the air handling company

robatherm AHUs.

Disabling and disposal.

December 2023

English - translation of the original instructions

Air handling units | Type RM/RL/TI-50

SCAN ME

You can find the currently valid version of these instructions, and further instructions, on our website at www.robatherm.com/manuals.

This leaflet is based on the generally accepted engineering standards at the time of drafting. Since the printed version is not subject to change control, the current version must be requested from robatherm or downloaded from the Internet at www.robatherm.com before application.

Content subject to change.

To improve readability, this document does not use male, female, and non-binary pronouns (m/f/d). All pronouns apply equally to all genders.

Last modified: December 2023

Contents

General remarks

Information about these instructions

These instructions will facilitate safe and efficient use of the AHU.

All persons working on the AHU must thoroughly read and understand these instructions before starting any kind of work.

Safe working is dependent on adhering to all safety information and instructions.

Further information

The instructions describe all the available options. Whether and which options are available in the AHU depends on the options selected and the country for which the AHU is intended. The illustrations serve as an example and may differ.

The instructions consist of several parts and have the following structure:

Fig. 1: Parts of the instructions

Main operating instructions

- ➔ Transport and unloading
- ➔ Installation and assembly
- ➔ Commissioning
- ➔ Operation and incidents
- ➔ Maintenance and cleaning
- ➔ Disabling and disposal

Disabling

If the AHU is taken out of service for an extended period, it is imperative to observe the individual information provided by the component manufacturers in addition to the instructions described in the components.

Commissioning must be performed to restore operation.

NOTE

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Material damage due to freezing

Operation temperatures below 4 °C can cause frost damage to the AHU, components, and duct system if the unit is not disabled properly.

- Follow the steps for securing against restarting.
- Decommission each component as described in this manual.

Security

General risk sources

Electrical hazards due to electric current and voltage

DANGER

Risk of electric shock

Risk of death from electric current when touching parts with live voltage. If the insulation is damaged, there is risk of death from electric current.

- When the insulation is damaged, turn the voltage supply off immediately, and arrange for repair.
- Before carrying out any work on the AHU, disconnect power and voltage supply as follows:
  - Turn the main switch to position "0".
  - Secure the main switch with a lock.
  - Disconnect AHU from power and voltage supply of the supply line.
  - Ensure that the unit is disconnected.
  - Ground and short-circuit.
  - Do not bridge or switch off fuses.
  - Keep moisture away from live parts.

DANGER

Danger to life due to stored electric charge!

DC link capacitors of the frequency converter can remain charged even when the mains supply is switched off and disconnected. There is a risk of death if the discharging time is not observed.

- Wait for a discharging time of 15 minutes.

WARNING

Risk of electric shock

When the main switch is switched off, the following parts are still live and can cause injury from electric current: electrical conductors and terminals upstream of the main switch, switch cabinet lamps, surge arresters including their connected wires, cables and terminals.

- Do not touch live parts.
- Work on the switch cabinet may only be carried out by a qualified electrician.

Mechanical hazards due to machine movements

WARNING

Risk of death due to sudden switch-on

When AHU is switched off, or the electrical power supply fails, certain control functions (e.g., timer programs, pump-out, fan overshoot, frost protection) or power restoration can cause components to switch on immediately. This poses danger to life.

- Carry out the steps "Securing the AHU against restarting" (see "Main operating instructions", section "Securing against restarting").

WARNING

Danger from moving parts

After switching off the AHU, there is still a risk of death due to moving parts, as the components do not have immediate stop functions.

- Wait for all moving parts (e.g., fan, rotary heat exchanger, motor, belt drive) to come to a standstill.

Thermal hazards due to hot and cold surfaces

CAUTION

Risk of burns due to hot surfaces

Hot surfaces of components (e.g., heating coils, direct firing, pressure steam humidifiers, steam heaters) pose a risk of burn injuries during operation and even after the AHU has been switched off.

- Let the fan run to cool down to room temperature.
- Do not touch the hot surface.

CAUTION

Risk of burns due to hot surfaces

There is a risk of burns when touching hot pipes.

- Pipes outside the AHU must be insulated by the customer to make them impermeable.

CAUTION

Risk of injury due to cold surfaces

Cold surfaces of components (e.g., cooling coils, refrigeration technology) pose a risk of injury from ice burns or frostbite during operation and even after the AHU has been switched off.

- Wait until the temperature of components matches room temperature.
- Do not touch cold surfaces.

CAUTION

Risk of injury due to cold surfaces

There is a risk of injury from ice burns or frostbite when touching cold pipes.

- Pipes outside the AHU must be insulated by the customer to make them impermeable.

General hazards

WARNING

Danger to life from falling!

If a grate above an air opening is overloaded downwards (>400kg), this will cause the structure to fail. When a person steps on the grate, the structure may fail, causing a risk to life by falling through the air opening.

- Do not exceed the maximum load (≤400kg or 2 persons).

WARNING

Danger to life from falling!

When stepping on the protection roof, there is a risk to life from falling, as the protection roof is unsuitable for supporting loads.

- Do not enter the protection roof.

NOTE

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Material damage due to localized weight

If more than one person enters the AHU at a time or localized loads are otherwise applied, pans and floors may be deformed.

- Do not let several persons enter the AHU at the same time.
- If this becomes necessary, take suitable measures to distribute the weight (e.g., grates, wooden boards, wood beams).

Personnel qualification

The work described in this section may only be performed if the person has the following qualifications:

- ➔ Qualified person in accordance with pressure equipment regulation
- ➔ Qualified electrician
- ➔ Registered gas installer
- ➔ Refrigeration specialist
- ➔ Mechanic
- ➔ Cleaning specialist

Filter component

CAUTION

Allergic reactions to skin, eyes, or respiratory tract due to contact with filter dust

Filters may be contaminated with viruses, bacteria, or fungi. When removing the filters, there is a risk of allergic reactions to skin, eyes, or respiratory tract.

- Comply with work instructions.
- Wear protective clothing, gloves, safety glasses, and respiratory protection.
- Avoid contaminating the environment.

Fan

Fan with housing

Remove V-belts when the machine is stationary for 3 months or more to avoid intermittent bearing loads.

In the case of idle time of one year or more, replace bearings before recommissioning or, in the case of bearings with a regreasing system, remove the old grease and regrease. Observe the fan manufacturer's instructions.

Heat recovery systems (HRS)

Rotary heat exchanger

In case of longer standstill to maintain self-cleaning, start the rotary heat exchanger intermittently according to the manufacturer's specifications.

Desiccant rotor

In case of longer standstill to maintain self-cleaning, start the rotary heat exchanger intermittently according to the manufacturer's specifications.

Heating coil, cooling coil, and electric heater

Heating coil

In case of a prolonged standstill, especially if there is a risk of freezing, all coils must be completely drained if no frost protection agent has been added.

1. Remove venting screws.
2. Remove drain screws.
3. To empty completely, blow air (compressed air, blower, etc.) through each coil, as up to 50 % of the medium remains in the coil when drained freely, which poses a high risk of damage in the event of frost.
4. Dispose of brine according to manufacturer's instructions.

Cooling coil

In case of a prolonged standstill, especially if there is a risk of freezing, all coils must be completely drained if no frost protection agent has been added.

1. Remove venting screws.
2. Remove drain screws.
3. To empty completely, blow air (compressed air, blower, etc.) through each coil, as up to 50 % of the medium remains in the coil when drained freely, which poses a high risk of damage in the event of frost.
4. Dispose of brine according to manufacturer's instructions.

Humidifier

CAUTION

Severe health damage due to infection and hypersensitivity reactions

When emptied incompletely, there is a health risk due to viruses, bacteria, or fungi because of poor water quality.

- Comply with work instructions.
  Empty the humidifier thoroughly.
- Clean the humidifier.
- Dry the humidifier.

Circulating water spray humidifier (low pressure)

1. Completely empty the humidifier tray, siphon, and pump using the drain plug or drain valve.
2. Remove droplet eliminator and flow rectifier profiles for cleaning.
3. Clean spray humidifier with a cleaning agent and a descaling agent if necessary.
4. Dry inner surfaces.

Hygiene monitoring

Desalination system

- For disabling, see appendix "Herco – desalination system Cooltrol data", "Disabling" section.

UV-C technology for water disinfection

WARNING

Damage to health from mercury

UV-C illuminants contain mercury. Mercury is toxic and dangerous to the environment.

- Avoid contact with skin and eyes. In case of contact, flush skin and eyes with plenty of water. Take off contaminated clothing.
- Do not swallow. If swallowed, induce vomiting.
- Ensure good air exchange in the danger zone.
- Comply with the safety data sheet of the manufacturer.

CAUTION

Risk of serious injuries due to hazardous substances

There is a risk of poisoning if the carton is damaged or if the UV-C illuminants break.

- When handling broken UV-C illuminants, follow the safety instructions for handling mercury.
- Avoid direct contact with eyes, skin, and clothing.
- Ensure excellent ventilation of the AHU and the rooms connected via the ducts.
- Keep broken pieces of UV-C illuminants in airtight packaging and dispose of properly.

TIP

Removal of small amounts of mercury

UV-C illuminants contain small amounts of mercury. Removal of the small amount leaked at breakage can be done with special sorbents for mercury.

For disabling, see appendix "Herco – UV disinfection system UVE 35 – 45 (P) digital", "Disabling" section.

Fresh water spray humidifier (high pressure)

WARNING

Danger to life from high pressure!

When working with spray humidifiers in the high-pressure range, there is a danger to life due to a pressure build-up in the pipelines or in the pressure vessel.

- Before carrying out any work on high pressure spray humidifiers, switch off the AHU and secure it so that it cannot be switched back on.

1. Empty all water-filled parts.
2. Clean the spray humidifier. Observe manufacturer's information.
3. Dry the spray humidifier.

Circulating water contact humidifier

UV-C technology for water disinfection

WARNING

Damage to health from mercury

UV-C illuminants contain mercury. Mercury is toxic and dangerous to the environment.

- Avoid contact with skin and eyes. In case of contact, flush skin and eyes with plenty of water. Take off contaminated clothing.
- Do not swallow. If swallowed, induce vomiting.
- Ensure good air exchange in the danger zone.
- Comply with the safety data sheet of the manufacturer.

CAUTION

Risk of serious injuries due to hazardous substances

There is a risk of poisoning if the carton is damaged or if the UV-C illuminants break.

- When handling broken UV-C illuminants, follow the safety instructions for handling mercury.
- Avoid direct contact with eyes, skin, and clothing.
- Ensure excellent ventilation of the AHU and the rooms connected via the ducts.
- Keep broken pieces of UV-C illuminants in airtight packaging and dispose of properly.

TIP

Removal of small amounts of mercury

UV-C illuminants contain small amounts of mercury. Removal of the small amount leaked at breakage can be done with special sorbents for mercury.

Pressure steam humidifier

WARNING

Danger to life from high pressure!

When working with pressure steam humidifiers, there is a risk of death due to pressure build-up in the pipelines or in the pressure vessel.

- Before carrying out any work on pressure steam humidifiers, switch off the AHU and secure it so that it cannot be switched back on.

Observe manufacturer's information.

Electro steam humidifier

Observe manufacturer's information.

Refrigeration technology (refrigeration plant, heat pump, and split air conditioner)

WARNING

Danger to life from explosion

In the event of leakages or when handling refrigerant R32, there is a risk of explosion, as A2L refrigerants can produce a potentially explosive atmosphere.

- Avoid potential sources of ignition.
- Ventilate the room.
- Check the inside of the AHU with a refrigerant sensor before starting any work.
- Only use a tool designed for A2L refrigerant.

For requirements, see service manual for refrigeration plants.

Hydraulic set

In case of a prolonged standstill, especially if there is a risk of freezing, the hydraulic set must be drained completely.

1. Open venting and draining devices.
2. To empty completely, blow through the hydraulic set with air (compressed air, blower, etc.)

Direct firing

Combustion chamber

WARNING

Danger to life due to burns

There is a danger to life from burns when working on the flame pot.

- Wear personal protective equipment (safety glasses, respiratory protection, and protective clothing).

UV-C technology

WARNING

Damage to health from mercury

UV-C illuminants contain mercury. Mercury is toxic and dangerous to the environment.

- Avoid contact with skin and eyes. In case of contact, flush skin and eyes with plenty of water. Take off contaminated clothing.
- Do not swallow. If swallowed, induce vomiting.
- Ensure good air exchange in the danger zone.
- Comply with the safety data sheet of the manufacturer.

CAUTION

Risk of serious injuries due to hazardous substances

There is a risk of poisoning if the carton is damaged or if the UV-C illuminants break.

- When handling broken UV-C illuminants, follow the safety instructions for handling mercury.
- Avoid direct contact with eyes, skin, and clothing.
- Ensure excellent ventilation of the AHU and the rooms connected via the ducts.
- Keep broken pieces of UV-C illuminants in airtight packaging and dispose of properly.

TIP

Removal of small amounts of mercury

UV-C illuminants contain small amounts of mercury. Removal of the small amount leaked at breakage can be done with special sorbents for mercury.

CAUTION

Risk of injury from UV-C radiation

During operation of the UV-C lamp, there is a risk of injury from direct exposure to high-energy UV-C radiation.

- Equip doors with door contact switches for safe shutdown of the UV-C lamp in case of unauthorized access.
- Before carrying out any work on UV-C lamps, switch off the AHU and secure it so that it cannot be switched back on.

CAUTION

Risk of injury due to hot surfaces

When working on the UV-C lamps in the AHU, there is a risk of burns from hot surfaces.

- Let the fan run to cool down to room temperature.
- Before carrying out any work on UV-C lamps, switch off the AHU and secure it so that it cannot be switched back on.
- Wear heat-resistant gloves.

Disposal

Local regulations must be observed when disposing of components and waste to protect the environment and conserve resources.

At the end of its service life, the AHU must be dismantled by an authorized specialist company. To avoid injuries or material damage when dismantling the AHU, the precautions described for the individual components and the individual information provided by the component manufacturers must be observed.

Security

General hazards

WARNING

Danger to life from falling!

If a grate above an air opening is overloaded downwards (>400kg), this will cause the structure to fail. When a person steps on the grate, the structure may fail, causing a risk to life by falling through the air opening.

- Do not exceed the maximum load (≤400kg or 2 persons).

WARNING

Danger to life from falling!

Removing the grates in the floor causes a risk to life from falling, as the opening in the floor is exposed.

- When working on air openings with removed grates, the customer must provide protection against falling.
- After the work, mount the grates again according to the instructions.

WARNING

Risk to life from falling objects

Risk to life from being struck by falling objects.

- Cordon off the endangered area under the opening to secure persons against falling objects.
- After the work, mount the grates again according to the instructions.

WARNING

Danger to life from falling!

When stepping on the protection roof, there is a risk to life from falling, as the protection roof is unsuitable for supporting loads.

- Do not enter the protection roof.

NOTE

!

Material damage due to localized weight

If more than one person enters the AHU at a time or localized loads are otherwise applied, pans and floors may be deformed.

- Do not let several persons enter the AHU at the same time.
- If this becomes necessary, take suitable measures to distribute the weight (e.g., grates, wooden boards, wood beams).

Personnel qualification

The work described in this section may only be performed if the person has the following qualifications:

- ➔ Waste disposal and recycling company and waste and recycling specialist
- ➔ Qualified person in accordance with pressure equipment regulation
- ➔ Qualified electrician
- ➔ Registered gas installer
- ➔ Refrigeration specialist
- ➔ Mechanic

Filter component

CAUTION

Allergic reactions to skin, eyes, or respiratory tract due to contact with filter dust

Filters may be contaminated with viruses, bacteria, or fungi. When removing the filters, there is a risk of allergic reactions to skin, eyes, or respiratory tract.

- Comply with work instructions.
- Wear protective clothing, gloves, safety glasses, and respiratory protection.
- Avoid contaminating the environment.

Silencer

CAUTION

Allergic reactions to skin, eyes, or respiratory tract due to contact with splitters

Splitters may be contaminated with viruses, bacteria, or fungi. When removing the silencers, there is a risk of allergic reactions to skin, eyes, or respiratory tract.

- Comply with work instructions.
- Wear protective clothing, gloves, safety glasses, and respiratory protection.
- Avoid contaminating the environment.

Humidifier

Circulating water spray humidifier (low pressure)

UV-C technology for water disinfection

WARNING

Damage to health from mercury

UV-C illuminants contain mercury. Mercury is toxic and dangerous to the environment.

- Avoid contact with skin and eyes. In case of contact, flush skin and eyes with plenty of water. Take off contaminated clothing.
- Do not swallow. If swallowed, induce vomiting.
- Ensure good air exchange in the danger zone.
- Comply with the safety data sheet of the manufacturer.

CAUTION

Risk of serious injuries due to hazardous substances

There is a risk of poisoning if the carton is damaged or if the UV-C illuminants break.

- When handling broken UV-C illuminants, follow the safety instructions for handling mercury.
- Avoid direct contact with eyes, skin, and clothing.
- Ensure excellent ventilation of the AHU and the rooms connected via the ducts.
- Keep broken pieces of UV-C illuminants in airtight packaging and dispose of properly.

TIP

Removal of small amounts of mercury

UV-C illuminants contain small amounts of mercury. Removal of the small amount leaked at breakage can be done with special sorbents for mercury.

For disposal of UV-C illuminants, see appendix “Herco – UV disinfection system UVE 35 – 45 (P) digital”, “Disposal” section.

Circulating water contact humidifier

UV-C technology for water disinfection

WARNING

Damage to health from mercury

UV-C illuminants contain mercury. Mercury is toxic and dangerous to the environment.

- Avoid contact with skin and eyes. In case of contact, flush skin and eyes with plenty of water. Take off contaminated clothing.
- Do not swallow. If swallowed, induce vomiting.
- Ensure good air exchange in the danger zone.
- Comply with the safety data sheet of the manufacturer.

CAUTION

Risk of serious injuries due to hazardous substances

There is a risk of poisoning if the carton is damaged or if the UV-C illuminants break.

- When handling broken UV-C illuminants, follow the safety instructions for handling mercury.
- Avoid direct contact with eyes, skin, and clothing.
- Ensure excellent ventilation of the AHU and the rooms connected via the ducts.
- Keep broken pieces of UV-C illuminants in airtight packaging and dispose of properly.

TIP

Removal of small amounts of mercury

UV-C illuminants contain small amounts of mercury. Removal of the small amount leaked at breakage can be done with special sorbents for mercury.

Refrigeration technology (refrigeration plant, heat pump, and split air conditioner)

WARNING

Danger to life from explosion

In the event of leakages or when handling refrigerant R32, there is a risk of explosion, as A2L refrigerants can produce a potentially explosive atmosphere.

- Avoid potential sources of ignition.
- Ventilate the room.
- Check the inside of the AHU with a refrigerant sensor before starting any work.
- Only use a tool designed for A2L refrigerant.

For requirements, see service manual for refrigeration plants.

Direct firing

Combustion chamber

WARNING

Danger to life due to burns

There is a danger to life from burns when working on the flame pot.

- Wear personal protective equipment (safety glasses, respiratory protection, and protective clothing).

Components and equipment

WARNING

Danger to life due to harmful substances

In conjunction with an open flame, refrigerants and compressor oils develop toxic substances that are harmful to health.

- Do not smoke in the machinery compartment.

WARNING

Danger to life due to suffocation!

There is a risk of suffocation if refrigerant escapes, as refrigerant is odorless and tasteless and displaces atmospheric oxygen.

- A refrigerant sensor for monitoring the installation site and suitable ventilation must be present and functional.
- Observe the safety data sheet of the refrigerant.
- Leave the danger zone.
- Ensure good air exchange in the danger zone.
- Use self-contained respiratory protection.

WARNING

Eye injury from refrigerant-filled coils due to pressure

When opening the piping to prepare for brazing of refrigerant-filled coils, nitrogen escapes at approx. 5-10 bar. This can result in small flying parts and chips that can cause injury to the eye.

- Wear protective goggles with side protection

All components and equipment (such as oils, refrigerants, brine, batteries) must be disposed of in accordance with local regulations.

When disposing of refrigerant or compressor oil, the relevant environmental protection regulations must be observed.

Electronic waste, metal, and plastic parts should be separated by type and sent for recycling to conserve resources.

Panel profiles are made of polyvinyl chloride (PVC).

UV-C technology

WARNING

Damage to health from mercury

UV-C illuminants contain mercury. Mercury is toxic and dangerous to the environment.

- Avoid contact with skin and eyes. In case of contact, flush skin and eyes with plenty of water. Take off contaminated clothing.
- Do not swallow. If swallowed, induce vomiting.
- Ensure good air exchange in the danger zone.
- Comply with the safety data sheet of the manufacturer.

CAUTION

Risk of serious injuries due to hazardous substances

There is a risk of poisoning if the carton is damaged or if the UV-C illuminants break.

- When handling broken UV-C illuminants, follow the safety instructions for handling mercury.
- Avoid direct contact with eyes, skin, and clothing.
- Ensure excellent ventilation of the AHU and the rooms connected via the ducts.
- Keep broken pieces of UV-C illuminants in airtight packaging and dispose of properly.

TIP

Removal of small amounts of mercury

UV-C illuminants contain small amounts of mercury. Removal of the small amount leaked at breakage can be done with special sorbents for mercury.

UV-C illuminants contain mercury and, therefore, must be disposed of with hazardous waste at a local waste disposal and recycling company. Disposal with residual waste is not permitted.

UV-C technology for air disinfection

For disposal, see

- Appendix “Light progress – Master-SM operating instructions”, “Scrapping and disposal” section and
- Appendix “Light progress – UV-DUCT-SQ SB-SQ operating instructions”, “Scrapping and disposal” section.

UV-C technology for surface disinfection

For disposal, see

- Appendix “Light progress – Master-16-MA operating instructions”, “Demolition and disposal” section and
- Appendix “Light progress – UV-STICK...AL-SCR operating instructions”, “Scrapping and disposal” section.

Directory

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