

# Data Sheet

## Peltier-Switch Cabinet Cooler FR-208-AC, Standard\_AC Series

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&  
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FR-208-AC (NSBon-38-2) Thermoelectric Cooler or Thermoelectric Assembly is designed to remove heat around critical components within an electrical enclosure with IP66 / NEMA4 protection category. This is a thermoelectric module (thermoelectric air conditioner) using the Peltier effect. The thermoelectric modules create a temperature difference between the internal and ambient heat sinks. It makes internal air colder while heat is dissipating into the external environment. Fans help the transfer of heating from the heat sinks.

The main advantages of Thermoelectric Cooler over conventional compressor are:

- it can be controlled electronically;
- it is easily reversible when the current is reversed;
- it can work in harsh environments:
  - in high ambient temperatures or heavily polluted ambient air;
  - in application with vibrations or strong accelerations.

\* No need for additional power supply. This is the main advantage of Standard AC Series, since the power supply takes up a lot of space and emits extra heat, which must be compensated.

### Technical Data FR-208-AC

Supply voltage : 90-305 VAC, 47-63 Hz, 127-431 VDC
Rated input : 200 W
Protection category outer side (warm) : IP67
Protection category internal side (cold) : IP20
Operating temperature range: -40°C to 70°C
Storage temperature range : -40°C to 70°C
Alarm transductor: NO-contact, max. 250 VAC/30 VDC, 5 A
Switch point fault message: +80°C (+/- 5°C) heat sink temp.
Switch point safety shutdown: +90°C (+/- 5°C) heat sink temp.
Dimensions: 268 x 195 x 155 mm
Weight : 6,5 kg
Fitting position: Variable



### Electrical enclosures with installed Thermoelectric assembly FR-208-AC

NSBox-ICE is a special series of electrical enclosures with installed thermoelectric assembly. The units are mounted in various series of electrical enclosures with protection category IP66 / NEMA4: powder-coated sheet steel, glass reinforced polyester, depending on the field of application and operating conditions.



NSB-3860C4: Sheet steel enclosure,  
380x600x210mm



NSP-4060C4: Polyester enclosure,  
400x600x230mm



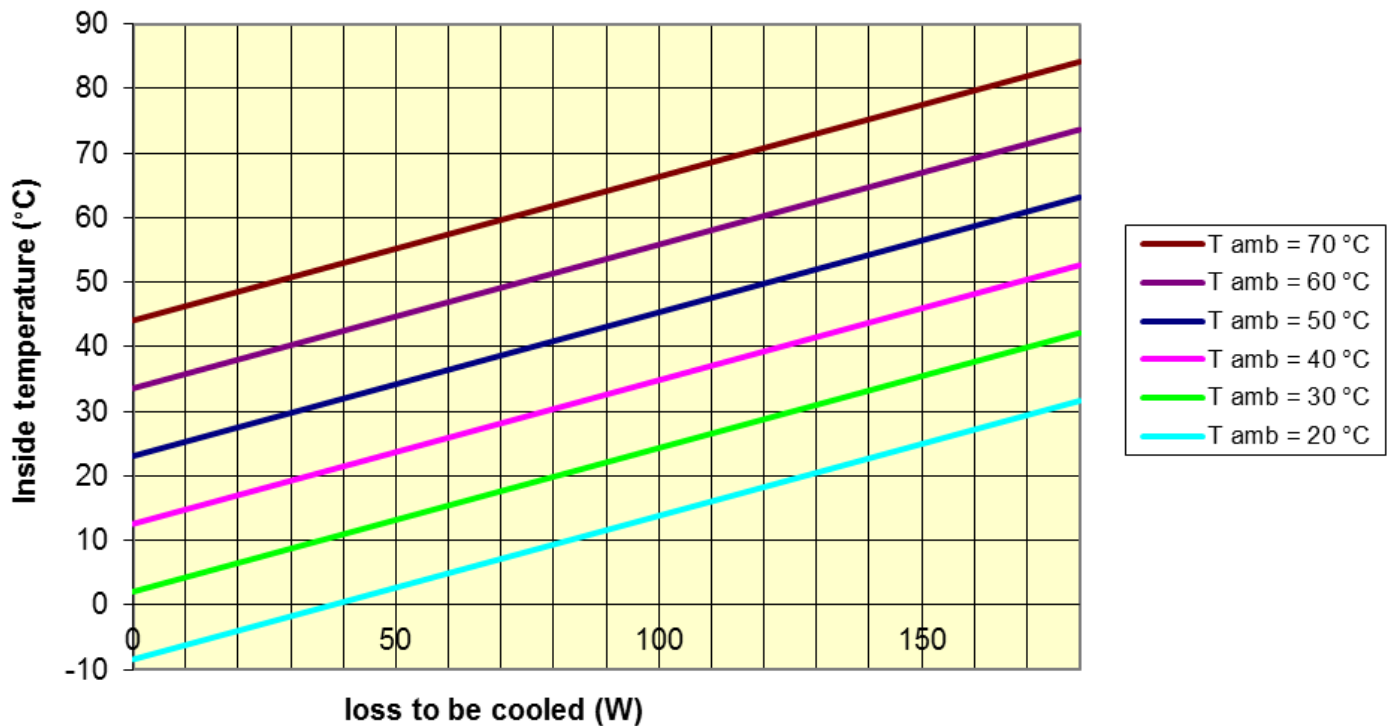
NSB-4040C4: Sheet steel enclosure,  
400x400x230mm

## Performance diagram

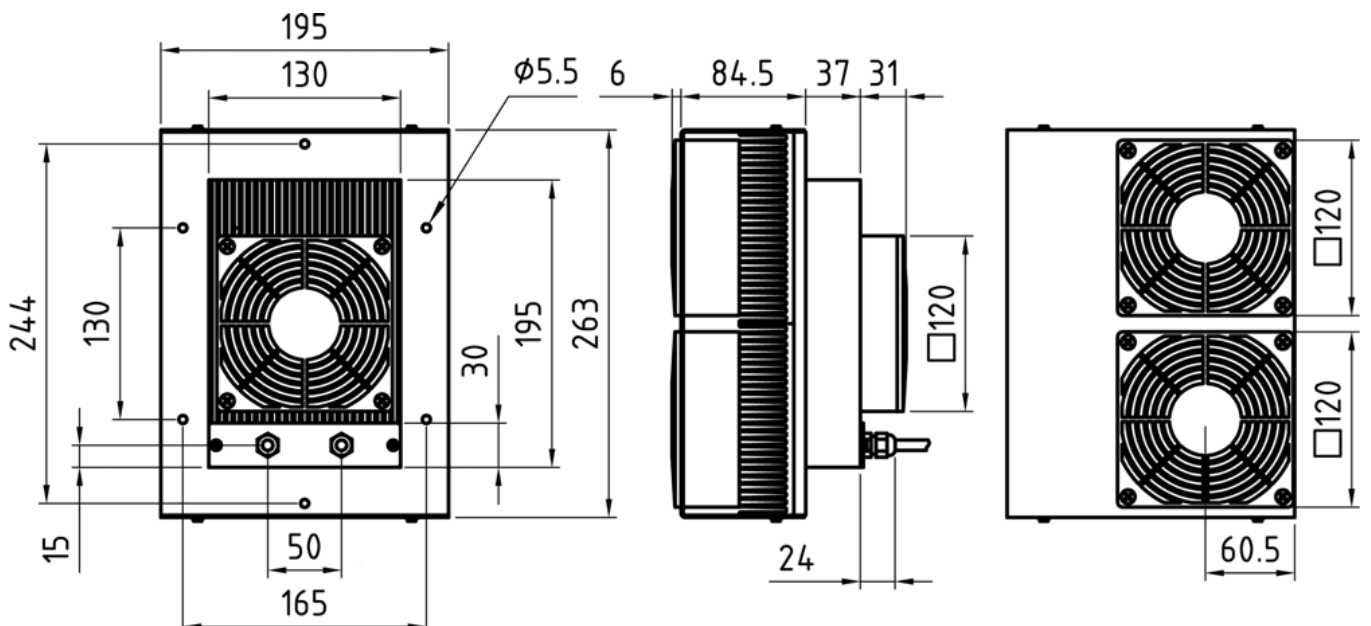
The performance diagrams depict the exact performance of a cooler relative to the ambient temperature and internal temperature of the cabinet. For the layout design, the operating point is first assumed, which means that the cooling capacity of the Peltier device corresponds exactly with dissipation loss in the cabinet. That keeps the internal temperature stable. In order to determine this, the dissipation loss is first located on the X-axis of the diagram and a vertical line is drawn through it. On the Y-axis, a horizontal line is then drawn through the intersection of this vertical line and the line for maximum ambient temperature. The internal temperature can be read on this horizontal line. If the temperature is too high, the next larger cooler model is tested in the same way. If the internal temperature is clearly too low, a smaller cooler type can be used.

If the exact cooling capacity of a device at a given temperature needs to be determined, a horizontal line is first drawn through the corresponding internal temperature on the Y-axis. A vertical line is then drawn down to the X-axis through the intersection of the horizontal line and the colour-coded maximum ambient temperature line. This indicates the exact cooling capacity of the device.

### Performance curve FR-208-AC



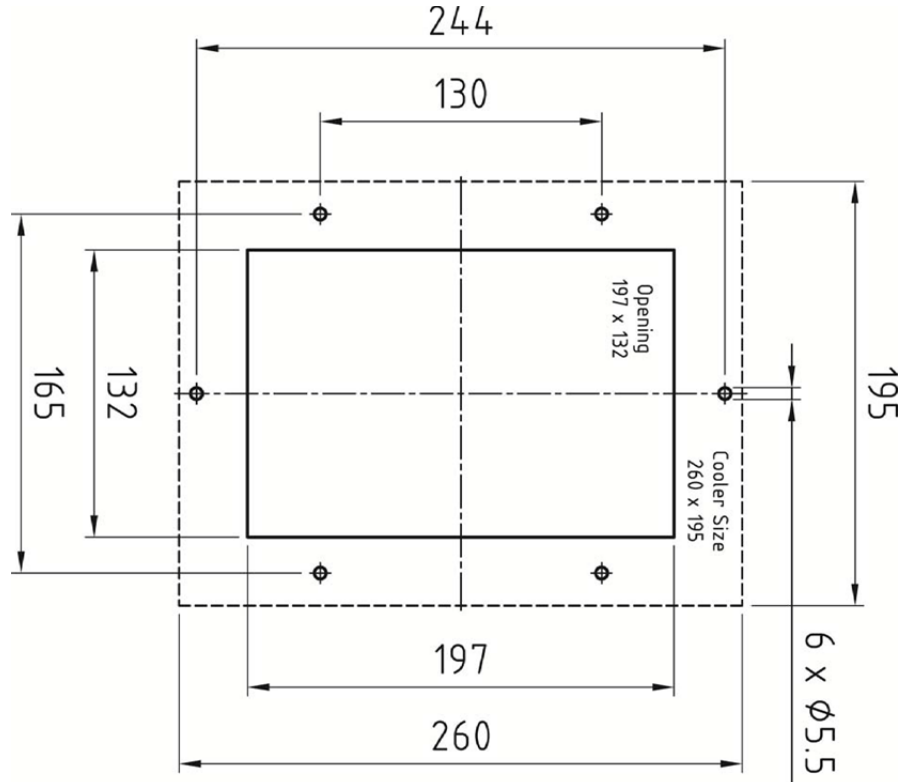
## Main dimensions:



Terminal assignment:

Cable	Core colour	Connection
white	brown	phase
white	blue	neutral
white	yellow / green	ground
black	blue	Alarm transducer (NO contact)
black	brown	Alarm transducer (NO contact)

The necessary opening for installation:



The product „Control Cabinet Cooler – FR-208-AC“ has been given the CE mark on the basis of the Directive 89/336/EEC of the Council of the European Community of 29 April 1991 for harmonization of legislation of member-states on communication systems including mutual recognition of their conformity.

This product has been designed for use with power packs bearing the CE mark.

The product „Control Cabinet Cooler – FR-208-AC“ meets the requirements for a CE mark:

**Interference immunity to EN 61000-6-2/VDE 0839 Part 6-2**

Electromagnetic compatibility; basic standard on interference immunity

**Radio interference suppression to EN 55022 Class A**

Electromagnetic compatibility of equipment for information processing and telecommunication

**Electric safety to EN 60950**

Safety of equipment of information engineering including electric office machines.

This product has been designed for use in industrial applications. Interference immunity and the rate of emitted interference are in conformity with the directives on industrial equipment. When the product is used in residential homes and business offices interference with other equipment items (e.g. radio receivers) might occur. The user shall ensure itself that no third party will be exposed to any interference.

This declaration is delivered in the responsibility of the manufacturer

