

# INSTRUCTION MANUAL



Document version: EN.14 08 12

Product: RLA-71LR

## Dehumidifier RECUSORB RLA-71R/71LR



*The product picture may differ from the actual product*



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# 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.

Noncompliance 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, use the normal shut down procedure as described in operation and allow the system to cool down before attempting to access internal components.


 **Danger!** 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.


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

 **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!** Use the normal shut down procedure as described in operation. 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

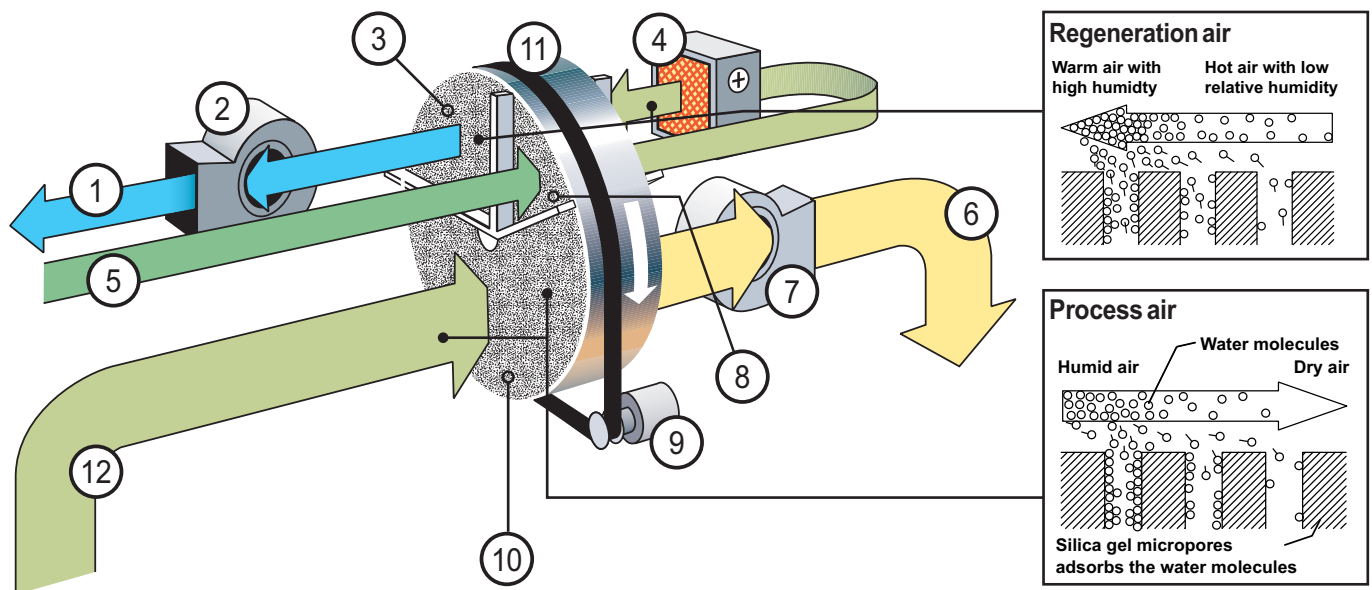
The dehumidifiers are made as complete units including rotor, fans, rotor motor and rotor drive transmission, heater for the regeneration, controls and electrical equipment.

The water vapour is effectively adsorbed from the treated air in the 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 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.

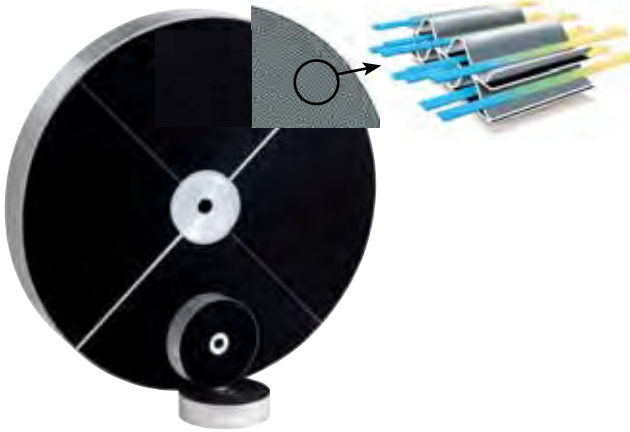


# 3 PRODUCT DESCRIPTION

## 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!

### 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.

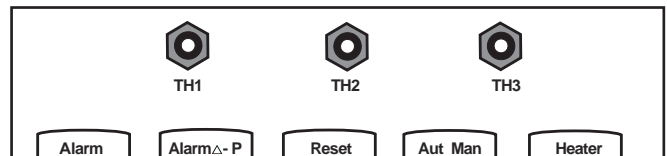
**Note:** Should TH1 trip, it will automatically disable the regeneration heater circuit breakers. These must be reset before attempting to restart the unit.

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**

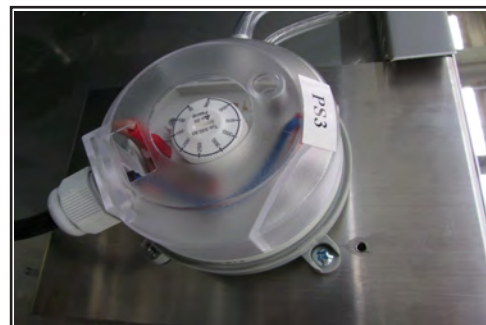
The temperature controller and temperature limiter are located on the control panel with the reset buttons on the front. The settings are placed inside of the unit behind TH1, TH2 and TH3.

## 3.2 OPTIONAL COMPONENTS

### 3.2.1 FILTER GUARDS

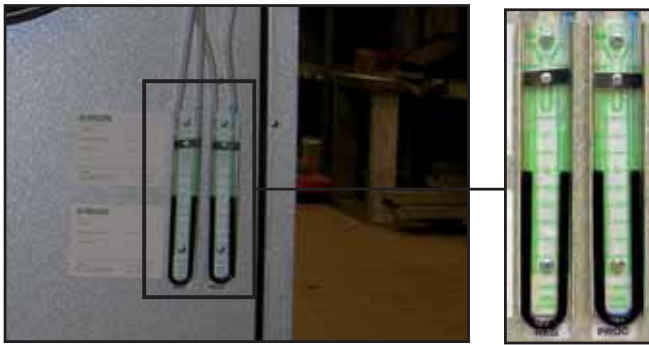
**Note:** Option

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 differential change before and after the filter.

## 3.2.2 CONTROL OF THE REACTIVATION HEATER

**Note:** Option

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 electronic controller.

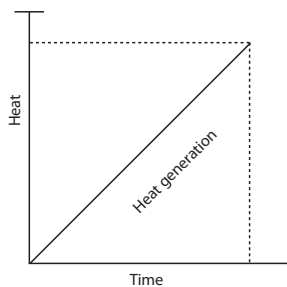
The device pulses out power to the regeneration heater in order to control the heater. The pulse frequency varies depending on the analogue input signal (0-10VDC). The higher the analogue signal = the longer it pulses, which in turn produces a higher heater output. If the analogue signal is low = the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

**Note:** Option

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

## 3.2.4 ENERGY SAVING

**Note:** Option

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 HMM, or the controllers EH3 or EH4.

**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.



# 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 single-handedly! Always ask for assistance or use lifting aid!

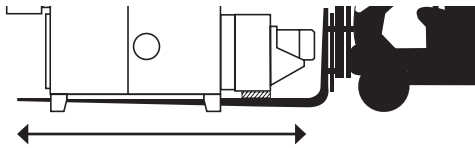


FIGURE 7: Forks in contact with both sides of the frame.

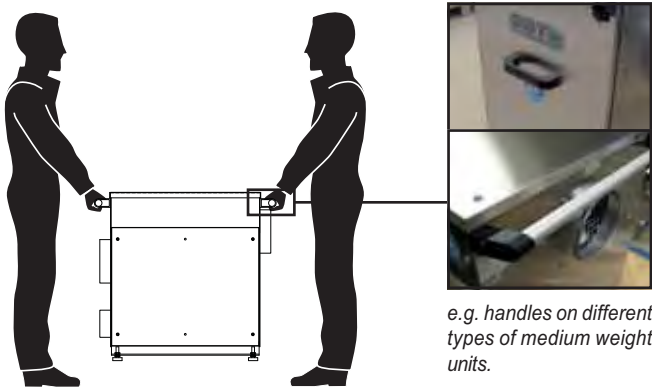


FIGURE 8: Medium size units

### 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.

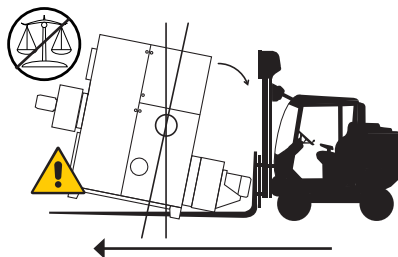


FIGURE 9: Exercise caution when lifting and transport a unit

*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 for RL-71R, RZ-series and CZ-series only.

To allow securing of the dehumidifier to the floor or to a pedestal, four brackets with predrilled 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.

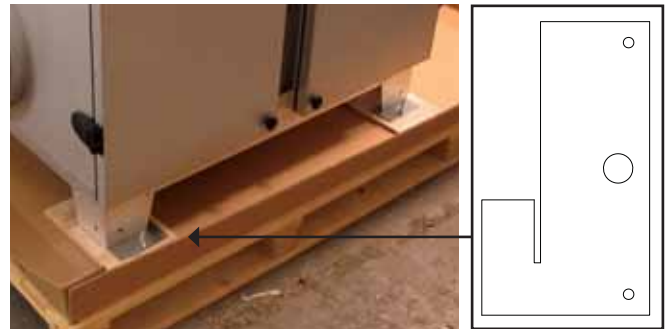


FIGURE 10: Foot brackets fixed on a pallet during transport

## 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 duct work. 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 duct work.

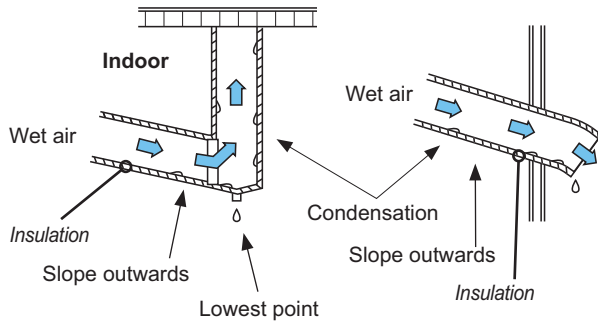


FIGURE 11: Installation of wet air out duct

## 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 and process air in. See dimension for installation.

## 4.3 HUMIDISTAT/ELECTRONIC CONTROLLER INSTALLATION

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

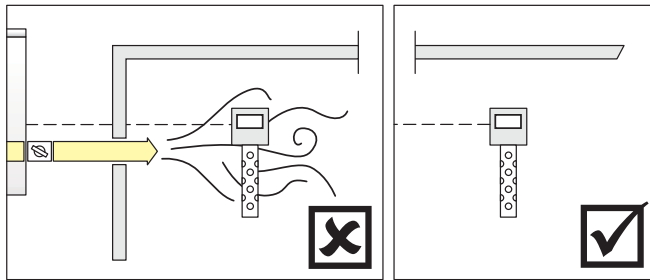


FIGURE 12: Humidistat positioning

## 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

**Note:** Option

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 duct work 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.

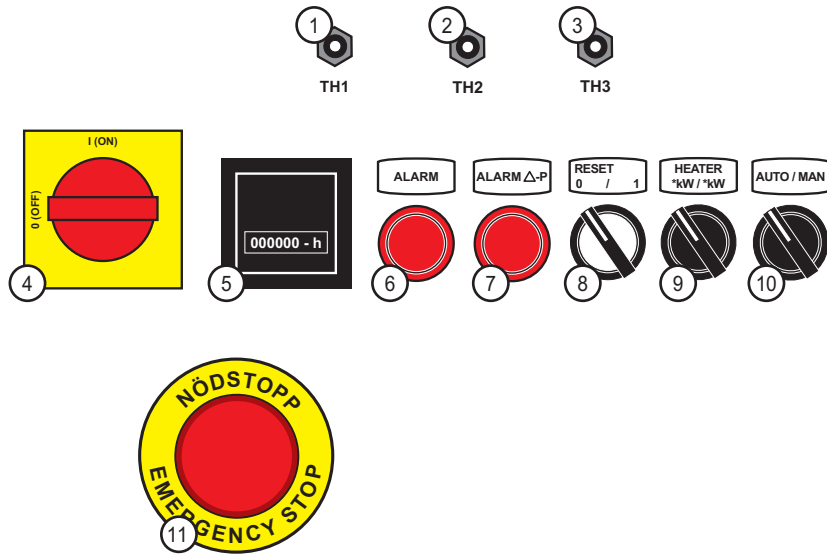
## 5.2 START-UP TEST AND ADJUSTMENT

---

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 duct work 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/electronic controller 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.
9. [HEATER] - Switch for selecting output in kW
10. [AUTO/MAN]
11. [EMERGENCY] - Emergency stop button

\*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 electronic controller from shutting down the unit.

- "AUTO"-mode, the unit is controlled automatically by a humidistat/electronic controller.

1. Turn [MAIN] to "I".
2. Turn [AUTO/MAN] to "MAN" for continuous dehumidification or "AUTO" for automatic-mode with connected humidistat/electronic controller.
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.

1. 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 [0/1]-switch to "0"-position. Restart the unit by turning the switch to "1" to resume operation.

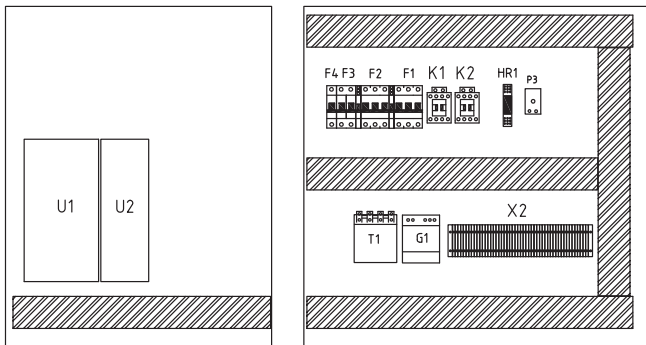


FIGURE 13: Example of a component layout inside an electrical cabinet.

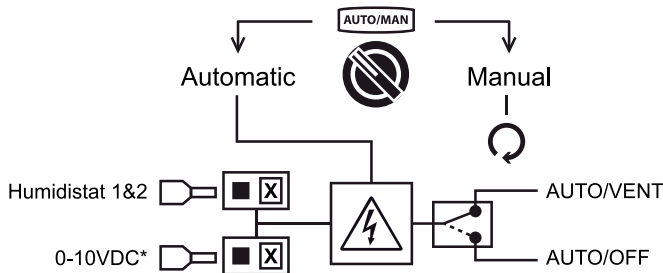
### ! Attention!

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 or electronic controller (0-10VDC)\*, a manual override, and options to set the ventilation modes.



**FIGURE 14: Illustration of automatic and manual functions**

\*) Option. 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.

<b>[AUTO]</b> Automatic	<p>The unit is controlled automatically by a humidistat/electronic controller. Automatic mode stops dehumidification and suspends the unit into a ventilation mode or a idle 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>
<b>[MAN]</b> Manual	<p>The unit dehumidifies until it is manually turned off. This mode will prevent a humidistat/electronic controller from controlling the unit.</p> <p>The heater output is selectable for some models, see "6 Operating" for more information.</p>

### 7.1.2 AUTO/VENT OR AUTO/OFF

A user selectable feature is included to allow the unit to start ventilate (AUTO/VENT) or powers down to an idle mode (AUTO/OFF) when the dehumidification stops.

AUTO/VENT	AUTO/OFF
When set to <b>AUTOMATIC/ VENTILATION</b> mode. The unit is ventilation with the process fan only. The regeneration fan acts a cooler for the regeneration heater. It will be turned off after a timed cooling period.	When set to <b>AUTOMATIC - OFF</b> mode, the unit powers down to a idle mode, and stands ready to resume operation. The regeneration fan acts a cooler for the regeneration heater. It will be turned off after a timed cooling period.

**Note:** AUTO-mode is only operable when a humidistat/electronic controller is connected.

**Note:** The unit is set for either AUTO/VENT or AUTO/OFF. For units with PLC, change the mode in the PLC. For units without PLC, change the ventilation mode by changing the terminal link wire inside the electrical cabinet. See electrical diagram for default ventilation mode on the unit.

## 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 ( <b>Opened</b> ) Humidistat 1 (Closed)	Reduced effect*
3	Humidistat 2 ( <b>Opened</b> ) Humidistat 1 ( <b>Opened</b> )	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). The reduced effect for electrical heaters is listed in the technical data.

\*\*) The unit also enters a ventilation mode, AUTO/VENT or AUTO/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.

Electronic controller	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 <b>ALARM</b> -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	
<b>EMERGENCY STOP BUTTON</b> 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 <b>ALARM ΔP</b> -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 <b>ALARM ΔP</b> -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 <b>ALARM</b> -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 <b>RUN</b> -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 duct work 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 duct work 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/m<sup>3</sup>) and  $D_{ro}$ .
- Measure the airflow rate in each duct, e.g using a Prandtl tube. The airflow rate is the dynamic pressure,  $\Delta p$  (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 duct work. 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,  $V_{po}$  (m<sup>3</sup>/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 INTERVAL

---

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 INTERVAL

---

Depending on the application or the industry an assessment from a service engineering should determined 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

RLA-71 RLA-71 ICE RLA-71LR ICE

Capacity			
Capacity [kg/h] 1)	13	14	17
Nominal dry air flow [m <sup>3</sup> /h] 2)	2500	3000	3200
External static pressure dry air [Pa] 3)	400	400	200
Nominal wet air flow [m <sup>3</sup> /h] 4)	800	800	1000
External static pressure wet air [Pa] 3)	300	300	200
Regeneration heater - Electric			
Heater power [kW]	17	17	24
Number of electric heater steps	2	2	2
Heating power in steps [kW]	1/2-12,5 2/2-17	1/2-12,5 2/2-17	1/2-6 2/2-18
Heating power with linear control [kW] 5)	0-17	0-17	0-24
Regeneration heater - Steam 5)			
Heater power [kW]	17	17	-
Operating pressure [bar(g)]	6	6	-
Max. Operating pressure [bar(g)]	10	10	-
Steam consumption [kg/h]	-	-	-
Freeze protection alarm [°C] 5)	7	7	-
Setpoint for humidistat/humidity sensor 5)			
Humidistat setpoint [%RH] Step 1	47	47	47
Humidistat setpoint [%RH] Step 2	50	50	50
Humidistat 2 opens and reduce the effect to [kW]	12.5	12.5	18
Total power - Electrical			
Total motor power [kW]	3.3	4.1	4.1
Total power [kW]	20.3	21.1	28.1
Other electrical information			
Supply fuse 3x230V/50Hz [A]	80	80	125

Supply fuse 3x400V/50Hz [A]	50	50	63
Electric compartment protection class	IP54	IP54	IP54
Humidistat connection 6)	230VAC	230VAC	230VAC
Humidistat supply current [A] 7)	< 1	< 1	< 1
Temperature setpoint settings			
Overheat protection TH1 [C]	200	200	200
Thermostat TH2 [C]	180	180	180
Overheat protection TH3 [C]	95	95	95
Rotor data			
Speed of rotor rotation [rph]	50	50	50
Rotor type	DMR	DMR	DMR
Other technical data			
Air filter class (regeneration/process)	G4/G4	G4/G4	G4/G4
Filter change at pressure (G4/F7) [Pa] 5)	200/250	200/250	200/250
Noise level [dB(A)] 4)	75	75	75
Regeneration, fan delay [min]	12	12	12
Weight [kg]	190	195	196

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/m<sup>3</sup>.

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 RLA-71R/71LR

Description	Antal Qty.	Benämning	Typ, ritn nr o dyl Type, Drawg No etc	71	71 ICE	71L	Art. Nr Art No	Tillverkare / Leverantör Manufact. / Supplier	Anmärkningar Notes
<b>Rotor unit</b>		<b>Rotorenhet</b>							
Rotor	1	Rotor	DMR-660H10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11120001	Seibu Giken /	
Radial seal	2,4m	Teflonremsa	0,35x35x1000mm; Teflon	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11120021		
Periferal seal	4m	Periferitättning	Felt+EPDM, 1x30x2500 (2st)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11090017		
Hose clamp	10m	Slangklämma	30m; 9mm; Stainless (2st)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Lock hose clamp	2	Slangklämma - Lås		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Rotormotor	1	Drivmotor	M7Rx15G4GGA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11050114		
Beltpulley	1	Remskiva	T18	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Belt	1	Drivrem	10T102260	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	250042		
<b>Fans</b>		<b>Fläktar</b>							
Proc.fan	1	Processfläkt	GSF-2-200/104 -220 T 2,2kW;3x230/400V / 50Hz;	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11060064		
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"/>	<input checked="" type="checkbox"/>	11120002		
<b>Filter</b>		<b>Filter</b>							
Filter	1	Filter	AP 705x330x50 G4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11070168		Process
Filter	1	Filter	AP 705x330x50 G4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	11070168		Regeneration
<b>Regeneration heater - Resistive heater</b>		<b>Regenereringsvärmare - Resistivvärmare</b>							
Reg.heater	1	Reg. värmare	17kW (12,5+4,5); 3x400V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
Reg.heater	1	Reg. värmare	24kW (18+6); 3x400V	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Overheat protection	1	Överhettningsskydd	TH1: heaTHERM 160-200°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	12030202		
Electric box	1	Elcentral	Dwg: 10464-00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
Electric box	1	Elcentral	Dwg: 10620-00	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
<b>Other</b>		<b>Övrigt</b>							
Overheat protection	1	Överhettningsskydd	TH3: heaTHERM 50-100°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	12030204		
Thermostat	1	Termostat	TH2: heaTHERM 0-200°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	12030203		

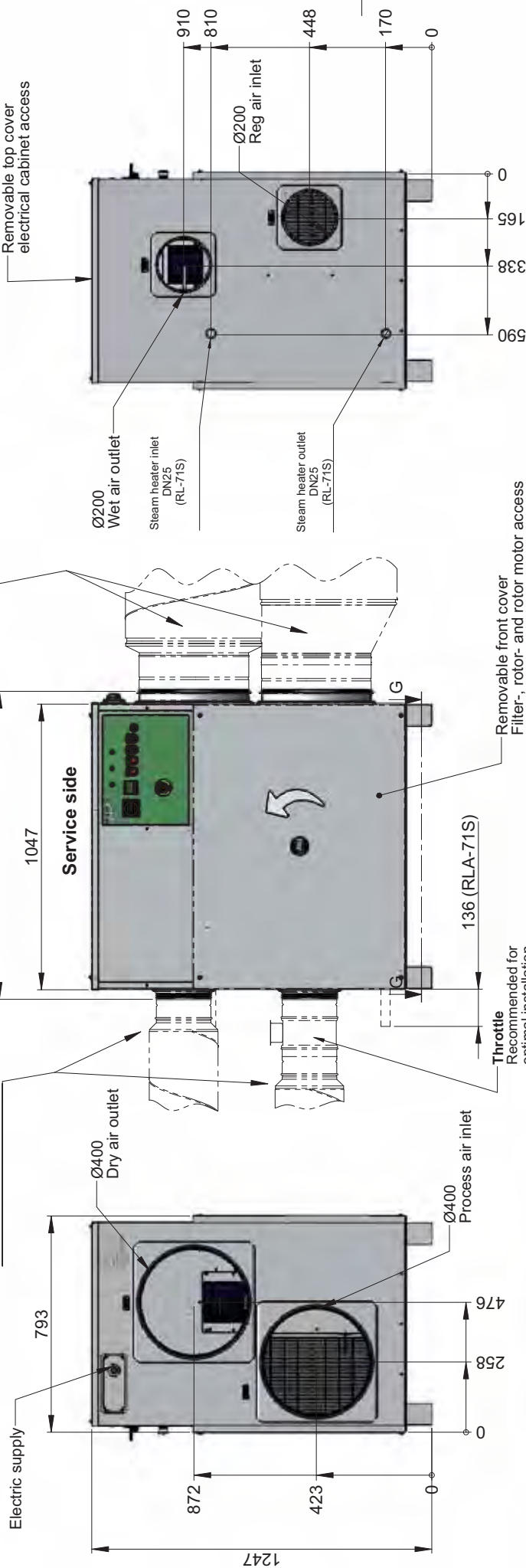
**Packaging dimensions:**  
 WxDxH = 1340x940x1400  
 Weight ~ 110 kg

Recommended reducers (Dry air flow > 2500 m<sup>3</sup>/h):  
 Ø400-Ø500

Recommended reducers:  
 Ø250 > Ø200

Recommended reducers:  
 Ø250 > Ø200

Recommended reducers:  
 Ø250 > Ø200



REV.	DESCRIPTION	DATE	APPROVED
01	Drawing layout improved	2012-12-17	EL
02	Drawing info added	2013-01-10	EL
03	Mass properties corrected and attachment holes view added.	2013-07-26	EL
04	Drawing updated to include heater options LR and S. Packaging dimensions and weight added.	2013-11-13	EL

**DST**

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Drawn by: Erik L  
 Date: 2012-11-21

Checked by: Erik L  
 Date: 2012-11-21

Approved by: \_\_\_\_\_  
 Date: \_\_\_\_\_

Material: \_\_\_\_\_  
 Thickness: t= \_\_\_\_\_

Scale: 1:15 A3  
 Sheet/Sheet: 1/3  
 Rev Part: 00+  
 ISO 2768-1m  
 Rev Part: 00+  
 Weight (kg): 199.095

Title/Description: **Dimensionsritning**  
 Dimension drawing

**RL-71 R/R ICE/LR/S/ICE**

Drawing no: **DST04470**  
 Rev: **04+**

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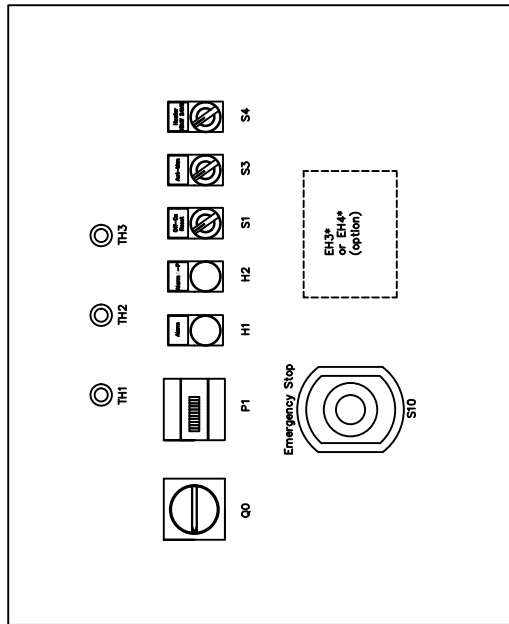
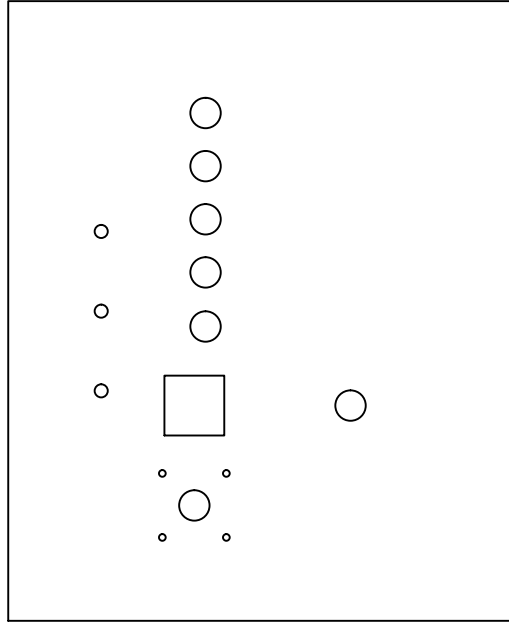
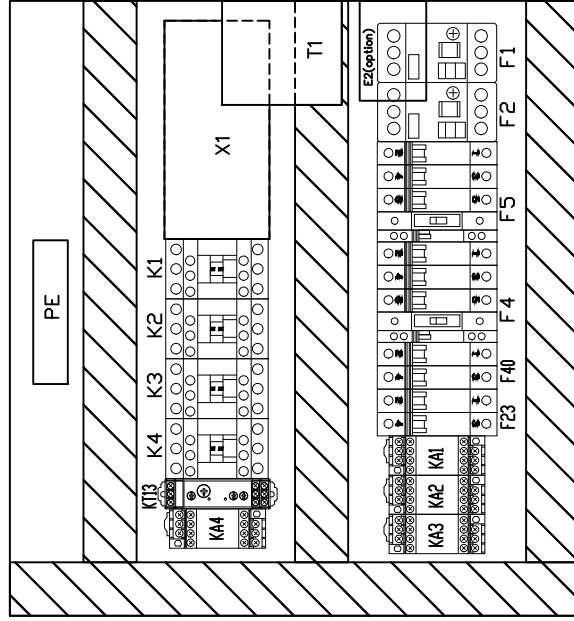


X1—Upper row

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

X1—lower row

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----

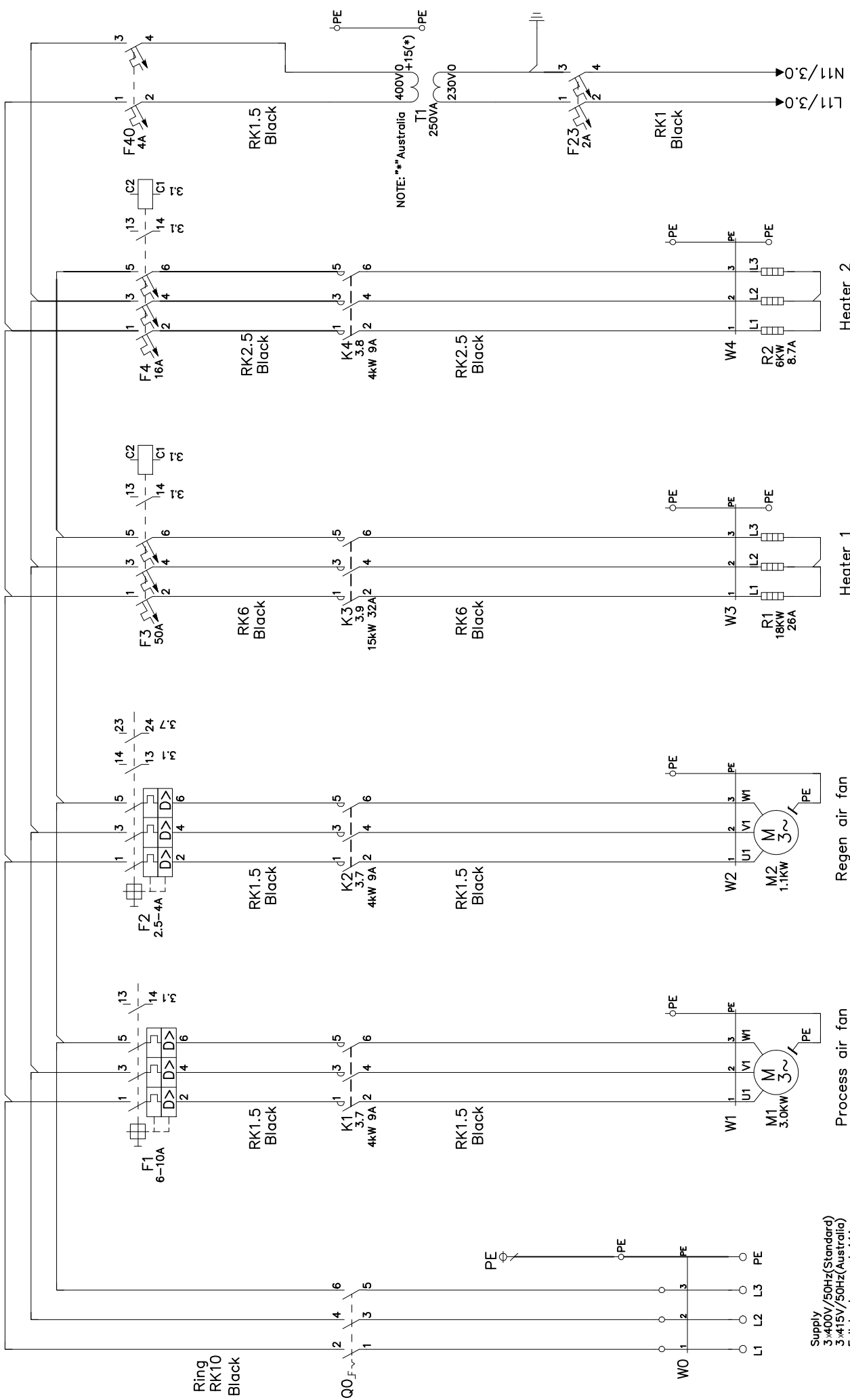


Rated voltage: 3x400V 50Hz(Standard)  
3x415V 50Hz(Australia)

Full load current: 44A  
Short circuit interrupting capacity of the machine: 10kA Acc: to EN60947.2  
Max fuse: 63A  
IP54

X1: 1-2=On/Vent  
X1: 2-3=On/Off  
Connection labelling  
Bridge X1: 1-2  
Bridge X1: 6-7-8-9-10  
Bridge X1: 17-18  
Bridge X1: 27-28

0 1 2 3 4 5 6 7 8 9

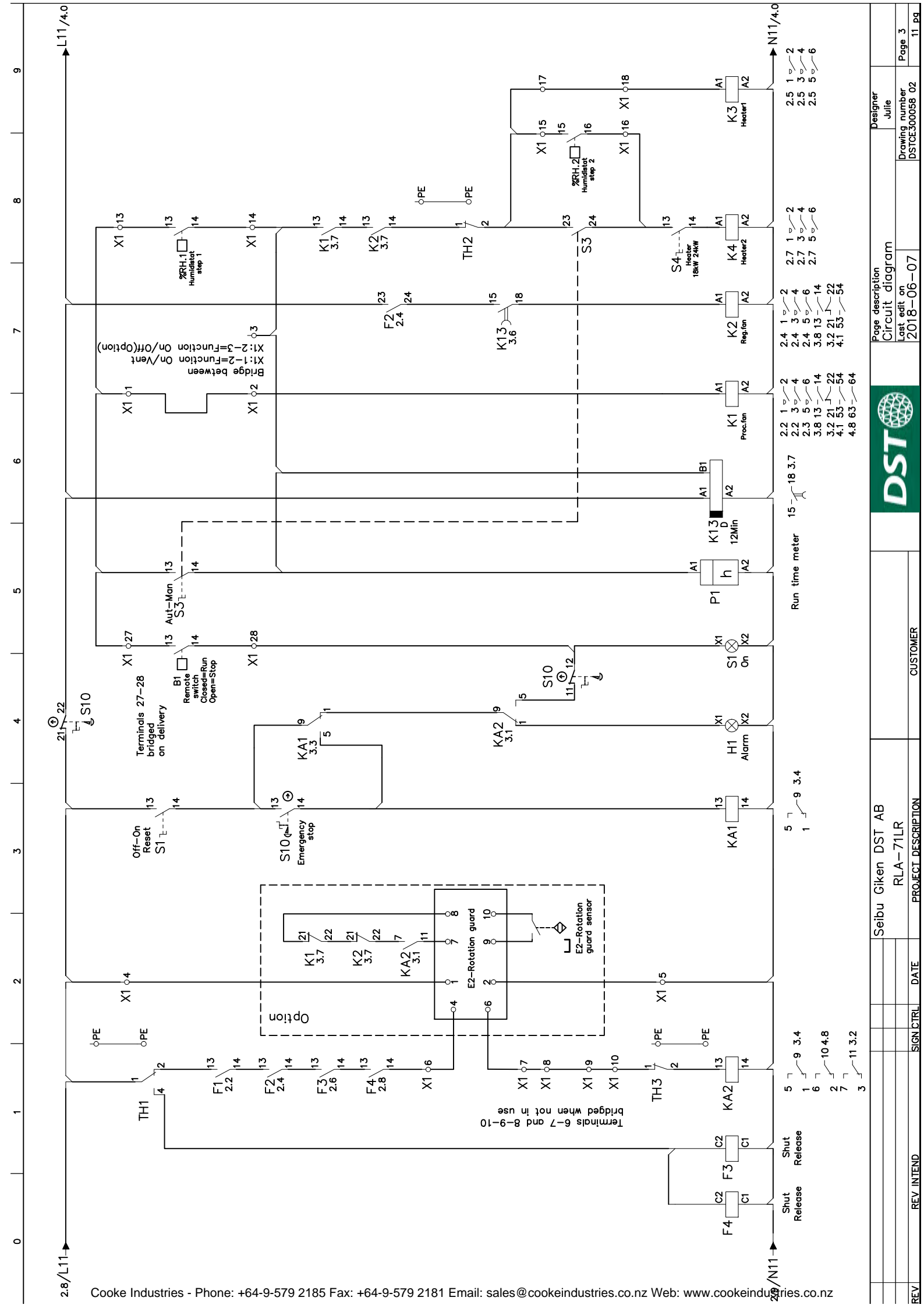


Supply  
 3x400V/50Hz(Standard)  
 3x415V/50Hz(Australia)  
 Full load current: 44A  
 Max fuse: 63A

NOTE: (F1, F2)  
 The current setting reference motor nameplate parameters

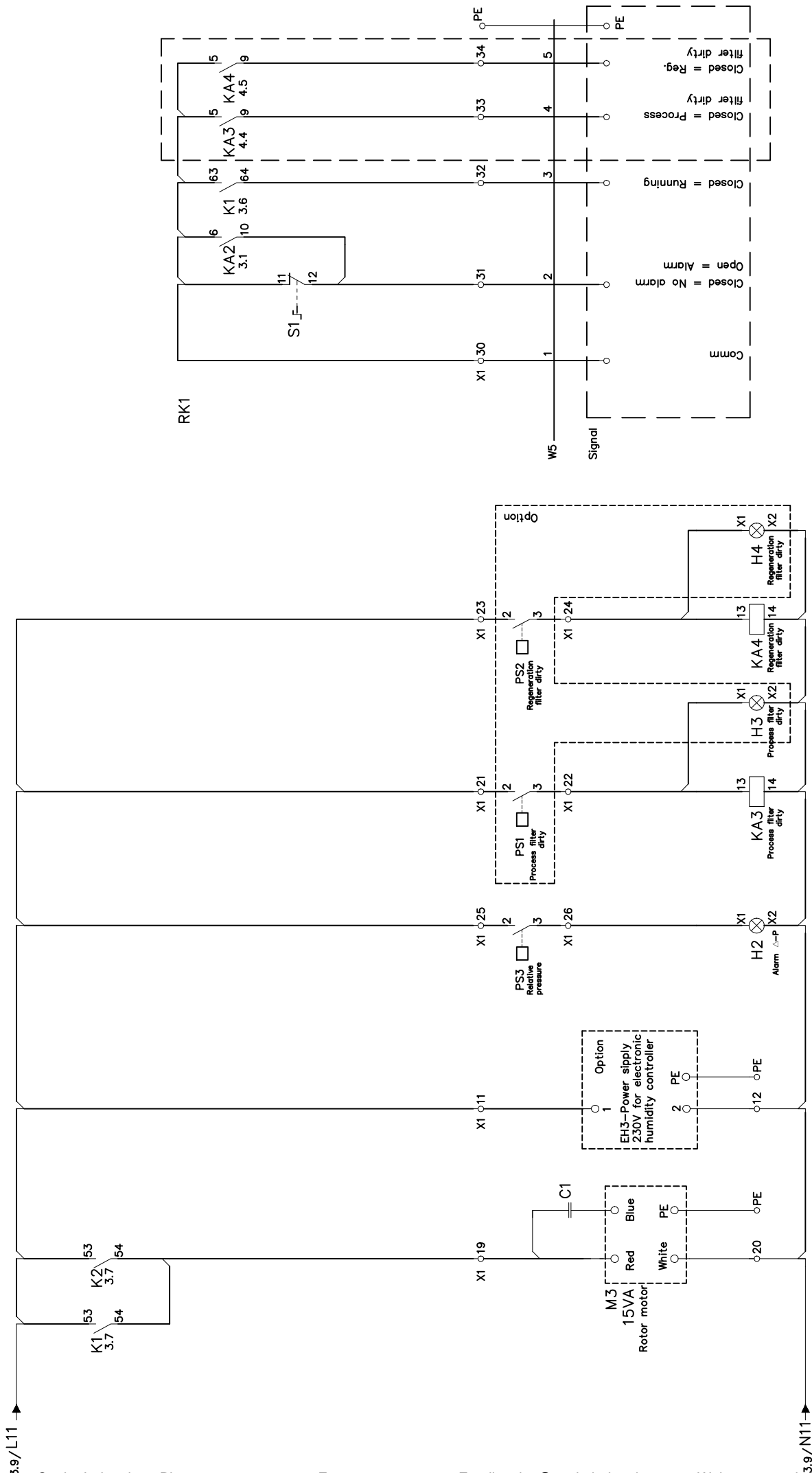
REV	REV INTEND	SIGN CTRL	DATE	PROJECT DESCRIPTION	CUSTOMER	Page description Circuit diagram Last edit on 2018-06-07	Designer Julie Drawing number DSTCE300058 02	Page 2 11 pg
				Seibu Giken DST AB RLA-71LR				





REV	REV INTEND	SIGN CTRL	DATE	PROJECT DESCRIPTION	CUSTOMER	Seibu Giken DST AB RLA-71LR	Page description Circuit diagram	Designer Julie	Drawing number DSTCE300058 02	Page 3 11 pg
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5 1 9 4.8 1 9 4.9

REV	REV INTEND	SIGN CTRL	DATE	PROJECT DESCRIPTION	CUSTOMER		Page description Circuit diagram	Designer Julie	Drawing number DSTCE300058 02	Page 4 11 pg
							Last edit on 2018-06-07			

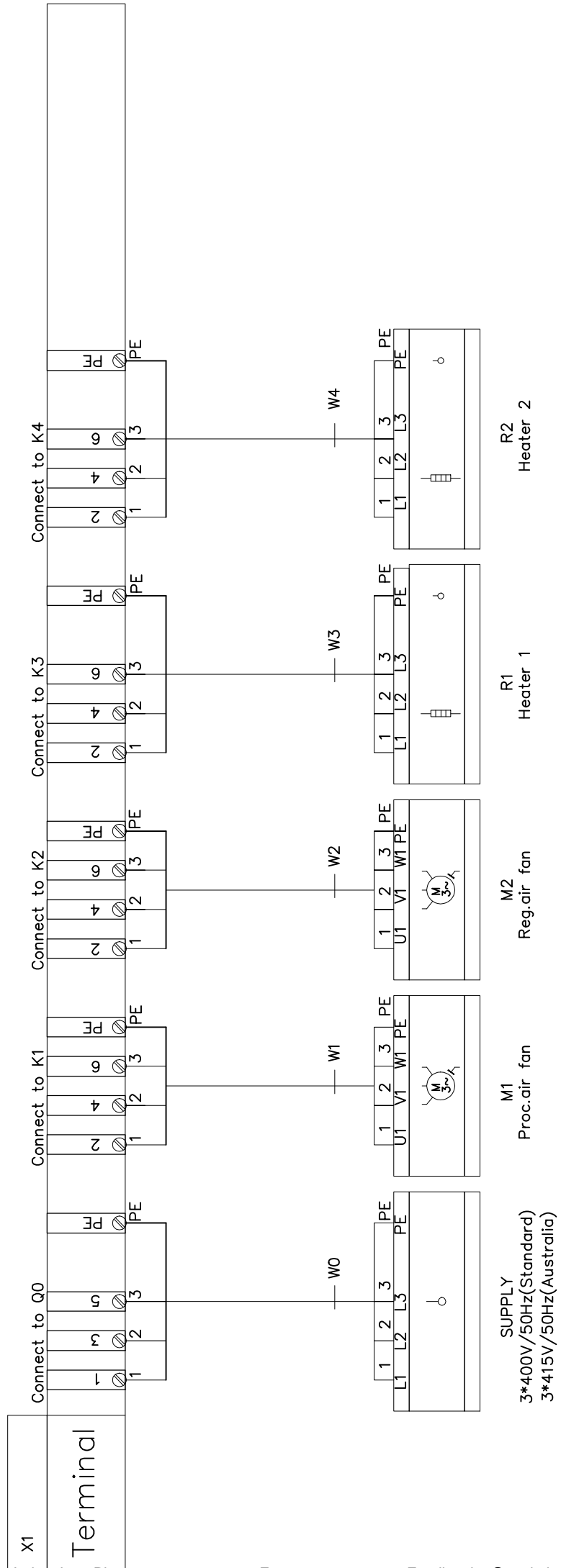
Pos	Component	Manufacturer	Art.number	Electrical	Quantity	Page
E2	Rotor rotation guard	Regin		option	1	3
EH3				option	1	1
EH4				option	1	1
F1	Circuit breaker 6-10A	Schneider	GV2-ME14C	6-10A	1	2
	Auxilliary contact	Schneider	GVAE20	2NO	1	2
F2	Circuit breaker 2.5-4A	Schneider	GV2-ME08C	2.5-4A	1	2
	Auxilliary contact	Schneider	GVAE20	2NO	1	2
F3	Circuit breaker C50A 3P	Siemens	5SY6 C50 3P	5SY63507CC	1	2
	Auxilliary contact AS	Siemens	5ST3 011-0CC	2NO	1	2
	Shunt release ST	Siemens	5ST3 030	AC 110~415V	1	2
F4	Circuit breaker C16A 3P	Siemens	5SY6 C16 3P	5SY63167CC	1	2
	Auxilliary contact AS	Siemens	5ST3 011-0CC	2NO	1	2
	Shunt release ST	Siemens	5ST3 030	AC 110~415V	1	2
F40	Circuit breaker D4A 2P	Siemens	5SY6 D4 2P	5SY62048CC	1	2
F23	Circuit breaker D2A 2P	Siemens	5SY6 D2 2P	5SY62028CC	1	2
Q0	Switch	ABB	OT63FT3	63A	1	2
	Handle	ABB	OHYS2RJ		1	2

Pos	Component	Manufacturer	Art.number	Electrical	Quantity	Page
K1	Contact	ABB	LC1D09M7C	9A	1	2
	Contact	Schneider	LADN20C	2NO	1	2
	RC-Module	Schneider	LAD4RCU	110-240VAC	1	2
K2	Contact	Schneider	LC1D09M7C	9A	1	2
	Contact	Schneider	LADN20C	2NO	1	2
	RC-Module	Schneider	LAD4RCU	110-240VAC	1	2
K3	Contact	Schneider	LC1D32M7C	32A	1	2
	RC-Module	Schneider	LAD4RCU	110-240VAC	1	2
K4	Contact	Schneider	LC1D09M7C	9A	1	2
	RC-Module	Schneider	LAD4RCU	110-240VAC	1	2
KA1	Relay	Omron	MY4N-CR-GS, AC220/240V	AC220/240V	1	3
	Socket	Omron	PYF14A-E		1	3
KA2	Relay	Omron	MY4N-CR-GS, AC220/240V	AC220/240V	1	3
	Socket	Omron	PYF14A-E		1	3
KA3	Relay	Omron	MY4N-CR-GS, AC220/240V	AC220/240V	1	4
	Socket	Omron	PYF14A-E		1	4
KA4	Relay	Omron	MY4N-CR-GS, AC220/240V	AC220/240V	1	4



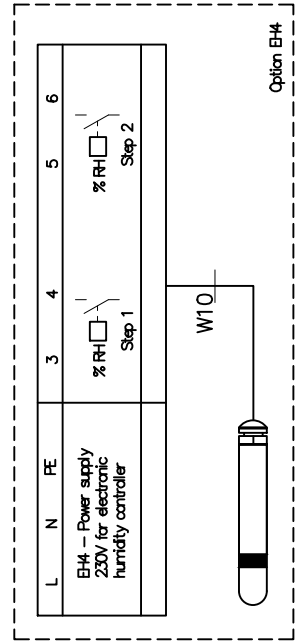
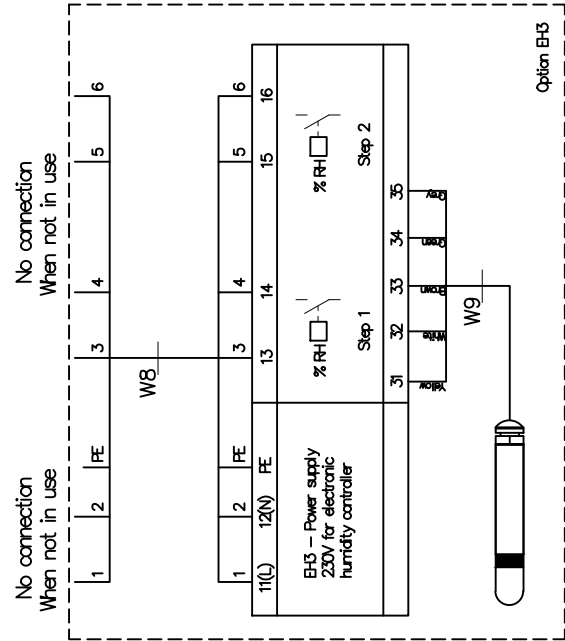
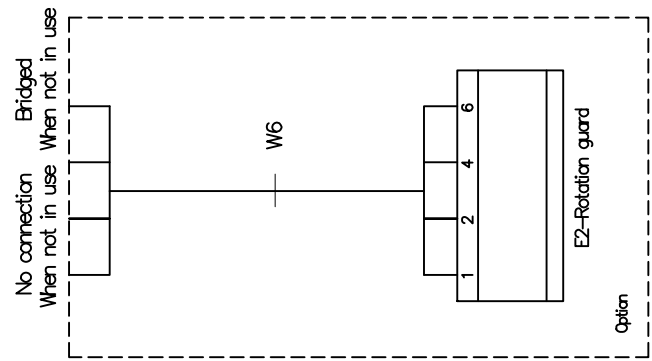
Pos	Component	Manufacturer	Art.number	Electrical	Quantity	Page
	Socket	Omron	PYF14A-E		1	4
K13	Time relay	Omron	H3DK-M2 AC/DC24-240		1	3
T1	Transformer	Schneider	ABL6TTS25U		1	2
H1	Red led lamp 220VAC	Schneider	XB2BVM4LC		1	3
H2	Red led lamp 220VAC	Schneider	XB2BVM4LC		1	4
H3	Yellow led lamp 220VAC	Schneider	XB2BVM5LC	option	1	4
H4	Yellow led lamp 220VAC	Schneider	XB2BVM5LC	option	1	4
S10	Emergency stop	Schneider	ZB2BS54C		1	3
	Contact	Schneider	ZB2BZ105C		1	3
	Contact	Schneider	ZB2BE102C		1	3
	Lable&Protective holder	Kacon	HP119E+KEG12Y		1	3
S1	Switch button	KD	KD-Y22-2DXG/220V		1	3
	Contact	Schneider	ZB2BE101C		1	3
	Contact	Schneider	ZB2BE102C		1	4
S3	Switch button	Schneider	XB2BD21C		1	3
	Contact	Schneider	ZB2BE101C		1	3
S4	Switch button	Schneider	XB2BD21C		1	3

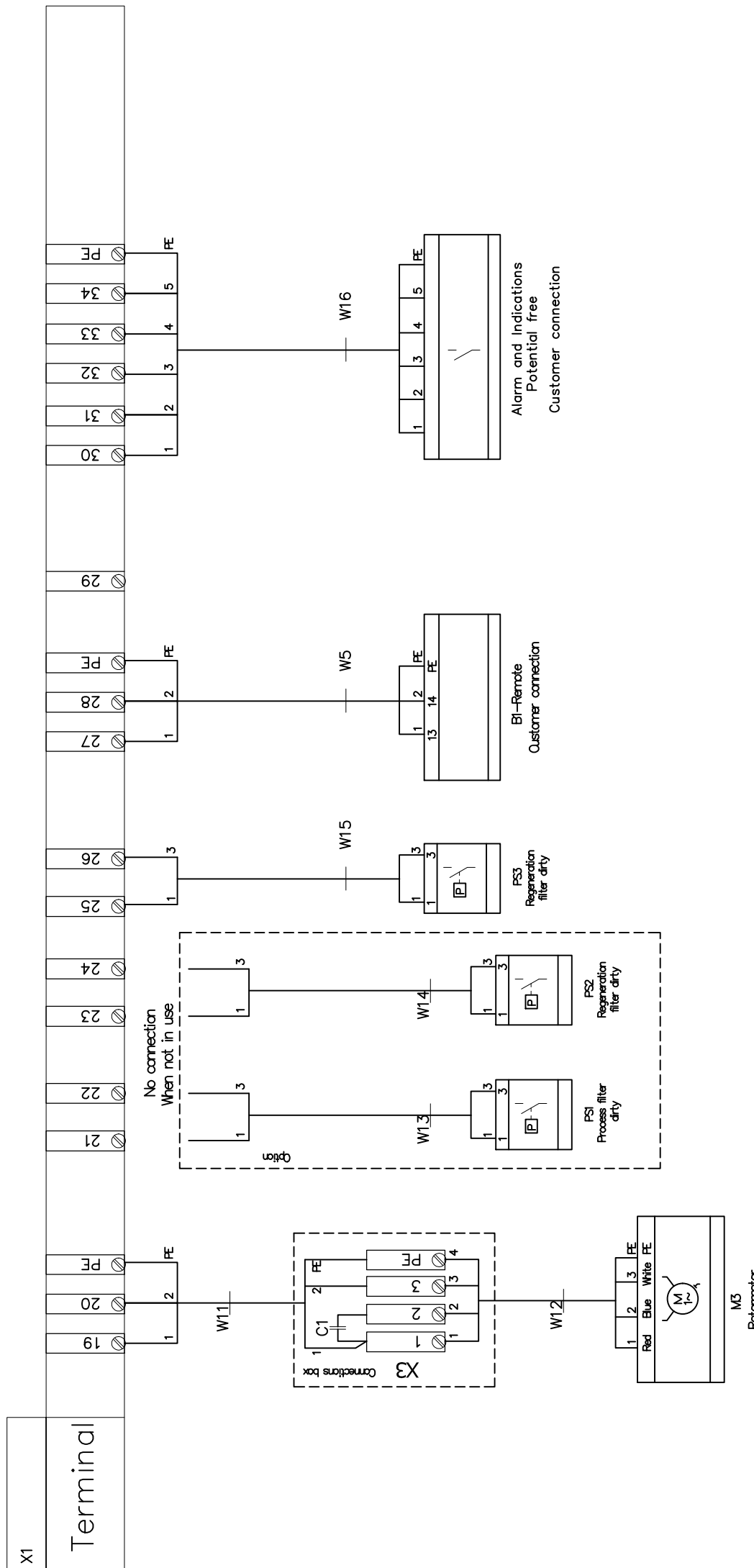
Pos	Component	Manufacturer	Art.number	Electrical	Quantity	Page
P1	Run time meter	Schneider	XBKH70000002M		1	3
PS1	Pressure difference switch	Beck	930.83	option	1	4
PS2	Pressure difference switch	Beck	930.83	option	1	4
PS3	Pressure difference switch	Beck	930.83		1	4
TH1	thermostat	Schneider	602031/81 (160-200°C)		1	3
TH2	thermostat	Schneider	602030/02 (0-200°C)		1	3
TH3	thermostat	Schneider	602031/81 (50-100°C)		1	3





Bridge between  
X1:1-2=Function On/Vent  
X2:2-3=Function On/Off(Option)





REV	REV INTEND	SIGN CTRL	DATE	PROJECT DESCRIPTION	CUSTOMER	Seibu Giken DST AB RLA-71LR	Page description Terminal—connection diagram	Designer Julie	Page 11
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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	Cloggs the micro pores on the silica gel/zeolite.
2	Ammonia	2ppm and above, prolonged exposure	NH <sub>3</sub>	Degrades the silica gel/zeolite.
3	Amine		RNH <sub>2</sub>	
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	Cloggs 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 <sub>3</sub>	
13	Seawater		N/A	
14	Strong acid	pH=3 and below	N/A	Deteriorates the honeycomb's physical structure.
15	Plasticizer		N/A	Cloggs the micro pores on the silica gel/zeolite.
16	Nitrogen oxides	High concentration, excessive exposure	NO <sub>x</sub>	Deteriorates the honeycomb's physical structure.
17	Sulfur oxides	High concentration, excessive exposure	SO <sub>x</sub>	
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
<b>Unit</b>														
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	
Inspect fan, fan wheel, casing, motor and bearings, renew if necessary 3)			X		X		X		X		X		X	
Inspect features and functionality 4)	X		X		X		X		X		X		X	
Inspect electric and control system, cables, electrical components and functionality 5)			X		X		X		X		X		X	
Inspect access panels, locks and seals 6)			X				X				X			
Inspect duct and duct connections 7)	X				X				X				X	
Inspect heater and cooler 8)			X		X		X		X		X		X	
Inspect and renew humidistat/humidity sensor if necessary 9)			X		X		X		X		X		X	
Inspect rotor motor and renew if necessary 10)			X		X		X		X		X		X	
Inspect and renew seals on removable panels if necessary 11)			X		X		X		X		X		X	
Inspect and renew peripheral seals if necessary 12)			X		X		X		X		X		X	
Inspect rotor seals and renew if necessary 13)			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	
Inspect rotor 15)	X		X		X		X		X		X		X	

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

Service performed	Date:													
	Performed by:													

This is a general service chart and the time to service and to replace a part may vary depending on the operating condition. Some options listed here may not be installed or available for this specific unit. Check user's manual content and the component list for more information.

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 for the contactors. Check the entire unit's electrical and control system, especially in those areas where components and cables are exposed 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 month. 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 divides the rotor into purge, regeneration and process sector for possible wear, infiltration, properly installed, etc... Consult the supplier before attempting to change or renew the peripheral seals.
13. Inspect rotor seals around on 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 a 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 stops 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.

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