

■ Operating and installation instructions

REMKO SLN series Swimming pool dehumidifiers

SLN 45, SLN 65, SLN 85



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Carefully read this operating manual prior to commissioning/using the units!

This operating manual is a translation of the German original.

These original instructions are an integral part of the unit and must always be kept in the vicinity of the installation location or on the unit itself.

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

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Safety notes

The units have been subjected to extensive material, functional and quality inspections prior to delivery.

However, dangers can result from the units if they are used improperly or not as intended by untrained personnel.

The following notes must be observed in full:

- The units may not be installed or operated in explosive environments
- The units must not be installed or operated in atmospheres containing oil, sulphur or salt
- The units must not be exposed to direct jets of water
- An unobstructed air inlet and air outlet must be guaranteed at all times
- The air-inlet grill must always be kept free of dirt and loose objects
- The units must not be covered during operation
- Never stick foreign objects into the units
- All electrical cables on the outside of the units must be protected against damage (e.g. by animals etc.)
- The units are only permitted to be set up or installed in the intended position (upright)
- Unobstructed and frost-proof condensate drainage must be ensured at all times
- The unit connections must always be established according to the applicable installation regulations

CAUTION

The units must be set up and installed in such a way that they are easily accessible for monitoring, repair and maintenance work.

Air dehumidification

The correlations occurring when air is dehumidified are based on physical laws.

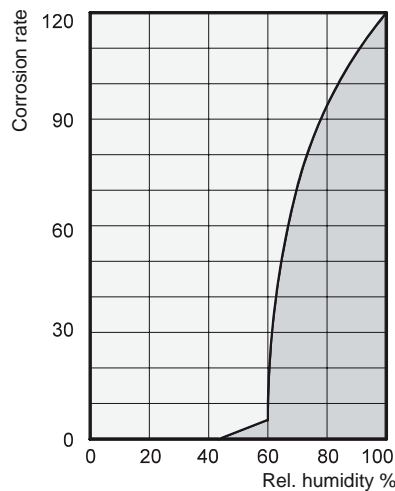
These are depicted here in graphical form in order to provide you with a brief overview of the principles of air dehumidification.

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 shows the corrosion rate of metal in different levels of 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 according to 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.

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).

1 m³ 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.

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| Temp. | Water vapour content in g/m ³ at humidity of | | | |
|-------|---|------|------|-------|
| | 40 % | 60 % | 80 % | 100 % |
| °C | | | | |
| -5 | 1.3 | 1.9 | 2.6 | 3.3 |
| +10 | 3.8 | 5.6 | 7.5 | 9.4 |
| +15 | 5.1 | 7.7 | 10.2 | 12.8 |
| +20 | 6.9 | 10.4 | 13.8 | 17.3 |
| +25 | 9.2 | 13.8 | 18.4 | 23.0 |
| +30 | 12.9 | 18.2 | 24.3 | 30.3 |

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.

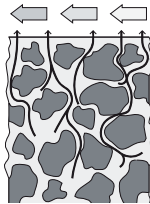
If the temperature continues to fall, the capacity for the maximum possible volume of water vapour is reduced so much so that it is ultimately equal to the volume of water vapour contained in the air. This temperature is referred to as the dew point. If the air is cooled to below dew point, the volume 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.

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

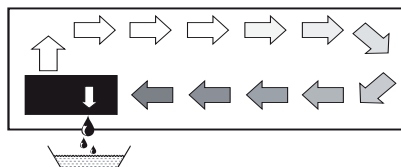


- Evaporation occurs on the surface = transfer of water vapour to the ambient air

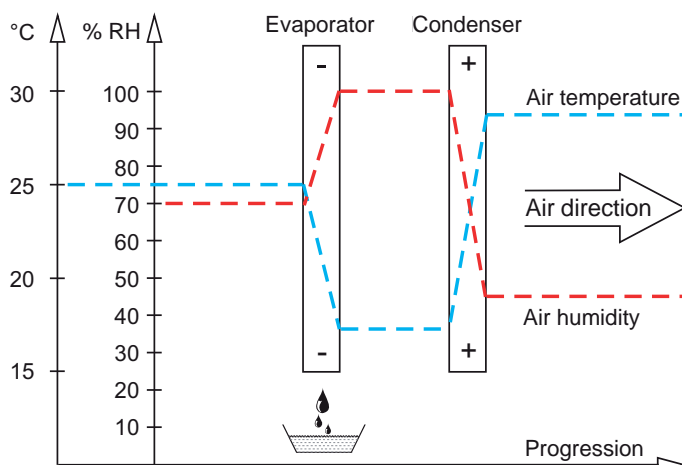
- The air containing water vapour is constantly circulated through the REMKO air dehumidifier. The air is dehumidified and, slightly heated, leaves the unit in order to re-absorb water vapour

- 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.



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.



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 liquefying 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.

If the moisture that it is to be condensed is not introduced by evaporation in the room itself, but from outside, e.g. through ventilation, the condensation heat released contributes to the heating of the room.

When dehumidifying, a heat cycle is created, whereby heat is consumed for evaporation and released for condensation.

When dehumidifying fed air, a larger contribution of heat is created, which manifests itself as a temperature increase.

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.

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Testing the water quality

Water quality

The correct combination of chemicals in swimming pools in indoor areas is of major importance to the health of the users and for systems in the vicinity of the swimming pool and its plant room.

Inadequately treated water leads to poor hygiene, whilst water that has been excessively treated gives off chlorine into the air, which can irritate the eyes and lead to respiratory problems. At the same time, an incorrect combination of chemicals in the water can lead within a very short time to the destruction of all systems - including the dehumidifier and other systems that have been installed for air treatment.

The following tables contain the limit values for swimming pools in indoor areas in accordance with EN/ISO 12944-2, corrosivity category C4.

These limit values must be observed, otherwise the guarantee is voided

When adding chemicals

The following guideline values apply to swimming pools when adding chemicals:

| Chemical values | ppm |
|---------------------------|---------------------------------------|
| Free chlorine content | 1,0 - 2,0 |
| Combined chlorine content | max. 1/3 of the free chlorine content |
| pH value | 7,2 - 7,6 |
| Total alkalinity | 80 - 150 |
| Calcium hardness | 250 - 450 |
| Total dissolved solids | < 2000 |
| Sulphates | < 360 |

With own production of chlorine

The following guideline values apply to swimming pools with own production of chlorine:

| Chemical values | ppm |
|------------------------|-----------|
| Salt (NaCl) | < 30000 |
| Total dissolved solids | < 5 500 |
| pH value | 7,2 - 7,6 |
| Total alkalinity | 80 - 150 |
| Calcium hardness | 250 - 450 |
| Sulphates | < 360 |

Langelier saturation index

To make sure the various water quality parameters remain within an acceptable range, the Langelier saturation index should be applied.

Unit description

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

Their compact dimensions allow the units to be transported and set up/installed with ease in the adjacent room.

The units operate in accordance with the condensation principle and are equipped with a hermetically sealed refrigerant system and low-noise and low-maintenance fan(s).

The fully-automated electronic controller, an integrated hygostat and connection ports for condensate drainage provided by the customer ensure continuous fault-free operation.

The units are reliable and conform to the fundamental health and safety requirements of the appropriate EU stipulations.

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 have been designed exclusively for installation in a suitable adjacent room by way of a duct interface.

The units may be used to dehumidify areas such as:

- Private swimming pools
- Spa areas
- Fitness centres
- Storage rooms
- Archives
- Museums

Operating sequence

The units are switched on and off using the integrated hygostat.

The hygostat is set to 60 % RH in the factory.

The respective unit function is indicated by a multi-colour LED display on the front of the unit.

The fan extracts the moist room air through the lower duct connector and filter.

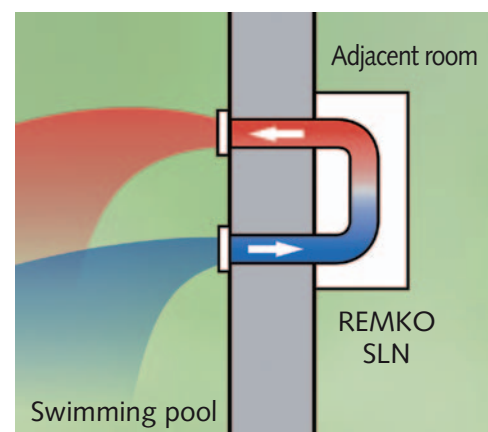
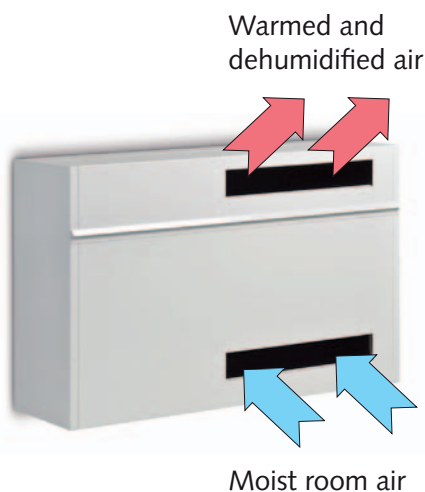
Heat is removed from the room air on the cold *evaporator*. The air is then cooled to below dew point. The water vapour contained in the room air is then deposited as condensate or rime on the evaporator fins.

On the *condenser*, the cold and dehumidified air is warmed up again and discharged back into the room via the upper duct connectors with a temperature increase of around 5 °K above the room temperature.

The processed, dry air therefore continuously 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.

Schematic depiction of the workings of the SLN 45-85 air dehumidifier



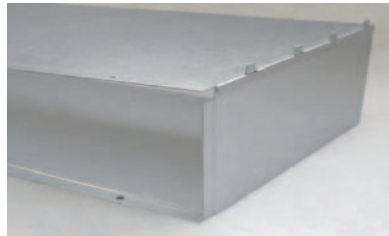
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Set-up

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

- Two duct openings must be created in the wall between the room to be dehumidified and the installation room before the units are installed in the adjacent room. The inside dimensions of these openings can be taken from the sketch.
- The openings must be created in such a way that the air in the room to be dehumidified can be extracted through the lower duct (with filter) in an unrestricted manner and blown out through the upper duct.
- The unit must be mounted upright to ensure that the condensate can drain freely.

- Observe the illustrated minimum gaps between the unit and the ceiling and floor in the installation room to ensure safe operation.
- The wall fittings must be adjusted to the required length before assembling the duct interfaces. The max. wall strength is limited to 290 mm. Ensure that the embossed side is not damaged when adjustments are made.

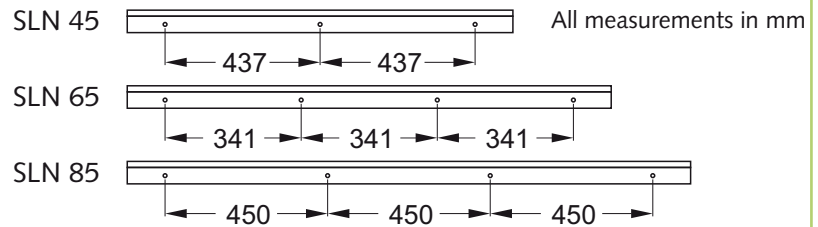


- Fit the air circulation inlet filter, the grille installation fittings and the ventilation grille together with the wall supports.
- Install both duct interfaces into the duct openings.



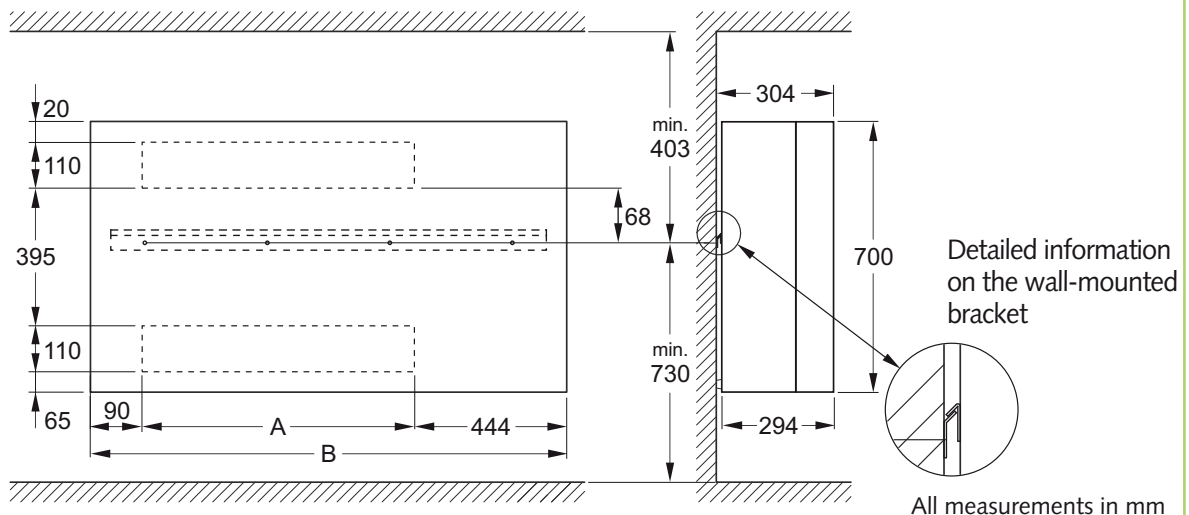
- Fit the duct piece together with the filter into the lower duct opening where the air in the room being dehumidified is to be extracted.
- From the adjacent room side, connect the unit connection fittings together with the self-sealing profile to the

Wall-mounted bracket for the units



| Series | Dimension A | Dimension B | Clear wall opening |
|--------|-------------|-------------|--------------------|
| SLN 45 | 464 | 998 | 110 x 610 |
| SLN 65 | 614 | 1148 | 110 x 760 |
| SLN 85 | 949 | 1483 | 110 x 1095 |

Mounting the units on the wall



Duct interface found in the wall opening.

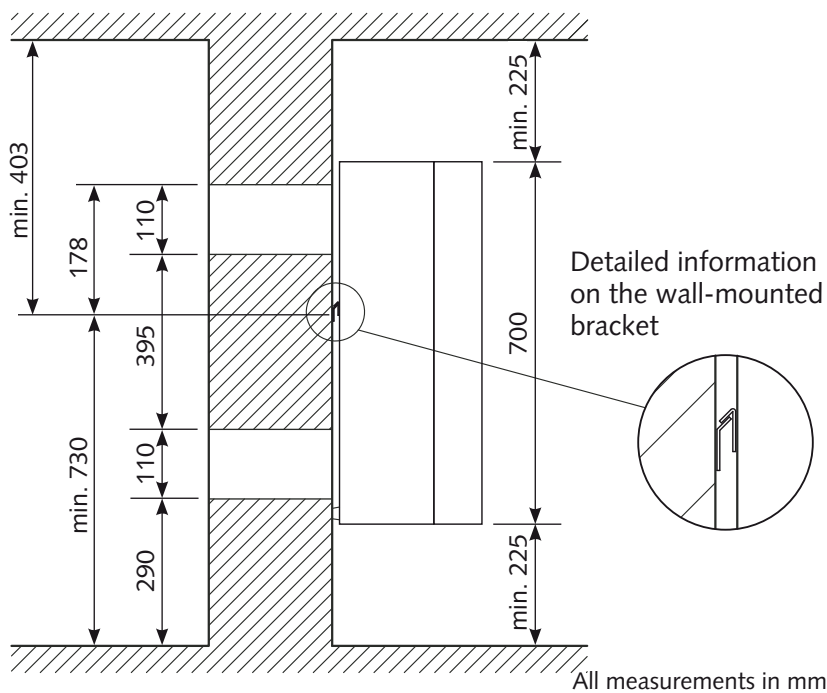
- Secure the wall spacers provided with the unit to the bottom corners of the unit using adhesive.
- Affix the wall-mounted bracket to the wall in the adjacent room and hang the unit on it.
- The unit is connected to the duct interfaces that are already mounted on the wall by way of the self-sealing profile lips on the unit connection fittings.
- The unit must never be mounted in the immediate vicinity of heaters or other sources of heat.
- The room being dehumidified must be closed to the neighbouring atmosphere.
- Avoid having opened windows and doors etc., and avoid frequent entry to or exit from the room as much as possible.
- In order to achieve optimum room air circulation using the dehumidifier, the supply and exhaust air openings must remain clear.

Condensate water drain

The condensate water drain is located on the unit's base. The condensate drainage is connected to the discharge nozzle supplied. A solid or flexible 1/2" discharge connector can be installed on this.

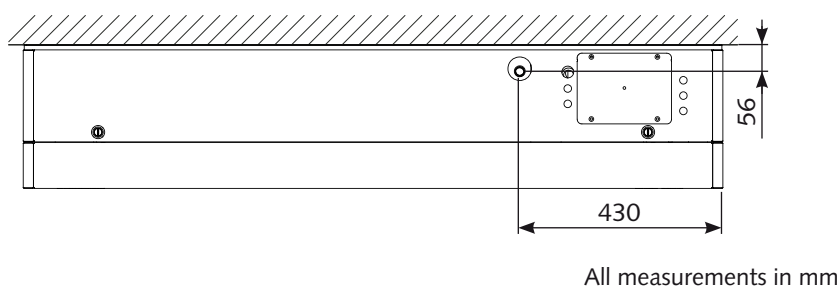
- The discharge hose must always be laid at an incline of at least 2 % so that the water can flow unhindered from the drip tray.
- Alternatively, a condensate pump can be fitted to the unit in order to pump the condensate water to a drainage point located at a higher level.

Location of the wall-mounted bracket using the example of the unit SLN 65



- If drainage is to be carried out through the wall, the relevant measures such as holes for correct condensate drainage must be taken before installing the unit.
- See the diagram at the side for information on the location of the drainage connection.

Location of the condensate drain



Access to the controller

Remove the front plate after opening the lock on the underside. Lift the cover vertically upwards and then pull away from the unit horizontally.

The controller is located behind the top cover of the internal housing parts above the compressor.

The controller is accessed by removing the 2 screws on the front of the internal housing parts.

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Mounting the unit exchange adapter

If the SLN unit is replacing a previous model, then the unit exchange adapter is required. This is affixed using the sealing tape provided as shown in the image. Attach the adapter in such a way that it covers the existing apertures in the wall and creates a seal at the wall where the sheet-metal edges were affixed previously.

Once the adapter has been fitted to the wall correctly, the unit can be hung on the bracket that is fitted to the adapter. The rubber lips together with the unit housing and the adapter create a complete seal.



NOTE

Make sure that there are no air leaks as these will severely impair the functionality of the unit.

Unit exchange adapter



Mounting the units with an adapter



Commissioning

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

The units are operated using an integrated hygostat that is set to 60 % RH (default value for spas and indoor swimming pools).

If the room humidity is below 60 % RH, the unit does not start. If the relative humidity is above 60 %, the unit starts the dehumidification process automatically.

If you would like to make changes to the hygostat settings, remove the front housing cover and the control board cover located in the upper section in order to access the control board.

NOTE

Interrupting the operation of the unit before the compressor has run for 6 minutes will activate a restart lock lasting approx. 4 minutes.

NOTE

If the air humidity is lower than the set value, the unit will not start up, even if the mains voltage is connected.

NOTE

When the unit is switched on or off using the main switch, a signal is issued upon startup and the LED display lights up blue as soon as the unit is ready for operation. Once all conditions have been met, the dehumidifying process begins.

Control board

The units are equipped with an electronic controller. This features various interfaces and a display. The following section describes these features in detail.

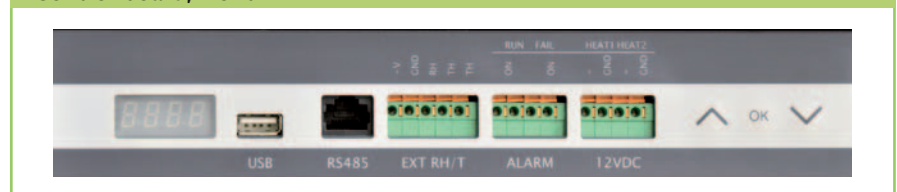
USB interface

The information on the USB interface can be found further on in this manual.

RS-485 interface

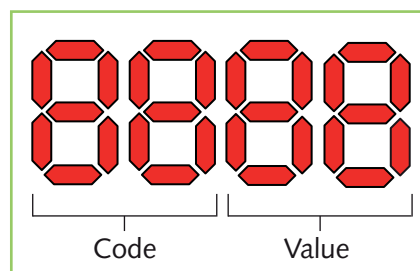
The information on the RS-485 interface can be found further on in this manual.

Control board, front



Display and operator panel

The display is a four-digit seven segment display. The first two digits are used to display the respective "code", e.g. rHXX, for setting the room humidity and the last two digits correspond to the value set.



In the standard view, no code is shown on the display. It is only the value of the humidity currently measured that is displayed.

The operator panel with the buttons "Up", "Down" and "OK" can be found on the right-hand side of the front of the control board. These can be used to navigate around the menu structure of the control board and to couple the control board with a wireless remote control.

EXT RH/T

These terminals allow you to connect up an external electronic humidity and temperature probe. The temperature probe must be an NTC probe with 10 k Ω at 25 °C and a B25/85 of 3969 K. The humidity probe must be designed for a voltage supply of 12 V DC and feature an analogue voltage output of 0-10 V with max. 10 mA.

ALARM

The alarm contacts are two potential-free contacts that are open in an unswitched state. The RUN contact is closed when the compressor is in operation. The FAIL contact is closed when there is a malfunction in the unit.

12VDC

Relays can be controlled via the HEAT contacts in order to switch the external heating on and off. They are active when the °C option in the menu is set to a value.

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Menu structure

To define the setpoints using the integrated operator panel, hold down the "OK" key for 5 seconds so that the display switches from the humidity currently measured to the menu item rHXX.

If you would like to exit the menu, do not press any keys on the operator panel for 10 seconds.

Menu items

Code: RH

The code "RH" stands for the relative air humidity that the unit should reach. The value can be set between 40 and 99 % RH. The default value is 60.

Code: °C

The code "°C" stands for external heating control with the aim of reaching a defined setpoint. The value can be set to between 05 and 34. This value is set to "OF" by default.

Code: EF

The code "EF" stands for external heating control with the aim of reaching the specified air humidity more quickly. The set value may differ from the setpoint humidity so that the external heating can either operate permanently or merely provide a support function. The value can be set between 40 and 99 % RH. The default value is set to "OF" in this case.

Code: SI

The code "SI" stands for the maintenance interval that the operator or fitter requires. This value is indicated in weeks and can be set from 01 to 99. The default value is "OF."

Code: tE

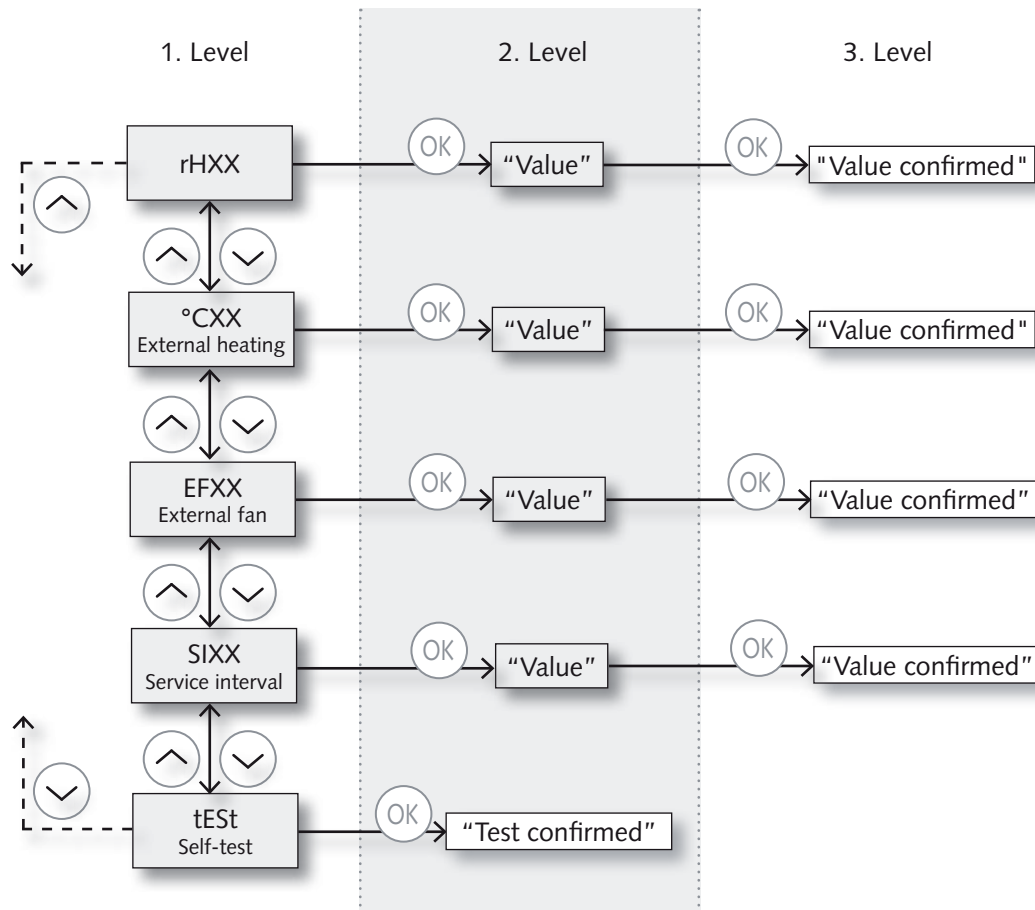
The code "tE" stands for testing and the value "St" for self-test. To start the self-test, press "OK" and to cancel it, hold the down key down for 5 seconds.



NOTE

The corresponding terminals for these options are located on the control board of the unit.

Menu structure of the SLN air dehumidifier



Unit function

Fan control

When the control board puts the dehumidifier into operation, the fan(s) switch on together with the compressor.

Defrosting

The units feature an intelligent and active defrosting function. If the room temperature is below 20 °C, the evaporator will start to ice up after a short time.

If the evaporator probe registers a temperature of less than 5 °C on the evaporator surface, the unit only continues to run in dehumidification mode for a further 30 minutes.

Once this time has expired, the fans stop and the solenoid valve for hot-gas defrosting opens. When the evaporator probe registers a temperature higher than 5 °C again, the solenoid valve closes and the unit resumes dehumidification.

Safety circuit

If the temperature exceeds 55 °C on the condenser (e.g. due to a fan failure or an overly high room temperature (higher than 36 °C)), the compressor stops automatically to prevent an overload.

As soon as the temperature on the condenser permits dehumidification again, the unit starts up automatically.

Compressor control

The compressor has a 6 minute restart delay as a safety function. The delay period must elapse before it is possible to restart the compressor.

This safety function protects the compressor against an overload caused by overly high pressure in the cooling cycle.

In order to prevent damage to the condenser, the units are equipped with a mechanism that prevents the compressor being immediately switched back on after it is switched off via the mains power supply.

The compressor does not switch back on until after a waiting time of approx. 30 seconds!

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Wireless remote control

Wireless remote control allows an SLN unit to be operated and adjusted in a simple and convenient manner. The current humidity and temperature can be viewed on the wireless remote control and the setpoint humidity can be adjusted.

The wireless remote control is intended for use with the dehumidifier models SLN 45-65-85.

The wireless remote control has a coverage distance of up to 50 metres from the installation location of the unit.

Design of the wireless remote control

The wireless remote control is equipped with a large, clear display and has operating buttons for the different options Up, Down, Left, Right and Enter.

The display values and the air humidity scale have a value range of 0 to 99 % RH.

The display values and the air temperature scale have a value range of 0 °C to 40 °C.

Information display

The information display shows the setpoint values for the unit. Fault messages together with the fault symbols are also displayed here.

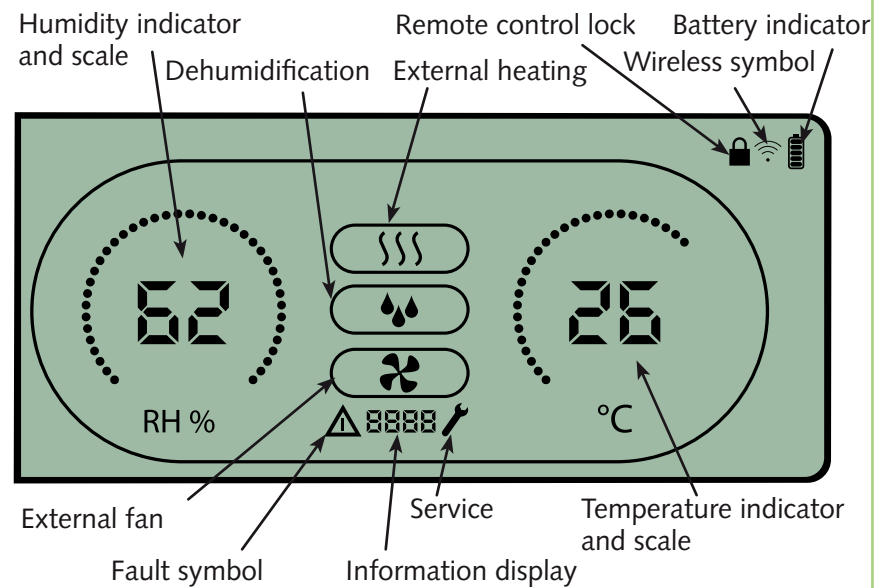
Power supply

The wireless remote control can be powered using 2 AAA batteries with 1.5 V each or can be powered externally using the USB cable provided.

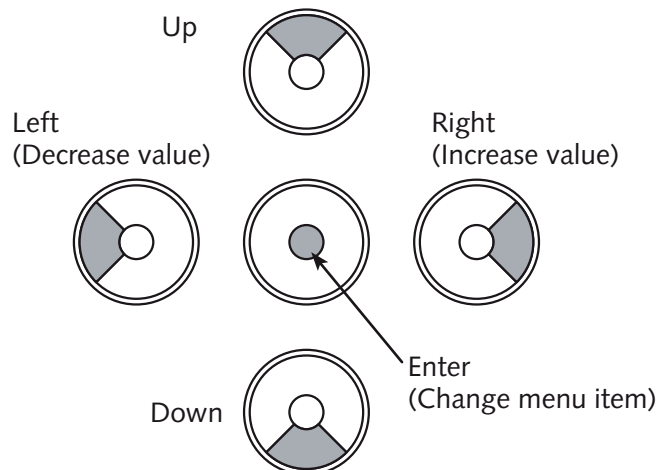
Wireless remote control



Overview of the display



Operating button control options



Coupling

Connecting the antenna

The antenna is located on the control board inside the unit or can be fitted there. This will be pre-installed if the unit is delivered together with the remote control. Before fitting the antenna, disconnect the unit from the power supply. Then slacken the two fastening screws on the underside of the unit, tilt the front cover of the unit and lift it up. In the upper right area, remove the two screws on the board cover and remove the cover. Pull the control board forwards, screw the antenna into place and bend it forwards. Once the antenna is screwed in place and the board has been returned to the previous position, the unit can now be provided with power in order to couple it with the wireless remote control. Then screw the housing parts back into place.

Switching on and coupling the remote control

The wireless remote control must be coupled with the unit before it can be used. To do so, carry out the following steps.

1. Insert the batteries provided into the battery compartment on the rear of the wireless remote control.
- 2a. The remote control will search for the unit for two minutes. During this time, the remote control display flashes every 2 seconds.
- 2b. During the search phase, hold down the Up and Down keys on the operator panel of the control board at the same time for 5 seconds.

Location of the control board



Connecting the antenna



3. If coupling was successful, the unit sends a serial number to the wireless remote control and the wireless symbol is displayed.
4. The swimming pool dehumidifier confirms the connection by displaying the code "Conn" for a period of 3 seconds.

This procedure can also be carried out using several remote controls so that an air dehumidifier can be controller by several remote controls.

Coupling failure

If the wireless remote control fails to couple with the unit, the fault symbol becomes visible, "Conn" is shown permanently on the display and the wireless symbol flashes.

The wireless remote control needs to be reset before a new coupling attempt can be made. To do so, hold the Left key on the wireless remote control down for 10 seconds.

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General

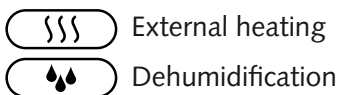
The wireless remote control displays the values for humidity and temperature at all times. The values only disappear when a malfunction arises. Depending on which function is currently active, one or more of the symbols appear in the centre of the display.

User setup menu

Hold down the Enter key for 3 seconds to open the user setup menu.

In this menu it is possible to switch between the wireless remote control symbols using the Up and Down keys provided the corresponding option of "OF" has been set to a value on the control board itself. Please read pages 11 and 12 to set these values.

User setup menu symbols

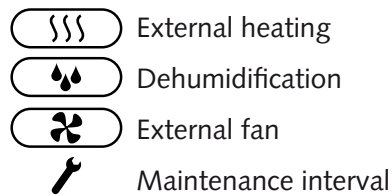


The Left and Right keys can be used to set these parameter values. The parameter is confirmed as a new setpoint using the Enter key. When this is confirmed, the remote control switches back to the symbol and exits the menu. If you would like to exit the user setup menu, do not press any keys on the remote control for 10 seconds.

Fitter setup menu

Hold down the Right key for 5 seconds to open the fitter setup menu. At this point it is possible to access all four menu items. It is also necessary to set the respective "OF" option on the control board to a specific value to enable access.

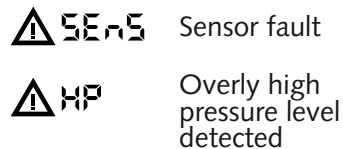
Fitter setup menu symbols



Fault messages

The fault messages correspond to the alarm messages which can also be shown on the unit's control board display. To make the alarm message recognizable, the fault symbol is also displayed on the wireless remote control.

Examples of fault messages



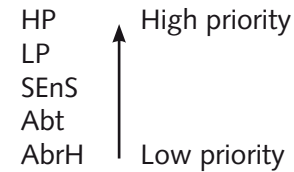
Generally speaking, the fault messages can only be reset on the display panel of the control board. The unit must be thoroughly inspected and the fault reset following rectification each and every time.

No changes can be made to the setpoints in the setup menus while there is an active fault.

Fault priority

In the event that several faults occur at the same time, only the fault with the highest priority is displayed.

Fault priority



NOTE

Do not simply reset the fault messages without establishing the cause first.

Maintenance message

Unlike the other fault messages, the maintenance message can be acknowledged or reset via the wireless remote control. This is due to the fact that it is a purely informative message.

Maintenance message



Proceed as follows to set up the new maintenance interval.

1. Hold down the Right key for 5 seconds to open the fitter menu.
2. Use the Up and Down keys to navigate to the maintenance symbol.
3. Use the Right and Left keys to change the 0 value to the required maintenance interval.
4. Confirm the new maintenance interval by pressing the Enter key.

Care and maintenance



NOTE

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.

- Observe the regular care and maintenance intervals
- 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
- If the unit is contaminated, it can be cleaned using a vacuum cleaner. The condenser in particular must be vacuumed thoroughly
- If the evaporator's fins are heavily soiled, they can be cleaned carefully with soapy water
- Never subject to direct jets of water e.g. **pressure washers etc.**
- Never use abrasive or solvent-based cleaners
- Use only suitable cleaners, even for heavy contamination

Cleaning the suction filter

Check the suction filter at regular intervals and clean if necessary. The filter is secured in a bracket behind the intake openings.



CAUTION

Check the intake and outlet openings, as well as filters, regularly for contamination.

- Light filter contamination can 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 filter, ensure that it's fully dry and that no damage has been sustained
- The units may only be operated with the filter in place



NOTE

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

Cleaning the condensate water collection tray

To ensure that the condensate water that accumulates can always drain freely, the collection tray for the condensate and the drain must be cleaned regularly.

Operating LED

The multi-colour LED display is located at the upper edge in the centre of the unit. They indicate the current operating state of the unit.

Legend of the LED colours

The LED lights up "blue" and stays that way when the unit is connected to the mains power supply.

The LED lights up "green" and stays that way when the compressor is in operation and the unit is in dehumidifying or defrosting mode.

The LED lights up "yellow" and stays that way when the unit is operating in wireless remote control mode.

The LED lights up "red" when a fault has occurred. Please refer to the Troubleshooting chapter to rectify the fault.

REMKO SLN Series

Troubleshooting

| Malfunction | Possible cause | Remedial measures |
|---|---|--|
| <ul style="list-style-type: none"> The unit does not start. The display does not light up. | No mains voltage. | <ul style="list-style-type: none"> Check the power supply or fuses or switches on site. |
| <ul style="list-style-type: none"> The unit does not start. Display indicates incorrect type. | <p>Air humidity in room too low.</p> <p>The unit is outwith its usable limits of 10 - 36 °C.</p> | <ul style="list-style-type: none"> Check the integrated hygostat and set it to a low relative humidity, e.g. < 40 % RH. Check the room conditions and alter as required. |
| <ul style="list-style-type: none"> The compressor does not start. | <p>The compressor switched off automatically due to an overly high condensor temperature.</p> <p>Lack of air ventilation.</p> <p>Overly high ambient temperature.</p> <p>Contaminated filter/intake device.</p> | <p>Check the following points if the unit does not start after 45 minutes:</p> <ul style="list-style-type: none"> Check if the fan(s) is/are working. Check if the intake filter is contaminated. Check that the intake and outlet openings are free of contamination. Check if the condensor fins are contaminated. Check if the room temperature is above 36 °C. <p>If the room temperature is above 36°C, the unit must be switched off.</p> |

NOTE

If it is not possible to determine the cause of the fault, switch off the unit immediately and disconnect it from the mains power supply to prevent further damage.

CAUTION

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

CAUTION

Prior to maintenance or repair work, the unit must be disconnected from the mains power supply.

NOTE

If all of the functional checks have been carried out without any findings, please contact an authorised service station.

Fault messages

| Code and value | Cause | Remedial measures |
|----------------|--|---|
| LOSS | The connection to the remote control has been lost | When the connection is restored, acknowledge by clicking "OK". |
| Abt | Ambient temperature is outwith the permissible range | Acknowledgement not possible. Automatic reset as soon as the temperature has returned to the permissible range. |
| AbrH | Air humidity is outwith the permissible range | Acknowledgement not possible. Automatic reset as soon as the air humidity has returned to the permissible range. |
| SEnS | Sensor fault, causes the unit to stop | <p>Press the Up or Down key to see which probe is affected. Exchange the probe if necessary.</p> <p>COnd - condensor probe EUAP - evaporator probe RH^t - humidity and temperature probe</p> <p>Acknowledgement possible only by way of unlocking sequence. Initiate the sequence by pressing the "OK" key.</p> |
| LP | Low pressure level detected | Malfunction must be established and rectified by specialist personnel. Acknowledgement possible only by way of unlocking sequence. Initiate the sequence by pressing the "OK" key. |
| HP | High pressure level detected | Malfunction must be established and rectified by specialist personnel. Acknowledgement possible only by way of unlocking sequence. Initiate the sequence by pressing the "OK" key. |

Unlocking sequence

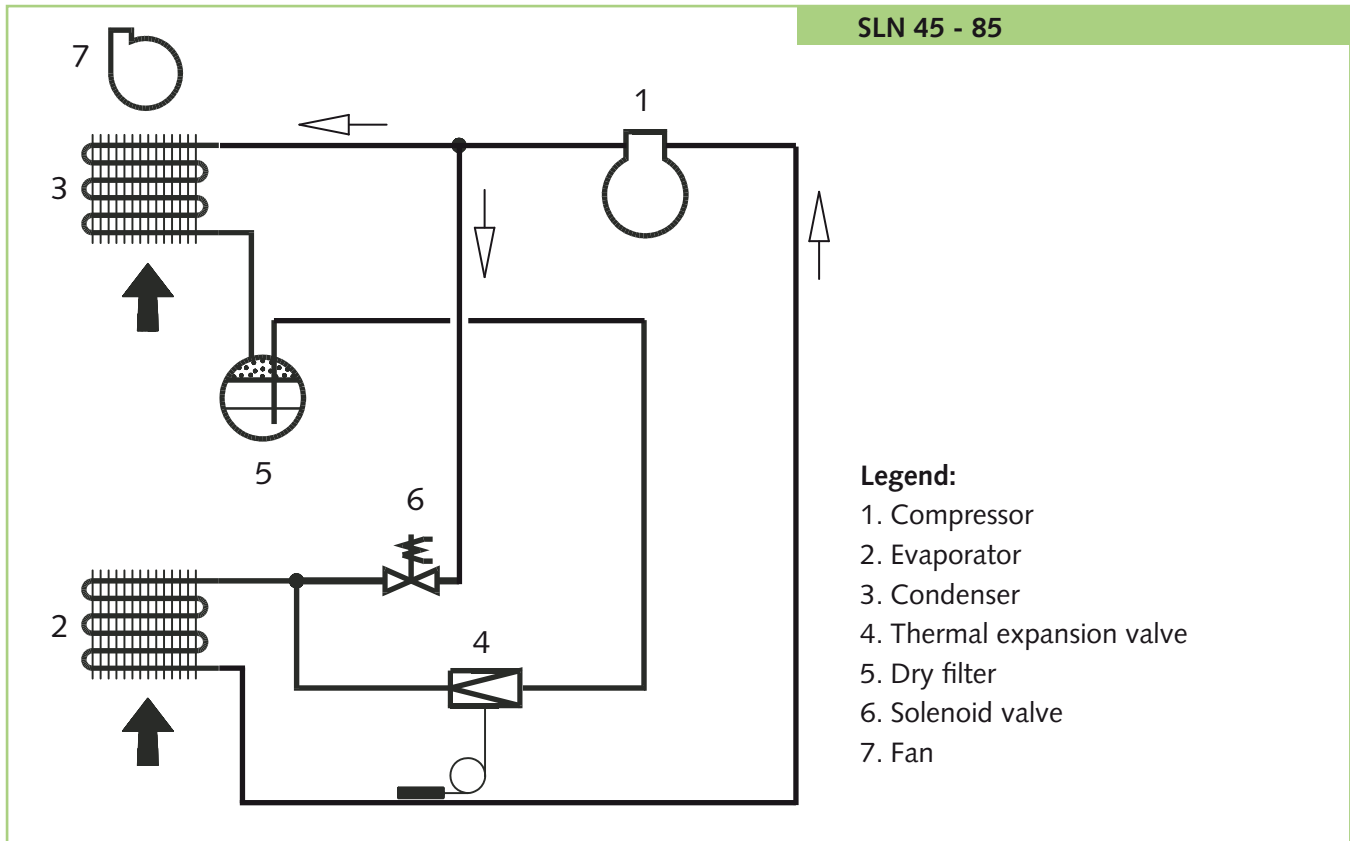
Once the unlocking sequence has been initiated, the unit displays the information "Loc". If the Down key is pressed at this point, the information display switches to "UnLo" which displays the unlocking option. If "UnLo" is confirmed with the "OK" key, the unit is enabled again.

Information messages

| Code and value | Occurrence | Comment |
|----------------|---|--|
| Log | After inserting a USB memory stick into the USB interface | Once the USB stick has been inserted, the process of copying the log data from the internal memory to the USB memory stick is initiated and declared as finished by the information "Log". |

REMKO SLN Series

Cooling cycle

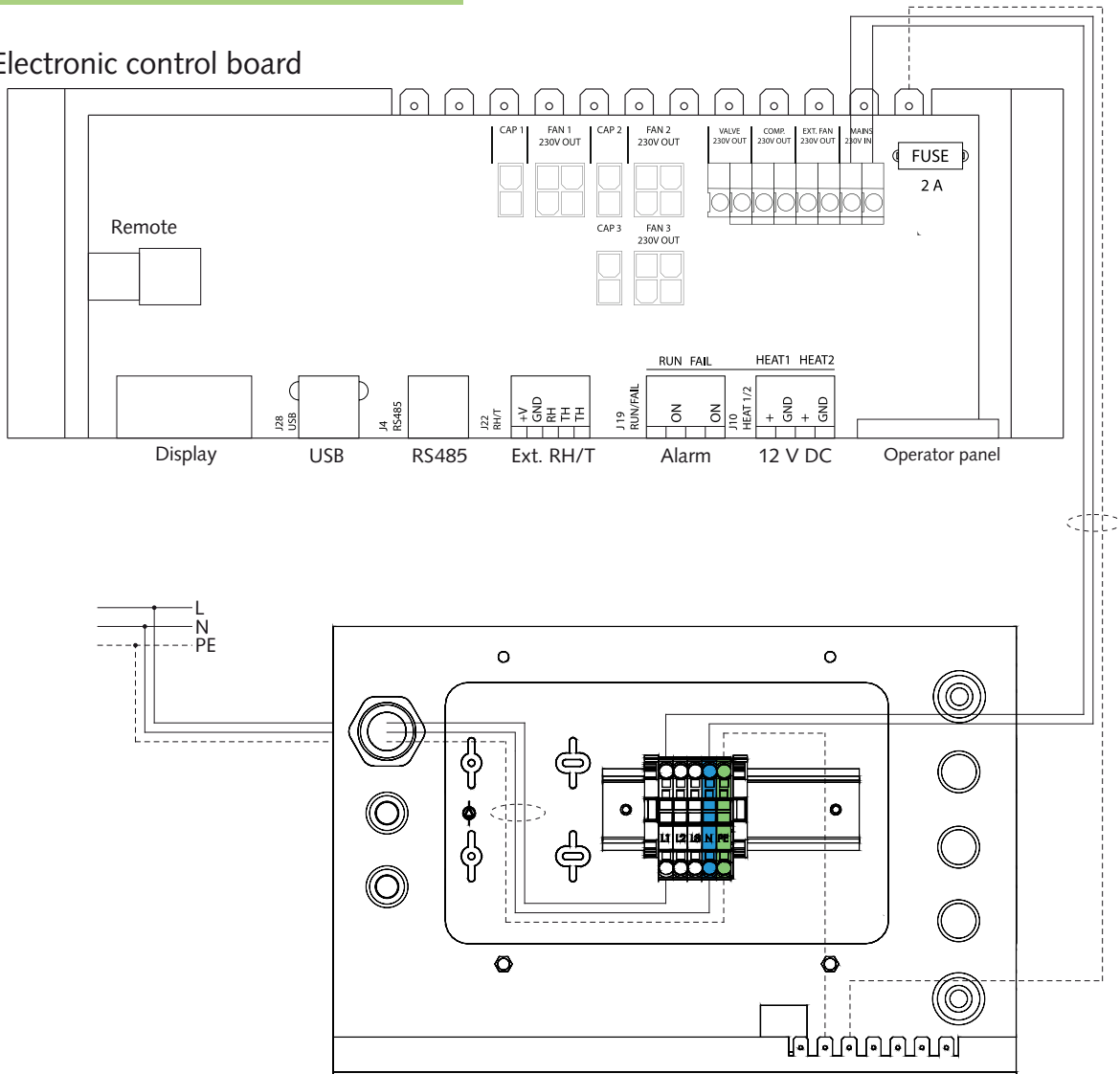


We reserve the right to modify the dimensions and design as part of the ongoing technical development process.

Electrical wiring diagram

SLN 45 - 85

Electronic control board



Legend:

FAN 1 = fan motor 1
 FAN 2 = fan motor 2
 FAN 3 = fan motor 3
 CAP 1 = capacitor 1
 CAP 2 = capacitor 2
 CAP 3 = capacitor 3

COMP. = compressor
 VALVE = solenoid valve
 RUN = potential-free contact
 FAIL = potential-free contact
 HEAT 1/2 = 12 V supply voltage for controlling relays

Fan motors:

SLN 45 = FAN 1
 SLN 65 = FAN 1 and FAN 2
 SLN 85 = FAN 1, FAN 2 and FAN 3

CAUTION

Prior to maintenance or assembly work, the unit must be disconnected from the mains power supply.

NOTE

A main switch should be installed at a suitable and easily accessible point in the mains supply line. We recommend using a mains supply line of 2.5 mm² for the units.

NOTE

Assembly and maintenance work on the units may only be carried out by authorised and qualified technicians.

REMKO SLN Series

Intended use

The units are designed exclusively for dehumidification purposes on the basis of their structural design and equipment.

A failure to observe the manufacturer's specifications, the respective local legal requirements or arbitrary alterations to the units, exempts the manufacturer from liability for resulting damage.



NOTE

Operation other than the types listed in this operating manual is prohibited. With non-observance, any manufacturer liability or guarantee claims are voided.



CAUTION

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Customer service and guarantee

As a prerequisite for any guarantee claims to be considered, it is essential that the ordering party or their representative complete and return the "**Certificate of guarantee**" to REMKO GmbH & Co. KG at the time when the units are purchased and commissioned.

The units are tested several times to verify their correct function. However, if malfunctions should arise that cannot be remedied by the operator with the assistance of the troubleshooting section, please contact your specialist dealer or contractual partner.



NOTE

Setting and maintenance work may only be carried out by authorised and qualified technicians.



Important information concerning recycling

The units are operated with environmentally-friendly and ozone-neutral R407C refrigerant. The mixture of refrigerant and oil within the unit must be disposed of properly in accordance with the statutory or locally-applicable regulations.



Environmental protection and recycling

Disposal of packaging

When disposing of packaging material, please consider our environment.

Our units are carefully packed and delivered in stable transport packaging and, if applicable, on a wooden pallet.

The packaging materials are environmentally-friendly and can be recycled.

By recycling packaging materials, you make a valuable contribution to the reduction of waste and conservation of raw materials.

Therefore, only dispose of packaging material at appropriate collection points.

Disposal of the old unit

The manufacturing process for the units is subject to continuous quality control.

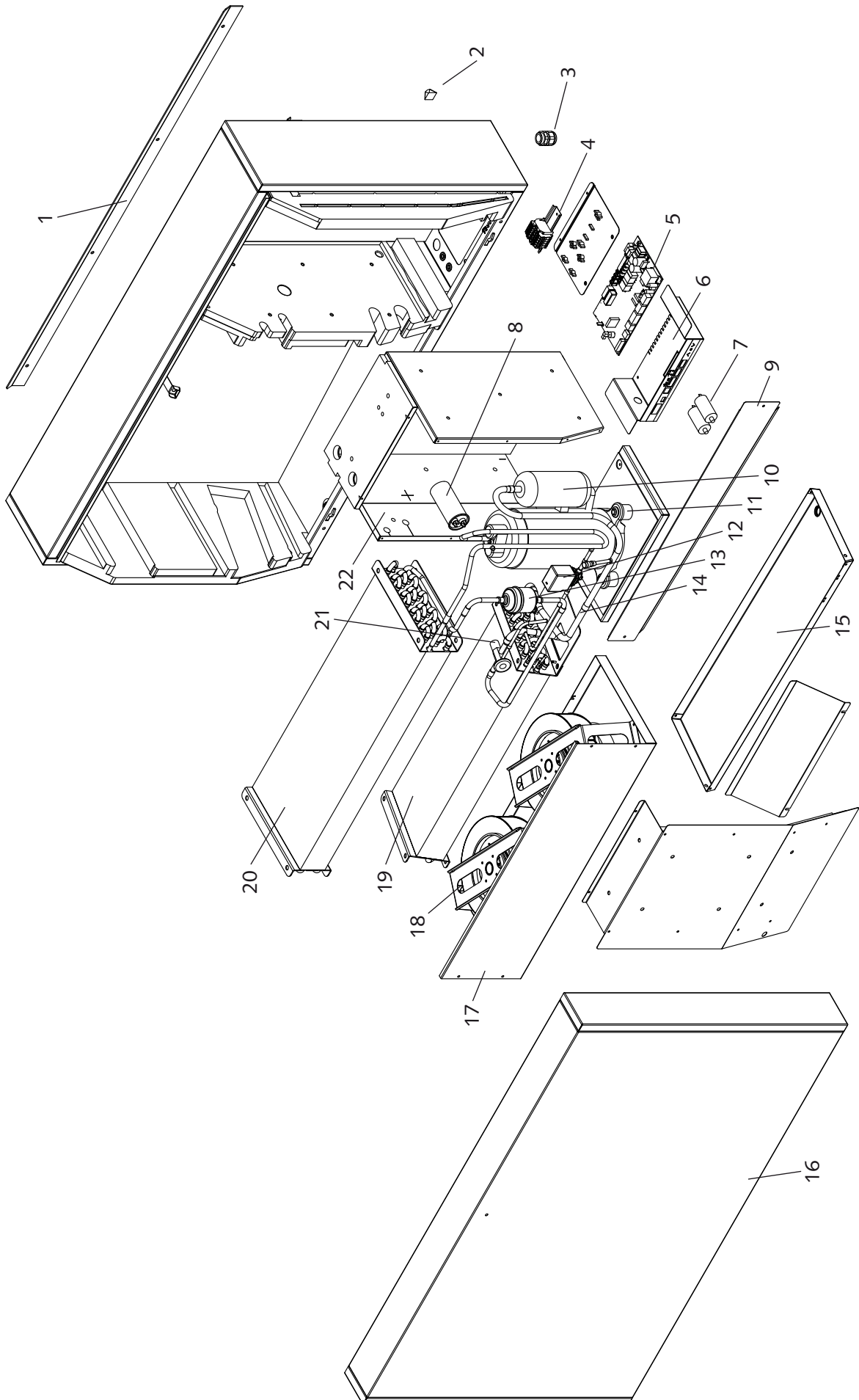
Only high-grade materials are processed, the majority of which are recyclable.

You also contribute to environmental protection by ensuring that your old equipment is only disposed of in an environment friendly manner.

Therefore, only bring the old unit to an authorised recycling business or to an appropriate collection point.



Exploded view of the unit



REMKO SLN Series

Spare parts list

| No. | Designation | SLN 45 | SLN 65 | SLN 85 |
|-----|--|--------|--------|--------|
| 1 | Wall-mounted bracket | | | |
| 2 | Wall spacer | | | |
| 3 | Cable gland | | | |
| 4 | Series terminals on DIN rail | | | |
| 5 | Control board | | | |
| 6 | Holder for control board with operator panel | | | |
| 7 | Condenser fan | | | |
| 8 | Compressor capacitor | | | |
| 9 | Spatter guard | | | |
| 10 | Compressor | | | |
| 11 | Compressor accessories | | | |
| 12 | Solenoid valve | | | |
| 13 | Dry filter | | | |
| 14 | Copper piping set | | | |
| 15 | Condensate tray | | | |
| 16 | Housing cover | | | |
| 17 | Fan module | | | |
| 18 | Fan | | | |
| 19 | Evaporator | | | |
| 20 | Condenser | | | |
| 21 | Temperature valve | | | |
| 22 | Compressor insulation. | | | |
| - | Air circulation intake filter (duct) | | | |

EDP no. on request

When ordering replacement parts, please always state the EDP no. and unit number (see name plate)!

RS-485 interface

The RS-485 interface uses the Modbus RTU protocol as a slave unit. The unit does not have an address. Settings: 115200, N, 8, 1. It accepts queries for any address.

| Code functions | |
|----------------|---------------------------|
| 0x06 | Present single register |
| 0x10 | Present multiple register |
| 0x03 | Read holding register |

| Register | Byte | Database parameters | Min | Max | Hr. | Description |
|----------|------|-----------------------|-----|-----|-----|--|
| 2 | 2 | Comp_state | 0 | 1 | 0 | Compressor status: 0 – Compressor stopped 1 – Compressor running |
| | 3 | Fan_state | 0 | 1 | 0 | Fan status: 0 – Fan stopped 1 – Fan running |
| 3 | 4 | Sole_state | 0 | 1 | 0 | Solenoid valve: 0 – closed 1 – open |
| | 5 | ExFan_state | 0 | 1 | 0 | Extractor fan status: 0 – Fan stopped 1 – Fan running |
| 4 | 6 | Heat1_state | 0 | 1 | 0 | Status HEAT 1: 0 – HEAT 1 off 1 – HEAT 1 on |
| | 7 | Heat2_state | 0 | 1 | 0 | Status HEAT 2: 0 – HEAT 2 off 1 – HEAT 2 on |
| 5 | 8 | Alarm1_state | 0 | 1 | 0 | Output alarm 1: 0 – Alarm output off 1 – Alarm output on |
| | 9 | Alarm2_state | 0 | 1 | 0 | Output alarm 2: 0 – Alarm output off 1 – Alarm output on |
| 6 | 10 | Evap_temp1 (decimal) | -40 | 100 | 0 | Temperature of evaporator 1: Decimal: Can be used as an integer value for temperature. Fraction: Can be converted to a decimal value. To obtain the total value, use the equation for floating-point numbers: "Value = decimal + (fraction/256)". |
| | 11 | Evap_temp1 (fraction) | -40 | 100 | 0 | |
| 7 | 12 | Evap_temp2 (decimal) | -40 | 100 | 0 | Temperature of evaporator 2: Use as described above. |
| | 13 | Evap_temp2 (fraction) | -40 | 100 | 0 | |

REMKO SLN Series

| Register | Byte | Database parameters | Min | Max | Hr. | Description |
|----------|------|-----------------------|-----|-----|-----|--|
| 8 | 14 | Cond_temp1 (decimal) | -40 | 100 | 0 | Condenser temperature: Use as described above. |
| | 15 | Cond_temp1 (fraction) | -40 | 100 | 0 | |
| 9 | 16 | Aux_temp (fraction) | -40 | 100 | 0 | Auxiliary probe temperature: Use as described above. |
| | 17 | Aux_temp (fraction) | -40 | 100 | 0 | |
| 10 | 18 | Amb_temp (decimal) | -40 | 100 | 0 | Ambient air temperature: Use as described above. |
| | 19 | Amb_temp (fraction) | -40 | 100 | 0 | |
| 11 | 20 | Amb_hum (high byte) | 0 | 100 | 0 | Ambient air humidity: High byte is insignificant and always contains zero. Only low byte can be used. |
| | 21 | Amb_hum (low byte) | | | | |
| 12 | 22 | RH_set | 40 | 95 | 40 | Humidity setpoint. |
| | 23 | RH_Fan | 40 | 95 | 40 | Humidity setpoint for extractor fan start. |
| 13 | 24 | Temp_set (decimal) | 0 | 36 | 0 | Temperature setpoint: Used in the same way as Evap_temp1. |
| | 25 | Temp_set (fraction) | | | | |
| 16 | 30 | Fail_start | 0 | 1 | 0 | Status of Fail_start mode. |
| | 31 | SB_mode | 0 | 1 | 0 | Standby mode status. |
| 17 | 32 | DEH_mode | 0 | 1 | 0 | Dehumidification status. |
| | 33 | Ice_mode | 0 | 1 | 0 | Defrosting mode. |
| 18 | 34 | LP_mode | 0 | 1 | 0 | LP fault mode status. |
| | 35 | Sens_mode | 0 | 1 | 0 | Sensor fault mode status. |
| 19 | 36 | HP_mode | 0 | 1 | 0 | HP fault mode status. |
| | 37 | Amb_mode | 0 | 1 | 0 | Ambient fault mode status. |
| 20 | 38 | AmbT_mode | 0 | 1 | 0 | Ambient temperature fault mode status. |
| | 39 | AmbRH_mode | 0 | 1 | 0 | Ambient humidity fault mode status. |

| Register | Byte | Database parameters | Min | Max | Hr. | Description |
|----------|------|----------------------------------|-----|-------|------|--|
| 21 | 40 | SW build number (high) | 0 | 65535 | x | Software build number. |
| | 41 | SW build number (low) | 0 | | | |
| 22 | 42 | Software version (main version) | 0 | 255 | x | Main version number of the software. |
| | 43 | Software version (minor version) | 0 | 255 | x | Minor version number of the software. |
| 23 | 44 | HP alarm temp. (decimal) | 0 | 99 | 60 | HP faults occur when Cond_temp1 is greater than this value. Used in the same way as Evap_temp1. |
| | 45 | HP alarm temp. (fraction) | | | | |
| 41 | 80 | Fan_function | 0 | 1 | 0 | Activate fan function in standby mode. |
| | 81 | | | | | |
| 42 | 82 | Time_wait_fan | 60 | 7200 | 3600 | Waiting time until fan starts up in standby mode, if activated (seconds). |
| | 83 | | | | | |
| 43 | 84 | Time_run_fan | 15 | 600 | 60 | Fan operating time in standby mode, if activated (seconds). |
| | 85 | | | | | |
| 44 | 86 | RH_Fen | 0 | 1 | 0 | Activate/deactivate extractor fan function. |
| | 87 | Service_ena | 0 | 1 | 0 | Activate/deactivate maintenance interval function. |
| 45 | 88 | Service_int | 0 | 99 | 0 | Maintenance interval value in weeks. |
| | 89 | | | | | |

REMKO SLN Series

USB interface

The USB interface is used for transferring data logs from the unit to a USB stick.

The unit data is saved every three hours and stored in the internal memory. Switching the status to fault mode also triggers the storage of data.

If the memory is completely full, the oldest logs are overwritten by the newest logs.

When a USB stick is inserted into the USB interface, all of the logs that have been recorded are saved in the CSV file "data_log.csv". The data in the internal memory is not deleted as a result of this process and can therefore be transferred to several USB sticks.

The data log is saved in the form of the following parameters:

| Database parameters | Size (bits) | Output text | CSV column |
|---------------------|-------------|---------------|------------|
| Work_time | 32 | <dd:mm:hh:ss> | Time stamp |
| Amb_temp | 8 | <Value> | T_amb |
| Amb_int_temp | 8 | <Value> | T_amb_int |
| Amb_ext_temp | 8 | <Value> | T_amb_ext |
| Aux_temp | 8 | <Value> | T_aux |
| Cond_temp1 | 8 | <Value> | T_cond |
| Evap_temp1 | 8 | <Value> | T_evap1 |
| Evap_temp2 | 8 | <Value> | T_evap2 |
| Temp_set | 8 | <Value> | T_set |
| Amb_hum | 8 | <Value> | RH_amb |
| Amb_int_hum | 8 | <Value> | RH_amb_int |
| Amb_ext_hum | 8 | <Value> | RH_amb_ext |
| RH_set | 8 | <Value> | RH_set |
| RH_Fan | 8 | <Value> | ExtFanSet |
| Evap_temp_err | 1 | EVAP | Error |
| Cond_temp_err | 1 | COND | Error |
| Aux_temp_err | 1 | AUX | Error |
| Amb_int_err | 1 | AMB_INT | Error |
| Amb_ext_err | 1 | AMB_EXT | Error |
| SB_mode | 1 | SB | Mode |
| Startup_mode | 1 | STARTUP | Mode |
| DEH_mode | 1 | DEH | Mode |
| Ice_mode | 1 | ICE | Mode |
| LP_mode | 1 | LP | Mode |
| HP_mode | 1 | HP | Mode |
| Sens_mode | 1 | SENS | Mode |
| AmbT_mode | 1 | AMBT | Mode |
| AmbRH_mode | 1 | AMBRH | Mode |
| Service_ena | 1 | ENABLED | Mode |

Maintenance protocol

Unit type: Unit number:

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|
| Unit cleaned - outside - | | | | | | | | | | | | | | | | | | | | |
| Unit cleaned - inside - | | | | | | | | | | | | | | | | | | | | |
| Condenser cleaned | | | | | | | | | | | | | | | | | | | | |
| Evaporator cleaned | | | | | | | | | | | | | | | | | | | | |
| Fan function checked | | | | | | | | | | | | | | | | | | | | |
| Unit checked for damage | | | | | | | | | | | | | | | | | | | | |
| Safety devices checked | | | | | | | | | | | | | | | | | | | | |
| All fastening screws checked | | | | | | | | | | | | | | | | | | | | |
| Electrical safety check | | | | | | | | | | | | | | | | | | | | |
| Test run | | | | | | | | | | | | | | | | | | | | |

Comments:

.....

.....

.....

| | | | | |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| 1. Date: Signature | 2. Date: Signature | 3. Date: Signature | 4. Date: Signature | 5. Date: Signature |
| 6. Date: Signature | 7. Date: Signature | 8. Date: Signature | 9. 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 |

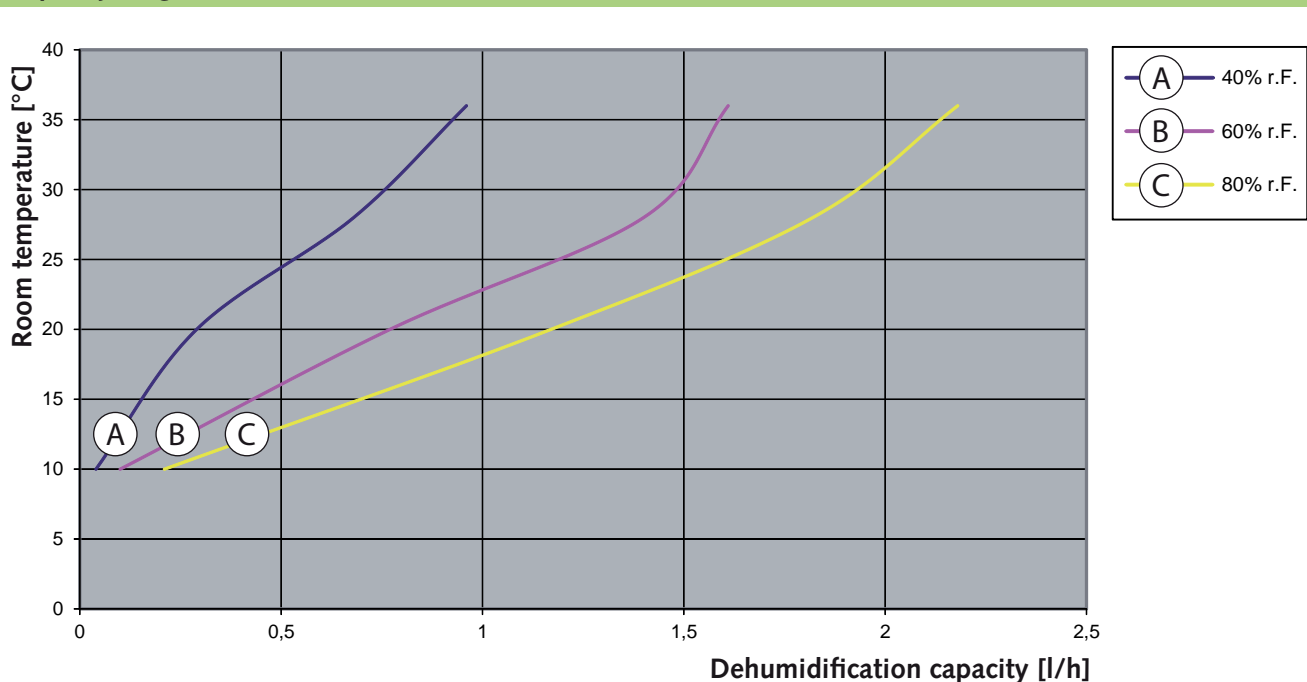
REMKO SLN Series

Technical data

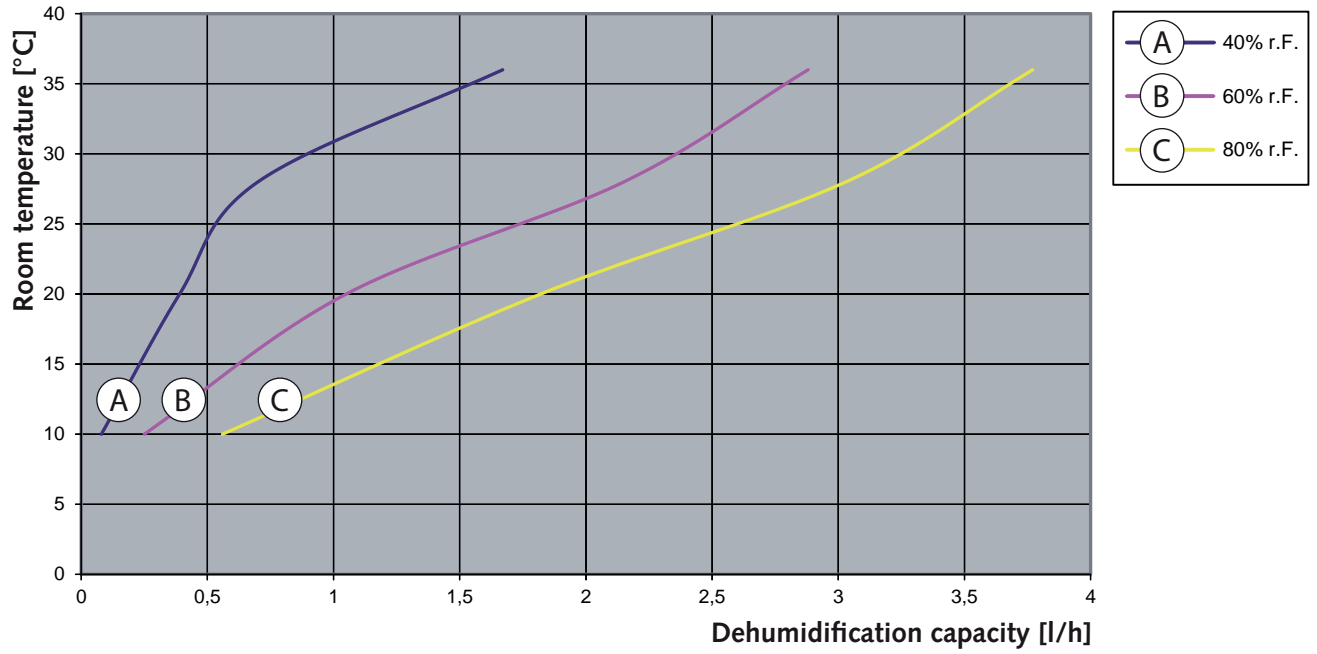
| Series | | SLN 45 | SLN 65 | SLN 85 |
|---|-------------------|-------------|--------------|--------------|
| Daily dehumidification capacity at 30 °C and 80 % RH | Litres/day | 47 | 78 | 104 |
| Daily dehumidification capacity at 30 °C and 60% RH | Litres/day | 35.5 | 56.2 | 78.8 |
| Operational temperature range | °C | 10 to 36 | | |
| Usable humidity range | % RH | 40 to 100 | | |
| Air volume | m ³ /h | 400 | 680 | 900 |
| Power supply | V/Hz | 230/1~/50 | | |
| Max. power consumption | kW | 0.9 | 1.5 | 1.8 |
| Max. rated current consumption | A | 3.8 | 6.6 | 8 |
| Max. switching voltage from RUN and FAIL contact | V | 50 | 50 | 50 |
| Max. switching current from RUN and FAIL contact | A | 0.5 | 0.5 | 0.5 |
| HEAT contact voltage | V | 12 | 12 | 12 |
| Maximum current limit of a HEAT contact | mA | 60 | 60 | 60 |
| Refrigerant ¹⁾ | | R407C | | |
| Refrigerant quantity | kg | 0.7 | 0.9 | 1.2 |
| Sound pressure level L _{pA} 1m ²⁾ | dB (A) | 43 | 44 | 47 |
| Depth / Width / Height | mm | 294/998/700 | 294/1148/700 | 294/1483/700 |
| Weight | kg | 57 | 66 | 77 |
| IP enclosure class | | X4 | X4 | X4 |
| EDP no. | | 616455 | 616655 | 616855 |

1) Contains greenhouse gas according to Kyoto protocol 2) Noise level measurement DIN 45635 - 13 - KL 3 carried out at duct openings

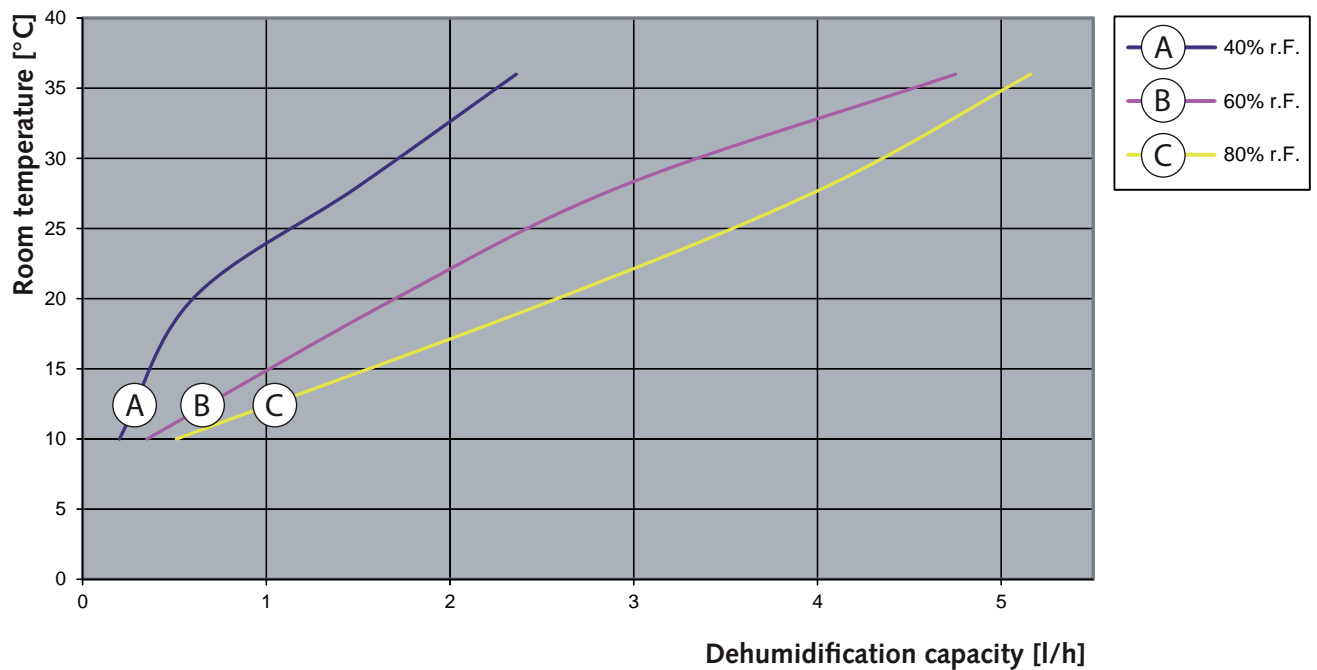
Capacity diagram SLN 45



Capacity diagram SLN 65



Capacity diagram SLN 85

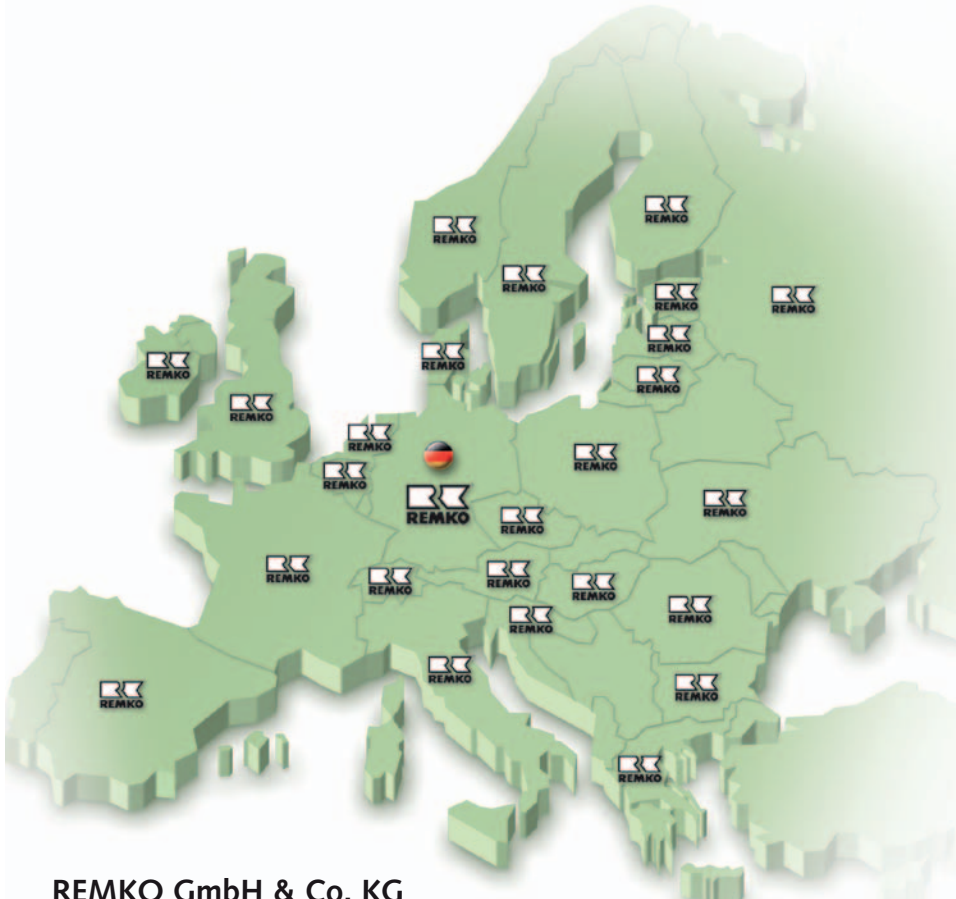


Notes

A series of 18 horizontal light green bars, stacked vertically, intended for writing notes. Each bar is a solid, uniform light green color and spans most of the width of the page.

REMKO INTERNATIONAL

*... and also right in your neighbourhood!
Take advantage of our experience and advice*



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Consulting

Thanks to intensive training, our consultants are always completely up-to-date when it comes to technical expertise. This has given us the reputation of being more than just an excellent, reliable supplier: REMKO, a partner who helps to solve problems.

Sales

REMKO offers not just a well established sales network both nationally and internationally, but also has exceptionally highly-qualified sales specialists. REMKO employees in the field are more than just sales people: above all, they must be advisers to our customers in air conditioning and heating technology.

Customer service

Our units operate precisely and reliably. However, in the event of a malfunction REMKO customer service is quickly on the scene. Our extensive network of experienced dealers guarantees quick and reliable service.

