC, 89/336/EEC and Low Voltage Directive 2006/95/EC, 73/23/EEC and CE-marking Directive 93/68/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility, which relate to electrical appliances used in set voltage classes.

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**DESIGN**

The casing is made of aluminium profile and double-skinned aluzinc panels, internally filled with 20 mm mineral wool layer for heat- and sound-insulation. The casing has mounting brackets with anti-vibration rubber mounts for easy installation.

The spigots are located at the sides of the unit and are equipped with rubber seals for airtight connection to the air ducts.

The hinged side panels ensure easy access to the internals for service works including cleaning, filter replacement, etc.

The unit is equipped with external rotor AC-motors and centrifugal double-inlet impellers with forward curved blades. The motors are equipped with integrated overheating protection with automatic restart and ball bearings for a long service life.

Connect the unit to power mains through the terminal block located in the terminal box on the side panel of the casing.

The unit incorporates a plate cross-flow aluminium heat exchanger. The drain pan under the heat exchanger block is used for condensate collection and drainage.

The unit is equipped with a built-in heat exchanger protection system to prevent its freezing in the cold season. If the heat exchanger freezing becomes imminent a thermostat relay interrupts the supply fan circuit. After the supply fan shuts down automatically the heat exchanger is warmed up

by the stream of warm air from the exhaust fan. After that the supply fan is turned on and the unit reverts to the normal operation mode. To set the thermostat operation temperature turn the control knob until reaching the desired value. The recommended operating value for the thermostat relay in the absence of a duct heater in the air supply part of the ventilation system is +5 °C.

Two built-in G4 cassette filters provide high-end air purification. Optionally F7 intake filter may be mounted.

The unit incorporates an external CDP-3/5 four-position speed switch that enables setting low, medium, maximum speed and turning the unit off.

The switch mounted on the side panel allows to switch off the supply fan if necessary.

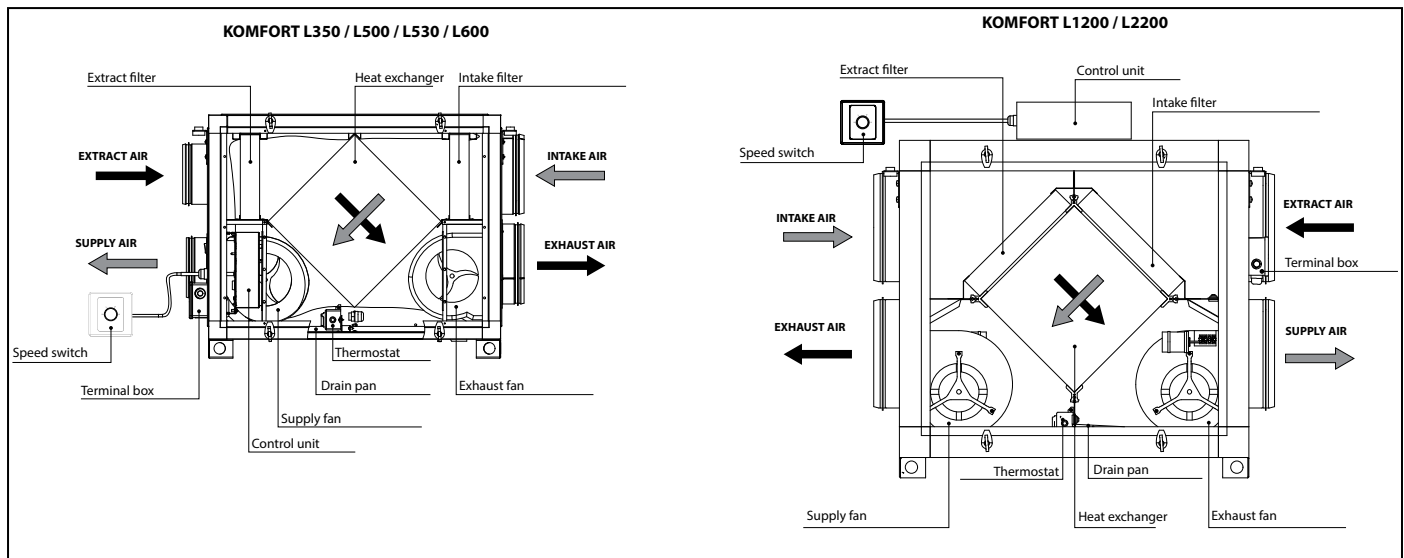


Fig. 1. Unit design and operating logic

**OPERATING LOGIC**

Cold fresh air from outside flows through the heat exchanger and is moved to the room with the supply fan.

Warm extract air is extracted from the room with the exhaust fan and is moved through the heat exchanger, where it transfers its heat energy to the intake air. After that it is exhausted outside.

Heat energy of warm and humid extract air is transferred to the cold fresh air. The air flows are fully separated while flowing through the heat exchanger. Heat recovery minimizes heat losses caused by traditional window ventilation and saves energy.

In summer the heat exchanger performs reverse and transfers cold from the cooled extract air to the warm fresh air. This contributes to better

performance of the air conditioner in ventilated premises.

In summer, when the indoor and outdoor temperature difference is low heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for warm seasons. Available upon separate order.

**DELIVERY SET**

- ✓ Air handling unit – 1 item
- ✓ Operation manual – 1 item
- ✓ Speed switch – 1 item
- ✓ Packing box – 1 item

**ATTENTION**



Make sure the unit has no visible transport damages while accepting the goods. Check the ordered and the delivered goods for compliance.

### TECHNICAL DATA

Table 1. Technical data

Parameters	KOMFORT L350	KOMFORT L500	KOMFORT L530	KOMFORT L600	KOMFORT L1200	KOMFORT L2200
Voltage [V]	1~ 230 / 50-60 Hz				1~ 230 / 50 Hz	1~ 230 / 50-60 Hz
Power [kW]	0.26	0.3	0.3	0.39	0.82	1.3
Current [A]	1.2	1.32	1.32	1.72	3.6	5.68
Max. air capacity [m <sup>3</sup> /h]	350	500	530	600	1200	2200
R.p.m.	1150	1100	1100	1350	1850	1150
Sound pressure level at 3 m distance [dB(A)]	24-45	28-47	28-47	32-48	60	65
Transported air temperature [°C]	from -25 up to +55	from -25 up to +50		from -25 up to +55	from -25 up to +40	
Casing material	aluzinc					
Insulation	25 mm mineral wool				50 mm mineral wool	
Extract filter	cassette G4					
Intake filter	cassette G4					
Connected air duct diameter [mm]	125	150	160	200	250	315
Weight [kg]	45	49	49	54	85	96
Heat recovery efficiency [%]	up to 78	up to 88		up to 85	up to 88	up to 87
Heat exchanger type	cross-flow					
Heat exchanger material	polystyrene					

Table 2. Overall dimensions

Model	Dimensions [mm]									
	D	B	B1	B2	B3	H	H1	H2	L	L1
KOMFORT L350	124	416	300	54	207	603	230	148	722	768
KOMFORT L500	149	416	300	54	207	603	230	148	722	768
KOMFORT L530	159	416	300	54	207	603	230	148	722	768
KOMFORT L600	199	416	300	54	207	603	230	148	722	768
KOMFORT L1200	248	548	496	60	213	794	290	200	802	850
KOMFORT L2200	313	846	796	235	588	968	360	246	1000	1050

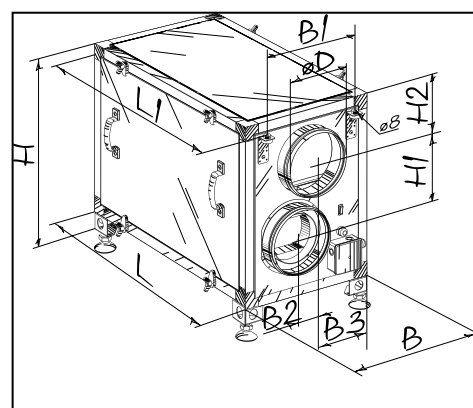


Fig. 2. Overall dimensions

Table 3. Accessories

Model	Replaceable G4 cassette filter
KOMFORT L350	FP-L350-600 G4
KOMFORT L500	
KOMFORT L530	
KOMFORT L600	
KOMFORT L1200	FP-L1200 G4
KOMFORT L2200	FP-L2200 G4

## MOUNTING

**WARNING****Safety precautions:**

The unit must be mounted to a rigid and stable structure. The unit must be suspended using anchor bolts. Make sure that the base structure is capable of sustaining the unit weight.

The unit mounting is allowed only after power cut-off and full stop of the rotating parts.

**Restrictions:**

Do not operate the unit beyond the determined temperatures, in aggressive and in explosive medias. Do not connect the clothes dryer or other similar equipment to the ventilation system.

Do not use the unit for air/dust mixture handling.

The unit is designed for indoor mounting. The unit has versatile mounting possibilities and may be installed on the floor, suspended to the ceiling or fixed to the wall. The unit is suitable for mounting in technical, service premises as well as living and lounge areas.

Install straight air ducts on both sides of the unit to minimize aerodynamic resistance caused by air flow turbulence, the minimum air duct section length is equal to 1 time air duct diameter on the inlet side and 3 time air duct diameters on the outlet side.

While planning the ductwork layout avoid too long air duct sections, numerous bends and reducers because it may reduce air flow.

The mounted air ducts must not be deformed. Provide airtight connection of the air ducts to the unit spigots and fittings.

While mounting consider the need to ensure sufficient service access to the unit. The unit mounting position must provide condensate drainage and access to the terminal box for electric connection and access to the service panel for maintenance and filter replacement.

In case of insufficient length or no air ducts cover the unit spigots with a protecting grille or any other protecting device with maximum mesh width 12.5 mm to prevent ingress of foreign objects inside the unit and to prevent contact with unit fans.

**Unit mounting on a horizontal plane**

Fix the unit on a rigid and stable horizontal plane.

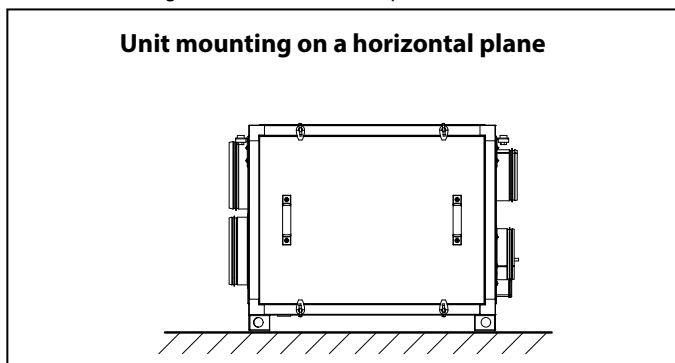


Fig. 3. Unit mounting on a horizontal plane

**Suspended mounting**

Prior to starting mounting make sure the mounting surface has sufficient load capacity matching the unit weight. Otherwise reinforce the installation place with beams.

The unit must be rigidly fixed! Loose fixation of the unit may result in noise and vibration generation.

The unit is suspended to the ceiling with four M8 anchor bolts, the matching dowels, nuts and washers.

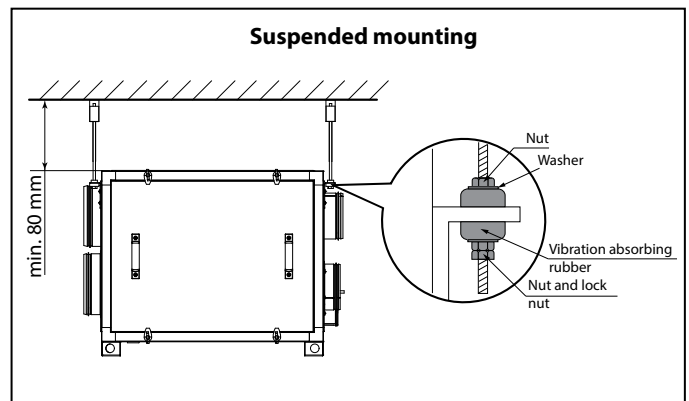


Fig. 4. Suspended mounting of the unit

**CDP-3/5 speed switch mounting (Fig. 5):**

- 1) Remove the speed switch knob.
- 2) Use a screwdriver to carefully undo the clips on the front panel of the speed switch and remove the panel.
- 3) Route the cable in the wall to the speed switch installation site.
- 4) Connect the wires to the speed switch and fix the back panel to the wall through the mounting holes.
- 5) Install the front panel and the control knob of the speed switch.

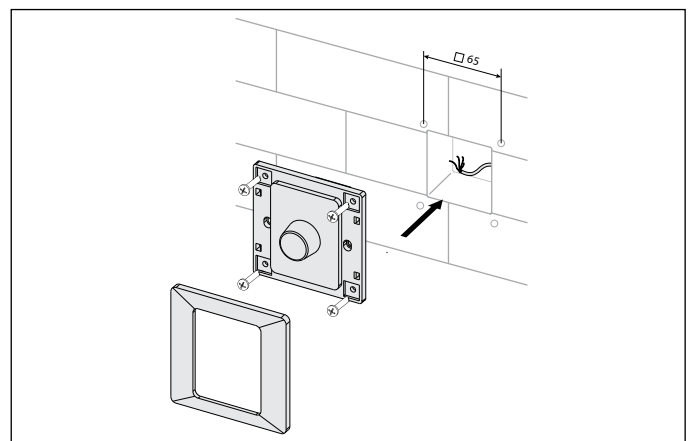


Fig. 5. Speed switch mounting

## CONDENSATE DRAINAGE

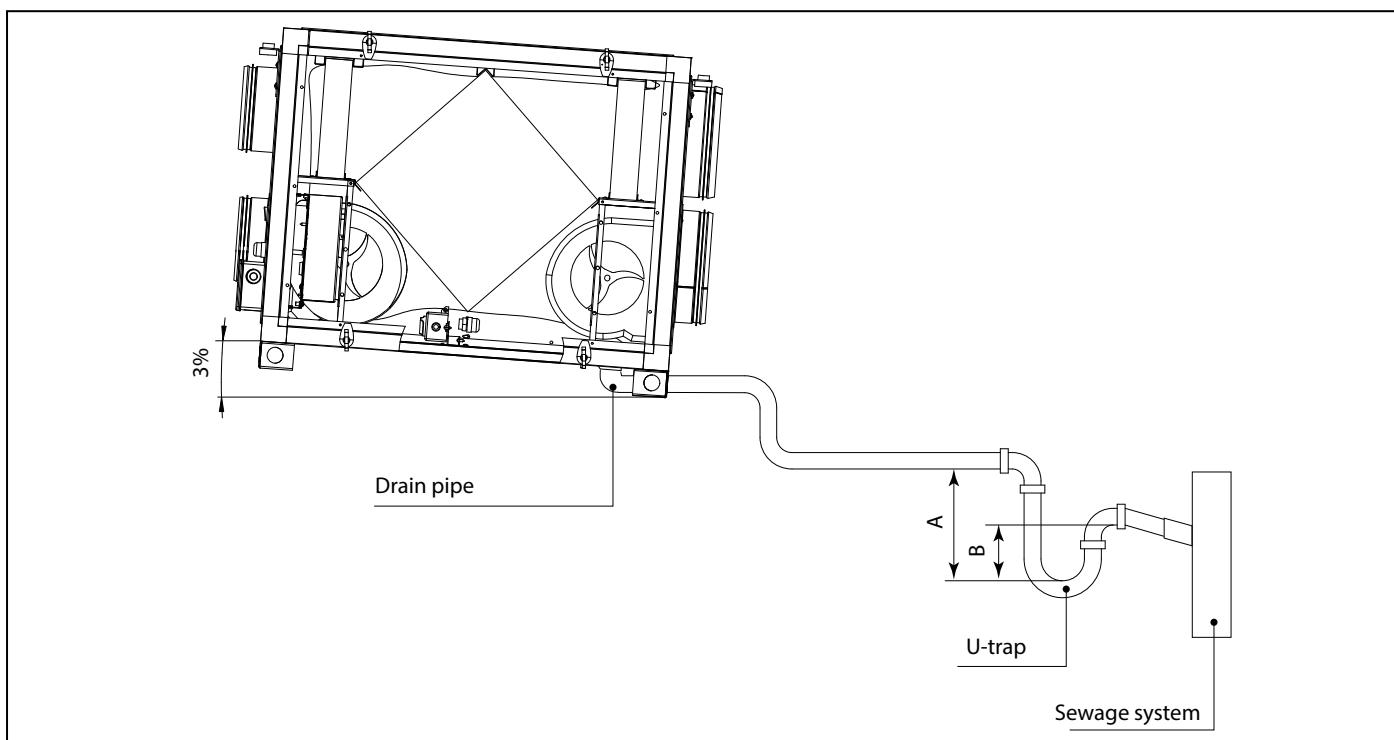


Fig. 6. Condensate drainage

The drain pan is equipped with a drain pipe for condensate removal outside the unit.

Connect the drain pipe, the U-trap (not included into the delivery set) and a sewage system with drain hoses. While laying the hoses provide the slope downward min 3 %.

Fill the system with water prior to connecting it to power supply. The U-trap must always be filled with water to maintain free flow of condensate.

**The condensate drain system is suitable for indoor frost-free application with the ambient temperature above 0 °C! If the expected ambient temperature is below 0 °C provide heating for the drain system.**

Table 4. Recommended dimensions of the U-trap

Model	Minimum dimensions [mm]	
	A	B
KOMFORT L350	120	60
KOMFORT L500		
KOMFORT L530		
KOMFORT L600	200	110
KOMFORT L1200		
KOMFORT L2200		

**WARNING**

*In case of several units mounting connect each unit to an individual U-trap.*

*Direct condensate drainage with no connection to the drain system is not allowed.*

**CONNECTION TO POWER MAINS**



**WARNING**

Read the service instruction prior to any electric installations. Connection of the unit to power mains is allowed by a qualified electrician only.  
 The rated electrical parameters are stated on the rating plate. Any tampering with the internal connections is prohibited and will void the warranty.  
 Connect the unit only to power mains with valid electric standards.  
 Follow the respective electric standards, safety rules (DIN VDE 0100), TAB der EVUs. The house cabling system must be equipped with a magnetic trip automatic switch at the external input. The contact gap on all poles must be at least 3 mm (VDE 0700 T1 7.12.2 / EN 60335-1).  
 The automatic switch trip current must be not below the rated current consumption (see Table 1). Enable quick access to an automatic switch installation place.

The unit is rated for connection to single-phase AC power mains according to the Table 1 „Technical data“. The electric connections must be performed with insulated, durable and heat-resistant conductors (cables, wires) with a matching cross section.

The above cross section is for reference only. The applicable cable must be selected in consideration of the maximum wire temperature depending on the wire and insulation type, the maximum current, the lead wire length and its installation method.

Use copper wires only.

The unit must be grounded in compliance with the valid electrical standards of the user country!

The unit connection must be consistent with the Wiring diagram and the terminal designations given on Fig. 7. Connect all the control and supply cables in compliance with the terminal marking and polarity!

The rating plate with a terminal designation is placed inside of the terminal box.

Table 5. Recommended currents of the of automatic switch

Model	Rated current of the automatic switch [A]
KOMFORT L350	1,6
KOMFORT L500	
KOMFORT L530	
KOMFORT L600	2
KOMFORT L1200	6
KOMFORT L2200	10

Cut power supply to the unit off by turning the automatic electric switch QF to OFF position prior to any operations. Take steps to prevent activation of the automatic switch before finishing all the operations.

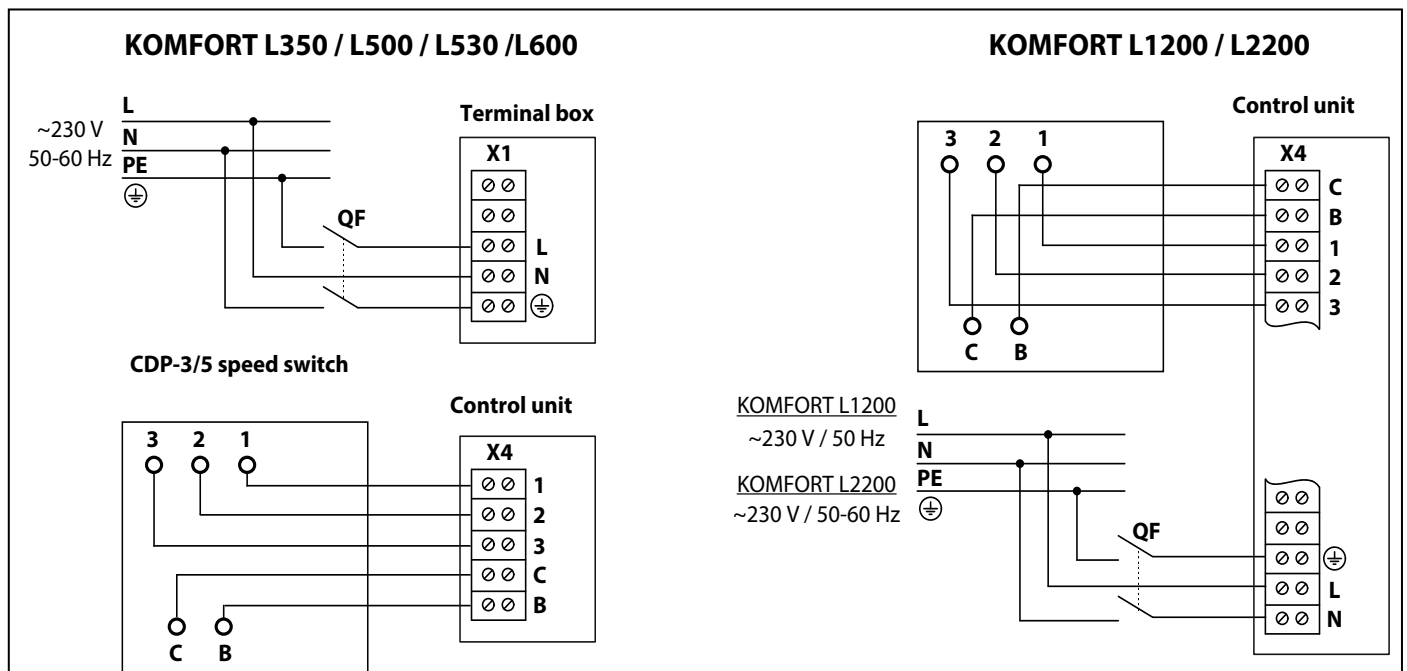
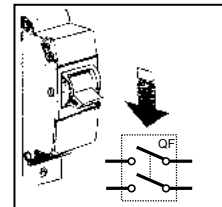


Fig. 7. Wiring diagram



## UNIT CONTROL

The step control of the unit air flow is performed with the speed switch. Make sure to install the switch in a convenient location.

The units are equipped with the CDP 3/5 speed controller. It is factory-connected to the unit terminal block in compliance with the Wiring diagram on page 7.

To engage the desired speed turn the speed control knob clockwise into one of the three positions available (Fig. 8):

1 – Speed 1; 2 – Speed 2; 3 – Speed 3.

To switch off the unit turn the speed control knob counterclockwise until reaching the «0» (left) position.

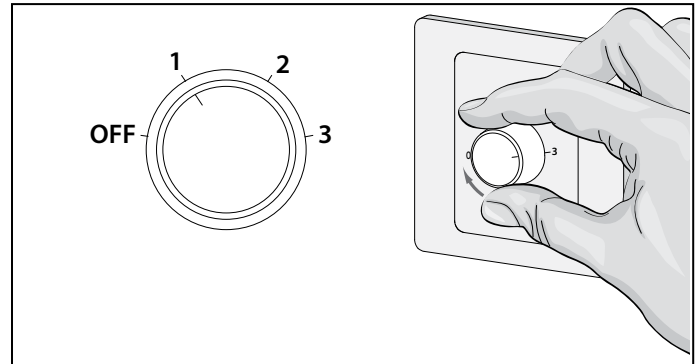


Fig. 8. Speed switch control

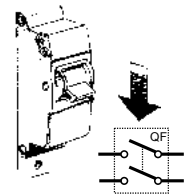
## TECHNICAL MAINTENANCE



### WARNING

*Cut power supply to the unit off by turning the automatic electric switch QF to OFF position prior to any maintenance operations.*

*Take steps to prevent activation of the automatic switch before finishing all the operations.*



Regular technical supervision and maintenance of the unit are required to ensure the product long service life and non-stop operation.

Disconnect the unit from power supply prior to any maintenance operations.

**WARNING! Consider the unit sharp edges! Fulfil maintenance operations in work gloves!**

Maintenance operations of the unit are required 3–4 times per year.

The unit technical maintenance includes regular cleaning and other works:

### 1. Filter maintenance (3–4 times per year).

Dirty filters increase air resistance and decrease supply air volume. Clean the filters with a vacuum cleaner or flush those with water. After two consecutive cleanings the filter must be replaced. Install dry filters only! Contact a local distributor to purchase the filters stated above in the „Technical data“ section.

**Dirty filters are not considered as a warranty case!**

**Replace humid and mouldy filters immediately.**

To remove the filters proceed as follows:

- Make sure the unit is disconnected from power mains.
- Unlatch and open the service panel.
- Remove the dirty filters from the unit and install new or cleaned filters.

### 2. Heat exchanger maintenance (once a year).

The heat exchanger must be regularly cleaned to maintain high heat recovery efficiency even in case of the regular filter cleaning. To clean the heat exchanger pull it out, flush the heat exchanger with warm detergent solution. After cleaning install the dry heat exchanger back to the unit.

Sequence of heat exchanger removal:

- Make sure the unit is disconnected from power mains.
- Unlatch and open the service panel.
- Remove the filters from the unit. If necessary install new or cleaned filters.
- Remove the dirty heat exchanger from the unit. After technical maintenance install the dry heat exchanger back to the unit.

### 3. Fan maintenance (once a year).

The regular filter cleaning may not completely prevent the dust ingress into the unit, which results in the unit performance decrease.

Clean the fan with a soft cloth or a brush.

Cleaning with water, abrasive detergents, sharp object or chemicals is not allowed.

### 4. Condensate drain system maintenance (once per year).

The condensate drainage (drain line) may get clogged by dirt and dust particles contained in the exhaust air. Check the drain line operation by filling the drain pan under the unit with water, clean the U-trap and the drain line, if necessary.

### 5. Technical maintenance of the supply grille (twice a year).

Check the supply grille and remove foreign objects to maintain free air intake.

### 6. Air ducts maintenance (once in 5 years).

Even regular fulfilling of all the prescribed above maintenance operations may not completely prevent dirt accumulation in the air ducts which reduces the unit capacity. Duct maintenance means regular cleaning or replacement.

### 7. Exhaust grilles and intake diffusers maintenance (if required).

Remove the exhaust grilles and the intake diffusers and flush those with warm detergent solution.

Check the ductworks connections periodically!

## TROUBLESHOOTING

Fault	Possible reason	Troubleshooting
<b>The fans do not operate</b>	No power supply or wrong connection to power mains.	Connect the unit to power supply. Troubleshoot the connection error.
	The motor is jammed, the impeller blades are soiled.	Remove the motor jam, clean the impeller blades.
<b>Automatic switch tripping</b>	Short circuit in power grid.	Turn the unit off and contact the unit Seller for troubleshooting.
<b>Low air flow</b>	Too low set speed.	Set higher speed.
	The filters and the fans are soiled, the heat exchanger is soiled.	Clean or replace the filters, clean the fans and the heat exchanger.
	The air dampers, the supply diffusers or the exhaust grilles are closed or soiled.	Open and clean the air dampers, the supply diffusers, the exhaust grilles to ensure free air flow.
<b>Noise, vibration</b>	The impeller is soiled.	Clean the impeller.
	The screw connection is loose.	Tighten the screws.
	No flexible anti-vibration connectors.	Install the flexible anti-vibration connectors.
<b>Condensate leakage</b>	The drain system is clogged, damaged or wrong installed.	Clean the condensate drain system. Check the drain hose slope. Make sure the U-trap is filled with water and the drain system is frost-protected.

**ACCEPTANCE CERTIFICATE****The air handling unit with heat recovery**

KOMFORT L350		KOMFORT L600	
KOMFORT L500		KOMFORT L1200	
KOMFORT L530		KOMFORT L2200	

**is recognized as serviceable.**

The unit complies with the requirements according to the EU norms and directives, to the relevant EU-Low Voltage Equipment Directives, EU-Directives on Electromagnetic Compatibility. We hereby declare that the unit complies with the essential protection requirements of Electromagnetic Council Directive 2004/108/EC, 89/336/EEC and Low Voltage Directive 2006/95/EC, 73/23/EEC and CE-marking Directive 93/68/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility, which relate to electrical appliances used in set voltage classes.

This certificate is issued following test carried out on samples of the product referred to above.

Approval mark \_\_\_\_\_ Manufacturing date \_\_\_\_\_

**CONNECTION CERTIFICATE****Heat recovery air handling unit**

KOMFORT L350		KOMFORT L600	
KOMFORT L500		KOMFORT L1200	
KOMFORT L530		KOMFORT L2200	

is connected to power mains in compliance with the operation manual requirements by the professional:

Company: \_\_\_\_\_

Expert's Full Name \_\_\_\_\_

Date \_\_\_\_\_ Signature \_\_\_\_\_

**WARRANTY CARD**

KOMFORT L350		KOMFORT L600	
KOMFORT L500		KOMFORT L1200	
KOMFORT L530		KOMFORT L2200	

**SELLER****PURCHASE DATE****REPRESENTATIVE IN EU**

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