DanVex®

Desiccant Dehumidifiers
AD-800 / AD-1000 / AD-1500

»OPERATING AND MAINTENANCE MANUAL

Rev. 6.14

CONTENTS

KEEP THESE INSTRUCTIONS FOR FUTURE REFERENCE

Desiccant Dehumidifiers
AD-800 / AD-1000 / AD-1500

FOREWORD

Purpose

This manual provides all the information about this precise dehumidifier, including the structure, installation, principle, work process and the detailed operating instruction is provided

Content

Dehumidifying control system, operating ways, maintain, regular failure and failure elimination

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WARNING!!!

All electrical connections works must be done by local professionals, according to relevant provisions to operate, or some loss of life, personal injury, property loss may be happen.

Do please read through the manual before electrical works, avoiding any fault operation that causing loss of life or property.

Please contact the supplier or the manufacturer if there are any issues arises that are not stated in this manual.

1 SAFETY AND APPLICATION

1.1 Safety

The dehumidifier meets the specifications and safety requirements of European standards, and takes into account the safety of personnel and unit in design and manufacturing.

In each chapter of this manual, there is safety information, and also clearly pointed out dangerous operations. The danger symbol is marked on the unit as a warning.

The manual provides the best dehumidifier operating experience and procedures, but these suggestions are only for guidance and do not assume any personal responsibllity or fulfill local safety regulations. When installing and operating the unit, you should keep the notice:

During the installation and operating the unit, you should keep the notice:

- Follow the description and instructions in this manual to protect the safety of the equipment;
- Take into account the safety of yourself and others;
- The unit must be operated and maintained by professional technicians;
- Electrical parts must be maintained by authorized electricians;
- It is forbidden to install the unit in areas equipped with explosion-proof devices;
- Before opening any maintenance panel, disconnect the unit from the main power supply;
- The unit should be cooled for at least 15 minutes before maintenance;
- The maintenance panel should be closed after maintenance;
- The unit is limited to perform dehumidification under atmospheric pressure;
- It is forbidden to use the unit without filter. If the filter is not installed, the rotor will be contaminated and lose function;
- It is prohibited to delete or alter the markings and instructions on the unit;
- This manual should be properly kept;
- Original spare parts should be used;
- Written permission must be obtained for any adjustments or modifications.

1.2 Application

The unit adopts a solid-state dehumidification silica-gel rotor design, which can dry the air under atmospheric pressure. The unit can dehumidify the air with a temperature range of -20 °C to +40 °C within 100% relative humidity.

Desiccant dehumidifiers has a wide range of applications, such as:

- rooms and areas with low temperatures and low humidity;
- areas with relative humidity below 35% and low dew point;
- process air preparation systems;
- single pass airflow systems;
- manufacturing, packaging, storage, testing and research of pharmaceutical products;
- production and packaging of confectionery and food products;
- pneumatic conveying of powder materials;
- electronics manufacturing;
- archival storage of photographic materials and films;
- refrigerated warehouses;
- seed storage;
- "clean" rooms;
- pumping stations;
- injection molding production areas;
- ice rinks;
- drying of tanks and ship holds;
- conservation of turbines in the prevention of corrosion at power plants;
- and etc.

2 INTRODUCTIONS OF DEVICE

2.1 Standards

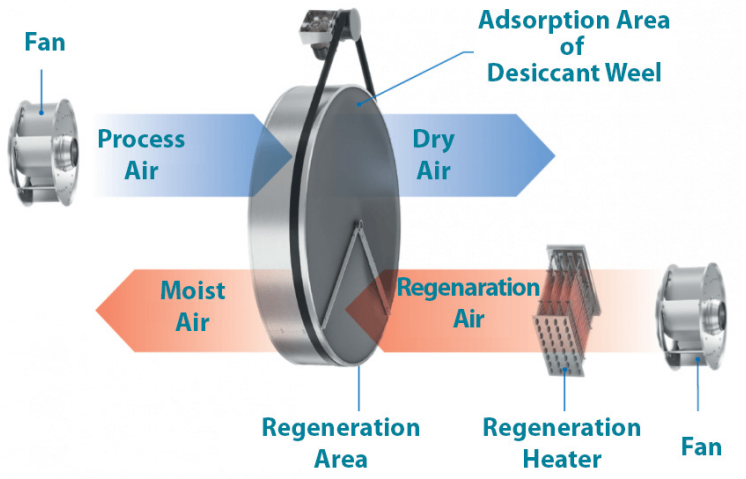
The design meets IEC protection class IP 44 requirements.

2.2 Working principle

The core component of the unit is a honeycomb rotor, which is composed of a special ceramic fiber and active silica gel. The two sides of the rotor are divided into two areas by special sealing devices: the process area (3/4) and the regeneration area (1/4). When the humid process air is drawn into the rotor through a filter, the moisture in the air is absorbed by the desiccant rotor, and the dried air is sent out from the other side of the rotor by the process fan. Simultaneously, the regeneration air is drawn through a filter and is heated and enters the regeneration segment of the rotor. In the area, the water vapor of the moist air is absorbed by the active silica gel of the runner. This heated regeneration air removes the previously adsorbed moisture as a vapor from the desiccant rotor and is discharged to the outdoors. The desiccant rotor continues to rotate, and the above-mentioned dehumidification and regeneration are performed repeatedly to ensure the dehumidifier's continuous and stable performance.

Operation flow chart

Note: The chart does not show the obligatory filters for process and regeneration air



2.3 Structure

2.3.1 Housing

- The unit adopts a steel housing,which has a compact structure, strong corrosion resistance, and is equipped with an anti-cold bridge device to prevent the occurrence of "condensation";
- The unit is a steel base structure, which is convenient for forklift hoisting during transportation and installation;
- Spacious access panel, detachable panels and hinged doors makes maintenance of the equipment very convenient;
- The unique rotor-driven self-tensioning device and contact sealing system strongly ensure the effective and reliable operation of the rotor;
- The selection and design of the components take into account the minimum pressure drop, so that the operation is reliable and economical.

2.3.2 Process air duct

- The process air inlet is equipped with a G4 filter. The filter is very convenient to disassemble and change. Generally it can be cleaned three times;
- The fan adopts centrifugal external rotor fan, steel volute and blades, with high efficiency, low noise and large air volume;
- The process air duct can be connected with AHU according to the needs of users.

2.3.3 Regeneration air duct

- The regeneration air inlet is equipped with a G4 filter. The filter is very convenient to disassemble and change. Generally it can be cleaned three times;
- The fan adopts direct-connected fan with compact size, light weight and low noise. The regenerative fan shutdown adopts the regenerative temperature (60 °C) to delay the shutdown to ensure that the waste heat and water vapor in the regenerative air duct are taken away.
- Heating tube is used for regenerative heating. The signal collected by the temperature transmitter in the heating box is sent to the controller, and PID is adjusted inside the controller, and the power of the SCR is adjusted to ensure that the temperature through the rotor is at a constant temperature, so as to achieve the purpose of energy saving.

2.3.4 Rotor and cassette

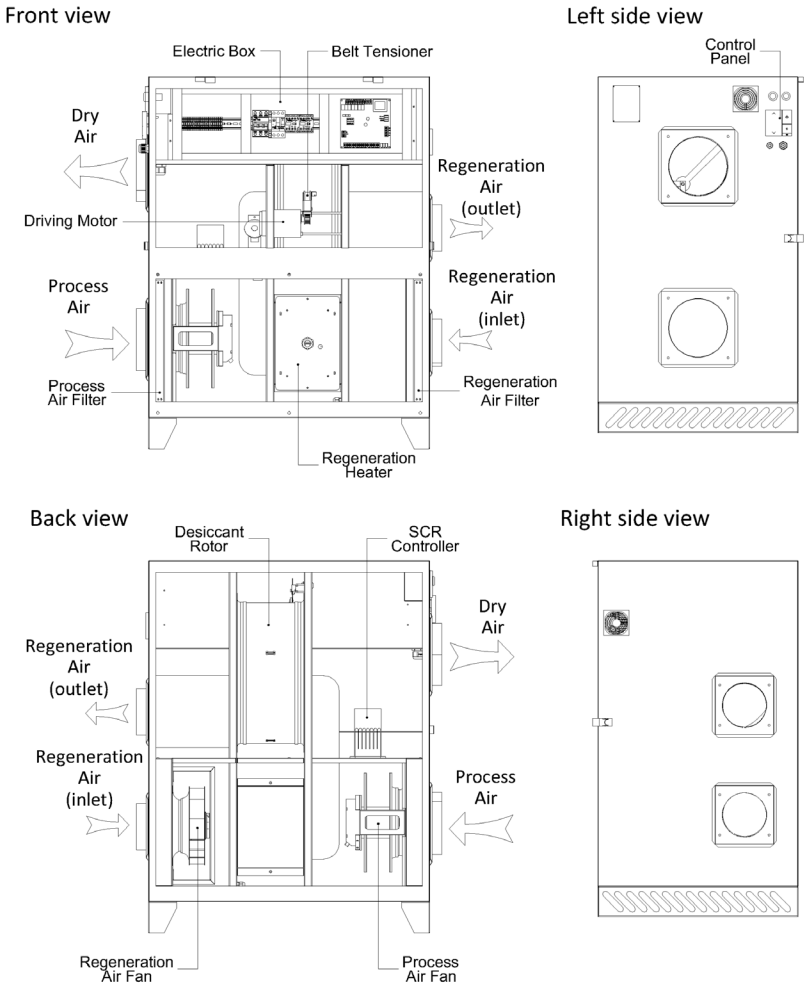
The rotor and the cassette are the care parts of the dehumidifier. Its characteristics directly affect the performance and function of the dehumidifier.

- The drying rotor is made of special heat-resistant composite material, the composite material is corrugated structure loaded with high-performance moisture absorbent, forming many small air flow channels, contacting the air with a large area, and improving the dehumidification efficiency;
- Both the rotor and the sealing belt are brand-name products.

2.3.5 Driving motor

- Slow rotation of the rotor can be achieved by a motor and a belt drive. The belt is located on the outer rim of the rotor and is driven by the pulley of the motor.

- The belt tension device can keep the belt at a proper tightness, thereby preventing the it from slipping off. Correct operation of the driving motor should be performed. Regular check of the rotor's rotation direction is required.



2.3.6 Electrical protection

- Motor overload and short circuit protection: processing motor, regenerative motor and driving motor all have overload and short circuit protection functions.
- Shutdown protection: When the dehumidifier shuts down under normal conditions, the regeneration fan (including the rotor) will continue to run until the regeneration heater is cooled down below 60°C.
- Error alarm: the motor switch trips, regeneration high temperature, rotor high temperature, etc., the operation panel has an alarm indication.

3 INSTALLATION

3.1 Introduction

The content of this chapter involves the description of the work required to install the unit. Reading before the installation will help you to arrange the work correctly.

3.2 Shipping & storage

Each unit has been inspected before leaving the factory. If the unit needs to be stored for a period of time before installation, the following items should be noted:

- It is not suggested to remove the shipping packaging;
- The location of the unit should avoid physical damage;
- It should be stored under a cover to prevent the intrusion of dust, frost and rain.

3.3 Inspection

Open the transportation package of the unit and inspect the unit to ensure that it is not damaged during transportation. If you find any damage, please contact the supplier. If the duct connected to the unit has been arranged, check whether the duct arrangement is appropriate. If the environment and installation conditions are not satisfactory, please contact the relevant design and technical personnel of the supplier.

3.4 Movement

The weight of the unit is more than 50 kg, and it can be lifted and transported with a hydraulic truck. In order to prevent unit damage and personal injury, it is recommended to use lifting device. The unit must be treated with care. When the unit is moving, a crane or forklift can be used. When using a crane, a suitable lifting point should be selected. The lifting point cannot touch the motor, control system and exposed duct flanges to avoid damage to the unit. The lower part of the unit has fork foot holes for forklifts and lifting holes for cranes.

3.5 Location requirements

In order to obtain the best performance and easy maintenance, the unit should be installed indoors and should be installed in an upright way. During installation, the unit should be fixed on the floor with bolts. There should be an 800 mm interval on the top of the unit to facilitate future inspection and maintenance. It is very important to keep the necessary and compact service space for the future maintenance. The open service space should be as wide as the unit.

In order to prevent condensation inside the unit, it should not be exposed to an environment with a temperature lower than the dew point of the processing air.

The unit cannot be placed in an explosive place, and also cannot work with air containing explosive substances.

In addition, if the unit is installed outdoors, appropriate protective measures should be taken to prevent rain, snow and dust from entering.

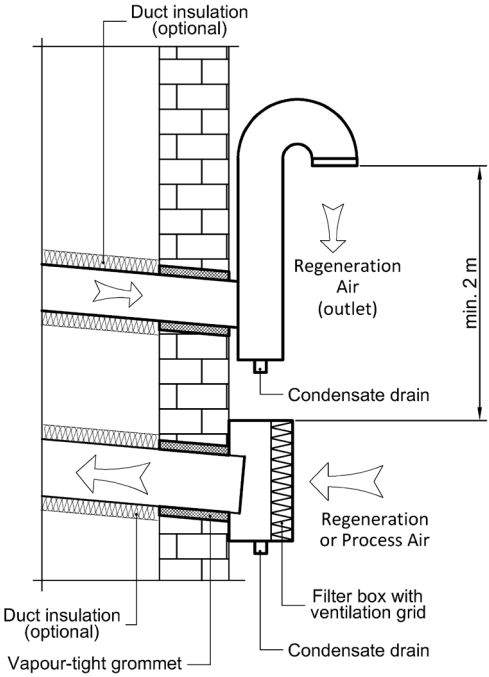
3.6 Basics

The unit must be installed on a level ground that can bear its weight. If the unit is required to be fixedly installed, the installation holes need to be prefabricated on the steel foundation of the unit.

3.7 Duct connection

The size of the process air and regeneration air ducts should meet the recommended values of ISO 7807. For the installation of duct joints of ducts and elbow flanges, the bolt length shall not exceed 20 mm. When instaling the inlet and outlet connecting ducts of the unit, the following suggestions should be paid attention to:

- Minimize the length of the air duct in order to reduce the static pressure loss of the air system;
- In order to ensure performance, all rigid (galvanized) duct connections must be airtight;
- The duct should be insulated to avoid condensation on the outer wall of the duct when the temperature of the airflow in the duct drops below the dew point temperature of the outside air, which will lead to duct corrosion and energy loss can be avoided;
- The ductline directly installed on the unit should be fully supported in order to reduce the load and pressure caused by the gravity and operation of the ductline;
- In order to reduce noise and vibration along the ductline, the regeneration air outlet can be installed with a soft connection with good quality and strong air tightness.



If the system is introduced into the dehumidification unit from the outside, the air inlet should be sufficiently high from the ground to prevent the inhalation of dust and debris. The entrance must be far away from possible pollution sources, such as energy waste gas, steam and harmful gases. In order to prevent humid air from humidifying the process air (inlet), the outdoor process air inlet must be at least 2 meters away from the humid air outlet. The ductline design should prevent the intrusion of rain and snow.

The outlet regeneration air is hot and humid. It can be easily formed on the inner wall of the ductline. The ductline should be installed at a downward slope from the unit. In addition, the condensate drain should be set at the lowest point of the ductline to prevent internal water accumulation. The humid air ductline must be insulated to prevent condensation on the inner wall of the ductline when the dew point temperature of the air in the ductline is higher than the temperature of the outside air, which may cause corrosion and water accumulation in the ductline.

The dry air outlet of the unit can be equipped with a regulating valve, which can be used to control the operation of the dehumidifier. If you want the dry air to contain lower humidity, the regulating valve must be installed at the dry air outlet. If the maximum dehumidification capacity is not required, the regulating valve should be installed at the humid air outlet. If the humid air outlet contains high humidity, condensation may occur in the duct. Therefore, it is recommended that the duct of the humid air outlet be insulated and installed at an angle so that the condensed water will not flow back to the dehumidifier. There must be a hole with a diameter of 10 mm in the lower part of the duct to discharge the condensed water.

3.7.1 Duct connection way for return air circulation

The unit can be installed in a room or a separate room where dehumidification is required. In order to ensure the best performance, the blower outlet should be equipped with a diffuser.

3.7.2 Duct connection way for regeneration air outlet

The humid air should be exhausted to the outdoors. The length of the duct should be minimized as much as possible to minimize the chance of condensation of humid air. The duct should be tilted slightly downward to prevent the condensate from flowing back into the unit. If the regeneration ductline is particularly long and must be installed above the unit, it must be thermally insulated, and a drainage point (2-4 mm) is specially set up at its lowest position. The exhaust port of the ductline should be equipped with metal mesh to prevent debris from entering the ductline.

3.7.3 Duct connection way for regeneration air inlet

Shorten the regeneration air inlet duct, and equip the metal mesh at the entrance to prevent debris from entering the duct. In some environments, other conduits can be used to connect, and an air volume control valve should be installed on the ductline to ensure that the regeneration air flow rate is properly adjusted during the trial operation.

3.7.4 Duct connection way for the unit installed in the designated room

When the unit is installed in a room that needs dehumidification, the process air inlet does not need any duct connection. A protection net at the process air inlet is required. The dry air outlet should be equipped with a duct so that the dry air can be evenly distributed to all areas in the room.

The intake of regeneration air must be carried out outside the room to be dried. Otherwise, due to rarefaction, uncontrolled suction of moist air from outside or adjacent rooms into the room being dried is possible. The regeneration air must be vented to the outside.

3.7.5 Duct connection way for the unit installed in the mechanical room

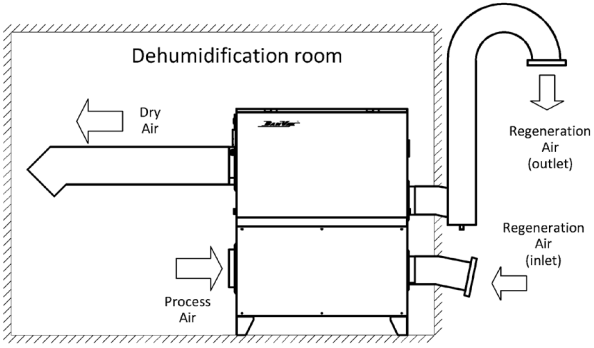
When the unit is installed in a separate mechanical room, all inlets and outlets should be equipped with duct connections. It should process the ambient air or return air from the room to be dehumidified. At the same time, the dry air should be post-processed or ducted back to the room that needs to be dehumidified.

The regeneration air intake can be carried out both outside and from the technical room. The release of regeneration air must be carried out outside.

The air volume regulating valve can be installed on the process air ductline to adjust the flow of dry air.

Indoor installation

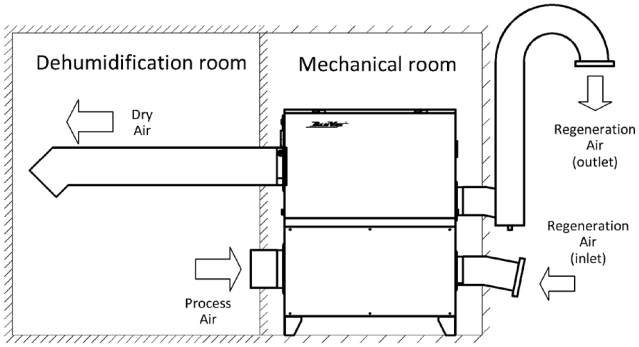
The regeneration air inlet and regeneration air outlet ducts must be placed outside of the space. Dry air must be distributed evenly in the dehumidified room, and the processing air inlet does not need to be connected.



Indoor Installation Diagram

Outdoor / Mechanical room Installation

The regeneration air inlet and regeneration air outlet need to be spaced apart. The process air outlet and the processed air inlet are connected to the dehumidified area.



Outdoor Installation Diagram

3.8 Electrical connection

The electrical connection must be performed by qualified electricians in accordance with the electrical standards at the location of the unit! The unit is designed with a three-phase AC power supply, and the installation and configuration should be in accordance with the voltage and frequency marked on the unit nameplate!

- The unit cannot be operated at a voltage and frequency beyond the manufacturing range;
- Before the unit is connected to the main power supply, check the threephase AC power supply to ensure that the fluctuation range of the supplied voltage does not exceed ±10% of the marked voltage and frequency. For highload occasions (due to the conversion of larger electrical equipment) that can cause voltage fluctuations, this inspection is particularly important;
- The unit must be grounded and a power isolation switch is provided to ensure that the unit is cut off during inspection and maintenance;
- The fusing power of the power supply fuse must be consistent with the power and type of the unit. The fuse should be installed near the unit. The selection of the power supply cable and the main fuse should correspond to the correct operating power of the unit.

3.9 External humidity sensor connect

The electrical wiring can be pre-arranged to communicate with the external control system, and provide wiring terminals for connecting external control components. When installing the temperature and humidity sensor (sensitive element), its installation position should comply with the following requirements:

- The temperature and humidity sensor should be installed at a position 1 - 1.5 meters above the ground in order to detect a representative level in the controlled area, or be installed at the detection point in accordance with the design requirements;
- The sensor should be installed in a location that is not affected by dry or humid air and airflow outside the control area;
- Avoid placing temperature and humidity probes near heat sinks or exposed to direct sunlight, because temperature changes will affect the actual detection value;
- The external control system must be compatible with the low-voltage control circuit of the unit.

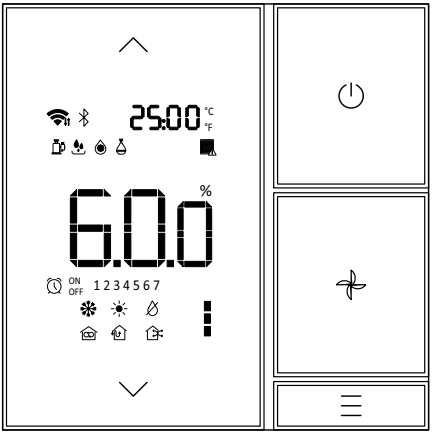
The connecting scheme an external temperature and humidity sensor to the controller is shown in the general wiring diagram of the installation. Sensors and terminals characteristics are also indicated in the section with a description of the controller terminals.

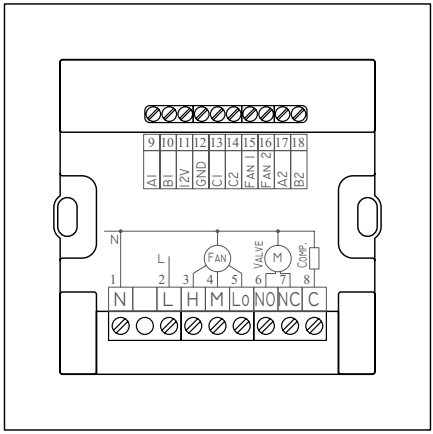
4. OPERATIONS

4.1 Touch control panel G6 with built-in humidity and temperature sensors

ATTENTION! ***The control functions supported by the controller are only partially implemented in the dehumidifier, so some of the functions are either not available in a particular model of the dehumidifier, or can only be available as an option***

The universal remote control (controller) is equipped with built-in temperature and humidity sensors, and allows you to monitor the temperature and humidity in the room in real time.

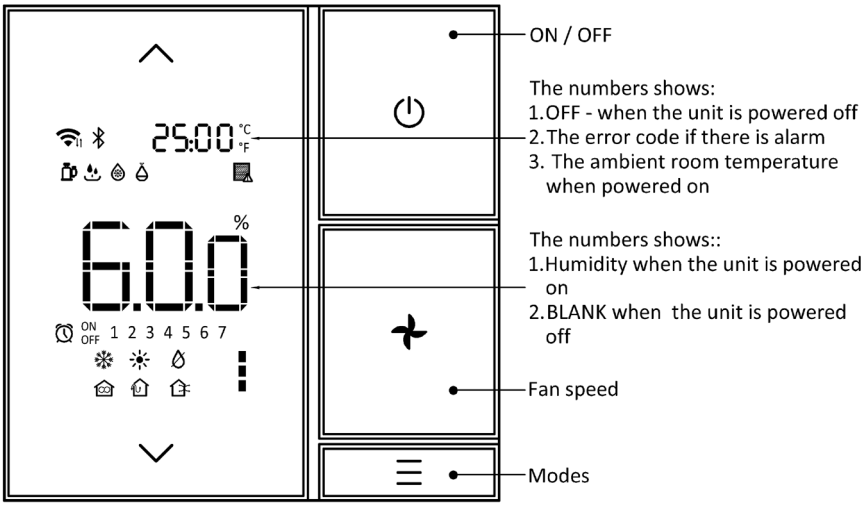




4.1.1 4.1.1 Controller terminals

Terminal		Description	Load
1	N	230 VAC	Power supply
2	L	230 VAC	Power supply
3	H - Relay 1	230 VAC output, Max.1A	High fan speed
4	M - Relay 2	230 VAC output, Max.1A	Medium fan speed; Fan coil valve
5	Lo - Relay 3	230 VAC output, Max.1A	Low fan speed; Humidifier
6	NO - Relay 5	230 VAC output, Max.1A, SPDT (single-pole double-throw)	Air damper open
7	NC - Relay 5	230 VAC output, Max.1A, SPDT (single-pole double-throw)	Air damper close
8	C - Relay 4	230 VAC output, Max.1A	Compressor
9	A1-RS485		Communicate with external temp.& humidity sensor
10	B1-RS485		Communicate with external temp.& humidity sensor
11	12V		Power the external temp.& humidity sensor
12	GND		Weak current common terminal
13	C1-RS485		Communicate with third-party
14	C2-RS485		Communicate with third-party
15	Fan1	0~10V	EC motor supply fan
16	Fan2	0~10V	EC motor exhaust fan
17	A2-RS485		Communicate with third-party
18	B2-RS485		Communicate with third-party

4.1.2 Controller's Interface



4.1.3 Parameters Setting

A. General parameters

- ON/OFF:

  Short press to turn on/off the controller: the small OFF appear in the top when the unit is powered off and disappear after 3 minutes;

  Short press to exit during parameters setting.

- Fan Speed:

  Press to adjust the fan speed.

- Air Damper:

  Press to open or close the air damper.

- Mode Change:

  Short press & simultaneously to change the available system working mode.

- Humidity Set:

  Press to reduce humidity, press to raise humidity (1% changed each press).

- Temperature Set:

  Only for the available system working mode.

- Filter:

  Long press & simultaneously for 5 seconds to display the run time, wait for 5 seconds to exit,

  Long press for 10 seconds to clear the alarm and reset the time.

B. Factory parameters

Long press for 5 seconds to enter the factory parameters setting mode: the parameters code R,P,O,H,C,A,D,F will appear.

Press or to select the parameters code R,P,O,H,C,A,D,F;

Short press to set the available code;

Press or to adjust the code value;

Short press to save the code value ;

Short press to exit without saving during the code value setting or return to the previous page.

Long press & & simultaneously for 3 seconds to reboot the controller's setting.

10 seconds without setting, the value will not be saved and exit to the home screen.

4.1.4 Icon's meaning

Icon	Description
	WIFI connection established
	WIFI connection not established
	ESP32 trigger
	Defrost
	Filter max. working time alarm,disappear after reset
	Compressor relay output active
	*Compressor working *Flashing when the minimum absolute humidity protection is activated
	Humidification
	Timer
°F	H05=1,temperature in degrees Fahrenheit
°C	H05=0,temperature in degrees Celsius
60%	Current humidity
▬▬▬▬▬	Current air speed, AC 3 speeds, EC 1~5 speed
	100% return air
	100% fresh air
	Mixed fresh and return air
	Dehumidification mode
	Cooling mode
	Heating mode

4.1.5 Dehumidification Working Mode

Mode Code	H04=0
Function	Dehumidification
Relay 1	High fan speed
Relay 2	Medium fan speed
Relay 3	Low fan speed
Relay 4	Compressor
Relay 5	Air damper open

Description

If the humidity of the air is higher than the setting, the fan turns on; 5 seconds later,the compressor turns on;.

If the humidity of the air is lower than the setting, the compressor turns off; 3 minutes later,the fan turns off.

Initial Value

The controller has data memory function when there is power failure.

The initial value as below:

- Fan speed - high;
- Air damper - close;
- Mode - the same before the power failure.

Fan Control

The initial value is high speed, can be adjusted manually.

EC motor (0~10V) fan has 5 fan speeds, which can be set separately.

AC motor fan speed can be adjusted manually when H04=0:

- F01=1, high fan speed available;
- F01=2, high fan speed & low fan speed available;
- F01=3, high fan speed & medium fan speed & low fan speed available.

High fan speed & low fan speed available when H04=1.

High fan speed available when H04=2.

Fan works according to F02 when achieve the set humidity and temperature (only for the available system working mode):

- F02=1, the fan turns off 3 minutes later after achieved the set humidity and temperature (only for the available system working mode);
- F02=2, the fan keeps working after achieved the set humidity and temperature (only for the available system working mode).

Air Damper Control

Air damper works according to H01,R03 when the unit is turned on manually.

Open or close air damper manually when H01=0:

- Air damper close: 100% return air
- Air damper open: mixed fresh and return air

Open or close air damper automatically when H01=1:

- Indoor humidity ≥ R03: air damper close; Indoor humidity ≤ R03~R04: air damper open.
- Can switch to manual mode from automatic mode and works manually for 30 minutes amd continue to work automatically.
- Air damper close when the unit is powered off manually.

Defrost Control

Defrost conditions: Indoor temperature ≤ D3, Defrost interval ≥ D1

Defrost mode: compressor cycle off & fan runs at high speed.

Defrost stop conditions:

- Defrost time ≥ D2;
- Unit is turned off manually;
- Unit is turned off faulty.

Alarm

- Filter Alarm: If the fan's running hour ≥ H02, the filter alarm icon will appear.Reset the timer, the alarm will disappear.
- Built-in temp. & humid sensor Error

  When H03=1, if there is an open/short circuit of the humidity sensor or abnormal data (out of the normal temp.&humidity range), only the fan keeps working. The error code is E01. It will resume operation after the error addressed.
- RS485-1 Communication Error

  When H03=0, if there is RS485-1 communication failure,only the fan keeps working. The error code is E03. It will resume operation after the error addressed.

4.1.6 Parameters Code Description

Parameters	Code	Default	Precision	Range
Humidity set (dehumidify)	R01	50%	1%	1%~99%
Air damper automatic close/open value	R03	50%	1%	1%~99%
Air damper humidity differential	R04	3%	1%	1%~10%
Indoor temp. set	R05	25 (77°F)	0.5 (1°F)	5~35°C (41~95°F)
Humidity set (humidify)	R06	70%	1%	1%~99%
Humidity differential (humidify)	R07	3%	1%	1%~10%
Air damper automatic close/open	H01	1	/	0 - no in use 1 - in use
Filter alarm hour	H02	200	1	0 – no alarm 100 - 990, 1=10 hours
Defrost interval	D01	40 minutes	1 minute	30~60 minutes
Defrost stop	D02	10 minutes	1 minute	1~15 minutes
Defrost start	D03	17 (62°F)	1 (2°F)	1~20°C (34~68°F)
AC fan speed set	F01	1	/	1 – low speed; 2 - medium speed (DC motor fan: 1,2 - low; 3,4,5 - high); 3 - high speed (DC motor fan: 1,2 - low; 3,4 - medium; 5 - high)
Fan set under achieved humidity	F02	1	/	1 - turns off 3 minutes later after achieved the set humidity; 2 - keeps working after achieved the set humidity
FAN1, DC fan motor, speed 1 voltage	F03	500 (5V)	10 (0.1V)	400~950
FAN1, DC fan motor, speed 2 voltage	F04	600 (6V)	10 (0.1V)	F03~950
FAN1, DC fan motor, speed 3 voltage	F05	700 (7V)	10 (0.1V)	F04~950
FAN1, DC fan motor, speed 4 voltage	F06	800 (8V)	10 (0.1V)	F05~950
FAN1, DC fan motor, speed 5 voltage	F07	900 (9V)	10 (0.1V)	F06~950
FAN2, DC fan motor, speed 1 voltage	F08	400 (4V)	10 (0.1V)	400~950
FAN2, DC fan motor, speed 2 voltage	F09	500 (5V)	10 (0.1V)	F08~950
FAN2, DC fan motor, speed 3 voltage	F10	600 (6V)	10 (0.1V)	F09~950

Parameters	Code	Default	Precision	Range
FAN2, DC fan motor, speed 4 voltage	F11	700 (7V)	10(0.1V)	F10~950
FAN2, DC fan motor, speed 5 voltage	F12	800 (8V)	10 (0.1V)	F11~950
RS485-2 Baud rate	P01	0		0-4800 1-9600
RS485-2 Address	P02	1		1~255
RS485-2 Protocol	P03	0		General open protocol
Protection of the minimum absolute humidity	A01	1	/	0 - not activated 1 - activated
RS485-2 Communication status	007			0 - abnormal 1 - normal
Software version	009			
Dew point	010			
Absolute humidity	011			

4.1.7 Working Status Display

Type	Range	Precision
Indoor temperature	-30~99°C, -22~210°F	0.1°C, 1°F
Indoor humidity	0~100%	0.1 %
Absolute humidity	0.0~99.9	0.1 g/kg
Fan's running time	0~999	10 hours

4.1.8 Error Code

Error	Code
Built-in temp. & humidity sensor failure	E01
External temp. & humidity sensor failure	E02
RS485-1 communication failure	E03

4.1.9 External temp. & humidity sensor

The controller supports connection of external sensors via MODBUS RTU RS485

MODBUS RS485-1; Address: 13; Baud rate: 9600; Parity: 8N1

Name	Add	Code	Byte	Read Only or Read/Write	Precision	Data Type
Humidity	0000H	03	2	Read Only	0.1%	Temp1
Temperature	0001H	03	2	Read Only	0.1%	Temp1

4.1.10 RS485-2 MODBUS communication protocol

Function code description:

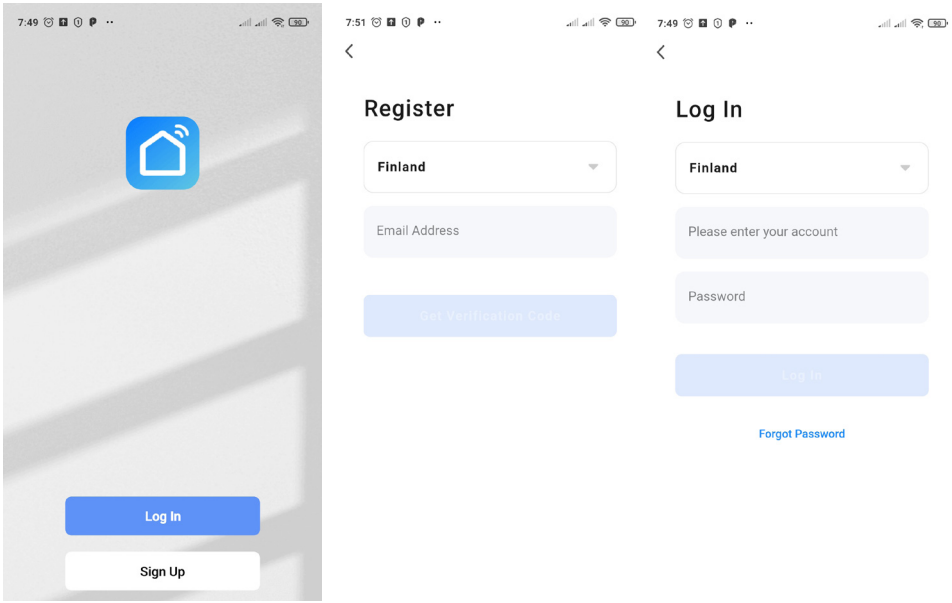
function 03 – read; function 06 – write single; function 16 – write multiple

Address	Function Code	Object	Byte	Read Only or Read/Write	Data
0x1001	03/16/16	ON/OFF	2 bytes	Read/Write	0 - OFF 1 - ON
0x1002	03/16/16	Fan speed	2 bytes	Read/Write	1 - 1st fan speed 2 - 2nd fan speed 3 - 3rd fan speed 4 - 4th fan speed 5 - 5th fan speed
0x1003	03/16/16	Air damper close/open	2 bytes	Read/Write	0 - close 1 - open
0x1004	03/16/16	Humidity set	2 bytes	Read/Write	1~99%
0x1006	03/16/16	Air damper automatic humidity set	2 bytes	Read/Write	1~99%
0x1008	03/16/16	Air damper automatic close/open	2 bytes	Read/Write	0 – not in use 1 - in use
0x101B	03/16/16	Temperature set	2 bytes	Read/Write	5~35°C
0x101C	03/16/16	Working modes	2 bytes	Read/Write	0 - dehumidification 1 – cooling+dehumidification 2 – heating+dehumidification 3 – cooling+humidification 4 – heating+humidification 5 - humidification
0x101D	03/16/16	Humidification set	2 bytes	Read/Write	1~99
0x2001	03	Indoor temperature sensor	2 bytes	Read Only	
0x2002	03	Indoor humdity sensor	2 bytes	Read Only	
0x2003	03	External temperature sensor	2 bytes	Read Only	
0x2004	03	External humidity sensor	2 bytes	Read Only	
0x2005	03	Fan running time	2 bytes	Read Only	1=10 hours
0x2006	03	Failure	2 bytes	Read Only	Bit 0: built sensor failure bit 1: external sensor failure bit 2: filter alarm bit 3: minimum absolute humidity protection bit 4: in defrost
0x2007	03	Dew point	2 bytes	Read Only	
0x2008	03	Absolute humidity	2 bytes	Read Only	

4.1.11 Wi-Fi connection

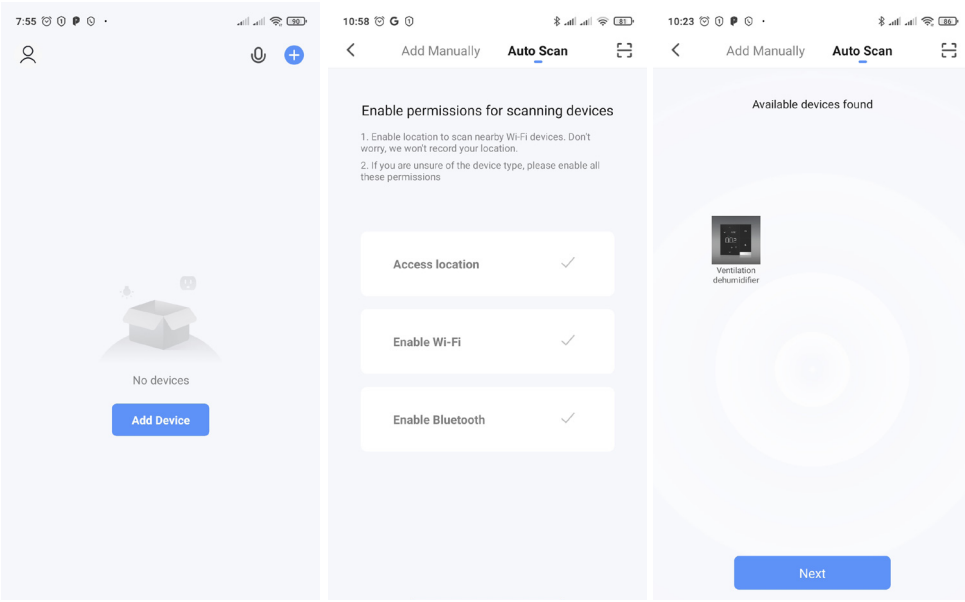
1. Connect your smartphone to local Wi-Fi router
2. Turn on Bluetooth and GPS on your smartphone
3. Download and install the "Smart life" application by scanning the QR code

4. Open the app, register and login

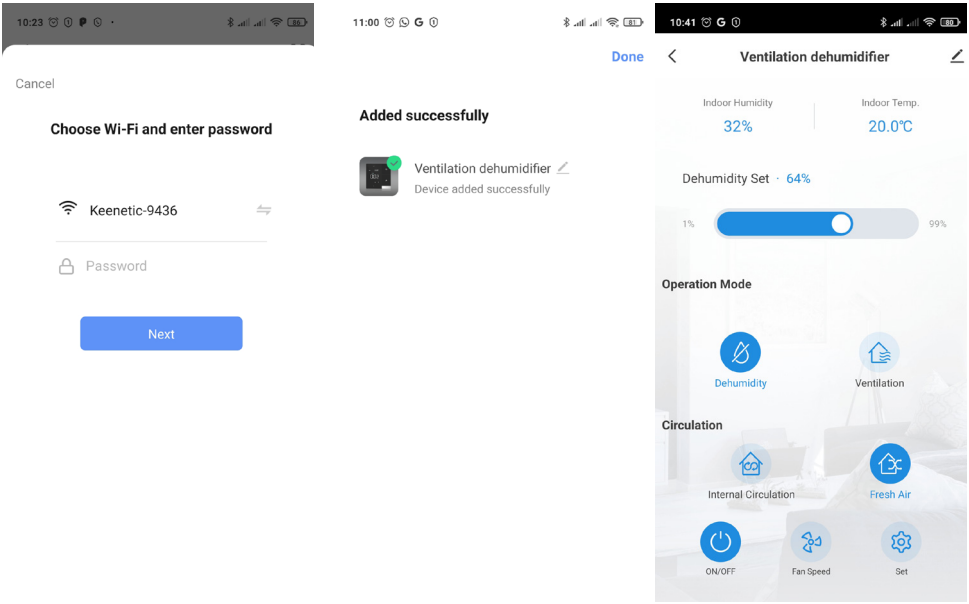


5. Select "Add device" to add a device
6. Go to "Auto Scan" to automatically search for the device

7. Press and hold the "ON/OFF" button on the controller for 10 seconds until the LCD boots up. Then release the button. The display will flash
8. The app will automatically detect the device. Then click "Next"



9. Enter your Wi-Fi password and click "Next"



10. Setup completed.

5 MAINTENANCE

5.1 Introduction

The unit can be operated for a long time with very little maintenance. The regular maintenance is beneficial to the long-term and good operation of the unit. The frequency of maintenance depends on the operating conditions of the unit and the quality of the installation environment. lf the dust content of the air being processed is high, the relative maintenance work needs to be performed more frequently. lmproper maintenance may reduce the dehumidification performance of the unit.

Turn off the unit from the main power supply

There is a high voltage inside the unit. Before any maintenance work, make sure that the power supply of the unit is cut off

There is a high temperature area (regeneration heating section) inside the unit, it should be cooled down before maintenance. Before opening the panel, turn off the unit for about 15 minutes to allow the electric heater to cool down completely

5.2 Filters

The unit is equipped with two filters: process air inlet filter and regeneration air inlet filter, so that the air that is about to enter the unit can be cleanly filtered. The interval between cleaning or replacing the filter device should be determined according to the amount of dust and particles in the air at the installation site. lt is forbldden to operate the unit without a filter! Because in this case, dust and impurities may damage the runner. lt is recommended to inspect the filter at least once a month.

5.3 Rotor

Generally, there is no need to maintain the rotor. lf it is necessary to maintain it, it is recommended to use highpressured air for cleaning. The heavily polluted rotor should be washed with water. The frequency of washing with water should not be too much. The rotor and the rotor shaft should be inspected every year.

5.4 Motor

The motor equipped with bearings. The service life of the bearing is the same as that of the motor, so no additional maintenance is required. Check the motor once a year to ensure that it is in good condition.

5.5 Electric heater

There is no need to maintain the regeneration air electric heater, but it should be inspected twice a year to check whether the heating device is damaged due to other maintenance work.

5.6 Driving belt

Check the belt tension regularly. During normal operation of the equipment, there is no need to adjust the belt.

6. TROUBLESHOOTING

6.1 Inspection and maintenance procedures

The purpose of this chapter is to analyze the cause of the failure and master the method of troubleshooting. In order to facilitate failure analysis, please refer to the circuit diagram and related materials provided with the unit**.**

Parts	3-6 months	12 months
Filters	Clean the filter. If the filter is dirty, replace the filter	
Fan		The dust and debris in the cooling grooves on the surface of the motor housing must be removed. Check the wiring terminals of the motor to ensure that the wiring is not loose. Check the lubrication of the fan bearing and add lubricating oil. Check the impeller of the fan for damage. If there are signs of corrosion, take immediate measures
Driving motor	Check the drive belt for signs of damage and proper installation	Check the wiring of the motor and make sure that the wiring is not loose. Check for signs of damage and overheating
Electric heater	Remove the debris and dust remaining on the bottom and surface of the heater	
Desiccant rotor		Check for signs of overheating and clogging. Clean the dust on the surface of the rotor
Seal	Check for signs of damage and displacement. If it worn or damaged, it should be replaced	
Temperature and humidity control		Check the working conditions of all external temperature and humidity probes and calibrate as required

There is a high voltage inside the unit. Before any maintenance work, make sure that the power supply of the unit is cut off

There is a high temperature area (regeneration heating section) inside the unit, it should be cooled down before maintenance

The adjustment, maintenance and repair of the unit should be carried out by qualified technicians. The relevant personnel should be aware of the high temperature and high pressure inside the unit

6.2 Troubleshooting procedures

If the unit fails, please refer to the failure analysis and corresponding solutions provided in the following content before contacting the supplier. It may be easy to troubleshoot. The following table does not include the content of external parts related to the unit.

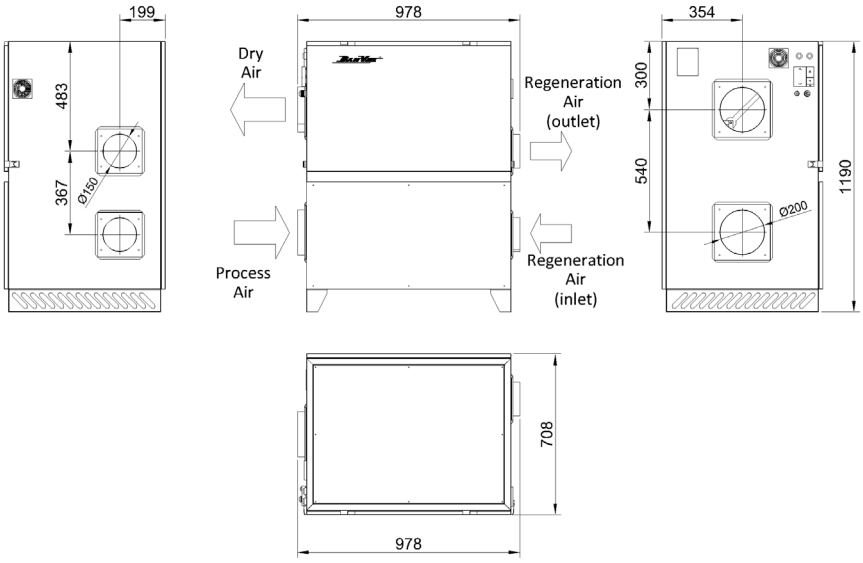
ERROR	POSSIBLE CAUSES OF ERROR	THE CORRECT WAY TO TROUBLESHOOT
Does not work or poor performance	•blocked filter •electric heater malfunction •reduced airflow •regeneration air temperature change •air leak	•clean or replace the filter •check whether the electric fuse is damage •check the pipe and the air volume adjustment •check the electric heater •check panels and seals
Breaker or fuse failure	•the blower failure •the rotor failure •the electric heater failure	•check the blower and motor •check the drive motor and belt •check the electric heater
Unit does not start	•no control power •control signal failure •phase short circuit falt •fuse control failure	•check the control fuse •check external start/stop signal •check the main fuse and phase sequence •check electrical parts
The rotor does not work	•slipped belt •broken or worn belt •stuck rotor •drive rotor failure	•check the tightness of the belt •replace the drive belt •check the center bearing and outer rim •replace the entire gear motor
No dry air	•blocked filter •fan failure •phase failure •blocked pipeline	•clean or replace the filter •check the blower, motor and propeller •check the main fuse and phase sequence •check the air volume adjustment and duct

7. TECHNICAL SPECIFICATIONS

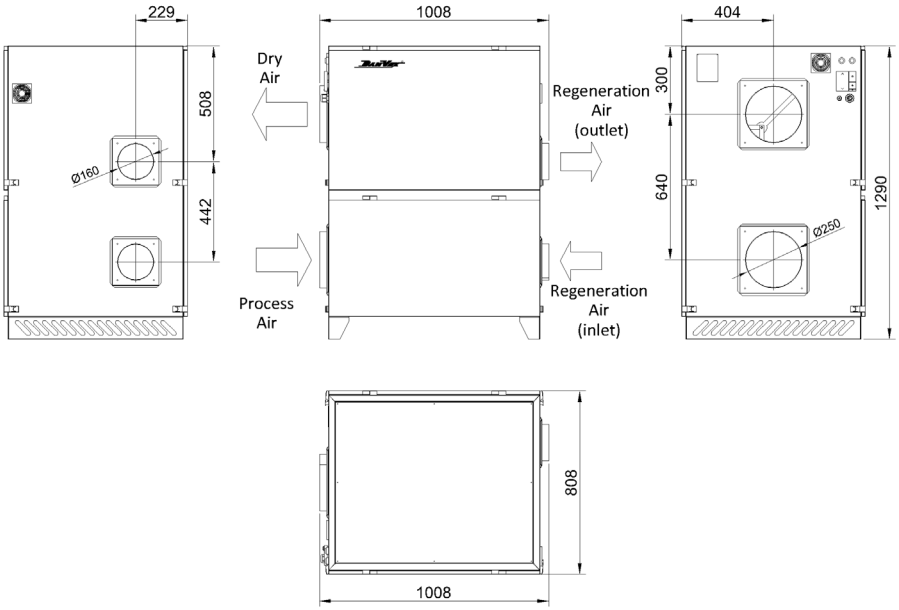
MODEL	AD-800	AD-1000	AD-1500
Nominal capacity (20°C/60%), kg/hour	5	7	11
Nominal capacity (20°C/60%), kg/24 hours	120	168	264
Temperature range, °C	-20 .. +40		
Dehumidification range, RH%	2 - 100		
Process airflow, m3/hour	820	1100	1550
Static pressure, Pa	200	200	200
Regeneration airflow, m3/hour	250	400	580
Static pressure, Pa	150	150	150
Current, A	13,6	18	20
Power consumption, KW	9	12	13
Supply	400V / 50Hz	400V / 50Hz	400V / 50Hz
Noise level, dB	70	70	80
Proces air IN, mm	D200	D200	D250
Dry air OUT, mm	D200	D200	D250
Regenertion air IN, mm	D150	D150	D160
Regeneration air OUT, mm	D150	D150	D160
Filters type	G4 667*389*25	G4 667*389*25	G4 667*389*25
Dimensions, mm (depth * width * height)	640*877*1232	640*877*1232	660*888*1238
Weight, kg	165	175	190

8. DRAWINGS

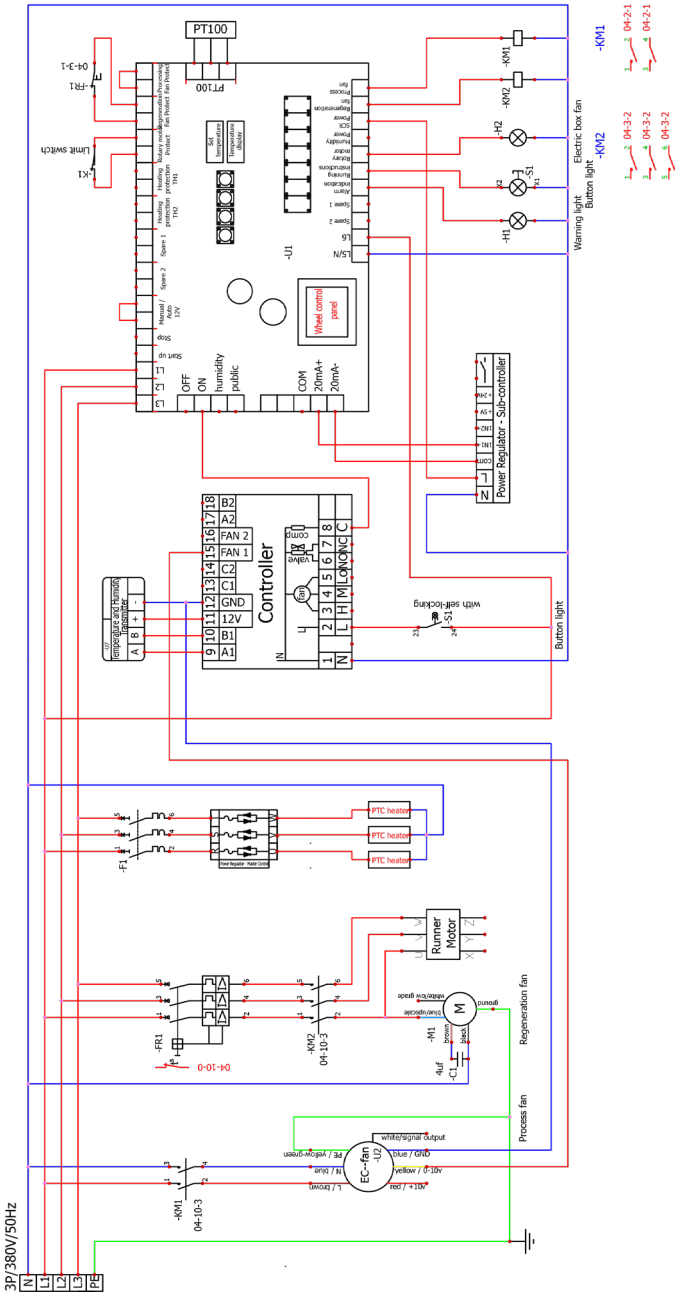
AD-800/1000



AD-1500



9. CIRCUIT DIAGRAMS



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