

Operation principle, performance parameters and test data of META constant humidifier

1、 The dehumidifying principle

META dehumidifier is condensation dehumidification. The constant humidifier fan introduces the ambient air into the equipment, and produces heat exchange with the refrigerant at the position of the evaporator inside the equipment, reducing the air temperature below the dew point temperature. The precipitated water condenses into large water droplets on the surface of the evaporator in a liquid form, so as to realize the function of dehumidification.

2. Adjustment strategy of air supply, temperature and humidity

The air temperature of META is ambient temperature. We installed the thermal compensation component on the air supply duct of the constant humidifier, and set up a wind supply temperature sensor to detect the air supply temperature. During dehumidification, the switch of the thermal compensation component is constantly adjusted according to the feedback value of the air supply temperature sensor, so that the air supply temperature is always not different from the ambient temperature.

The air supply humidity control is controlled by the frequency conversion refrigeration system. The equipment will calculate the target dew point temperature according to the ambient temperature and set the target relative humidity value, and then calculate the evaporation temperature value of the refrigeration system according to the target dew point temperature, through the PID adjustment logic of the control system, adjust the compressor output power, make the evaporation temperature is always kept at the target value, so as to realize the precise control of the air supply humidity.

3. Main performance parameters: (Due to product improvement, the following parameters may be changed, subject to the nameplate parameters)

Model number: FHB-MATE

Power supply: AC220V50Hz

Maximum dehumidification: 60g / h (27°C, 90%RH)

Maximum power of the compressor: 120W

Refrigerant: R134a

Maximum air volume: 15m³/h

Wet control range: 30-70 ± 3%

Maximum power of the whole machine: 300W

Overall dimension: 500420160mm

Weight: 18kg

Fluorinated charge: 230g

4、 META humidifier over traditional, humidifier

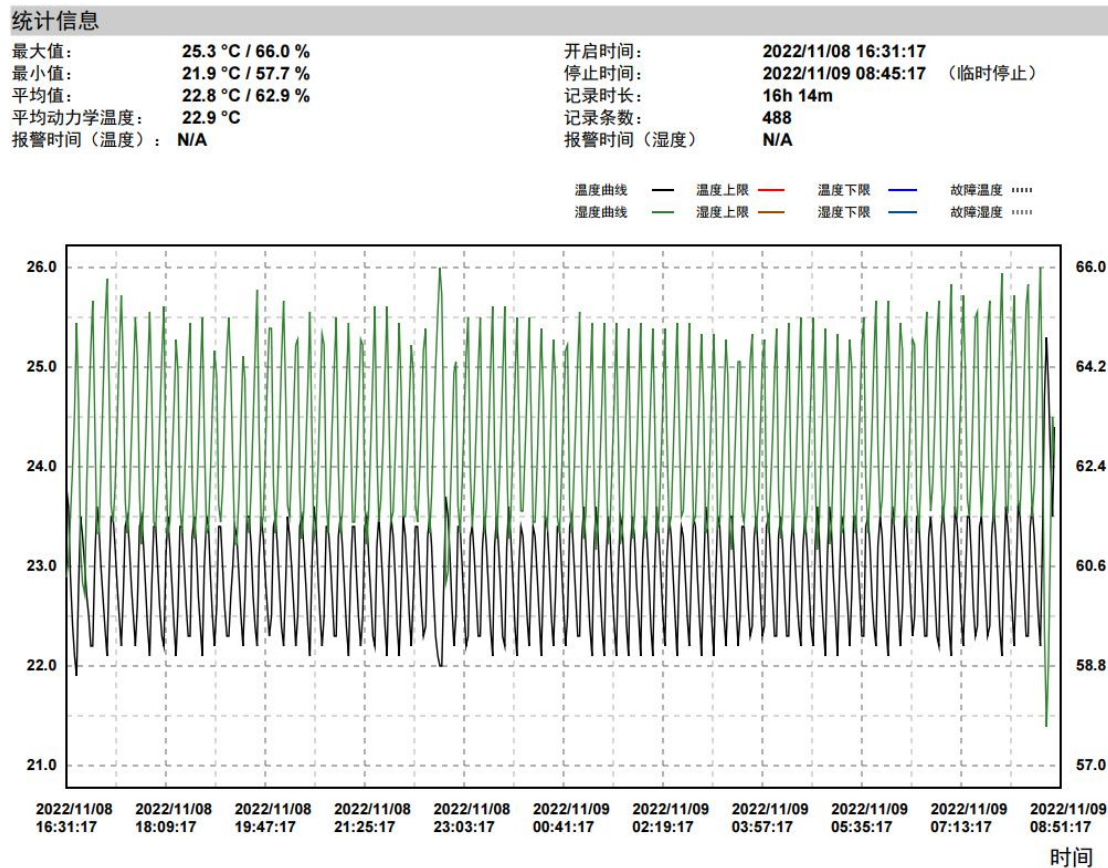
(1) META humidifier can realize accurate control of evaporation temperature and air supply temperature, and avoid low temperature air supply affecting the temperature in the showcase. At the same time, there

will be no excessive dehumidification phenomenon, and through the program control to avoid the refrigeration system into the defrosting mode, so that the constant humidifier can continuously provide the air to meet the demand.

- (2) M ETA type constant humidity machine can adapt to the change of environmental temperature, in the constant humidity machine design temperature range, can stably provide low humidity air, will not make the humidity in the cabinet to produce large fluctuations.
- (3) The minimum height of the humidifier can be 160mm and can be placed into the bottom space of the display case.
- (4) Compared with the constant humidity using semiconductor cooler, the compressor refrigeration system has lower energy consumption and more energy saving.

5、test data

(1) The test environment parameters are 23°C, 63%RH, and the specific data are as shown below:

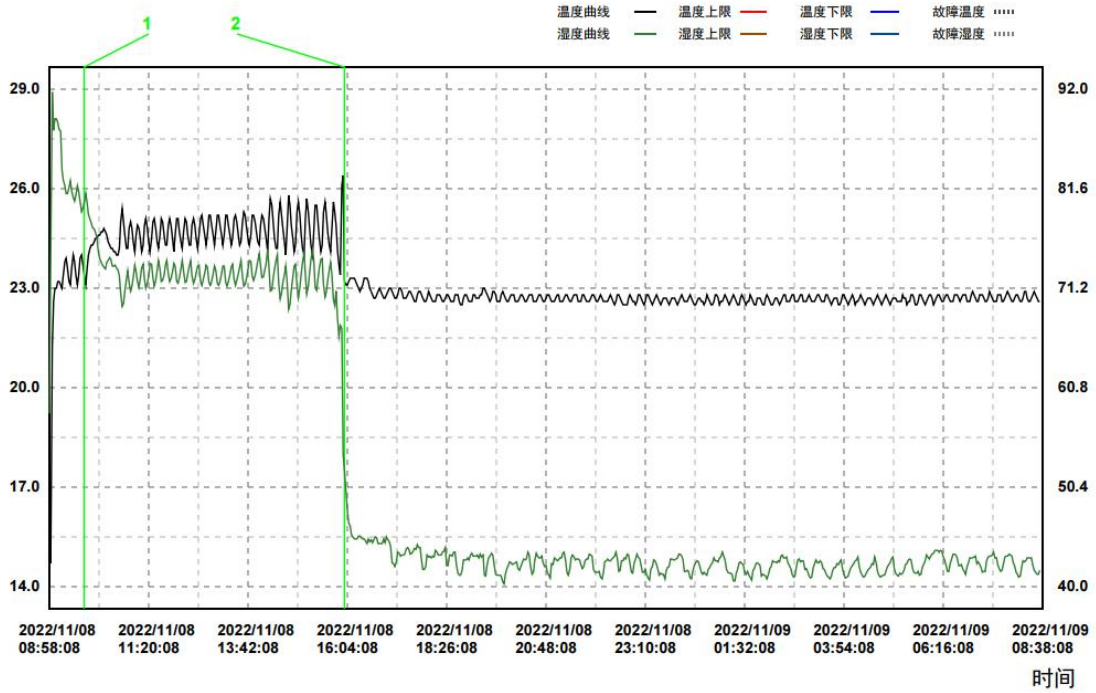


The set target humidity is 45%RH, and the air parameter data of the air outlet of the equipment is shown below (stage 2 is the test data):

统计信息

最大值: 26.4 °C / 91.7 %
 最小值: 14.7 °C / 40.3 %
 平均值: 23.2 °C / 51.8 %
 平均动力学温度: 23.2 °C
 报警时间 (温度): N/A

开启时间: 2022/11/08 08:58:08
 停止时间: 2022/11/09 08:34:08 (临时停止)
 记录时长: 23h 36m
 记录条数: 709
 报警时间 (湿度): N/A

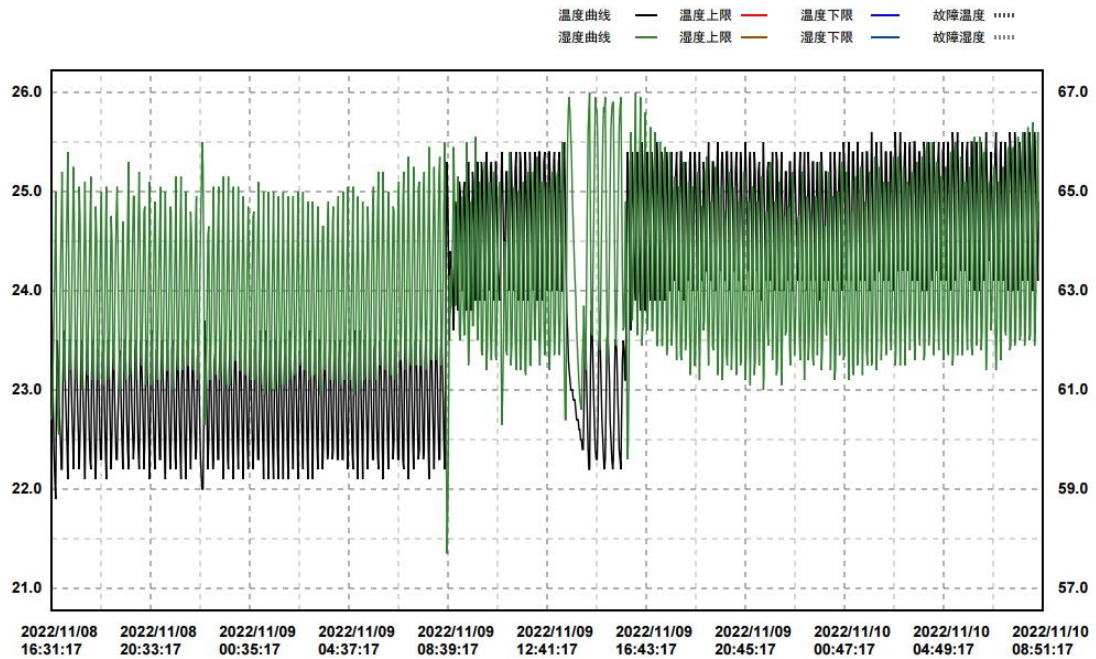


(2) The test environment is 23°C -25°C, and the relative humidity is 63%RH. The specific data are shown below:

统计信息

最大值: 25.6 °C / 67.0 %
 最小值: 21.9 °C / 57.7 %
 平均值: 23.8 °C / 63.2 %
 平均动力学温度: 23.9 °C
 报警时间 (温度): N/A

开启时间: 2022/11/08 16:31:17
 停止时间: 2022/11/10 08:41:17 (临时停止)
 记录时长: 1d 16h 10m
 记录条数: 1206
 报警时间 (湿度): N/A



The set target value of the constant humidifier is 40%RH, and the air parameters of

the air outlet of the equipment are shown below (the en-route stage 2 is the test data):

统计信息

最大值: 26.4 °C / 91.7 %
 最小值: 14.7 °C / 39.1 %
 平均值: 23.7 °C / 46.7 %
 平均动力学温度: 23.8 °C
 报警时间 (温度): N/A

开启时间: 2022/11/08 08:58:08
 停止时间: 2022/11/10 08:44:08 (临时停止)
 记录时长: 1d 23h 46m
 记录条数: 1434
 报警时间 (湿度): N/A

