Shijiazhuang Maxwell Technology Co.,Ltd.

MXR100200 Charging Module
User Manual
Data version V1.3

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Chapter1 MXR100200 Charging Module Overview

MXR100200 is a low-voltage and high-current charging module, with three industry-leading advantages of ultra-wide constant power range, ultra-large output current, and ultra-high full-load operating temperature; at the same time, high reliability, high efficiency, high power factor, and high power density. , Low standby power consumption is also the main feature of this series of modules.

1.1 Technical Parameters

Table1-1 Charging module technical parameters

Name	Parameter
Basic Index	
Size	84mm（H）×226mm（W）×395mm（D）
Weight	≤11kg
Efficiency	>95%
Standby Consumption	8.5W+/-0.5W
Cooling Method	Forced air cooling
Communication	CAN bus
Number of Parallel	≤60
Indicator light	Green: Normal operation Yellow: Protection alarm Red: Fault alarm
Input characteristics	
Input Voltage	285Vac～475Vac,three-phase + PE
Input Current	＜40A
Grid Frequency	45Hz～65Hz
Power Factor	≥0.99 @50%～100% full load output power
ITHD	≤5％ @50%～100% full load output power
Output Characteristics	
Voltage Range	40Vdc～100Vdc
Current Range	0A～200A
Rated Current	200A
Voltage Accuracy	≤±0.5％
Current accuracy	≤±1% (Output load 20%～100% rated range)
current unbalance	≤±5％
Ripple Factor (Peak to Peak)	≤1%
Environment Conditions	
Operating Temperature	－40 ℃ ～ ＋75 ℃, derating should be used above 50 ℃
Storage Temperature	－40℃～＋75℃
Relative humidity	≤95％RH, no condensation
Altitude	≤1000m without derating，>1000m , the working temperature decrease by 1℃ for every 100 meters
MTBF	>500,000 hours
Other	

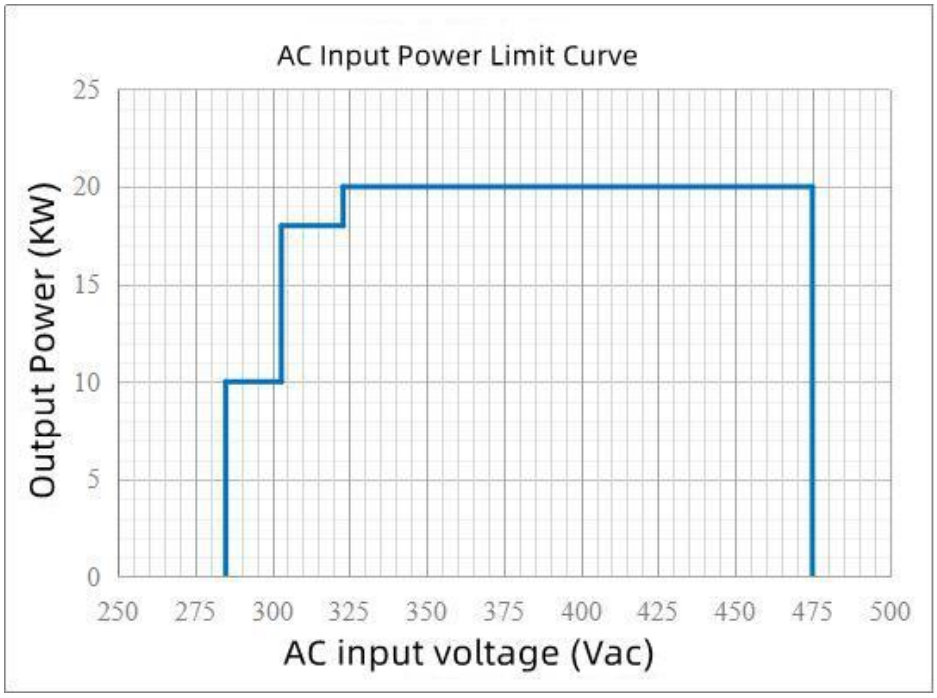
Safety requirements	Meet the general technical specifications for off-board DC chargers for electric vehicles, NB/T 33001-2018, NB/T 33008.1-2018
Start time	Output start time 3 ~ 8s
Insulation resistance	The insulation resistance between the DC part, the AC part and the casing, and the AC part and the DC part is ≥10MΩ
Dielectric strength	The AC input terminal is subjected to a DC voltage of 3500V on the housing for 1 minute, no breakdown, no arcing phenomenon, and the steady-state leakage current is less than 10mA; AC input terminal to DC output terminal 3500V DC voltage for 1 minute, no breakdown, no arcing phenomenon, steady-state leakage current is less than 10mA; The DC output terminal is subjected to a DC voltage of 3500V on the housing for 1 minute, no breakdown, no arcing phenomenon, and the steady-state leakage current is less than 10mA;
ROHS	R5

1.2 Protection and Power Limiting Policies

1.2.1 Input Power Limit Control

The relationship between the output power of the charging module and the input voltage is shown in Figure 1-1. When the input voltage is between 323Vac and 475Vac (the hysteresis difference is less than 15V), the module can output the maximum power.

Figure 1-1 AC input power limit curve



1.2.2 Output constant power control

When the rated input voltage of MXR100200 is used, the allowable output power of the module is 20kW. The relationship between the output voltage and the output current of the module is shown in Figure 1-2.

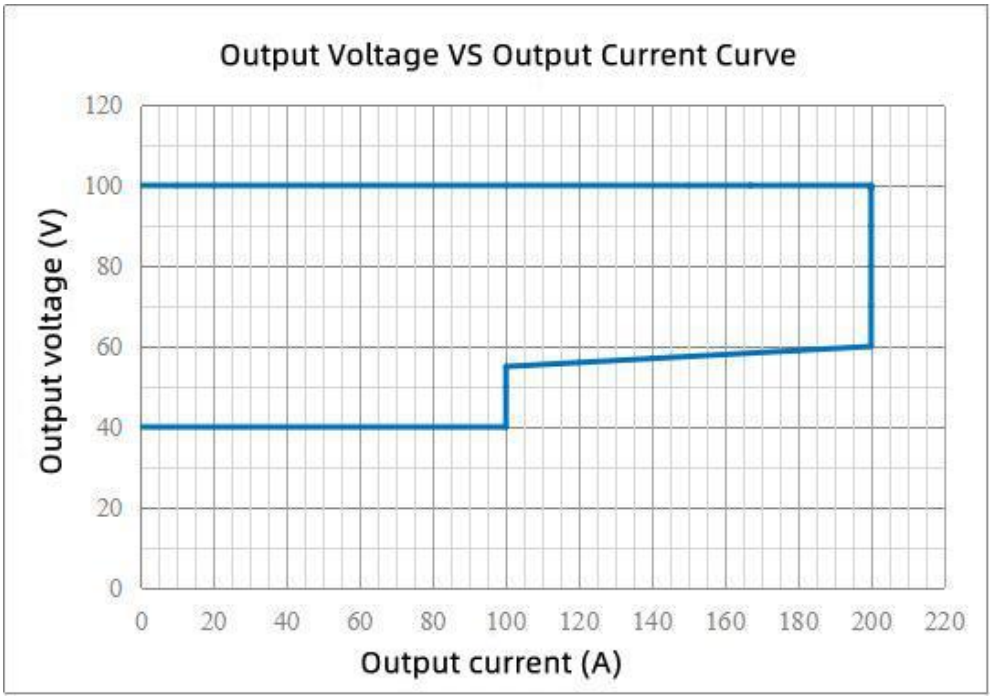


Figure 1-2 output voltage vs. output current curve

1.2.3 Temperature limit power

When the ambient temperature is below 50˚C, the module outputs full power;

The use of derating above the ambient temperature of 50˚C is a piecewise linear power limit;

75˚C ambient temperature, the module allows the output power to be 5kW;

When the ambient temperature is above 75˚C, the output power of the module drops to 0;

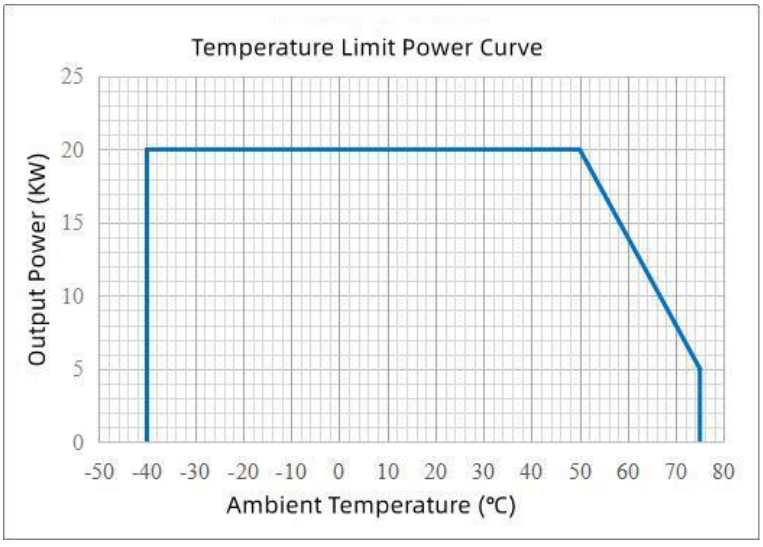


Figure 1-3 Temperature limit power curve

1.2.4 Input over/under voltage protection

When the input voltage of the module is less than 270Vac or greater than 490Vac, the yellow indicator light is on, and the module will stop working and have no output.

When an overvoltage or undervoltage alarm occurs, the module will report the alarm information to the monitoring; when the input voltage returns to the normal range, the alarm disappears, and the module returns to the normal working state at the same time

1.2.5 Output over/under voltage protection

The MXR100200 has a fixed overvoltage protection point of 115Vdc (±10Vdc) and an output undervoltage point of 35Vdc. After overvoltage protection, manual intervention is required to start the machine. After under-voltage protection, the yellow indicator light is on, the output voltage is greater than 35Vdc, the module clears the alarm and resumes power on.

Manual intervention method: The module can be reset by monitoring the module, or it can be reset by removing the module from the system.

1.2.6 Over temperature protection

The ambient temperature over-temperature protection point is 75°C.

1.2.7 Short circuit protection

When the module is short-circuited, the protection will shut down, the red indicator light on the panel will be on, and the "module fault" will be reported to the monitoring.

1.2.8 Background communication interrupted

If the communication of the module is interrupted for more than 10s, the module will be shut down for protection, no voltage output, and the yellow indicator light will flash at the same time. When the communication of the module is restored, the yellow indicator light returns to normal, and the module returns to the default state to work.

Chapter 2 Structure and Dimension

2.1 Structure

2.1.1 Front Panel

There are indicators on the front panel of the charging module, as shown in Figure 2-1 and 2-2. See Table 2-1 for the description of the indicator lights.

Figure 2-1 Front panel

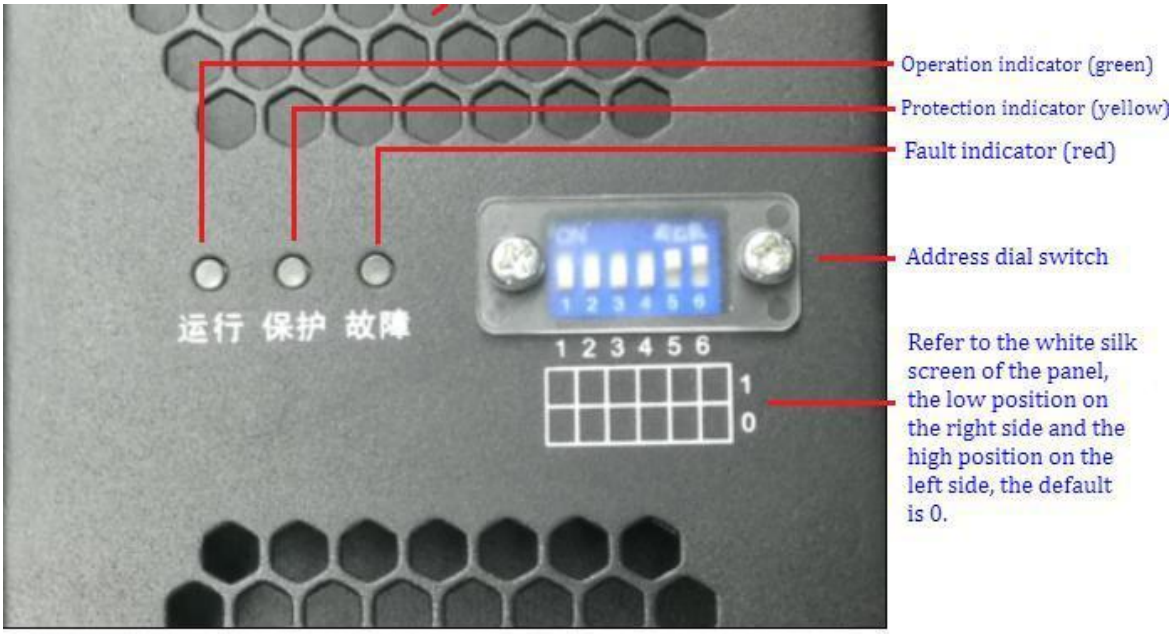


Figure 2-2 front panel Schematic diagram

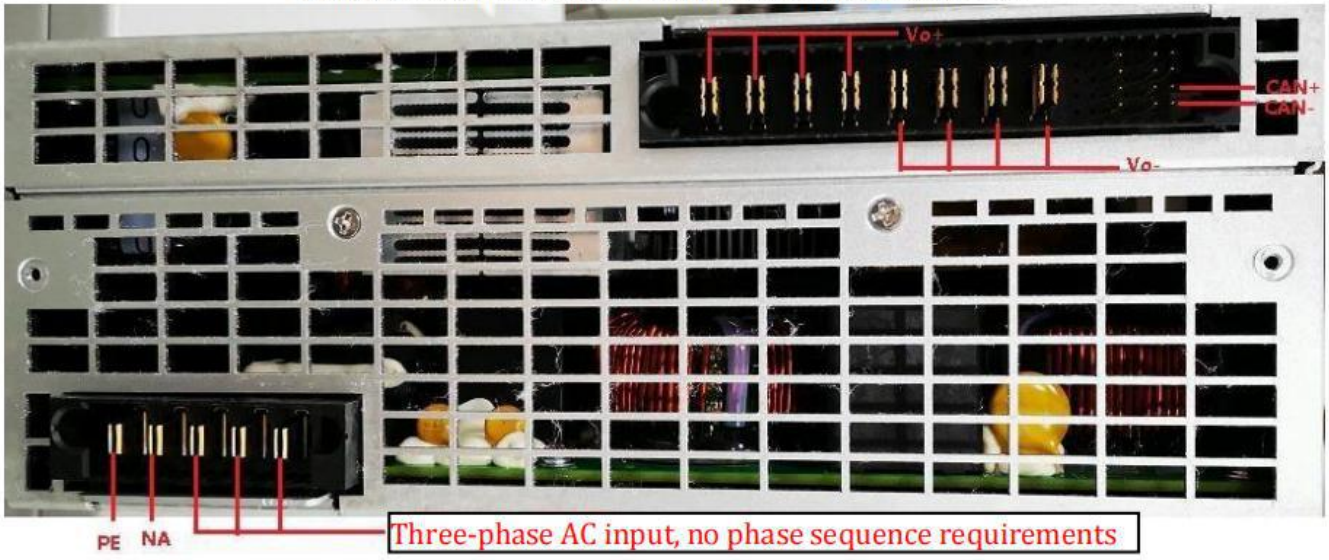
Table2-1 Indicator light description Indicator light

Indicator light	Normal status	Abnormal state	Abnormal
Running lights(green)	Bright	Extinguish	No input power
Alarm indicator(yellow)	Extinguish	Bright	AC input failure,module overtemperature, abnormal bus voltage,output undervoltage, severe uneven current
		Flashing	Communication is interrupted
Fault indicator (red)	Extinguish	Bright	Output overvoltage,output short circuit, internal address conflict
		Flashing	Fan failure

2.1.2 Module Interface Definition

There are AC input sockets and DC output sockets at the rear of the charging module, as shown in Figure 2-3.

Figure 2-3 Schematic diagram of input and output port definition



2.2 Module Size

2.2.1 The installation dimensions of MXR100200 module are shown in Figure2-4.

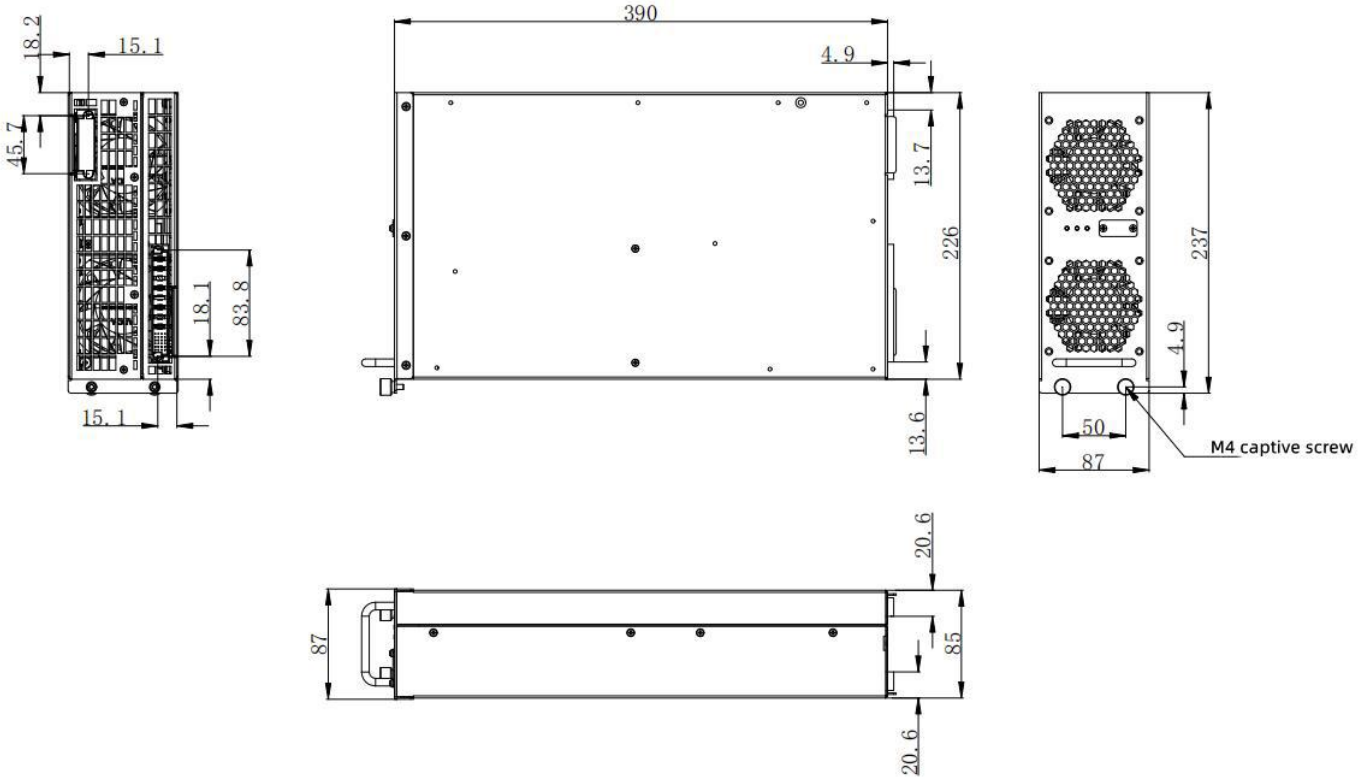


Figure 2-4 Module dimension (mm)

2.2.2 MXR100200 module system terminal assembly specifications:

1) The system terminals (input cable terminals, output cable terminals) are installed on the mounting plate of the pile, as shown in Figure 2-5

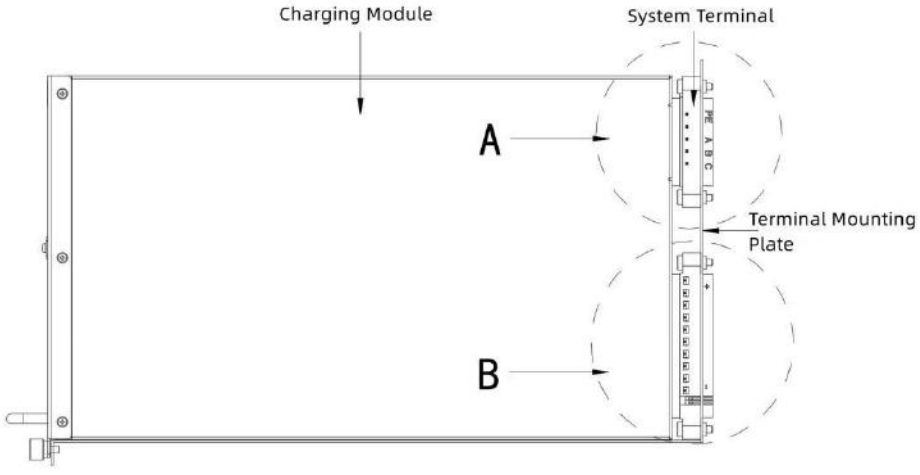


Figure 2-5 system terminal installation

2)After the module is assembled on the pile, it is required that the module terminals and the system terminals are in close contact with no gaps, so as to ensure reliable plug-in contact between the system terminals and the module terminals, as shown in Figure 2-6.

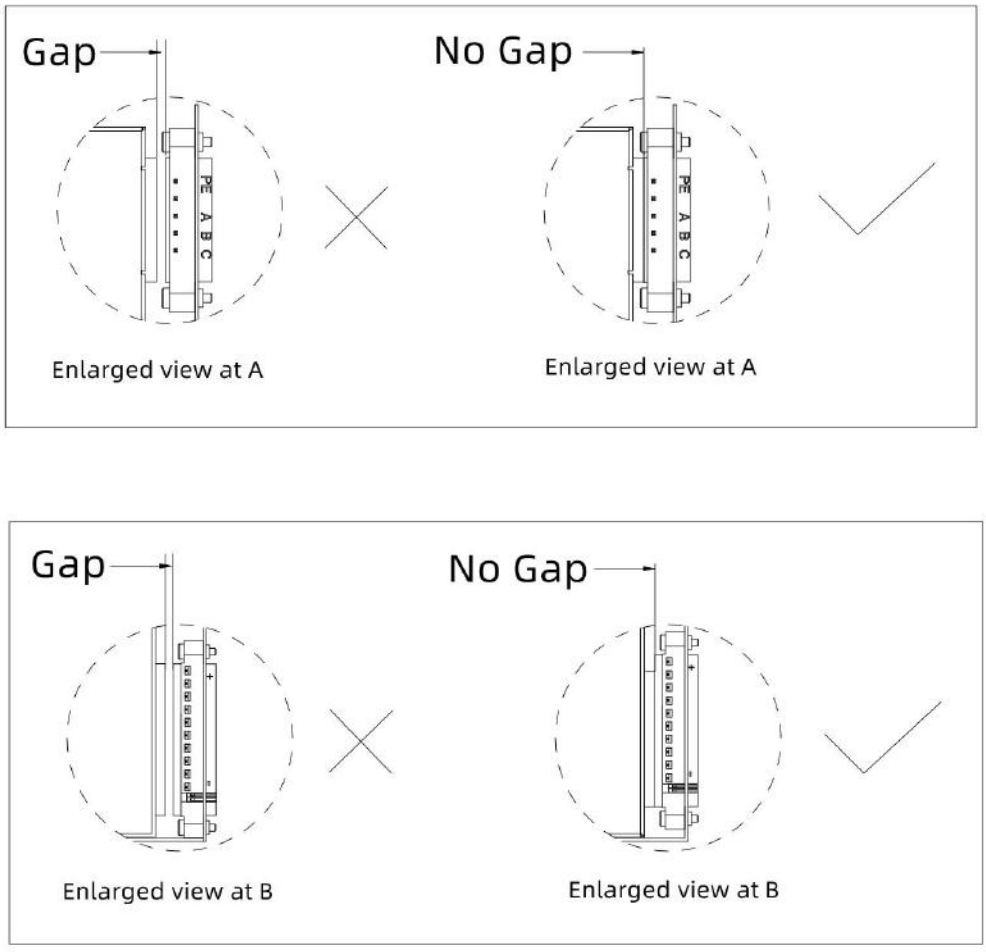


Figure 2-6 Assembly instruction diagram of module terminal and system terminals

2.3 Use

After the charging module is installed in the system cabinet, the system can run after power on.

Use environment

1. Over-voltage/installation category: over-voltage category Ⅱ.
2. Pollution degree: Pollution degree III.
3. Altitude: ≤1000m without derating, >1000m, the working temperature will decrease by 1℃ for every 100 meters.
4. AC input power distribution system: TN or TT system.
5. System exhaust volume requirements:

(1) Calculation of system air volume, there are two methods for system air volume calculation:

Method 1: Calculate according to the total loss of the system

Calculate according to the thermal formula, according to the formula: V=Q/(CP*ρ*ΔT), CP is the current temperature air specific heat (kJ/(kg*K), ρ is the current temperature air density (kg / m3), the current The temperature is the average temperature of the inlet and outlet wind, the temperature difference between the inlet and outlet of the ΔT system (outdoor cabinets generally choose 13 degrees Celsius), Q is the total loss of the system (unit kw) (the Q value in strong sunshine areas also needs to add solar radiation), this formula The system air volume V (m3/s) can be calculated.

Method 2: Calculate according to the air volume of the module

System air volume V=n*v, n is the number of system modules, v is the maximum air volume of a single module, v=131CFM (0.0618m3/s).

(2) System fan selection

The system fan selection is determined according to the system air volume V. Its parameters are mainly the maximum air volume and air pressure of the fan. Under the premise that the fan air pressure matches the system impedance, the maximum air volume of the system fan is equal to 1.5 to 2 times the system air volume, namely (1.5～2)*V, if the wind pressure of the fan is high and the system impedance is small, it can be close to 1.5 times; if the wind pressure of the fan is low and the system impedance is large, it can be doubled or even greater than 2 times. Under normal circumstances, the fan's air pressure is not less than 200Pa, and it can be calculated by 2 times.

6. Suggestions for the use of charging modules

The charging module is used in the charging pile system. The temperature difference ΔT between the module air inlet and the air outlet (including the air inlet and outlet of the pile body) is recommended to not exceed 25℃. The specific test points are shown in the following figure: