

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

**INDIAN RAILWAY STANDARD SPECIFICATION**

**FOR**

**SINGLE LINE TOKENLESS BLOCK INSTRUMENT HANDLE TYPE  
(Tentative)**

Serial No. S 98-2001

**0. Foreword**

- 0.1 This specification is issued under the fixed serial number S-98, the final number indicates the year of original adoption as IRS standard, or in the case of revision, the year of last revision.

**ADOPTED, 2001**

- 0.2 This specification requires reference to the following Indian Railway Standard (IRS), Indian Standard (IS) & British Railway Standard (BRS) specifications.

IRS:S 23-83

Specification for Electrical Signalling and Interlocking equipment.

IS:9000

Basic Environmental Testing Procedure for Electronics and Electrical items.

BRS 930A

Miniature Tractive Armature D.C. Neutral Line Relay, Plug-in Type for Railway Signalling Purposes.

BRS 931A

Miniature Tractive Armature D.C. Neutral Line Relay, AC Immune, Plug-in Type for Railway Signalling Purposes.

BRS 932A

Miniature Tractive Armature D.C. Biased Line Relay AC Immune, Plug-in Type for Railway Signalling Purposes.

BRS 960

Miniature twin Tractive Armature D.C. Neutral line Relay, Plug-in Type for Railway Signalling Purposes.

BRS 960A

Miniature twin Tractive Armature D.C. Neutral Line Relay, AC Immune, Plug-in Type

for Railway Signalling Purposes. British Transport Commission.

IRS:S 61-2000

Electronic Fail Safe Timer for Railway Signalling Purposes.

IRS:S 79-92

Specification for Multi-way Isolating Terminal Blocks (Barrier type) for signalling installations.

- 0.3 This specification is intended mainly to cover the technical provisions and provisions relating to the general requirements of the equipment and supply of materials and does not include all the necessary provisions of a contract.

## 1. **Scope**

- 1.1 This specification covers the general requirements of Handle type Single Line Tokenless Block Instrument for use in RE as also in Non-RE sections of Indian Railways.
- 1.2. Special arrangements for controlling outlying siding in the Block Section shall be provided in the instrument, when required by the Purchaser.
- 1.3 This specification does not cover the requirements of all the associated devices used in conjunction with the block instrument for its working.

## 2. **Manufacture**

- 2.1 The manufacturer shall ensure that in addition to all the provisions of this specification, the requirements of the Indian Railway Standard Specification No. S 23, and any approved drawings and specifications supplied/referred to by the purchaser are fully complied with.

## 3. **System Configuration**

The following components shall be provided within the block instrument:-

- I) Galvo:- To indicate incoming / outgoing DC current.
- II) Time Release Indicator:- To indicate the operation of time element relay during cancellation.
- III) 'TRAIN ON LINE' indicator:- To indicate entry of train into block section.
- IV) Switch S1 with Counter:- For cancellation of line clear.
- V) Switch S2 with Counter:- For normalising the instrument during push back operation.
- VI) Push button PB1:- To transmit bell codes for exchange of bell codes.
- VII) Push button PB2:- Used in conjunction with PB1 to transmit frequency modulated codes for operation of Block Handle cum Indicator at other station.
- VIII) Block handle:- To be operated to send/receive trains.
- IX) Single stroke bell hereafter called 'BELL':- To receive bell code. It may be

electromagnetic/electronic.

- X) Buzzer:- Two electronic buzzers BZ1(Whooping type) – for train entering into the block section and BZ2 (Continuous type) for train arriving into station areas.
- XI) SM's Key:- To avoid unauthorised operation in the absence of SM.
- XII) Shunting Key:- To permit shunting between last stop and opposing first stop signal under certain condition.
- XIII) Siding Key:- To be provided if outlying siding exists between two stations.
- XIV) Transmitter & Receiver:- For transmission and reception of frequency modulated code between station.
- XV) Telephone:- For communication between two stations.

#### 4. **Indicators & Counters**

- 4.1 The instrument shall be provided with visual indicators giving the following indications:-
  - 4.1.1 'Line Closed':- When the instrument is normal and there is no train in block section.
  - 4.1.2 'Train Going To':- When 'Line Clear' for train to leave block station has been received from block station ahead.
  - 4.1.3 'Train Coming From':- When 'Line clear' for train to leave block station in rear has been given.
  - 4.1.4 The indications mentioned in 4.1.1 to 4.1.3 shall be through a mechanically operated block handle. The upright position of the handle shall show 'Line Closed'; the horizontal position to the left shall show 'Train Going To' and the horizontal position to the right shall shown 'Train Coming From'. Labels to indicate the above mentioned three positions shall be provided and the block handle shall be of such a design that the position in which it is lying can be easily distinguished.
- 4.2 'Train on Line':- An indicator to indicate automatically, the entry of train into block section.
- 4.3 The block handle shall be provided with an electric locking device which shall lock the handle in the position indicated in Cl. 4.1.1, 4.1.2 & 4.1.3. This device shall be of forced-drop type to prevent faulty operation due to residual magnetism or other causes. The forced drop device shall be easy to inspect.
- 4.4 A Galvo operated by incoming and outgoing line currents shall be provided. It shall be suitably damped. It shall also indicate the actual instant of operation of the block handle of the connected instrument by a momentary click.
- 4.5 A 'SIGNAL NORMAL' indicator shall be provided to indicate normal condition of all controls pertaining to reception and despatch of trains.
- 4.6 A 'TIME RELEASE' indicator indicating maturity of 120 second cancellation timer.
- 4.7 A 'NORMAL' cancellation counter to indicate the number of cancellation for records and a 'PUSH BACK' counter for register of push back operation.
- 4.8 Any other additional indication as specified by the purchaser.

#### 5. **Control**

- 5.1 The block instrument shall be such that:-
  - 5.1.1 The SM has to go through one or more definite moving operations of the Block handle in addition to working of bell push button before:-
    - I) 'Line Clear' to the SM at the other end of the Block Section.
    - II) Receiving the 'Line Clear' even with the permission of the SM at the other end of

the 'Block Section'.

- III) Grant of permission to the SM at the receiving end and to close the block section after the arrival of a train.
- 5.1.2 The last stop signal can not be taken 'OFF' until such time the instrument has been operated to 'Train going To' position at the despatching end station and to 'Train Coming From' position at the receiving end station.
- 5.1.3 The block handle has a check lock position in addition to the normal lock position while being turned from 'Line Closed' to 'Train Going To'.
- 5.1.4 It provides means for exchange of bell codes by the operation of a single stroke bell.
- 5.1.5 It ensures that the Last Stop Signal of the block station, which shall be replaced to 'ON' by the entry of train into the block section, is maintained in that position until the train has cleared the block section, and the instruments have been put back to 'Line Closed' position and again set as in Cl. 5.1.2 above.
- 5.1.6 It is possible to take 'OFF' the Last Stop Signal any number of times so long as the instruments are maintained as in para 5.1.2 and train has not entered the block section and cancellation as given in Cl. 6 has not been done.
- 5.1.7 It gives visual 'Train on Line' indication on the instruments at both despatching and receiving and stations, in addition to the ringing of buzzer at from receiving station when a train passes the last stop signal, and enters the block section. The buzzer may also ring at despatch station. The buzzer shall silence on acknowledgement sent by pressing and PB1 at receiving station.
- 5.1.8 It ensures the block handles to be maintained in position as in Cl. 5.1.2 above on the entry of the train into the block section until the train has cleared the block section.
- 5.1.9 That it prevents last stop signals of the block section to be taken 'OFF' at one and the same times.
- 5.1.10 The block clearance relay is energised through the last vehicle track circuit to ring a train arrival buzzer at the station, after the passage of the last vehicle of the train received on proper signals. The circuit for last vehicle effect shall be directional.
- 5.1.11 It is not possible to make any operation of block handle, unless all relevant signals are proved at 'ON'.
- 5.1.12 Unless all relevant signals are proved at 'ON' it shall not be possible to receive or despatch any code for operation of block handle, except automatic "Train on Line" code and code of bell signals.
6. **Cancellation of line clear**
- 6.1 Provision shall be made for cancellation of 'Line Clear' by the operation of a cancellation switch (S1) /button and such cancellations shall be recorded on a counter.
- 6.2 It shall be possible to cancel 'Line Clear' only if the train has not entered the block section.
- 6.3 The initiation of the cancellation procedure by the operation of cancellation switch /button shall replace the last stop signal to 'ON', if it has been already taken 'OFF' and maintained at 'ON' until instrument have been put back to 'Line Closed' position and again set as in Cl. 5.1.2.
- 6.4 The cancellation of 'Line Clear' shall be possible only with the co-operation of the other station. The procedure here shall be that the station cancelling 'Line Clear' shall first co-operate in normalising the instrument at the other station, who will in turn co-operate in normalising the instrument at the other station, who will in turn co-operate in normalising

- the instrument at the station cancelling the 'Line Clear'.
- 6.5 A time release set to 120 second shall be provided for the cancellation of 'Line Clear'.
- 6.6 Arrangements shall be provided to lock mechanically the cancellation switch in its normal position when the SM's Key is out.
- 6.7 No operation of the block handle shall be possible unless the cancellation switch /button is in the normal position.
- 7. Closing of Block Section after push back**
- 7.1 Provision shall be made for closing the block section after a train has 'Pushed Back' to the station, from which it started. Such operations of the closing of the block section, by the operation of a switch /button, shall be recorded on a counter.
- 7.2 It shall be possible to close the block section only if the train being 'Pushed Back' has been received on proper reception signals.
- 7.3 It shall be possible to close the block section only if the train being 'Pushed Back' has been received on proper reception signals.
- 7.4 The closing of the block section in this case shall be possible only with the co-operation of the other station. The procedure here shall be same as for the closing of block section by the receiving station, after reception of a train; that is, the station to which the train has been 'Pushed Back' shall first co-operate in normalising the instrument at the other station, who will in turn co-operate in normalising the instrument at the former station.
- 7.5 Arrangements shall be provided to lock mechanically this switch in its normal position, when the SM's key is 'Out'.
- 7.6 No operation of the block handle shall be possible unless this switch /button is in the normal position.
- 8. Shunting Key**
- 8.1 Provision shall be made for a shunting key suitably interlocked with the instrument for use as authority for the driver to pass the Last Stop Signal at 'ON' for shunting up to the opposing first stop signals.
- 8.2 It shall not be possible to take out the shunting key in any position of the instrument other than the 'Line Closed' and 'Train Going To' position; the key when extracted shall lock the Block Handle and prevent any operation of the instrument other than the reception and despatch of automatic 'TOL' code 'Train on Line' indicator & bell signals.
- 8.3 It shall not be possible to insert and extract the shunting key unless the S.M.'s key is 'In'. It shall be possible to extract the S.M.'s key with shunting key 'Out'.
- 8.4 The keys shall be robust and so designed that the key of one instrument can not be inserted in any other instrument at the same station.
- 9. Electrical Circuit**
- 9.1 The instrument and its internal circuit shall be so designed that all requirements of safety of train working are fully complied with.
- 9.2 All equipments in external circuits shall be protected from crosses and rendered immune to false operation by stray currents.
- 9.3 The electrical circuitry of the block instrument shall be such that the internal circuits are electrically isolated from all external circuits including the signal control circuits and the

- line circuit, which feeds the codes to the other station.
- 9.4 All relays used for relay logic circuit shall conform to BRS:930A, BRS:960 and BRS:932A.
- 9.5 All relays used for detecting line signals and transferring them to internal circuits shall to BRS:931A.
- 9.6 The circuit arrangements of the instrument with the accessories shall be such that any failure of the equipment is on the safe side and does not go unnoticed.
10. **General**
- 10.1 The instrument shall be compact and robust in construction and fit to stand rough handling.
- 10.2 It shall be easy for maintenance and removal. The replacement of any independent part or sub-assembly shall not disturb the adjoining parts/sub-assemblies.
- 10.3 There shall not be any opening on the exterior of the instrument, permitting irregular access to interior causing unsafe operation and/or interference to its working parts.
- 10.4 All indication labels, Galvo, indicator, button /switch and other accessories shall be so fixed on the front side of the instrument as to prevent their unauthorised removal from outside.
- 10.5 A lock or other device shall be provided to lock the instrument in any condition to enable the SM to prevent unauthorised manipulation of the instrument during his absence When the SM's Key is 'Out', it shall not be possible to operate the instrument, but reception of code of bell signals from the other station and the automatic transmission and reception of 'Train on Line' code shall be possible.
- 10.6 Facilities shall be provided for double locking and sealing the cover, giving access to interior of the block instrument.
- 10.7 The instrument shall have two line terminals, and shall be suitable for operation, on a pair of conductors unless more number of conductors are approved by purchaser or shown in approved circuit / wiring diagram.
- 10.8 A telephone of an approved type shall be provided for each instrument. Means shall be provided for isolating the telephone circuit while transmitting or receiving currents intended for operating the vital circuits, and vice versa. The telephone shall be superimposed on the same pair of block wires.
- 10.9 Single stroke bell gong shall have different audible notes to distinguish between the bell codes received at a station from adjoining stations.
- 10.10 All components of the Block instrument shall preferably be enclosed in one housing.
- 10.11 The wiring inside the instrument shall follow a colour code.
- 10.12 The base of the instrument shall be so constructed as to permit rotation of the instrument through 180<sup>0</sup> to give easy access to various parts of the instrument.
- 10.13 The terminals boards, commutator contacts and plunger contacts shall be fixed in a vertical plane.
- 10.14 The 'Train Going To' and 'Train Coming From' labels mentioned in Cl. 4.1.4 shall have sufficient space for painting or engraving the adjacent station name. A separate label for painting or engraving the name of the station at which the instrument is used shall also be provided just above the 'Line Closed' label.
- 10.15 The instrument and relays shall be tropicalised as to comply with the requirements in the Indian Railway Standard Specification S23 for electrical signalling and Interlocking Equipment.

## 11. **Transmitter & Receiver**

### 11.1 General Requirements

- 11.1.1 The casing should be dust proof and sturdy to withstand mechanical vibration and shock.
- 11.1.2 The equipment should be fully solid state device with printed circuit board manufactured as per RDSO/SPN/121/91. Interchangeability for the same carrier frequency should be ensured. The general requirement of Electronic Circuits shall conform to IRS:S 23 (Pt. III)-89 & RDSO/SPN-144.
- 11.1.3 The output transformer of the receiver shall be of iron core or R-Core and other transformer used in the equipment shall have ferrite core properly encased and sealed to avoid absorption of moisture. The copper wire used in the transformer coils, shall conform to IS:4800. Necessary isolation should be provided through transformer.
- 11.1.4 Any transmitter should be able to work with any receiver of same frequency sampled at random.
- 11.1.5 The equipment shall withstand AC immunity test as specified in Cl. 13.9 of the specification.
- 11.1.6 The gas discharge tube on line side shall be housed separately in TRANSMITTER & RECEIVER units and should be supplied separately fitted in a block.
- 11.1.7 Standard 8-way polarised rack and panel coupler with locking arrangement shall be provided for external connections.
- 11.1.8 Complete circuit diagram, contact analysis & service particulars shall be supplied along with the equipment, TRANSMITTER/RECEIVER be numbered serially.
- 11.1.9 Colour code in wiring shall be as per IS specification and be indicated in circuit diagram.
- 11.1.10 Prototype approval, guarantee of the equipment, and other general requirements like packing etc. shall be as per IRS:S 23, unless otherwise specified by the purchaser.
- 11.1.11 The voltage at different stages in the circuit diagram shall be indicated and each set of TRANSMITTER/RECEIVER be furnished with test procedure.
- 11.1.12 The transformers, condensers and other electronic components shall be provided with proper support to minimise the damage to the equipment during transshipment and in actual working conditions.
- 11.1.13 The casing shall be spray painted or anodized. The face of the casing should have a half inch border of Red colour for 1800 Hertz & blue for 2700 Hertz
- 11.1.14 Each set of TRANSMITTER/RECEIVER be supplied with one set of cartridge fuse block and two numbers of male coupler with gland.
- 11.1.15 Rating of the individual components shall be so selected so that the loading may not exceed 50% of its rating under any adverse conditions.
- 11.1.16 The equipment shall withstand HV test and IR test as per S.No. 13.3 & 13.4 respectively of this specification.
- 11.1.17 Sealing arrangement should be provided for transmitters and receivers.
- 11.1.18 Terminal blocks used in the equipment should be of PBT materials as per IRS specification S-75/91 or S-79/92.
- 11.1.19 The receiver shall be capable to work with a maximum attenuation of 19 dB with transmitter output power of 1 mw and one transmitter of opposite frequency in parallel with it.
- 11.1.20 The overall size of the transmitter and receiver shall be such that it shall be accommodated within the block instrument.

### 11.2 **Type:**

The transmitter and receiver shall be of following type:-

| Type      | Transmitter frequency | Receiver Frequency |
|-----------|-----------------------|--------------------|
| 1800 type | 1800Hz                | 1800Hz             |
| 2700 type | 2700Hz                | 2700Hz             |

### 11.3 Performance

The performance of transmitter and receiver shall be as follows:-

#### 11.3.1 Transmitter:-

| Item                   | Rating                        | Remarks   |
|------------------------|-------------------------------|-----------|
| Transmission frequency | 1800Hz or 2700 Hz             | ±2%       |
| Transmission output    | 1mw, 3mw, 5mw adjustable      | ±10%, -5% |
| Output impedance       | 600 ohm, 1120 ohms adjustable | ±10%      |
| Modulation system      | Frequency Modulation          |           |
| Modulation frequency   | 65Hz or 85Hz                  | ±1.5Hz    |
| Power consumption      | 1.2 watt or less              | At 24V DC |
| Input power supply     | 24V DC                        | ±20%      |
| Shift frequency        | 160 Hz                        | ±15%      |

#### 11.3.2 Receiver

| Item                         | Rating                         | Remarks                  |
|------------------------------|--------------------------------|--------------------------|
| Receiving frequency          | 1800 Hz or 2700Hz              | ±2%                      |
| Level range                  | 1 to 28 dB                     | In steps of 2 dB or less |
| Input impedance              | 600 ohms, 1120 ohms adjustable | ±10%                     |
| Relay output voltage         | 24V DC or above                | 21V. Min.                |
| Power consumption            | 8 watts or less                | At 24V DC                |
| Input power supply           | 24V DC                         | ±20%                     |
| Sense level for receiving    | more than -19 dBm              |                          |
| No sense level for receiving | less than -22 dBm              |                          |

### 11.4 Connection Terminals & test blocks

#### 11.4.1 Transmitter

##### Connection Terminals

The transmitter shall have 8 fixed terminals. Serial Nos. & connections shall be as given below:-

| Terminal Nos. | Connections       |
|---------------|-------------------|
| 1 & 2         | Output            |
| 3             | Positive DC input |
| 4             | Negative DC input |
| 5             | Common            |
| 6             | 85 Hz             |
| 7             | 65Hz              |
| 8             | Spare             |

### Test Blocks

Test block shall be provided at the back side of the transmitter for testing with a cover and testing arrangement.

1. 24V DC supply
2. Regulated voltage
3. Modulated frequency 65Hz & 85Hz
4. Carrier frequency 1800Hz/2700Hz
5. Transmitter output

### Receiver

#### Connection Terminals:-

The receiver shall have 8 fixed terminals, Serial Nos. and connections shall be as follows

| Terminal Nos. | Connections                      |
|---------------|----------------------------------|
| 1 & 2         | Input                            |
| 3             | Positive DC input                |
| 4             | Negative DC input                |
| 5 & 6         | Output for CR2 relay (+ve & -ve) |
| 7 & 8         | Output for CR1 relay (+ve & -ve) |

### Test Blocks

Test blocks shall be provided at the back of the Receiver for testing with a cover and seating arrangement.

1. 24V DC supply
2. Regulated DC supply
3. Input
4. Demodulated signal
5. Input to CR1
6. Input to CR2

11.5 The relay output voltage of the receiver shall be as follows:-

| Keying | Relay Terminals |             |
|--------|-----------------|-------------|
|        | CR1             | CR2         |
| 65Hz   | 0.5V max.       | 21V DC min. |
| 85Hz   | 21V DC min.     | 0.5V max.   |

- 11.6 The rectified output voltage of the receiver shall be suitable for use with plug in type 'Q' series relays (8F/8B) with coil resistance varying between 340-345 ohms and working current of 70mA at 24V DC. Minimum output rectified voltage should be 21V steady DC.
- 11.7 'LED' indication shall be provided on the front panel of the receiver to register the correct incoming level of the signals to operate CR1 or CR2 and indication be displayed only when CR1 or CR2 pick-up.
- 11.8 A special protection shall be provided in receiver in addition to the band pass filter, zener, G.D. tube etc. to eliminate the effects of noise levels from supply source and line to ensure unsafe side failures of CR1 & CR2 relays.

## 12. **Operating Requirements**

- 12.1 The instrument shall be suitable to work on 24V DC with a variation of  $\pm 20\%$  of the rated voltage satisfactorily. The internal circuit of the block instrument shall not draw a current of more than 700mA during normal sequential operation.
- 12.2 Line current shall not exceed 110mA.
- 12.3 The instrument shall work on frequency modulated current system so as to immune from the effects of extraneous currents.
- 12.4 The following codes shall be employed for operation of instrument:-
  - 12.4.1 1800Hz or 2700Hz modulated by 85Hz with DC + ve (to permit operation of block handle from line closed to TCF i.e. "Train Coming From", TCF to line closed and TGT i.e. 'Train Going To' to line closed).
  - 12.4.2 1800Hz or 2700Hz modulated by 65Hz with DC + ve (to permit operation of block handle from line closed to TGT).
  - 12.4.3 1800Hz or 2700Hz modulated by 65Hz (To set the other end instrument to TOL i.e. 'Train On Line'.
  - 12.4.4 DC -ve (for exchanging Bell Code Signals).

## 13. **Tests and Inspection**

### 13.1 **General:**

The general requirements on tests and inspection shall conform to Cl. 14.1 of IRS:S 23 Pt. II

### 13.2 **Visual inspection:**

Visual inspection shall be carried in accordance with Cl. 14.2 of IRS:S 23 Pt. II

### 13.3 **Applied High Voltage Test:**

- 13.3.1 With telephone and oscillator unit, if any, removed, the insulation of the assembled block instrument shall withstand for one minute, test voltage of 2000 volts r.m.s. applied between all parts of electric circuits and other metallic parts insulated therefrom.

- 13.3.2 The transmitter & receiver units shall withstand the di-electric test in accordance with Cl. 13.3.1 above with test voltage of 1000 volts, AC rms.

- 13.3.3 The bell oscillator unit and the telephone shall withstand the high voltage test in accordance with Cl. 13.3.1 above excepting that the value of voltage applied shall be 500V instead of 2000 volts rms.

### 13.4 **Insulation Resistance Test:**

- 13.4.1 After conducting high voltage test as stated in Cl. 13.3 above, IR test shall be done immediately at a potential of not less than 500 volts DC.
- 13.4.2 The insulation resistance shall be measured between each insulated circuit and with respect to earth. The insulation value shall not be less than 10 Mohm at an ambient temperature between 27°C - 37°C at 98% RH.

### 13.5 **Coil Resistance Test:**

The resistance of each coil shall be measured by any standard method (as agreed to by the purchaser) and it shall be corrected according to the standard temperature correction chart for comparison purpose with the specified resistance at 20°C. The nominal values of resistance for each coil shall be within  $\pm 5\%$  of the normal value indicated in Annexure B(I).

- 13.6 Wire count and continuity test as per approved circuit shall be carried out on

each instrument.

**13.7 Performance test**

- 13.7.1 The equipment shall work correctly for the purpose intended and shall show no sign of jamming anywhere or erratic behaviour under all possible simulated conditions or environmental conditions visualized for working in actual service conditions.
- 13.7.2 Current under different operating conditions of the block instrument shall be measured and the values shall be within  $\pm 5\%$  of normal values indicated in Annexure B (II).
- 13.7.3 Test data for TRANSMITTER/RECEIVER when measured during testing of the equipment shall be within the tolerances specified in Cl. 11.3
- 13.7.4 Performance of a pair of instrument connected on a bench shall be tested as given in Annexure A.

### 13.8 Climatic test

13.8.1 The climatic test on the block instrument shall be carried out in accordance with IS:9000 as per sequence and severity indicated below:

| S.No.                                                                                                                                                                                                                     | Test                                     | In            | Duration                                                                                      |                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------|-----------------------------------------------------------------------------------------------|------------------------|
| 1.                                                                                                                                                                                                                        | Cold test                                | 0°C           | Hot & cold test to be repeated alternatively for 3 cycles with 3 hours duration in each cycle | IS:9000 Pt. XIV Sec. 1 |
| 2.                                                                                                                                                                                                                        | Dry Heat test                            | 55°C          | -do-                                                                                          | -do-                   |
| 3.                                                                                                                                                                                                                        | Damp heat test<br>(Accelerated 7 cycles) | 40°C R.H. 95% |                                                                                               | IS:9000 Pt. V Sec. 1   |
| Note: After completion of damp heat cycles test & standard 24 hrs. recovery period the instrument shall withstand 2KV HV test as per Cl. 13.3 above the IR values measured (Cl. 13.4) shall not be less than 10 meg.ohms. |                                          |               |                                                                                               |                        |

13.8.2 In case, it is not possible to subject the complete equipment to climatic test, the following essential components shall be subjected to climatic test as per Cl. 13.8.1.

1. 'TRAIN ON LINE' Indicator Coil Assembly.
2. Lock magnet with operating handle, along with roller band with 24 sets of circuit controller contacts.
3. Choke coil
4. Bell coil assembly
5. Induction coil fitted with core.
6. Time release indicator coil assembly
7. Terminal assembly.
8. Buzzer assembly
9. PB1 assembly
10. PB2 assembly
11. S1 assembly / Cancel Button
12. S2 assembly / Push Back Button
13. Galvo assembly
14. SM key assembly

Note: After completion of climatic test of the components above will be reassembled and the block instrument shall be subjected to HV and IR tests as per Cl. 13.3.1 and 13.4 and performance test as per Cl. 13.7.1.

13.8.5 The transmitter and receiver (both of 1800 Hz and 2700 Hz) shall be put to climatic severities as mentioned in Cl. 13.8.1. The equipment should work

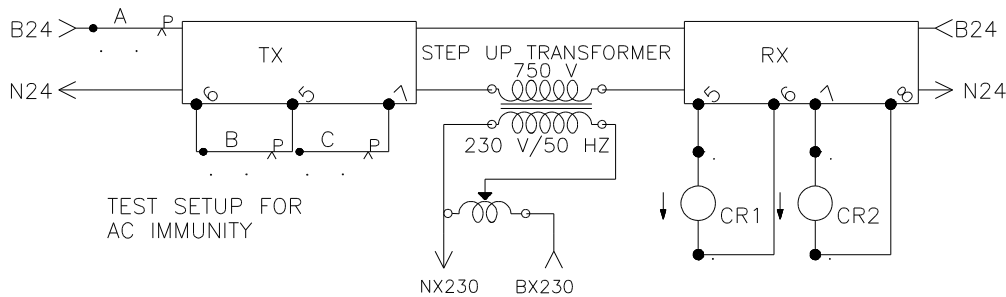
satisfactorily when subjected to climatic severities as well after recovery period.

### 13.9 AC Immunity Test

The transmitter and receiver (of both types) shall be subjected to AC immunity test as per procedure given below:-

#### Operational tests for AC immunity:

For this purpose, circuit as shown below shall be followed:-



#### a) Tests with no carrier frequency and keying frequency:-

Switch A, B & C shall be kept in open position and the inducing AC voltage shall be adjusted to 600V. Switch 'D' shall be pressed for not more than 300 ms and shall be released. The back contacts of QNA1 relays connected across terminals 5, 6, 7 & 8 shall not break. This shall be detected by means of a thyristor-controlled circuit so that monetary break of back contact can be detected.

#### b) Tests with carrier frequency and keying frequency of 85 Hz

Switches A and B shall be closed, while switch C shall be kept open. The voltage across terminals 5 and 6 of the receiver shall be greater than the maximum pick up voltage of QNA1 relay. When 600V AC is applied by operating switch 'D' for less than 300 mili sec., the front contacts of CR1 relay and back contact of CR2 relay shall not break. The above tests shall be detected by a thyristor controlled circuit as in (a) above.

#### c) Tests with carrier frequency and keying frequency of 65 Hz.

Switch A and C shall be closed, while switch B shall be kept open. The voltage available across terminals 7 and 8 of the receiver shall be higher than the maximum of the pick up value of QNA1 relay. When switch 'D' is operated for less than 300 milisec., the back contacts of CR1 relay shall not break and the front contacts of CR2 relay shall not break. This shall be checked by means of a thyristor controlled circuit as in (a) above.

(d) All the three tests (a), (b) & (c) above shall be repeated with a gradual application of AC up to 350V injected on the line by keeping switch 'D' closed and the same observation as above shall be made.

### 13.10 Routine Test

The following shall constitute the routine tests and shall be carried on each block instrument including transmitter and receiver by the manufacturer. The test results will be submitted to inspecting authority at the time of inspection:-

- |      |                              |                                                                   |
|------|------------------------------|-------------------------------------------------------------------|
| i)   | Visual inspection            | Cl. 13.2                                                          |
| ii)  | High voltage test            | Cl. 13.3                                                          |
| iii) | Insulation resistance test   | Cl. 13.4                                                          |
| iv)  | Coil resistance test         | Cl. 13.5                                                          |
| v)   | Wire Count & Continuity test | Cl. 13.6                                                          |
| vi)  | Performance test             | Cl. 13.7 & Cl. 11.3 (except input/output impedances measurements) |
| vii) | AC immunity test             | Cl. 13.9                                                          |

### 13.11 Acceptance test

These test shall be carried out by inspecting authority on each equipment before accepting the delivery.

The acceptance test shall include the following:-

- |      |                              |                                                                 |
|------|------------------------------|-----------------------------------------------------------------|
| i)   | Visual inspection            | Cl. 13.2                                                        |
| ii)  | High voltage test            | Cl. 13.3                                                        |
| iii) | Insulation resistance test   | Cl. 13.4                                                        |
| iv)  | Coil resistance test         | Cl. 13.5                                                        |
| v)   | Wire Count & Continuity test | Cl. 13.6                                                        |
| vi)  | Performance test             | Cl. 13.7 & Cl. 11.3 (except input/output impedance measurement) |
| vii) | AC immunity test             | Cl. 13.9                                                        |

### 13.12 Type test

13.12.1 The validity of type test shall normally be 3 years from the date of issue. The type approval certificate once issued shall not be valid if , a change in design, raw materials used or manufacturing process is made subsequently.

13.12.2 Six month before the expiry of type approval, manufacturer shall submit two prototype samples of the equipment if required labour and appliances shall also be arranged by the manufacturer free of cost.

13.12.3 If agreed by the purchaser or his nominee, the manufacturer can furnish the test certificate from an approved test laboratory, giving the results on the equipment and/or components/materials to prove their conformity to the requirements of this specification.

13.12.4 The type test shall include the following tests:-

- |      |                            |          |
|------|----------------------------|----------|
| i)   | Visual inspection          | Cl. 13.2 |
| ii)  | High voltage test          | Cl. 13.3 |
| iii) | Insulation resistance test | Cl. 13.4 |
| iv)  | Coil resistance test       | Cl. 13.5 |

- |       |                              |          |
|-------|------------------------------|----------|
| v)    | Wire Count & Continuity test | Cl. 13.6 |
| vi)   | Performance test             | Cl. 13.7 |
| vii)  | Climatic test                | Cl. 13.8 |
| viii) | AC immunity test             | Cl. 13.9 |
14. **Manufacture:**
- 14.1 The manufacturer shall ensure that in addition to all the provisions of this specification, the requirements of other specification referred to in this specification as far as they are applicable and such of the specifications referred to in relevant IRS drawings are fully complied with.
- 14.2 The manufacturer shall also ensure that material composition and surface finish for all components are in accordance with relevant IRS drawings supplied by the purchaser and specn. IRS:S 10 & IRS:S 23.
- 14.3 Workmanship, limits and fittings, insulating materials, electro-magnetic coils, electrical contacts and springs, magnetic materials, terminal with washers, wiring, rejection, marking and identification, packing and warranty shall be in accordance with the requirements of relevant clauses of IRS:S 23 (Part I to III).
15. **Marking and Identification**
- 15.1 Wherever possible an engraved name plate giving manufacturer's name, the IRS No. if any and serial no. and year of manufacture shall be attached on the outside of the apparatus in a conspicuous position.
- 15.2 When the size of the part permits, all metal parts shall have the letters IRS (where applicable) and the part number shown on the drawings stamped or cast thereon, in letters and figures of suitable size, cast or malleable iron parts or nylon phenolic and other moulded parts shall have in addition to the above, manufacturer's name or initial of trade make moulded stamped or engraved thereon when the size of the part permits.
16. **Packing:**
- 16.1 Equipment shall be so packed as to permit convenient handling and to protect against loss or damage during transit and storage.
17. **Warranty**
- 17.1 The manufacturer shall warrant the material covered by this Specification, to be free from defects in design, material and workmanship under normal use and service, his obligation under this warranty being limited to replace free of cost those parts which shall be found defective within one year after delivery to the purchaser. This warranty shall not apply to any apparatus which shall have been repaired or altered in any way by any one other than the manufacturer thereof, so as to affect in contractor's judgement, its proper functioning or reliability or which has been subjected to misuse, negligence or accident.

### **ANNEXURE 'A'**

Performance Test (Reference Cl. 13.7.4) method of operation for single line tokenless block instrument. Both stations are assumed to be equipped with semaphore signal.

#### **(A) Despatching train from Station 'A' to Station 'B'.**

| S. No | Station 'A'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Station 'B'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | <p><b>Normal Status:-</b> Block indicator of the instrument in 'Line Closed' position. All relevant signals and their controls are normal.</p> <ol style="list-style-type: none"> <li>1. Inserts 'SM's Key' and turns.</li> <li>2. Presses the 'BELL' push button and sends 'call attention' code of bell signals.</li> <li>3.</li> <li>4.</li> <li>5.</li> <li>6. Bell Sounds as acknowledgement of 'call attention' code of bell signals</li> <li>7. Sends 'Attend Telephone' code of bell signals by pressing the 'BELL' push button</li> <li>8.</li> <li>9. Asks for 'Line Clear' on telephone (giving name of station on the telephone)</li> <li>10.</li> <li>11. Sends 'Is Line Clear' enquiry code of signals by pressing 'BELL'/ PB1 button along with PB2 button until Galvo needle gives a kick</li> <li>12.</li> <li>13.</li> <li>14. On receiving answer back to its 'Is Line Clear' code, turns Block handle to 'Train Going To' indicator.</li> <li>15. (a) Takes 'OFF' the Last Stop Signal.<br/>(b) Train enters Block Section.<br/>(c) Last Stop Signal return to 'ON' position.<br/>(d) 'Train on Line' Indicator appears automatically and Buzzer starts</li> </ol> | <p><b>Normal Status:-</b> Block indicator of the instrument in 'Line Closed' position. All relevant signals and their controls are normal.</p> <p>Bell sound for 'call attention' code of bell signals.</p> <p>Inserts 'SM's Key' and turns.</p> <p>Acknowledges the 'call attention' code by pressing the 'BELL' button</p> <p>Acknowledges the 'Attend Telephone' code of bell signals by pressing the 'BELL' push button to acknowledges the 'Attend Telephone' code and attends on telephone.</p> <p>Accepts the 'Line Clear' enquiry.</p> <p>On receiving 'Is Line Clear' code turns Block handle to 'Train Coming From' indicator.</p> <p>Answers back the 'Is Line Clear' code of bell signals by pressing 'PB1' button along with 'PB2' button until Galvo needle gives a kick</p> |

- operating (Where provided).
- (e) Instrument send automatic 'Train on Line' code
- (f) Replaces Last Stop Signal Lever.
16. 'Train on Line' indicator appears on receiving the 'Train on Line' code, and Buzzer sounds.
  17. Sends 'Call attention' code of signals by pressing 'BELL' / PB1 button.
  18. The instrument stops automatic 'Train on Line' code.  
Where provided 'Train on line' buzzer stops.
  19. 'Train on Line' buzzer Stops.
  21. Acknowledges 'Call attention' code of signals by pressing 'BELL' / 'PB1' button
  22. Sends 'Train on Line' code of bell signals.
  23. Acknowledges 'Train on Line' code of bell signals.
  24. a) Takes 'OFF' the reception signals.  
b) Train enters the station.  
c) Reception Signal returns to 'ON' position.  
d) 'Train arrival' Buzzer sounds.  
e) Replaces Home Signal lever at SM's control.  
f) 'Train arrival' buzzer stops.  
Sends 'Call attention' code of bell signals.
  25. Acknowledges 'Call attention' code of signals.
  27. Sends 'Train arrived' code by pressing 'PB1' button along with 'PB2' button until 'Galvo' needle gives a kick.
  28. On reception of 'Line Closed' code turns Block handle to 'Line Closed' indicator. 'Train on Line' indicator turns 'OFF'
  29. a) Answers back the 'Line Closed' code of bell signals by pressing 'PB1' button along with 'PB2' button until 'Galvo' needle gives a kick
  30. On reception of 'Line Closed' code, turns Block handle to 'Line Closed'.

Note: Similar procedure is repeated when despatching a train from Station 'B' to Station 'A'.

**(B) To cancel a 'line clear' before the train enters the Block Section.**

| S.            | Station 'A' | Station 'B'   |
|---------------|-------------|---------------|
| IRS:S 98-2001 |             | Page 17 of 26 |

| No. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | <p><b><u>Normal Status:-</u></b> Block handle at 'Train Going To' position.</p> <ol style="list-style-type: none"> <li>1. Calls the attention of station 'B' and takes his consent on telephone.</li> <li>2.</li> <li>3. <ol style="list-style-type: none"> <li>a) Operates 'Cancel' switch to reverse/ presses 'Cancel' button</li> <li>b) Puts back all controls of relevant signals to 'ON' and ensures all concerned signals &amp; their controls at normal on 'SIGNAL NORMAL' indicator.</li> <li>c) Counter registers next higher number</li> <li>d) Waits for 2 minutes for 'TIME RELEASE' indicator.</li> <li>e) 'TIME RELEASE' indicator operates.</li> <li>f) Turns 'Cancel' switch (if a switch is provided) to normal</li> </ol> </li> <li>4. Sends 'Call attention' code of signals</li> <li>5.</li> <li>6. Sends 'Cancellation' code of Bell signals as under: <ol style="list-style-type: none"> <li>a) Presses 'PB1' button along with 'PB2' button until 'Galvo' needle gives a kick</li> </ol> </li> <li>7.</li> <li>8.</li> <li>9. On reception of answer back 'Cancellation' code <ol style="list-style-type: none"> <li>a) Turns Block handle to 'Line Closed' indicator.</li> </ol> </li> </ol> <p><b>(C) Closing of Block Section after the train pushes back to the despatching station.</b></p> | <p><b><u>Normal Status:-</u></b> Block handle at 'Train Coming From' position.</p> <p>Gives consent on telephone and ensures all concerned signals &amp; their controls at normal on 'SIGNAL NORMAL' indicator.</p> <p>Acknowledges 'Call attention' code of signals.</p> <p>On reception of 'Cancellation' code</p> <ol style="list-style-type: none"> <li>a) Turns Block handle to 'Line Closed' indicator.</li> </ol> <p>a) Answers back the 'Line Closed' code of bell signals by pressing 'PB1' button along with 'PB2' button until 'Galvo' needle gives a kick</p> |

| S.No.         | Station 'A' | Station 'B'   |
|---------------|-------------|---------------|
| IRS:S 98-2001 |             | Page 18 of 26 |

Block handle at 'Train Going to' indicator 'TRAIN ON LINE' Indicator ON

Block handle at 'Train Coming From' indicator 'TRAIN ON LINE' Indicator ON

1. Calls the attention of Station 'B' on telephones and takes his consent.

2.

Gives consent on telephone and ensures all concerned signals & controls at normal on its 'SIGNAL NORMAL' indicator.

- 3.
- a) Takes 'OFF' the reception signals.
  - b) Train enters the station.
  - c) Home Signal returns to 'ON' position.
  - d) 'Train arrival' Buzzer sounds.
  - e) Replaces Home Signal lever at operator's control.
  - f) 'Train arrival' buzzer stops.
  - g) Operates 'Cancel' switch to reverse/ presses 'Cancel' button
  - h) Cancellation counter registers next higher number
  - i) Turns 'Cancel' switch (if a switch is provided) to normal
  - j) Ensures all concerned signals & controls at normal on its 'SIGNAL NORMAL' indicator.

4. Sends 'Call attention' code of signals

5.

Acknowledges 'Call attention' code of signals.

6. Sends 'Cancellation' code of Bell signals  
Presses 'PB1' button along with 'PB2' button until 'Galvo' needle gives a kick.

7.

On reception of 'Cancellation' code Turns Block handle to 'Line Closed' indicator. 'Train on Line' indicator turns OFF

8.

Answers back the 'Line Closed' code of bell signals by pressing 'PB1' button along with 'PB2' button until 'Galvo' needle gives a kick

9. On reception of answer back 'Cancellation' code  
a) Turns Block handle to 'Line Closed' indicator 'TRAIN ON LINE' Indicator turns OFF.

**(D) Shunting between Last Stop Signal and Opposing First Stop Signal**

Instrument Block Indicator in 'Line closed' position. All concerned signals at normal on its 'SIGNAL NORMAL' indicator. Reception signal shall not be taken 'OFF' for shunting.

Instrument Block handle in 'Line closed' position.

1. Calls the attention of Station 'B' and obtains his consent on telephone.
- 2.
3. (a) Applies 'SM's' key and takes out the shunting Key of the concerned section Block instrument.  
(b) Hands over Shunting Key to the Driver.  
(c) Driver completes shunting and returns Key to S.M.  
(d) Applies 'SM's'. Shunting Key is replaced in the instrument.
4. Informs the SM at 'B' on telephone.
- 5.

Gives consent on telephone.

Acknowledges on telephone.

**(E) Shunting between last Stop Signal and opposing First Stop Signal behind a departing train with Block indicator in 'Train Going To' position with or without 'Train on Line' indicator:-**

Instrument Block Indicator in 'Train Going To' position. All reception signals at 'NORMAL'. Reception signal shall not be taken 'OFF' for shunting.

Instrument Block Indicator in 'Train Coming From' position.

1. Calls the attention of Station 'B' and obtains his consent on telephone for shunting behind the train.
- 2.
3. (a) Applies SM's key and takes out the 'Shunting Key' of the concerned section's Block Instrument.  
(b) Hands over Shunting Key to the Driver.  
(c) Driver completes shunting and returns key to SM  
(d) Applies SM's key. Shunting key is replaced in the Instrument.
4. Informs the SM at 'B' on telephone.

Gives consent on the telephone.

5.

Acknowledges telephone. Initiates the procedure for closing of the Block section to 'Line Closed' position in case the train has already been received. In case the train has not been received prior to completion of shunting at Station 'A', initiates the procedure for closing of the Block section to 'Line Closed' position after the reception of the train.

## **ANNEXURE – ‘B’**

### **I. COIL RESISTANCE (Refer Cl. 13.5)**

| <b>S. No.</b> | <b>Name of component</b>      | <b>Nominal value of resistance in ohms</b> |
|---------------|-------------------------------|--------------------------------------------|
| 1.            | Galvo coil                    | 18*                                        |
| 2.            | TOL indicator coil            | 500/200                                    |
| 3.            | ‘Time Release’ indicator coil | 200                                        |
| 4.            | Block handle lock coil        | 310                                        |
| 5.            | Bell coil                     | 310                                        |
| 6.            | Choke coil                    | 28                                         |
| 7.            | Induction coil                | 410/19.0/30.0                              |
| 8.            | Telephone relay coil          | 485                                        |

### **II. CURRENT UNDER DIFFERENT OPERATING CONDITIONS (Refer Cl. 13.7.2)**

| <b>S. No.</b> | <b>State of Measurement</b>               | <b>Current Value (in mA)</b> |
|---------------|-------------------------------------------|------------------------------|
| 1.            | Line current                              | 110 or less*                 |
| 2.            | External battery (IR and TPR energised)   | 250                          |
| 3.            | Internal battery                          |                              |
|               | i) Transmission of TCF code               | 110                          |
|               | ii) Reception of TCF code                 | 90                           |
|               | iii) Transmission of TGT code             | 180                          |
|               | iv) Reception of TGT code                 | 90                           |
|               | v) Block handle turning from ‘N’ to ‘R’   | 500                          |
|               | vi) Block handle turning from ‘N’ to ‘L’. | 600                          |
|               | vii) TCF (idle)                           | 60                           |
|               | viii) TGT (idle)                          | 80                           |
|               | ix) Transmission of ‘TOL’ code            | 180                          |
|               | x) Reception of ‘TOL’ code                | 400                          |
|               | xi) Train Reception                       | 150                          |
|               | xii) B.H. Turning from ‘L’ to ‘N’         | 450                          |
|               | xiii) B.H. Turning from ‘R’ to ‘N’        | 550                          |
|               | xiv) Cancellation (current)               | 400*                         |

- This value may vary according to type of relay used in line circuit.

**Amendment No. 1 of June 2001  
to  
Indian Railways  
Standard Specification  
for  
Tokenless Block Instrument  
Single Line (Handle Type)  
as per  
Serial No. S 98/2001 (Tentative)**

| <b>S.No.</b> | <b>Clause</b>          | <b>Amendment</b>                                                                                                                                                                                              |                             |                                             |
|--------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------------------|
| 1.           | 7.3                    | Clause 7.3 modified and may be replaced by:-<br>“It shall be possible to lower the reception signals for a train being ‘Pushed Back’ by operation of switch/button provided for this purpose”.                |                             |                                             |
| 2.           | 11.3.1                 | Last row in the table mentioning shift frequency as 160 Hz is hereby deleted, other items of the table remain unchanged.                                                                                      |                             |                                             |
| 3.           | 13.7.2                 | Clause modified and may be read as under:-<br>“Current under different operating conditions of the block instrument shall be measured. Maximum values under such conditions are given in the Annexure B(II).” |                             |                                             |
| 4.           | 13.11(v)               | Clause 13.11(v) covering ‘Wire Count and Continuity Test’ is hereby deleted.                                                                                                                                  |                             |                                             |
| 5.           | Annexure BI(7)         | Clause modified and may be read as under                                                                                                                                                                      |                             |                                             |
|              |                        | <b>S. No.</b>                                                                                                                                                                                                 | <b>Name of Component</b>    | <b>Nominal Value of resistance (in ohm)</b> |
|              |                        | 7                                                                                                                                                                                                             | Induction Coil              | 410/9.4/30                                  |
| 6.           | Annexure BII<br>3(vii) | Clause modified and may be read as under:-                                                                                                                                                                    |                             |                                             |
|              |                        | <b>S.No.</b>                                                                                                                                                                                                  | <b>State of measurement</b> | <b>Current Value (in mA)</b>                |
|              |                        | 3(vii)                                                                                                                                                                                                        | TCF (Idle)                  | 70                                          |

**Amendment No. 2 of December 2002**  
to  
**Indian Railways**  
**Standard Specification**  
for  
**Tokenless Block Instrument**  
**Single Line (Handle Type)**

**Serial No. S 98/2001 (Tentative)**

| S.No.                                                                  | Clause                       | Amendment                                                                                                      |                                         |                          |
|------------------------------------------------------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------------|
| 1.                                                                     | Annexure ‘B’,<br>Table 2     | S.No. 3 (x) of Table II of Annexure ‘B’ may be read as 500 mA instead of 400 mA. Table 2 is revised as under:- |                                         |                          |
|                                                                        |                              | II. CURRENT UNDER DIFFERENT OPERATING CONDITIONS<br>(Refer Cl. 13.7.2)                                         |                                         |                          |
|                                                                        |                              | S. No.                                                                                                         | State of Measurement                    | Current Value<br>(in mA) |
|                                                                        |                              | 1.                                                                                                             | Line current                            | 110 or less*             |
|                                                                        |                              | 2.                                                                                                             | External battery (IR and TPR energised) | 250                      |
|                                                                        |                              | 3.                                                                                                             | Internal battery                        |                          |
|                                                                        |                              | i)                                                                                                             | Transmission of TCF code                | 110                      |
|                                                                        |                              | ii)                                                                                                            | Reception of TCF code                   | 90                       |
|                                                                        |                              | iii)                                                                                                           | Transmission of TGT code                | 180                      |
|                                                                        |                              | iv)                                                                                                            | Reception of TGT code                   | 90                       |
|                                                                        |                              | v)                                                                                                             | Block handle turning from ‘N’ to ‘R’    | 500                      |
|                                                                        |                              | vi)                                                                                                            | Block handle turning from ‘N’ to ‘L’.   | 600                      |
|                                                                        |                              | vii)                                                                                                           | TCF (idle)                              | 70                       |
| viii)                                                                  | TGT (idle)                   | 80                                                                                                             |                                         |                          |
| ix)                                                                    | Transmission of ‘TOL’ code   | 180                                                                                                            |                                         |                          |
| x)                                                                     | Reception of ‘TOL’ code      | 500                                                                                                            |                                         |                          |
| xi)                                                                    | Train Reception              | 150                                                                                                            |                                         |                          |
| xii)                                                                   | B.H. Turning from ‘L’ to ‘N’ | 450                                                                                                            |                                         |                          |
| xiii)                                                                  | B.H. Turning from ‘R’ to ‘N’ | 550                                                                                                            |                                         |                          |
| xiv)                                                                   | Cancellation (current)       | 400*                                                                                                           |                                         |                          |
| • This value may vary according to type of relay used in line circuit. |                              |                                                                                                                |                                         |                          |

Telephone : 2451200 Extn. 42394  
: 2450063  
Tele Fax : 91-0522-2452332  
E-mail : dsig4@rdso.railnet.gov.in



Government of India - Ministry of Railways  
Research Designs & Standards Organisation  
LUCKNOW - 226011



Ref: STS/E/SL/TBI

24<sup>th</sup> June 2004

**The General Manager/S&T/Const./Stores,**  
**Central Railway, Mumbai CST-400 001.**  
**Eastern Railway, Fairlie Place, Kolkata-700 001.**  
**East Cost Railway, Bhubaneswar.**  
**East Central Railway, Hajipur.**  
**Northern Railway, Baroda House, New Delhi-110 001.**  
**North-Eastern Railway, Gorakhpur-273 012.**  
**North-East Frontier Railway, Maligaon, Guwahati-781 011.**  
**North Western Railway, Jaipur.**  
**North Central Railway, Allahabad.**  
**Southern Railway, Park Town, Chennai-600 003.**  
**South Central Railway, Rail Nilayam, Secunderabad-500 371.**  
**South Eastern Railway, Garden Reach, Kolkata-700 043.**  
**South East Central Railway, Bilaspur.**  
**South Western Railway, Hubli.**  
**Western Railway, Churchgate, Mumbai-400 020.**  
**West Central Railway, Jabalpur.**  
**CORE, Nawab Yusuf Road, Civil Lines, Allahabad-211 001.**  
**Metro Railway, 23A, Jawaharlal Nehru Road, Kolkata-700001.**  
**Director, IRISSET, Secunderabad-500017.**

**Sub:** Amendment No. 3 to specification no. IRS:S 98/2001 for Tokenless Block Instrument – Single Line handle type (Tentative).

\*\*\*

Based on 78<sup>th</sup> SSC recommendations on item no. 1075 and Railway Board's approval communicated vide letter No. 2003/SIG/M/7(78<sup>th</sup> SSC) dt. 5.5.04, Amendment No. 3 to specification no. IRS:S 98/2001 is enclosed herewith for information and necessary action please.  
DA: As above.

**( A.K.Dwivedi )**  
**Director/Signal**  
**for Director General/Signal**

Copy to:-

1. The Secretary/Signal, Railway Board, Rail Bhawan, New Delhi.
2. The ED/QA/S&T, RDSO, Lucknow.
3. The Dir.Insp./S&T/RDSO, 1<sup>st</sup> Floor, New Annexe Bldg., W.Rly., Churchgate, Mumbai-20.
4. The Director(Insp)/ S&T/RDSO, 4th Floor, West Wing, 17, N.S.Road, Kolkata.
5. The Director(Insp)/S&T/RDSO, 1<sup>st</sup> Floor, IRCOT Bldg., Behind Shankar Market, New Delhi.
6. The Director(Insp)/ S&T/RDSO, Gr. Floor, DRM's Office Bldg., Southern Rly., Bangalore.
7. M/s. AKG Electronic Industries, 4/2, Middleton Street, Kolkata-700 071.
8. M/s. Digital Communication & Control, Webal Industrial Estate, Electronic Complex, Room No. 213/215/217, P-1, Taratalla Road, Kolkata-700088.

DA: As above.

**( A.K.Dwivedi )**  
**Director/Signal**  
**for Director General/Signal**

**AMENDMENT NO. 3  
TO  
TOKENLESS BLOCK INSTRUMENT SINGLE LINE (HANDLE TYPE)  
SERIAL NO. IRS:S 98/2001**

| <b>S.No.</b> | <b>Para No.</b> | <b>Amendment</b>                                                                                                                                                                                                      |
|--------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.           | 8.3             | Para 8.3 modified and may be replaced by:-<br>“It shall not be possible to insert and extract shunting key unless the SM’s key is ‘IN’. It shall be possible to extract the SM’s key with shunting key ‘In’ or ‘Out’. |

Place : Lucknow  
Dated : 24.6.2004

**( A.K.Dwivedi )  
Director/Signal  
for Director General/Signal**