

Description

Stainless steel terminals for screws M6, Very robust design for high energy pulses and heavy overload, Suitable for group assemblies

Mechanical characteristics

IP00, Wire wound on ceramic support mounted on a metallic bar

Applications

Dynamic braking, Charge/discharge capacitor, Load Bank

Market

Industrial automation, Energy

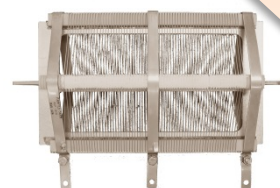
Special version

Adjustable

RDP



1.0 ÷ 8.2 KW



ELECTRICAL CHARACTERISTICS

refers to room temperature 25°C

ID	Rated Power	CuNi44	NiCr40	FeCrAl
Unit	W	Min Max Resistance Ω		
RDP 420	1000 ÷ 3200	2.2 ÷ 4.7	5.1 ÷ 6.2	6.8 ÷ 110
RDP 540	1300 ÷ 4200	3 ÷ 6.2	6.8 ÷ 8.2	9.1 ÷ 150
RDP 1300	800 ÷ 2400	1.8 ÷ 3.6	3.9 ÷ 4.7	5.1 ÷ 82
RDP 2200	1200 ÷ 3900	2.7 ÷ 5.6	6.2 ÷ 7.5	8.2 ÷ 130
RDP 3000	1400 ÷ 4700	3.3 ÷ 6.8	7.5 ÷ 8.2	9.1 ÷ 150
RDP 4000	1800 ÷ 5100	3.9 ÷ 7.5	8.2 ÷ 10	11 ÷ 180
RDP 5000	2700 ÷ 8200	6.2 ÷ 12	13 ÷ 16	18 ÷ 300

Insulation resistance 1000 VDC ≥ 100 MΩ

Limit Voltage 2000 V

Active material CuNi44 has a TCR of 40 ppm/°C, FeCrAl that has a TCR of 70 ppm/°C, NiCr40 has a TCR of 240 ppm/°C.

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/m² K)

A is the surface area of the wire (m²)

T_{env} is the temperature of the environment

T is the temperature of the wire

In the case of model RDP, 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

S is the cross section of the conductor

The number of the turns in the RDP model is fixed and depends on the diameter of the wire.

As a result, the lower is the ohmic value, the higher is the surface area and then the power. At the contrary the higher is the ohmic value, the lower is the surface area and then the power.

In the above table min and max rated power refer to wire temperature 600 °C and resistor placed in free air, in the graph of rated power is shown the power that corresponds to a temperature of wire of 600 °C for ohmic values from the minimum to the maximum.

The same reason is for the energy absorption. Lower ohmic values have higher mass of active material because

$$m = S \cdot l \cdot \rho$$

Where

m is the mass of active material, S is the cross section of the conductor, l is the length of the conductor, ρ is the density of active material.

In the graph of pulse load is shown the energy in kJ that corresponds to a ΔT of the wire of 900 °C according to the law

$$\Delta E = m \cdot c_p \cdot \Delta T$$

Where

ΔE is the amount of energy that enter in the resistor

m is the mass of the wire

c_p is the specific heat of the wire

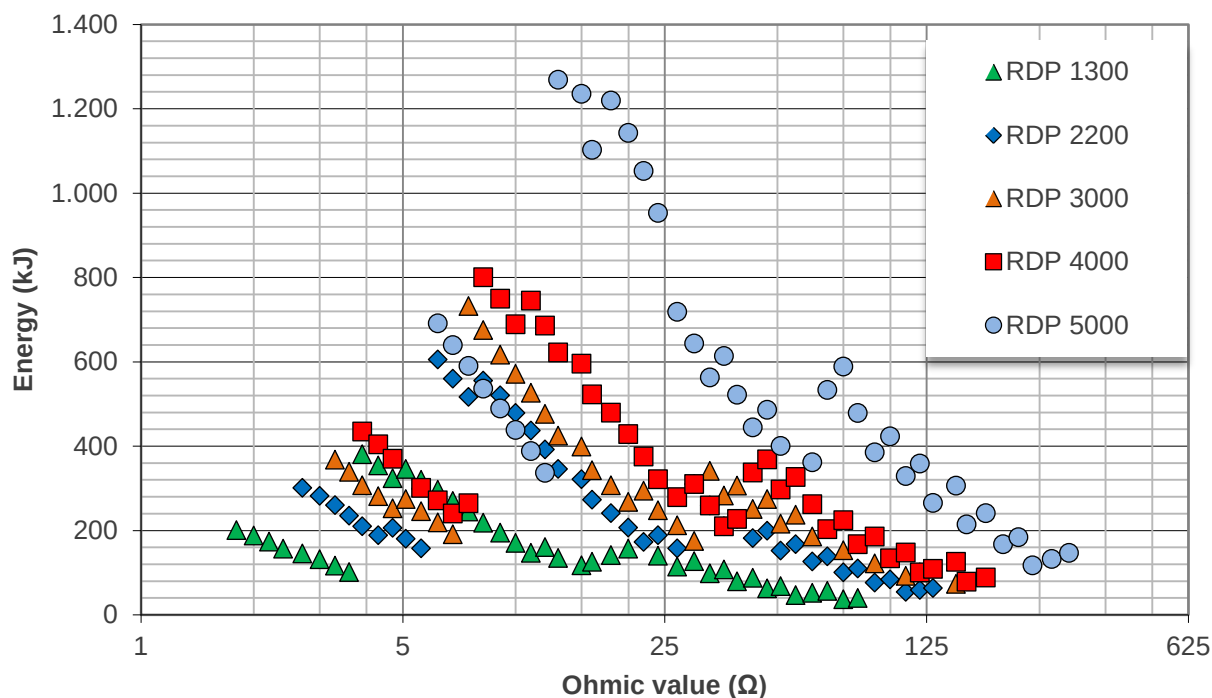
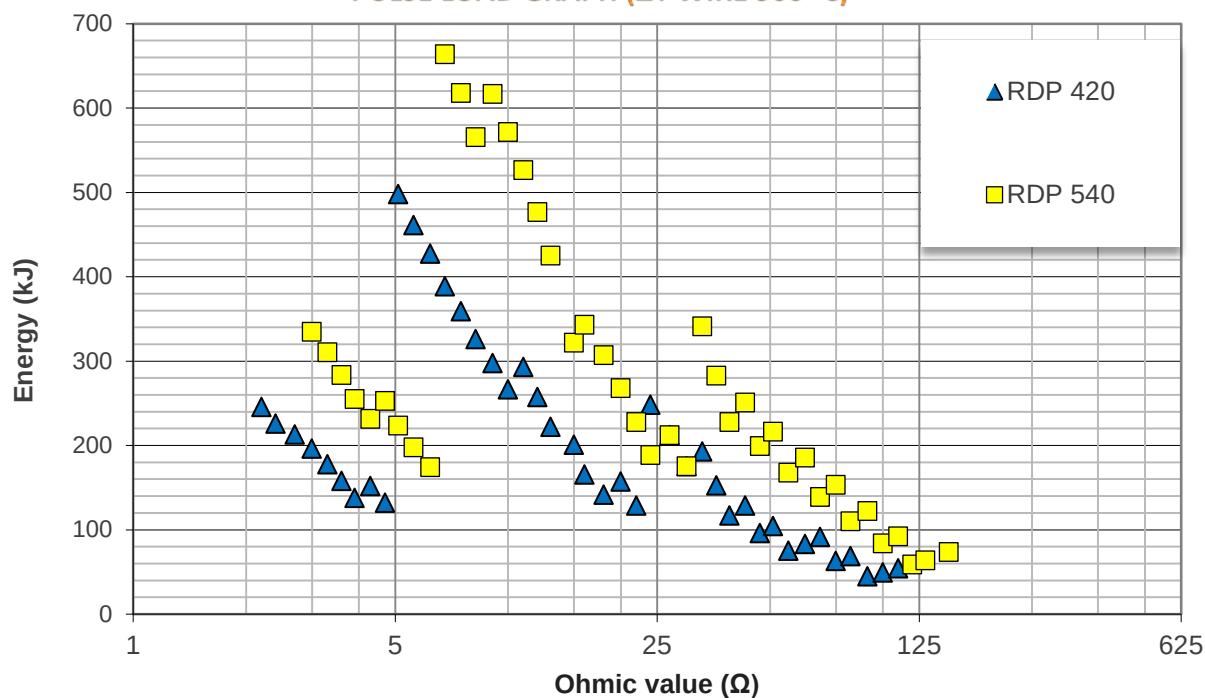
ΔT is the over-temperature of the wire

This equation is valid only when the pulse is very short (< 0.5 s) and it is called adiabatic, it means that all the energy is dissipated by the wire itself. When the pulse duration is longer, the wire can exchange the energy with the surrounding ambient, then the energy that can be dissipated is higher.

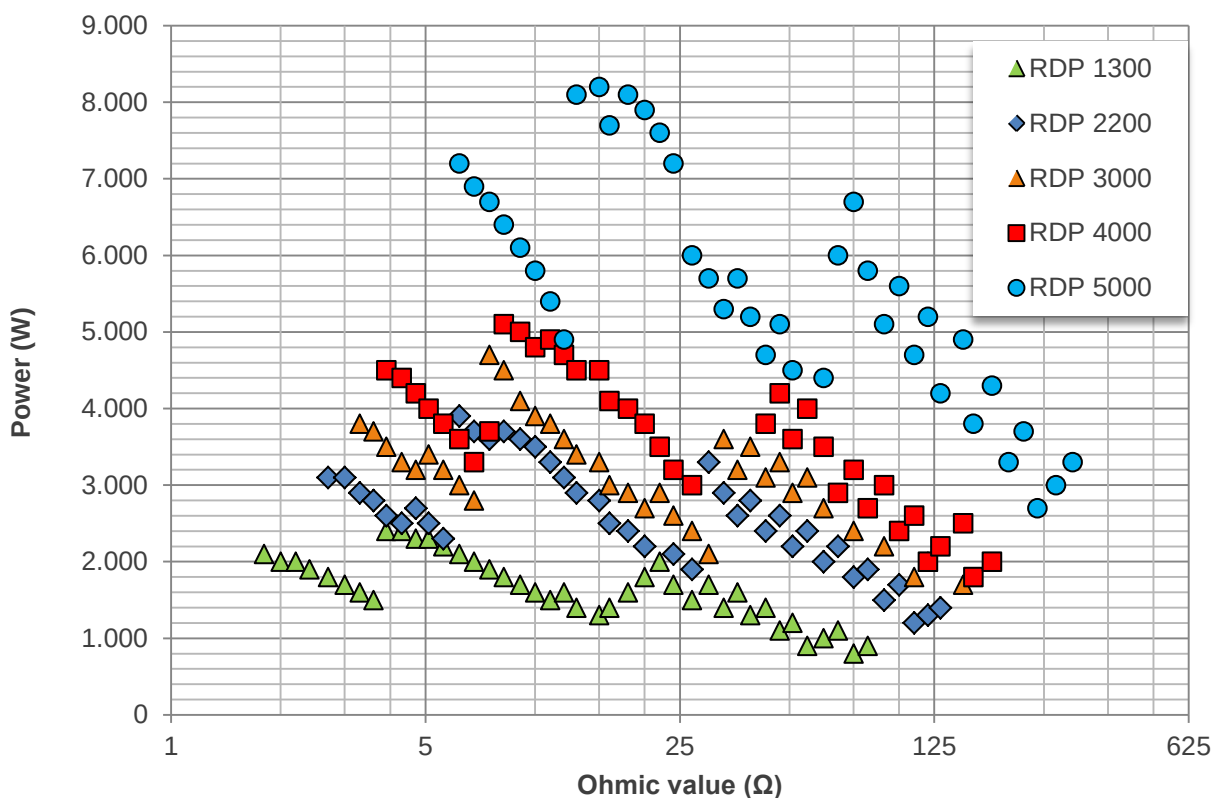
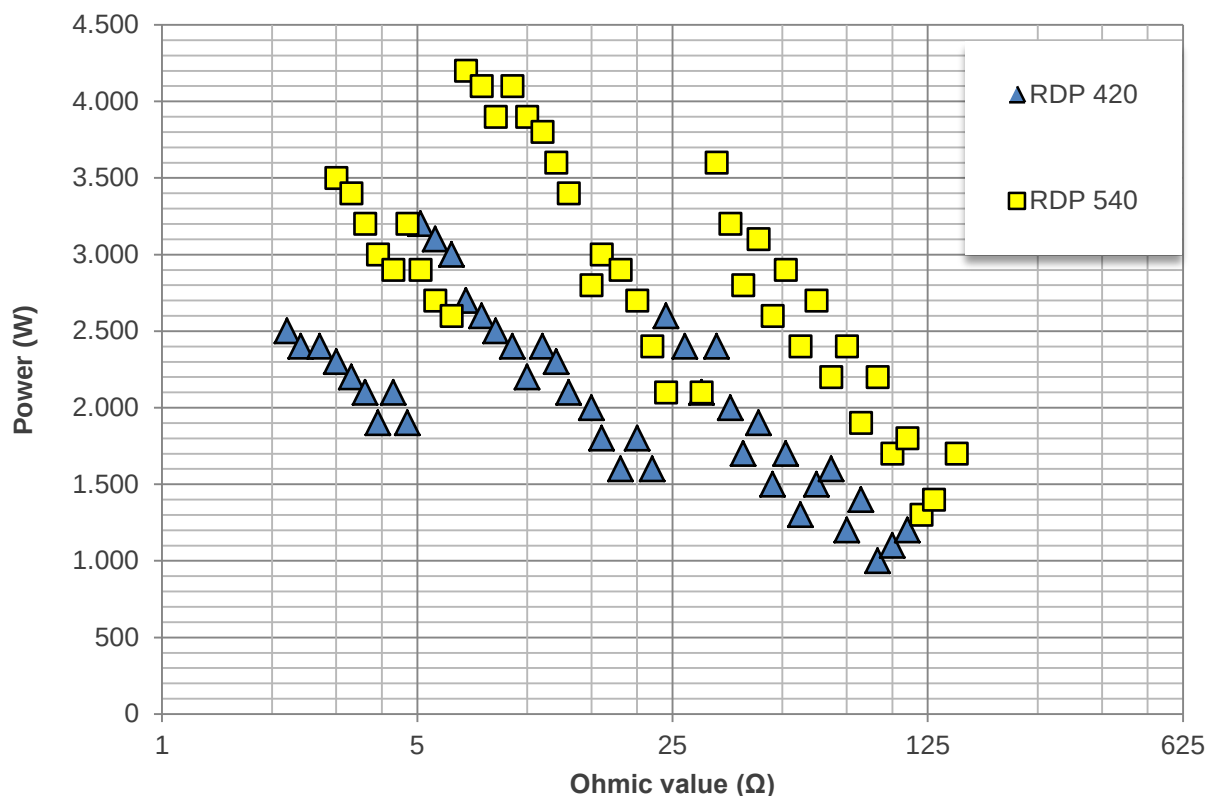
For pulse duration less than 60 s, the mass of the wire is determinant to calculate the overload conditions.

Please contact Fairfield technical office for more details.

PULSE LOAD GRAPH (ΔT WIRE 900 °C)



POWER VS. OHMIC VALUE (WIRE TEMP. 600°C)



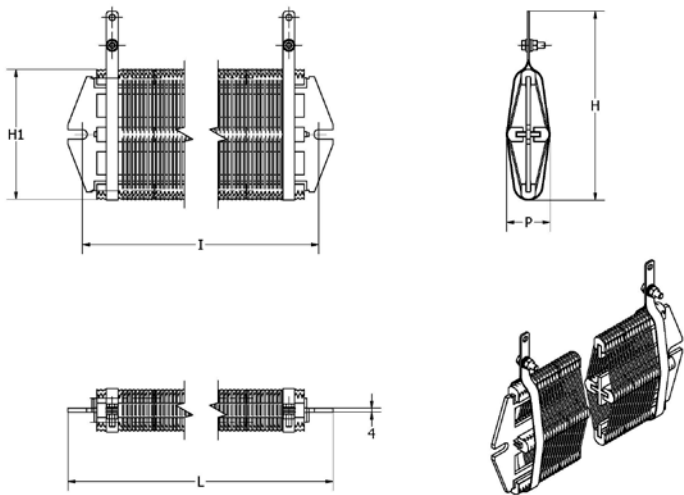
MECHANICAL DATA

Unit [mm]	A [mm]	I [mm]	L [mm]	P [mm]	H [mm]	H1 [mm]	Weight [g]
RDP 420	10	390	420	45	190	135	2400
RDP 540	10	510	540	45	190	135	3000
RDP 1300	11	280	310	55	200	160	2800
RDP 2200	11	380	410	55	200	160	3400
RDP 3000	11	380	410	55	230	190	3500
RDP 4000	11	380	410	55	260	230	3600
RDP 5000	11	570	600	55	260	230	4200

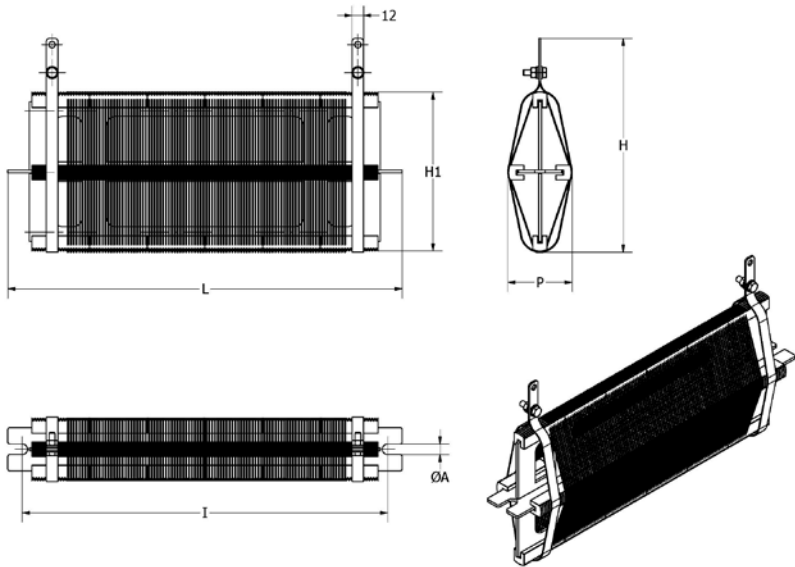
Weight indicated in the table is approximate data, the exact data depends on wire mass.

DRAWING 420 – 540

Unless otherwise specified, applicable standard of general tolerances for linear and angular dimensions is ISO 2768-1 class c.
Holes for M6 connection are 6.3 mm.



DRAWING 1300 - 5000



Wirewound naked resistor

Marking

The resistor is marked on the collar with indelible ink high temperature
FAIRFIELD – RDP 3000 150R +15% 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.

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Ordering information

RDP/Y XXX RRRR 5%

Y R : adjustable version

XXX Model 420, 540, 1300, 2200, 3000, 4000, 5000

RRRR Resistance value (nominal at 20°C)

Example

RDP/R 3000 150R +15%

RDP is the name of the product

3300 is the model

150R means 150 Ω that is the nominal ohmic value at 20°C

+15% is the tolerance on the ohmic value, in this case the value of the
resistor is accepted when is within 150 Ω ÷ 172.5 Ω

Note: tolerance on ohmic value for adjustable resistors is normally -
0+15% with collar mounted in the resistor.

Standard tolerance on ohmic value is ±5%.

RDP model is manufactured according to E24 series.