424W-48V

Thermoelectric Air Cooling Module

PRODUCT SPECIFICATION | PRODUCT OVERVIEW

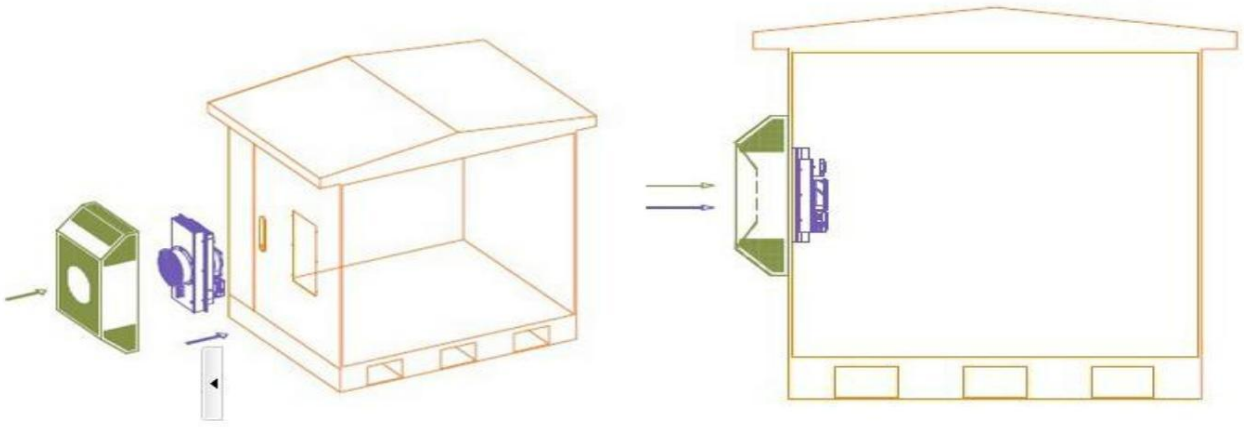


Product introduction

- Widely used for temperature control in outdoor battery cabinets and battery compartments in telecommunications equipment rooms. It can also be used in other enclosures requiring temperature control, such as power cabinets and test chambers.
- Suitable for harsh operating environments, with continuous operation at ambient temperatures from -20 to 70°C.
- The Thermoelectric Air Cooling Module mainly consists of cold-side and hot-side heat sinks, P-N elements, control components, a cold-side fan, a heat-dissipation fan and a temperature sensor.

Model	Cooling capacity	Rated voltage	Weight
424W-48V	424 W	48 VDC	11.69 kg

Quick and simple installation



Cooling for power cabinets and battery compartments.

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01 / PERFORMANCE

Product Specifications

Parameter	Specification
Model	**424W-48V**
Cooling method	Air-to-air
Cooling capacity	424 W
Rated voltage	48 VDC
Cooling current	At startup: 12 A Steady state: 9.6 A
Temperature controller	Optional
Dimensions	330 × 330 × 181 mm
Weight	11.69 kg
Noise level	53 dB(A)
Operating temperature	-20 to 70°C
Fan protection rating	IP65

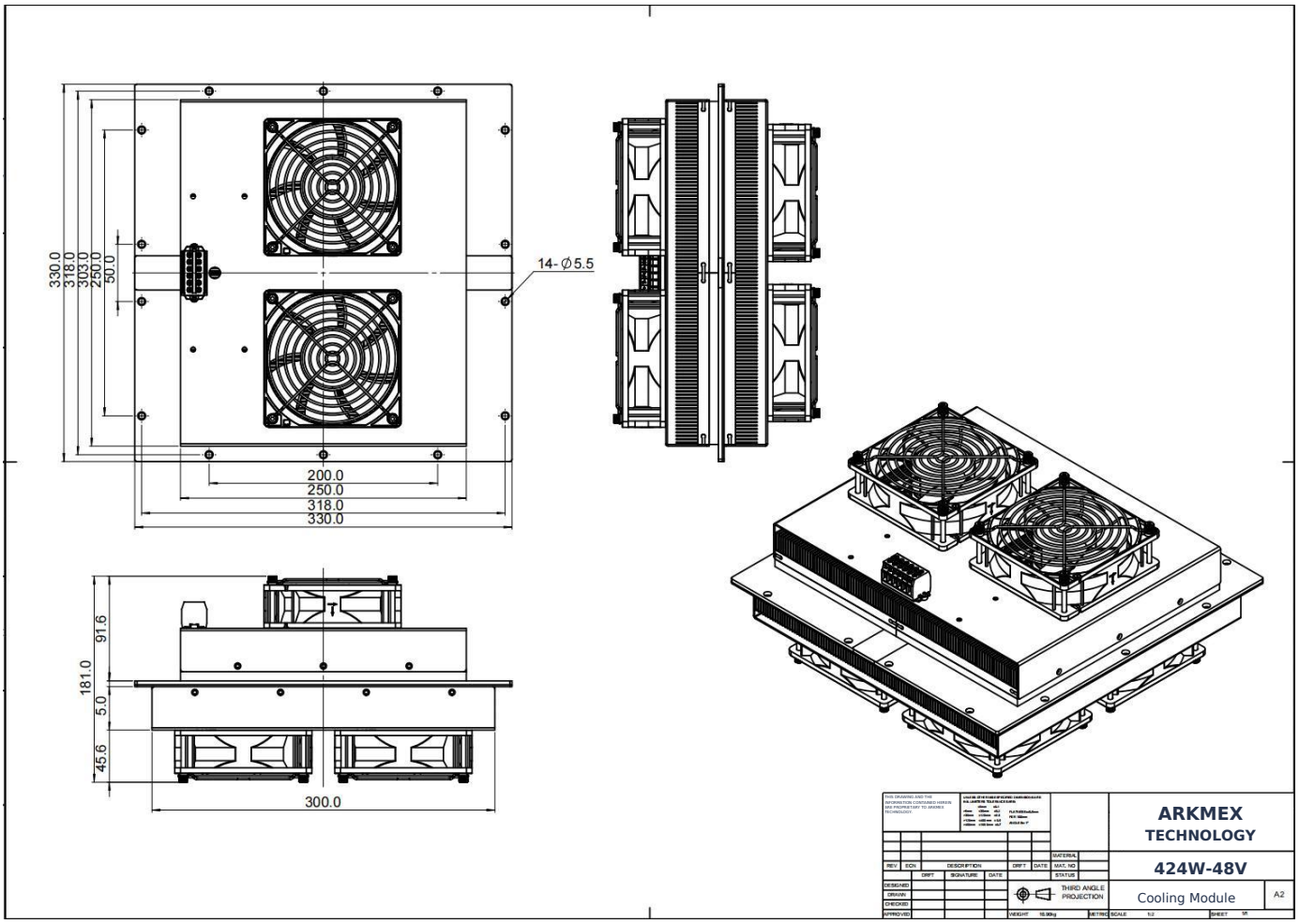


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02 / MECHANICAL DRAWING

Product Dimensions

Dimensional drawing for model **424W-48V**.





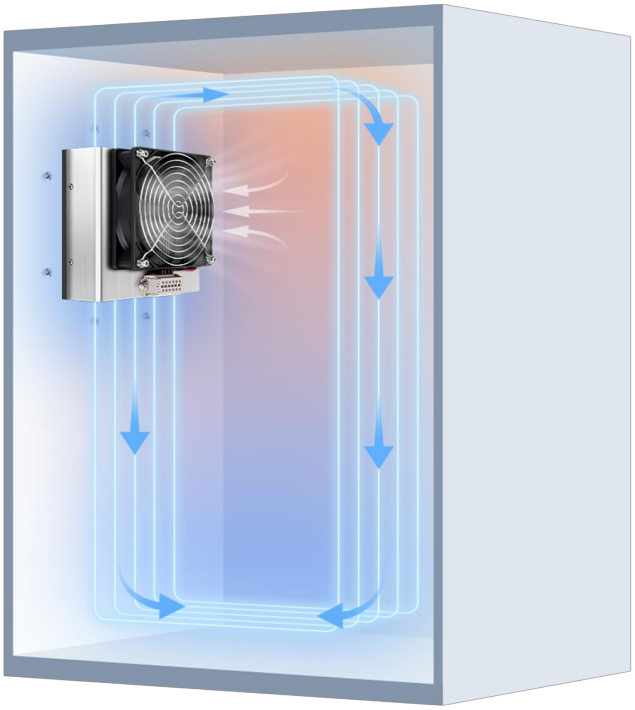
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Operating Principle

The **424W-48V** Thermoelectric Air Cooling Module consists of six main parts: the thermoelectric module (including sealing and thermal insulation materials), cold-side heat sink, hot-side heat sink, cold-side fan, hot-side fan and monitoring module.

When power is supplied to the **424W-48V**, one side of the thermoelectric module cools while the other side heats. The cooling and heating effects are transferred to the surrounding air through the respective heat sinks and fans.

The cold-side heat sink and fan form the internal air circuit to cool the cabinet interior. The hot-side heat sink and fan form the external air circuit to dissipate heat to the outside environment, as illustrated below.



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Components & Materials

Component	Specification
Heat sink	Aluminium
Foam gasket	EVA
Thermoelectric module	Model: TEC1-12706 Service life: more than 7 years Dimensions: 40 × 40 × 3.8 Maximum temperature difference: ΔTmax ≥ 69°C Conditions: Qc = 0; Th = 30°C

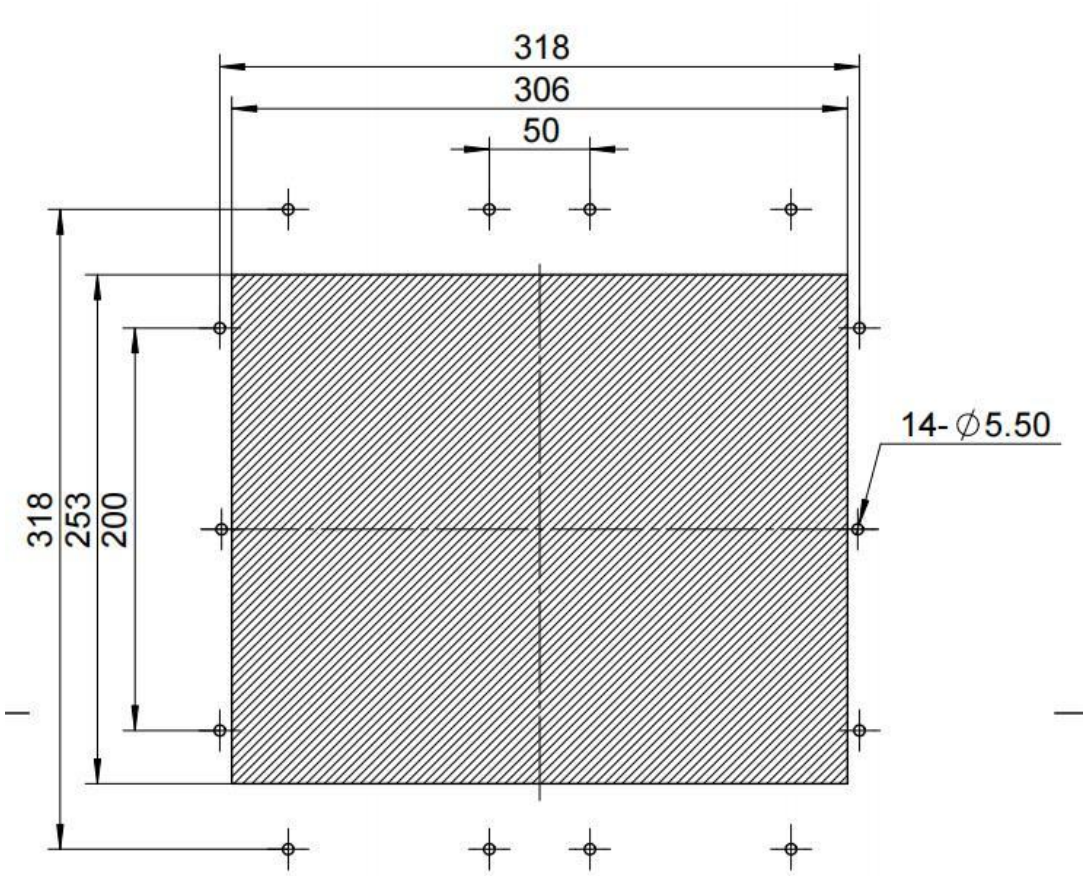
Fan specifications

Operating voltage: **35-57 VDC**
Estimated life: **70,000 hours at 40°C**, with relative humidity (RH) of **15%-65%**.
Bearing type: **Double ball bearing**.

Parameter	Internal fan / Cold side	External fan / Hot side
Model	12308	12308
Rated voltage	48 VDC	48 VDC
Rated speed	3,200 RPM ±15%	3,200 RPM ±15%
Noise level	47.8 dBA	47.8 dBA
Dimensions	120 × 120 × 38	120 × 120 × 38

Mounting Cutout Dimensions

Mounting cutout drawing for model **424W-48V**.



Installation, Operation & Maintenance

Installation and operating precautions

1. Prevent impacts and drops during transport and installation.
2. Provide good ventilation. Keep both cold-side and hot-side fans and heat sinks unobstructed. Ensure that the fans operate normally and air flows freely.
3. The standard version is for indoor use only. Contact us for outdoor use or use in harsh environments or hazardous locations.
4. The standard version requires a DC power supply. Use an isolated switching power supply. Never connect the unit directly to AC mains.
5. Where possible, add a fan-failure alarm to the control circuit and stop cooling if a fan fails.
6. Do not touch the cooler while it is operating, to avoid burns or cold injury.

Regular inspection

- Check that the Thermoelectric Air Cooling Module operates normally and produces no unusual noise.
- Check that the air circulation openings are unobstructed.
- Check that the DC power supply is operating normally.
- Set an inspection interval according to the actual operating environment. Four routine inspections per year are recommended.

Periodic maintenance

During prolonged outdoor operation, dust and other foreign matter can accumulate on the external air inlet, external fan and extruded aluminium heat sink surfaces, reducing heat dissipation. Clean and maintain these parts regularly, preferably at the same time as routine inspections.

Switch off the product before performing maintenance.

Troubleshooting & Repair

Fault	Possible causes	Corrective action
Internal fan failure	1. Loose internal fan terminal connection. 2. Internal fan jammed. 3. Internal fan defective.	1. Securely reconnect the internal fan terminal. 2. Adjust the fan mounting position. 3. Replace the internal fan.
External fan failure	1. Loose external fan terminal connection. 2. External fan jammed. 3. External fan defective.	1. Securely reconnect the external fan terminal. 2. Adjust the fan mounting position. 3. Replace the external fan.
Thermoelectric Air Cooling Module failure	1. Loose input power connection. 2. Reversed power supply polarity. 3. Control board fault prevents operation.	1. Securely reconnect the power cable. 2. Correct the positive and negative power connections. 3. Replace the control board.

After-sales Service & Warranty

1. Warranty period

Provided the product is used correctly, the warranty period is as specified in the contract.

2. Warranty coverage

During the warranty period, the company will provide free repair for faults caused by product quality defects. The customer must provide the product serial number. The following are excluded from warranty coverage:

1. The warranty period has expired.
2. The product factory serial number cannot be provided.
3. The fault is not caused by this product, but by equipment, software or other items used by the customer.
4. Damage is caused by the customer replacing or removing product components, or by disassembly or repair by an unauthorised service provider or individual.
5. The fault results from operation under abnormal conditions or in an abnormal environment, or from installation, maintenance or other actions inconsistent with these instructions, such as excessive voltage or blocked ventilation openings.
6. The fault or loss is caused by force majeure, such as earthquakes, floods or fire.

3. Disclaimer

The company’s warranty obligations are limited to the products supplied. The company is not liable for any losses arising from a product failure.