COUDOINT

Woven Resistors

Hardware Reference

Document 1101064 - Edition June 2009

Table of Contents

1 General Description....3

2 Examples of Designs

2.1 Heating Resistor.... 4

2.2 Test Resistor....4

2.3 Resistor for Switch Test Bench....4

2.4 Resistors for Load Bank....4

2.5 Resistors for Load Bank in 19” Rack Mount....5

2.6 Resistor for On-Board Load Bank....5

2.7 Resistor for Integration in a Heating Case....5

2.8 Heating Resistor with Integrated Thermostat....5

2.9 Replacement Resistor....6

2.10 Resistors for Extra High Voltage Testing....6

3 Product Identification Code....7

COUDOINT

Tel.: +33 1 30 41 55 00 *Fax:* +33 1 30 41 55 62

Email: commercial@coudoint.com *Website:* www.coudoint.com

Address: 19, Avenue de la gare 78690 Les Essarts Le Roi FRANCE

1 General Description

Description :

Woven resistors are flexible mats constructed with:

- a resistance weft wire
- a nonconductive chain warp thread wire, with impregnation, to maintain the resistance wire
- plain strips at the ends for mechanical fixation

Specific characteristics

The technology used in woven resistors has numerous advantages :

- the possibility of designing **power resistors with high ohmic values** (up to 10 kΩ)
- **reduced weight and dimensions**, for example 150 g for a 960 W resistor of 190 x 190 x 3 mm
- large flexibility in terms of dimensions, shape and mechanical fixation
- **good thermal properties**: withstands high temperature, very low calorific inertia, good heat exchange coefficient with air: typically 250 W by dm²
- well suited to applications with **high voltages**
- low inductance
- good mechanical properties, in particular low length variation versus temperature
- long lifetime (15 to 20 years on average)
- possibility of grouping many resistors together on one single mat

Series and models

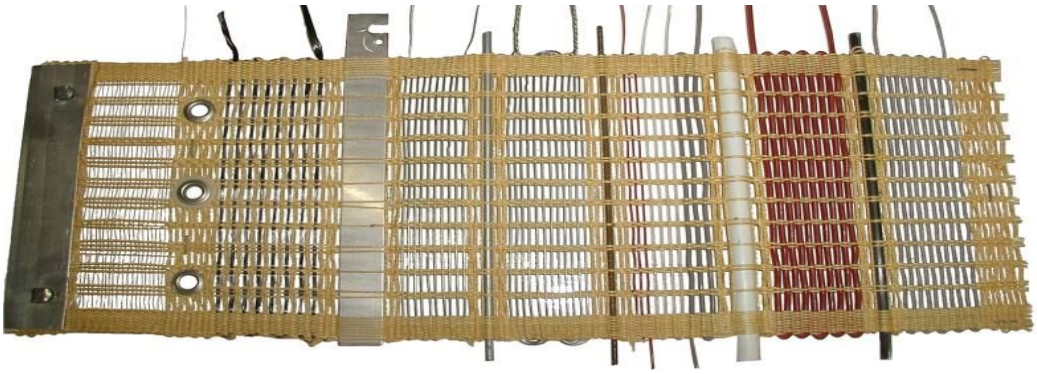
Each woven resistor is designed according to the required specifications or to your special needs described to us in terms of power rating, ohmic value, operating voltage, current intensity, dimensions, shape, **even for a single unit**. Ask us for a proposal.

Applications

- load banks, battery discharge benches, especially in portable (lightness) or on-board applications
- heating resistor for dryers, drying cupboards, heating rings (pipes, filters) or heating cases
- heating or defrosting resin overmolded resistor
- high voltages applications: EHV benches, impulse testing, etc.

Features

- dimensions: maximum width: 1 meter; maximum length: no constraint; usually rectangular, the resistors can be woven on request into other shapes : triangle, trapezoid, etc.
- resistive wires: chromium-nickel, copper-nickel, carbon fiber conductors, etc.; insulated cables can be woven if required (waterproofness, immersion, voltage insulation)
- chain wire: fiberglass, silica fiber, polyester fiber, kevlar, etc.
- connections: direct wires, optionally with ceramic insulated beads, or insulated cables, etc.
- mechanical fixation: plain strips at the ends or at intermediary positions are used to insert rivets, metal eyelets, clips, metal stems:

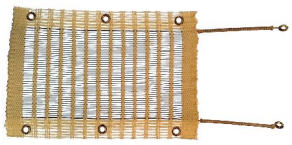


Examples of the various types of resistance wires and of the various mounting styles

2 Examples of designs

2.1 Heating Resistor

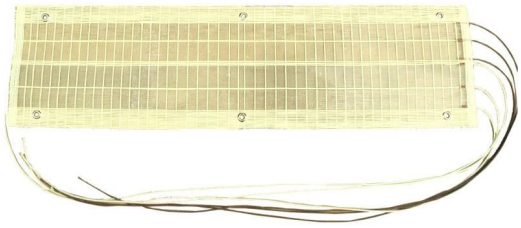
- power rating: 375 W
- ohmic value: 35 Ω
- dimensions: 180 x 115 mm
- chromium-nickel resistance wire
- fiberglass chain wire
- 6 eyelets for mechanical fixation
- terminal connections by insulated cables



Model: RRT180X115EC13EAR35T016

2.2 Test Resistor

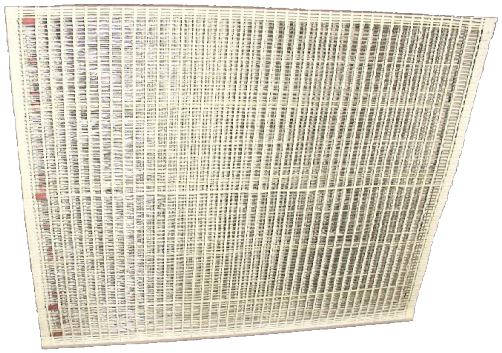
- 4 resistors per mat: 121 Ω (2), 242 Ω, 484 Ω
- power rating per mat: 1100 W
- dimensions: 200 x 770 mm
- chromium-nickel resistance wire
- fiberglass chain wire
- 6 eyelets for mechanical fixation



Model: RRT200X770EE9E01KT008

2.3 Resistor for Switches Test Bench

- set of various mats, each one supporting several resistors
- 3 resistors on the mat shown here: 8.5 Ω; 6.2 Ω; 1.9 Ω
- maximum current: 15 amps
- dimensions: 600 x 590 mm
- chromium-nickel resistance wire
- fiberglass chain wire
- mat fixed via springs to a metallic body
- used with forced-air cooling



Model: RRT600X590EC13CB16R6T056

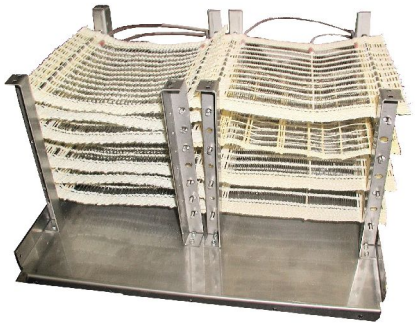
2.4 Resistors for Load Bank

- 4 resistors per mat: 1000 Ω, 500 Ω, 250 Ω (2)
- power rating per mat: 550 W
- dimensions: 440 x 360 mm
- chromium-nickel resistance wire
- fiberglass chain wire
- eyelets for mechanical fixation
- terminal connections: high temperature insulated cables

Model: RRT440X360EC9ED2KRT003

2.5 Resistors for Load Bank in 19-inch Rack Mount

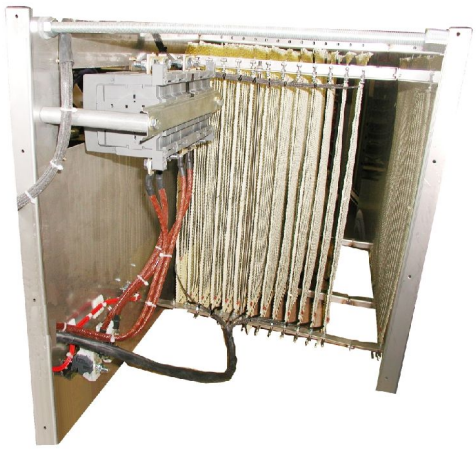
- ohmic value: 1,12 Ω
- power rating: 700 W (each resistor)
- dimensions of the mats: 190 x 190 mm
- chromium-nickel resistance wire
- fiberglass chain wire
- mechanical fixation by stainless steel bars
- for forced-air cooling



Model: RRT190X190EC13BA1R12

2.6 Resistor for On-Board Load Bank

- set of resistors for an on-board load bank for trucks, submitted to mechanical shocks
- ohmic value: 116 Ω
- nominal current: 1 amp
- dimensions: 500 x 520 mm
- chromium-nickel resistance wire
- fiberglass chain wire
- mechanical fixation by stainless steel bars
- terminal connections : high temperature insulated cables



Model: RRT520x50EC13BA115R6T060

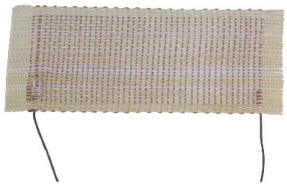
2.7 Resistor for Integration in a Heating Case

- heating resistor intended to be over-molded to build a railway switch mechanism housing
- ohmic value: 570 Ω
- dimensions: 1180 x 155 mm
- carbon fiber resistance wire
- fiberglass chain wire

Model: RRT1180X155EC9BAR570T007

2.8 Heating resistor with Integrated Thermostat

- ohmic value: 2.88 Ω
- dimensions: 380 x 165 mm
- silicone elastomer cord with nickel-copper resistance wire
- thermostat wired and mounted in the chain warp



Model: RRT380X165EC13XA2R88T010

2.9 Replacement Resistor – energy pulsed mode

- woven resistor rolled into a cylinder in the required dimensions
- ohmic value: 3.6 Ω
- instantaneous energy: 7.3 kJ
- dimensions of the mat: 450 x 140 mm
- dimension of the cylinder L 661 x Ø 66.5 mm
- chromium-nickel resistance wire
- fiberglass chain wire
- same terminal connections as the replaced resistor

Model: RRT450x140EC13A3R6

2.10 Resistors for Extra High Voltage Testing

- set of vertically mounted woven resistors
- resistor shown here: 1000 Ω. 2 MJ
- dimensions: 5500 x 600 mm
- cupro-nickel resistance wire
- fiberglass chain wire
- specific mechanical fixation

3 Product Identification Code

RRT	180X115	EC13	E	A	0R35

Product:

"RRT" for Woven resistors

Total ohmic value:

nnnRddd for nnn.ddd Ω
Ex.: 0R35 for 0.35 ohm

Dimensions:

"LLLXlll" for:
length equal to LLL mm
width equal to lll mm

Number of circuits:

"A" for 1 circuit
"B" for 2 circuits
"C" for 3 circuits
etc.

Chain wire:

Type and gauge of the chain wire: EC13, etc.

Mechanical fixation:

"B" for "metallic round bar"
"BA" for "metallic flat bar"
"C" for "metallic body"
"CE" for "tinned copper"
"E" for “eyelet”
"S" for “special”
"X" for “without”

This identification above code is followed:
– when ordering, from the list of the optional features which are not described in the code,
– internally, from a special code if the product cannot be considered as a standard model.

COUDOINT

Tel.: +33 1 30 41 55 00 *Fax:* +33 1 30 41 55 62

Email: commercial@coudoint.com *Website:* www.coudoint.com

Address: 19, Avenue de la gare 78690 Les Essarts Le Roi FRANCE