Edge wound naked resistor

Descriptions
Low ohmic values, Extremely high energy pulses, Suitable for group assemblies

Mechanical characteristics
IP00, Ribbon wound on edge mounted on ceramic support fixed on a metallic bar

Applications
Dynamic braking, Starting motor, Crowbar

Market
Railways, Industrial automation, Energy

Special version
Ohmic values out of range, Special tolerance on resistance (2%, 1%), Intermediate grip

RNP

CE RoHS COMPLIANT Pb Pb-Free

0.8 ÷ 4.4 KW

ELECTRICAL CHARACTERISTICS

refers to room temperature 25°C

ID	Rated Power	Min Resistance	Max Resistance
Unit	W	Ω	Ω
RNP 800	800 ÷ 2800	0.1	2.7
RNP 1000	1000 ÷ 3600	0.12	3.6
RNP 1200	1200 ÷ 4400	0.15	4.3
Dielectric strength 50Hz; 60" 2500 V		Limit Voltage 1500 V	

RNP is a standard resistor only regarding the dimensions, whereas for rated power and thermal capacity must be designed on purpose. In fact it can be made with several different alloys and cross sections, then the overload operations, the rated power and the thermal capacity are very wide.
The number of the turns are fixed, so in general the higher is the ohmic value, the lower is the energy absorption.
In the table above the min rated power is related to the smallest ribbon that is possible to mount on the ceramics (5x0.5), and the max refers to the biggest one (12x3).
Rated power is given considering the temperature of the ribbon at 600 °C and the resistor placed in free air.

Rated power depends on total surface area according to Newton's law

$$\frac{dQ}{dt} = h \cdot A \cdot (T_{env} - T)$$

Where
Q is the thermal energy in joules
h is the heat transfer coefficient (W/m^2 K)
A is the surface area of ribbon (m^2)
T_{env} is the temperature of the enviroment
T is the temperature of the ribbon

In the case of model RNP, the total surface area depends on the ohmic value according to Ohm's law

$$R = \rho \cdot \frac{l}{S}$$

Where
R is the resistance
ρ is the resistivity of the used alloy
l is the length of the conductor (ribbon)
S is the cross section of the conductor (ribbon)

For each given S, there are several combination of height and thickness of the ribbon that brings to different surface area and then rated power.
The rated power is also influenced by the pitch between the turns and the grouping of resistors.
In the below table is represented the surface load for 4 different alloys and sections, data refer to ribbon temperature 600 °C.

Pitch – floors	NI/CR 80/20 10x1,8	INCONEL 601 8,5x1,2	NI/CR 40 7x1,2	AISI 304 8x1
Pitch 5,2 mm 2 floors	0,69 W/cm²	0,98 W/cm²	1,7498 W/cm²	1,0598 W/cm²
Pitch 5,2 mm 1 floor	0,77 W/cm²	1,05 W/cm²	1,0998 W/cm²	1,1098 W/cm²
Pitch 6 mm 2 floors	0,82 W/cm²	1,09 W/cm²	1,2498 W/cm²	1,3398 W/cm²
Pitch 6 mm 1 floor	0,89 W/cm²	1,27 W/cm²	1,4998 W/cm²	1,3498 W/cm²
Pitch 7.5 mm 2 floors	0,93 W/cm²	1,35 W/cm²	1,5198 W/cm²	1,3798 W/cm²
Pitch 7.5 mm 1 floors	1,01 W/cm²	1,52 W/cm²	1,7398 W/cm²	1,6498 W/cm²

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FAIRFILD SRL – Via Eching, 12 20090 Trezzano sul Naviglio (MI) Italy – C.F. 03539970156 – P.ta Iva IT02736630167 – REA MI 1630934 – C.S i.v. 45.900 €

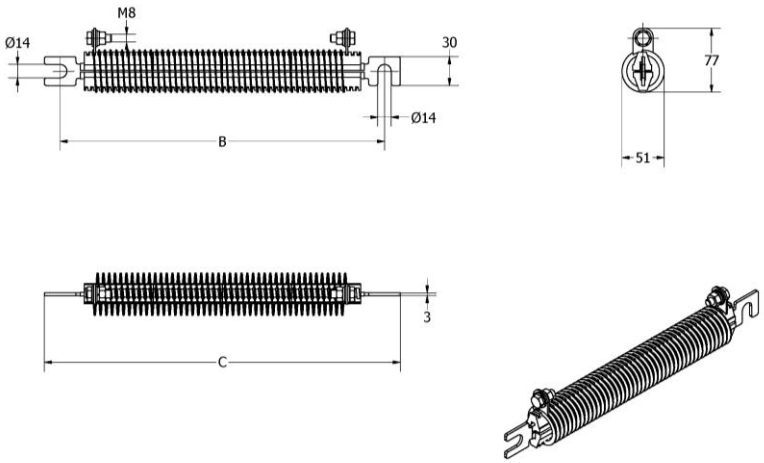
MECHANICAL DATA

ID	B [mm]	C [mm]	Weight [g]
RNP 800	338	371	1350
RNP 1000	410	443	1600
RNP 1200	489	522	1900

Weight is average value between minimum and maximum.
Unless otherwise specified, applicable standard of general tolerances for linear and angular dimensions is ISO 2768-1 class c.

Dimensions 51 and 77 are based on widest ribbon available for RNP assemblies.

DRAWING



Marking

The resistor is marked on the bar with indelible ink high temperature
FAIRFILD – RNP 800 1R5 10% WW/YY (week / year)

Installation

In case of group mounting keep a distance of at least 30 mm between consecutive resistors.

Packing

The resistor is packed in a way to preserve incidental damages due to transport. The resistor is made by ceramic parts, accidental fall can damage it, handle with care.

Disclaimer

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Ordering Information

RNP XXX RRRR 10%

XXX Model 800, 1000, 1200

RRRR Resistance value (nominal at 20°C)

Example
RNP 800 1R5 10%
RNP is the name of the product
800 is the model
1R5 means 1,5 Ω that is the nominal ohmic value at 20°C
10% is the tolerance on the ohmic value, in this case the value of the resistor is accepted when is within 1.35 Ω ÷ 1.65 Ω

Standard tolerance on ohmic value is ±10%.

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