



**AUSTRALIAN RAIL TRACK CORPORATION LTD**

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**Discipline**  
**Engineering Standard - NSW**

**Category**  
**Signalling**

**Title**  
**Lightning/Surge Protection - Varistor Panel**

**Reference Number**  
**SPS 36 - (RIC Standard: SC 09 15 03 00 SP)**

**Document Control**

<b>Status</b>	<b>Date</b>	<b>Prepared</b>	<b>Reviewed</b>	<b>Endorsed</b>	<b>Approved</b>
Issue 1 Revision 3	May 05	Standards and Systems	Standards Engineer	GM Infrastructure Strategy & Performance	Safety Committee
		Refer to Reference Number	H Olsen	M Owens	Refer to minutes of meeting 12/08/04

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The technical content of this document has been approved by the relevant ARTC engineering authority and has also been endorsed by the ARTC Safety Committee.

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## **About This Standard**

This Specification describes the general requirements for Varistor Panels to be manufactured and supplied to Australian Rail Track Corporation and contractors to Australian Rail Track Corporation.

## Document History

**Primary Source** – RIC Standard SC 09 15 03 00 SP Version 2.0

### List of Amendments –

ISSUE	DATE	CLAUSE	DESCRIPTION
1.1	01/09/2004		Reformatting to ARTC Standard
1.2	14/03/2005	Disclaimer	Minor editorial change
1.3	06/05/2005	All	Document reformatted

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## 1. Introduction

This Specification describes the general requirements for Varistor Panels to be manufactured and supplied to Australian Rail Track Corporation and contractors to Australian Rail Track Corporation.

## 2. Applicable Documents

### 2.1 ARTC Specifications

This Specification refers to:

Specification SCP 04 - Surge Protection requirements.

### 2.2 Australian Standards

AS 3000/1991 - Electrical Installations-Building, Structures & Premises.

## 3. General

Varistor Panel shall be required to provide lightning/surge suppression on AC and DC power supply mains. The panel shall be referred to as VP-20KA or VP-60KA as appropriate.

## 4. Operation Conditions

The equipment shall be capable of operating satisfactorily under the following conditions:

- a) ambient temperature range -10 C to 70 C
- b) relative humidity 0 to 95%

## 5. Design Requirements

### 5.1 Construction

- a) Construction shall be in accordance with SRA, Signals Standards drawing M08-400 for VP-20KA and VP-60KA. Critical values are the overall size, mounting centres, and the relative position of the input, output and earth terminations.
- b) All components shall be securely mounted on a 6mm panel. The panel shall be made of either paper-based Phenolic or ABS.
- c) All components shall be readily and individually replaceable in case of a failure.
- d) All material fittings, bolts, nuts, etc shall be Nickel plated Brass.

### 5.2 Components

The Varistors to be used in VP-20KA and VP-60KA shall be "Siemens" type SIOVB32K150 and "Siemens" type SIOVB60K150 respectively or an approved type equivalent in voltage and power ratings.

### 5.3 Wiring

- a) All conductors shall be multi-stranded, with sizes and current ratings in accordance with AS3000-1991.
- b) Minimum insulation shall be 0.6KV, V75 grade PVC.
- c) All conductors shall be as short and as straight as practicable with smooth curves of maximum radius.
- d) All conductors shall be terminated with suitable crimp lugs either pre-insulated double-grip type for smaller conductors, or in the case of larger conductors, non-insulated lugs with a heat-shrink sleeve applied after crimping. The heat shrink sleeve shall cover the body of the crimp lug and extend at least 15mm over the conductor insulation.

### 5.4 Terminals

The Earth terminal shall be M6 and 40 mm long Nickel plated Brass stud provided with 3 washers, 2 nuts and one lock nut. The other terminals shall be as shown in drawing M08-400.

### 5.5 Labelling

- a) All labelling shall be permanently affixed, clearly legible, and of a material which will not deteriorate on ageing.
- b) The terminals shall be labelled "E1 ", "E2", "L1" and "L2", and the Earth terminal shall be labelled "Signalling Earth" as shown in the drawing.
- c) In addition the unit must be fitted with a readily visible label stating "VP-20KA or "VP-60KA" as appropriate, the manufacturer's identification and date of manufacture.