

# SABIEL DA860

## Rotor dehumidifier

### Operation Manual



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## General Introduction

SABIEL DA860 dehumidifier is a kind of effective and quick air drying equipment with the feature of compact structure, stable and reliable performance, easy to operation and maintenance. It is widely used in the fields of military, space and aviation, medical manufacture, file storage, as well as the industries of electronics, ship building, and food processes and working conditions which has strict humidity requirements. This series dehumidifier can control the humidity continuously and reliable, which provide reliable technology guarantee of manufacturing high quality products. With more than 30 years of experience in manufacturer of dehumidifiers by high technology, we provide excellent dehumidify equipment for all kinds industries.

## Typical application fields SABIEL DA860 Dehumidifier

- 1. Space and Aviation:** It is used to control the humidity of satellite, spacecraft assembly and tests area, and it's also used in the warplane engine room, the tank cockpit and the ammunition depot.
- 2. Pharmaceutical Industry:** Along with the implementation of GMP authentication, it's more and more important to control the temperature and humidity in pharmaceutical production. SABIEL series dehumidifier can build a excellent environment for pharmaceutical production to keep the good quality of the drugs.

3. **Electronics Industry:** It is widely used for precision instrument manufactures which needs strict control of moisture, such as electronic components, astronautical component and lithium battery etc.

4. **Chemical Fiber Industry:** Used with chiller, it can make the dew point of the environment below  $-40^{\circ}\text{C}$ , especially suitable for the process of PET chip in the chemical fibre factory.

5. **Food Processing Industry:** Because of SABIEL series dehumidifier has the function of de-bacteria and the relative humidity after processed is generally lower than 10%, it is especially suitable for the process occasions needs normal temperature and dry air in the product lines of thermo sensitive food, such as milk powder, animal glue and granulated sugar etc.

6. **Warehouse, Library and Archives:** Kept in low humidity environment, the goods, books and files will not be damaged for a long time.

#### Operation principle and structure

The core component of SABIEL DA860 rotary dehumidifier is a special paper honeycomb desiccant wheel which contained hygroscopic agent. Due to the aperture of the honeycomb is only 1.5 mm, the moisture absorption area of  $1\text{ m}^3$  wheel paper core is  $3000\text{ m}^2$ . The honeycomb pore canal air flows go through is in a boundary laminar condition, wet exchange effect is good, so the

dehumidification ability is great.

The desiccant wheel adopts reducer drive, and turns eight spin per hour. 3/4 of the wheel section is processing area, when the air needs to process get through this area, the moisture will be adsorbed into dry air sending out from another side to required location by a fan.

Meanwhile, the regenerative air is heated to 120 °C after filtering, and get into the in 1/4 area of wheel section, the regenerative area, from the opposite direction. The dry air rises the temperature of the wheel turning into this area, and makes the adsorbed water vaporizing, then the water vapor sends out by the heat flow, which make the wheel recover dehumidification function, and the desiccant wheel get regeneration.

When the desiccant wheel turns slowly, adsorption and regeneration is performed simultaneously, so the dehumidifier could ensure continuous, stable output dry air. A wear-resisting heat-resistant special elastic rubber sealing strip is used to insulate the regeneration area and process area, which ensures the air won't mix.

The principle diagram is as below:

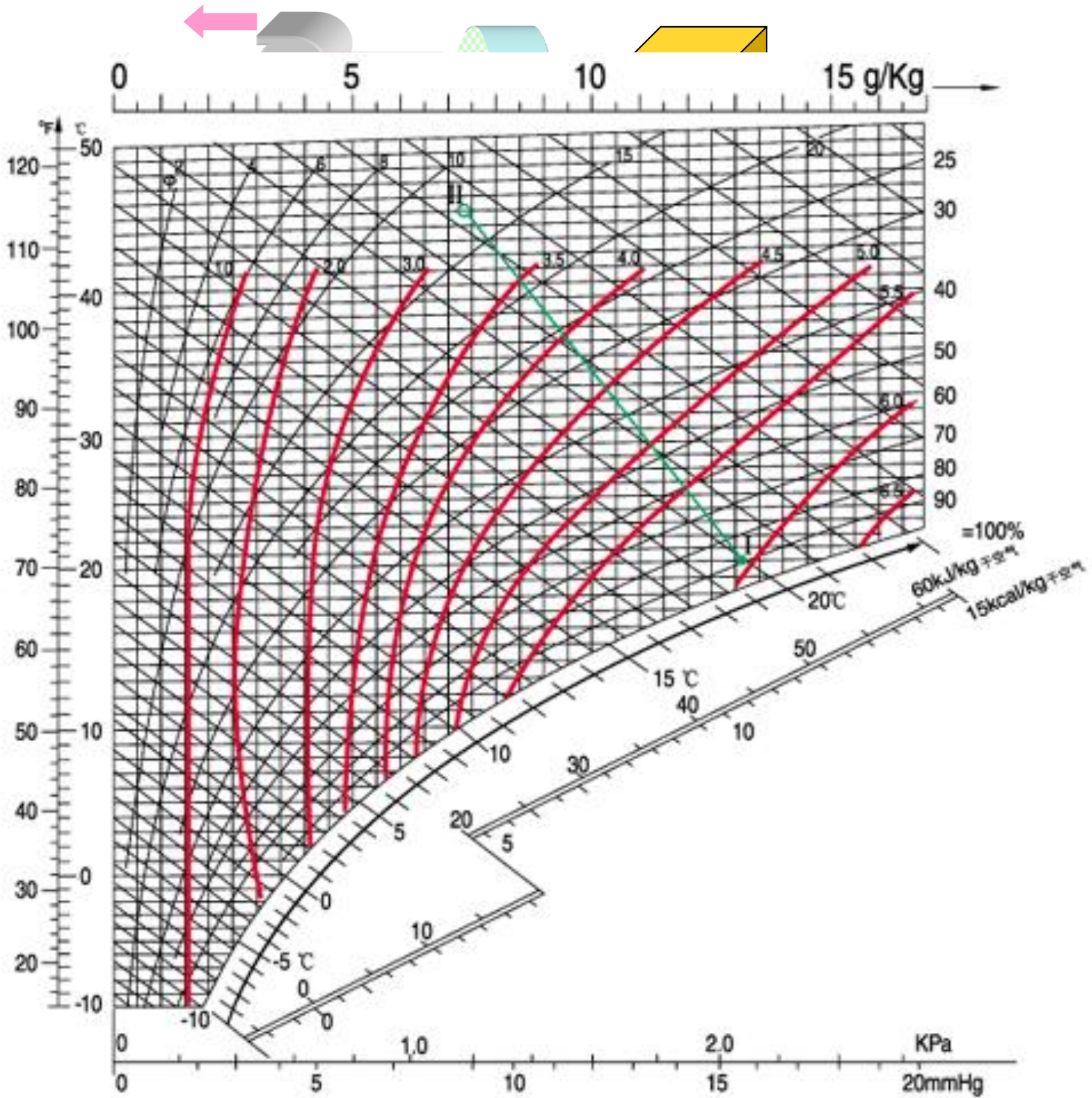


Fig 2 Features Diagram for Rotary (Under 1 Standard P a)

Dehumidifying performance diagram:

## Technical parameter

Item	Model DA860
Rated process airflow, m <sup>3</sup> /h	5000
Rated reactivation airflow, m <sup>3</sup> /h	1670
Reactivation heating temperature, °C	120±10
Reactivation heating power, kW	60.0
Process fan power, kW	4
Reactivation fan power, kW	3
Rotor drive power, kW	0.09
Total Installed power, kW	67.09
Overall Dimensions (L×W×H), mm	3519×1262×1992
Power supply	380V/60Hz
Approx. Weight, kg	800

Note: The measurement environment of rated dehumidify capacity is that the temperature is 20°C and RH is 90%.

Outside measurement (attachment)

## Installation

When the equipment reaches your site, you should unpacking and accept, check the equipment and random files according to delivery list. Handling lifting equipment, the origin of force should be on the bottom frame to prevent air leakage from deformation of the enclosure. When installed, the unit shall be placed leveled.

Connect of air duct and circuit should pay attention to:

1. The process air inlet and regenerative air outlet are preferably in different direction to prevent short circuits.
2. The duct of regeneration system should select heat and wet resistant materials, pipeline should not be too long, and there should be a slope not less than 2‰ at the direction of outlet to prevent dew backflow and damage desiccant wheel. The inlet and outlet duct exposed outside the wall should defend the rain measure.
3. Fresh air inlet should be the proper height off the ground to avoid dust and insects inhaling and polluting the filter.
4. The temperature of dehumidifier installation environment should be higher than the dew point temperature of processing air, if not possible, deal with treatment for duct insulation to prevent condensation of water.
5. Air valves should be installed at the processing air inlet and outlet to adjust processing airflow, and when it is closed, make the wheel



separated from the outside moist air.

6. The front of the dehumidifier inspection door should stay equivalent to device width maintenance space to facilitate equipment maintenance. Electric control cabinet should be reliably grounded.

### Commissioning

After installation, the dehumidifier can be commissioning.

1. Phase of the motors of the react. fan and the rotor have been modulated at the factory. When start at the site, if the reactivation fan turns at the opposition direction, please modulate the phase to right order in the terminals box.
2. Before running the dehumidifier, pipe valve should be checked to ensure that the entire air valve is open.
3. Check the regeneration temperature settings are correct, the setting range of desiccant wheel regeneration temperature should be: 110 °C -140 °C.
4. After the dehumidifier running, observe whether the moving parts are operating normally, if any abnormal should immediately stop for the corresponding processing.
5. Normal operation, check the return air duct for leaks, if there is any leak, should be sealed.

## Operation procedures

### Start and stop operation procedures

#### 1. The starting procedure:

Before the unit begins to work, please check whether the power phase sequence protector and every electric apparatus component is in normal state. and whether the air valves of the dehumidifier and the parts of control system (instrument, electrical) are at the rated value, the user should not modify freely.

**Press “Start/Stop” button to start the unit**, the reactivation fan, rotor drive motor, process fan and reactivation heater of the dehumidifier will start one after another. Control the reactivation temperature at  $125 \pm 10^{\circ}\text{C}$ , the dehumidifier start running normally.

**The whole unit enters into operation**, automatic monitoring the supply air temperature

#### 2. The Stopping procedure:

**Press “Start/Stop” button to stop the unit**, the reactivation electrical heater and process fan stop working, the rotor drive motor and reactivation fan will continue running until the reactivation air temperature being lower than  $60^{\circ}\text{C}$ , then whole unit stops running.

### **Microcomputer operating control instructions**

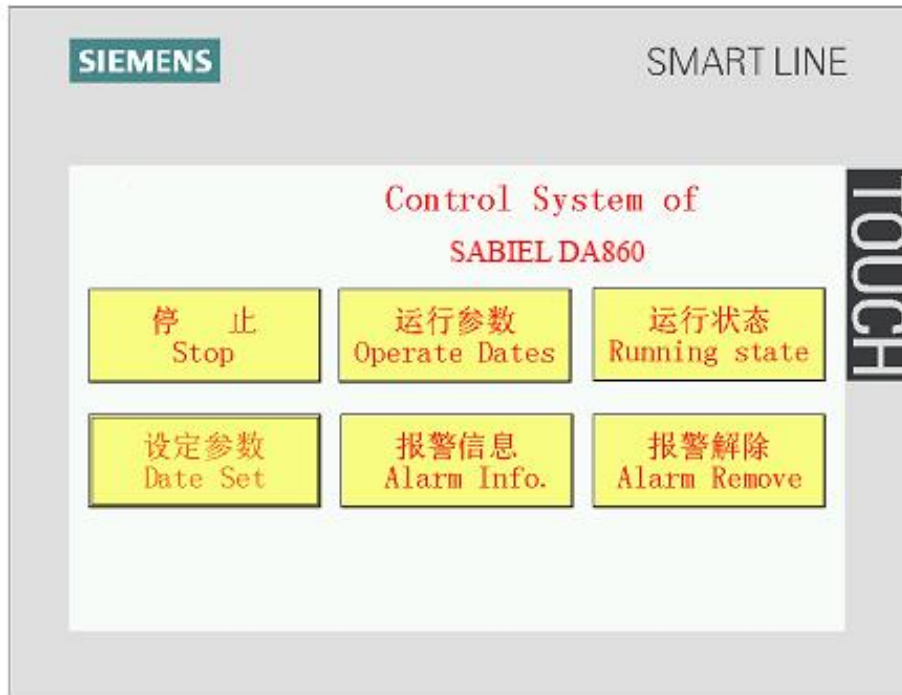
SABIEL DA860 desiccant rotor dehumidifiers adopt advanced microcomputer control which inspects and controls the unit automatically according to the change of working condition of the unit. Meanwhile, because of the reduction of electrical control module largely, the trouble caused by those electrical control modules will be reduced, the reliability of the unit is increased and the unit is operated and managed more easily.

The Controller is composed by temperature sensor, relative humidity sensor, PLC, and touch panel.

### 1. Touch panel operation instruction

The touch panel shows as below:

Start the power supply, the touch panel shows as below:

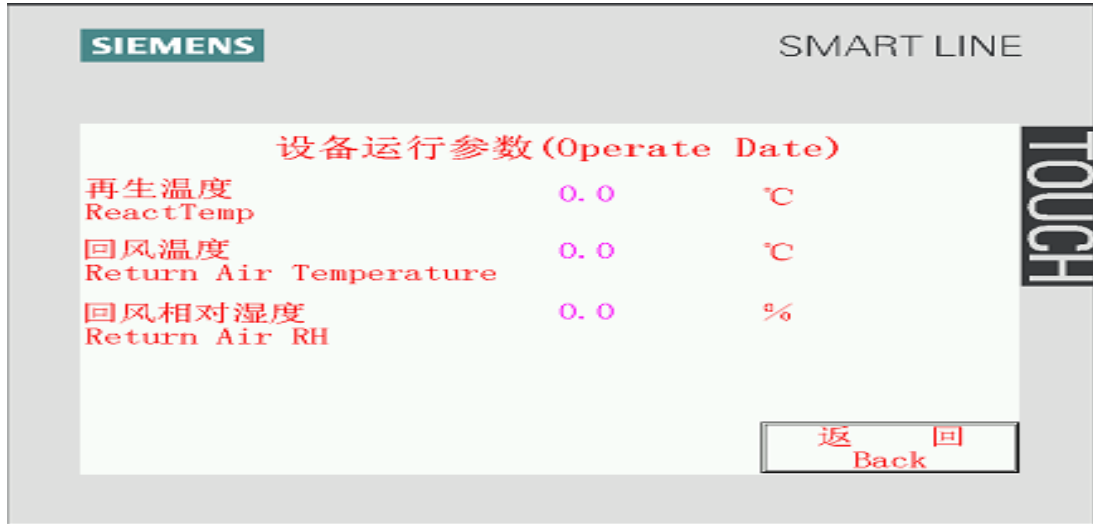


#### Check the temperature measured value and working state:

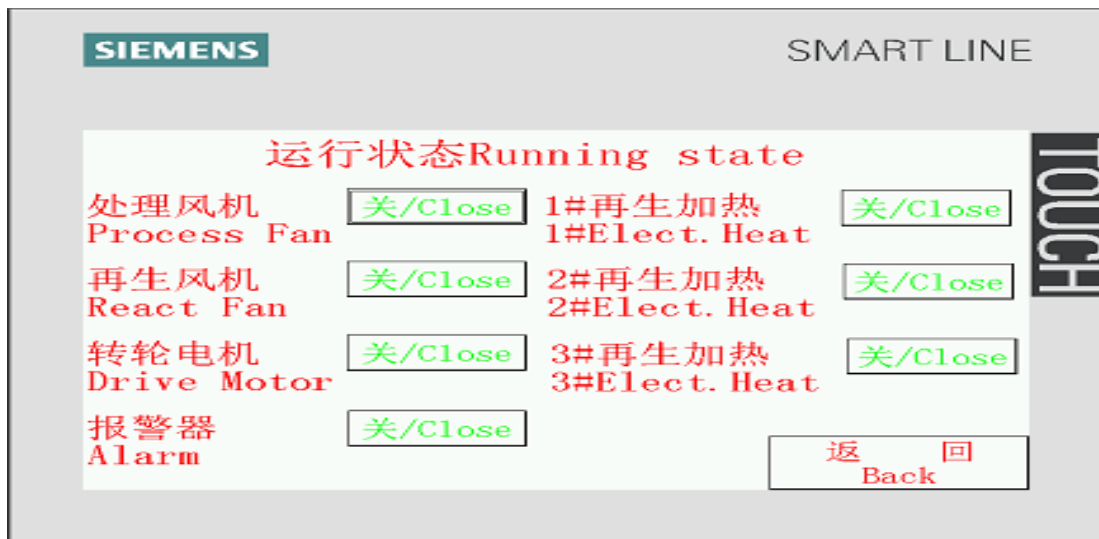
- ◆ “Start/Stop” button: to start or stop the dehumidifier. ( Login passwords 1111 )
- ◆ “Operation Dates” button: to show the operation dates of the dehumidifier.
- ◆ “Running State” button: to show the running state of the dehumidifier.
- ◆ “Date Set” button: to set the operation dates of the dehumidifier.( Login passwords 1111 )
- ◆ “Alarm Info.” button: to show the alarm information of the dehumidifier.
- ◆ “Alarm Remove” button: to stop the alarm.
- ◆ **Note: If the dehumidifier stop working because of the fault,**

to run again, please press “ Alarm Remove ” first to eliminate the failure information (that is, reset the relay alarm in PLC).

Press “Operation Dates” button, the panel shows:

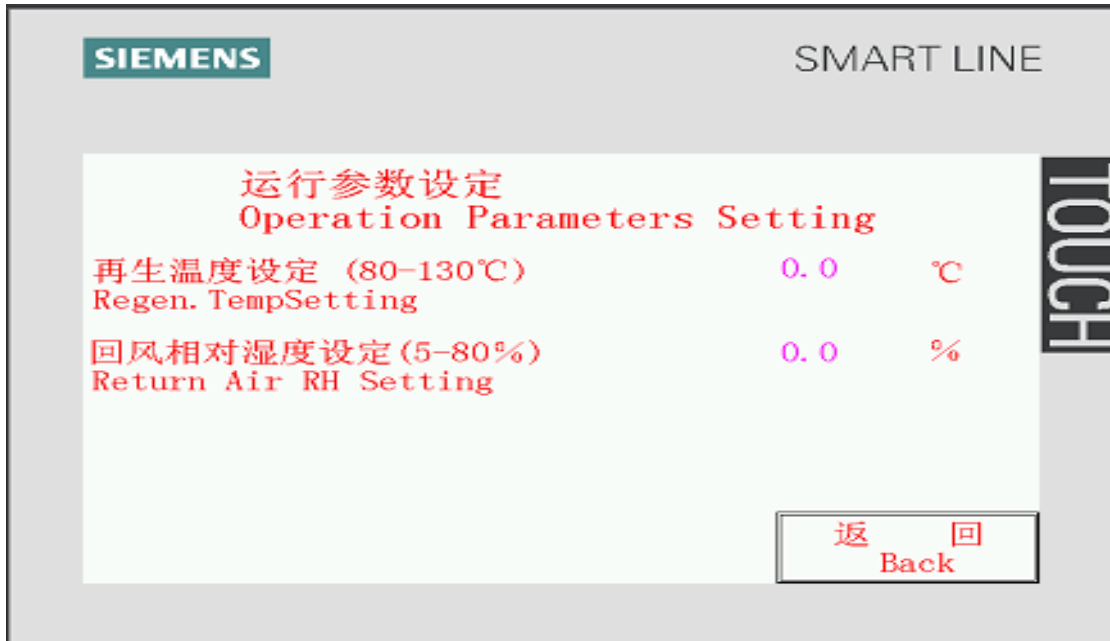


Press “Running State” button, the panel shows:



## 2、The parameter setting:

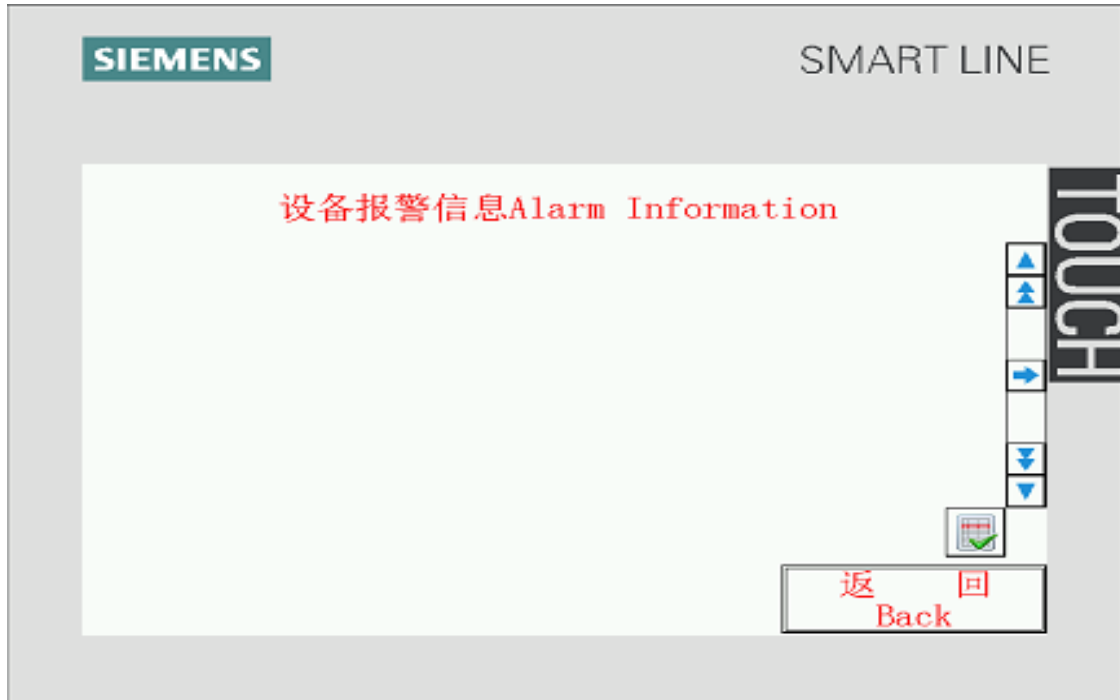
Users can set the parameters according to the actual operation situation, to meet the demand of the normal operation of production technology and equipment.



**Regeneration/reactivation temperature setting:** check the regeneration temperature, automatic control of 2 #, regeneration electricity heating start-up according to the measured values and setting value. (when set regeneration temperature to control heating, set the relative humidity at 5%).

**Return air RH setting:** check the return air RH, automatic control of regeneration electricity heating 1# and 2 #, rstart-up according to the measured values and setting value. (when set supply air RH to control heating, set the regeneration temperature at 135 degree C).

**Fault information:** Press “Alarm Info.” button to show the alarm information of the dehumidifier.



### 3、 Fault alarm and fault diagnosis

No.	Fault Alarm	Fault Diagnosis
1	The rotor stop running protection	Check the driver of rotor and proximity switch.
2	Process fan fault	Check the current process fan and reset thermal relay.
3	Reactivation fan/rotor motor fault	Check the current of reactivation fan and rotor motor and reset thermal relay.
4	Reactivation temperature sensor fault	Check the reactivation temperature sensor.
5	Phase sequence protection	Check the three-phase power supply voltage and phase sequence.

6	Over-temperature protection	Check the regeneration temperature sensor and regeneration exhaust air.
7	Temperature sensor failure	Check the temperature sensor failure.

### Maintenance and repairs

1. There are air filters in regeneration air inlet and processing air inlet, the filter should be cleaned timely. If stained with dust will affect the air flow, resulting in high regeneration temperature, causing failure.

2. Every six months a desiccant wheel maintenance

(1). Check whether the sprocket is failure, the drive chain is deformation, wear and failure, the spring is failure or not.

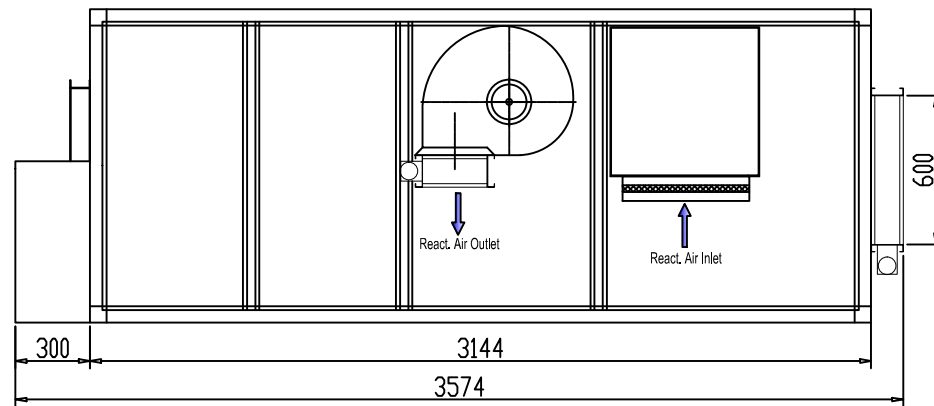
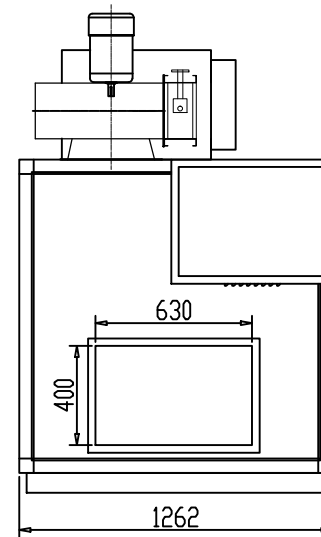
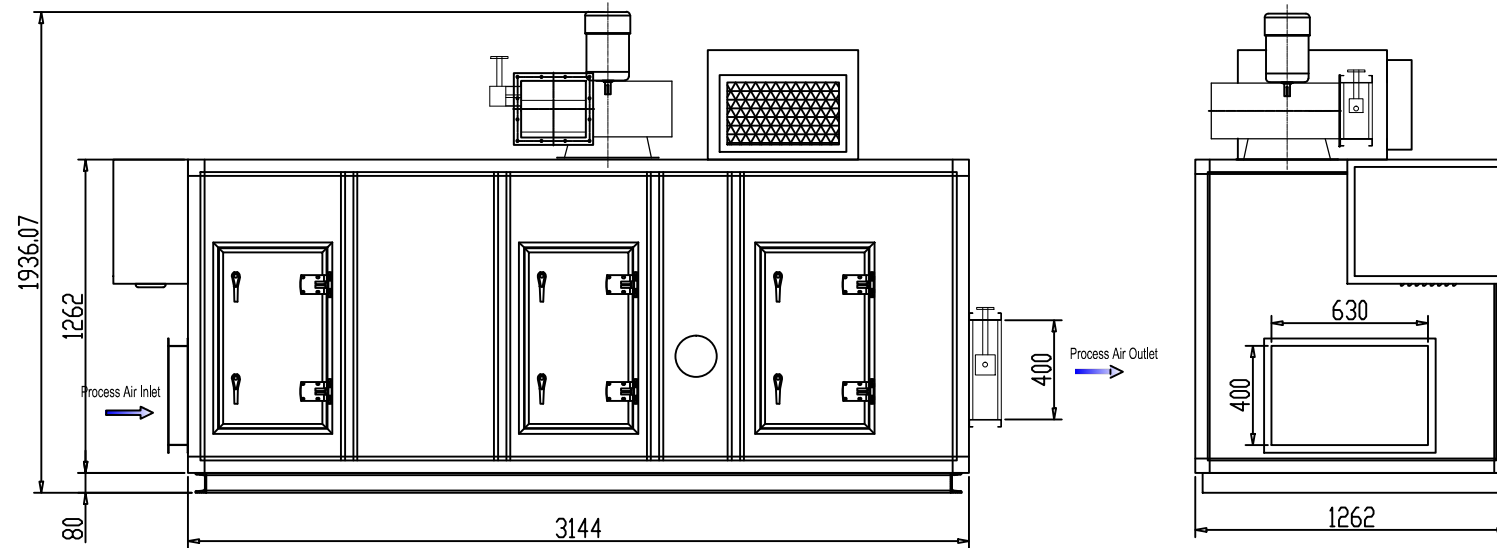
(2). Clean the dust at desiccant wheel surface and micro-spore with a vacuum cleaner or hair dryer to make the wheel keep good dehumidification effect.

(3). Check the distance between the four contacts of the wheel and proximity switch less than 10mm, when swivel bolt of the wheel near the proximity switch installed inside machine, the light-emitting diode flicker, it is working normally.

### Accompanying Documents

The unit is sent to the user together with the following documents.

1. Outside Measurement Drawing      1 piece
2. Electrical Schematic Diagram      1 piece



				SABIEL	
				Outside Drawing	
				DA860	