सत्यमेव जयते

INDIAN RAILWAY STANDARD SPECIFICATION FOR INSPECTION AND TESTING OF SM'S CONTROL FRAME

(TENTATIVE)

SPECIFICATION NO. IRS: S 48 -74

Revision 0.0

Number of pages: 11

SIGNAL DIRECTORATE
RESEARCH DESIGNS & STANDARDS ORGANISATION
LUCKNOW-226011

DOCUMENT DATA SHEET			
Designation **IRS: S 48-74**			**Revision** **0.0**
Title of Document **Indian Railway Standard Specification for Inspection and Testing of SM's Control Frame**			
Authors **Director/ Signal/ RDSO**			
Approved by **Sr. Executive Director/ Signal, RDSO**			
Abstract This document specifies Technical specification for Inspection and Testing of SM's Control Frame.			

DOCUMENT CONTROL SHEET

NAME	ORGANIZATION	FUNCTION	LEVEL
Director/ Signal	**RDSO**	**Member**	**Prepare**
Sr. Executive Director/ Signal	**RDSO**	**-**	**Approve**

Converted into electronic form on 07.11.2005

Prepared By: K.C.Bharti
Sr. Section Engineer / Signal

Checked By: R. Sahariya
Asstt. Design Engineer

AMENDMENTS

Version	Chapter/ Annexure	Amendment	Effective date
IRS: S 48/1974		FIRST ISSUE	1974

TABLE OF CONTENTS

Government of India
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

सत्यमेव जयते

INDIAN RAILWAY STANDARD SPECIFICATION
for
INSPECTION AND TESTING OF SM'S CONTROL FRAME
(Tentative)

SPECIFICATION NO. IRS: S 48-74

0. FOREWORD

0.1 This specification is issued under the fixed Serial No. S 48, the final number indicates the year of original adoption as standard or in the event of revision, the year of the last revision.

ADOPTED, 1974

0.2 This specification requires reference to the following Indian Railway Standard (IRS) Specifications:

IRS : S 10 Mechanical Signalling and Interlocking Equipment.

IRS : S 23 Electrical Signalling and Interlocking Equipment (Tentative).

0.3 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 of that specification is implied otherwise, the particular issue referred to is meant.

0.4 This specification is intended chiefly to cover the technical provisions and the provisions relating to supply of the equipment and so does not include all the necessary provisions of a contract.

1. SCOPE

1.1 This specification covers the inspection and testing requirements of Station Master's Control Frame, hereinafter called the control frame, used in railway signalling.

2. TERMINOLOGY

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

3. GENERAL REQUIREMENTS

3.1 The control frame shall conform to the drawings approved by the purchaser.

3.2 The control frame shall be manufactured in accordance with the best engineering practice.

3.3 All exposed metal parts of the control frame shall be plated, painted or otherwise protected against corrosion.

3.4 All parts of the control frame shall be readily accessible for inspection, repair and maintenance.

3.5 No part of the control frame shall get out of order or displaced due to vibration or other causes as may be met in railway usage.

3.6 The control frame shall be provided with sealing and locking arrangement.

3.7 The slides of the control frame shall be properly machined so that the movement of the slides is free and without any sticking and undue rubbing. The slides shall be held in the last operated position.

3.8 Unless otherwise specified, the stroke of the slides shall be 20 $\pm$ 1 mm.

3.9 The number of slides and contacts shall be as specified by the purchaser.

3.10 All contacts of a slide shall make and break at the same time.

3.11 Electrical contacts and springs shall be of phosphor bronze or any other suitable material approved by the purchaser. The contacts and springs shall be protected from formation of rust or oxide coatings which may render the control frame inoperative.

---

* Electrical signalling and interlocking equipment.

3.12 The contact springs shall be of uniform thickness. The surface of contact springs shall be smooth and free from defects like scratches, pits, etc.

3.13 If required by the purchaser, mechanical interlocking between various slides of the control frame shall be provided.

4. TEST 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 4.3. A recommended sampling procedure for acceptance of lots is given in Appendix 'B'. Tests given in clause 4.4 are routine tests which shall be carried out by the manufacturer on all the control frames offered for inspection.

NOTE- When large sizes of lots are involved, the number of samples shall be agreed to between the purchaser and the manufacturer.

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 (clause 4.6),
c) Insulation Resistance Test (clause 4.7),
d) Tests for Electrical Contacts and Springs (clause 4.8), and
e) Life Test (clause 4.9).

4.3 **Acceptance tests**- The following shall constitute acceptance tests:

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

4.4 **Routine tests**- The following shall constitute routine tests:

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

4.5 **Visual Inspection**- The control frame 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 S 23* and of clause 8.3 of IRS Specification S 10**.

* Electrical signalling and interlocking equipment.
** Mechanical signalling and interlocking equipment.

4.6 **Applied High Voltage Test**- The control frame 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 sinu-soidal wave form and of any frequency between 50 Hz and 100 Hz.

4.7 **Insulation Resistance Test**- This test shall be carried out immediately after the Applied High Voltage Test. Insulation resistance shall be measured between individual insulated circuits and earth. Insulation resistance shall be measured at a voltage not less than 500 V dc and it shall not be less than 10 meg ohms.

4.8 **Tests for Electrical Contacts and Springs**

4.8.1 The initial contact pressure in closed position when measured at the free end of the spring shall not be less than 200 gms.

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

4.9 **Life Test**- The control frame shall be tested for one lakh cycles of operation at the rate of 10 makes and breaks per minute. During the test, the contact shall be connected to a non-inductive circuit carrying a current of 100 mA. On completion of the test, the control frame shall satisfy the following:

a) The control frame shall be checked for performance. No part(s) of the control frame shall show any sign of breakage, fatigue or erratic behaviour.
b) The contact resistance shall not exceed 0.06 ohm.
c) The loss in contact pressure shall not exceed 2% of the initial contact pressure.

5. MARKING

5.1 The name plate clearly and indelibly marked with the following information shall be attached on the outside of the control frame at a conspicuous position.

a) Name or trade mark of the manufacture.
b) IRS number.
c) Serial number.

5.2 The parts of the control frame when the size permits, shall have the letters IRS and the part number stamped or cast thereon in letters and figures of suitable size.

6. PACKING

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

APPENDIX A

INFORMATION TO BE SUPPLIED BY THE PURCHASER

A-1 The following information shall be supplied by the purchaser when ordering control frames to this specification:-

a) Drawing No. (clause 3.1).
b) No. of slides and contacts (clause 3.9).
c) Whether interlocking between slides required, If so, the interlocking table (clause 3.13).
d) Any other requirement.

APPENDIX- B

(Clause 4.1)

SAMPLING FOR ACCEPTANCE OF LOTS

B-1. **LOT**

B-1.1 In any consignment, all the control frames of the same type manufactured by the same factory during the same period, shall be grouped together to constitute a lot.

B-1.2 From each lot a certain number of control frames (as specified in Table 1) shall be selected at random and subjected to the tests specified in clause 4.3 or to tests as agreed between the purchaser and the manufacturer.

B- 2 **CRITERION FOR CONFORMITY**

B-2.1 The actual number of control frames to be selected from a lot shall be in accordance with Table 1. In this table, N1 is the size of the first sample. If the number of failures found in this sample is less than or equal to C1, the lot shall be considered to be conforming to this specification and accepted. If the number of failures is greater than or equal to C2, the lot shall be rejected. If the number of failures is between C1 and C2, further samples of N2 pieces shall be taken and subjected to all tests. If the total number of failures in the two samples is less than C2, the lot shall be accepted, otherwise the lot shall be rejected.

TABLE 1 SAMPLING PLAN

Lot size	N1	N2	(N1+N2)	C1	C2
Under 25	3	6	9	0	2
25 to 50	7	14	21	0	3
51 to 100	10	20	30	0	3
101 to 200	13	26	39	0	5
201 to 300	20	40	60	1	5
301 to 500	25	50	75	1	6
501 to 800	35	70	105	2	7
801 to 1300	50	100	150	3	10
Above 1301	75	150	225	5	12