

**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)
INDIAN RAILWAY**



**STANDARD SPECIFICATION
for
AC IMMUNISATION CHARACTERISTICS OF DC NEUTRAL TRACTIVE
ARMATURE MINIATURE PLUG-IN TYPE LINE RELAYS FOR RAILWAY
SIGNALLING
(Tentative)**

Serial No. IRS:S 60-78.

0. FOREWARD

- 0.1 This specification is issued under fixed serial No. S:60; the final number indicates the year of original adoption as standard or in the case of revision, the year of last revision.

ADOPTED 1978

- 0.2 This specification requires reference to the following Indian Railway Standard (IRS) specifications:-
- | | | |
|------|----------|---|
| i) | IRS:S 23 | Electrical signalling and interlocking equipment |
| ii) | IRS:S 34 | Testing railway signalling relays (General) |
| iii) | IRS:S 42 | Tractive armature, shelf type, direct current neutral line relays (non-proved type) for railway signalling. |
- 0.3 Wherever in this specification, any of the above mentioned specifications is referred to by numbers only without mentioning the year of issue, the latest issue of the specification is implied, otherwise the particular issue referred to is meant.
- 0.4 This specifications 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 relates only to the requirements of AC immunisation characteristics of line relays miniature plug-in types, for use in signalling circuits in 25KV, 50Hz single phase AC electrified sections where the maximum induced voltage under normal working conditions is limited to 300V AC and does not cover the design and other characteristics of the relays which shall be to an approved specifications.

2. AC IMMUNISATION CHARACTERISTICS

- 2.1 The relays design shall be inherently such that the AC immunisation is achieved intrinsically without use of any external means.
- 2.2 The relay shall not make any of its front contacts as a result of 1000V (r.m.s.), single phase, 50Hz. sinusoidal AC voltage applied abruptly at any instant of the 50Hz. cycle to the terminals of the coil(s) of the relay. The testing circuit shall be as shown in Appendix 'A'.
- 2.3 The relay shall not break any of its back contacts as a result of 300V (r.m.s.), single phase, 50Hz. sinusoidal AC voltage applied gradually and abruptly at any instant of the 50Hz. cycle to the terminals of the coil(s) of the relay. The testing circuit shall be as shown in Appendix 'A'.
- 2.4 The pick-up transfer and release transfer operating times of the relay shall not exceed 200 ms when the relay is energised at 80% rated voltage with an ambient temperature of 20°C.

2.5 Slow to operate relays

- 2.5.1 Relays used as repeating relays for a pick-up (open type) track circuit for Block Release shall have a pick-up time of 700 ms (min.) and release time of 500 ms (min.). The test shall be made when the relay is energised at the rated voltage at 20°C.
- 2.5.2 Relays used as repeating relays for (closed type) track circuit provided with plug-in type AC immunised track relays shall have a pick-up time (time between applying energy to the coil and making of the first front contact at least 400 ms in excess of the release time (time between opening the coil circuit and breaking of last front contact). This release time shall be 200 ms (max.). the timings shall be measured when the relay is energised at the rated voltage at 20°C.
- 2.5.3 (a) Relays controlling the changeover of shelf type line relays with a pick-up transfer time of 450 ms maximum shall have a delayed release (non-mechanical) of 500 ms (Min.).
 (b) This time shall be 250 ms (min.) for relays controlling changeover of plug-in type relays with a pick-up transfer time of 200 ms (maximum).
 (c) For use in Automatic Signalling section the delayed release timing shall, however, be 600 ms minimum.

The timings in (a), (b) & (c) above shall be measured when the relay is energised at 80% of the rated voltage at 20°C.

- 2.5.4 For relays, not covered by this specification, the special requirements shall be prescribed by the purchaser.

3. INSPECTION AND TESTING

- 3.1 General requirements of inspection and testing shall be according to IRS:S 23* and IRS:S 34** to the extent applicable. The relays shall also be tested as per their approved specification.

*Electrical signalling and interlocking equipment

**Testing railway signalling relays (General)

3.2 Type tests – The following shall constitute the type tests:-

- 3.2.1 1000V AC immunisation test - (Cl. 2.2)
- 3.2.2 300V AC immunisation test - (Cl. 2.3)
- 3.2.3 Test for timing characteristics - (Cl. 2.4 & 2.5) for slow to operate relays.

3.3 Routine Test:- The following shall constitute the routine tests which shall be carried out by the manufacturer on each and every relay to be supplied.

- 3.3.1 300V AC immunisation test - (Cl. 2.3)
- 3.3.2 Test for timing characteristics - (Cl. 2.4 & 2.5) for slow to operate relays.
- 3.3.3 Any other tests which the manufacturer may perform to ensure that the relays meet the requirements of this specifications.

3.4 Acceptance Tests – The following shall constitute the acceptance tests which shall be carried out by the inspecting authority for the purpose of accepting the lots offered for inspection.

- 3.4.1 300V AC immunisation test - (Cl. 2.3)
- 3.4.2 Test for timing characteristics - (Cl. 2.4) for slow to operate relays.
- 3.4.3 Any other test which the inspecting authority considers necessary for the purpose of ascertaining that the relays offered for inspection meet the requirements of this specifications.

3.5 Sampling

- 3.5.1 The sampling plan shall be in accordance with IRS:S 34*.

3.6 Testing Method

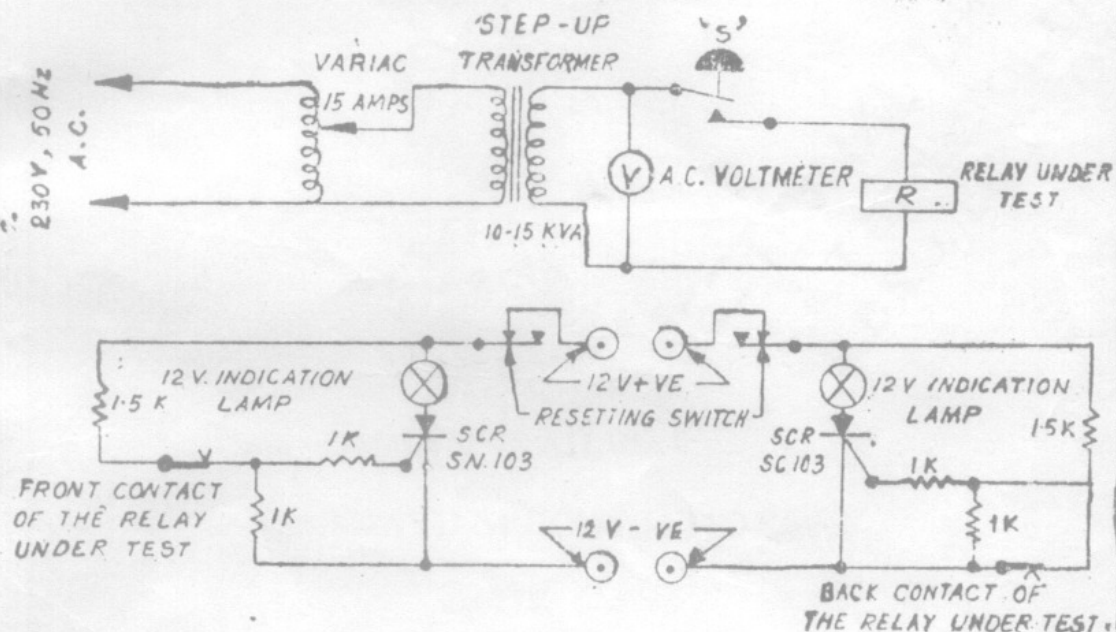
- 3.6.1 The testing circuit for AC immunisation test shall be as shown in Appendix 'A'.
- 3.6.2 For timing and other tests, the relevant testing method referred to in IRS:S 53* or the particular specification of the relay, as the case may be shall be followed.

*Testing railway signalling relays (General)

** Tractive armature, shelf type, direct current, neutral line relay (non-proved type) for Railway signalling

IRS: S 60-78

APPENDIX A (CLAUSE 2.2 & 2.3)



INDICATION CIRCUIT FOR THE
MOMENTARY/STEADY MAKE
OF THE FRONT CONTACT

INDICATION CIRCUIT FOR THE
MOMENTARY/STEADY BREAK
OF THE BACK CONTACT

CIRCUIT FOR TESTING 'IMMUNISA- TION CHARACTERISTICS OF A RELAY TO APPLICATION OF A.C. VOLTAGES

- 5 IN PLACE OF THE INDICATION CIRCUIT SHOWN ABOVE AN OSCILLOSCOPE MAY BE USED FOR INDICATION.
- 4 THE INSTANT OF APPLICATION IN THE CYCLE SHOULD NORMALLY BE SET BY A CHRONOSTARTER, TILL SUCH TIME AS A CHRONOSTARTER IS NOT AVAILABLE AT LEAST 10 APPLICATIONS AT RANDOM INTERVALS MAY BE MADE FOR THIS TEST.
- 3 THERE SHALL BE AN INTERVAL OF 1 SEC. MINIMUM BETWEEN TWO ABRUPT APPLICATIONS OF VOLTAGE
- 2 THE SWITCH-S IS MANUALLY OPERATED FOR ABRUPT APPLICATION OF AC VOLTAGE AT DIFFERENT INSTANTS/PHASE ANGLES OF THE AC CYCLE
- 1 VOLTAGE REGULATION OF THE STEP UP TRANSFORMER SHOULD BE AS LOW AS POSSIBLE AND THE VOLTMETER READING SHOULD BE TAKEN AFTER CLOSING THE SWITCH-S.

NOTE

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Government of India - Ministry of Railways
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No. STS/E/Relays/Genl. Misc. Vol. XII

25th July 2017

मुख्य संकेत एवं दूरसंचार अभियन्ता, मुख्य संकेत एवं दूरसंचार अभियन्ता (निर्माण), मुख्य संकेत एवं दूरसंचार अभियन्ता (प्रॉजेक्ट)	Chief Signal & Telecom Engineer, Chief Signal & Telecom Engineer (Const.), Chief Signal & Telecom Engineer (Project)
मध्य रेलवे, मुम्बई सी.एस.टी. – 400 001	Central Rly, Mumbai CST – 400 001
पश्चिम रेलवे, चर्च गेट, मुम्बई – 400 020	Western Rly, Churchgate, Mumbai – 400 020
पूर्व रेलवे, फेयरली प्लेस, कोलकाता – 700 001	Eastern Rly, Fairlie Place, Kolkata – 700 001
दक्षिण पूर्व रेलवे, गार्डन रीच, कोलकाता – 700 043	South Eastern Rly., Garden Reach, Kolkata – 43
उत्तर रेलवे, बड़ौदा हाउस, नई दिल्ली – 110 001	Northern Rly., Baroda House, New Delhi – 01
पूर्वोत्तर रेलवे, गोरखपुर – 273 012	Northeastern Rly., Gorakhpur – 273 012
पूर्वोत्तर सीमान्त रेलवे, मालीगांव, गुवाहाटी – 780 011	North Frontier Rly., Maligaon, Guwahati – 011
दक्षिण रेलवे, पार्क टाउन, चेन्नई – 600 003	Southern Rly., Park Town, Chennai – 600 003
दक्षिण मध्य रेलवे, सिकन्दराबाद – 500 371	South Central Rly, Rail Nilayam, Secunderabad– 71
पूर्व मध्य रेलवे, हाजीपुर – 841 101	East Central Railway, Hazipur - 841 101
उत्तर पश्चिम रेलवे, जयपुर – 302 006	North Western Railway, Jaipur – 302 006
पूर्व तटीय रेलवे, ग्राउन्ड तल, उत्तरी ब्लॉक, समन्त बिहार, भुवनेश्वर – 17	East Coast Railway, Rail Vihar, Ground floor, North Block, Samant Vihar, Bhubaneswar – 17
उत्तर मध्य रेलवे, गंगा कॉम्प्लेक्स, सूबेदारगंज, इलाहाबाद	North Central Railway, Ganga Complex, Subedarganj, Allahabad.
दक्षिण पश्चिम रेलवे, मुख्य कार्यालय, क्लब रोड, केशवपुर, हुबली – 580 023	South Western Railway, Main Office, Club Road, Keshavpur, Hubli – 23
पश्चिम मध्य रेलवे, द्वितीय तल, डी.आर.एम. ऑफिस, जबलपुर – 482 001	West Central Railway, II nd Floor, DRM Office, Jabalpur – 482 001
दक्षिण पूर्व मध्य रेलवे, आर0ई0 ऑफिस कॉम्प्लेक्स, बिलासपुर – 495 004	South East Central Railway, R. E. Office Complex, Bilaspur – 495 004
मेट्रो रेलवे, 33/1, जवाहर लाल नेहरू रोड, कोलकाता – 700 071	Metro Railway, 33/1, Jawaharlal Nehru Road, Kolkata – 700071
कोर , नवाब युसुफ रोड, सिविल लाइन्स, इलाहाबाद – 211 001	CORE, Nawab Yusuf Road, Civil Lines, Allahabad –211 001
निदेशक/इरिसेट, तारनाका रोड, लालागुडा, पी. ओ. सिकन्दराबाद – 17	Director/IRISET, Tarnaka Road Lallaguda, P.O. Secunderabad –17

Sub: Amendment No. 1 to the Specification No. IRS : S - 60/78 for A.C. Immunisation Characteristics of D.C. Neutral Tractive Armature Miniature Plug-in type Line Relays for Railway Signalling.

In compliance to Vigilance Cell/RDSO's letter No. 13/Vig/Policy dtd. 26.07.16 & 08.09.16, Amendment No. 1 to the Specification No. IRS:S-60/78 for A.C. Immunisation Characteristics of D.C. Neutral Tractive Armature Miniature Plug-in type Line Relays for Railway Signalling is hereby issued with the approval of competent authority for information & implementation please.

DA: Copy of Amendment No. 1 to the
Specification No. IRS : S - 60/78.

(V. K. Agarwal)
Jt. Director/Signal
for Director General/Signal

25/07/17

Copy to :-

कार्यकारी निदेशक / गुणवत्ता आश्वासन / अ०अ०मा०सं०, लखनऊ	Executive Director/QA/S&T/RDSO/Lucknow
निदेशक / गुणवत्ता आश्वासन / सिगनल एवं दूरसंचार, / अ०अ०मा०सं०, निकट इरकॉट बिल्डिंग, शंकर मार्केट के पीछे, शिवाजी ब्रिज, नई दिल्ली – 110 001	Director/QA/S&T/RDSO, 1st Floor, Near IRCOT Building, Behind Shanker Market, Shivaji Bridge, New Delhi – 110 001
निदेशक / गुणवत्ता आश्वासन / संकेत एवं दूरसंचार, / अ०अ०मा०सं०, प्रथम तल, न्यू एनेक्सी बिल्डिंग, चर्चगेट, पश्चिम रेलवे, मुंबई – 400 020	Director/QA./S&T/RDSO, 1st Floor, New Annexe Building., Western Railway, Churchgate, Mumbai – 400 020
निदेशक / गुणवत्ता आश्वासन / सिगनल एवं दूरसंचार, / अ०अ०मा०सं०, भूतल, डी०आर०एम० ऑफिस, बंगलोर – 560 023	Director/QA./S&T/RDSO, Ground Floor, DRM Office, Bangalore – 560 023
निदेशक / गुणवत्ता आश्वासन / सिगनल एवं दूरसंचार, / अ०अ०मा०सं०, चौथी मंजिल, 17 एन.एस. रोड, वेस्ट विंग, फेयरली प्लेस, कोलकाता – 700 001	Director/QA./S&T/RDSO, 4th Floor, 17 N.S. Road, West Wing, Fairlie Place, Kolkata – 700 001
निदेशक / गुणवत्ता आश्वासन / सिगनल एवं दूरसंचार, / अ०अ०मा०सं०, हसनपुरा रोड, जयपुर – 302 006	Director/QA/S&T/RDSO, Hasanpura Road, In Front of Railway Hospital, JAIPUR – 302 006
1. M/s. Siemens Ltd., 130, Pandurang Budhkar Marg, Worli, Mumbai – 18	
2. M/s. Integra Engineering India Ltd., P.O. No. 55, Chandrapura Village, Tal. : Halol, Distt. Panchmahals – 389 350 (Gujarat)	
3. M/s. AEW Technology LLP, 32/J, Sahitya Parishad Street, Ground Floor, Kolkata – 700 006	
4. M/s Crompton Greaves Ltd., Signalling Relay Unit, 11-B, Industrial Area No. 1, Pithampur, Disstt. Dhar – 454775	
5. M/s. Eldyne Electro Systems Pvt. Ltd., EP-14/1, Praffula Kanan (Off. VIP Road), Krishanpur, Kolkata – 700 059	
6. The Chief Workshop Manager, Signal Workshop, Southern Railway, Podanur – 641 023	
7. M/s. Instrumentation Ltd., Signalling Division, Kota – 324 005. (RAJASTHAN)	
8. M/s. Cosine Comm. & Electronics (P) Ltd., Plot No. 150, C&F, IDA Phase-II, Cherlapally, Hyderabad-51	
9. M/s. Orient Relay & Equipments, 69/1/7, Diamond Harbour Road, Kolkata – 700 038	
10. M/s. Hytronics Enterprises, 24-B, Electronics Complex, Kushaiguda, Hyderabad – 500 762.	
11. M/s. Ultra Electronic Pvt. Ltd., 32B, Ganesh Chandra Avenue, Ground Floor, Kolkata – 700 013.	
12. M/s. Westinghouse Saxby Farmer Ltd., 17, Convent Road, Entally, Kolkata – 700 014.	
13. The Chief Workshop Manager, Signal Workshop, N.E. Railway, Gorakhpur – 273 008	
14. M/s. Demson & Co., A-16, SIDCO Industrial Estate, Villivakkam, Chennai – 600 049.	

DA: Copy of Amendment No. 1 to the
Specification No. IRS : S - 60/78.

(V. K. Agarwal)
Jt. Director/Signal
for Director General/Signal

28/07/17

Amendment No. 1

To

RDSO Specification No. IRS : S - 60/78

For

**A.C. Immunisation Characteristics of D.C. Neutral Tractive Armature
Miniature Plug-in type Line Relays for Railway Signalling**

Following new clause is added to the Specification No. IRS : S - 60/78 for A.C. Immunisation Characteristics of D.C. Neutral Tractive Armature Miniature Plug-in type Line Relays for Railway Signalling.

Clause No. 4

“All the provisions contained in RDSO’s ISO procedures laid down in Document No. QO-D-7.1-11 dated 19.07.2016 (titled “Vendor Changes in approved status”) and subsequent versions/amendments thereof, shall be binding and applicable on the successful vendor/vendors in the contracts floated by Railways to maintain quality of products supplied to Railways”.

End of Amendment No. 1