Operating and installation instructions

REMKO LTE Eco series

Dehumidifier

LTE 50 Eco, LTE 60 Eco, LTE 80 Eco

0284-2021-02 Edition 1, en_GB

Read the instructions prior to performing any task!

Read these operating instructions carefully before commissioning / using this device!

These instructions are an integral part of the system and must always be kept near or on the device.

Subject to modifications; No liability accepted for errors or misprints!

Translation of the original

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1 Safety and usage instructions

1.1 General safety notes

Carefully read the operating manual before commissioning the units for the first time. It contains useful tips and notes such as hazard warnings to prevent personal injury and material damage. Failure to follow the directions in this manual not only presents a danger to people, the environment and the system itself, but will void any claims for liability.

Keep this operating manual and the refrigerant data sheet near to the units.

The refrigerant used in the system is flammable. If applicable, observe the local safety conditions.

Caution, risk of fire

1.2 Identification of notes

This section provides an overview of all important safety aspects for proper protection of people and safe and fault-free operation.The instructions and safety notes contained within this manual must be observed in order to prevent accidents, personal injury and material damage.

Notes attached directly to the units must be observed in their entirety and be kept in a fully legible condition.

Safety notes in this manual are indicated by symbols. Safety notes are introduced with signal words which help to highlight the magnitude of the danger in question.

DANGER!

Contact with live parts poses an immediate danger of death due to electric shock. Damage to the insulation or individual components may pose a danger of death.

DANGER!

This combination of symbol and signal word warns of a situation in which there is immediate danger, which if not avoided may be fatal or cause serious injury.

WARNING!

This combination of symbol and signal word warns of a potentially hazardous situation, which if not avoided may be fatal or cause serious injury.

CAUTION!

This combination of symbol and signal word warns of a potentially hazardous situation, which if not avoided may cause injury or material and environmental damage.

NOTICE!

This combination of symbol and signal word warns of a potentially hazardous situation, which if not avoided may cause material and environmental damage.

This symbol highlights useful tips and recommendations as well as information for efficient and fault-free operation.

1.3 Personnel qualifications

Personnel responsible for commissioning, operation, maintenance, inspection and installation must be able to demonstrate that they hold a qualification which proves their ability to undertake the work.

1.4 Dangers of failure to observe the safety notes

Failure to observe the safety notes may pose a risk to people, the environment and the units. Failure to observe the safety notes may void any claims for damages.

In particular, failure to observe the safety notes may pose the following risks:

- The failure of important unit functions.
- The failure of prescribed methods of maintenance and repair.
- Danger to people on account of electrical and mechanical effects.

1.5 Safety-conscious working

The safety notes contained in this manual, the existing national regulations concerning accident prevention as well as any internal company working, operating and safety regulations must be observed.

1.6 Safety instructions for the operator

The operational safety of the units and components is only assured providing they are used as intended and in a fully assembled state.

This unit can be used by children above the age of 8, as well as by people with impaired physical, sensory or mental capabilities or a lack of experience and knowledge if they are supervised or have received instruction in the safe operation of the unit, and if they understand the associated potential hazards. Children must never play with the device. Cleaning and user maintenance must not be carried out by unsupervised children.

- The units and components may only be set up, installed and maintained by qualified personnel.
- If the mains power supply line of this unit is damaged, this must be replaced by the manufacturer or their customer services department or a similarly qualified person in order to avoid any hazard.
- Do not operate units or components with obvious defects or signs of damage.
- The units may not be installed or operated in explosive environments.
- The units must not be installed or operated in atmospheres containing oil, sulphur, chlorine or salt.
- The units must be installed upright and in a stable position.
- The units and components must not be exposed to any mechanical load, extreme levels of humidity or extreme temperatures.
- All housing parts and device openings, e.g. air inlets and outlets, must be free from foreign objects. An unobstructed air inlet and air outlet must be guaranteed at all times.
- The units must not be covered during operation.
- Never stick foreign objects into the units.
- The units must not be transported while they are running.
- The units must only be transported when the condensate container is empty and the evaporator is dry.
- All electrical cables on the outside of the units must be protected against damage (e.g. by animals etc.).
- Before each change of location, the condensate container must be emptied.
- The units must be inspected by a service technician to ensure that they are safe to use and fully functional at least once yearly. Visual inspections and cleaning may be performed by the operator when the units are disconnected from the mains.
- The units shall be installed, operated and stored in a room with a floor area larger than 4 m^2.
- The refrigerant R454C fulfils the requirements of the European F-Gas regulation.
- The units must not be burned, drilled or pierced.
- The units may only be operated in well ventilated areas.

! NOTICE!

Extensions to the connection cable must only be conducted by authorised specialist electricians, taking into consideration the unit power consumption, cable length and local use.

! NOTICE!

Work on the refrigerant system and on the electrical equipment must only be conducted by a specially-authorised specialist!

1.7 Safety notes for installation, maintenance and inspection work

- Appropriate hazard prevention measures must be taken to prevent risks to people when performing installation, repair, maintenance or cleaning work on the units.
- The setup, connection and operation of the units and its components must be undertaken in accordance with the usage and operating conditions stipulated in this manual and comply with all applicable regional regulations.
- If the mains power supply line of this unit is damaged, this must be replaced by the manufacturer or their customer services department or a similarly qualified person in order to avoid any hazard.

- The units must be installed upright and in a stable position.
- The units must not be exposed to direct jets of water, e.g. pressure washers etc.
- Safety devices may not be modified or bypassed.
- The units and components may only be set up, installed and maintained by qualified personnel.
- Do not operate units or components with obvious defects or signs of damage.
- The units may not be installed or operated in explosive environments.
- The units must not be installed or operated in atmospheres containing oil, sulphur, chlorine or salt.
- The units and components must not be exposed to any mechanical load, extreme levels of humidity or extreme temperatures.
- All housing parts and device openings, e.g. air inlets and outlets, must be free from foreign objects. An unobstructed air inlet and air outlet must be guaranteed at all times.
- All electrical cables on the outside of the units must be protected against damage (e.g. by animals etc.).
- The units must be inspected by a service technician to ensure that they are safe to use and fully functional at least once yearly. Visual inspections and cleaning may be performed by the operator when the units are disconnected from the mains.
- The refrigerant R454C used in the system is flammable. If applicable, observe the local safety conditions.
- Note that refrigerant may be odourless.

1.8 Unauthorised modification and changes

Modifications or changes to units and components are not permitted and may cause malfunctions. Safety devices may not be modified or bypassed. Original replacement parts and accessories authorised by the manufactured ensure safety. The use of other parts may invalidate liability for resulting consequences.

1.9 Intended use

The units are designed exclusively for drying and dehumidification purposes in industrial or commercial situations on the basis of their structural design and equipment. The units must only be operated by appropriately instructed personnel.

Any different or additional use is a non-intended use. The manufacturer/supplier assumes no liability for damages arising from non-intended use. The user bears the sole risk in such cases. Intended use also includes working in accordance with the operating and installation instructions and complying with the maintenance requirements.

The threshold values specified in the technical data must not be exceeded.

1.10 Warranty

For warranty claims to be considered, it is essential that the ordering party or its representative complete and return the "certificate of warranty" to REMKO GmbH & Co. KG at the time when the units are purchased and commissioned.

The warranty conditions are detailed in the "General business and delivery conditions". Furthermore, only the parties to a contract can conclude special agreements beyond these conditions. In this case, contact your contractual partner in the first instance.

1.11 Transport and packaging

The devices are supplied in a sturdy shipping container. Please check the equipment immediately upon delivery and note any damage or missing parts on the delivery and inform the shipper and your contractual partner. For later complaints can not be guaranteed.

WARNING!

Plastic films and bags etc. are dangerous toys for children!

Why:

- Leave packaging material are not around.

- Packaging material may not be accessible to children!

1.12 Environmental protection and recycling

Disposal of packaging

All products are packed for transport in environmentally friendly materials. Make a valuable contribution to reducing waste and sustaining raw materials. Only dispose of packaging at approved collection points.

Disposal of equipment and components

Only recyclable materials are used in the manufacture of the devices and components. Help protect the environment by ensuring that the devices or components (for example batteries) are not disposed in household waste, but only in accordance with local regulations and in an environmentally safe manner, e.g. using certified firms and recycling specialists or at collection points.

2 Technical data

2.1 Unit data

Unit type		LTE 50 Eco	LTE 60 Eco	LTE 80 Eco
Operating range, temperature	°C	3 to 32		
Operating range, humidity	% RH	40 to 100		
Dehumidification capacity max.	l/day	51	62	80
at 30 °C / 80% RH	l/day	46,1	54,2	70,1
at 20 °C / 70% RH	l/day	25.6	31.9	40.7
at 10 °C / 60% RH	l/day	8.0	10.1	12.3
Max. airflow volume	m^3/h	380	465	490
Condensate container capacity	l	10.0		
Compressor / condenser - design		Rotary piston		
Refrigerant [1)]		R454C		
Refrigerant quantity	g	420	520	630
Power supply	V/Ph/Hz	220-240/1~/50		
Max. rated current consumption	A	2.86	3.61	4.01
Max. power consumption	kW	0,63	0,71	0,93
At 20 °C / 70% RH	kW	0,5	0,57	0,74
Specific energy consumption	kWh/l	0,30	0,29	0,28
At 20 °C / 70% RH	kWh/l	0,43	0,43	0,40
Customer-provided electrical protection	A	16		
Type of connection		Y		
Enclosure class		IPX4		
Sound pressure level L_{pA} 1m [2)]	dB(A)	49	53	52
Electronic start safeguard		Series		
Operating hours counter		Series		
Power meters		Series		
Hot gas defrosting		Series		
Hygrostat		Series		
Room temperature sensor		Series		
Condensate pump, built-in		Option		
Hose length (condensate pump)	m	5 (10 [3)])		
Delivery height (condensate pump)	m	5		

For more, see the next page.

Unit type		LTE 50 Eco	LTE 60 Eco	LTE 80 Eco
Dimensions				
Depth	mm	512		
Width	mm	540		
Height	mm	795		
Height incl. transportation bracket	mm	945		
Weight	kg	38.5	40.0	45.0
EDP no.		618510	618610	618810
EDP no. Unit with condensate pump		618515	618615	618815

[1] Contains greenhouse gas according to Kyoto protocol.

[2] Noise level measurement DIN 3744 - KL 2

[3] Max. permissible hose length

We reserve the right to modify the dimensions and design as part of the ongoing technical development process.

3 Design and function

3.1 Air dehumidification - general note

The correlations occurring when air is dehumidified are based on physical laws. These are depicted here in graphical form in order to provide you with a brief overview of the principles of air dehumidification

The use of REMKO air dehumidifiers

- Even if windows and doors are well insulated, water and moisture are still capable of penetrating thick concrete walls.
- The water required for setting in the production of concrete, mortar and plaster etc. may only be diffused after 1-2 months.
- Even moisture trapped in the masonry after high-water or a flood is released very slowly.
- The same is also true of moisture contained in stored materials for example.

The moisture (water vapour) released from parts of a building or materials is absorbed by the surrounding air. As a result, the moisture content increases, which ultimately gives rise to corrosion, mould, rot, peeling of paint and other unwanted damage. By way of example, the diagram below shows the corrosion rate of metal in different levels of humidity.

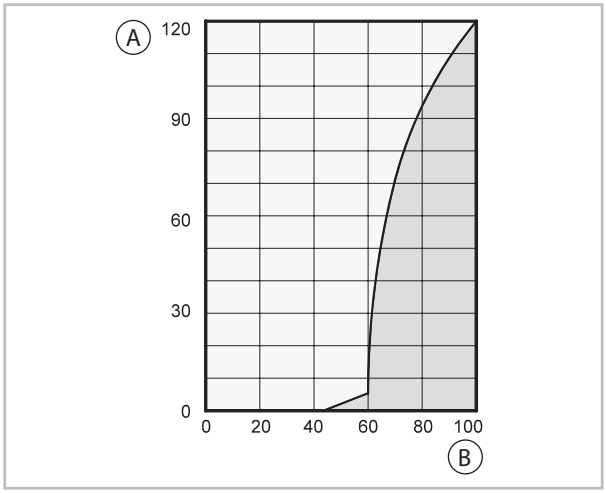


Fig. 1: Corrosion rate in relation to relative humidity

A: Corrosion rate
B: Relative humidity [%]

It is evident that the corrosion rate below 50% relative humidity (RH) is low, and below 40% is negligible.

The corrosion rate increases significantly above 60% RH. This threshold for damage as the result of humidity also applies to other materials, such as powdery substances, packaging, wood and electronic units.

Buildings may be dried in a variety of ways:

1. By heating and air exchange: The air in the room is heated in order for moisture to be removed and then this air is fed outside. All of the energy that is involved is lost together with the moist air that is released.
2. By air dehumidification: The moist air that is present within an enclosed space is continuously dehumidified in accordance with the condensation principle.

With regard to energy consumption, air dehumidification has one distinct advantage:

Energy expenditure is limited exclusively to the air volumes present. The mechanical heat that is released by the dehumidification process is fed back into the room.

! NOTICE!

Under normal use, the air dehumidifier uses approximately 25% of the energy that is required for the "heating and ventilating" principle.

Relative air humidity

Our ambient air is a gaseous mixture which always contains a certain volume of water in the form of water vapour. This volume of water is specified in g per kg of dry air (absolute moisture content).

1m³ of air weighs approx. 1.2 kg at 20 °C

Depending on the temperature, each kg of air is only capable of absorbing a certain volume of water vapour. Once this capacity has been reached, the air is referred to as "saturated" and has a relative humidity (RH) of 100%.

Relative humidity is understood to mean the ratio between the current quantity of water vapour in the air and the maximum possible quantity of water vapour at the same temperature. The ability of the air to absorb water vapour increases as the temperature rises. I.e. the maximum possible (absolute) water content becomes greater as the temperature rises.

Temp.	Water vapour content in g/m³ at humidity of	
°C	40%	60%
-5	1.3	1.9
+10	3.8	5.6
+15	5.1	7.7
+20	6.9	10.4
+25	9.2	13.8
+30	12.9	18.2
°C	80%	100%
-5	2.6	3.3
+10	7.5	9.4
+15	10.2	12.8
+20	13.8	17.3
+25	18.4	23.0
+30	24.3	30.3

Drying materials

Building materials and structures are capable of absorbing considerable volumes of water, such as brick 90-190 l/m³, heavy concrete 140-190 l/m³ and limestone 180-270 l/m³. The drying of moist materials such as masonry is effected as follows:

The moisture moves from the inside of the material to its surface.

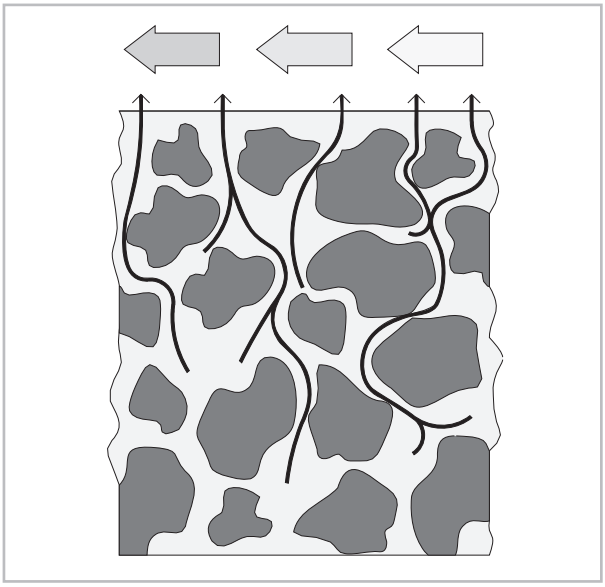


Fig. 2: Drying damp masonry

- Evaporation occurs on the surface = Transfer of water vapour to the ambient air
- The air containing water vapour is constantly circulated through the REMKO air dehumidifier. The air is dehumidified and, slightly heated, leaves the unit in order to re-absorb water vapour
- In this way, the moisture contained in the material is reduced gradually

The material is dried!

The accumulated condensate is collected in the unit and drained off from there.

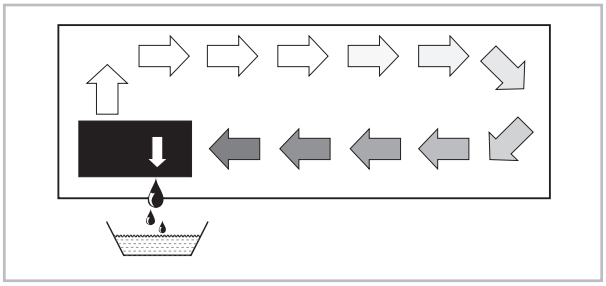


Fig. 3: Extracting and collecting condensate

Functional principle of the air dehumidifier

As it flows through or over the evaporator, the air stream is cooled to dew point. The water vapour condenses, and is collected in a condensate trap from where it is drained off.

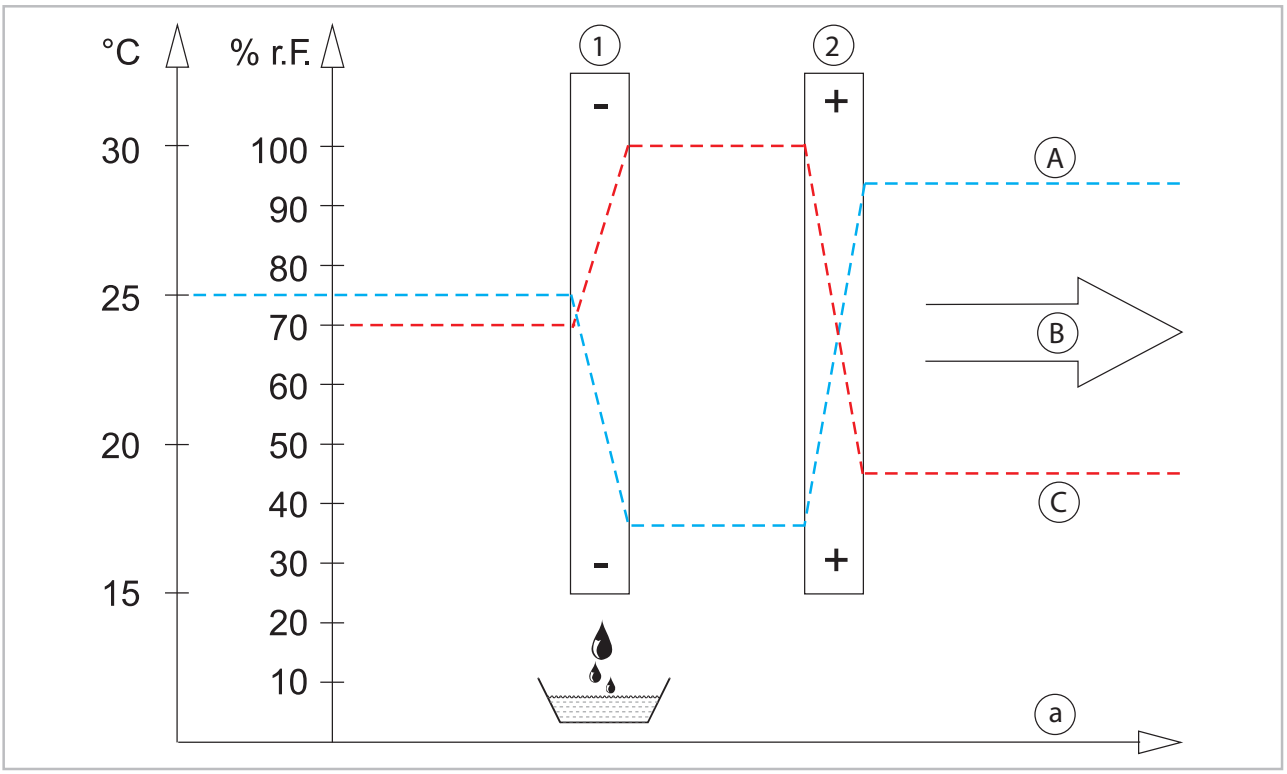


Fig. 4: Functional principle of the air dehumidifier

1: Evaporator
2: Condenser
A: Air temperature
B: Air direction
C: Humidity
a: Progression

The condensation of water vapour

Because the capacity for the maximum possible volume of water vapour increases as the air is heated, the volume of water vapour contained remains constant and so relative humidity falls.

In contrast, because the capacity for the maximum possible volume of water vapour decreases as the air is cooled, the volume of water vapour contained remains constant and so relative humidity increases. If the temperature continues to fall, the capacity for the maximum possible volume of water vapour is reduced so much so that it is ultimately equal to the volume of water vapour contained in the air.

This temperature is referred to as the dew point. If the air is cooled to below dew point, the volume of water vapour in the air will become greater than the maximum possible volume of water vapour. At this point, the water vapour begins to precipitate. It then condenses to water. Humidity is then removed from the air.

Examples of condensation include steamed-up window panes in winter, or the moisture on the outside of a cold drinks bottle.

As the relative humidity of the air increases, so too does the dew point, making it easier for the temperature to fall below it.

Condensation heat

The energy transferred to the air from the condenser consists of:

1. the amount of heat derived beforehand in the evaporator
2. the electrical drive energy
3. the condensation heat released by the liquefying of the water vapour.

Energy must be supplied when liquid is converted into a gas. This energy is designated as evaporation heat. It does not cause any increase in temperature, but is required to convert a liquid into a gas. Conversely, energy is released when gas is liquefied, this is designated as condensation heat.

The amount of energy from evaporation heat and condensation heat is the same.

For water, this is: 2250 kJ/kg (4.18 kJ = 1kcal)

From this it is evident that the condensation of water vapour causes a large quantity of energy to be released. With drying operations, a heat cycle is created, whereby heat is consumed for evaporation and released for condensation.

Generally speaking, the time required for the drying process is not only dependent on the output of the unit, but is determined to a greater extent by the speed at which the material or building section loses its moisture.

3.2 Unit description

The units have been designed for universal and straightforward air dehumidification.

Their compact dimensions allow the unit to be transported and set up with ease.

The units operate in accordance with the condensation principle and are equipped with a hermetically sealed refrigerant system, low-noise and low-maintenance fan, operating hours and energy counter as well as a connection cable with plug. Fully-automatic electronic controller, a condensate container with integrated overflow protection in addition to connection ports for direct condensate drainage help to ensure continuous fault-free operation.

The units conform to the fundamental health and safety requirements of the appropriate EU stipulations. The units are dependable and offer ease of operation.

Locations at which units are used

The units are used in all locations, where dry air is a must and where economic consequential damage (such as that caused by mould) must be prevented.

The units may be used for the drying and dehumidification of areas such as:

- New buildings, industrial buildings
- Basements, storage rooms
- Archives, laboratories
- Weekend homes, caravans
- Bathrooms, wash rooms and changing rooms etc.

Operating sequence

Switching on the unit puts the electrical control into operation. The green "COMP. ON" indicator light on the control panel illuminates. Due to an automatic pressure equalisation, the units start with a time delay of around 10 seconds.

The fan extracts the moist room air through the dust filter, evaporator and the condenser behind.

Heat is removed from the room air on the cold evaporator. The air is then cooled to below dew point. The water vapour contained in the room air is then deposited as condensate or rime on the evaporator fins.

If the temperature sensor here measures a pre-set minimum, it activates a timer with a 30 minute delay. If the evaporator temperature stops increasing during this period, the cooling cycle switches to hot gas defrosting after the timer cycle.

The fan remains out of operation during the defrosting phase.

As soon as the rime (ice) has been defrosted and the temperature at the probe has increased, the unit switches back to normal dehumidification mode.

If the room temperature is sufficiently high, the surface of the fins will not be cold enough for rime formation to occur, rendering defrosting unnecessary. Therefore, the air dehumidifiers work economically.

The cooled and dehumidified air is re-heated by the condenser (heat exchanger), and blown back into the room through the outlet grille. The processed, dry, heated air then re-mixes with the room air.

Continuous circulation of the room air through the unit gradually reduces the relative humidity (% RH) in the room to the desired humidity level. Depending on the room temperature and the humidity, only 30-40% electrical energy is required, in accordance with the output of the unit.

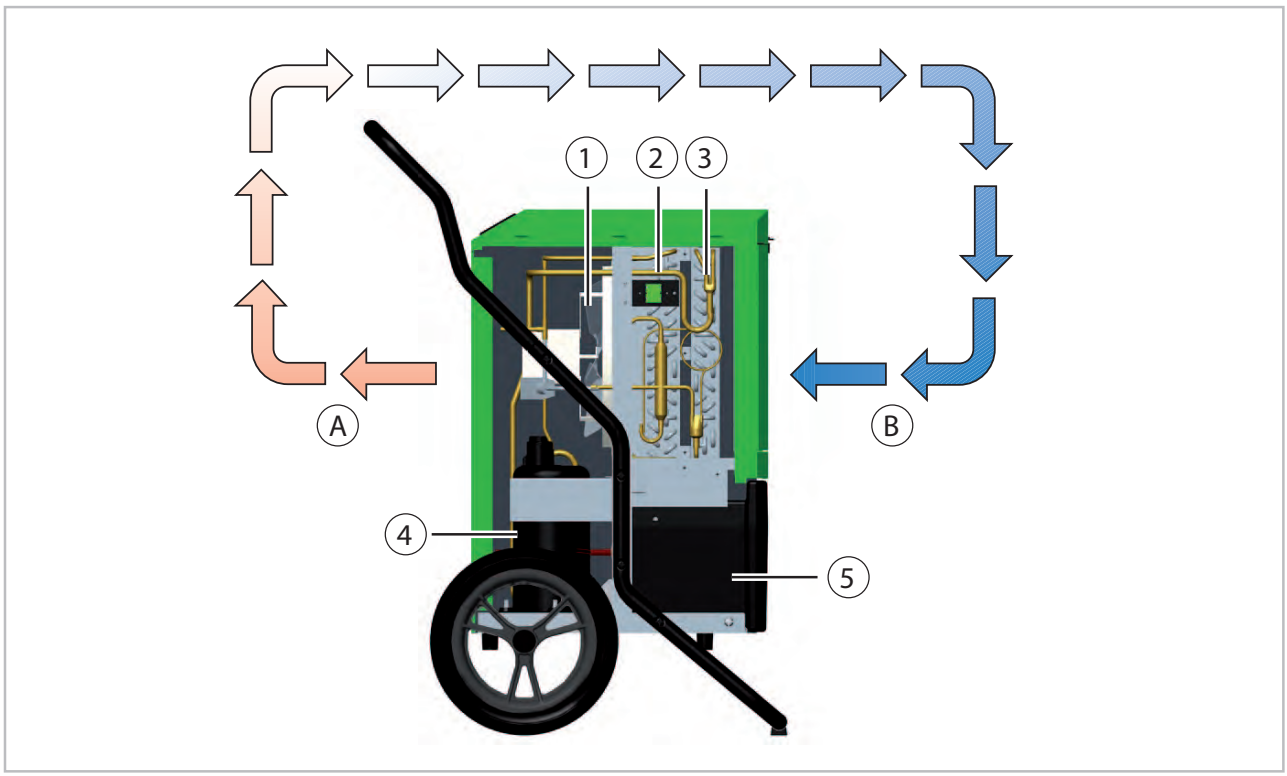


Fig. 5: Air dehumidification operating principle

A: Dehumidified room air
B: Moist room air
1: Fan
2: Condenser
3: Evaporator
4: Compressor
5: Condensate container

4 Assembly

4.1 Setting up the unit

For the best economic and safe use of the units, the following notes must be followed in full:

- The units must be set up in an upright and level position, to ensure that the condensate can drain freely
- To ensure optimum air circulation, the units should be set up in the centre of the room, where possible
- It must be ensured that the air can be sucked in on the front of the unit and blown out of the rear of the unit without obstruction
- Observe a minimum clearance of 50 cm from walls at all times
- Units must never be set up in the immediate vicinity of heaters or other sources of heat
- The room being dried or dehumidified must be closed to the surrounding atmosphere
- Air circulation is improved if the unit is set up approx. 1 m above the ground
- Avoid having opened windows and doors etc., and avoid frequent entry to or exit from the room as much as possible
- If the units are to be used in dusty environments, appropriate care and maintenance measures should be taken in accordance with the relevant conditions
- The output of the unit is entirely dependent on the conditions inside the room, room temperature, relative humidity and observance of the set-up instructions
- The units may not be used in environments containing a great deal of dust or chlorine, or in places with atmospheres containing ammonia

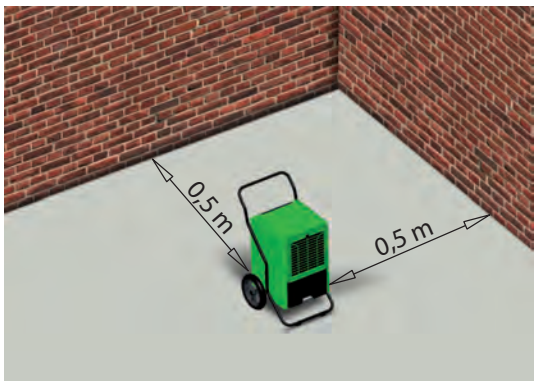


Fig. 6: Setting up the unit

NOTES:

- *Keep windows and doors closed!*
- *Keep at least 0.5 m away from walls.*
- *Maintain adequate clearance from heaters or other sources of heat.*

4.2 Unit transport

For easy transportation, the units are equipped with 2 large wheels and an ergonomic transportation handle and protective frame. This can also be dismantled easily if required.

When transporting the units, observe the following:

1. Before each change of location, switch off the unit and remove the power plug from the mains socket.
2. Drain the condensate container.

3. Only transport the units in an upright position where possible.
4. If the unit was transported on its side, you must wait 1 hour with the unit in an upright position before switching on.

! NOTICE!

Beware of dripping condensate. After switching off the units, the evaporator may continue to defrost under the influence of the ambient temperature.

⚠ WARNING!

The mains cable must never be used as a pull cord or fixing device.

5 Electrical wiring

5.1 General notes

- The units are operated with 220-240 V/50 Hz alternating current
- The electrical connection is made using a built-in mains cable with earthed safety plug

WARNING!

The electrical connection to the units must be made at feed-points with residual current devices in accordance with VDE 0100, Section 704. When installing the units in extremely damp environments such as laundry rooms, showers etc., the unit must secured with a residual current device provided by the customer in accordance with the regulations.

- Extensions to the connection cable may only be carried out by authorised electricians, subject to the length of the cable, connected load of the unit and taking into consideration how the unit is used at its location
- The LTE 80 is intended for operation on a power supply network with a system impedance Zmax at the transfer point (house connection) of max. 0.09 Ohm. The user must ensure that the unit is only operated on a power supply network that meets these requirements. If necessary, the system impedance can be obtained from the local power supply company

CAUTION!

All cable extensions must only be used in fully un-reeled or reeled off condition.

5.2 Electrical wiring diagram

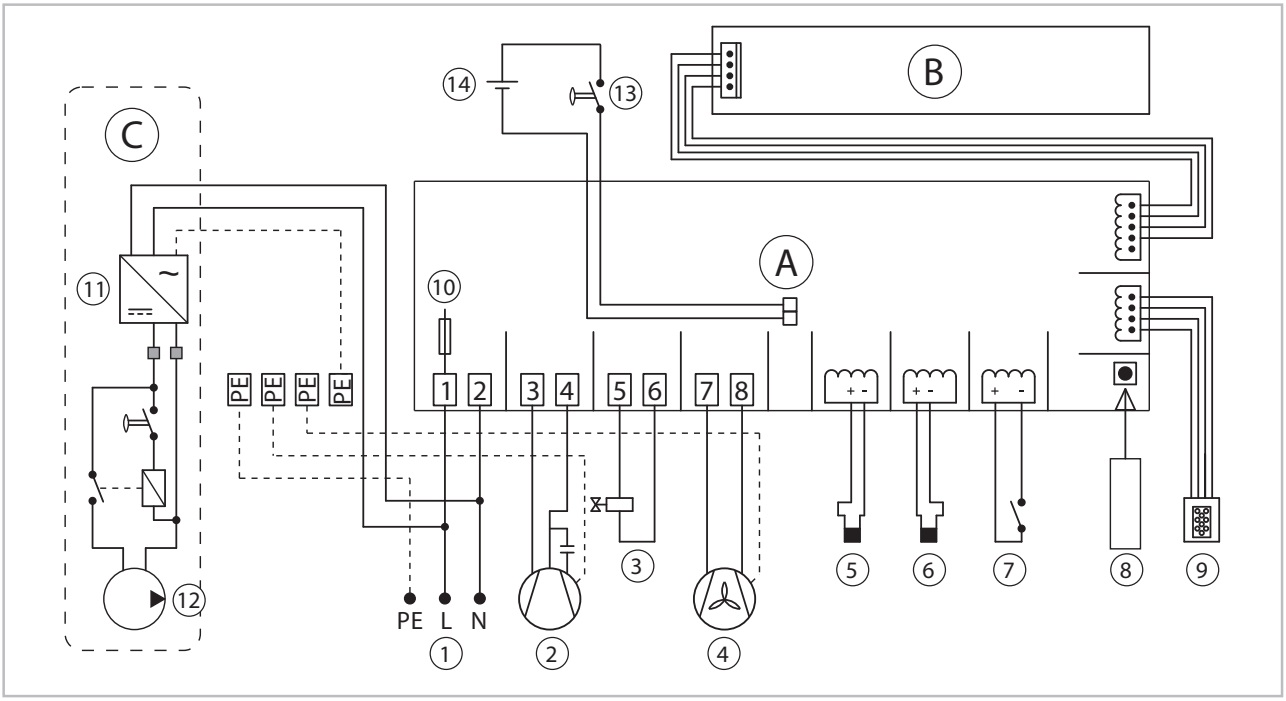


Fig. 7: Electrical wiring diagram

A: Control board / B: Display circuit board
C: Optional
1: Power supply
2: Compressor
3: Solenoid valve
4: Fan motor
5: Evaporator probe
6: Condenser probe
7: Water stop probe
8: RESET button
9: Humidity probe
10: Fuse 3.15A 250V
11: Mains adapter
12: Condensate pump
13: "kWh" key
14: 9V block battery

6 Commissioning

Before commissioning the unit or if local requirements dictate, the air-inlet grille and air-outlet grille must be checked for contamination.

> **! NOTICE!**
> A contaminated grille or filter must be cleaned or replaced immediately.

Important notes prior to commissioning

- All extensions to the electrical connection must be of a sufficient cable size and must only be used fully rolled out or unrolled.
- Never use the power supply connection cable as a pull cord.
- After being switched on, the units operate fully-automatically until switched off by the float when the condensate container is full.
- The condensate container must be inserted properly.
- In order to prevent damage to the condenser, the units are equipped with a mechanism that prevents the compressor from being immediately switched back on after it is switched off

  The compressor does not switch back on until after a waiting time of ca. 1 minute!

> **! NOTICE!**
> In room temperatures below **10 °C** and relative humidity below **40%**, economical use of the unit can no longer be guaranteed.

Starting the unit

Start the unit as follows:

1. Plug the unit's power plug into a properly installed and fused mains socket (220-240 V/50 Hz).

If you connect the dehumidifier to the mains, the unit should be switched off (not operating). The segment display and LED indicators illuminate for 3 seconds (the humidity display shows "88" and the hour counter display shows "88888.8"). After that the segment display for the humidity [3] shows the environmental humidity and the display for the operating hours counter and the energy counter [6] shows the operating hours counted for the compressor.

2. Actuate the "ON/OFF" key.

The green "COMP. ON" indicator light illuminates. The unit switches on with a time delay of around 10 seconds and then runs in continuous operating mode.

The unit will now operates fully-automatically until the desired relative humidity (% RH) has been reached or until the unit is switched off by the float when the condensate container is full. In this case, the red "FULL TANK" indicator light illuminates.

Automatic restart after power failure:

If the electrical power fails or if the power plug is pulled out during operation, the unit switches off. When the unit is switched back on again or if the power plug is put back in again the unit starts up again automatically after a safety delay time of 70 seconds.

Control and display panel:

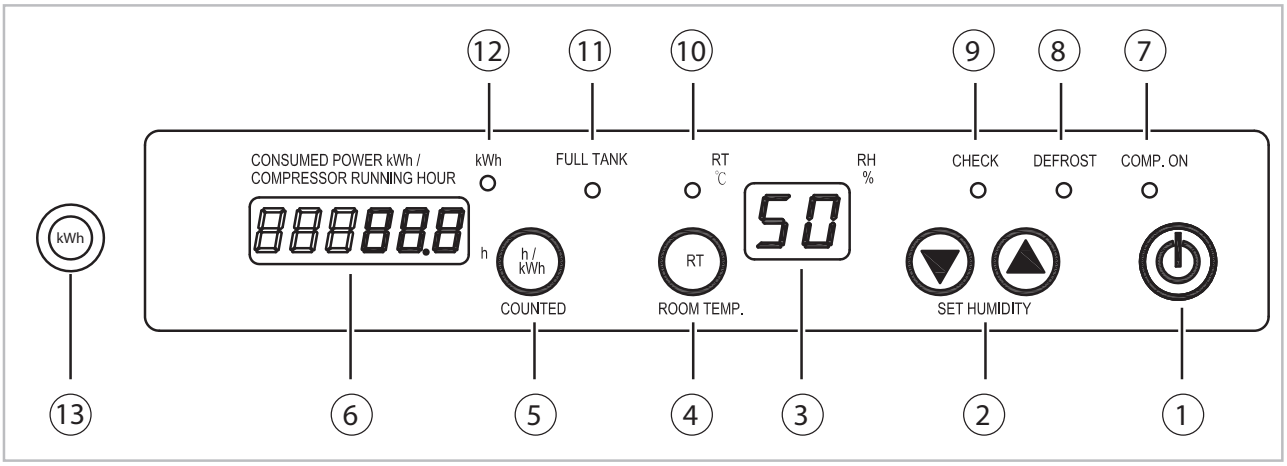


Fig. 8: Control panel

① **ON / OFF key:**

After actuating the ON / OFF key whilst switched off, the unit starts as soon as the humidity in the room (RH) is 4% higher than the target value set for the humidity in the room. The start sequence is: Fan motor ON → solenoid valve ON 10 seconds and then OFF → compressor ON. If the room humidity is lower than the target value set for the humidity in the room, then the "COMP. ON" indicator flashes and the unit is in standby mode (not operating).

If the ON / OFF key is actuated during operation, the unit and the COMP ON" display switch off. The ON / OFF delay time of the compressor is 1 minute.

② **SET HUMIDITY - Desired humidity setting:**

After the unit is switched on, the target room humidity can be adjusted up or down by pressing the arrow keys. As soon as the room humidity reaches the target humidity set, the compressor and the fan motor stop. The target room humidity set is displayed for 3 seconds during the adjustment and then reverts to the current measured room humidity.

NOTE:

- If the unit is restarted it reverts to the previous setting
- The adjustment steps for the target humidity are 5% (RH) per key press. The adjustment range for the target humidity should lie between 30% and 70% (RH)

If the humidity lies below the target humidity set (i.e.: △RH <-3%), the compressor and the fan motor stop. If the humidity is higher than the target humidity set (i.e.: △RH >+4%), the unit restarts with a 3 minute delay.

Example: If the target humidity = 50% RH, but the room humidity is 47% RH, then the compressor and fan motor stop and the "COMP. ON" indicator flashes (standby display!). While the room humidity rises to 54% RH, the unit restarts with a 3 minute delay time in accordance with the start function sequence.

The target room humidity value must be set within 3 seconds by pressing the up arrow or down arrow keys. Then the current room humidity is displayed again.

③ **Segment display for humidity, room temperature and malfunction code:**

The standard display is the current measured room humidity. The humidity value to be changed is displayed for 3 seconds by pressing one of the arrow keys [2] to set the target room humidity. If the ROOM TEMP key is pressed, the current measured room temperature is shown in the display for 5 seconds and then the display automatically switches back to the current measured room humidity.

Function or situation	Segment display
Power plug is plugged in, the unit is switched off	Current measured room humidity is displayed
The unit starts	Current measured room humidity is displayed
During the adjustment of the target room humidity	The target room humidity set is displayed
Upon actuation of the ROOM TEMP. Key	The current measured room temperature is displayed for 5 secs
Is a malfunction is present	Error code is displayed

④ Room temperature key (RT) - To display the room temperature:

By actuating the "ROOM TEMP." key, the red RT °C indicator illuminates and the current room temperature is displayed for 5 seconds in the segment display [3]. Then the current measured room humidity appears again automatically.

⑤ COUNTED key - to display the electrical power consumed or the compressor run-time counted:

By actuating the "COUNTED" key, the "kWh" indicator illuminates and the electrical power (kW) consumed by the unit is displayed in the segment display [6].

Actuating the "COUNTED" key again switches off the "kWh" indicator and the operating hours (h) of the compressor are displayed in the segment display [6].

⑥ Indicator of the counted compressor running time or max. consumed electrical energy:

In standby mode, the current compressor run-time (h) is displayed in the segment display [6] or, by actuating the "COUNTED" key, the max. electrical power consumed (kWh).

The segment display [6] shows the operating hours of the compressor or the max. electrical power consumed by the unit. The display shows values from "0.0" to "99999.9"

The unit has a built-in operating hours counter. To determine the maximum consumed electrical energy, the compressor running time is multiplied by the maximum power consumption. The unit does not have a stand-alone current or energy meter.

⑦ COMP. ON INDICATOR:

If the compressor is running, this indicator is illuminated. If the compressor is stops, the indicator flashes.

The unit has a 3 minute restart delay for the compressor as a safety function. This means that the compressor requires 3 minutes to restart after it has stopped due to having reached the target room humidity set. The "COMP. ON" indicator flashes during the 3-minute protection period

⑧ DEFROST INDICATOR:

If the temperature of the evaporator (Te) is <= 1 °C and the compressor runs for more than 5 minutes, the DEFROST indicator flashes and the 30-minute delay timer for the defrost function starts.

Defrost function: Compressor still ON, fan motor OFF, solenoid valve ON, DEFROST indicator illuminates. If the temperature of the evaporator (Te) is >= 3 °C then the defrost function stops and the DEFROST indicator extinguishes.

Function of the unit after defrost: Compressor ON, fan motor ON, solenoid valve OFF, DEFROST indicator off

⑨ "CHECK" indicator:

If there is an abnormal situation (malfunction), the CHECK indicator [9] illuminates or flashes. If the temperature probe (Te or Tc) or the humidity probe is defective, the unit switches off and the indicator light [9] illuminates. Then the error code (E1, E2, E4 or E5) is displayed in the segment display [3]. If the water tank is full (FULL TANK), the indicator light (CHECK) flashes.

If the temperature of the condenser (Tc) is over 50 °C while the unit is running, the indicator light (CHECK) flashes.

There are two types of protective function for the Tc over-temperature (50 °C):

If Tc is >50 °C and the compressor runs within 5 minutes, the unit switches off and the error code "E3" is shown in the segment display [3] and the CHECK indicator [9] flashes. In this case, the fault cannot be reset with a key press. The unit power plug must be removed from the socket so that the unit is completely de-energised. Then, the dehumidifier can be restarted after a restart delay of 70 seconds.

If Tc is > 50 °C and the compressor runs over 5 minutes, the compressor stops but the fan motor continues to run for a further 30 minutes. The segment display flashes with fault code E3 during this time. After 30 minutes the unit is restarted for normal function with the previous setting.

NOTE:

- Within this 30 minute protective period, the "ON / OFF" key can be pressed in order to switch the unit off. If the "ON / OFF" key is then pressed, the unit restarts after a delay time of 1 minute.

⑩ RT °C INDICATOR:

If the "ROOM TEMP" key is pressed, the RT indicator [10] illuminates for 5 seconds.

⑪ "FULL TANK" DISPLAY:

If the water tank is full the "FULL TANK" and "CHECK" indicators illuminate. The compressor and the fan motor are automatically switched off at this time.

In order to reset the messages described, the condensate water must be removed from the water tank. Then the water tank must be properly inserted back into the unit. After that the unit will start again after a 3 minute delay time.

If the unit is switched off while the "FULL TANK" and "CHECK" indicators are illuminated, both indicators switch off.

If the unit is switched on, but is in standby mode (i.e.: room humidity is lower than the target room humidity set), the compressor and the fan motor are switched off and the "COMP. ON" indicator illuminates. If the water tank is full at this time, the "FULL TANK" and "CHECK" indicators flash.

⑫ kWh INDICATOR:

By actuating the "COUNTED" key, the "kWh" indicator illuminates and the max. electrical power in kW consumed by the unit is displayed in the segment display [6].

The kWh indicator may not be used as an energy meter in commercial transactions (as defined in applicable standards and directives, in particular the Measuring Instruments Directive 2014/32/EU).

⑬ kWh key:

By pressing the “kWh” key, the control panel can be activated in a de-energised state. This allows the consumed electrical power or the counted compressor running time to be displayed without current.

Function table:

	Functions	Power plug inserted	Operating status: Unit operating or in standby		Defrost function		Full tank function
		OFF (no operation)	Standby (no operation) △ RH <-3%	The unit starts △ RH >+4%	30 min. timer expires if Te<=1 °C	After the 30 mins. defrost timer function has passed	
A	Comp. ON LED	OFF	Flashes	ON	ON	ON	OFF
B	Check LED	OFF	OFF	OFF	OFF	OFF	Flashes
C	Defrost LED	OFF	OFF	OFF	Flashes	ON If Te >=3 °C, then OFF	OFF
D	Full Tank LED	OFF	OFF	OFF	OFF	OFF	Flashes
E	Solenoid valve	OFF	OFF	ON for 10 sec. then OFF	OFF	ON If Te >=3 °C, then OFF	OFF
F	Fan motor	OFF	OFF	ON after 10 sec.	ON	OFF If Te >=3 °C, then ON	OFF
G	Compressor	OFF	OFF	ON after 10+0.5 sec	ON	ON	OFF
H	Humidity segment display [3]	Current room humidity is displayed					
I	Operating hours / power consumption segment display [6]	Operating hours or power consumption are displayed (changeover by actuating the "h/kWh" key)					

7 Condensate removal

Depending on the air temperature and the relative humidity, condensed water will drip into the condensate container either continuously or only during the defrosting phases.

A float is located inside the condensate container. In the event that the container is full, the float will activate a water stop switch which will switch off dehumidification mode.

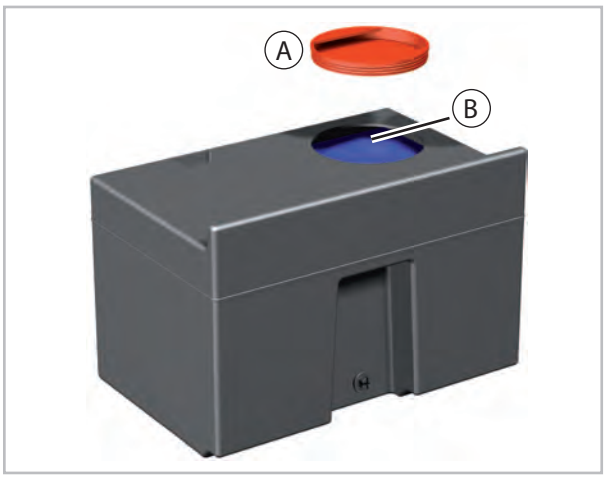
To guard against accidental stops caused by water sloshing around etc., this switch does not activate until after a time delay of 10 seconds. The unit will switch off and the red "TANK FULL" indicator light on the control panel will flash.

In order to empty the condensate tank, proceed as follows:

1. Actuate the "ON/OFF" switch.
2. Remove the filled condensate tank. To do this, lift the container slightly using the embedded recessed grip and then pull it carefully forwards and out.

> **! NOTICE!**
> Beware of dripping condensate. After switching off the units, the evaporator may continue to defrost under the influence of the ambient temperature.

3. Place the container carefully outside the unit and pull of the sealing cover [A] of the pouring opening [B].



4. Pour the water into a drain.

5. Close the pouring opening [B] and carefully insert the condensate container back into the unit.
6.

> **! NOTICE!**
> After being emptied, the condensate container incl. float must be checked for damage, contamination etc.

Switch the unit on again with the "ON/OFF" key .

> **! NOTICE!**
> The units are only fully functional if the condensate container is inserted properly.

Unit operation with hose connection

The hose connection is implemented directly on the 12 mm Ø screw-in hose nozzle that is placed on the top edge of the condensate tank when shipped.

Connect the hose as follows:

1. Remove the condensate tank.
2. Remove the screw-in hose nozzle from the place-holder [D] and swap this for the sealing screw in the 3/8" inside thread [C]. Then tighten the screw-in hose nozzle hand-tight.

   Ensure that the connection is sealed!
3. Plug hose with inside diameter 12 mm onto the screw-in hose nozzle and secure this with a hose clamp to prevent it slipping off.
4. Then fit the condensate tank back into place.

   Ensure that there are no kinks in the hose!

Fig. 9: Detailed view

Fig. 10: Placeholder

Fig. 11: Sealing screw

Fig. 12: Screw-in hose nozzle

In unattended permanent operating mode, the condensate should preferably be drained into a lower-level drain. If using a collection container (pan, bucket, etc.), the unit must be placed at a correct height.

Unit operation with condensate pump (optional)

The condensate tank with integrated pump has two magnetic contacts [E] on the rear to establish the electrical connection with the unit. If the unit is supplied with power, 12 V DC is continuously present at the contacts on the unit side. This provides the power supply for the condensate pump.

Fig. 13: Condensate tank at the rear

The following steps should be carried out for unit operation with condensate pump:

1. Remove the condensate tank.
2. Plug the hose supplied onto the pass-though hose nozzle [F] fitted previously and secure this with a hose clamp to prevent it slipping off.
3. Ensure that the connection is sealed.
4. Fit the condensate tank back into place. The pump is immediately ready for use. If the water level in the condensate tank is sufficiently high, this starts to pump out the water.

   Ensure that there are no kinks in the hose!

Fig. 14: Condensate tank and hose

! NOTICE!

Unit operation with condensate pump is only possible with units that were shipped with the pump installed.

NOTICE!

If the condensate pump runs for an extended period of time, the condensate tank must be checked for contamination at regular intervals.

Unit operation with a condensate tank without pump is possible at any time.

8 Troubleshooting and customer service

The unit and components are manufactured using state-of-the-art production methods and tested several times to verify that they function correctly. However, if alarms should occur, please check the functions as detailed in the list below. Please inform your dealer if the unit is still not working correctly after all function checks have been performed!

Operational malfunctions

Malfunction	Remedial measures
The unit does not start	Check the setting of the "ON/OFF" switch. The green "COMP. "ON" indicator must illuminate
	Check the power supply and the power fuse provided by the customer 220-240 V/50 Hz
	Check the power plug and the cable for damage
	Check the level and correct seating of the condensate tank
	Check the setting of the desired humidity. The pre-set value must be lower than the relative humidity in the room
The red CHECK (malfunction) indicator light illuminates	The cooling cycle is overloaded or overheated (see "CHECK" indicator ↳ *on page 19*)
	Before starting the unit again, first identify the cause of the malfunction. (see "CHECK" indicator ↳ *on page 19*)
The unit runs but does not form any condensate	Check the room temperature. The operating range of the unit is between 3 °C and 32 °C
	Check humidity of the air, min. 40% RH required
	Check the dust filter for contamination and clean or replace if necessary
	Check the evaporator and condenser fins for contamination and clean if necessary
	Check the evaporator for ice or rime formation. If ice has formed, check the functionality of the automatic defrost and the temperature sensor
	If the unit fails to function correctly after the checks have been carried out, contact an authorised specialist

WARNING!

Work on the refrigerant system and on the electrical equipment must only be conducted by a specially-authorised specialist!

Display of error codes

Error codes are displayed in the segment display [1].

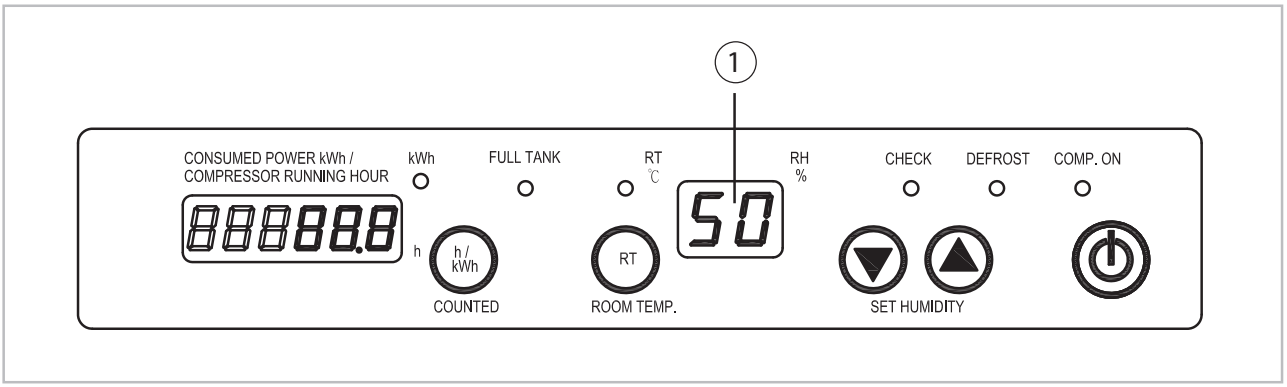


Fig. 15: Segment display

Error code description:

Error code	Error description
E1	Evaporator temperature probe (Te) defective
E2	Condensate temperature probe (Tc) defective
E3	Compressor runs within 5 minutes and the condenser temperature (Tc) > 50 °C
E3 flashes	Compressor runs over 5 minutes and the condenser temperature (Tc) > 50 °C
E4	Humidity/temperature probe (hygrostat) defective (room humidity measured > 100% RH)
E5	Humidity/temperature probe (room temperature Rt)

9 Shutdown

Actuate the "ON/OFF" key, the "COMP. ON" indicator must extinguish.

If the units are inactive for longer periods, disconnect them from the mains power supply.

Empty the condensate container and dry with a clean cloth.

Beware of dripping condensate!

When storing the unit, cover with a plastic sheet/ foil if necessary and store in an upright position in a sheltered and dry location.

To save space when storing, the units can be stacked on top of one another (max. two units stacked on top of each another). For this purpose, they are equipped with rubber pads on the base plate.

! NOTICE!

The units must be protected against falling down and unauthorised access after stacking.

Fig. 16: Stacking with max. 2 units

10 Care and maintenance

10.1 Care and maintenance

General notes

Regular care and maintenance is fundamental to a long service life and fault-free operation of the unit.

All moving parts have a low-maintenance permanent coat of lubricant. The refrigerant system is designed as a hermetically sealed system and may only be repaired by a specialist.

DANGER!

Before undertaking any work on the units, the mains plug must be removed from the mains socket.

- Observe the regular care and maintenance intervals

NOTICE!

Check the inlet and outlet grille for contamination on a regular basis.

- In accordance with the operating conditions, the units must be checked as and when required, but at least once per year, by a specialist to ensure that they are in a condition that is safe to use
- Keep the units free of dust and other debris
- Only clean the units with a dry or moistened cloth
- Never subject to direct jets of water (**e.g. pressure washers etc.**)
- Never use abrasive or solvent-based cleaners
- Even with heavy contamination, use only suitable cleaners

Cleaning the dust filter

NOTICE!

Check the inlet and outlet grille and the dust filter for contamination on a regular basis.

Pull the protection grid forwards and then remove upwards.

Then remove the dust filter which has now been released. Light contamination of the dust filter may be remedied with careful blowing or suction.

Heavier contamination may be remedied by rinsing the filter in a lukewarm (max. 40 °C) soap solution. Finally, always rinse the filter carefully with clear water and allow to dry!

Before refitting the dust filter, ensure that its fully dry and that no damage has been sustained.

NOTICE!

Heavily contaminated dust filters must be replaced with new parts. Only original replacement parts may be used.

The units may only be operated with the dust filter in place.

Cleaning the units

The unit housing must be opened to allow the inside of the unit to be cleaned and to provide access to electrical components.

> **! NOTICE!**
>
> Adjustment and maintenance work may only be carried out by authorised qualified technicians.

1. Loosen the two fastening screws [C].
2. Lift up the service flap and unhook the top lugs.

3. Clean the condenser fins by blowing, with suction or using a smooth brush.
4. Clean the evaporator fins, for example with a lukewarm soap solution (or similar).

> **! NOTICE!**
>
> When cleaning the exchanger, particular care must be taken because the fine aluminium fins bend very easily.

5. Never subject to direct jets of water.
6. Rinse with clean water to remove any remaining soap.
7. Clean the internal surfaces of the unit and the fan blade.
8. Clean the condensate trap and the connection nozzle.
9. Once cleaning has been completed, the unit should be dried. **Take particular care with electrical components!**
10. Re-install all dismantled components in reverse order.
11. Carry out a unit function check and electrical safety check.

> **⚠ WARNING!**
>
> An electrical safety check must be carried out in accordance with VDE 0701 after any work on the units.

10.2 Maintenance protocol

Unit type: ----------	**Unit number:** ----------	

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
Unit cleaned - outside -																				
Unit cleaned - inside -																				
Fan blade cleaned																				
Fan housing cleaned																				
Condenser cleaned																				
Evaporator cleaned																				
Fan function checked																				
Air-inlet grid with filter cleaned																				
Unit checked for damage																				
Safety devices checked																				
All fastening screws checked																				
Electrical safety check																				
Test run																				

Comments: .....

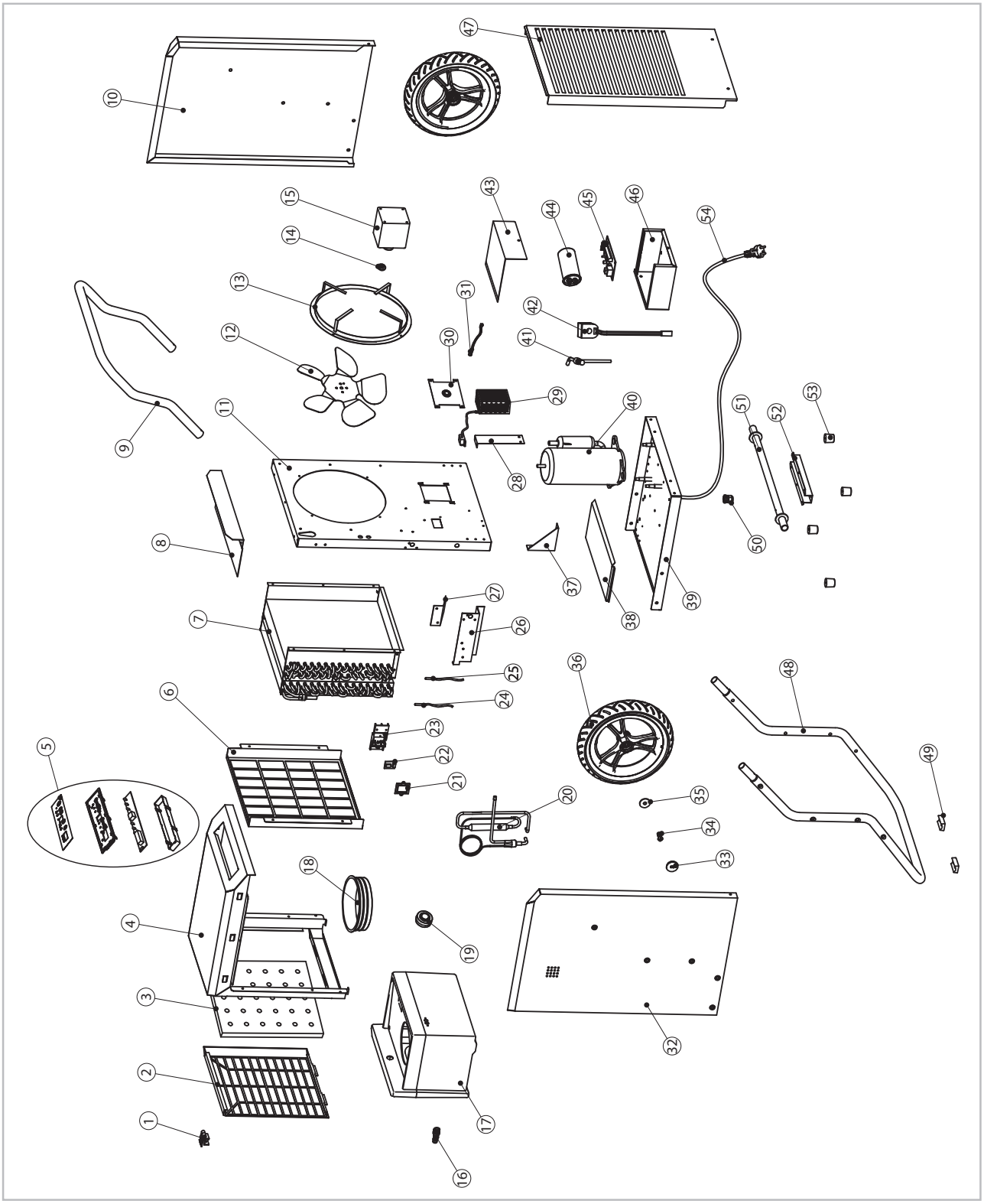
.....

01. Date: .... Signature	02. Date: .... Signature	03. Date: .... Signature	04. Date: .... Signature	05. Date: .... Signature
06. Date: .... Signature	07. Date: .... Signature	08. Date: .... Signature	09. Date: .... Signature	10. Date: .... Signature
11. Date: .... Signature	12. Date: .... Signature	13. Date: .... Signature	14. Date: .... Signature	15. Date: .... Signature
16. Date: .... Signature	17. Date: .... Signature	18. Date: .... Signature	19. Date: .... Signature	20. Date: .... Signature

Unit to be maintained only by authorised specialists in accordance with the statutory regulations.

11 Exploded view of unit and spare parts

11.1 Exploded view of the unit LTE 50/60/80 Eco



We reserve the right to modify the dimensions and design as part of the ongoing technical development process.

11.2 Spare parts list LTE 50/60/80 Eco

No.	Designation	LTE 50 Eco	LTE 60 Eco	LTE 80 Eco
1	Lock for sealing flap	On request by providing the serial number		
2	Air-inlet grille			
3	Dust filter			
4	Unit housing			
5	Control panel			
6	Filter grill, interior			
7	Evaporator fin package cpl.			
8	Top separating panel			
9	Transportation bracket			
10	Side covering, right			
11	Support frame			
12	Fan blade			
13	Engine mounting cpl.			
14	Drive clutch			
15	Fan motor			
16	Hose clamp 3/8" x 12 mm with O-ring			
17	Condensate container cpl.			
18	Taper plug			
19	Magnetic float compl.			
20	Dry filter			
21	Humidity / temp. probe cover			
22	Humidity / temp. probe			
23	Humidity / temp. probe holder			
24	NTC evaporator probe			
25	NTC condenser probe			
26	Condensate tank slide rail (left, right)			
27	Condensate guide panel (left, right)			
28	Magnetic contact retaining plate			
29	Pump mains power unit with magnetic contact and cable			
30	Fastening plate for water stop switch			
31	Water stop switch (reed contact)			
32	Side covering, left			
33	Hub cover cap			
34	Wheel screw			

REMKO LTE Eco series

No.	Designation	LTE 50 Eco	LTE 60 Eco	LTE 80 Eco
35	Wheel	On request by providing the serial number		
36	Wheel			
37	Triangular bracket			
38	Condensate tank fastening plate			
39	Base plate			
40	Compressor, cpl.			
41	Solenoid valve			
42	Coil for solenoid valve			
43	Housing cover			
44	Operating condenser			
45	Control board			
46	Switch cabinet housing			
47	Rear wall, housing parts			
48	Stand			
49	Rubber stopper, stand (2 pieces / set)			
50	Strain relief			
51	Axle			
52	Axle fastening plate			
53	Rubber stopper, base plate (4 pieces / set)			
54	Mains cable with plug			
	Spare parts not illustrated			
	Sealing screw with O-ring	On request by providing the serial number		
	Magnetic float brake			
	O-ring			
	Condensate tank with pump cpl.			
	Tank pass-through			
	Check valve			
	Hose 1m			

To assure the correct delivery of spare parts, please always provide the unit type with its corresponding serial number (see name plate).

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