

INSTRUCTION MANUAL



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Product: RL-71R

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Dehumidifier **RECUSORB RL-71R**



The product picture may differ from the actual product



Contents

1. Safety advice	7	6. Operating	15
1.1 Aim of this documentation.....	7	6.1 Control panel	15
1.2 Accentuations in the text	7	6.2 Start	16
1.3 Inspection of goods.....	7	6.3 Stop	16
1.4 Safety	7	6.4 Reset buttons & switches.....	16
1.5 Intended use	7	7. Functionality & mode	17
1.5.1 Hazardous operating conditions.....	7	7.1 Dehumidification control	17
1.5.2 Responsibilities of the operator	7	7.1.1 Automatic or Manual.....	17
1.5.3 Minimising hazards	7	7.1.2 AUTO/VENT or AUTO/OFF	17
1.6 Disposal/recycling	7	7.1.3 Humidistat 1 & 2 connection.....	17
1.7 Electrical installation	7	7.1.4 0-10VDC connection	17
1.8 Mechanical installation	8	7.2 remote power switch.....	17
1.8.1 Safety advice regarding transportation.....	8	8. Troubleshooting	18
1.8.2 Safety advice - Mechanical.....	8	8.1 error codes	18
1.9 Maintenance.....	8	8.2 General troubleshooting	18
1.10 Commissioning	8	8.3 Capacity troubleshooting.....	19
1.11 Operation.....	8	8.4 Capacity Test.....	19
2. Principle of operation	9	9. Maintenance	20
2.1 Applications	9	9.1 Regular inspection interval	20
2.2 Design	9	9.2 Regular service interval	20
2.3 Principle of operation	9	9.3 Washing the rotor.....	20
3. Product description	10	10. Technical data	21
3.1 Components descriptions.....	10		
3.1.1 Rotor	10		
3.1.2 Filter	10		
3.1.3 Fan	10		
3.1.4 Reactivation heater	10		
3.1.5 Electrical box design.....	10		
3.1.6 Temperature safety devices	10		
3.2 Optional components	10		
3.2.1 Filter guards	10		
3.2.2 Control of the reactivation heater	11		
3.2.3 Automatic restart	11		
3.2.4 Emergency stop button	11		
3.2.5 Rotation guard.....	11		
3.2.6 Adjustable rotor speed	11		
3.2.7 Energy saving.....	11		
4. Installation	12		
4.1 Unit installation	12		
4.1.1 Fork lifting	12		
4.1.2 Transport.....	12		
4.1.3 Positioning	12		
4.1.4 Securing the unit.....	12		
4.2 General Duct work installation	12		
4.2.1 Regeneration air inlet	13		
4.3 Humidistat/humidity sensor installation	13		
4.4 Electrical connection	13		
4.4.1 Power supply.....	13		
4.4.2 Humidistat connections.....	13		
4.4.3 Electronic controller / external regulator	13		
4.4.4 Remote control.....	13		
4.4.5 Potential-free signals.....	13		
5. Operation check & adjustment	14		
5.1 Pre-operation check	14		
5.2 Start-up test and adjustment.....	14		

Appendix

1. Component list
2. Dimension
3. Harmful chemicals and solvents for rotors
4. Service schedule
5. Energy saving
6. CE-declaration

Electrical wiring diagram is stored in the document pocket, depending on the unit, inside or outside the electrical box. The electric diagram has a drawing number. This number should correspond to the sticker with a drawing number found inside the electric cabinet.

If applicable, separate users' manuals for components with separate controls are found in the document pocket.

Figures

FIGURE 1: Principle of operation & rotor	9
FIGURE 2: Rotor	10
FIGURE 3: Reset buttons and settings	10
FIGURE 4: Electronic filter guard	10
FIGURE 5: Mechanical filter guard*	11
FIGURE 6: Reactivation heater control	11
FIGURE 7: Forks in contact with both sides of the frame.....	12
FIGURE 8: Medium size units	12
FIGURE 9: Exercise caution when lifting and transport a unit	12
FIGURE 10: Foot brackets fixed on a pallet during transport	12
FIGURE 11: Installation of wet air out duct	13
FIGURE 12: Humidistat positioning.....	13
FIGURE 13: Example of a component layout inside an electrical cabinet.	16
FIGURE 14: Illustration of automatic and manual functions.....	17
FIGURE 15: Alarm table and solution	18
FIGURE 16: General troubleshooting table and solution.....	18
FIGURE 17: Capacity troubleshooting and solution table.....	19

1 SAFETY ADVICE

1.1 AIM OF THIS DOCUMENTATION

This document is included at delivery and is therefore an integral part of the equipment. It describes the machine's design and configuration at the time of delivery.

In the interest of safety, please study this documentation before installing or operating the equipment.

Instructions relating to safety, handling, operation and maintenance are to be followed.

Non-compliance can result in serious personal injury or damage to the machinery and may invalidate manufacturers' liabilities and warranties.

This documentation includes guidance for:

- Installers
- Operators
- Maintenance staff

Please retain this documentation throughout the lifetime of the equipment.

1.2 ACCENTUATIONS IN THE TEXT



Caution! Identifies hazards that could lead to damage of the equipment.



Warning! Indicates "potentially" hazardous situations, which could result in damage of the equipment, serious personal injury or death.



Danger! Indicates "imminently" hazardous situations, which could result in damage of the equipment, serious personal injury or death.



Attention! Indicate important information or instruction that requires special attention.

1.3 INSPECTION OF GOODS

Check for transportation damage! Continue the use of this product only if you assess it as being undamaged and faultless. Any damage must be recorded by the forwarder at time of delivery and reported to the supplier of the equipment at the earliest opportunity.

Please check condition of the equipment carefully for damage upon receipt and after removal of all packaging.

1.4 SAFETY

This equipment conforms to the appropriate European regulations and directives and is designed and manufactured to be safe and reliable in operation.

Continued safety and reliability is entirely dependent on correct handling, installation, operation and maintenance of the equipment supplied.

1.5 INTENDED USE

This equipment is specifically designed for atmospheric air drying. It is unsuitable for any other use. For further advice please contact your DST representative.

Unless specifically stated in this manual, the following applications are prohibited:

- Conditioning of gases (other than air).
- Conditioning of air contaminated with chemicals or aggressive elements.
- Conditioning of air containing flammable or explosive elements.
- On rooms or air systems having a potentially explosive atmosphere (Ex-Zones).
- Conditioning of air at elevated pressures.
- Unless the air that enter the unit is properly filtered with at least G4 class.

1.5.1 HAZARDOUS OPERATING CONDITIONS

Operation of the system is deemed to be hazardous, if:

- Is not operated inside or is not protected within a weatherproof enclosure.
- Is not operated within the permitted operating parameters (see technical specifications).
- Is operated outside the scope of 'normal' use (see intended use).

1.5.2 RESPONSIBILITIES OF THE OPERATOR

It is the responsibility of the operator of the system to ensure that all personnel engaged with installation, operation, maintenance and service of the equipment have read and understand the relevant sections of this manual.

For your own safety, wear the appropriate personal protective equipment (PPE).

1.5.3 MINIMISING HAZARDS

To ensure risk to personnel is minimised:

- Ensure that all activities relating to this equipment are carried out by qualified and authorised staff only.
- Identify and prevent potential safety hazards in the environment.

To ensure a failure-free operation:

- Keep this manual ready to hand with the unit.
- Use the machine as intended only.
- Only use the machine if it is fully functional.
- Check the condition of the machine before using.
- Check the machine on operational efficiency at regular intervals.
- Carry out maintenance and testing at the prescribed intervals.

1.6 DISPOSAL/RECYCLING

When unit is no longer in use and taking out of service - dismantle the unit and recycle the components according to the local regulations. Contact your DST representative for any questions.

1.7 ELECTRICAL INSTALLATION



Attention! Wherever possible, all electrical work must be carried out with the electric supply switched off. It is recommended that electrical isolators are locked in the off position. All electrical work must be carried out by a qualified person or under supervision of a qualified person.

A qualified person (electrical) is defined in this manual as:

- An electrical technician or engineer qualified to service and maintain air conditioning plant.
- Has completed the appropriate health and safety training.
- Has read and is familiar with the contents of this manual.



Danger! If the unit control panel isolation switch is off, the incoming cable terminals may still be live!



Danger! If working on the unit's isolation switch, ensure that electrical power is isolated and locked to prevent accidental resetting.



Danger! Electrical connection are to be made in accordance with local regulations.



Attention! Check incoming electrical voltage and operating frequency conform to the electrical wiring diagram and the manufacturer's type plate attached to the unit.

Caution! Loose terminal connections! Due to vibration during transportation it is advised that electrical terminals are checked for security and retightened where necessary. The following connecting terminals in the electrical control cabinet should be checked periodically and retightened if necessary:

- Connecting terminals in the main isolator switch.
- Connecting terminals in main components of the heater circuits.
- Connecting terminals in main components of the fans circuits.

Periodical as defined in this manual means:

- During installation.
- During maintenance.

Caution! Parameters used in the electrical protection and alarm circuits must not be modified or adjusted. Factory (default) parameters are shown in the electrical wiring diagrams, technical data or parameter list.

Warning! This equipment will contain high voltage electrical components!

1.8 MECHANICAL INSTALLATION

1.8.1 SAFETY ADVICE REGARDING TRANSPORTATION

Warning! Only use tested and certified lifting equipment to offload and position the unit.

Warning! If a fork lift is used to move the unit, please ensure the load is evenly balanced.

Warning! If lifting the unit on a pallet, ensure the unit is firmly secured to the pallet.

Warning! Evacuate and secure the danger area during lifting and positioning of the unit.

1.8.2 SAFETY ADVICE - MECHANICAL

Attention! Installation, testing, commissioning preventative and corrective maintenance must be carried out by a qualified person or under supervision of a qualified person. Wherever possible, all mechanical work must be carried out with the electric supply switched off.

A qualified person (mechanical) is defined in this manual as:

- A mechanical technician or engineer qualified to service and maintain air conditioning plant and associated systems.
- Has completed the appropriate health and safety training.
- Has read and is familiar with the contents of this manual.
- Is professionally competent to commission and service this type of equipment.

Caution! The air dryer is designed for internal installation. For external use it will require a weatherproof enclosure.

Caution! The air dryer or rotor cassette requires installing on a horizontal plane.

Attention! The air ducts must be vibration free and no pressure load.

Attention! Wet air outlet duct must be insulated to prevent condensate and ice build during cold conditions.

Caution! Due to concentrated water content in the wet air outlet duct, incidental condensate may flow back into the machine and damage the equipment. To prevent this, install the wet air outlet duct at a slight gradient. If the duct needs to be installed at high level, fix a condensate drain at the lowest point of the duct. And, ensure that the condensate drain does not create an ice hazard in winter.

1.9 MAINTENANCE

Caution! Defective electrical components and defective wiring must be replaced immediately. The equipment must not be operated until the defect has been repaired and the unit has been retested.

Caution! For maintenance purposes shut down the unit using the OFF button and allow the system to cool down before attempting to access internal components.

Danger! If the automatic restart function was selected (option), to prevent unintentional restart, ensure that the main isolator switch is off and power isolated before servicing internal components.

Attention! Advise all operating & maintenance personnel regarding automatic restart function if applicable.

Attention! Pay attention to accessibility requirements for maintenance and service purposes.

Danger! Only certified personnel are allowed to adjust, repair and modify the unit's refrigerant system. Contact your DST representative for any questions (Econosorb & Frigosorb only).

Caution! The operation of all electric safety devices are to be checked at commissioning and during service/maintenance. Under no circumstances are these devices to be deactivated (e.g. adjustment or bridging).

Caution! Do not rinse the unit with water.

Warning! Allow fans to come to a complete stop and the unit must be isolated from the electrical supply before removing any panels!

Warning! The unit is equipped with a heating element. Do not touch the equipment whilst it is hot. Allow the unit to cool for at least 30 min before any service or maintenance is performed.

Danger! The unit must be manually isolated from the electrical supply by turning the main isolator to "OFF" and secured with a lock pad before conducting any types of service and maintenance work on the unit.

1.10 COMMISSIONING

Attention! Equipment fans can produce noise levels above 80 dB (A). Use ear protection if remaining close to an operating machine for any length of time.

1.11 OPERATION

Caution! For normal shut down, switch off the unit using the OFF-button. If switching the unit off in an EMERGENCY, the main isolator switch or emergency stop button may be used. However, residual heat from the heater elements will remain in the unit and this can result in damage to components close to the heater and release of the safety thermostat TH1.

Caution! On no account should the unit be operated without air filters installed!

Caution! Do not expose the unit to ambient temperature that exceeds 50°C (e.g. inside a plant room) for longer period of time. This may damage the internal components!

Caution! Do not process air with temperature higher than 40°C. This may damage the internal components!

2 PRINCIPLE OF OPERATION

2.1 APPLICATIONS

DST desiccant type dehumidifiers are normally used where dry air is essential to the various manufacturing processes used in chemical, pharmaceutical, food or confectionery industries, or where a dry environment is required for storing and handling of moisture sensitive products and raw materials.

The well proven air drying technology using the adsorption principle provides great flexibility in solving humidity problems. It offers the user independent humidity control, down to dew points far lower than the effective operating range of refrigeration dehumidifiers.

2.2 DESIGN

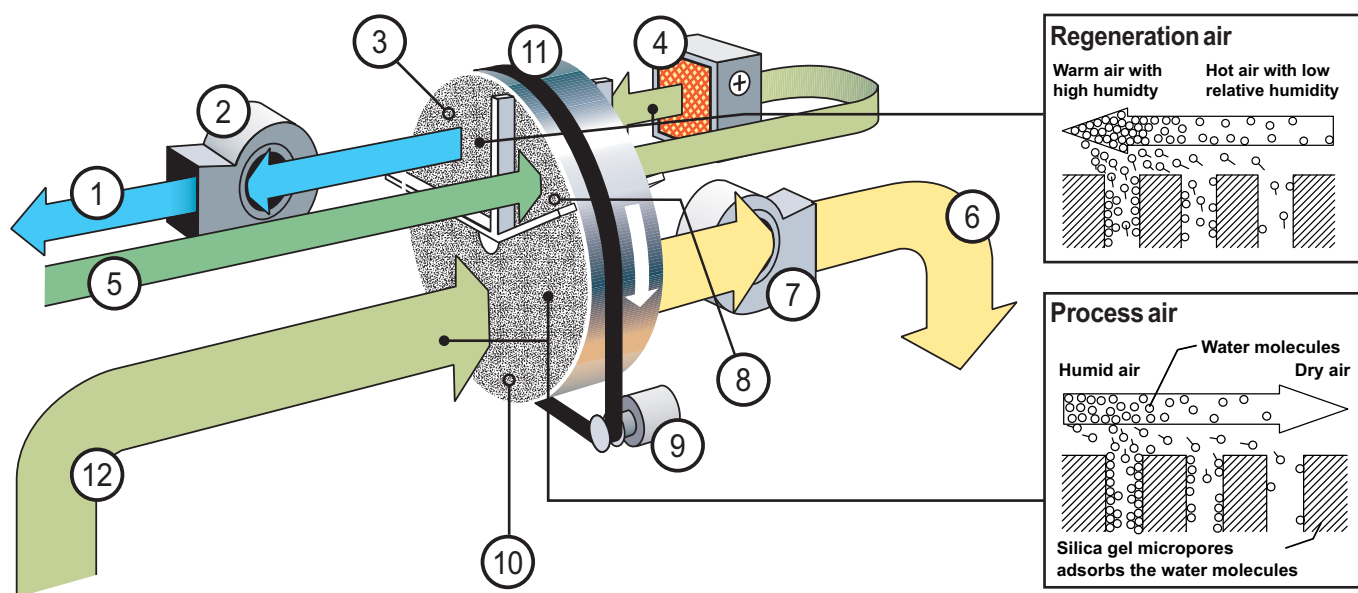
The dehumidifiers are made as complete units including rotor, fans, rotor motor and rotor drive transmission, heater for the regeneration, controls and electrical equipment.

The water vapour is effectively adsorbed from the treated air in the SSCR silica gel rotor.

2.3 PRINCIPLE OF OPERATION

It works on a continuous process with two air streams of different flow rates, normally having a flow ratio of approximately 3:1. The greater flow, *process air*, is dried as it passes through the dehumidifier, while the smaller flow, *regeneration air*, is used to heat the rotor material to drive the adsorbed moisture vapour from the desiccant. The moisture which is removed from the process air, is transferred over to the other as the SSCR rotor turns slowly.

FIGURE 1: Principle of operation & rotor



1. Wet air outlet
2. Regeneration air fan
3. Regeneration sector
4. Regeneration heater
5. Regeneration air in
6. Dry air outlet
7. Process air fan
8. Purge sector
9. Rotor motor
10. Process sector
11. Rotor
12. Process air inlet

RECUSORB is a continuous dehumidifier with internal energy recovery and able to reach very low dew points. During regeneration, sensible heat is adsorbed by the rotor material. This heat is transferred to a purge sector where the incoming regeneration air is preheated and its moisture content reduced. While less heat is now required to reach the final regeneration temperature, the air will also be at a much lower relative humidity. As a result of this, the dry air outlet is both cooler and drier than that achieved by other desiccant systems.

3 PRODUCT DESCRIPTION

3.1 COMPONENTS DESCRIPTIONS

3.1.1 ROTOR

The heart of a DST dehumidifier is the very efficient patented silica gel rotor. The rotor matrix is manufactured from alternate layers of flat and corrugated sheets of silica gel and metal silicates, chemically bonded into a tissue of inorganic fibres. It is made to form a vast number of axial air channels running parallel through the structure. The large internal surface area combined with the special micro structure of the silica gel material, ensures maximum contact area to give the rotor an extremely high capacity for adsorbing water vapour.

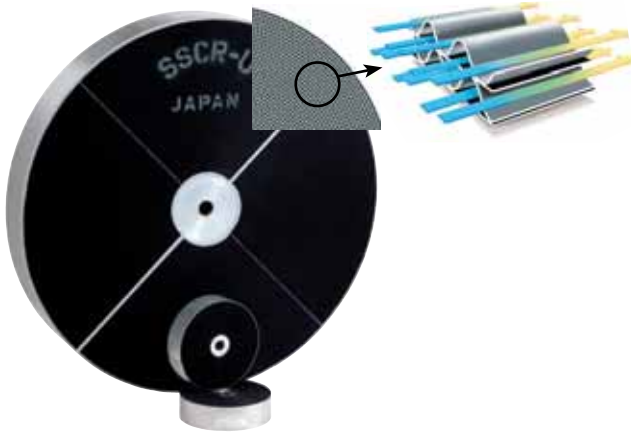


FIGURE 2: Rotor

Section of a dehumidifier rotor from Seibu Giken. The high number of channels means that moisture is adsorbed with extra efficiency!

⚠ Caution!

See appendix for information on which compounds will deteriorate the silica gel rotor (SSCR & SZCR)!

3.1.2 FILTER

By default the unit is equipped with G4 filters. Other air filter class and types are available for purchase.

See "10 Technical data" for more information.

3.1.3 FAN

The process fan is a direct driven plug fan with forward curved impeller. The regeneration fan is a direct driven centrifugal fan.

3.1.4 REACTIVATION HEATER

The standard regeneration heater is a resistive electric heater.

See "10 Technical data" for more information.

3.1.5 ELECTRICAL BOX DESIGN

The control panel is located at the front of the electrical panel. The electric cabinet houses multiple electronic devices and control units, such as contactors, fuses, motor protectors, relays, transformer.

See electrical diagram for more information.

3.1.6 TEMPERATURE SAFETY DEVICES

Integral "fail-safe" temperature devices will protect the unit from damage caused by component failure, incorrect settings or abnormal operating conditions.

Type	Sensor function	Sensor location	Reset is required
TH1	High temperature alarm	Inside the regeneration heater compartment	Yes*
TH2	Max temperature (control override)		No
TH3	High temperature alarm	In proximity of wet air outlet	Yes

Temperature device types used will vary between models fitted with a PLC and those without a PLC. See below.

Units with PLC	Units without PLC
Two shielded electronic sensors, programmed on PLC as TH2 and TH3. Reset TH3 on PLC.	Only mechanical thermostats installed - TH1, TH2 and TH3
Mechanical thermostat TH1* – reset on thermostat.	Mechanical thermostat TH1 and TH3 - reset on thermostats.

Note: If TH1 or TH3 are tripped, an automatic safe shut down procedure will be initiated. On units fitted with a PLC an alarm code will be displayed. On units without a PLC an alarm is indicated by a red light on the control panel. The shut down procedure includes a timed cooling down period and, if fitted, closing of associated valve actuators.

Note: Should TH1 trip, it will automatically disable the regeneration heater circuit breakers. These must be reset before attempting to restart the unit.

See "10 Technical data" for default temperature settings.

See electrical diagram for more information.

⚠ Caution!

Unless otherwise specified, units fitted with regeneration heater coils (water, oil or steam), are not equipped with TH1.

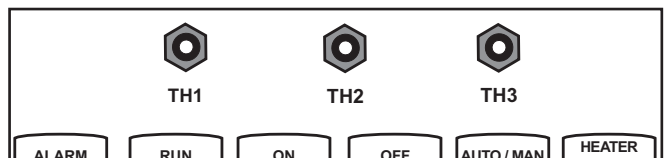


FIGURE 3: Reset buttons and settings

The temperature controller and temperature limiter are located on the control panel with the reset buttons on the front. The settings are placed inside of the unit behind TH1, TH2 and TH3.

3.2 OPTIONAL COMPONENTS

3.2.1 FILTER GUARDS

Filter guard is a pressure indicator which tells the condition of the filter. Different options are available for purchase and comes in different varieties, such as a mechanical (differential U-tube manometer) or an electronic.



FIGURE 4: Electronic filter guard

If the differential pressure increases beyond the recommended value, the filter needs to be replaced as soon as possible. This is indicated by warning light or a message on the PLC. See "10 Technical data" for recommended pressure.

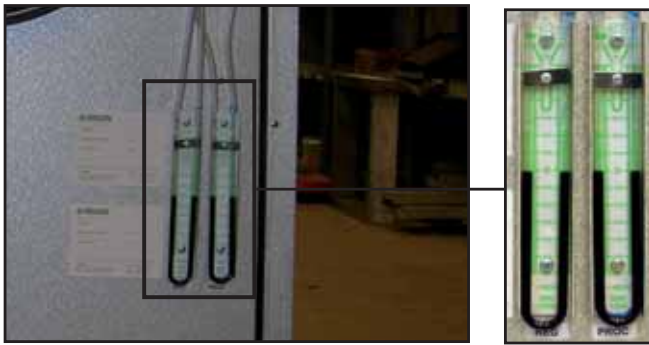


FIGURE 5: Mechanical filter guard*

A differential U-tube manometers uses a liquid to measure the pressure change before and after the filter.

Energy saving 2: Controls the heater for units with electric heater. Can be linear, via a thyristor, or binary. The dehumidifier is controlled by an external regulator signal 0-10vdc, e.g. from an electronic controller EH3.

See appendix on energy saving.

3.2.2 CONTROL OF THE REACTIVATION HEATER

For accurate capacity control of the dehumidification process, the heater output can be regulated linearly by a thyristor mounted in the electric control panel. The thyristor receives its analogue input signal of 0-10vdc from an external regulator or a humidity sensor.

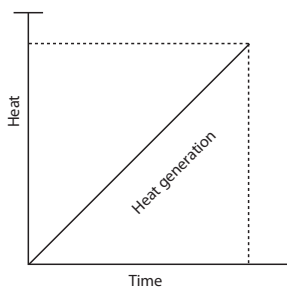
The device pulses out power to the regeneration heater in order to control the heater. The pulse frequency varies depending on the analogue input signal (0-10vdc). The higher the analogue signal = the longer it pulses, which in turn produces a higher heater output. If the analogue signal is low = the shorter it pulses, which in turn produces a lower heater output.

This option includes a rotation guard for the rotor.

See "3 Product description" for more details on energy efficiency.

See "3 Product description" for details on rotation guard device.

See "10 Technical data" for binary heating steps.



Linear control

FIGURE 6: Reactivation heater control

3.2.3 AUTOMATIC RESTART

Automatic restart after power failure. Also equipped with a emergency stop button and labelled with a warning sign.

3.2.4 EMERGENCY STOP BUTTON

Press the emergency stop button to stop the machine immediately in case of emergency. Always installed on the front electrical panel when the unit is equipped with automatic restart.

3.2.5 ROTATION GUARD

Monitors the rotor rotation. If the rotor stops turning, the rotation guard sends a signal to an external control panel or PLC to stop the machine and at the same time display an alarm.

3.2.6 ADJUSTABLE ROTOR SPEED

Stepless setting of the rotor speed. Manually controlled from the PLC or a control box with a built-in potentiometer.

3.2.7 ENERGY SAVING

To save energy, the unit can be fitted with 3 different "Energy saving versions".

Energy saving 1: The dehumidifier is controlled by 1- or 2-step humidistats. E.g. an electric-mechanical HMH, or the controllers EH3 or EH4.

4 INSTALLATION

4.1 UNIT INSTALLATION

Follow the directions regarding installation of heavy and medium weight dehumidifiers.

Note: Use the installation guidelines as a reference only.

4.1.1 FORK LIFTING

The unit can be off-loaded and positioned using a fork lift by lifting between the feet of the unit, alt. on some dehumidifiers, lift the unit using the built-in handles.

- The forks must be of sufficient length to be in contact with both sides of the base frame.
- The forks should be initially positioned centrally across the middle sections of the unit but must be checked for balance prior to final lifting.
- Larger units equipped with handles are very heavy. Do not lift the unit singlehandedly! Always ask for assistance or use lifting aid!

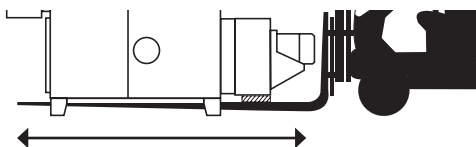


FIGURE 7: Forks in contact with both sides of the frame.

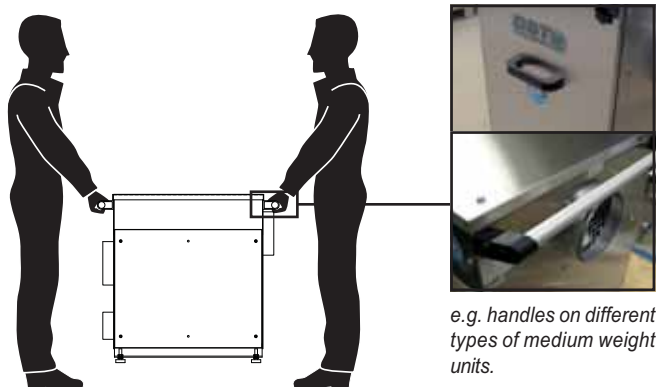


FIGURE 8: Medium size units

4.1.2 TRANSPORT

Dehumidifiers with external fans or a high centre of gravity runs the risk of tipping. Use caution when lifting and moving the dehumidifier.

Note:

- Secure any panels, doors or loose equipment.
- Keep the unit balanced at all times when moving the unit.
- See safety chapter regarding lifting safety.

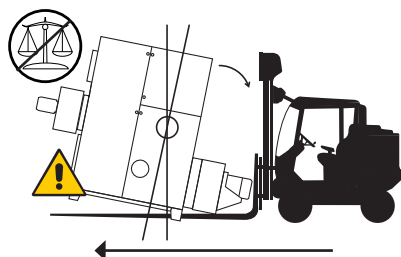


FIGURE 9: Exercise caution when lifting and transport a unit

If not balanced, the unit may run the risk of tipping during transport.

See "10 Technical data" for weight information.

4.1.3 POSITIONING

Position the machine with adequate working space around the unit to allow inspection and service. Size of unit and the position of the access panels/doors vary depending on the model. Follow the recommendation below to avoid incorrect positioning.

- Adequate space must be left clear around the unit to allow access to doors/panels and for removal of the rotor.
- The free floor area in front of the inspection doors should be as wide as the unit.
- See dimensional drawing in the appendix regarding service space and foot bolt-hole dimensions.

4.1.4 SECURING THE UNIT

Note: Applies RL-71R, RZ-series och CZ-series only.

To allow securing of the dehumidifier to the floor or to a pedestal, four brackets with pre-drilled bolt-holes are included with the unit.

At delivery, the brackets are used to secure the unit to the pallet for transportation. Do not discard the foot brackets (!) Remove and reuse them if required.

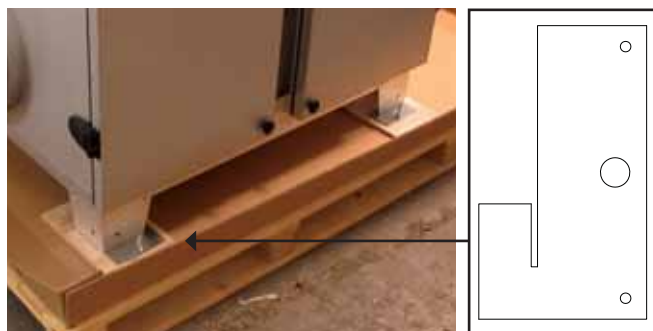


FIGURE 10: Foot brackets fixed on a pallet during transport

4.2 GENERAL DUCT WORK INSTALLATION

The guidelines are to assist the installers and operators to adjust the duct/dehumidifier installation. Consult your DST representative or local mechanical installation company for more information.

- Avoid recirculation from the separate air flows, direct entering and exiting air flow away from each other.
- Check if the dry air is well distributed in the dehumidified area.
- The regeneration air in and wet air out has to be connected to the outside of the dehumidified area, preferable outdoor.
- To increase the lifetime of the filter, it is recommended taking air from a higher level where dust and other particles are kept at minimum.
- Install dry air out duct/channel at a high level.
- To maximize the drying capacity, free blowing on dry air out without reduction is recommended.
- Allow wet air to disperse freely when exiting the duct.
- It is recommended to insulate the wet air duct and have it installed at a sloping outwards angle, due to risk of condensation inside the ductwork. The setup will also prevent condensation flowing back into the dehumidifier.
- If the duct must be installed higher than the outlet, a small drain hole will allow discharge of condensation at the lowest point in the ductwork.

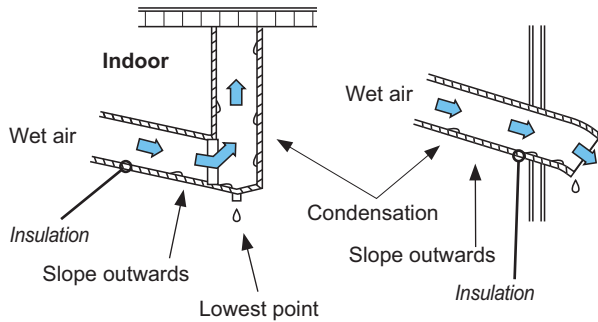


FIGURE 11: Installation of wet air out duct

4.2.1 REGENERATION AIR INLET

Installation remarks concerning regeneration air inlet.

- It is recommended to install a damper on regeneration air inlet to adjust pressure balance between regeneration air in och process air in. See dimension for installation.

4.3 HUMIDISTAT/HUMIDITY SENSOR INSTALLATION

Install the humidistat/humidity sensor away from the dry air out path to avoid potential false readings.

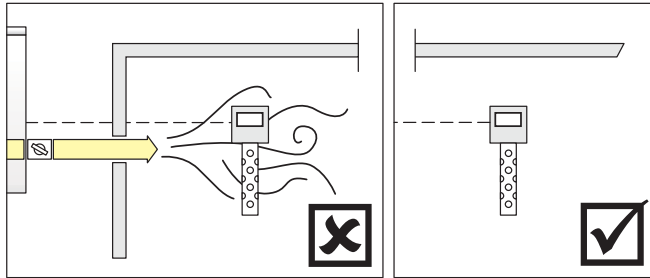


FIGURE 12: Humidistat positioning

4.4 ELECTRICAL CONNECTION

Electrical components should be connected to the supply according to the local regulations and requirements.

4.4.1 POWER SUPPLY

The incoming three-phase cable with L1, L2 and L3 are directly connected to the main switch and PE-cable connected to the earth bar.

The electrical feed must be provided on-site in accordance with the electrical diagram and local requirements.

See electrical diagram for a detailed layout and description.

4.4.2 HUMIDISTAT CONNECTIONS

The dehumidifier has a connection for a 1-step or 2-step humidistat.

See electrical diagram for connections.

See "7 Functionality & mode" for more details.

4.4.3 ELECTRONIC CONTROLLER / EXTERNAL REGULATOR

Units with optional connections points for an electronic controller is marked on the electrical diagram.

Selecting an electronic controller, the dehumidification process is controlled binary or linearly.

See "7 Functionality & mode" for more details.

See electrical diagram for connections.

4.4.4 REMOTE CONTROL

The unit has a connection point for a remote switch.

See electrical diagram for connections details.

See "7 Functionality & mode" for more details.

4.4.5 POTENTIAL-FREE SIGNALS

Potential free contacts are marked on the electrical diagram for connecting external indicators. These indicators are used to transmit signals to a remote centre, to indicate if unit or fans are still in operation.

Standard indicator

- Alarm indicator
- Run indicator*
- Reg. fan indicator*
- Process fan indicator*

Optional indicators (N/A for certain units)

- Filter guard (regeneration) indicator
- Filter guard (process) indicator
- MAN/AUTO indicator

Each indicator, standard or optional, are marked on the electrical diagram to indicate whether it is a normally closed or a normally opened circuit.

*) Standard indicator may differ depending on model and configuration. See electrical diagram for more information.

5 OPERATION CHECK & ADJUSTMENT

5.1 PRE-OPERATION CHECK

Danger!

The operator of the system has to ensure that all personnel who are involved with installation, operation and maintenance of the machine have read the "Safety" sections of this manual.

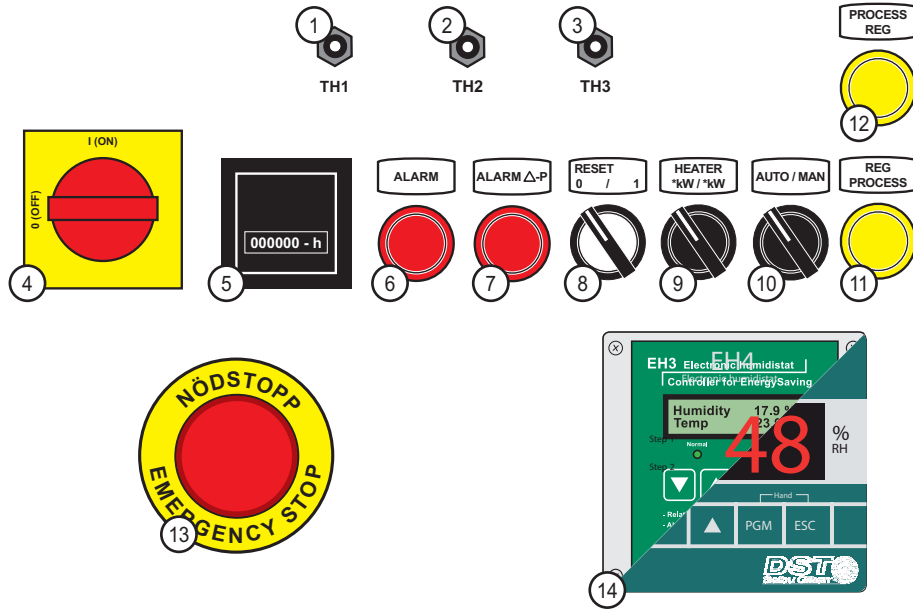
1. Inspect and clean the inside of the unit from foreign objects such as rags, tools, particles of metal, and such, that may pose damage to the inside of the unit.
2. If fitted, ensure that both air balance dampers are fully open and check that the air paths of the ductwork are not obstructed in any way.
3. Check that the filters are securely in place.
4. Confirm both motor overload protectors are set to Start/On position.
5. Confirm thermostat and overheat protection settings are in accordance with table shown "10 Technical Data".
6. Confirm the incoming electrical power cable is secure and ensure that live wires are securely located in the correct terminals. Ensure the earth wire is securely located onto the earth strap or earth terminal provided.
7. Check that the rating of the electrical supply fuses is correct, see wiring diagram.

5.2 START-UP TEST AND ADJUSTMENT

1. Close and secure all access doors
2. Switch the main switch to "I" and check the supply voltage is correct.
3. Briefly start the unit and then turn it off. Promptly check if the process fan and regeneration fan is rotating in the correct direction. If incorrect check "6 Troubleshooting".
See "6 Operating" on "Start" and "Stop".
4. If fitted, balance the airflows, using the dampers in the ductwork or adjust the frequency of each frequency converter to obtain the required values.
5. Check the operation of fault alarms by temporarily reducing the set points of alarm giving thermostats and motor protectors. Do not forget to reset to the original settings according to component list.
6. Measure the current on both fans and compare with the electrical specifications printed on the fan motor casing. If the current is too high, reduce the airflow slightly by closing down on the respective balance damper.
7. If connected, check remote control operation.
8. If connected, check remote alarm function (see 5 above).
9. If connected, check humidistat/humidity sensor function.

6 OPERATING

6.1 CONTROL PANEL



1. [TH1] - High temperature alarm - Reset switch
2. [TH2] - Maximum temperature limiter
3. [TH3] - High temperature alarm - Reset switch
4. [MAIN] - Main isolation switch
5. Run time meter
6. [ALARM] - General alarm light
7. [ALARM Δ-P] - Regeneration air flow alarm light
8. [0 RESET/1] - Combined operating switch ("ON=1" or "OFF=0") and run light indicator. The switch also acts as a reset switch when the emergency stop button has been used (See "8.2 General troubleshooting" on page 18).

9. [HEATER] - Switch for selecting output in kW
10. [AUTO/MAN] - Mode switch for AUTO eller MAN
11. [FILTER PROCESS] - Warning light for filter guard on process air in*
12. [FILTER REG] - Warning light for filter guard on regeneration air in*
13. [EMERGENCY] - Emergency stop button
14. Electronic controller* / Humidistat*

*Option

6.2 START

Start the unit.

- In MAN-mode, the unit will run on the selected heater output until manually turned off. This mode will also prevent a humidistat or a humidity sensor from shutting down the unit.

- "AUTO"-mode, the unit is controlled automatically by a humidistat/humidity sensor.

1. Turn [MAIN] to "1".
2. Turn [AUTO/MAN] to "MAN" for continuous dehumidification or "AUTO" for automatic-mode with connected humidistat/humidity sensor.
3. Choose the output on [Heater].
4. Turn [0/1] to "1" and the unit starts running.

6.3 STOP

Unit will shut down.

- A timed cooling down period on the regeneration fan is initiated before turned off.

5. Turn [0/1] to "0".

6.4 RESET BUTTONS & SWITCHES

Circuit breakers, overheat protections or motor protectors are found inside the electrical cabinet. The position and denotation of the devices may vary depending on the unit and configuration.

! Attention!

If the emergency stop button has been used. Restore the unit by pulling the emergency stop button and then turn the the [0/1]-switch to "0"-position. Restart the unit by turning the switch to "1" to resume operation.

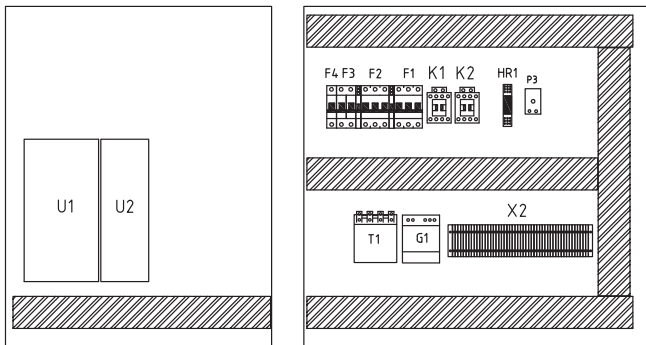


FIGURE 13: Example of a component layout inside an electrical cabinet.

! Attention!

See the electrical diagram for correct layout and information of the reset devices.

7 FUNCTIONALITY & MODE

7.1 DEHUMIDIFICATION CONTROL

The unit is equipped with multiple modes to control the dehumidification. It allows automatic control with connected humidistat/humidity sensor (0-10VDC), or manual override, and options to set the ventilation modes.

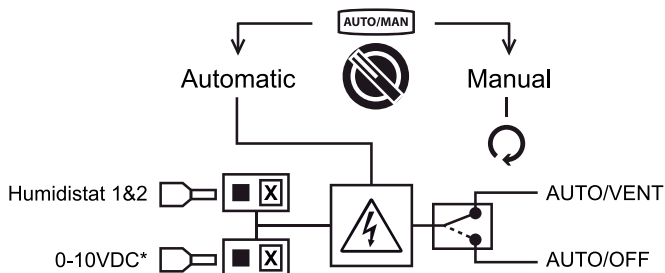


FIGURE 14: Illustration of automatic and manual functions

*) Optional feature to install linear or binary heating control. See "2 Product description" for more information.

7.1.1 AUTOMATIC OR MANUAL

Main operation control is operated by selecting automatic or manual mode on the [AUTO/MAN]-switch. The modes are explained below.

[AUTO] Automatic	<p>The unit is controlled automatically by a humidistat/humidity sensor. Automatic mode stops dehumidification and suspends the unit into a ventilation mode when the control set point has been achieved. When the measured value rises above the control set point, the unit automatically resumes operation.</p> <p>See "7.1.2 AUTO/VENT or AUTO/OFF" to select ventilation mode.</p>
[MAN] Manual	<p>The unit will run on the selected heater output until manually turned off. This mode will also prevent a humidistat or a humidity sensor from shutting down the unit.</p> <p>Output is only selectable for electrical heater.</p>

7.1.2 AUTO/VENT OR AUTO/OFF

In [AUTO]-mode, the unit will stop dehumidification and start ventilation mode when the control set point is achieved. There are two selectable ventilation modes.

AUTO/VENT	AUTO/OFF
The unit keeps running normally with the regeneration heater turned off. A timed cooling down period on the regeneration fan is initiated before turned off.	The unit shuts down to a suspend mode. During shut down procedure, the unit initiates a timed cooling down period.

Note: AUTO-mode is only operatable when a humidistat/humidity sensor is connected.

Note: The unit is delivered ON/VENT by default. This mode is modifiable in the PLC. For units without PLC, change the ventilation mode by changing the terminal link wire inside the electrical cabinet See electrical diagram.

7.1.3 HUMIDISTAT 1 & 2 CONNECTION

Standard units have the option to use the built-in Humidistat inputs to control the dehumidification using a one-step or two-step humidistat.

The built-in humidistat controls the heater i 3 different output modes, maximum effect, reduced effect and zero effect.

Mode	Humidistat inputs	Output
1	Humidistat 2 (Closed) Humidistat 1 (Closed)	Full effect
2*	Humidistat 2 (Opened) Humidistat 1 (Closed)	reduced effect
3	Humidistat 2 (Opened) Humidistat 1 (Opened)	Zero effect**

*) The effect is adjusted approximately to 50% at the factory. This is applicable for models with optional heater coils (hot water, steam or gas). Units equipped with electrical heaters, the reduced effect is listed in the technical data.

***) The unit enters a ventilation mode, ON/VENT or ON/OFF.

See electrical diagram for details and connections.

7.1.4 0-10VDC CONNECTION

Units with optional feature linear or binary heater control, use the 0-10VDC signal to control the dehumidification accurately.

Humidity sensor	Sensor output	Heater output
EH3/EH4/others	0...10VDC	0...100%

See electrical diagram for customer connection.

Note: If the input signal is <0.5V for longer than 2 minutes, the unit will automatically suspend into a ventilation mode.

7.2 REMOTE POWER SWITCH

Connections for a remote power switch is available on certain units. The remote power switch allows the user to shut down or turn on the unit from another location.

See electrical diagram for connections.

8 TROUBLESHOOTING

8.1 ERROR CODES

The dehumidifier will automatically shut down if an error is detected. During shut down, a timed cooling down period on the regeneration fan is initiated before turned off. See below for error codes.

CODE	EXPLANATION	CAUSE	SOLUTION
If the unit stops and the ALARM -light is lit	Process fan overload	Excessive airflow	Check fan Check setpoint of F1/F2
	Regeneration fan overload	Short-circuit or fan malfunction	Reset F1 or F2 – check and adjust airflow Have a qualified electrical technician to investigate
	Regeneration air thermostat TH1 has tripped	TH1 setting incorrect TH1 defective (fail safe) Incorrect shut down	Check TH1 setting Check correct operation of TH1 Reset TH1 - reset F3 - F5
	Regeneration heater overload	Insufficient regeneration airflow Excessive regeneration heater power Regeneration heater malfunction	Check regeneration airflow and fan operation Check TH2 setting Check and replace heater
	Overload in the transformer	Short-circuit or transformer malfunction	Check transformer
	Wet air thermostat tripped (TH3)	TH3 setting incorrect Excessive regeneration airflow Excessive regeneration heater power Incorrect or intermittent rotor rotation Insufficient system moisture load	Check TH3 setting Check and adjust regeneration airflow Check TH2 setting Check rotor drive system Check process airflow and fan operation Check process inlet moisture content Check RH controller set point/output control signal
	Rotation guard sensor has not detected movement	Rotor drive system failure Sensor failure or incorrect clearance	Check drive motor & transmission (correct belt tension) Check clearance gap between sensor and rotor marker
Frequency converter alarm	Frequency converter internal alarm activated – fault code shown	Refer to converter manual for fault code explanation	
EMERGENCY STOP BUTTON is lit	Operation terminated	Emergency button activated [0/1]-switch is active	Pull the emergency button to restore Turn the [0/1]-switch to "0"-position to restore
The unit is running and the ALARM ΔP -light is lit	Internal pressure balance is not optimal	Pressure on regeneration air inlet is higher than process air inlet	Throttle the damper on regeneration air in until ALARM ΔP -light is turned off Check the air flow guard Check the air flow guard setting (recommended is 20Pa)

FIGURE 15: Alarm table and solution

8.2 GENERAL TROUBLESHOOTING

Check for following if the unit will not start-up.

PROBLEM	CAUSE	SOLUTION
Unit will not start. None of the light indicators are on.	No power to unit No power to control circuit The emergency stop button is active	Confirm electric supply and check local isolator is on Check remote control is set to 'On/Run' position Check all circuit breakers are set to 'Start/On' position Pull the emergency stop button and then reset the switch to "0". Have a qualified electrical technician to investigate
The ALARM -light is on but the unit will not start.	Alarm circuit is preventing start-up	Check TH1 & TH3 thermostats are set Check all circuit breakers are set to 'Start/On' position Check fan motor overloads are set to 'Start/On' position
The RUN -light is on, but the dehumidifier does not appear to be operating	The measured value is below the control set point Remote stop/start is disabled	Operation can be checked by lowering control set point or switching to 'manual' operation Check remote control is set to 'On/Run' position

FIGURE 16: General troubleshooting table and solution

8.3 CAPACITY TROUBLESHOOTING

The dehumidifier performance can be roughly checked by feeling the temperature of the uninsulated ductwork near the unit.

Normally with the unit working at nominal conditions (with process air at room temperature), the dry air duct should be warm (25-40°C) and the wet air duct should be warm or hot (30-60°C).

If the unit does not maintain the required condition, check table below.

PROBLEM	OBSERVATION	SOLUTION
The dehumidifier does not maintain required condition or achieve expected performance, despite being operated at full power	Dry air outlet duct is warm and wet air outlet duct is very warm (normal operation)	Check actual moisture load against calculated design moisture load Check controller set point/output signal Check airflows are set as specified, adjust as necessary Check air filters Check dehumidifier casing and ductwork for air leakage Check rotor alignment and condition of radial and peripheral rotor seals
	Both outlet air ducts are cold (no alarm)	Check regeneration airflow and fan operation Check regeneration heater operation Check controller set point/output signal Check TH2 setting
	Dry air outlet duct is cold, wet air outlet duct is hot (no alarm)	Check rotor rotation Check process airflow and fan operation
Measured airflows are lower than specified	Fan is not rotating in direction indicated by arrow on fan motor casing. The incoming phase supply is incorrect	Isolate mains electrical power supply to the unit Change over two of the three incoming phase supply wires. Re-check fan rotation

FIGURE 17: Capacity troubleshooting and solution table

8.4 CAPACITY TEST

If no fault can be found after checking as troubleshooting table, a performance test should be carried out on the dehumidifier, proceeding as follows.

- The different moisture contents x (g/kg), in the four airflows, can be determined by using wet and dry thermometers or calibrated instruments for temp and humidity. To receive the moisture contents the measured temperatures shall be plotted in a psychometric chart.

Process air in: x_{pi}

Process air out: x_{po}

Regeneration air in: x_{ri}

Wet air out: x_{ro}

- Calculate from the actual temperatures the density of the two outlet airflows D_{po} (kg/m³) and D_{ro} .
- Measure the airflow rate in each duct, e.g using a Prandtl tube. The airflow rate is the dynamic pressure, Δp (Pa), which is measured by the difference between the total pressure and static pressure in the duct.

Measurements shall be done in a straight part of the ductwork. In order to avoid faulty measurements caused by turbulent flows, measurements should not be done close after a bend or a fan.

The flow rate in each duct can be calculated as:

$$w = (2 * \Delta p / D)^{1/2} \text{ (m/s)}$$

Where D is the density according to item 2.

Then calculate the volume air flows, V_{po} (m³/h) for the dry air and V_{ro} for the wet air:

$$V = w * A * 3600 \text{ (m}^3\text{/h)}$$

Where A is the cross section area of each duct.

- Now determine the de-humidification capacity, Q (kg/h), by the following equation.

$$Q = (Q_p + Q_r) / 2 \text{ (kg/h)}$$

where

$$Q_p = V_{po} * D_{po} * (x_{pi} - x_{po}) / 1000$$

and

$$Q_r = V_{ro} * D_{ro} * (x_{ro} - x_{ri}) / 1000$$

Compare this measured capacity to the capacity which can be calculated from the data sheet.

9 MAINTENANCE

9.1 REGULAR INSPECTION INTERVALL

It is recommended that the machine should go through a basic inspection on a regular basis during start-up, stopping or per operation round.

1. Check for physical damages and foreign objects by inspecting the dehumidifier internally and externally.
2. Check filter and change if necessary.
3. Check the rotor drive system during operation.
4. Check on all moving components, especially fan for unnatural noises.
5. Check the regeneration heater or, if fitted, coolers if heat and cool is produced.
6. Check for any air infiltration through panels or worn-out sealings.
7. Check electrical equipment is in order, i.e. electrical cabinet or panels are locked and secured or loose components.
8. Water trap is working as well as the drip pan is transporting the condensate into the drain.

9.2 REGULAR SERVICE INTERVALL

Depending on the application or the industry an assessment from a service engineering should determine if the interval of the service should increase or decrease depending on the operating condition.

The provided service schedule in the appendix is an estimate service time and must be adapted to the operating condition.

Caution!

The operator of the system has to ensure that all personnel who are involved with installation, operation and maintenance of the machine have read the "Safety" sections of this manual.

9.3 WASHING THE ROTOR

The rotor contained in DST dehumidifiers has a distinct advantage over other types of desiccant rotors in that dust can be washed out of the material without any need for reimpregnation after the treatment.

Washing the rotor is not a maintenance process but a method to restore the rotor's adsorption ability. This should only be carried out as last resort and in an extreme case if other attempt to restore the adsorption ability is futile.

Caution!

Please contact a DST-representative before attempting to wash the rotor!

10 TECHNICAL DATA

RL-71R RL-71RICE

Capacity		
Capacity [kg/h] 1)	13	14
Nominal dry air flow [m ³ /h] 2)	2500	3000
External static pressure dry air [Pa] 3)	400	400
Nominal wet air flow [m ³ /h] 4)	800	800
External static pressure wet air [Pa] 3)	300	300
Regeneration heater - Electric		
Heater power [kW]	17	17
Number of electric heater steps	2	3
Heating power in steps [kW]	1/2-12,5 2/2-17	1/2-12,5 2/2-17
Heating power with linear control [kW] 5)	0-17	0-17
Setpoint for humidistat/humidty sensor 5)		
Humidistat setpoint [%RH] Step 1	47	47
Humidistat setpoint [%RH] Step 2	50	50
Humidistat 2 opens and reduce the effect to [kW]	12.5	12.5
Total power - Electrical		
Total motor power [kW]	3.3	4.3
Total power [kW]	20.3	21.3
Other electrical information		
Supply fuse 3x230V/50Hz [A]	-	-
Supply fuse 3x400V/50Hz [A]	50	50
Electric compartment protection class	IP54	IP54
Humidistat connection 6)	230VAC	230VAC
Humidistat supply current [A] 7)	< 1	< 1

Temperature setpoint settings		
Overheat protection TH1 [C]	190	190
Thermostat TH2 [C]	160	160
Overheat protection TH3 [C]	80	80
Rotor data		
Speed of rotor rotation [rph]	45	45
Rotor type	SSCR-U	SSCR-U
Other technical data		
Air filter class (regeneration/process)	G4/G4	G4/G4
Filter change at pressure (G4/F7) [Pa] 5)	250/300	250/300
Noise level [dB(A)] 4)	-	-
Regeneration. fan delay [min]	12	12
Weight [kg]	190	195

1) Valid for inlet conditions 20°C/60%RH. For other inlet conditions the capacity can be calculated by the correction factor from below diagram.

2) Volume flow for density 1.20 kg/m³.

3) If no data is stated here the volume flow above is given at free blowing airflow.

4) Unit connected to uninsulated ducts. Nominal air flows.

5) Applies for dehumidifiers with installed optional feature.

6) Only use humidistats that are capable of load current of 1A min.

7) The current provided by the humidistat connection.

The content of in this document may be subject to change without prior notice.

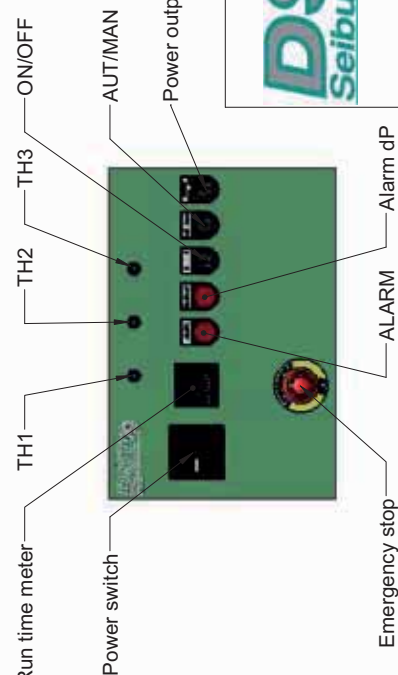
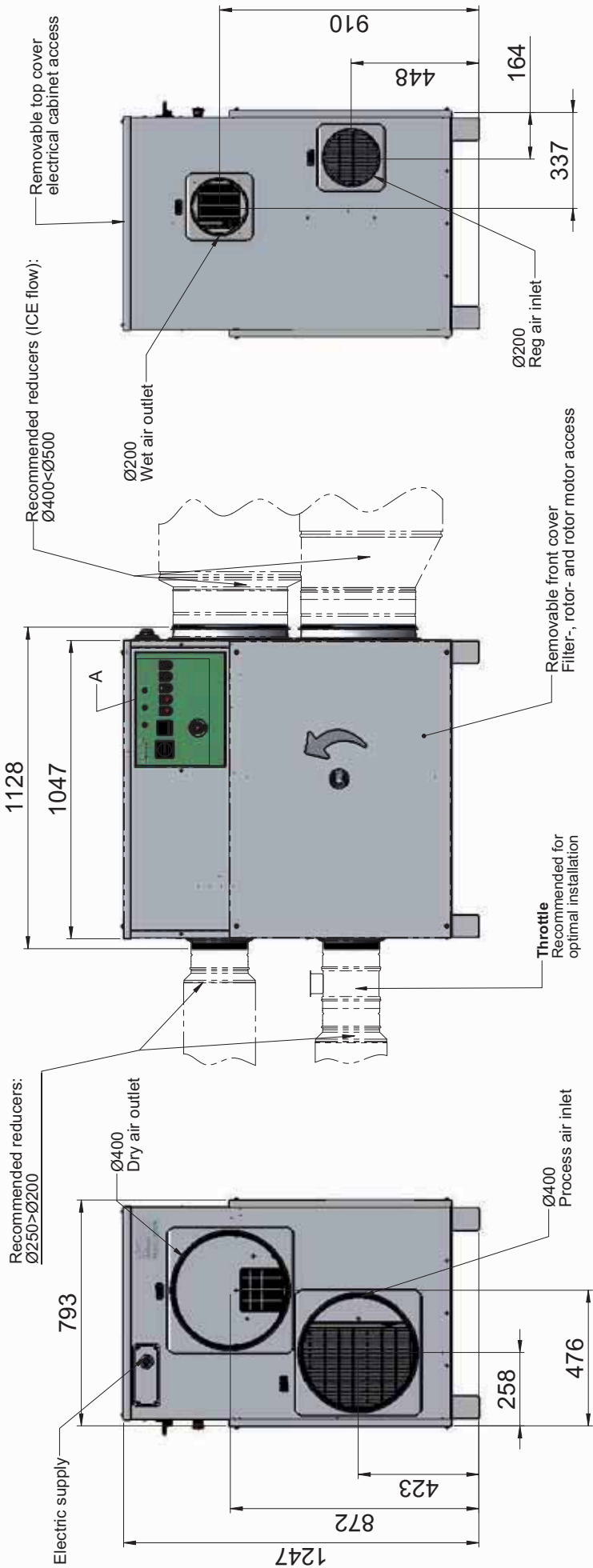
For questions and comments regarding the content in this document, please send it to

Seibu Giken DST AB, ATT: Documentation, Avestagatan 33, 163 53 SPÅNGA, SWEDEN.

Komponentlista / Component list RL-71R

Description	Antal Qty.	Benämning	Typ, ritn nr o dyl	Type, Drwg No etc	71	71 ICE	Art. Nr Art No	Tillverkare / Leverantör Manufact. / Supplier	Anmärkingar Notes
Rotor	1	Rotor	SSCR-U 660H10		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	107953	Seibu Giken /	
Rotormotor	1	Drivmotor	SGM65/30-4 10rph		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	104436		
Radial seal	2,4m	Teflonremsa	0,35x35x1000mm; Teflon		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	105241		
Hose clamp	10m	Slangklämma	30m; 9mm; Stainless (2st)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	102179		
Lock hose clamp	2	Slangklämma - Lås			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	102180		
Beltpulley	1	Remskiva	16 L 050 d=8mm		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	100212		
Perifer seal	4m	Periferitätning	Felt+EPDM, 1x30x2500 (2st)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	103132		
Belt	1	Drivrem	884L 050		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	108239		
Fans		Fläktar							
Proc.fan	1	Processfläkt	GSF-2-200/104 -220 T 2,2kW;3x230/400V / 50Hz;		<input checked="" type="checkbox"/>	<input type="checkbox"/>			
Proc.fan	1	Processfläkt	GSF-2-225/104 -300 T 3,0kW;3x230/400V / 50Hz;		<input type="checkbox"/>	<input checked="" type="checkbox"/>	107952		
Reg.fan	1	Reg.fläkt	GSF-2-200/74 -110 T 1,1kW; 3x230/400V/50 Hz;		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	107951		
Filter		Filter							
Filter proc.	1	Filter proc.	AP 705x330x50 G4		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	107975		
Filter reg.	1	Filter reg.	AP 705x330x50 G4		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	107975		
Heater		Värmare							
Reg.heater	1	Reg. värmare	17kW (12,5kW resp 4,5kW); 3x400V		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	107964		
Overheat protection	1	Överhettningsskydd	TH1: heaTHERM 160-200°C		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	106157		
Other		Övrigt							
Electric box	1	Elcentral	Drw 10464 rev00		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	108391		

Service side



REVISIONS		DATE	APPROVED
REV. 01	DESCRIPTION	2012-12-17	EL
02	Drawing layout improved	2013-01-10	EL
		Drawing info added	

Designed by	Erik L	Date	2012-11-21
Drawn by	Erik L	Date	2012-11-21
Approved by		Date	
Material		Thickness	t=

Title/Description		Dimensionsritning	
		Dimension drawing	
Drawing no		Rev	
DST04470		02+	

Status	Construction	ISO 2768-1m
Scale	1:15 A3	1/5 00+ 276.523



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DETAIL A
SCALE 1 : 6

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Harmful chemicals and solvents for rotors

SEIBU GIKEN CO.,LTD.

Reduced performance and/or rotor degradation is possible when adsorping the following substances.

	Substance	Note	Chemical formula	Cause
1	Oil vapor		N/A	Clogs the micro pores on the silica gel/zeolite.
2	Ammonia	2ppm and above, prolonged exposure	NH ₃	Degrades the silica gel/zeolite.
3	Amine		RNH ₂	
4	Hydrogen fluoride		HF	Corrodes the silica gel/zeolite.
5	Sodium hydroxide	High concentration	NaOH	Dissolves the silica gel/zeolite.
6	Potassium hydrate	High concentration	KOH	Clogs the micro pores on the silica gel/zeolite.
7	Lithium chloride		LiCl	
8	Sodium chloride		NaCl	
9	Potassium chloride		KCl	
10	Calcium chloride		CaCl	
11	Magnesium chloride		MgCl	
12	Aluminum chloride		AlCl ₃	
13	Seawater		N/A	
14	Strong acid	pH=3 and below	N/A	Deteriorates the honeycomb's physical structure.
15	Plasticizer		N/A	Clogs the micro pores on the silica gel/zeolite.
16	Nitrogen oxides	High concentration, excessive exposure	NO _x	Deteriorates the honeycomb's physical structure.
17	Sulfur oxides	High concentration, excessive exposure	SO _x	
18	High-temperature steam	Exposod to vapor of 100 and above.	N/A	Cracks occurs on the honyecomb.
19	Heat solubility dust		N/A	Dust covers the silica gel/zeolite surface.

There is no guarantee that other substances beyond this list may reduce the dehumidification performance or damage the silica gel/zeolite.

Service schedule recommended by DST

Service time	Run time in hours	0	4 000	8 000	12 000	16 000	20 000	24 000	28 000	32 000	36 000	40 000	44 000	48 000
	Calendar time in months	0	6	12	18	24	30	36	42	48	54	60	66	72
Unit														
Inspect and change filter if necessary 1)	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Clean and inspect the unit 2)			X	X	X	X	X	X	X	X	X	X	X	X
Inspect fan, fan wheel, casing, motor and bearings, renew if necessary 3)			X	X	X	X	X	X	X	X	X	X	X	X
Inspect features and functionality 4)	X		X	X	X	X	X	X	X	X	X	X	X	X
Inspect electric and control system, cables, electrical components and functionality 5)			X	X	X	X	X	X	X	X	X	X	X	X
Inspect access panels, locks and seals 6)			X	X	X	X	X	X	X	X	X	X	X	X
Inspect duct and duct connections 7)	X			X	X	X	X	X	X	X	X	X	X	X
Inspect heater and cooler 8)			X	X	X	X	X	X	X	X	X	X	X	X
Inspect and renew humidistat/humidity sensor if necessary 9)			X	X	X	X	X	X	X	X	X	X	X	X
Inspect rotor motor and renew if necessary 10)			X	X	X	X	X	X	X	X	X	X	X	X
Inspect and renew seals on removable panels if necessary 11)			X	X	X	X	X	X	X	X	X	X	X	X
Inspect and renew peripheral seals if necessary 12)			X	X	X	X	X	X	X	X	X	X	X	X
Inspect rotor seals and renew if necessary 13)			X	X	X	X	X	X	X	X	X	X	X	X
Inspect and renew drive chain in the rotor rotation system if necessary 14)			X	X	X	X	X	X	X	X	X	X	X	X
Inspect rotor 15)	X		X	X	X	X	X	X	X	X	X	X	X	X

Safety feature check														
Inspect overheat protection 16)			X	X	X	X	X	X	X	X	X	X	X	X
Renew and inspect the freeze protection device if necessary 17)	X		X	X	X	X	X	X	X	X	X	X	X	X
Inspect rotation guard and renew if necessary 18)	X		X	X	X	X	X	X	X	X	X	X	X	X
Inspect damper, actuator and valves 19)	X		X	X	X	X	X	X	X	X	X	X	X	X
Inspect post-cooling function 20)	X		X	X	X	X	X	X	X	X	X	X	X	X

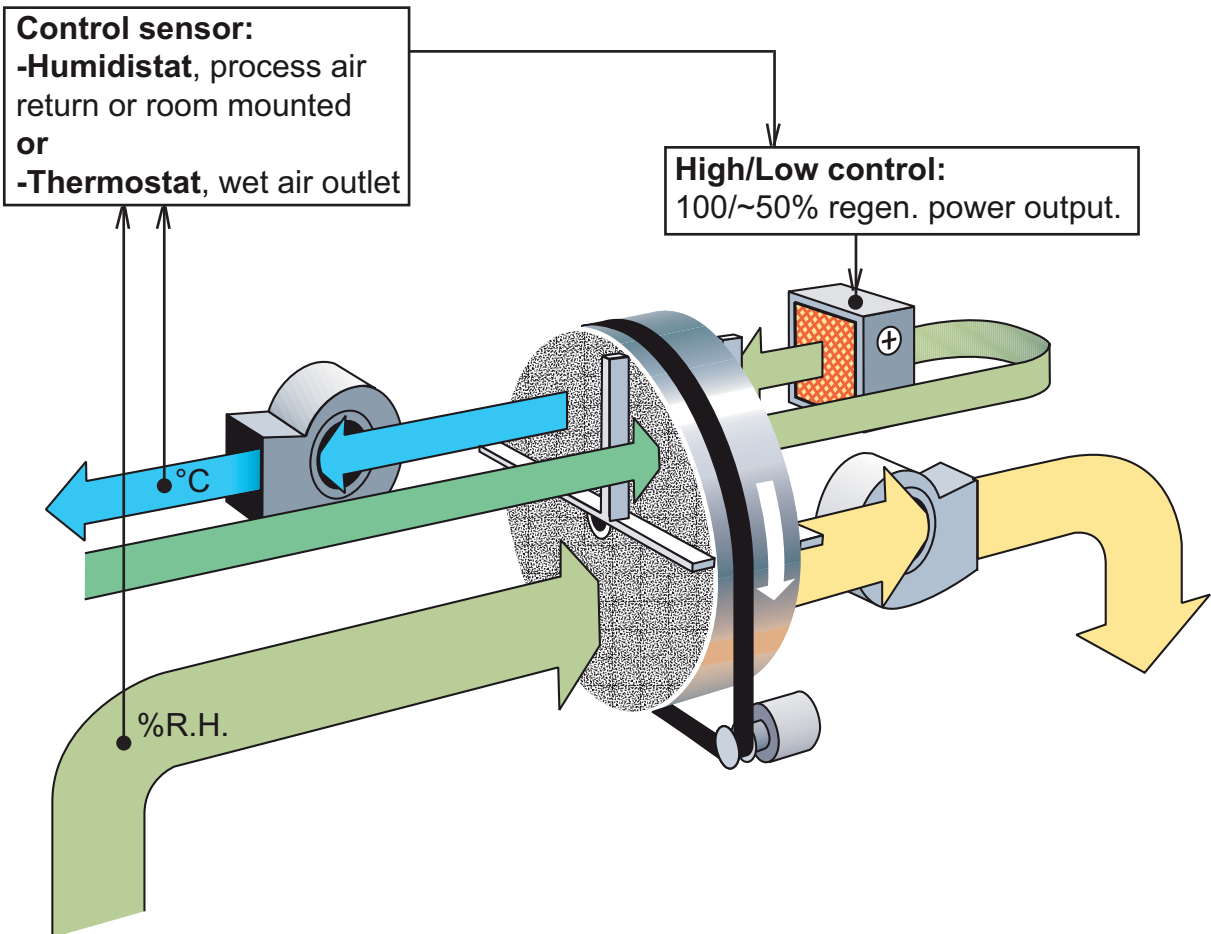
Service performed	Date:													
	Performed by:													

1. Replace filter according to the intervals. If the filter is not replaced, a frequent inspection interval is needed.
2. Inspect for physical damages by inspecting the dehumidifier internally and externally. Remove foreign objects and clean the dehumidifier on the inside and outside if needed. Use industrial vacuum cleaner. Do "NOT" use compressed air or high pressure washer!
3. Perform a visual inspection on the parts for any external damages and check moving components (Manually check if fans can move freely, loose cables, etc...)
4. Inspect the unit's basic functions and, if any, special function (rotations guard, triac, thyristor, frequency converter) are operational during normal operation.
5. In addition to (4), inspect cables from the contactors. Check the entire unit's electrical and control system, especially in those areas where components and cables are exposed to humidity and heat for any potential damages.
6. Inspect access panels and locks, used by service personnel and all types of seals for possible wear, infiltration, properly installed - Peripheral seals (zones), EPDM-seals (rotor seals), rubber seals (rotor cassette), etc...
7. Inspect if the ducts are properly sealed and for condensation, insulate if needed.
8. Inspect the heater or coolers for any foreign objects or leakage that may damage the equipment or jeopardize the unit to any hazardous danger, such as fire, etc... Inspect any drip pans and pipes for condensation. Clean if necessary.
9. Inspect the function of the mechanical humidistat and calibrate it every 24 months. Replace if necessary. Also check EH3/4, no calibration is required. Renew if necessary.
10. Inspect the entire rotor drive system and tension on the chain/belt drive
11. Inspect the seals around the inspection panels and locks used by service personnel for possible wear, infiltration, properly installed, etc...
12. Inspect and if necessary, renew the peripheral seals around the rotor sections that divide the rotor into purge, regeneration and process sectors for possible wear, infiltration, properly installed, etc... Consult the supplier before attempting to change or renew the peripheral seals.
13. Inspect rotor seals around the rotor for possible wear, infiltration, properly installed, etc... Consult the supplier before attempting to change or renew the rotor seals.
14. Inspect if the drive chain or drive belt has the proper tension on the rotor and the rotor rotation system, i.e. the rotor is spinning in the right direction with the right resistance.
15. Inspect the rotor for damages and for foreign objects that may have clogged matrix holes. Remove and clean possible dust and the foreign objects with an industrial vacuum cleaner. Do "NOT" use compressed air or high pressure washer! Renewing the rotor depends on the ability to maintain its capacity.
16. Inspect the settings on the overheat protections, as well as if they are operational and stop the unit if overheated.
17. If damper is installed (certain units only) the freeze protection device will close the dampers and the unit will shut down.
18. Check if the unit will automatically shut down if the rotor stops rotating.
19. If any, check for infiltration when dampers are closed, clean if necessary. Check if valve actuator and damper actuator are operational and if the valves can block the gas/liquid flow when closed.
20. The post-cooling feature will initiate automatically after a shut down or when it switches to stand-by mode by a humidistat/humidity sensor.

Energy saving



STEP 1



Optional power output control, step 1.

During low load conditions the control sensor automatically reduces the dehumidifier capacity by approximately 50%. Control can be by humidistat or thermostat.

Humidistat sensor

A two step humidistat is recommended, the upper set point reducing the dehumidifying capacity to around 50%, the lower set point reducing the capacity to zero.

In applications where there is no process pre-cooling or mixing with ambient air, the humidistat can be mounted inside the unit (factory-mounted) sensing the process air return condition. In other applications the humidistat is normally mounted within the conditioned area.

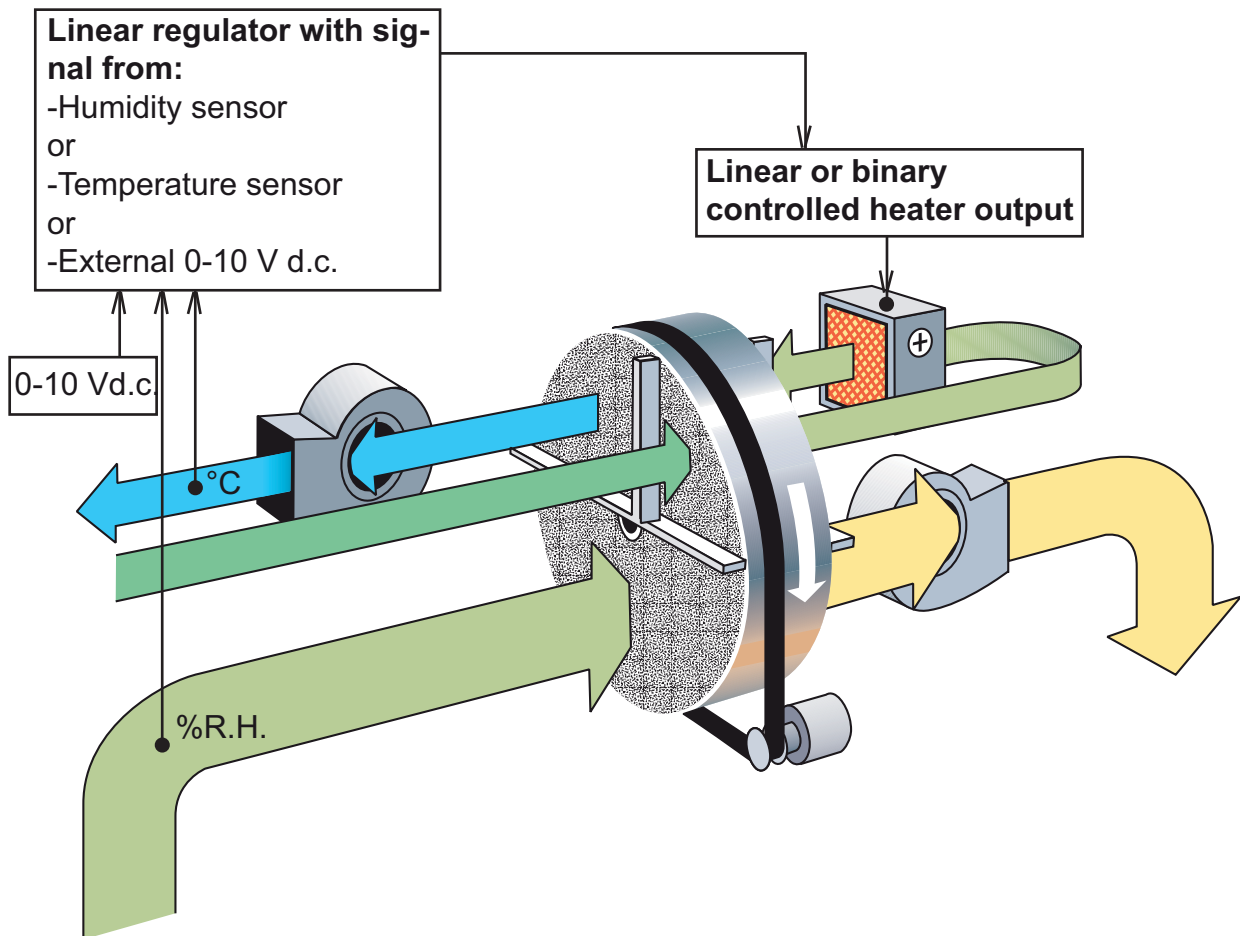
Thermostat sensor

On applications where a humidistat is not used, the unit can be delivered with a single step thermostat installed in the wet air outlet to provide capacity control. During low load conditions the wet air outlet temperature increases. When the thermostat set point, factory set at 60°C, is reached the dehumidifying capacity is automatically reduced to 50%.

Energy saving



STEP 2



Optional power output control, step 2.

In response to load changes, the dehumidifying capacity is automatically adjusted to between zero and full power. With the binary version the heater power is divided into equal steps, the number of stages in operation determined by the regulator signal. With the linear version the heater is triac controlled (on/off within a 60 s period) and is able to provide linear output across the full power range.

Control can be from a humidity or a temperature sensor or a 0-10 Vdc signal from an external system. In applications where there is no pre-cooling or mixing with ambient air, the humidity sensor can be mounted inside the unit (factory mounted) sensing the process air inlet condition. In other applications the humidity sensor is normally mounted within the conditioned area. On applications where a humidity sensor is not used, less accurate control can be achieved using a temperature sensor installed in the wet air outlet.

To monitor rotor operation, proximity sensor is included in Step 2.

EC declaration of conformity

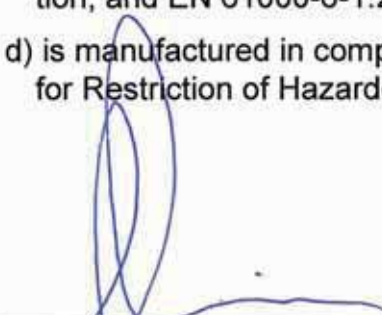
Manufacturer:

Seibu Giken DST AB
Avestagatan 33
S-163 53 SPÅNGA
Sweden
Tel: ...46 8 445 77 20 Fax: ...46 8 445 77 39

Hereby confirms that:

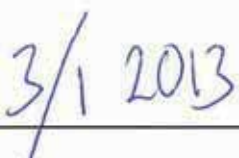
Machinery type RL-71

- a) is manufactured in compliance with DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)
- b) is manufactured in compliance with the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC
- c) is manufactured in compliance with European Standards EN 60204-1:2007 3rd edition, EN ISO 12100:2010, EN ISO 13857:2008, EN 61000-6-3:2007 2nd edition, and EN 61000-6-1:2007 2nd edition.
- d) is manufactured in compliance with European Directive 2002/95/EC for Restriction of Hazardous Substance (RoHS).



Anders Kristoferson, Managing Director

Spånga



3/1 2013

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