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No. S49-74

GOVERNMENT OF INDIA

MINISTRY OF RAILWAYS

(RAILWAY BOARD)



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INDIAN RAILWAY

STANDARD SPECIFICATION

for

ELECTRICAL POINT DETECTOR

(Tentative)

Serial No. S49-74

O. FOREWORD

1. This specification is issued under the fixed Serial No, S49 the final number indicates the year of original adoption as standard or in the event of revision, the year of last revision.

ADOPTED, 1974.

2. This specification requires reference to the following Indian Railway Standard (IRS) and Indian Standard (IS) specifications :

IRS : S10

Mechanical Signalling and Interlocking Equipment.

IRS : S23

Electrical Signalling and Interlocking Equipment (Tentative).

IRS : S24

Non-Trailable Electric Point Machine with plunger Type Locking

IS : 2106 (Part XI) ... Environmental tests for Electronic and Electrical Equipment : Part XI Water Spray test.

3. Wherever, in this specification, any of the above mentioned specifications is referred to by number only without mentioning the year of issue, the latest issue

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of that specification is implied; otherwise, the particular issue referred to is meant. This specification is intended chiefly to cover the technical provisions and the provisions relating to supply of the equipment and so does not include a necessary provisions of a contract.

1. SCOPE

1.1 This specification covers the requirements and tests for electrical point detector, hereinafter referred to as detector, used in railway signalling for detecting electrically the position of the point switches and if required the point lock.

1.2 The detector covered by this specification will be suitable for use with point operated mechanically, pneumatically or by power.

2. TERMINOLOGY

2.1 For the purpose of this specification, terminology given in IRS specification No. S 23* and S24** shall apply.

3. GENERAL REQUIREMENTS

3.1 The detector shall conform to the drawings approved by the purchaser.

3.2 The detector shall be suitable for fixing inside or outside the track, as specified by the purchaser, without infringing the standard moving dimensions.

3.3 The detector shall work with two or three slides as specified by the purchaser. The detector shall be provided with adjustable slides with lugs, if specified by the purchaser.

3.4 The detector mechanism and electrical contacts shall be mounted inside a metallic case accurately machined to enable all the moving parts to operate freely and without backlash.

3.5 The detector shall be water tight. A gasket shall be embedded in the rim of the case or cover of the detector to prevent ingress of water. A drain hole with a removable plug shall be provided to drain off accumulated water.

3.6 The entry slots for detector slides and lock plunger shall be fitted with suitable lubricating and wiping felt glands to prevent ingress of water inside the detector.

3.7 In a combined lock and detector, the slides for both the switches and the locking plunger shall be mechanically interlocked and the detection shall be possible only after the locking of the slides is complete.

*Electrical Signalling and Interlocking Equipment.

**Non-trailable electric point machine with plunger type locking.

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3.8 The detector cover shall be properly hinged, easily detachable, clamped with the case by wing nuts and provided with lugs for pad locking.

3.9 The detector contacts shall be cam-actuated.

3.10 The number of contacts shall be as specified by the purchaser. Adequate number of contacts shall be provided for cross protection.

3.11 All the contacts of a slide shall make and break at the same time. Suitable arrangement for adjustment shall be provided. The arrangement for adjustment of the contacts shall be such that both coarse and fine adjustments are possible and with a displacement of 3mm on any of the slides, all the contacts break.

3.12 Electrical contacts and springs shall comply with the requirements of clause 9 of IRS Specification S23*. The contacts and springs shall be protected from formation of rust or oxide coatings which may render the detector inoperative.

3.13 The detector shall be manufactured in accordance with the best engineering practices.

3.14 All exposed metal parts of the detector shall be plated, painted or otherwise protected against corrosion.

3.15 All parts of the detector shall be readily accessible for inspection, cleaning and oiling.

4. TESTS AND PERFORMANCE REQUIREMENTS

4.1 Tests given in clause 4.2 are Type Tests for which a minimum of one sample shall be tested. Acceptance Tests are given in Clause 4.3 and shall normally be carried out on all the detectors offered for inspection. However, when large sizes of lots are involved, the number of samples shall be agreed to between the purchaser and the manufacturer. Tests given in clause 4.4 are Routine Tests which shall be carried out by the manufacturer on all the detectors offered for inspection.

4.2 Type Tests.—The following shall constitute Type Tests and shall be carried out in the sequence given below :

- a) Visual Inspection (Clause 4.5)
- b) Applied High Voltage Test (Cl. 4.6)
- c) Insulation Resistance Test (Cl. 4.7)
- d) Tests for Electrical Contacts and Springs (Cl. 4.8)
- e) Life Test (Cl. 4.9)
- f) Driving Rain Test (Cl. 4.10)

*Electrical Signalling and Interlocking Equipment.

4.3 Acceptance Tests.—The following tests shall constitute Acceptance Tests and shall be carried out in the sequence given below :

- a) Visual Inspection (Clause 4.5)
- b) Applied High Voltage Test (Cl. 4.6)
- c) Insulation Resistance Test (Cl. 4.7)
- d) Tests for Electrical Contacts and Springs (Cl. 4.8)

4.4 Routine Tests.—The following tests shall be carried out as Routine Tests in the sequence given below :

- a) Visual Inspection (Clause 4.5)
- b) Applied High Voltage Test (Cl. 4.6)
- c) Insulation Resistance Test (Cl. 4.7)
- d) Tests for Electrical Contacts and Springs (Clauses 4.8.1 and 4.8.2 only).

4.5 Visual Inspection.—The detector shall be visually inspected for compliance with the requirements of clause 3 of this specification, and relevant sub-clauses of clause 14.2 of IRS Specification S23* and of clause 8.3 of IRS Specification S10**.

4.6 Applied High Voltage Test.—The detector shall withstand for one minute a test voltage of 2000 V (RMS) applied between all parts of electrical circuits and other metallic parts insulated therefrom without puncture and arcing. The test voltage shall be approximately of sinusoidal wave form and of any frequency between 50 Hz. and 100 Hz.

4.7 Insulation Resistance Test.—This test shall be made immediately after the Applied High Voltage Test. Insulation resistance shall be measured between electrical contacts and earth. Insulation resistance shall be measured at Voltage of 500V DC and shall not be less than 10 megohms.

4.8 Tests for Electrical Contacts and Springs

4.8.1 Tests shall be conducted to ensure that the normal or reverse contacts, and snub contacts if provided, open before the shunt contacts close ; and snub contacts if provided, close.

4.8.2 The initial contact pressure in closed position when measured very near the point of contact shall not be less than 275 gms.

4.8.3 The initial contact resistance shall not exceed 0.03 ohms. The resistance shall be measured when the contact is carrying a direct current of 100mA.

4.9 Life Test.—The detector shall be tested for one lakh cycles of operation perated at the rate of 10 cycles per minute. During the test, the contacts shall be connected to a non-inductive circuit carrying a current of 100mA. On completion of the test, the detector shall satisfy the following :

- a) The detector shall be checked for performance.

No part (s) of the detector shall show any sign of breakage, fatigue or erratic behaviour.

*Electrical Signalling and Interlocking Equipment.

**Mechanical Signalling and Interlocking Equipment.

- b) The contact resistance shall not exceed 0.060 ohms.

- c) The loss in contact pressure shall not exceed two percent of the initial contact pressure.

4.10 Driving Rain Test.—The detector shall be subjected to Water Spray Test as per IS : 2106 (Pt. XI)* to simulate the effect of driving rain. At the end of the test, the detector shall be visually inspected. No ingress of water shall take place inside the detector case. The detector shall then be subjected to Applied High Voltage Test as per clause 4.6 for one minute. No puncture or arcing shall take place. The insulation resistance measured in accordance with clause 4.7 shall not be less than 10 megohms.

5. MARKING.

5.1 A name plate clearly and indelibly marked with the following information shall be attached on the outside of detector at a conspicuous position :

- a) Name or trade mark of the manufacturer.
- b) IRS No.
- c) Serial No.
- d) Year of manufacture.

5.2 The detector frame and cover shall have the letters 'I. R. S.' and name or trade mark of the manufacturer stamped or cast thereon.

5.3 All parts of the detector, when the size permits, shall have the letters 'I. R. S.' and the part number, stamped or cast thereon, in letters and figures of suitable size.

6. PACKING.

6.1 The detector shall be so packed as to permit convenient handling and to protect against loss or damage during transit and storage.

APPENDIX A

INFORMATAION TO BE GIVEN BY THE PURCHASER

- A-1** Whether the detector is required to be fixed inside or outside the track (Clause 3.2)
- A-2** Number of slides required (Clause 3.3)
- A-3** Number of electrical contacts required (Clause 3.10)

*Environmental tests for electronic and electrical equipment :
Part XI water spray test.

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The General Manager/Metro,
Calcutta.

The General Manager/RE,
Allahabad.

Director,
IRISEL,
Allahabad.

Sub: IRS Specification for Electrical
Point Detector - Amendment No.1-90
to IRS: S49-74.

...

Based on the experience gained during type approval tests on electrical point detectors in this office, the following amendments to the above specification are being carried out:-

Clause 3.6 - The existing clause 3.6 may be deleted and the subsequent clauses 3.7 to 3.15 may be renumbered.

Clause 4.9(c) - The existing clause may be amended as under:

"(c) The loss in contact pressure shall not exceed ten per cent of the initial contact pressure, "

2. Other Clauses of the above specification shall remain unchanged. The amendments may please be incorporated suitably in the specification copies available with you.

DA: nil

Eshwar
21/5/90
(D. Eshwar)
for Director General (Signal)

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