

Description

Hermetic sealed aluminum heat sink case resistor

Mechanical characteristics

IP54, Wire coiled inserted in ceramic tube and filled with quartzite sand, Sealed by dielectric cement

Applications

Dynamic braking,
Charge/discharge capacitors

Market

Industrial automation,
Energy

Special version

Ohmic values out of range, Special tolerance on resistance (2%, 1%),
Different cable length, Thermal switch

RAF



0.7 W ÷ 1.1 KW

ELECTRICAL CHARACTERISTICS

refers to room temperature 25°C

ID	Max Power	Rated Power	Min Resistance	Max Resistance
Unit	W	W	Ω	Ω
RAF 700	700	325	8.2	200
RAF 900	900	375	11	300
RAF 1100	1100	415	13	360

Insulation resistance (1000 VDC) $\geq 1000 \text{ M}\Omega$	Dielectric strength (50Hz; 60") 3000 V
Limit Voltage 1500 V	Thermal time constant 1000 s

Active materials: calculation for min ohmic value are made considering wire material CuNi44, whereas max ohmic value refers to wire material FeCrAl. Resistors can be made also with NiCr alloys. Temp. Coefficient Resistance depends on the used alloy, typically it is between 20 and 240 $10^{-6}/^{\circ}\text{C}$.

The standard version cable is single core with flexible conductor silicone rubber insulated with fiberglass braid.
For cross section AWG14 and AWG16 the cable is classified 200°C – 600 V and made according to UL Style 3071.
For cross section 1 mm², 4 mm² and 6 mm² the cable is classified 180°C – 500 V and made according to IEC EN 60228 cl. 5 /CEI EN 50363-5.
The tolerance on cable length is $\pm 5 \text{ mm}$. The choice of cross section to be used depends on the current that flows in the resistor.
External thermal switch 160 $\pm 5^{\circ}\text{C}$ (rated voltage: 250 V; rated current: 16 A; leads Faston 6.3), it is an option and must be specified in the order.
Housing is aluminum extrude, it is oxidized upon customer's request.
Standard tolerance on ohmic value is $\pm 5\%$.
Max power can be supplied to the resistor for not more than 60 minutes.
Picture above refers to RAF 1100.

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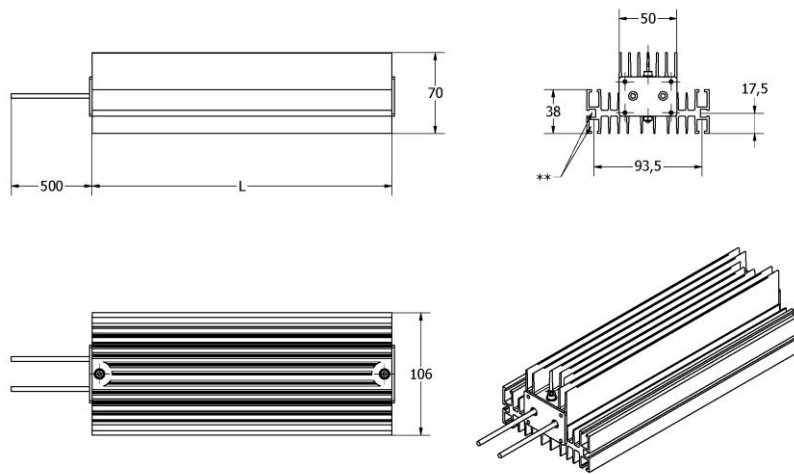
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MECHANICAL DATA

Dimensions [mm]	L	Weight [g]
RAF 700	200	1700
RAF 900	260	2200
RAF 1100	320	2700

Unless otherwise specified, applicable standard of general tolerances for linear and angular dimensions is ISO 2768-1 class c; applicable standard for aluminum profile is EN 755-9:2008.** Slot for screw M5

DRAWING



Overload conditions

Case resistors are mostly used for overload operation, such as precharge of capacitors, dynamic braking of VFD, crowbar operations.

We can distinguish between 3 typical overload conditions: one is the isolated single pulse (emergency braking, precharge in case of short circuit or abnormal duty), the second one is the cyclic work load (i.e. braking of a lift), and the third one is a long overload (i.e. due to a fault in the system).

In all 3 cases, we can state that for pulses of duration less than 60 s, the mass of the wire must be taken in account to define the admissible overload. The mass of the wire depends on the ohmic value.

Unless the pulse is very short (<0,5 s), the mass of the quartzite sand inside plays an important role for the calculation of the global thermal capacity. The longer is the duration of pulse, the higher is the multiplier of the thermal capacity of the wire.

Fairfield technical office is at your disposal for further detailed information.

As far the operation in the **cyclic work load** condition, we can easily calculate the admissible braking power in respect off the duty cycle (ton / total time): Braking power = Rated power * (1 / Duty cycle).

This is valid only if the period does not exceed 240 s.

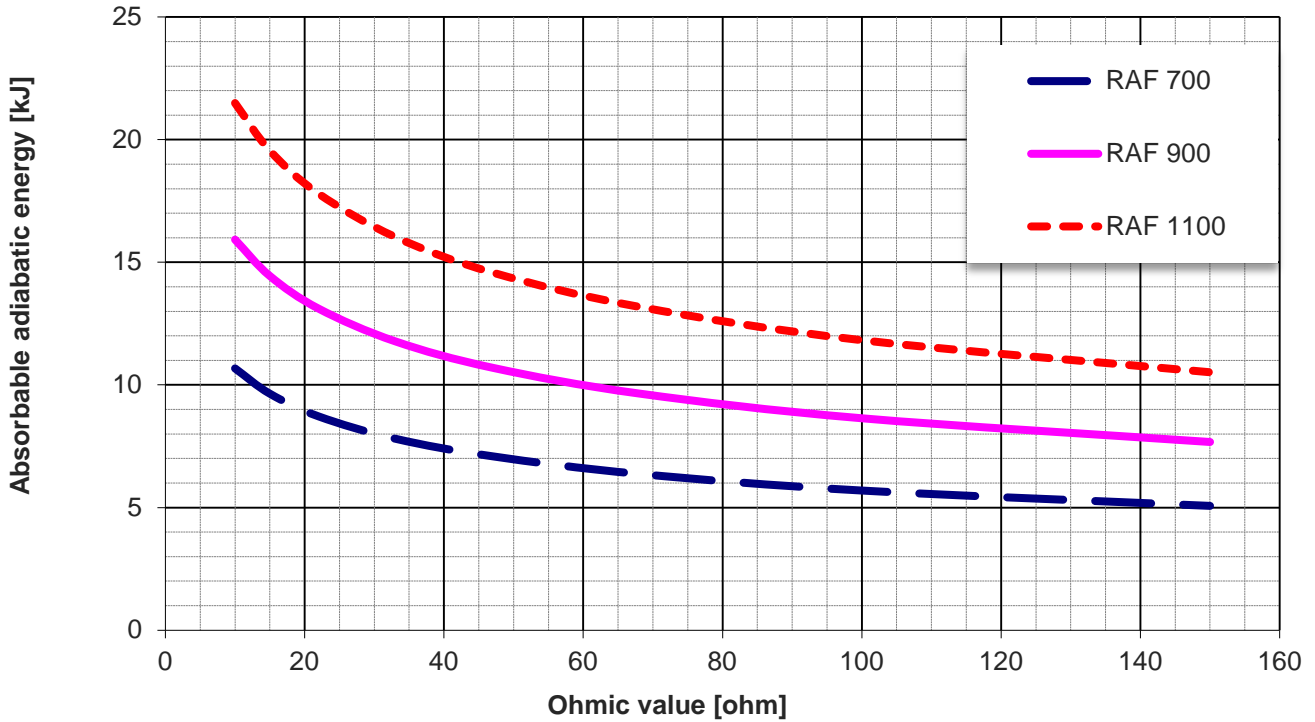
In the following table is shown the max power that is possible to supply for different duty cycle and period.

CYCLIC WORK LOAD

Model	Pulse load period 120s			
	ED 2.5%	ED 10%	ED 25%	ED 50%
	kW	kW	kW	kW
RAF 700	13.0	3.3	1.3	0.65
RAF 900	15.0	3.8	1.5	0.75
RAF 1100	16.6	4.2	1.7	0.83

PULSE LOAD GRAPH

In the following graph is shown, for ohmic value range between 10 Ω and 150 Ω, the maximum pulse energy of max 1 second that is possible to supply to the resistor in a cyclic load. In case of isolated pulse, the value can be multiplied times 2.

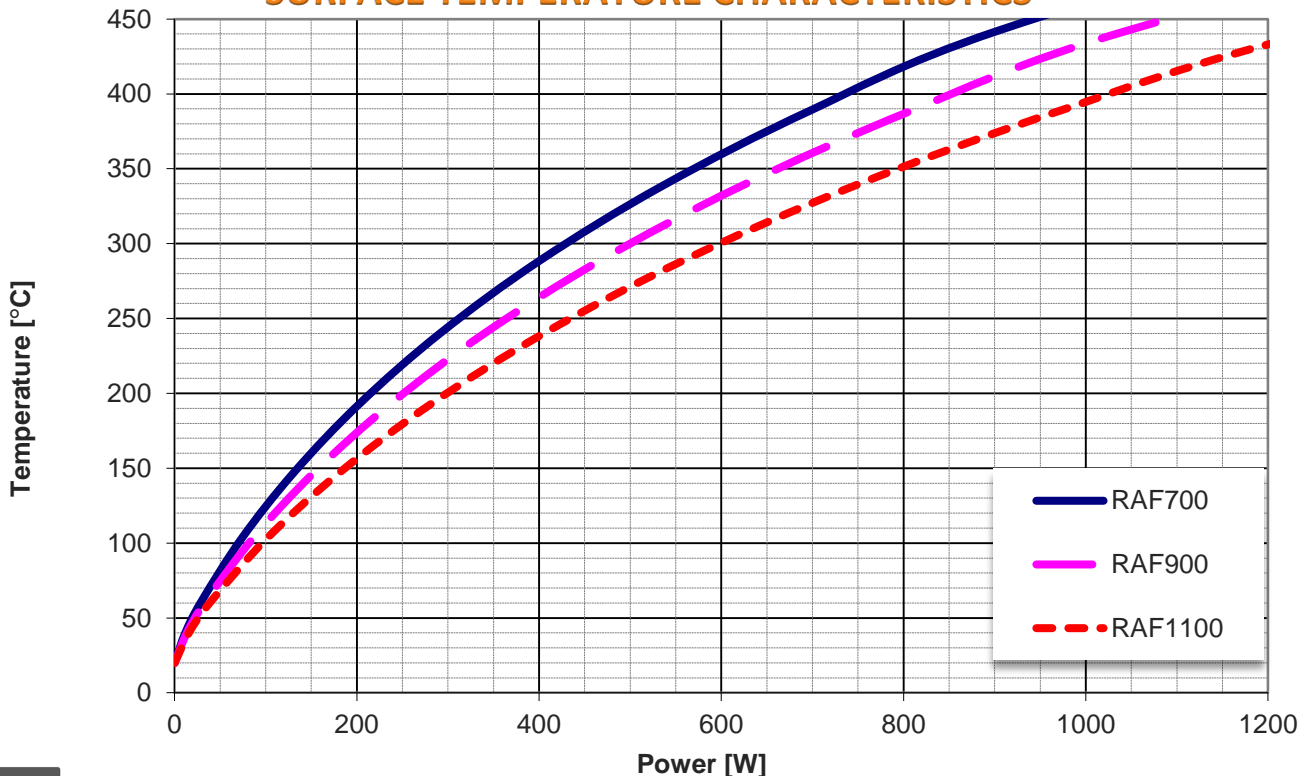


The rated power stated in this datasheet refers to the resistor mounted in horizontal position at the ambient temperature of 25°C and 250°C on the external surface. The power dissipation is influenced by:

- Mounting position and arrangement (wall, heat - sink)
- Number of resistors mounted together (grouping)
- Ambient temperature (in free air or inside an enclosure)

Ask the appropriate test reports for more details. See the following graph to know the external temperature corresponding to a certain continuous power.

SURFACE TEMPERATURE CHARACTERISTICS



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Marking

The resistor is marked on the housing with indelible ink high temperature

FAIRFIELD – RAF 1100 15R 5% WW/YY (week / year)

Installation

Warning: Units must never be mounted with the terminals uppermost

Packing

The resistor is packed in a way to preserve incidental damages due to transport. To avoid resistor's break we recommend to never take it from the cables and to handle with care inside the original boxes provided by the factory.

Disclaimer

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Ordering information

RAF/Y XXX RRRR 5%

Y T : External thermal switch 160±5°C (rated voltage: 250 V; rated current: 16 A; leads Faston 6.3)

XXX Model 700, 900, 1100

RRRR Resistance value (nominal at 20°C)

Example

RAF 1100 15R 5%

RAF is the name of the product

1100 is the model

15R means 15 Ω that is the nominal ohmic value at 20°C

5% is the tolerance on the ohmic value, in this case the value of the resistor is accepted when is within 14.25 Ω ÷ 15.75 Ω 5% is the tolerance on the ohmic value, in this case the value of the resistor is accepted when is within 142.5 Ω ÷ 157.5 Ω