



# Industrial air dehumidifiers DEH-2K / DEH-3K / DEH-5K / DEH-10K



Operation Manual



rev. 6.14

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**KEEP THESE INSTRUCTIONS FOR FUTURE REFERENCE**

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# Industrial air dehumidifiers

## DEH-2K / DEH-3K / DEH-5K / DEH-10K



## FOREWORD

### Purpose

This manual is intended to familiarize technical personnel and users with the equipment, its features during installation, operation and maintenance.

### Content

The manual provides general information about the control of the drying process, the operating principle and maintenance standards of the dehumidifier, installation and operating instructions, system errors and troubleshooting.

### Copyright

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## WARNING!!!

**All electrical connections works must be done by local professionals, according to relevant provisions to operate and local electrical codes, 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 INSTRUCTIONS AND APPLICATIONS**

### **1.1 Safety**

All models of dehumidifiers in this series are manufactured in compliance with the requirements of European safety standards and current regulations. The safety requirements of the operator and equipment were taken into account during design and production. Each section of this manual provides safety information and details circumstances that could lead to an emergency. Such information is marked with a warning sign "ATTENTION!"

This manual also provides information on how to maintain your dehumidifier. It is for informational purposes only and does not relieve the operator of responsibility for compliance with personal safety requirements at work and local safety standards.

During installation and operation of the equipment, each employee must follow the instructions presented below:

- Observe safety measures for yourself and others;
- Do not install the dehumidifier near explosion-proof devices;
- Only qualified personnel should be allowed to operate and maintain the dehumidifier;
- Before starting any work on the equipment, it is necessary to conduct a visual inspection of the condition of the equipment and its connections to the electrical and drainage networks, according to the recommendations described in this manual;
- Before carrying out maintenance work on the equipment, turn off its input circuit breaker and wait 15 minutes, then proceed with maintenance;
- Always disconnect the dehumidifier from the power supply before opening the housing panels;
- Service and other panels of the dehumidifier body must be closed unless maintenance work is being carried out;
- The air filter must be installed before using the dehumidifier;
- It is prohibited to remove markings/placards/signs from the dehumidifier body;
- Keep this manual carefully for future reference;
- Use only original spare parts;
- Before starting repair work, written permission from the manufacturer must be obtained.

### **1.2 Application**

The dehumidifiers of this series are widely used in the following areas:

- heated premises for storing and packaging finished products;
- production and storage of confectionery and food products;
- storage and aging of cheeses;
- drying vegetables and fruits, starch;
- painting booths;
- testing laboratories;

- production facilities with high-precision equipment;
- premises with open tanks and swimming pools;
- premises requiring frequent wet cleaning and laundries;
- pumping stations;
- injection molding production facilities;
- etc.

## 2 DEVICE INFO

### 2.1 Standards

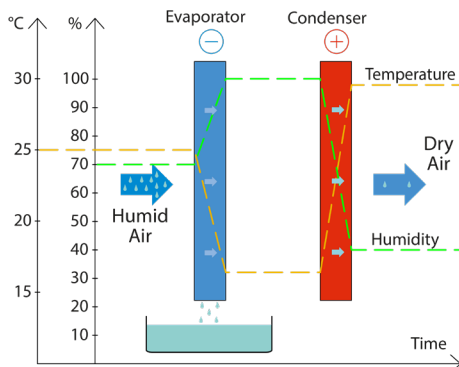
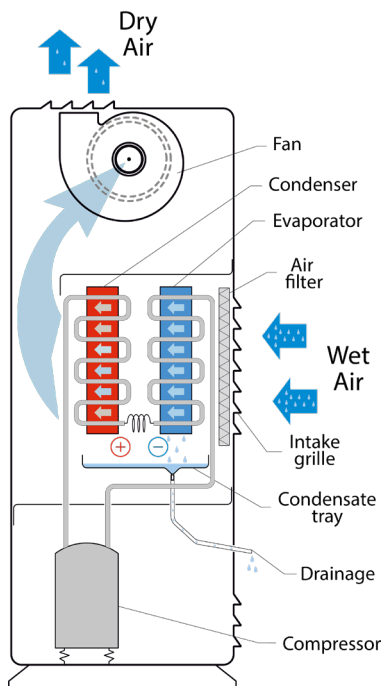
The design meets IEC protection class IPX 3 requirements.

### 2.2 Description and principle of operation

The unit is designed for automatic, uninterrupted and efficient dehumidification, as well as maintaining air humidity at normal atmospheric pressure.

The efficiency and performance of the dehumidifier significantly depend on the parameters of the air being dried. Humidity range of effective operation is 30-100%, temperature range of effective operation is +10 .. +38°C. Operation of the dehumidifier outside these ranges may be unstable, ineffective, and may cause increased wear on equipment components.

#### Schematic diagram of the dehumidifier operation



The operation of a dehumidifier is based on the principle of condensation of moisture from the air, where the air is cooled below the dew point, releasing water. The minimum achievable relative humidity in the room for this dehumidification method can be about 40%.

During operation of the dehumidifier, moist air is sucked into the dehumidifier by a fan and, passing through two heat exchangers of the compressor refrigeration machine, is first cooled in the “cold” heat exchanger (evaporator) below the dew point temperature with condensation, and then heated in the “warm” heat exchanger (condenser) and is discharged from the dehumidifier into the room being dried. The moisture released from the air in the form of condensate flows into the internal tray and is then removed from the dehumidifier by gravity, for example, into the sewer system.

The dehumidifier is controlled and monitored through a controller with an LCD display located on the electrical panel. The controller can display current and adjustable parameters, operating modes, as well as service information in case of a malfunction.

By drying the indoor air, continuous air circulation occurs through the dehumidifier and its humidity in the room gradually decreases. Unlike dehumidifiers that have outdoor and indoor units, in a dehumidifier with all elements placed in a single unit, the air outlet temperature in dehumidification mode is always higher than the air temperature at the inlet to the dehumidifier by approximately 5-8°C

It should be taken into account that the performance of the dehumidifier directly depends on the humidity and temperature of the air being dried. The lower the air temperature and humidity, the lower the dehumidifier's performance will be.

To drain condensate into the sewer, use a hose (not supplied with the dehumidifier) by connecting it to the fitting on the side panel of the dehumidifier.

If the heat exchanger freezes while the dehumidifier is operating, the controller turns off the compressor to defrost, and the fan continues to operate. After defrosting the heat exchanger, the compressor turns on automatically and air drying continues. Operating modes are displayed on the controller's LCD display.

The dehumidifier is equipped with a removable, serviceable filter to clean the incoming air. Using a dehumidifier without a filter is prohibited, as it leads to contamination of the internal components and heat exchanger, subsequent corrosion, overheating and, as a result, failure of the dehumidifier.

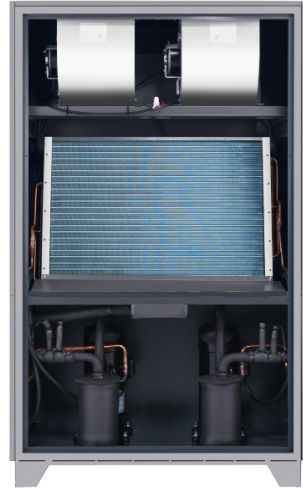
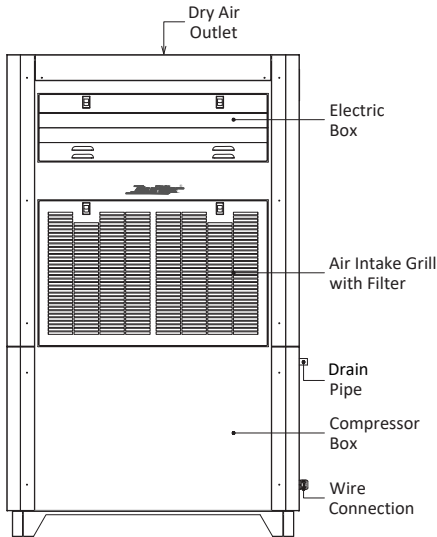
## **2.3 Structure**

### **2.3.1 Frame and housing**

- Steel spatial frame structure, corrosion resistant;
- Removable housing panels providing quick access to equipment components;
- An internal tray under the heat exchanger for collecting and discharging condensate by gravity into the sewer system.

### **2.3.2 Air inlet/outlet**

- YA removable serviceable filter installed at the air inlet ensures the necessary purification of the process air;
- Centrifugal fans with steel spiral and forward curved blades provide high performance and low noise levels.



### 2.3.3 Dehumidification section

- The system design has added an energy-saving heat exchanger, which adopts a combined design of a liquid separator and a heat exchanger, which can effectively adjust the liquid flow function of the system, and can also maximum the dehumidification capacity to ensure the optimal operation of the compressor. The system adds a dry filter to effectively prevent the turbid impurities in the system from blocking the expansion valve or capillary tube;
- The patented defrosting circuit ensures stable operation of the refrigeration system;
- A heat exchanger with hydrophilic coating fins increases heat transfer efficiency by 20%, which reduces the size and weight of the device. High-quality insulating material increases the insulating effect by 15%.

### 2.3.4 Compressor

The compressor is the main part of the dryer and ensures the operation of the entire system. It directly affects the performance of the dryer by compressing low temperature gas to exchange heat with the air passing through the heat exchanger. The dehumidifiers use efficient and reliable compressors from world famous brands.

### 2.3.5 Throttling section

The throttling component is one of the four indispensable components of the refrigeration system. Its function is to throttle and reduce the pressure of the high-pressure liquid from the condenser, so that the liquid refrigerant vaporizes and absorbs heat at low pressure (low temperature). Therefore, it is an important part to maintain the high pressure in the condenser and the low pressure in the evaporator. Due to the direct expansion method, the cooling loss is small and the efficiency is high. At the same time, it also has the function of preventing liquid shock to protect the compressor and abnormal overheating. The expansion valve has a stable degree of superheat, which makes the system run stably.



### 2.3.6 Protective functions

- The controller has improved characteristics to ensure high reliability under high loads, which ensures uninterrupted operation of the equipment;
- Fan and compressor motors are protected against overload and short circuit;
- "Start delay" function: if you turn off the dehumidifier during operation, the restart procedure will take about 3 minutes;
- "Stop delay" function: If the dehumidifier is turned off during operation, the fans will continue to run for 3 minutes to cool down the dehumidifier components;
- Fan operation mode: the fan can stop/continue to operate when the set relative humidity is reached. The operator can configure this function independently;
- High temperature protection: protect the compressor from continuous operation at high temperatures and prevent fire;
- Low pressure protection: prevents compressor failure during prolonged operation if refrigerant leaks from the system.

## 3 INSTALLATION

### 3.1 Introduction

The stationary dehumidifier can be installed in various locations, depending on customer requirements. It can be used as an independent unit or connected to the outlet of the dehumidifier with a supply air duct. This chapter provides information on the preparatory work for installing the dehumidifier.

### 3.2 Unpacking and Storage

To ensure the quality and reliability of each dehumidifier, we test all units at the factory. If the dehumidifier is in storage:

- keep the unit in its original packaging;
- avoid physical damage to equipment;
- store the unit in a heated room, protect from dust and moisture.

### 3.3 Inspection

First inspect the outside of the shipping packaging, then remove the packaging and check the equipment for visible damage. If damage is found, contact the shipping company or supplier.

### 3.4 Moving

Before starting loading and unloading operations, check the weight of the equipment. It is recommended to use appropriate equipment (hydraulic pallet truck or forklift) to move equipment over long distances. Remember that the unit should only be lifted properly and the lifting point should be away from the motor, control panel and accessible duct fittings to avoid damage.

### 3.5 Location requirement

When choosing a location for the unit, pay attention to the ease of connection to the power supply and drainage.



*Do not place the dehumidifier in close proximity to radiators or other heat sources!*

To ensure proper trouble-free operation, maximum performance and proper maintenance, when placing the dehumidifier indoors, it is necessary to provide free space around the unit for easy inspection and maintenance. In order to prevent condensation inside the dehumidification equipment, the unit should not be exposed to an environment with a temperature lower than the dew point of the processing air.

### **3.6 Placement**

The dehumidifier should be installed on a horizontal, rigid base to ensure proper drainage of condensate and to prevent internal leakage. Use a building level during installation.

### **3.7 Duct connection**

The dehumidifier does not require a connection to an air duct to operate. Due to the design of this series of dehumidifiers, the air duct can only be used on the dry air supply side of the dehumidifier (top panel of the housing). If you use a duct from the front panel of the dehumidifier housing and supply moist air to the dehumidifier, there will be no access to the service panel to replace the air filter.

The dimensions of the ducts used must comply with the recommendations of the ISO7807 standard. At the joints of air ducts and elbow flanges, the length of the bolt should not exceed 20 mm.

When connecting air ducts, the following recommendations should be observed:

- to reduce static pressure losses, if possible, reduce the length of the air duct;
- to ensure high dehumidifier performance, all rigid (galvanized) duct fittings must be sealed;
- the air duct must be insulated to protect the air duct from moisture condensation on it and prevent corrosion;
- the air duct connected to the dehumidifier must be secured to its own support in order to reduce the load on the dehumidifier from the own weight of the air duct;
- to reduce noise and vibration from air passing through the duct, use durable and soft, airtight adapters;
- to achieve the best dehumidification effect, the duct outlet should be equipped with a diffuser.

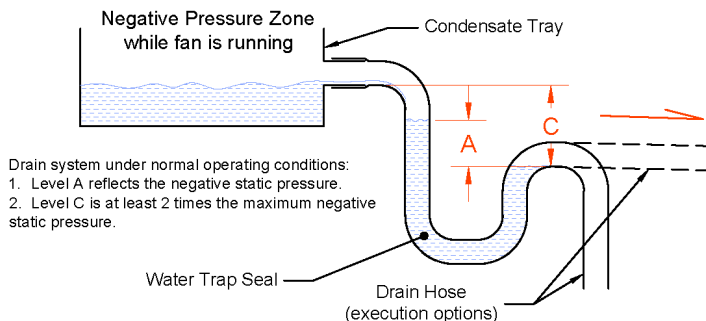
### **3.8 Drain connection**

During operation, dehumidifier fans create negative pressure inside the dehumidifier housing, which can prevent condensate from draining properly. To prevent the suction effect on the drain line and ensure proper removal of condensate, it is possible to use a check valve or a properly designed water seal with a sufficient level difference.

The removal of condensed moisture into the drain is free-flowing, so the drain line should be laid with a slope towards the drain, and the outlet of the hose should be below the point where the hose is connected to the dehumidifier.

The diameter of the hose or pipe is selected according to the diameter of the drain fitting (see the characteristics table). A drain hose (not included) attaches to the drain fitting on the side of the dehumidifier housing.

*Before starting the dehumidifier, it is recommended to test the drain line for correct operation and possible leaks!*



### 3.9 Electrical connection



*All work on electrical equipment must be carried out in accordance with the standards of the country in which the equipment is used and only by qualified personnel!*

- It is prohibited to connect the dehumidifier to a power supply whose power and frequency are outside the nominal values of the dehumidifier;
- For correct and convenient connection, the wires are color and symbol marked;
- A circuit breaker must be installed near the dehumidifier. The type of cable and circuit breaker must correspond to the operating power of the unit;
- Before connecting to the power supply, check that voltage and frequency differences at the connection point do not exceed  $\pm 10\%$ . Voltage fluctuations and interference in the power supply from nearby powerful equipment can damage the electrical components of the dehumidifier;
- Equipment should be grounded and always disconnected from the power supply during inspection.

### 3.10 Connecting a temperature/humidity sensor

The humidity sensor is already installed in the dehumidifier and connected to the controller. It is located on the heat exchanger at the air inlet, behind a panel with a removable serviceable filter.

If it is necessary to replace the sensor due to its failure, you should be guided by the general electrical diagram given in this manual.

Recommendations for the characteristics and placement of a remote temperature / humidity sensor for correct measurement::

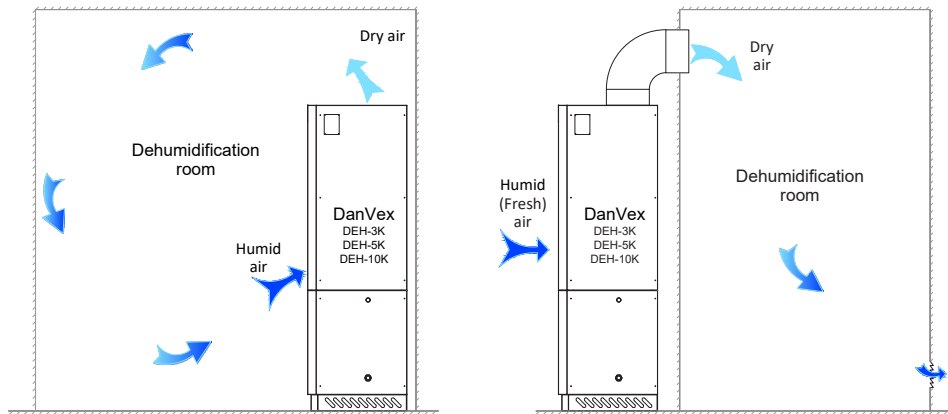
- The temperature/humidity sensor should be placed at a distance of 1–1.5 m from the floor level to correctly measure the humidity in the area being dried;
- The sensor should be installed away from incoming air flows, especially air from the external environment;
- The sensor should be installed away from refrigeration equipment, windows/doors or open water surfaces;
- Avoid installing the sensor near heating radiators and in places directly exposed to sunlight;
- The replacement sensor must support RS485 MODBUS RTU..

## 4 APPLICATION DIAGRAM

There are many ways to use a dehumidifier. Some of them are shown in the diagrams below.

### 4.1 Main scheme (multiple recirculation)

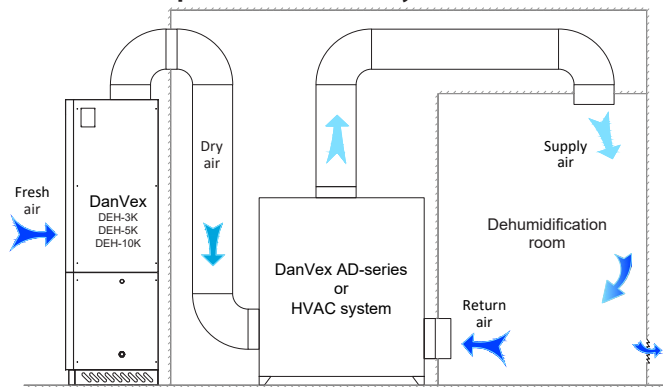
The dehumidifier is installed in the room to be dried without connecting to air ducts. The air in the designated room is dehumidified by constant circulation through a dehumidifier (diagram on the left).



### 4.2 Dehumidification then Supply

The dehumidifier is installed outside the room. Dry air is supplied to the room through an air duct (diagram on the right).

### 4.3 Combined dehumidifier operation with HVAC system or desiccant dehumidifier



The dehumidifier is installed outside the room. The dehumidified air is supplied to the outdoor (fresh) air duct of the HVAC system or desiccant dryer through the duct. The air flow rates in both units must be identical or adjusted using an additionally installed air damper on the duct.

## 5 COMMISSIONING

The controls for the dehumidifier are located behind the hinged panel of the electrical box. Before putting the unit into operation, be sure to read the description of the controller functions and configure it for optimal operation of the dehumidifier.

### 5.1 Pre-start unit checking



*Commissioning and start-up of the dehumidifier must be carried out by qualified technical personnel. Otherwise, the supplier is not responsible for any consequences.*

- Make sure that the main circuit breaker is turned off and there is no indication on the controller.
- Open the dehumidifier service panels and ensure that there are no foreign objects in the housing or electrical box.
- Check that the filter is installed and make sure it is clean.
- Make sure the main circuit breaker matches the equipment's capacity.

#### 5.1.1 Duct checking

- Check that the air ducts are securely fastened. The air ducts must be permanently attached to the base near the dehumidifier.
- Move all dampers to the half-open position, if equipped.
- Make sure that the shipping packaging is removed and does not interfere with the operation of the equipment..

#### 5.1.2 Wiring checking

- Make sure that the voltage and frequency of the power supply meet the requirements of the unit, and the fluctuation range does not exceed 10% of the specified rated value.
- The equipment should be grounded and an isolation switch should be installed to ensure that the equipment is insulated from the power supply during inspection and service.
- The power of the isolating switch and the fuse must be consistent with the model and type of the installed dehumidification unit.
- The power supply cable meets the design requirements
- Check that all cable connections are secure.

#### 5.1.3 Controller checking

- Check the installation location of the controller and the reliability of its wires.
- Check the installation location of the external temperature/humidity sensor to ensure it meets the installation requirements.
- After applying power to the controls, check for signs of excessive heating.
- Check the controller configuration and settings.

### 5.2 Unit Running

- Make sure the main circuit breaker is turned on and the unit is in standby mode. Then start the dehumidifier by pressing the power button on the controller.
- Check the equipment for vibrations and extraneous noise.
- Press the On/Off button on the controller, the controller will turn off and return to standby mode. The fan will run for a while after the dehumidifier is turned off.
- Check the drain connections for correctness and no leaks.

### 5.3 Air flow adjustment



The dehumidifiers of this series have fans with AC-type electric motors, and therefore do not have the ability to change the rotation speed. Pressing the corresponding button on the controller will not change the fan speed and air flow. Therefore, changing the air flow through the dehumidifier is only possible by using an adjustable damper in the supply duct.

- Start the dehumidifier and let it run continuously for 10 minutes.
- Adjust the valve on the air duct according to the process requirements and lock them in the desired position.

### 5.4 Testing

- Ensure that the air flow through the dehumidifier is rated or configured and that the dehumidification parameters in the controller are set correctly to determine the actual dehumidification performance.
- Perform multiple checks every 20 minutes to determine dehumidification stability.
- Measure the parameters of incoming and dehumidified air, calculate the dehumidification performance for inclusion in the commissioning protocol.

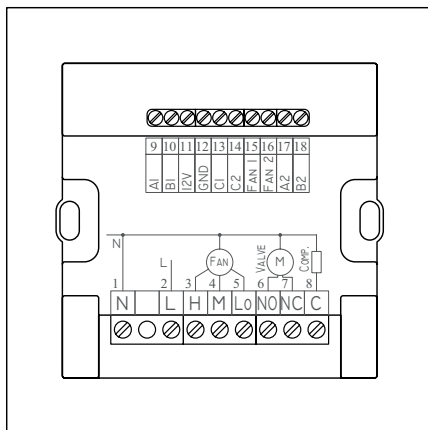
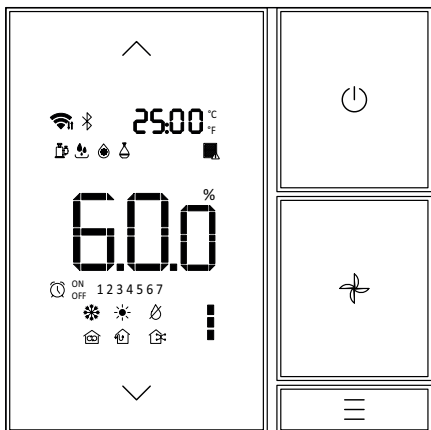
Note: The measuring device must be verified. Each test must last a certain amount of time to ensure accuracy. The readings from the dehumidifier's humidity sensor may differ from the readings from the meter.

## 6 OPERATIONS

### 6.1 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*

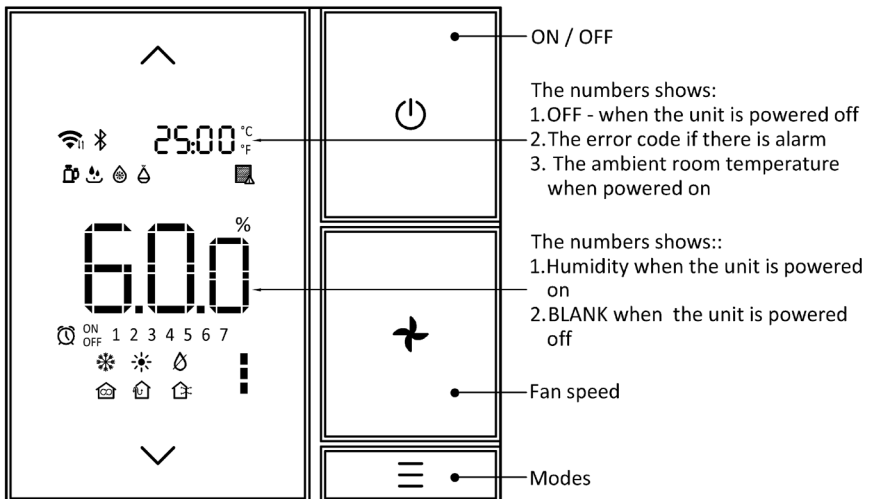
The universal remote control (controller) is equipped with built-in temperature and humidity sensors, and allows you to monitor the temperature and humidity in the room in real time.



### 6.1.1 Controller terminals












Terminal		Description	Load
1	N	230 VAC	Power supply
2	L	230 VAC	Power supply
3	H	230 VAC output, Max.1A	High fan speed
4	M	230 VAC output, Max.1A	Medium fan speed; Fan coil valve
5	Lo	230 VAC output, Max.1A	Low fan speed; Humidifier
6	NO	230 VAC output, Max.1A, SPDT (single-pole double-throw)	Air damper open
7	NC	230 VAC output, Max.1A, SPDT (single-pole double-throw)	Air damper close
8	C	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	0-10 V	EC motor supply fan
16	Fan2	0-10 V	EC motor exhaust fan
17	A2-RS485		Communicate with third-party
18	B2-RS485		Communicate with third-party

### 6.1.2 Controller's Interface














### 6.1.3 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.



### 6.1.4 Display 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

### 6.1.5 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

*Attention! The description of the fan speed setting is only relevant if the fan motor has the ability to change the rotation speed. The dehumidifiers in this series use AC type fans that have only one rotation speed.*

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

## Defrost Control

Defrost conditions: Indoor temperature  $\leq$  D3, Defrost interval  $\geq$  D1

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

Defrost stop conditions:

- Defrost time  $\geq$  D2;
- Unit is turned off manually;
- Unit is turned off faulty.

## Alarm

- Filter Alarm: If the fan's running hour  $\geq$  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.

### 6.1.6 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%
Temperature calibration	C01	0.0	0.1	-5 .. +5°C
Humidity calibration	C02	0	1%	-10 .. +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
Humidity sensor	H03	1	/	0 - external sensor RS485 1 - built-in sensor
Defrost interval	D01	40 minutes	1 minute	30~60 minutes
Defrost stop	D02	10 minutes	1 minute	1~15 minutes

Parameters	Code	Default	Precision	Range
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
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			

### 6.1.7 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

### 6.1.8 Error Code

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

### 6.1.9 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

### 6.1.10 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%

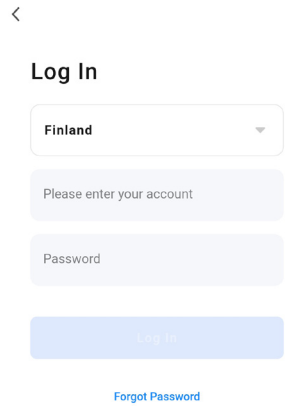
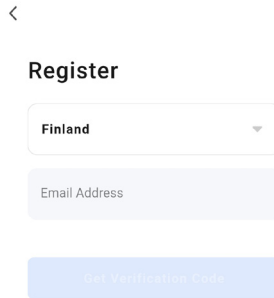
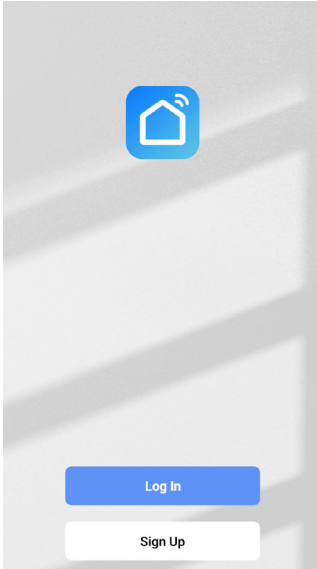
Address	Function Code	Object	Byte	Read Only or Read/Write	Data
0x1008	03/16/16	Air damper automatic close/open	2 bytes	Read/Write	0 – not in use 1 - in use
0x101B	03/16/16	Temperature set	2 bytes	Read/Write	5~35°C
0x101C	03/16/16	Working modes	2 bytes	Read/Write	0 - dehumidification 1 – cooling+dehumidification 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 humidity 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	


### 6.1.11 Wi-Fi connection

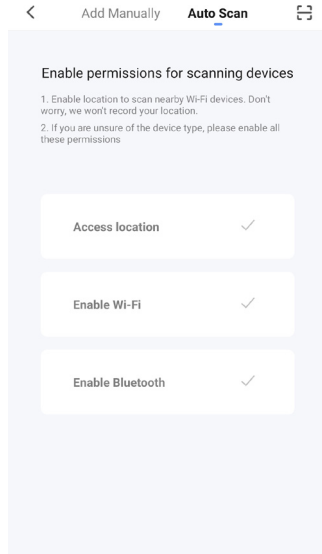
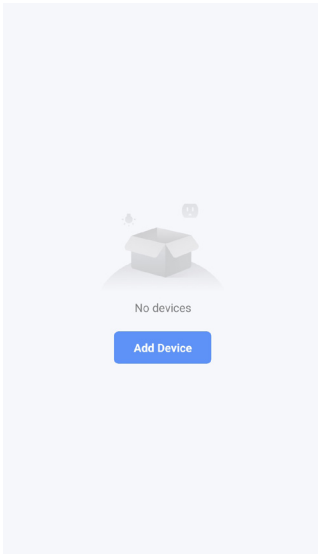
1. Connect your smartphone to local Wi-Fi router
2. Turn on Bluetooth and GPS on your smartphone
3. Download and install the "Smart life" application by scanning the QR code



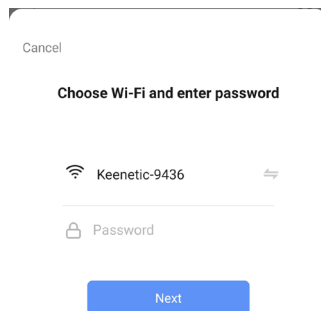
#### 4. Open the app, register and login





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"

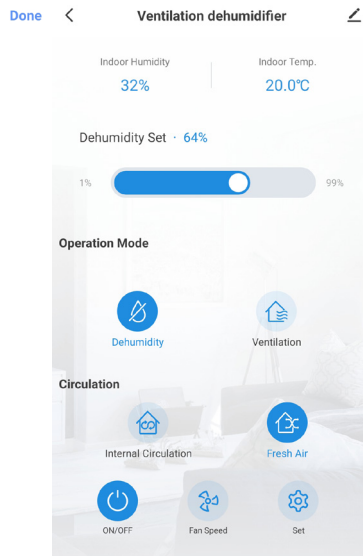


## 9. Enter your Wi-Fi password and click "Next"



**Added successfully**

 Ventilation dehumidifier   
Device added successfully



## 10. Setup completed.

### 6.2 Protection

- Do not use excessive force when opening or closing the dehumidifier housing panels, as this may cause damage to the equipment.
- The dehumidifier has moving elements that operate at high speed. Before turning on the dehumidifier, ensure that the housing panels are closed and secured properly and that the interior and external surfaces of the cabinet are free of foreign objects and debris.
- Acetone, chlorine and saturated vapors can damage dehumidifier components.
- The temperature and humidity sensor is a sensitive element, be careful when handling it. Do not install the sensor in a dusty room.
- All wires are color and symbol marked. Electrical connections must only be made by qualified personnel.
- Do not use the dehumidifier without an air filter.
- If a malfunction occurs, turn off the dehumidifier immediately. Before restarting, be sure to conduct a thorough inspection and diagnostics, and eliminate the malfunction.
- Do not move or unplug the dehumidifier until the fan has completely stopped.



## 7 MAINTENANCE

### 7.1 Introduction

A dehumidifier installed in a room under normal operating conditions can last a long time if properly maintained. The frequency of maintenance depends on the operating conditions of the dehumidifier. In this way, the maintenance cycle can be determined according to actual operating conditions. Improper or insufficient maintenance may reduce dehumidification efficiency or cause equipment failure.

### 7.2 Filter

The dehumidifier is equipped with a filter at the inlet of the process air. It helps filter dust and purify the air entering the dehumidifier to protect the heat exchanger and other internal components from excess contamination and subsequent system overheating. It is not recommended to run the dehumidifier without a filter. It is recommended to check the filter regularly (at least once a week) and clean/replace it if necessary.

### 7.3 Fan motor

The motor is equipped with bearings that have the same service life as the motor. Since after a certain time the bearings will become dirty and wear out, they need to be serviced (cleaned and lubricated) or replaced in a timely manner.

### 7.4 Service Schedule

The table (below) lists routine maintenance procedures for components to ensure proper operation of the equipment. If necessary, refer to other relevant information provided by the manufacturer.

Component	3 - 6 months	12 months
Filter	Checking and cleaning every week	
Compressor	Checking feeding operation and absence of excessive vibration	Check the electrical wiring for reliable contact, absence of damage and overheating
Coil	Cleaning from debris and dust	
Defrost Valve		Check for overheating or blocking. Checking the electrical wiring for reliable contact.
Seals	Check for signs of damage and displacement. If wear or damage is present, it should be replaced.	
Temperature / humidity sensor	Cleaning from dust	Check for correct operation and make adjustments if necessary

## 8. TROUBLESHOOTING

### 8.1 No response to humidity setpoint on controller/hygrostat

- 8.1.1 Make sure the controller/hygrostat is working
- 8.1.2 Check the control device calibration to determine if it is detecting humidity levels correctly

### 8.2 Neither the fan nor the compressor work

- 8.2.1 The device is unplugged or there is no mains power
- 8.2.2 The humidity value in the controller settings is set too high
- 8.2.3 Poor connection in internal or control wiring

8.2.4 Faulty compressor and fan relay

8.2.5 Controller/hygrostat faulty

### **8.3 Compressor doesn't work**

8.3.1 Faulty compressor capacitor

8.3.2 Poor connection in compressor circuit

8.3.3 Faulty compressor

8.3.4 Incorrect choice of operating mode in the controller settings

8.3.5 The dehumidifier is in defrost mode

### **8.4 Frequent switching on and off of the compressor**

8.4.1 Low ambient temperature and/or humidity causing the unit to cycle into defrost mode

8.4.2 Faulty compressor, overload

8.4.3 Inappropriate controller settings for defrost mode

8.4.4 Faulty defrost thermostat

8.4.5 Air filter dirty or air flow restricted

### **8.5 Fan doesn't work**

8.5.1 Poor connection in the fan circuit

8.5.2 Something is preventing the fan impeller from rotating

8.5.3 Faulty fan

8.5.4 Faulty fan relay

### **8.6 Low dehumidification performance**

8.6.1 The defrost thermostat is faulty or the defrost mode settings in the controller are incorrect for the current operating conditions

8.6.2 Low refrigerant level in the system

8.6.3 Air filter dirty or air flow restricted

8.6.4 An air duct of insufficient cross-section is connected to the device

### **8.7 The amount of condensate is unexpectedly small**

8.7.1 Temperature and/or humidity has decreased

8.7.2 Controller/hygrostat not calibrated for humidity

8.7.3 The dehumidifier has entered the defrost cycle

8.7.4 Air filter dirty

8.7.5 The defrost thermostat is faulty or the defrost mode settings in the controller are incorrect for the current operating conditions

8.7.6 Low refrigerant level in the system

8.7.7 Air leaks: such as a loose cabinet panel or leaks in ducts (if in use)

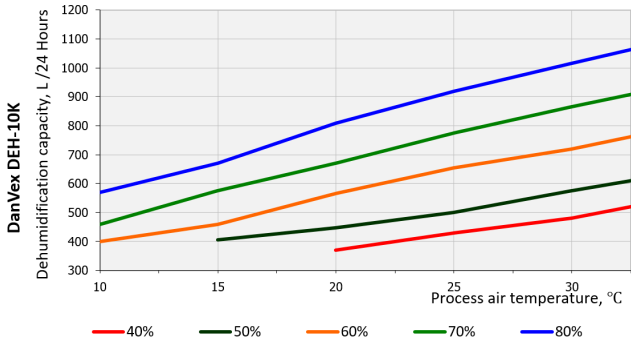
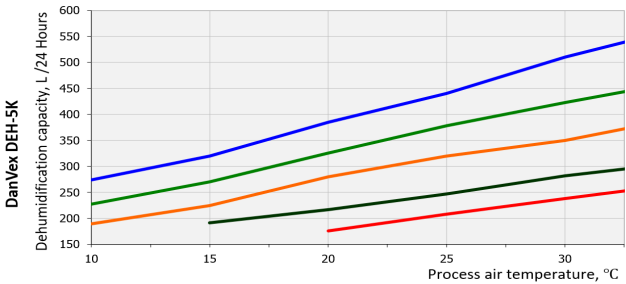
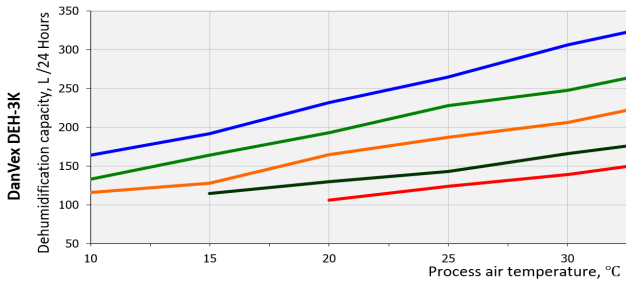
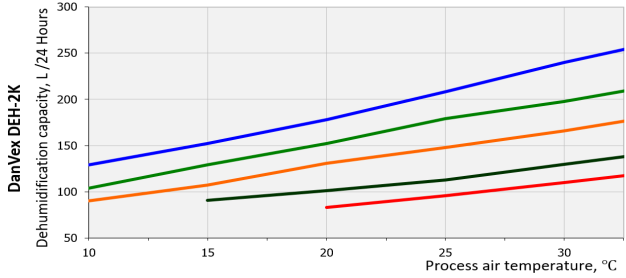
8.7.8 Faulty compressor

8.7.9 The duct cross-section is insufficient (when used)

## 9. TECHNICAL DATA

Model	DEH-2K	DEH-3K	DEH-5K	DEH-10K
Maximum capacity, liter/24 hours (30°C, 80%)	200	300	500	1000
Supply airflow, m <sup>3</sup> /h	2500	3500	5000	10000
Static Pressure, Pa	200	200	200	300
Fan type	Centrifugal with AC motor,			
Housing type	Single Core			
Working temperature range, °C	+10 .. +38			
Temperature range of effective operation, °C	+15 .. +35			
Humidity range, %	30-100			
Remote control	Wi-Fi (IOS & Android App), RS485 (MODBUS RTU)			
Power, kW	4	6	11	22
Current, A	7	10,8	20	40
Voltage	380-415V / 50Hz			
Noise level, dB(A)	<55	<55	<55	<65
Refrigerant / Number of compressors	R32 *1800g*1	R32 *1800g*2	R32 *2200g*2	R32 *2200g*4
Drain hole size, DN	25	25	25	32
Filter class	UV-lamp, G4			
Air disinfection	Germicidal UV-lamp			
IP rating	IPX3			
Dimensions, mm	833x600 x1850	1122x600 x1850	1122x600 x1850	1492x670 x1900
Weight, kg	161	220	250	310

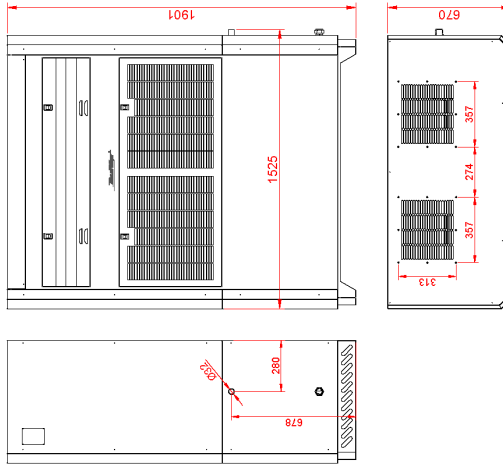
## 10. CAPACITY DIAGRAMS



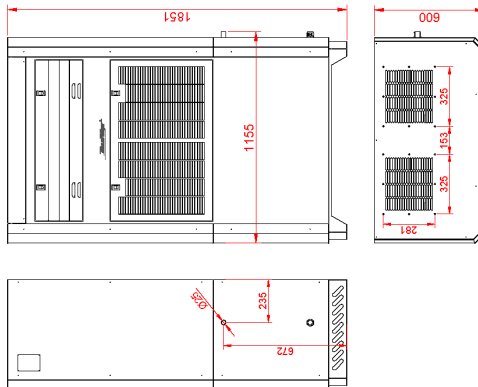
— 40%    — 50%    — 60%    — 70%    — 80%

# 11. DIMENSIONS

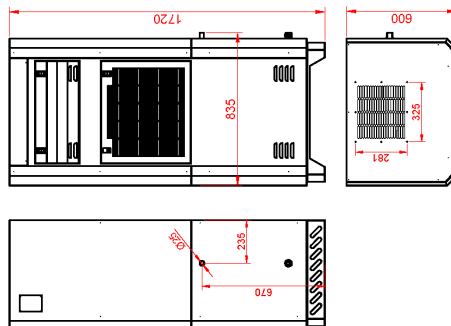
DanVex DEH-10K



DanVex DEH-3K/5K

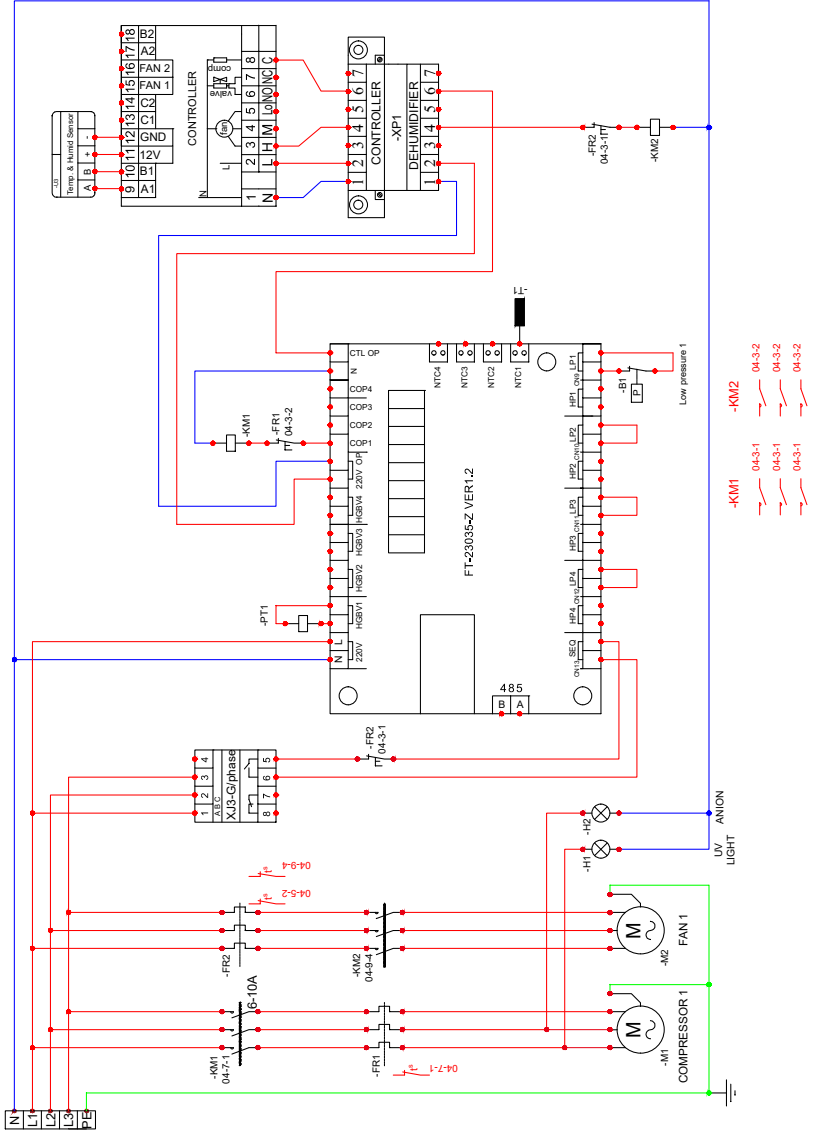


DanVex DEH-2K

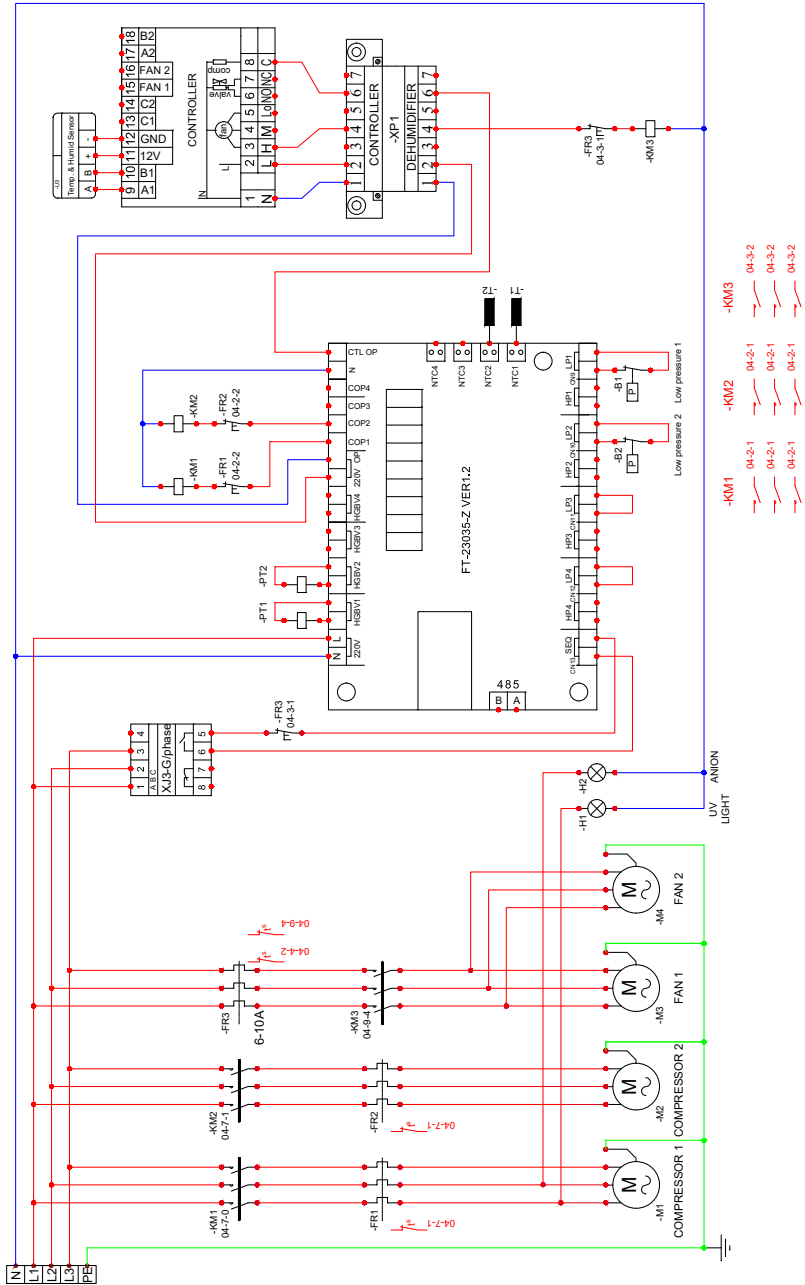


## 12. WIRING DIAGRAMS

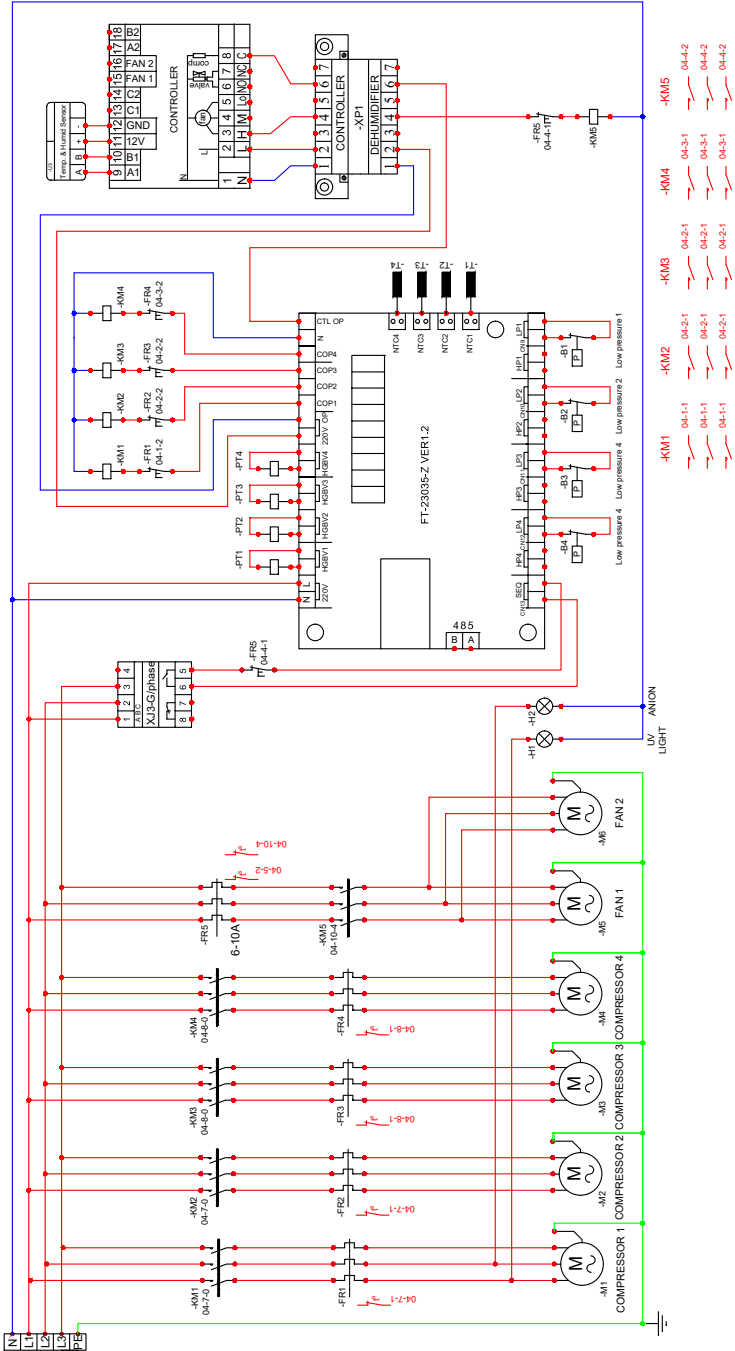
DanVex DEH-2K DEHUMIDIFIER WIRING DIAGRAM



# DanVex DEH-3K / 5K DEHUMIDIFIER WIRING DIAGRAM



DanVex DEH-10K DEHUMIDIFIER WIRING DIAGRAM







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