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

**Category**  
**Signalling**

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

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**SPS 34 - (RIC Standard: SC 09 15 01 00 SP)**

**Document Control**

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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 Inductor/Varistor Panels to be manufactured and supplied to Australian Rail Track Corporation of NSW.

## Document History

**Primary Source** – RIC Standard SC 09 15 01 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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## Contents

1.	Introduction.....	6
2.	Referenced Documents.....	6
2.1	ARTC Specifications.....	6
2.2	Australian Standards .....	6
3.	General .....	6
4.	Operation Conditions.....	6
5.	Design Requirements.....	6
5.1	Ratings.....	6
5.2	Construction .....	6
5.3	Components.....	7
5.4	Wiring.....	7
5.5	Terminals .....	7
5.6	Labelling.....	7

## 1. Introduction

This Specification describes the general requirements for Inductor/Varistor Panels to be manufactured and supplied to Australian Rail Track Corporation of NSW.

## 2. Referenced Documents

### 2.1 ARTC Specifications

This Specification refers to the following ARTC Specifications and Standards:

Specification SPS 37 - Power Inductor

Specification SCP 04- Surge Protection Requirements

### 2.2 Australian Standards

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

## 3. General

Inductor/Varistor Panel shall be required to provide lightning surge suppression on AC and DC power supply mains.

The panel shall be referred to as the IVP-15, IVP-50 or IVP-100 as appropriate.

Panels with higher current ratings shall comply with this Specification as far as practicable considering the following factors:

- 1) Voltage drop across the IVP shall not exceed 2.0V at full load
- 2) Temperature rise at full rated current shall not be above 40 C at ambient temperature of 70 C.

## 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 Ratings

15, 50, 100 amperes AC or DC for IVP-15, IVP-50 and IVP-100 respectively

### 5.2 Construction

- a) Construction shall be in accordance with the drawing No M08-402. 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 10mm 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 failure.
- d) All material fittings, bolts, nuts, etc, shall be Nickel plated Brass.

### 5.3 Components

- a) The inductors shall be as specified in Specification 868 for IVP-50 and IVP-100
- b) The varistors shall be "GE" type V150HE150, "Siemens" type SIOVB32K150 or an approved type equivalent in voltage and power ratings.

### 5.4 Wiring

- a) All conductors shall be multi-stranded, with sizes and current ratings in accordance with AS 3000-1991.
- b) Minimum insulation shall be 0.6KV, V75 grade PVC
- c) All conductors shall be as short and as direct as possible with smooth curves of maximum practical radius.
- d) All conductors shall be terminated with suitable crimp lugs either pre-insulated doublegrip 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.

### 5.5 Terminals

The Earth Terminal shall be a 40mm long M6 Nickel plated Brass stud provided with 3 washers, two nuts and one lock nut.

Terminals labelled as "Line" and "Equipment" form part of the inductor and shall be as described in Specification SPS 37.

### 5.6 Labelling

- a) All labelling shall be permanently affixed, clearly legible, and of a material which will not fade due to weathering over time or repeated handling.
- b) Input and Output terminals shall be labelled "Line 1", "Line 2", "Equipment 1" and "Equipment 2" respectively. The Earth terminal shall be labelled "Signalling Earth".
- c) In addition the unit must be fitted with a readily visible label stating "IVP-15", "IVP-50" or "IVP-100" as appropriate, the manufacturer's identification and date of manufacture.