

SPECIFICATION FOR ANNUNCIATOR FOR LHB TYPE COACHES

1.0 SCOPE:

This specification covers the requirements of design, manufacture, testing and supply of annunciation system for First Class A/C EOG LHB type coaches with 8 coupe configuration..

2.0 Service Conditions:

The equipment shall be sturdy and suitable for the following service conditions normally to be met in service:

2.1 Environmental Conditions:

- Ambient : 5°C to 55°C
- Humidity : upped 95% during rainy season
- Altitude : Max.1000 m above sea level

2.2 Working Conditions:

- Train Speed : 160 Km/h max.

- Vibration & Shocks:

- Vibrations:

- a) Maximum vertical acceleration : 1.0 g
- b) Maximum lateral acceleration : 0.5 g
- c) Maximum longitudinal acceleration : 3.0 g
- d) Frequency and amplitude:

Sinusoidal form of vibrations, the frequency 'f', lies between 1 Hz and 100 Hz and their amplitude 'a', expressed in mm, is given as a function 'f' by the equations:

$$a = 25/f \text{ for values of } f \text{ between } 1 \text{ Hz and } 10 \text{ Hz}$$

$$a = 250/f^2 \text{ for values of } f \text{ between } 10 \text{ Hz and } 100 \text{ Hz}$$

- Shocks: 3g in all direction as per IEC-571:

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3.0 GOVERNING SPECIFICATION:

3.1 Reference shall be made to the following standard Specifications: -

IS 13947 (Pt.1) 1993	Low voltage switchgear and controlgear: part-1: General rules.
IS: 8623-(Pt.1) 1993	Specification for the factory built assemblies of switchgear and controlgear for voltage upto and including 1000volts AC or 1200 volts DC.
IS:10118-1982	Code of practice for selection, installation and maintenance of switchgear and controlgear
IS:13723-1993	Low voltage fuse for voltages not exceeding 1000V AC or 1500 V DC.
IS: 513-94	Cold rolled low carbon steel sheets and strips.
IEC 68-2-30	Basic environmental tests procedure.
IEC 571-1980(PART-1)	Rules for the electronics used on Rail vehicles
IS: 616-1986	Safety requirements for mains operated electronic and related apparatus for household and similar general use (2nd Rev.).
RDSO Spec. No. E16/01(Rev.-A)	Reliability assurance specification.
1364-1992	Hexagon head bolts, screws and nuts of product grade A&B
IS: 3063-1994	Fasteners- single coil rectangular section spring washers
IS: 2016-1967,AM-4	Plain washer
IS 1573-1986	Electroplated coating of zinc on Iron and steel

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4.0 TECHNICAL REQUIREMENTS :



1. Input voltage
 - Nominal - 110V AC/DC
 - Variation - 85 V to 130 V AC/DC
2. Overall dimensions
 - H = 260 mm
 - W = 260 mm
 - D = 160 mm
3. Logic - Microprocessor based
4. No. of windows - 8 nos.
5. Size of windows - 45mm x 45mm
6. Mode of display
 - High intensity, high Efficiency, low power consuming, long life, Cluster of 4- LED's per Window for 'uniform display in the annunciator unit.'
 - Super bright, Red coloured, 10mm LEDs of reputed make for 'Indication outside coupe.'
7. Window color - Red
8. Facia type - Front replaceable
9. Operational sequence - First up sequence
10. Flash rate - 30 flashes / minute
11. Response time - 25 +/-10 m.secs.
12. Input signal - Opto isolated potential free contacts
13. Input delay - Nil
14. Output contacts - 2 nos. for hooter and 9 nos. for external LEDs
15. Contact rating - 5A, 250V (resistive)
16. Architecture - Integrated
17. Operational temp. - 0-60 °C

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- 18. Power consumption - 1.5 Watts per window
- 19. Buzzer & timer details - Compatible of Minilec or other reputed make (Prior approval shall be taken from CEE/RCF)
- 20. Cable terminations - Cage clamp type WAGO terminals suitable for 1.5 sq. cable.
- 21. Window legend size - As shown in the drawing.
- 22. Cable entry hole - Dai. 30-mm hole with suitable grommet to IS: 5270
- 23. Housing - The housing shall be made from 1.25mm thick CRCA sheet conforming to IS:513. The annunciator unit shall be with dimensions 260x260x160 and shall be conforming to Drg. No. LA72002 alt. 'a'.
- 24. PCB - (PC3S4) of glass epoxy with anti-fungal & anti-corrosive treatment.
- 25. Paint - Housing shall be powder coated to thickness of 50-60 microns to white color shade No. 023 of M/s Berger Paints, after surface treatment for anti rust and Anti corrosion.

5.0 PROTECTIONS :

- 5.1 Over current : Current-limiting features shall be provided to safeguard against failure of semiconductor devices under abnormal current conditions.
- 5.2 Input over Voltage : Over voltage protection shall be provided to limit the input voltage above 130 V AC/DC.
- 5.3 Under Voltage : The equipment should function even below 85 V DC, No damage should occur to the equipment.
- 5.4 Reverse polarity : No damage shall occur to equipment under reverse polarity connection at input terminals

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6.0 CONSTRUCTION:

6.1 The annunciator unit shall consist of housing, a microprocessor based annunciation system, a buzzer with timer and LED based indicators for individual indication outside each coupe. The system shall consist of 8 windows for message display corresponding to 8 different inputs from individual coupe in the coach. The coach shall consist of a total 8 nos. of coupes. The windows shall display the coupe no. from which the call has been received as indicated below:

Window No.	Indication display
Window-1	Coupe-A
Window-2	Coupe-B
Window-3	Coupe-C
Window-4	Coupe-D
Window-5	Coupe-E
Window-6	Coupe-F
Window-7	Coupe-G
Window-8	Coupe-H

LED based indicators with suitable connectors (supplied loose) shall be provided outside coupes for indication. These LEDs shall be connected in parallel with the LED connections in the annunciator unit. This shall be done by providing adequately rated load resistance in parallel to the existing circuit and terminating at externally provided terminals for coach cables. The terminals shall be suitable for 1.5 sq.mm cables.

6.2 The overall dimensions of the unit shall be as per drawing No. LA72002 alt 'a'.

6.3 The annunciation system shall be provided with 4 nos. externally operated push buttons as indicated below:

1. Test
2. Silence
3. Accept
4. Reset



6.4 The degree of protection of housing shall be IP23. Suitable louvers arrangement for heat dissipation and ventilation shall be provided.

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- 6.5 PVC copper cable of 1.5 sq. size to IS: 694 shall be employed for wiring of the unit.
- 6.6 Screen/photo printed legend plate shall be provided near the terminals for identification while making connections during installation / maintenance.
- 6.7 All components used in annunciator unit shall be of industrial grade.
- 6.8 The annunciator unit shall be rigidly fixed inside the housing by means of suitable clamping arrangement.
- 6.9 The annunciator unit should be fully solid state type without use of any Electro-mechanical relays.
- 6.10 All fasteners used shall be zinc plated and passivated according to IS:1573-86 and conforming to relevant Indian Standard Specification.
- 6.11 All the components/equipment/materials including paint shall be fire retardant. Manufacturer shall certify this requirement.
- 6.12 Prior approval shall be taken for power/control circuit for annunciators unit. Manufacturer shall submit circuit drawing alongwith technical details of all components and operating principles with write up for approval before manufacture of prototype unit.
- 6.13 The PCB and components inside the annunciator unit shall be easy to replace for maintenance.

7.0 SEQUENCE OF OPERATION:

- 7.1 On receiving call from any one or more coupe the following sequence shall take place:
1. Display window of one or more coupe from which calls have been received shall glow and start flashing and the hooter will be turned 'ON'.
 2. On pressing the 'silence' test button hooter sound will turn 'OFF'. The hooter shall automatically turn 'OFF' in 10 seconds if not silenced manually. A timer of reputed make shall be provided to cater this requirement.
 3. On pressing the 'Accept' push button window of the coupe from which the call has been signaled first shall keep flashing and the remaining windows shall stop flashing but will keep glowing continuously.

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4. On pressing the 'Reset' push button the flashing window will be turned 'OFF' and the subsequent call will start flashing while the other ones will keep steadily glowing. The same sequence shall be followed for each call.
5. In addition to above a parallel LED indication shall glow outside each coupe as per the sequence mentioned at 1 to 4 above.

8.0 TESTS:

8.1 Type tests:

All the type tests mentioned in table given below shall be carried out on a prototype unit at firm's premises at the manufacturer's cost. The firm manufacturing for first time shall get prototype approval from CEE/RCF.

8.2 Acceptance Test:

Acceptance test mentioned in table given below is to be carried out by an inspecting authority nominated by the purchaser at the works of the manufacturer, on the samples picked up by the inspecting authority.

8.3 Routine tests:

Routine test mentioned in table given below shall be carried out on each unit by the manufacturer at his works to ensure compliance with the specification and the drawing.

8.4 List of tests to be performed is given below: -

TABLE FOR TESTS

S.NO	TEST DESCRIPTION	TYPE TEST	ACCEPTANCE TEST	ROUTINE TEST	CLAUSE NO.
1	Visual inspection	√	√	√	8.5
2	Insulation resistance	√	√	√	8.6
3	Performance test	√	√	√	IEC571-20
4	Dielectric test	√	√	√	IEC571-21
5	Surge test	√	X	X	IEC571-22
6	Test for all protections	√	√	√	5.0
7	Degree of protection test	√	X	X	6.3

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8.5 VISUAL INSPECTION:

- Check for general workmanship, overall dimensions, mounting details, fabrication, finish as per approved drawings.
- Check size of displays windows, uniformity of display, size of characters, coupe numbers etc. as per clause 4.0.

8.6 INSULATION RESISTANCE:

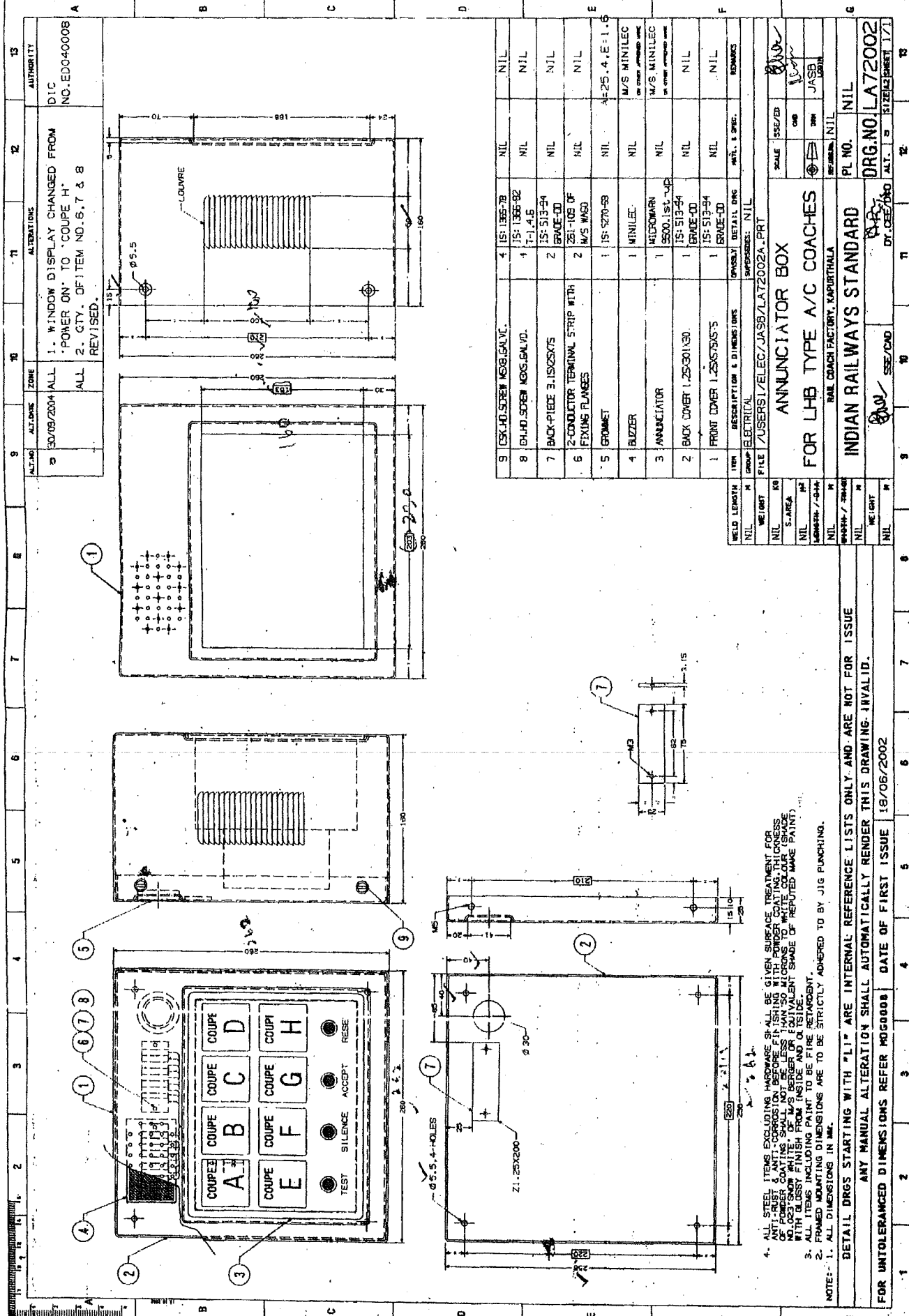
Meggar the electronic circuits, with 1000 V meggar. Insulation resistances should be greater than the following minimum requirements

- 110 V circuit and earth: 20-M ohms.
- Control and Electronics to earth: 10-M ohms.

9.0 ENCLOSURES:

- 1) Drawing No. LA72002 alt. 'a'.

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4. ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS TO BE 40 MICRONS. ALL M/S SURFACES TO BE PAINTED WITH COLOR SHADE NO. OCEAN WHITE. ALL M/S SURFACES TO BE PAINTED WITH FLUORENT SHADE OF REPUTED MAKE PAINT WITH GLOSSY FINISH FROM INSIDE AND OUTSIDE.

3. ALL ITEMS INCLUDING PAINT TO BE FIRE RETARDANT.

2. FRAMED MOUNTING DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.

NOTE:- 1. ALL DIMENSIONS IN MM.

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE
 ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.
 FOR UNTOLERANCED DIMENSIONS REFER DRG0008 DATE OF FIRST ISSUE 18/06/2002

13 AUTHORITY
 DTC
 NO. ED040008

12 ALTERATIONS
 1. WINDOW DISPLAY CHANGED FROM 'POWER ON' TO 'COUPE H'
 2. QTY. OF ITEM NO. 6, 7 & 8 REVISED.

11 ALTERNATIONS

10 ZONE

9 ALL

8

7

6

5

4

3

2

1

ITEM NO.	DESCRIPTION & DIMENSIONS	QTY.	UNIT	REMARKS
5	CSK. HD. STEEL MS&B GALV.	1	IS: 1366-78	NIL
8	CH. HD. SCREEN MS&B GALV.	1	IS: 1366-82 T-1.4.6	NIL
7	BACK-PIECE 3.15X25X75	2	IS: 513-94 GRADE-00	NIL
6	2-CONDUCTOR TERMINAL STRIP WITH FIXING FLANGES	2	251-105 OF M/S W&S	NIL
5	GROMMET	1	IS: 9270-89	AS-25.4, E-1.6
4	Buzzer	1	MINILEC	M/S MINILEC ON OTHER APPROVED MAKE
3	ANNUNCIATOR	1	WIDROWARN 5500.151-UP	M/S MINILEC ON OTHER APPROVED MAKE
2	BACK COVER 1.25X30X30	1	IS: 513-94 GRADE-00	NIL
1	FRONT COVER 1.25X35X75	1	IS: 513-94 GRADE-00	NIL

GROUP ELECTRICAL

DESCRIPTION & DIMENSIONS

DETAIL DRG

SUPPLIERS: NIL

FILE ZUSERSI/VELEC/JASB/LAT2002A.PRT

SCALE

DATE

DESIGNED BY

CHECKED BY

APPROVED BY

PL NO. NIL

DRG. NO. LA72002

INDIAN RAILWAYS STANDARD

RAIL COACH FACTORY, KAPURTHALA

SEE/CAD

DT. 06/06/02

SIZE: 1/1