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GOVERNMENT OF INDIA

MINISTRY OF RAILWAYS

अनुसंधान अभिकल्प एवं मानक संगठन

RESEARCH DESIGNS AND STANDARDS ORGANISATION

TITLE

SPECIFICATION FOR ENERGY EFFICIENT LED BASED LUMINAIRE
UNITS FOR PASSENGER COACHES

विशिष्ट सं० आर डी एस ओ/पी ई/टी एल/0091-2025 (रिव "2")

SPECIFICATION No. RDSO/PE/SPEC/TL/0091-2025 (Rev "2")

अनुमोदित

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Status of Revision

Sl. No.	Date of Revision/ amendment	Revision/ Amendment	Page no.	Remarks
1.	05.07.2016	Rev. 1	21	Incorporating all Amendments to Specification No. RDSO/PE/SPEC/TL/D/0091-2008 (Rev.0) and incorporation of light fittings in all type of Passenger coaches including retro-fitment of LED lamps in the existing coaches.
2.	--/--/----	Rev. 2	--	<ul style="list-style-type: none"> • Retrofitment clause 1.2 deleted • Clause 1.3 Operating voltage of change from 90 V to 77V and Under voltage trip added • Clause 4.1, minimum ambient air temperature changed to -10°C and altitude changed to 1776m • Clause 5.0 uniformity in accordance to EN 13272-1 added • Clause 5.0 k THD parameter changed with more clarity • Clause 5.1 CCT of the light changed in accordance to EN 13272-1 • Clause 6.11 Fire safety standard as per EN 45545 HL-3 level added • Additional tests to be performed in type test and acceptance test. Test scheme modified. • Clause 8.0 vi Undervoltage test requirement added • Clause 8.0 xiv Fire retardant test modified as per as per EN 45545 HL-3 • Clause 8.0 xxi Risk group defined for LED in accordance to EN 13272-1 • Clause 13.3 for mock up facility deleted.

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SPECIFICATION FOR ENERGY EFFICIENT LED BASED LUMINAIRE UNITS FOR PASSENGER COACHES

0.0 FORWARD

At present, conventional type luminaires are being provided inside the coaches of Indian Railways. With the introduction of white Light Emitting Diodes (LEDs) having the life not less than 50000 working hours, it, now, is possible to use these LED lamps in place of the existing fluorescent lamps /compact fluorescent lamps (FL/CFL) in the luminaire. These LEDs are almost maintenance free and the total saving in energy is expected to be more than 50%. Keeping in view the energy saving, the increased life of the fitting, vibration resistant features, ruggedness, no warm up period, excellent color rendering, controllable & recurring savings on account of maintenance and being environmental friendly, the use of energy efficient LED based luminaire is, now considered for provision in place of FL/CFL in the luminaire in passenger coaches of Indian Railways

At present LED based Luminaires are being used across Indian Railways in lighting application of coaches. These LEDs are almost maintenance free and the total saving in energy is more than 50% in comparison to FL/CFL. The adoption of LEDs has also improved operational reliability with features such as vibration resistance, durability, excellent color rendering, instant illumination, and enhanced environmental benefits. These luminaires have proven to be highly effective in meeting the stringent performance and safety requirements of railway operations. In light of the experience and successful deployment of LED-based luminaires, this specification has been revised to incorporate necessary modifications for further improving performance, ensuring compliance with evolving standards, and addressing operational feedback. The revised specification includes updates aligned with EN 45545 fire safety standards and other enhancements for optimal functionality and safety in passenger coaches.

1.0 SCOPE

- 1.1 New Coaches:** The scope includes design, development, manufacturing, testing and supply of energy efficient luminaires suitable for operation on 110V AC/DC supply complete with all accessories, LED lamps compatible with suitable current control driver circuit including mounting arrangement for illumination in the all type of passenger coaches i.e. air conditioned coaches, non air conditioned (sleeper), chair car, conventional EMU/MEMU, DEMU, three phase EMU, Kolkata Metro, LHB and new coaches for all passenger trains including Rajdhani and Shatabdi Express trains, etc. ~~as per the drawing numbers listed in Annexure-2.~~ The luminaires shall be of rugged and robust design suitable for Railway rolling stock working on Indian Railways under the operational and environmental conditions encountered during service as specified in clause 4.0. Types of luminaire covered in this specification are shown in Table-1.

TABLE-1 (TYPE OF LUMINAIRE)

Sl. No.	Type of Luminaire	Maximum Wattage of complete Luminaire	Usage of Luminaire
General			
1.	Type –A	18 Watt	Passenger area (Cabin) for conventional AC coaches
2.	Type –B1	9 Watt	• Corridor, Doorway & Gangway of all conventional

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			coaches (except ICF built AC) and Non AC LHB Coaches.
			<ul style="list-style-type: none"> • Passenger area (Cabin) of conventional Non-AC and LHB Non-AC coaches. • Conventional Non AC Chair car (Day coach)
3.	Type –B2	9 Watt	Door way & Gangway for ICF built conventional AC coaches.
4.	Type –C	9 Watt	Cabin and corridor area of ICF built SCN coaches
5.	Type –D	6.9 Watt	Lavatory/Mirror light
6.	Type –E	1 Watt	Night light luminaire cum berth indication for AC and non-AC coaches
7.	Type –F1	2 Watt	Berth reading light (Longitudinal) for LHB coaches
8.	Type –F2	2 Watt	Berth reading light (upper berth) for LHB coaches
9.	Type – F3	2 Watt	Berth reading light (transverse lower berth) RHS for LHB coaches
10.	Type – F4	2 Watt	Berth reading light (transverse lower berth) LHS for LHB coaches
11.	Type - F5	2 Watt	Berth reading light for Conventional coaches
12.	Type –G	1 Watt	Emergency Exit Indication light
13.	Type – H 1	1 Watt	Luminaire for Toilet indication for LHB AC coaches
14.	Type - H2	1 Watt	Luminaire for Toilet indication for Conventional AC coaches
15.	Type–I	3 Watt	Passenger alarm chain indication light
16.	Type-J	9 Watt	Luminaire for SLR coaches
17.	Type-K	9 Watt	Entrance doorway
For LHB AC Coaches			
18.	Type-L	18 Watt	Passenger area (Cabin)
19.	Type-M	9 Watt+ 1 Watt	Corridor light with night light
20.	Type-N	9 Watt	Doorway/ Gangway Area
For chair car/EMU/MEMU Coaches:			
21.	Type-O	18 Watt	Passenger area for LHB AC coaches
22.	Type-P	--	Dummy fitting for LHB AC Coaches
23.	Type-Q1	2 Watt	Reading light for LHB AC chair car (2-Seater)
24.	Type-Q2	2 Watt	Reading light for LHB AC chair car (3-Seater)
25.	Type-R	18 Watt	LHB Non-AC chair car
26.	Type-S	18 Watt	Conventional AC chair car, 3-Phase EMU
27.	Type-T	18 Watt	Compartment area for MEMU coaches (DMC/TC)

Note:

- i) This specification shall be applicable for all LED-based coach lighting systems across rolling stock platforms, including those not explicitly covered by existing drawings, subject to general compliance with performance and design requirements laid herein.
- ii) The luminaires shall generally be in accordance with drawings mentioned in Annexure- 2 are final. If any deviation is required to improve the luminaire, prior approval of OGA shall be obtained from the Vendor approving authority. The luminaires shall generally be in accordance with drawings mentioned in Annexure-3 2. Out of these, drawings for types – B2, C, E, F5, G, H2, K & S are tentative and for guidance purpose. However, The detailed drawings for these types shall be submitted by the manufacturer maintaining overall dimensions and mounting holes for approval before offering Prototype tests. For all other types the drawings

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~~mentioned in Annexure-3 are final and If any deviation is required to improve the luminaire, prior approval shall be obtained from the Vendor approving authority.~~

- iii) Each type of luminaire shall be supplied with the associated driver circuit and required optics. ~~Driver card as well as complete luminaire shall have validation by LED manufacturer for its compatibility.~~ LED array shall be designed in **SS/MS/Aluminum enclosure** (irrespective of materials given in the drawings) for thermal management and to maintain Junction Temperature (T_j) less than 85°C . **Aluminum enclosure shall not be of thickness less than 1mm.**
- iv) The output voltage of the driver for ~~9 W to 18 W~~, **more than or equal to 9W** luminaire shall be $24\text{V}\pm 5\%$ DC and for luminaire less than 9 W, the output voltage shall be $6/12\text{V}\pm 5\%$ at constant current for entire input voltage range.

1.2 ~~Retro-fitment of lamps in the existing/old coaches:~~

~~The scope includes design, development, manufacturing, testing and supply of LED lamps with inbuilt driver and with IP-65 protection as per IEC-60529 to be fitted in the existing holders provided for various types of fluorescent lamp (FL) / compact fluorescent lamp (CFL) / incandescent lamps being used as a light source in all types of Train Lighting, AC, conventional EMU/MEMU, DEMU, 3 Phase EMU & DEMU and Kolkata Metro coaches of Indian Railways.~~

1.2.1 ~~The following types of LED lamps to be operated in voltage range of 90V-140V AC/DC:~~

- a) ~~9 W tubular LED lamps to be used in the existing holder in place of 18 W FL in TL & AC coaches~~
- b) ~~5 W tubular LED lamps to be used in the existing holder in place of 11 W CFL in TL & AC coaches.~~
- c) ~~5 W LED lamp to be used in the existing bayonet cap type holder in place of 15/25 W incandescent lamp in TL & AC coaches.~~
- d) ~~5 W LED lamp to be used in the existing Edison screw type holder in place of 25 W incandescent lamp in TL & AC coaches.~~

1.2.2 ~~The following types of LED lamps to be operated in voltage range of 90V to 170V AC:~~

- a) ~~9 W (2 feet length) LED tubular lamps to be used in same holder in place of 18 W (2 feet length) FL in conventional EMU/MEMU, DEMU coaches~~
- b) ~~18 W (4 feet length) LED tubular lamps to be used in same holder in place and 36 W (4 feet length) FL being used in 3 phase EMU, DEMU & Kolkata Metro coaches.~~

- 1.3** Input to the luminaire will be fed through battery bank of 110V DC in parallel with alternator, rectifier cum regulator in conventional coaches, from battery charger through 60/15/9KVA, 750/415/110V transformer in LHB coaches **and from auxiliary converter in EMU/MEMU/Metro/Vande Bharat coaches.** The luminaire shall be suitable for operating at voltage range available as input i.e. **90V 77V** to 140V **AC/DC** with 15% **input ripple or supply THD.** There may be surges in input supply with peak value of approximately 350V. However, it is advised that the firm may measure the harmonic distortion and Surges in the Coach before designing the LED based luminaire. The over voltage trip shall be set between 200V to 205V AC(RMS)/DC. As soon as the voltage comes below 200 V AC(RMS)/DC, the luminaire should switch on automatically. **Under voltage trip shall be set between 60-66 VDC. The luminaries should switch-on automatically as soon as the voltage increases above 66VDC. The current drawn by luminaire after cutoff shall not me more than 2mA.**

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Light shall not fail/ destroy in voltage range from 0-200V AC/DC supply, and shall work normally after restoration of working voltage range.

In case of conventional EMU/MEMU, the Input to the luminaire will be fed through 141 V AC auxiliary winding of transformer (25 kV/862/266/141 V).

2.0 INFRINGEMENT OF PATENT RIGHTS

Indian Railways shall not be responsible for infringement of patent rights arising due to similarity in design, manufacturing process, use of the components, used in design, development and manufacturing of these light fittings and any other factor which may cause such dispute. The responsibility to settle any issue rises with the manufacturer.

3.0 REFERRED STANDARDS: The latest following standards shall be referred to

IEC 62504	General lighting – Light emitting diode (LED) products and related equipment – Terms and definitions
IEC 62560	Self-ballasted LED lamps for general lighting services Part-1-Safety requirements
IEC 62612 / IS 16102(Pt-2)	Self-ballasted LED lamps for general lighting services Part-2 Performance requirements
IEC 60598-1	Luminaires- General requirements and tests
IEC 62707-1	LED Binning-Part 1 General requirements and white grid
IEC 62717/IS 16103(Pt-2)	LED modules for general lighting-performance requirements
IEC 61347-2-13	Particular requirements for DC or AC supplied control gear for LED modules
IEC 62384/ IS 16104	DC or AC supplied electronic control gear for LED modules- performance requirements
IEC 62722-2-1	Luminaire performance Part-1: General requirements and Part-2-1: Particular requirements for LED luminaire
IEC 62031/IS16103(Pt-1)	LED modules for general lighting – Safety specifications
IEC 61347-1	Lamp control gear – General and safety requirements
IS 16107 (Part-1)	LED luminaires for general lighting purposes Part 1 safety requirements
IEC 62471/ IS 16108	Photo Biological safety of Lamps and Lamp system
IS 16107 (Part-2)	LED luminaires for general lighting Part 2 Performance requirements
IS: 513	Cold-rolled low carbon steel sheets.
IEC 60529	Classification of degree of protections provided by enclosures.
IEC 60571	Electronic equipment used on Railway vehicles.
ELRS/SPEC/S1/0015-OCT, 2001 (Rev.0)	Specification of Electronics used in Rolling Stock Application.
IEC 61373	Shock and Vibration Tests for rolling stock application
IEC 61000	Electromagnetic compatibility (EMC)
IS16106	Electrical and photometric measurement of solid state lighting (LED) products
LM-80 / IS16105	Method of measurement of lumen maintenance of solid state lighting (LED) sources
TM-21-11	Projecting long term lumen maintenance of LED light.
UIC-555	Electric lighting in passenger rolling stock.
EN 50155	Railway applications — Rolling stock — Electronic equipment

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EN 45545	Railway applications — Fire protection on railway vehicles
EN 13272-1	Railway applications - Electrical lighting for rolling stock in public transport systems

4.0 SERVICE CONDITIONS:

Recess mounting type light unit complete with luminaire and mounting accessories shall be suitable for working on coaches of Indian Railways under the following environmental and operational conditions encountered during service.

4.1 Environmental conditions

Maximum ambient air temperature	: 55° C
Minimum ambient air temperature	: 5° C -10°C
Max. Relative humidity	: 98 %
Atmosphere	: Extremely dusty and desert weather and desert terrain in certain areas. The dust contents in air may reach as high values as 1.6 mg/m ³
Coastal area	: The equipment shall be designed to work in coastal area in humid, salt laden and corrosive atmosphere.

The maximum value of the condition in the coastal area will be as follows:

Max. pH value	: 8.5
Sulphate	: 7 mg/litre
Max. concentration of chlorine	: 6 mg/ litre
Max. Conductivity	: 130 micro sec/cm Siemens/cm
Annual rainfall	: Ranging between 1750 to 6250 mm with thunder storm
Altitudes	: Not exceeding 1200 m 1776 m above sea level

4.2 Working Conditions

Train Speed	200 km/h
Supply voltage	<ul style="list-style-type: none"> • 110 V AC/DC (conventional/LHB / 3-phase EMU, DEMU/ Kolkata Metro coaches) • 127V AC (Conventional EMU/MEMU coaches)
Voltage range	<ul style="list-style-type: none"> • 77V 90 V -140 V AC/ DC (conventional/LHB/3-phase EMU, DEMU/ Kolkata Metro coaches) • 90 V-170 V AC (Conventional EMU/MEMU coaches)
Vibration and shocks	Maximum vertical acceleration — 3.0 g Maximum lateral acceleration — 3.0 g Maximum longitudinal acceleration — 3.0 g ('g' being the value of acceleration due to gravity)
Frequency & Amplitude	Sinusoidal form of vibration, the frequency 'f' lies between 1 Hz and 100 Hz. The amplitude 'a' expressed in mm is given as a function of 'f' by the equation $a = 25 / f$ for value of 'f' between 1 Hz and 10 Hz $a = 250 / f^2$ for value of 'f' between 10 Hz and 100Hz

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Track irregularities, level of shocks and vibrations to which the luminaires are exposed may be far more than actually given in IEC for on board (Ceiling) mounting arrangement. Measured data of vibration levels at critical locations of light fitting and its mounting arrangement of existing fittings, which can be used for design and in case of any doubt, the manufacturer must carry out instrumented trials on the existing stock for measurement of shocks and vibrations in consultation with the Vendor approving Authority at design stage itself. The fitting and its mounting arrangement shall be so designed that the performance is not adversely affected due to such high level of vibrations and shocks.

4.3 The manufacturer shall provide "In the field service support" during guarantee period.

5.0 CONSTRUCTION

- a) The RCF/ICF drawings of various types of luminaires mentioned in the specification are listed in Annexure 3 **2**. The performance requirement of the complete luminaire shall have uniformity level of at least 1:1.3 as per norm of UIC 555 **0.7 to 1.3 as per norms mentioned in EN 13272-1. in accordance with Annexure 4** To ensure uniformity level, arrangement of LED luminaire in the coaches should be shared by the PU with vendors. The simulation for lux level and uniformity that should be done by the vendors. The detailed calculation for lux level, uniformity in distribution as per clause no. 6.12 & 6.13 including the lux distribution curve/graph/spatial distribution shall be submitted.
- b) Deep drawn (not fabricated) housing of luminaire shall be made of 1.00 mm thick Steel sheet conforming to IS: 513 (Grade DD) unless otherwise mentioned in the respective drawings.
- c) Diffuser of sufficient strength shall be provided under the LED chamber to ensure glare free light and to protect the luminaire. Diffuser material shall be Fire retardant conforming to UL94 V0 grade made from "Lexan SP 24-492x" polycarbonate material (not less than 1.50 mm thick) of GE Plastic/Sabic make or any other equivalent make with the prior approval of Vendor approving authority. Selection of diffuser shall be such that the individual LEDs are not visible and appearance looks like a brightly lighted surface. **Diffuser material shall be fire safety compliant to HL-3 grade as per EN45545 irrespective of material mentioned in the drawing.**
- d) All steel items excluding hardware shall be given surface treatment for anti-rust and anti-corrosion before finishing with powder coating. The thickness of powder coating shall not be less than 60 microns to white colour (Shade no 042 'IFB white' of M/s Berger or similar in M/s Asian/M/s Nerolac/ **or any other equivalent make paint with the prior approval of Vendor approving authority**) with glossy finish from inside and outside.
- e) Housing of the driver for the luminaire (if required) shall be made of **Stainless steel (SS-304)** or Aluminum or **fire retardant polycarbonate/fibre sheet mild steel material** having IP65 protection. **The housing of the driver should be dust and water tight for IP 65 rating as per IEC 60529 including holes provided for the cable entry using proper cable gland/grommet/sealing arrangement.**
- f) Suitable number of LEDs shall be used in the luminaire. LED of NICHIA/OSRAM/SAMSUNG/LUMILEDS/CREE/AVAGO make shall be used for the purpose. The manufacturer shall submit the proof of procurement of LEDs from above OEMs at the time of testing **and shall maintain proper documentary accounting of LEDs purchased and consumed.**

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- g) Manufacturer shall be solely responsible for testing and performance of the luminaire after installation and shall also ensure the specified and uniform illumination and comfort level in the coach.
- h) Suitable WAGO/Phoenix or equivalent other makes cage-clamp type connectors with the approval of Vendor approving authority shall be used between driver and LED array and between driver to input.
- i) Suitable grommets/~~glands~~ shall be provided for cable traversing.
- j) The weight of the luminaire shall be as low as feasible.
- k) ~~Total harmonic distortion (THD) shall be less than 15% for luminaires up to 4Watt and less than 10% for luminaires more than 4 Watt at full load at nominal voltage.~~
The total harmonic distortion (THD) of current and voltage drawn by the luminaire, measured at full load and nominal voltage, shall not exceed 8% for luminaires rated above 4 watts, and shall not exceed 12% for luminaires rated at or below 4 watts, in order to minimize the impact on the power source.
- l) The power factor of the luminaire shall be more than 0.90 for the luminaire up to 4 Watt and more than 0.95 for the luminaire above 4 Watt.

5.1 High lumen and energy efficient LEDs with the following features shall be used:

- a) The working life of the ~~lamp~~ LED at junction temperature of 85°C for ~~350mA/175mA/80mA/65mA~~ test current ~~between 350mA and 65mA~~ shall not be less than 50000 hours of cumulative operation and shall be suitable for continuous operation of 24 hours per day. These features shall be supported by datasheet.
- b) Colour temperature of the white colour LED used in the luminaire shall be in the range of ~~6000 K-7000 K~~ 4000K- 5000K for neutral white. The tolerance of measured CCT should be within $\pm 10\%$ at luminaire level with respect to CCT of LED used.
- c) The output of LED (efficacy) shall not be less than 150 lumen per watt at minimal operating current and shall ensure guaranteed operation life of not less than 50000 burning hours with the controlled junction temperature of 85°C.
- d) LED controller (Driver) shall be EMI/EMC compliant.
- e) The LEDs used shall have white point stability less than 5 step (Macadam ellipse) or as per LM80. The manufacturer shall submit the compliance from OEM.
- f) The LEDs shall be LM80 certified for white LED along with TM21 projection for more than 50000 hours.
- g) The LEDs used shall be UL certified with UL number.
- h) The LED driving current shall not be more than ~~80%~~ 50% of absolute maximum forward current.
- i) The LED beam/view angle (typical) shall be 120° or more.

6.0 TECHNICAL REQUIREMENTS

6.1 The luminaire casing/housing shall be made as per the requirement in Clause 5.0(a).

6.2 The electronic components used shall be as follows:-

- a) All the electronic components used in the circuit shall be of industrial grade or above.
- b) Metallic film/Paper/Polyester Capacitor shall be rated for 5000 hours for 105°C or

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above temperature.

- d) The resistors shall be preferably made of metal film/chip resistor of adequate rating. The actual loading versus rating shall be 3.
 - e) The junction temperature of the Switching devices such as transistors and MOSFETs etc. shall not exceed 125°C (allowing thermal margin of 25°C).
 - g) The protective cum adhesive coating (fire retardant) used on PCBs shall be clear and transparent and shall not affect color code of electronic components or the product code of the company.
 - h) The heavy components shall be properly fixed. The solder connection should be with good finish.
 - i) The electronic circuits, PCB and components shall meet the requirement of RDSO Specification No. ELRS/SPEC/S1/0015-OCT, 2001 (Rev.0) for electronics used in Rolling Stock Application. The electronics covered for this equipment shall pass all the tests called for in the specification. The manufacturer shall indicate the deviation or compliance.
 - j) The infrastructure for Quality Assurance facilities as called for in the specification shall be available with the manufacture for this product.
- 6.3** ~~Low smoke, halogen free, fire retardant Thin walled flexible e-beam/PTFE cable of~~ **RDSO approved make** with multi-strand copper conductors suitable for continuous operation at 120°C shall be used inside the luminaire as connecting wires. ~~and fuse protection shall be provided at input side.~~
- 6.4** Adequate heat sink (if required) with proper thermal management shall be provided. Design should not consider heat dissipation through roof top as roof is provided with heat insulation material.
- 6.5** Care shall be taken in the design that there is no stagnation of water anywhere in the luminaire as well as driver. ~~The entire housing shall be dust proof and water spray having IP 65 protection as per IEC 60529. The part of the luminaire enclosure containing electronic components such as LED module housing and driver housing, including all cable entry points, shall be fully dust-tight and water-tight from all sides and shall conform to IP65 protection as per IEC 60529.~~
- 6.6** The unit shall be maintenance free.
- 6.7** ~~Temperature of diffuser's surface shall be lower than the fluorescent/compact fluorescent luminaire being used presently.~~
- 6.8** ~~The control gear shall be designed in such a way that temperature of heat sink shall not be more than 45°C for air conditioned coaches and 10°C above the ambient for non-air-conditioned coaches.~~
- 6.9** Diffusers used shall be such that the glare from individual LED is restricted and shall appear as a **uniformly lit** single source of light ~~as in the case for lighted globe~~ and it shall not cause inconvenience to the passengers.
- 6.10** ~~The illumination of the luminaire provided in the coach shall not have multiple shadows under one Luminaire.~~
- 6.11** **The complete luminiare should comply with standard EN 45545 HL-3 for all equipments under scope of supply and the reports should be submitted to vendor approving**

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authority.

- 6.12 Illumination Level:** The fitting shall be so designed that the illumination level shall be evenly distributed and shall be free from glare. Illumination level of different types of luminaire shall be as given below:

Sl. No.	Type of Luminaire	Vertical Distance (Mtrs) from the floor level	Average Illumination Level (Lux)	Colour of illumination
1.	Type –A	0.84	120	Cool day Neutral white
2.	Type –B1 & B2	0.84	80	Cool day Neutral white
3.	Type –C	0.84	80	Cool day Neutral white
4.	Type –D	0.50	100	Cool day Neutral white
5.	Type –E	10.0*	Clearly visible	Blue
6.	Type – F1/F2/F3/F4/F5	0.75	100	Cool day Neutral white
7.	Type –G	10.0*	Clearly visible	Cool day Neutral white
8.	Type –H1/H2	10.0*	Clearly visible	Green - Vacant Red – Occupied
9.	Type –I	400*	Clearly visible	Red
10.	Type –J	0.84	80	Cool day Neutral white
11.	Type –K	0.84	80	Cool day Neutral white
12.	Type –L	0.84	120	Cool day Neutral white
13.	Type –M	0.84	80	Cool day Neutral white
14.	Type –N	0.84	80	Cool day Neutral white
15.	Type –O	0.84	120	Cool day Neutral white
16.	Type –P	-	-	-
17.	Type –Q1/Q2	1.20	100	Cool day Neutral white
18.	Type-R	0.84	120	Cool day Neutral white
19.	Type-S	0.84	120	Cool day Neutral white
20.	Type-T	0.84	120	Cool day Neutral white

* Horizontal distances

Note:

- Variation in illumination level shall be $\pm 2\%$ for input voltage range from 77V 90V to 140 V AC/DC (for TL&AC coaches, 3 phase EMU, DEMU & Kolkata Metro coaches) and 90 V AC to 170 V AC (For Conventional EMU / MEMU coaches).
- The illumination shall not have infra-red and ultra-violet emission. The test certificate from the NABL approved laboratory shall be submitted.

- 6.13** After 50,000 burning hours, the luminaire intensity shall be at least 70% with degree of uniformity between 0.7 to 1.3 as per norms of EN 13272-1 of at least 1:1.3 as per UIC 555. Data sheet showing year wise deterioration in the LED shall also be submitted along with design.

- 6.14** Detailed design shall be furnished before manufacturing of prototype. However, information as per Annexure-2 1 shall be submitted by the manufacturers along with in-house test results while offering for witnessing the prototype testing at firm's premises.

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7.0 TESTS:

Tests are classified as:–

- Prototype test
- Type test
- Acceptance test
- Routine test.

7.1 Prototype Test

Prototype test is conducted on the first unit developed by the firm as per the relevant specification.

7.2 Type Test

Type tests shall be carried out to prove confirmation with the requirement of specification and general quality/design features of the unit. The results of the type tests shall be valid for a maximum period of 3 years. In case of any change in Bill of Material (BOM) or design of unit, complete type test shall be repeated.

If any sample fails in any of the type tests, two fresh samples shall be taken and tested. If any sample again fails in that test, the whole lot shall be rejected.

7.3 Acceptance Tests:

These tests are carried out by an inspecting authority at the manufacturer's premises on sample taken from a lot for the purpose of acceptance of a lot. Acceptance tests shall not be carried out from particular luminaire from the lot on which type tests have already been conducted. Recommended sampling plan is given below.

7.3.1 Sample size and criteria for conformity

The luminaire shall be selected from the lot at random. In order to ensure randomness of selection, procedures given in IS 4905-1968 (Reaffirmed 2001) may be followed.

7.4 Routine Tests:

These tests shall be performed by the manufacturer on each complete unit of the same type and the results shall be submitted to the inspecting agency, prior to offering the lot for acceptance test.

7.5 Test Scheme:

Sl. No.	Description of test	Clause no.	Prototype Test	Type Test	Acceptance Test	Routine Test
1.	Visual and Dimensional check	8 (i)	Y	Y	Y	Y
2.	Checking of Purchase documents of LED	8 (ii)	Y	Y	Y	Y
3.	Resistance to humidity	8 (iii)	Y	Y	-	-
4.	Insulation resistance test	8 (iv)	Y	Y	Y	Y
5.	HV test	8 (v)	Y	Y	Y	Y

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6.	Over voltage and under voltage protection	8 (vi)	Y	Y	Y	Y
7.	Wattage measurement	8 (vii)	Y	Y	Y	-
8.	Short circuit protection	8 (viii)	Y	Y	-	-
9.	Surge protection	8 (ix)	Y	Y	-	-
10.	Reverse polarity	8 (x)	Y	Y	Y	Y
11.	Temperature rise Test	8 (xi)	Y	Y	-	-
12.	Ra (Colour Rendering Index) measurement test	8 (xii)	Y	Y	Y	Y
13.	Lux measurement	8 (xiii)	Y	Y	Y	Y
14.	Fire retardant Test	8 (xiv)	Y	Y	Y	-
15.	Test for IP65 protection	8 (xv)	Y	Y	-	-
16.	Vibration and Shock test	8 (xvi)	Y	-	-	-
17.	Environmental tests	8 (xvii)	Y	Y ^a	Y ^b	Y ^c
18.	Life test	8 (xviii)	Y	Y	-	-
19.	EMI/EMC Test	8 (xix)	Y	Y ^a	-	-
20.	Endurance Test	8 (xx)	Y	Y	-	-
21.	Safety	8 (xxi)	Y	Y ^a	-	-

Note :

a	If there is no change in BOM then this test shall not be repeated and last prototype test report will be valid for this test.
b	In routine tests, 100% luminaires shall be kept 'ON' for 48 hours at 50°C ± 5°C, electrical parameters before and after tests shall be recorded and shall be in range before and after dry heat test. All parameters shall remain in the limit.
c	In acceptance tests, 5 luminaires shall be kept 'ON' for 2 hours at 50°C ± 5°C and -10°C ± 3°C. No luminaires shall fail in this test.

8.0 Method of Testing**i) Visual and Dimensional Check:**

The unit shall be checked visually for all dimensions as per approved design and drawing. General workmanship should be good; all the components properly secured and sharp edges shall be rounded off. Check the marking and quality of the workmanship visually. Check the rating and make of electronic/electrical items. Documents shall also be verified as mentioned in the specification.

ii) Checking of Purchase documents of LED

Document of purchase of LED lamps from the approved sources viz. NICHIA/OSRAM/SAMSUNG/Lumileds/CREE/AVAGO with bill of entry and certificate of conformance from manufacturer along with validation of driver controller card and luminaire by the manufacturer of the LEDs to ascertain the life of the LEDs shall be checked.

iii) Resistance to humidity test

This is carried out by suspending the painted panels in corrosion chamber maintained at 98% RH and temperature cycle of 42 to 48°C for 7 days and examining it for any sign of deterioration and corrosion of metal surface.

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iv) Insulation resistance test

The insulation resistance of the unit between earth and current carrying parts shorted together shall not be less than 100MΩ at 60% RH when measured with 500V megger before and after HV test.

v) HV test

Immediately after insulation resistance test, an AC voltage of 1.72 KV rms (1500 + 2 x rated voltage) of sine wave form of 50 Hz shall be applied for one minute between the live parts and frame. There shall not be any kind of break down, flashover or tripping of supply.

vi) Over voltage and under voltage protection

The Luminaire shall withstand at 250V DC/AC for two minutes.

The Luminaire shall withstand at 50V DC/AC for 2 Minutes.

After the cutoff, the input current draw from the luminaire shall not be more than 2mA.

The luminaire shall restore to its normal operation after restoring the supply to normal working voltage range.

vii) Wattage measurement

The wattage of luminaire shall be measured at 77V 90V, 110V and at 140V DC. In case of luminaire for conventional EMU/MEMU, DEMU, it shall be measured at 90V, 110V, 140 V and 170V AC. Wattage shall not be greater than as declared in the design.

viii) Short circuit protection

The luminaire shall withstand Short circuit protection. The luminaire shall work normal after re-setting.

ix) Surge protection

It shall withstand a surge of 3kV ±5% as per the procedure given in IEC-60571 at the input terminals for all types of luminaire.

x) Reverse polarity

The Luminaire shall withstand polarity reversal. It shall be operated with reverse voltage for 5 minutes at maximum value of voltage range. At the end of this period, the supply shall be made in correct polarity and Luminaire shall operate in a normal way.

xi) Temperature rise Test:

Temperature rise Test shall be conducted at 77V 90 V DC with full load. The temperature rise shall be recorded by temperature detectors mounted at the specified reference points on the body of semiconductors, capacitors and other components as agreed between purchaser and manufacturer. The maximum-recorded temperature under worst conditions shall be corrected to 55°C and compared with maximum permissible temperature (for power devices at junction). The thermal margin available shall be compared with the safety margin declared by the manufacturer. Under loading conditions as specified above, the corrected temperature of the power devices shall have a safety margin of minimum 10° C.

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Temperature at junction shall not exceed 125°C when corrected to 55°C . ~~The Luminaire shall also be subjected for short time rating after continuous loading to ensure the temperature rise within the permissible limit. The maximum temperature rise of the electronic devices on the PCBs shall not be more than 20°C .~~

xii) Ra (Colour Rendering Index) measurement test

~~The lumen is the unit of luminous flux, which is equal to the flux emitted in a solid angle of one Steradian by a uniform point source of one candela.~~

The initial reading of the chromaticity co-ordinates x & y shall be within 5 SDCM (Standards Deviation for Colour matching) from the standardised rated value as per Annexure D of IEC 60084 **IEC 62717**. The Colour Rendering Index shall be minimum 80.

~~The initial reading of the general colour rendering index (Ra) shall not be less than the rated value decreased by 3.~~

Certificate based on relevant standards to this measurement shall be obtained from the OEM.

xiii) Lux measurement

Lux measurement with the help of Lux meter shall be carried out at a distance as shown in clause no. 6.12 above. Value obtained shall not be less than the Lux specified in clause no. 6.12 of the specification.

xiv) Fire retardant Test

The complete luminaire should comply with standard EN 45545 HL-3 for all equipments under scope of supply. Firm should submit fire safety assessment with test reports to vendor approving authority. During acceptance test these reports should be presented to the accepting authority.

xv) Test for IP protection

The entire LED module and driver housing shall be dust and water spray proof having IP-65 protection from all the sides. This test shall be conducted as per IEC 60529 except berth reading light.

xvi) Vibration and Shock Test

The complete unit ~~cubicle~~ together with its driver and mounting arrangements (including shock-absorbing devices, if provided) shall be subjected to the vibration and shock testing (for Category-1, Class A) as per latest IEC 61373.

xvii) Environmental tests

- The Luminaire shall meet the following tests as prescribed in IEC – 60571/EN 50155:
 - a) Dry heat test.
 - b) ~~Damp heat test~~, **Cyclic damp heat test**
 - c) ~~Test in corrosive atmosphere~~ **Salt mist test**

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d) Burn-in test on PCB controller card only as per RDSO specification no. ELRS/SPEC/S1/0015-OCT, 2001 (Rev.0) for 45 hours.

- In routine tests, 100% luminaires shall be kept 'ON' for 48 hours at $50^{\circ}\text{C} \pm 5^{\circ}\text{C}$, electrical parameters before and after tests shall be recorded and shall be in range before and after dry heat test. All parameters shall remain in the limit.
- In acceptance tests, 5 luminaires shall be kept 'ON' for 2 hours at $50^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and $-10^{\circ}\text{C} \pm 3^{\circ}\text{C}$. No luminaires shall fail in this test.

xviii) Life Test

- The lumen maintenance & life test shall be as per LM80/IS 16105 and TM-21 respectively.
- ~~The lumen maintenance of the lamp shall not be less than 90% of the initial lumens after 6000 burning hours at condition of case temperature (or solder point temperature) of 105°C and ensure testing is done at minimum 80% of its absolute maximum forward current (I_f). The initial lumens will be taken after 100 hours aging. Certificate from OEM of LED manufacturer shall be submitted.~~

xix) EMI/EMC Test

EMI/EMC tests shall be conducted on complete luminaire unit as per IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4 and IEC 61000-4-6.

xx) Endurance Test

The Luminaire shall be kept "ON" with input voltage of 140 V DC (for luminaires for voltage range of ~~77~~ 90-140 V DC/AC) and at 170 V AC (for luminaires for voltage range of 90-170 V AC) for 200 hours. After this, the Luminaire is subjected to 20,000 cycles of "ON" and "OFF", each cycle consisting of 3 seconds "ON" and 10 seconds "OFF" period. Luminaire should pass this test. Then, the test is to be continued beyond 20,000 cycles up to one lakh cycles, followed by performance test.

xxi) Safety:

~~The complete Luminaire unit, LED and driver shall comply with the safety requirements as per IEC mentioned in clause no. 3.0 above.~~

LEDs used in the luminaire shall comply with Risk Group 0 or 1 (RG0/RG1) as per IEC 62471. Photo biological test report/datasheet of LED mentioning Risk Group should be submitted during design approval.

9.0 MARKING:

9.1 The following information shall be distinctly and indelibly marked on the housing:

- Indian Railways Insignia
- Year of manufacture/Serial Number (MMYY/ABCD)
- Name of Manufacturer
- Rated watt and voltage (Input)
- Rated watt - Output

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9.2 The make, month and year of manufacture shall also be marked on driver and LED panel.

~~**9.3** The following information shall be distinctly and indelibly marked on the lamps for retro fitment:~~

- ~~a) Indian Railways Insignia~~
- ~~b) Year of manufacture/Serial Number~~
- ~~c) Name of Manufacturer~~
- ~~d) Rated watt and voltage~~

10.0 ISO CERTIFICATION:

Firm shall possess the ISO certification for design, development, manufacturing and supply of the complete Lighting Unit.

11.0 GUARANTEE

The complete Luminaire shall have replacement guarantee for satisfactory performance and manufacturing defects for a period of 60 months from the date of commissioning or 72 months from the date of supply whichever is earlier.

12.0 APPROVAL

12.1 While seeking approval, the firm shall submit a sample to the Vendor approving authority along with test results, circuit diagrams and dimensional drawing of the Luminaire. The prototype testing shall be carried out at manufacturer's work.

12.2 The manufacturer shall also submit details like make, type, reliability grade, rating and loading of various electronic components used in the circuit. The temperature rise of the various components under the most adverse conditions shall also be declared.

12.3 Final approval for appearance in vendor directory is subject to field trials for a period of three months for performance/lumen measurement of the luminaire as compared to test results during prototype.

12.4 WITHDRAWAL OF APPROVAL

Approval granted to the manufacturer is liable to be withdrawn in the event of noticing any change at a later date in the design or change from the bill of material as approved earlier without seeking the prototype approving authority's approval or using components of inferior specification/quality compromising with the reliability.

13.0 SCHEDULE OF TECHNICAL REQUIREMENTS:

13.1 General

- a) The manufacturer shall have minimum three years' experience in design, manufacturing, installation and commissioning of different types of LED based luminaire.

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- b) The manufacturer should have technical collaboration/MoU with the LED manufacturer for supply of LEDs and know-how for adequate thermal management to ensure minimum guaranteed performance as given in the specification, the selection procedure for selecting right type of LEDs for such application.
- c) The MoU should also indicate the Quality Assurance Plan (QAP) for handling, storage and life cycle test of the LED proposed to be used.
- d) The manufacturer shall have all the requisite testing facilities for the tests mentioned above at their works. However, special tests such as IP protection, environmental, surge, vibration and shock tests etc. may be carried out in any NABL approved labs and test results shall be submitted to Vendor approving authority.

13.2 DETAILS OF ESSENTIAL INFRASTRUCTURE

- Dust free environment with ESD protection for the assembly of LEDs/PCB.
- Testing jigs for the testing of assembled LEDs/PCB.
- Component lead forming machines for through hole devices.
- Temperature controlled automatic wave-soldering machine with auto-fluxing facilities for through hole devices.
- Automatic Temperature controlled re-flow-soldering machine for surface mounted devices.
- Stencil and solder paste application machine for surface mounted devices
- Automatic Device insertion (Pick and place) machine for surface mounted devices with in-circuit testing facility.

All the above facilities are considered essential and shall be verified by Vendor approving authority. However, the firm may outsource only LEDs/PCB assembly and soldering with the sub-vendor at the developmental stage, which shall have the all above facilities. Railways officials may visit the premises of sub-vendor engaged by the firm for LEDs/PCB assembly. The firm shall arrange the visit to the sub-vendor's premises.

~~13.3 MOCK UP Facilities for for uniformity and lux level~~

~~Simulation design of Actual of the coach compartment/cabin (similar to at least two cabins of 3-tier AC coach) and lavatory etc shall be arranged by the manufacturer for measurement of lux level and uniformity level. Achievement shall be submitted along with the test data of prototype sample being offered for witnessing the prototype tests.~~

13.4 ESSENTIAL MEASURING INSTRUMENTS FOR TESTING

The following instruments with up-to-date calibration are considered essential for testing purpose: -

- Variable regulated DC supply at least up to 300 Volts.
- Heat chamber/oven having minimum range of 0-150°C with alternate arrangement of standby power supply for carrying out endurance tests.
- H.V. Tester.
- Adequate number of meters for measurement of different electrical parameters.
- Megger (500Volt)

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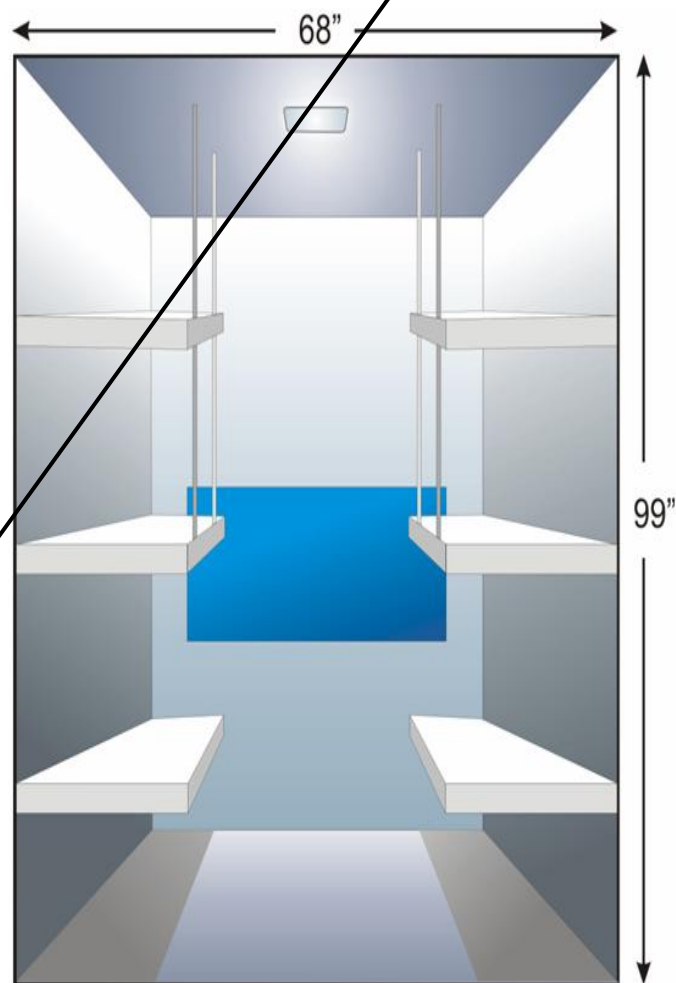
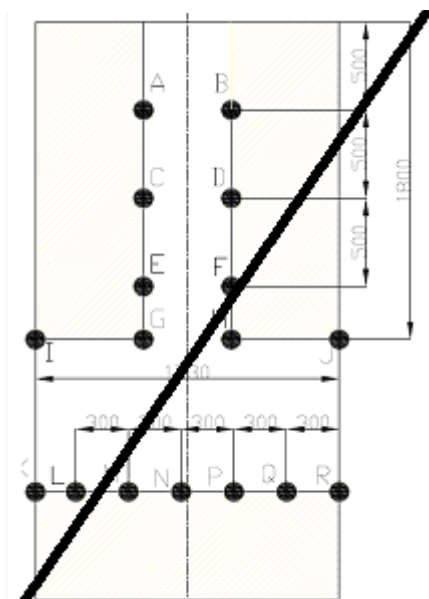
- Measuring Gauges such as Vernier caliper, micrometers, dial gauge,
- Non-contact digital thermometer, contact less thermometer and room thermometer.
- Digital multimeter.
- Digital Weighing machine.
- Complete test bench for measuring the different parameters as mentioned in the specification.
- Milli-ohm/Micro-ohm meter
- Lux meter.
- Storage type Oscilloscope.
- Power analyzer
- Chroma meter
- 8-channel Digital temperature scanner
- Spectrophotometer for single LED checking.
- Computerized test bench for PCB testing
- Computerised test setup for electrical parameter of Light testing
- Centre lathe, CNC milling machine, hydraulic press etc for manufacturing of luminaires (Optional)
- Dark room
- Powder coating plant (Optional)

All the above facilities are considered essential at the developmental stage itself and shall be verified by Vendor approving authority before considering the firm as a developmental source.

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Annexure-1

GENERAL LAYOUT OF COUPE (ACCN)



Measurement location	Lux measurement			
	Ground Level	Lower berth	Middle berth	Upper berth
A				
B				
C				
D				
E				
F				
G				
H				
I				
J				
K				
L				
M				
N				
O				
P				
Q				
R				
Linearity				
Uniformity				

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Annexure- 1**LUMINAIRE WISE DATA TO BE FURNISHED BY THE MANUFACTURER
WHILE OFFERING FOR WITNESSING THE PROTOTYPE TESTS****ILLUMINATION CHARACTERISTICS:** $T_j = \dots^\circ\text{C}$, $I_f = \dots\text{mA}$

Sl.No.	Parameter	Absolute Values		
		Min.	Typical	Max.
1	Luminous Flux (lm)			
2	Storage Temperature ($^\circ\text{C}$)			
3	Viewing Angle (Degree)			
4	Luminous Efficiency(lm/w)			
5	Dominant Wavelength (nm)			
6	Color temperature (K)			
7	Forward Voltage(v) Rank			
8	Colour Rendering Index			
9	CIE Coordinates (Rank ____)			

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Annexure-2

Details of LED Light Fittings of LHB, Conventional & MEMU/EMU coaches

Sr. No.	Description	Type of fitting	Drawing. No.	
			PU	NO.
1	LED Light Fitting for Passenger Area (Cabin) of conventional AC coaches	Type-A (18 W)	RCF	CC76452
2	LED Light Fitting for Corridor, Doorway & Gangway for all conventional Coaches (except ICF built AC Coaches) and Non AC LHB Coaches, Passenger area (Cabin) for conventional & LHB Non AC Coaches and Conventional Non AC Chair Car (Day Coach).	Type-B 1 (9 W)	RCF	CC76453
3	LED Light Fitting for Doorway & Gangway for ICF built conventional AC Coaches	Type-B 2 (9 W)	ICF	ICF/STD-7-6-050
4	LED light fitting for Cabin & Corridor Area of ICF Built SCN coaches	Type-C (9 W)	ICF	ICF/STD-7-6-046
5	LED Light Fitting for Lavatory/Mirror	Type-D (9 W)	RCF	LW76092
6	LED Light Fitting for Night Light with Berth Indication for AC & Non AC Coaches.	Type-E (1 W)	ICF	ICF/STD/7-6-053 (2 Sheets)
7	LED Light Fitting for Berth Reading Light (Longitudinal) for LHB coaches.	Type-F1 (2 W)	RCF	LW76093
8	LED Light Fitting for Berth Reading Light Upper Berth for LHB coaches.	Type-F2 (2 W)	RCF	LW76094
9	LED Light Fitting for Berth Reading Light Transverse Lower Berth RHS for LHB coaches.	Type-F3 (2 W)	RCF	LW76095
10	LED Light Fitting for Berth Reading Light Transverse Lower Berth LHS for LHB coaches.	Type-F4 (2 W)	RCF	LW76096
11	LED Light Fitting for Berth Reading Light for conventional AC coaches	Type F-5 (2W)	ICF	ICF/STD-7-6-051
12	LED Light Fitting for Emergency Exit indication.	Type-G (1 W)	ICF	ICF/STD-7-6-049
13	LED Light Fitting for Toilet Indication in LHB AC Coaches	Type-H 1 (1 W)	RCF	LW76097
14	LED Light Fitting for Toilet Indication in Conventional AC Coaches	Type-H 2 (1 W)	ICF	ICF/STD-7-6-052
15	LED Light Fitting for Passenger Alarm Chain Indication	Type-I (3 W)	RCF	LW76098
16	LED Light Fitting for SLR Coaches	Type-J (9 W)	RCF	CC76457
17	LED Light Fitting for Entrance Doorway	Type-K (9 W)		ICF/STD-7-6-048
18	LED Light Fitting for Passenger area (Cabin) for LHB AC Coaches	Type-L (18 W)	RCF	LW76090
19	LED Light Fitting with Night light (Corridor Area) for LHB AC Coaches	Type-M (9W + 1W)	RCF	LW76091
20	LED Light Fitting for Doorway/Gangway area for LHB AC Coaches	Type-N (9 W)	RCF	LW76099
21	LED Light Fitting for LHB type AC Chair Car	Type-O (18 W)	RCF	LW76100
22	Dummy Fitting for LHB type AC Chair Car	Type-P	RCF	LW76101
23	LED Light Fitting for Reading Light for LHB AC Chair Car (2 seater)	Type-Q1 (2 W)	RCF	LW76102
24	LED Light Fitting for Reading Light for LHB AC Chair Car (3 seater)	Type-Q2 (2 W)	RCF	LW76103

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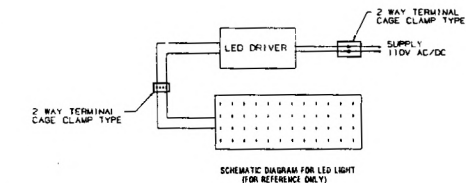
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25	LED Light Fitting for LHB Non-AC Chair Car	Type-R (18 W)	RCF	LW76104 (3 Sheets)
26	LED Light Fitting for Conv. AC Chair Car, EMU & DEMU coaches	Type-S (18 W)	ICF	ICF/STD-7-6-047
27	LED Light Fitting for MEMU coaches (DMC/TC)	Type-T (18 W)	RCF	CC76460 (9 sheets)
PART DRAWING				
28	Diffuser for LHB type Coaches		RCF	LW76105
29	Frame for LED light fitting for LHB type AC chair Car		RCF	LW76106
30	LED Module box with diffuser		RCF	LW76107
31	Diffuser for LED light fitting for LHB Non AC Chair Car		RCF	LW76108
32	Details for berth reading lights		RCF	LW76109
33	Front Cover		RCF	LW76110
34	Front cover		RCF	LW76111
35	Front cover for Transverse Lower Berth (RHS)		RCF	LW76112
36	Front cover for Transverse Lower Berth (LHS)		RCF	LW76113
37	FRP bracket Assembly		RCF	LW76114

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Technical drawing of a rectangular plate. The overall dimensions are 295 (width) and 270 (height). The inner rectangular area has dimensions 270 (width) and 270 (height). The plate has a central rectangular hole with a diameter of $\phi 13$. There are four circular holes, one in each corner, with a diameter of $\phi 10$. The plate is labeled with dimensions 295, 270, 270, and 270. The central hole is labeled $\phi 13$. The corner holes are labeled $\phi 10$.

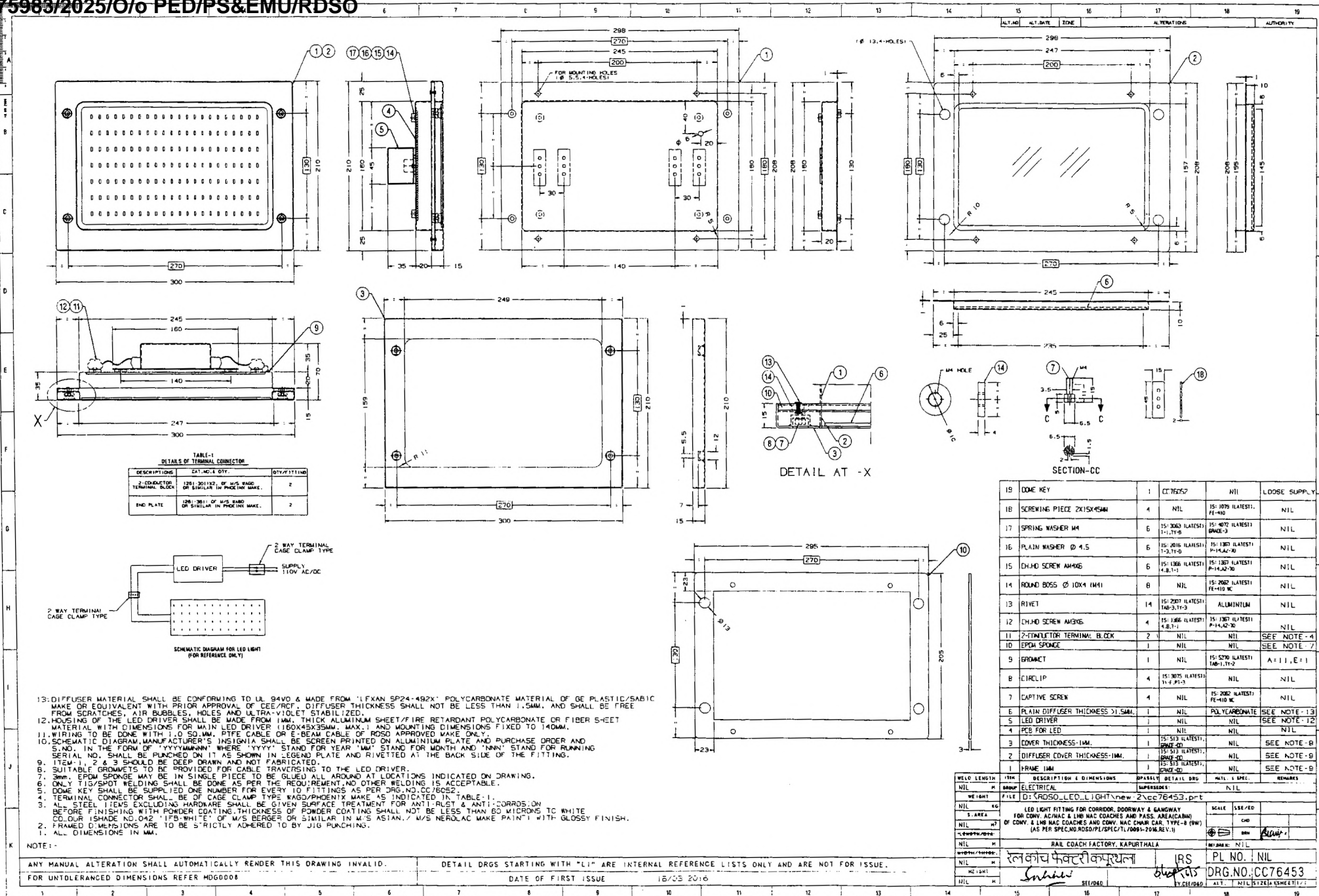
19	LOOSE KEY	1	FE-7052	NIL	LOOSE SUPPLY
18	SCREWING PIECE 2X15X45MM	4	NIL	FE-1079 (LATEST) FE-410	NIL
17	SPRING WASHER MM	6	15-1303 (LATEST) 1-1, 17-8	15-1072 (LATEST) DIN-934	NIL
16	PLAIN WASHER Ø 4.5	6	15-1006 (LATEST) 1-2, 17-0	15-1307 (LATEST) P-14-A2-0	NIL
15	CHUD SCREW 4MM	15	15-1366 (LATEST) 4-8, 1-1	15-1387 (LATEST) P-14-A2-0	NIL
14	ROUND BOSS Ø 10X (14)	8	NIL	15-2002 (LATEST) FE-410 MC	NIL
13	RIVET	14	15-2007 (LATEST) 14-3, 17-3	ALUMINIUM	NIL
12	CHUD SCREW 4MM	4	15-1366 (LATEST) 4-8, 1-1	15-1387 (LATEST) P-14-A2-0	NIL
11	2-CONDUCTOR TERMINAL B DTK	2	NIL	NIL	SEE NOTE - 1
10	SPON SPONGE	1	NIL	NIL	SEE NOTE - 1
9	BROMACT	1	NIL	15-5270 (LATEST) 14B-1, 17-2	A = 1, E = 1
8	CIRCLIP	4	15-1005 (LATEST) 17-0, P-13	NIL	NIL
7	CAPTIVE SCREW	4	NIL	15-2002 (LATEST) FE-410 MC	NIL
6	PLAIN DIFFUSER THICKNESS > 1.5MM	1	NIL	POLYCARBONATE	SEE NOTE - 1
5	LED DRIVER	1	NIL	NIL	SEE NOTE - 1
4	PCB FOR LED	1	NIL	NIL	NIL
3	COVER THICKNESS-1MM	1	15-513 (LATEST) DIN-934	NIL	SEE NOTE - 1
2	DIFFUSER COVER THICKNESS-1MM	1	15-513 (LATEST) DIN-934	NIL	SEE NOTE - 1
1	FRAME 1MM	1	15-513 (LATEST) DIN-934	NIL	SEE NOTE - 1

WELD LENGTH		PRIME TIME		CROSS ID		SEE NOTE 6	
N/L		TYPE		SPECIFICATION & DIMENSIONS		MATERIAL	
N/L		ELECTRICAL		SPECIFIC DETAIL DES		N/L	
WS (GHT)		FILED		LIGHTING		N/L	
N/L		ED		LED LIGHT FITTING FOR PASSENGER AREA (CASIN)		SCALE	
N/L		N/L		CONVENTIONAL AC COACHES, TYPE-A (18W)		GAC	
N/L		N/L		(AS PER SPEC.N.RDSO/PE/SPEC/TL/0905-196.REV.1)		GAC	
N/L		N/L		RAN COACH FACTORY, KAPURTHALA		SCALE: N/L	
N/L		N/L		REL को पंक्ती करायुथाना		PL NO. 1 N/L	
N/L		N/L		DRG.NO.1.CC76452		N/L	

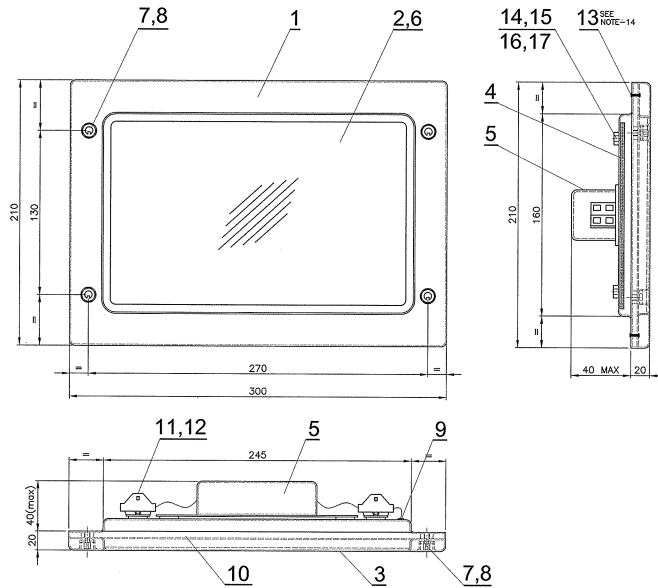
DETAIL DRGS STARTING WITH "L" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE

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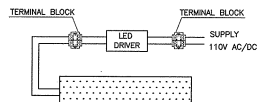
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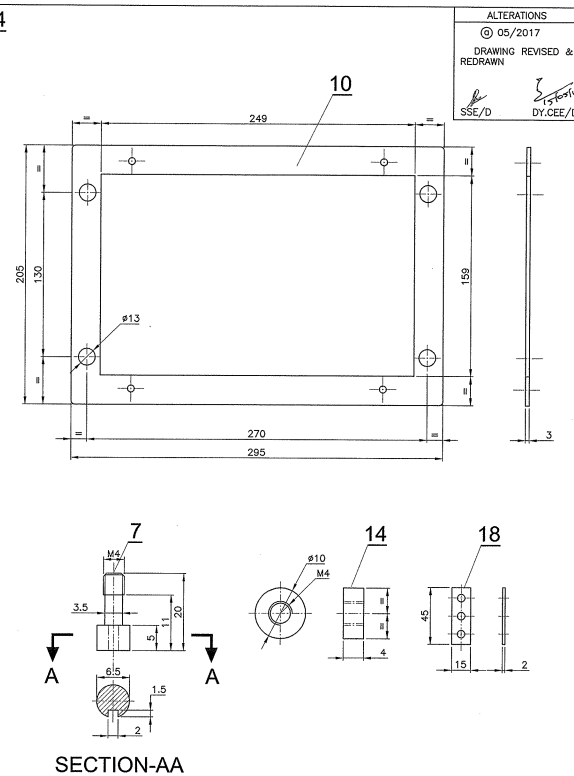
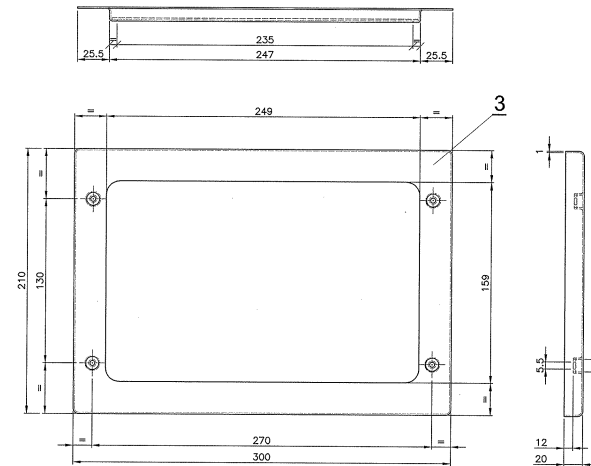
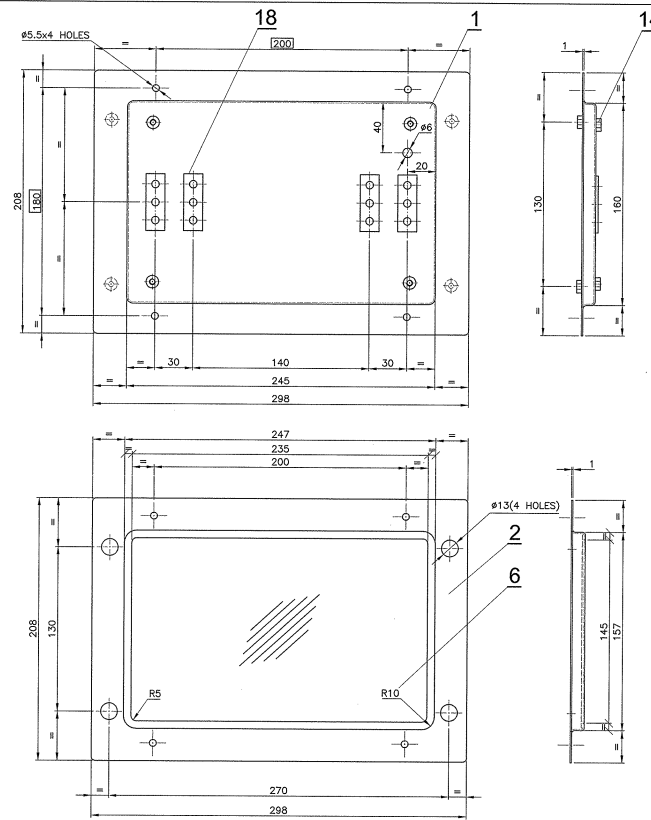
TABLE-1
DETAILS OF TERMINAL CONNECTOR

DESCRIPTION	CAT.NO & QTY.	QTY/FITTING
TWO CONDUCTOR TERMINAL BLOCK	(261-301)X2 OF M/S WAGO OR SIMILAR IN PHOENIX MAKE	2
END PLATE	(261-361) OF M/S WAGO OR SIMILAR IN PHOENIX MAKE	2

SCHEMATIC DIAGRAM FOR LED LIGHT
(FOR REFERENCE ONLY)

NOTE:

- ALL DIMENSIONS IN MM.
- FRAMED DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PINCHING.
- ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 'IFB WHITE' OF M/S BERGER OR SIMILAR IN M/S ASIAN, M/S NEROLAC MAKE PAINT) WITH GLASSY FINISH.
- TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHONEIX MAKE AS INDICATED IN TABLE-1.
- DOM KEY SHALL BE SUPPLIED ONE NUMBER FOR EVERY 10 FITTINGS AS PER DRG. NO:076052.
- ONLY TIG/SPOT WELDING SHALL BE DONE AS PER THE REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
- 3mm. EPDM GASKET MAY BE IN SINGLE PIECE TO BE GLUED ALL AROUND LOCATIONS INDICATED ON DRAWING.
- SUITABLE GROMMETS TO BE PROVIDED FOR CABLE TRAVERSING TO THE LED DRIVER.
- ITEMS-1,2 & 3 SHOULD BE DEEP DRAWN AND NOT FABRICATED.
- SCHEMATIC DIAGRAM, MANUFACTURER'S INSIGNIA SHALL BE SCREEN PRINTED ON ALUMINIUM PLATE AND PURCHASE ORDER AND S.NO. IN THE FORM OF 'YYYYMMNN' WHERE 'YYYY' STAND FOR YEAR 'MM' STAND FOR MONTH AND 'NN' STAND FOR RUNNING SERIAL NO. SHALL BE PINCHED ON IT AS SHOWN IN LEGEND PLATE AND RIVETTED AT THE BACK SIDE OF THE FITTING.
- WIRING TO BE DONE WITH 1.0 SQ.MM PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
- HOUSING OF LED DRIVER SHALL BE MADE FROM 1MM. THICK ALUMINIUM SHEET/FIRE RETARDANT POLYCARBONATE OR FIBER SHEET MATERIAL.
- DIFFUSER MATERIAL SHALL BE CONFORMING TO UL 94V0 & MADE FROM 'LEXAN SP24-492X' FIRE RETARDANT POLYCARBONATE MATERIAL OF GE PLASTIC/SABIC MAKE OR EQUIVALENT WITH PRIOR APPROVAL OF CEE/CF. DIFFUSER THICKNESS SHALL NOT BE LESS THAN 1.5MM AND SHALL BE FREE FROM SCRATCHES, AIR BUBBLES, HOLES AND ULTRA-VIOLET STABILIZED.
- AFTER RIVETING SURFACE SHALL BE FLAT FINISH WITHOUT ANY PROJECTION.
- IF SUPPLIER WISHES TO OFFER MODIFICATIONS OR CHANGES TO THE GIVEN ARRANGEMENT, THEY SHALL TAKE PRIOR APPROVAL BEFORE SUBMISSION OF PROTOTYPE SAMPLE.
- ONE PROTOTYPE SAMPLE SHALL BE SUBMITTED FOR APPROVAL BEFORE MANUFACTURING/EFFECTING BULK SUPPLY.



SECTION-AA

1	DOM KEY	19	0076052			LOOSE SUPPLY
4	SCREWING PIECE 2x15x45	18		IS1079-LATEST FE-410		
6	SPRING WASHER M4	17		IS3063-LATEST TAB-1,17-8	IS4072-LATEST GRADE-3	
6	PLAIN WASHER #4.5	16		IS2016-LATEST TAB-3,17-8	IS1367-LATEST P-14,A2-70	
6	CH. HD. SCREW AM4 x 6	15		IS1366-LATEST 4.8,1-1	IS1367-LATEST P-14,A2-70	
8	ROUND BOSS #10x4 (M4)	14		IS2062-LATEST FE-410 WC		
14	RIVET	13		IS2907-LATEST TAB-3,17-3	ALUMINIUM	
4	CH. HD. SCREW AM3 x 6	12		IS1366-LATEST 4.8,1-1	IS1367-LATEST P-14,A2-70	
2	TWO CONDUCTOR TERMINAL BLOCK	11				SEE NOTE-4
1	EPDM GASKET	10				SEE NOTE-7
1	GROMMET	9		IS5270-LATEST TAB-1,17-2		A=11,E=1
4	CIRCLIP	8		IS3075-LATEST TAB-E,PT-3		
4	CAPTIVE SCREW	7				
1	DIFFUSER 1.5MM	6				SEE NOTE-13
1	LED DRIVER	5				SEE NOTE-12
1	PCB FOR LED	4				
1	BOTTOM COVER FRAME 1MM	3		IS513-LATEST GRADE-00		
1	DIFFUSER COVER FRAME 1MM	2		IS513-LATEST GRADE-00		
1	TOP FRAME 1MM	1		IS513-LATEST GRADE-00		
NO. OFF DESCRIPTION & DIMENSIONS ITEM REF. DRG. MAT.& SPECN. WEIGHT/UNIT REMARKS						
IV III II I GROUP - 7-6						
SUPERSEDED BY: SUPERSEDES ICF/STD-7-6-050,ALT-1/-						
LED LIGHT FITTING, TYPE-B2 (9W)						
GANGWAY AREA OF ICF BUILT CONV. AC COACHES						
(AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016, REV.1)						
CAD FILE: ED-CAD\140 7-6 050-SA00.DWG						
DATA CODE NO. 140						
INDIAN RAILWAY STANDARDS						
SHEET 1 OF 1						
ICF/STD-7-6-050						
FORM SIZE A2 (600x420)						

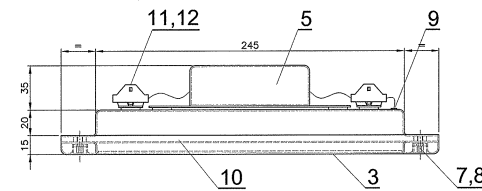
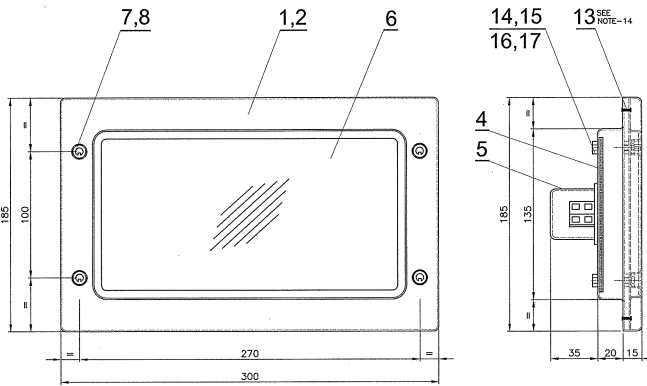
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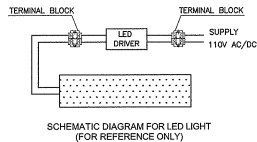
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4175983/2025/O/O PED/PS&EMU/RDSO

ICF/STD-7-6-046

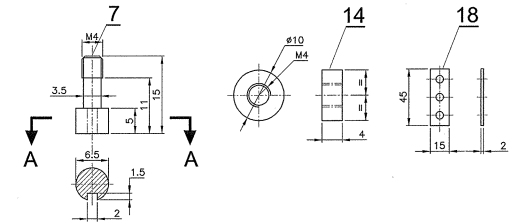
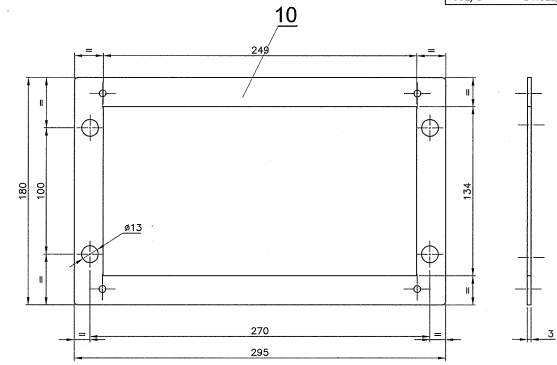
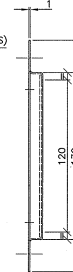
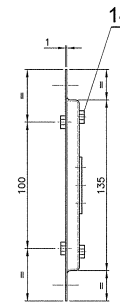
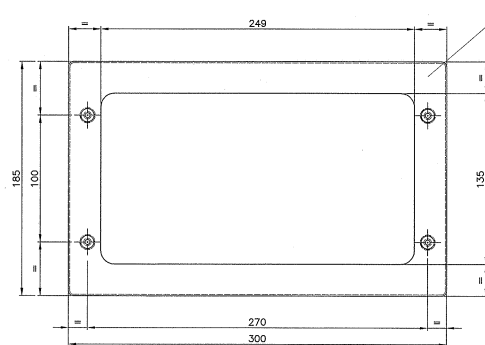
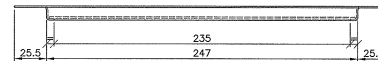
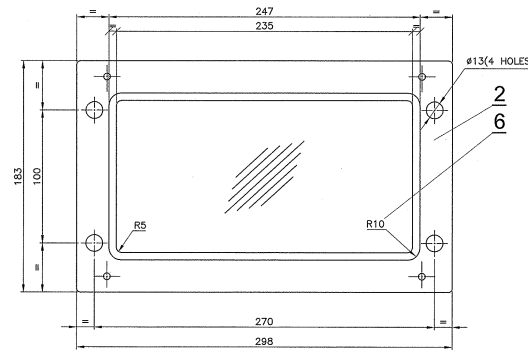
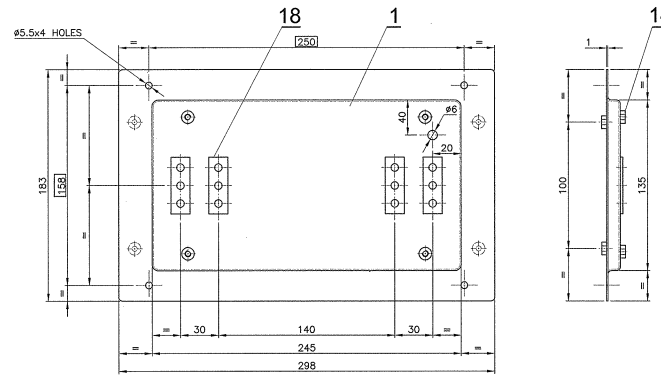
TABLE-1
DETAILS OF TERMINAL CONNECTOR

DESCRIPTION	CAT.NO & QTY.	QTY/FITTING
TWO CONDUCTOR TERMINAL BLOCK	(261-301)X2 OF M/S WAGO OR SIMILAR IN PHOENIX MAKE	2
END PLATE	(261-361) OF M/S WAGO OR SIMILAR IN PHOENIX MAKE	2



NOTE:

- ALL DIMENSIONS IN MM.
- FRAMED DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PINCHING.
- ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 'FB WHITE' OF M/S BERGER OR SIMILAR IN M/S ASIAN, M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
- TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHOENIX MAKE AS INDICATED IN TABLE-1.
- DOME KEY SHALL BE SUPPLIED ONE NUMBER FOR EVERY 10 FITTINGS AS PER DRG. NO:CC76052.
- ONLY TIG/SPOT WELDING SHALL BE DONE AS PER THE REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
- 3mm. EPDM GASKET MAY BE IN SINGLE PIECE TO BE GLUED ALL AROUND LOCATIONS INDICATED ON DRAWING.
- SUITABLE GROMMETS TO BE PROVIDED FOR CABLE TRAVERSING TO THE LED DRIVER.
- ITEMS-1,2 & 3 SHOULD BE DEEP DRAWN AND NOT FABRICATED.
- SCHEMATIC DIAGRAM, MANUFACTURER'S INSGIA SHALL BE SCREEN PRINTED ON ALUMINIUM PLATE AND PURCHASE ORDER AND S.NO. IN THE FORM OF 'YYYYMMNN' WHERE 'YYYY' STAND FOR YEAR 'MM' STAND FOR MONTH AND 'NN' STAND FOR RUNNING SERIAL NO. SHALL BE PINCHED ON IT AS SHOWN IN LEGEND PLATE AND RIVETED AT THE BACK SIDE OF THE FITTING.
- WIRING TO BE DONE WITH 1.0 SQ.MM PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
- HOUSING OF LED DRIVER SHALL BE MADE FROM 1MM. THICK ALUMINIUM SHEET/FIRE RETARDANT POLYCARBONATE OR FIBER SHEET MATERIAL.
- DIFFUSER MATERIAL SHALL BE CONFORMING TO UL 94V0 & MADE FROM 'LEXAN SP24-492X' FIRE RETARDANT POLYCARBONATE MATERIAL OF GE PLASTIC/SABIC MAKE OR EQUIVALENT WITH PRIOR APPROVAL OF CEE/RCF. DIFFUSER THICKNESS SHALL NOT BE LESS THAN 1.5MM AND SHALL BE FREE FROM SCRATCHES, AIR BUBBLES, HOLES AND ULTRA-VIOLET STABILIZED.
- AFTER RIVETING SURFACE SHALL BE FLAT FINISH WITHOUT ANY PROJECTION.
- IF SUPPLIER WISHES TO OFFER MODIFICATIONS OR CHANGES TO THE GIVEN ARRANGEMENT, THEY SHALL TAKE PRIOR APPROVAL BEFORE SUBMISSION OF PROTOTYPE SAMPLE.
- ONE PROTOTYPE SAMPLE SHALL BE SUBMITTED FOR APPROVAL BEFORE MANUFACTURING/EFFECTING BULK SUPPLY.



SECTION-AA

1	DOME KEY	19	CC76052	IS:1079-LATEST FE-410		LOOSE SUPPLY
4	SCREWING PIECE 2x15x45	18		IS:3063-LATEST TAB-1,1Y-B		
6	SPRING WASHER M4	17		IS:4072-LATEST GRADE-3		
6	PLAIN WASHER #4.5	16		IS:2016-LATEST TAB-3,1Y-B		
6	CH. HD. SCREW AM4 x 6	15		IS:1368-LATEST 4,8,1-1		
8	ROUND BOSS #10x4 (M4)	14		IS:2062-LATEST FE-410 WC		
14	RIVET	13		IS:2907-LATEST TAB-3,1Y-3		
4	CH. HD. SCREW AM3 x 6	12		IS:1368-LATEST 4,8,1-1		
2	TWO CONDUCTOR TERMINAL BLOCK	11				SEE NOTE-4
1	EPDM GASKET	10				SEE NOTE-7
1	GROMMET	9		IS:5070-LATEST TAB-1,1Y-2		A=11,E=1
4	CIRCLIP	8		IS:3075-LATEST 108-EPT-3		
4	CAPTIVE SCREW	7		IS:2062-LATEST FE-410 WC		
1	DIFFUSER >1.5MM	6				SEE NOTE-13
1	LED DRIVER	5				SEE NOTE-12
1	PCB FOR LED	4				
1	BOTTOM COVER FRAME 1MM	3		IS:513-LATEST GRADE-00		
1	DIFFUSER COVER FRAME 1MM	2		IS:513-LATEST GRADE-00		
1	TOP FRAME 1MM	1		IS:513-LATEST GRADE-00		
NO. OFF	DESCRIPTION & DIMENSIONS	ITEM	REF. DRG.	MAT.& SPECN.	WEIGHT/UNIT	REMARKS
IV III I	GROUP - 7-6					
SUPERSEDED BY:						
LED LIGHT FITTING, TYPE-C (9W)						
FOR CABIN & CORRIDOR AREA OF ICF BUILT SCN COACHES						
(AS PER SPEC. NO. RDSO/PE/SPEC/0091-2016, REV.1)						
CAD FILE: ED-CAD/140 7-6 046-SA00.DWG						
INDIAN RAILWAY STANDARDS						
SHEET 1 OF 1						
ICF/STD-7-6-046						

FORM SIZE A1 (84x600)

4175983/2025/O/o PED/PS&EMU/RDSO

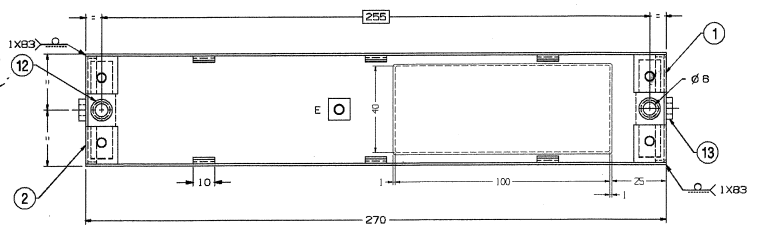
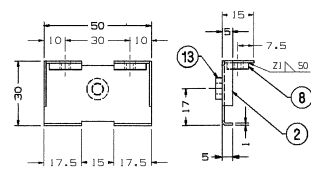
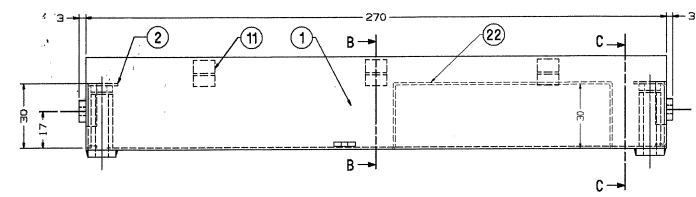
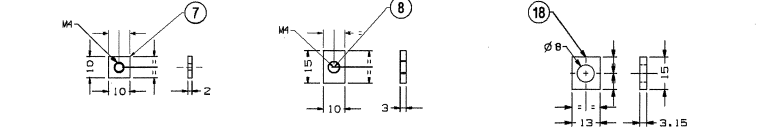
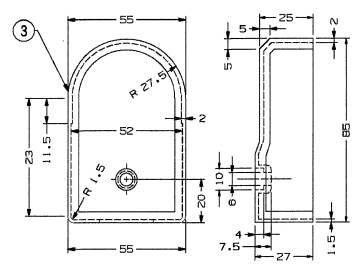
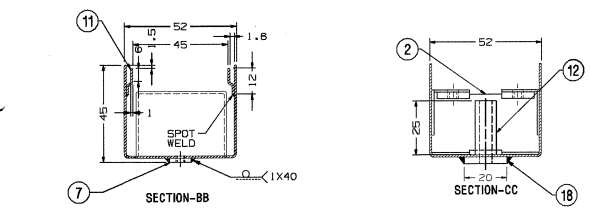
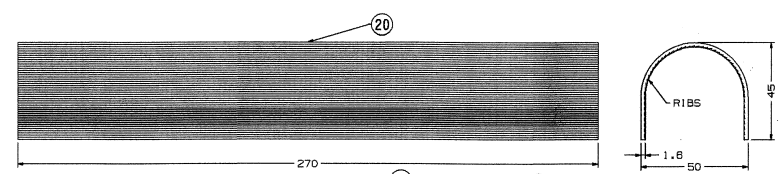
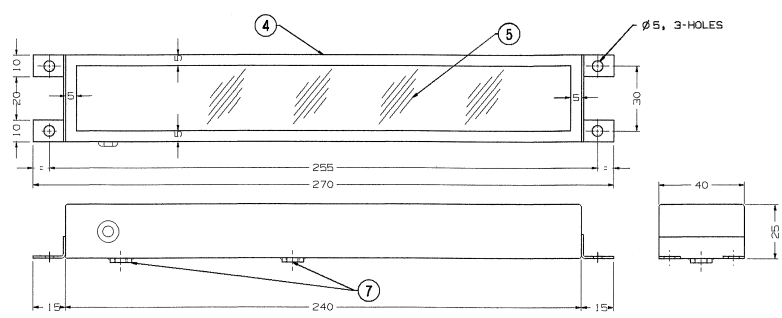
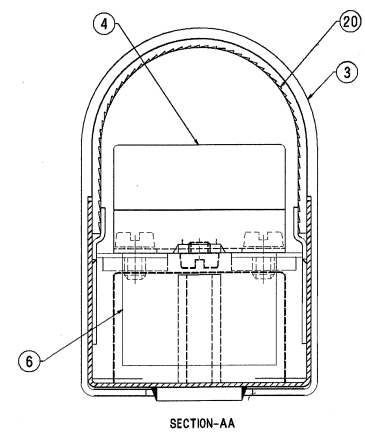
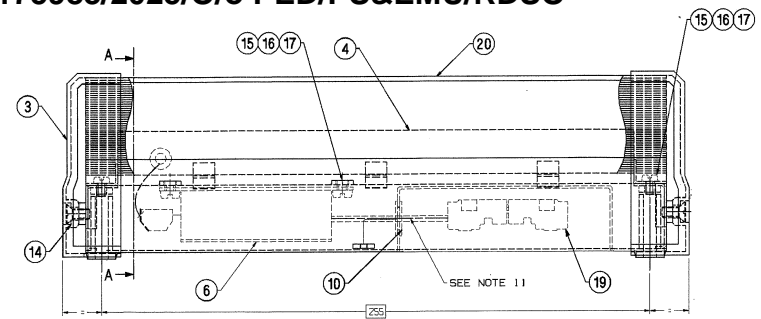
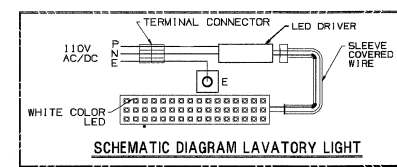


TABLE-1
DETAILS OF TERMINAL CONNECTOR

DESCRIPTIONS	CAT.NO.	QTY/FITTING
MALE CONNECTOR WITH CAGE CLAMP	(721-603) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE.	1
FEMALE CONNECTOR WITH CAGE CLAMP	(721-103/026-000) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1

LEGEND PLATE

MANU. INSIGNIA	DATE: S.N.O.	SCHEMATIC DIAGRAM	K K
P.D.NO.			
BO			



ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
0	24/01/2024	ALL	1. ITEM NO.22 PROVIDED ON BACK SIDE OF FRAME FOR COVERING TERMINAL CONNECTORS. 2. ITEM NO.9 DELETED. 3. SUITABLE SIZE OF LED DRIVER MOUNTED ON BACK SIDE OF LED MODULE. 4. EXTRA 2nos. NOTCHES ADDED FOR DIFFUSER. 5. POINT NO.12 & 13 MODIFIED AND 15 ADDED.	CR. NO.- 2300240001

22	CAVITY BOX FOR CONNECTORS 30X40X10MM	1	(181/100) LATEST BRAC-10	SEE NOTE-5
21	TERMINAL CONNECTOR	1	(181/100) LATEST MCE AND MCE JARD	ALUMINUM WARE.
20	DIFFUSER	1	POLYCARBONATE	SEE NOTE-7
19	TERMINAL CONNECTOR	1	(181/100) LATEST Pa-110	SEE NOTE-8
18	FLAT-3, 15X13X15	2	(181/100) LATEST Pa-110	
17	SPRING WASHER M4	7	(181/100) LATEST	
16	PLAIN WASHER Ø4.5	7	(181/100) LATEST	
15	CH. HD. SCREW AM4X8	7	(181/100) LATEST Pa-110	
14	PHILLIPS HD.CSK SCREW MSX15	2	(181/100) LATEST Pa-110	
13	RIVETTED BOSS Ø 10X3 (M5)	2	(181/100) LATEST Pa-110	
12	RIVETTED BOSS Ø 10X25	2	(181/100) LATEST Pa-110	
11	NOTCH FOR DIFFUSER	6	(181/100) LATEST Pa-110	
10	GROMET	2	(181/100) LATEST Pa-110	
9	NOTCHING TOOL (ILLUMINATED ON-OFF)	1	(181/100) LATEST Pa-110	
8	SCREWING PIECE 31X10X15	4	(181/100) LATEST Pa-110	
7	SCREWING PIECE 31X10X10	3	(181/100) LATEST Pa-110	
6	LED DRIVER	1		SEE NOTE-13
5	PLAIN DIFFUSER >1.5MM. THICK	1	POLYCARBONATE	SEE NOTE-14
4	LED MODULE BOX	1	(181/100) LATEST BRAC-10	SEE NOTE-5
3	END-COVER, t=1mm	2	POLYCARBONATE	COLOR GREY
2	END-PLATE t=1mm	2	(181/100) LATEST BRAC-10	SEE NOTE-5
1		1	(181/100) LATEST BRAC-10	

QTH	ITEM	DESCRIPTION & DIMENSIONS	SPACIAL DETAIL DRG	NAME	SPEC.	SUPERSEDES	REMARKS
H	GROUP	ELECTRICAL					
FILE	\\elec\YKDS\1w760920.prt			NIL			
KT	LED LIGHT FITTING FOR LAVATORY/MIRROR AREA, TYPE-D (9W)			SCALE: SIZE/ED			
H2	(AS PER SPEC. NO. RDSP/PE/SPEC/TL/19001-2016,REV.1)			CHD <i>Sh</i>			
TR	RAIL COACH FACTORY, KAPURTHALA			DRL <i>y.k. Dost</i>			
HOB	रेलकोच फैक्ट्री कपूरथला			REV. ORIGIN: NIL			
N	15			IRS		PL NO. NIL	
	SEE/DAD <i>Gurinder</i>		DY.CEE/DAD		DRG.NO. LW76092		
	16		17		ALT. 1 SIZE 10		

15. EARTHING WIRE SHOULD BE PROPERLY WIRMPED AND SCREWED WITH THE FRAME.
16. DIFFUSER MATERIAL SHALL BE CONFORMING TO UL 94V-0 MADE FROM "LEXAN SP24-492K" F1RE RETARDANT POLYCARBONATE MATERIAL OF GE PLASTIC/SABIC MAKE OR EQUIVALENT WITH PRIOR APPROVAL OF CEE. DIFFUSER THICKNESS SHALL NOT BE LESS THAN 1.5MM. AND SHALL BE FREE FROM SCRATCHES, AIR BUBBLES, HOLES AND ULTRA-VIOLET STABILIZED.
17. HOUSING OF THE LED DRIVER SHALL BE 1MM. THICK ALUMINUM SHEET/F1RE RETARDANT POLYCARBONATE GR.- UL94V0 WITH SUITABLE DIMENSIONS.
18. TAPPING IN ITEM NO.-7 SHALL BE DONE AFTER WELDING SUITABLY WITH ITEM NO.-4.
19. THE WIRING AND NOTICES SHALL BE PROVIDED WITH PROTECTIVE SLEEVES.
20. SCHEMATIC DIAGRAM, MANUFACTURER'S INSIGNIA SHALL BE SCREEN PRINTED ON AL-PLATE AND P.O. NO. & S.NO. IN THE FORM OF "YYYYMMNN" WHERE "YYYY" STANDS FOR YEAR, "MM" STANDS FOR MONTH AND "NNNN" STANDS FOR S.NO. SHALL BE SCREEN PRINTED ON IT TO SHOW IN JELCO AL-PLATE AND RIVETED AT THE BACK OF THE FITTING.
21. WIRING TO BE DONE WITH 1.0 SQ.MM. P.V.C. CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
22. TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHENIX MAKE AS INDICATED IN THE TABLE-1.
23. DIFFUSER MATERIAL SHALL BE CONFORMING TO UL 94V-0 MADE FROM "LEXAN SP24-492K" F1RE RETARDANT POLYCARBONATE GRAINS OF GE PLASTIC/SABIC MAKE OR EQUIVALENT WITH PRIOR APPROVAL OF CEE. DIFFUSER SHALL BE FREE FROM SCRATCHES, AIR BUBBLES, HOLES AND ULTRA-VIOLET STABILIZED.
24. RED/YELLOW PAINTED COLOURED BARS SHALL BE EACH OF 10mm WIDTH SHALL BE STENCIL MARKED ON BACK SIDE OF THE FITTING IDENTIFICATION IN THE FORM OF "CEC/DC" TITTING.
25. ITEM NO.-1, 2,4 & 22 SHALL BE DEEP DRAIN AND NOT FABRICATED.
26. ALL METAL SURFACES SHALL BE PROPERLY TREATED FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 "IFB WHITE" OF M/S BERGER OR SIMILAR IN M/S ASIAN. M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
27. TIG WELDING REQUIRED IN ANY OTHER WELDING IS ACCEPTABLE.
28. FRAMED MOUNTING DIMENSIONS TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
29. ALL DIMENSIONS IN MM.

NOTE:-

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008

DATE OF FIRST ISSUE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
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FORM SIZE A1a (1050x600)

4175983/2025/O/o PED/PS&EMU/RDSO

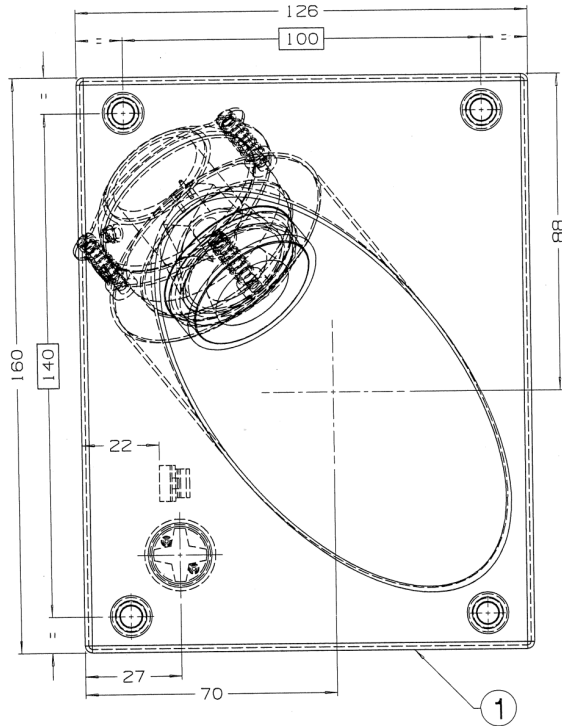
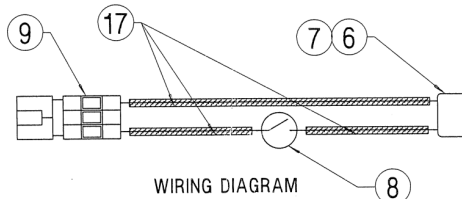
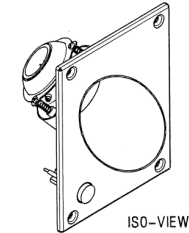
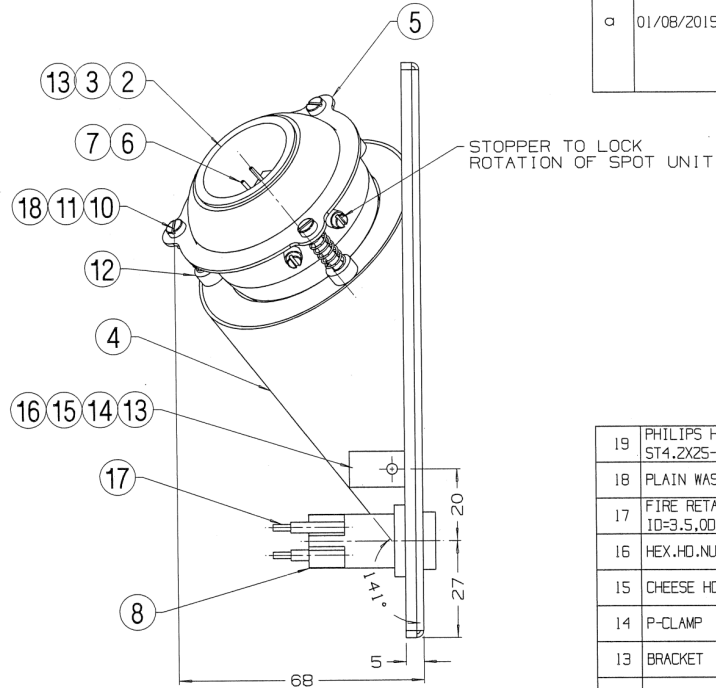


TABLE-1
DETAILS OF TERMINAL CONNECTOR

DESCRIPTION	CAT.NO.	QTY/FITTING
MALE CONNECTOR WITH CAGE CLAMP	(721-603) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1
FEMALE CONNECTOR WITH CAGE CLAMP	(721-103/026-000) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1



WIRING DIAGRAM

- ITEM-19 SHALL BE COLOUR ANODIZED TO MATCH WITH THE COLOUR SHADE OF THE FITTING AND SHALL BE SUPPLIED LOOSE FOR EACH FITTING.
- SUITABLE STOPPER TO BE PROVIDED TO LOCK CLOCK/ANTI-CLOCK ROTATION OF THE SPOT UNIT.
- ADEQUATE HEAT SINK WITH PROPER THERMAL MANAGEMENT SHALL BE PROVIDED WITH LED MODULE.
- LED CIRCUIT MODULE SHALL BE THE PART OF THE LED (INTEGRATED TYPE) MADE OF NON-METALIC PBT MATERIAL AND UNIVERSAL DESIGN SUITABLE FOR 110V AC/DC SUPPLY. THE OPERATING VOLTAGE SHALL VARY FROM 90V TO 140V WITH 15% RIPPLE.
- ENTIRE WIRING AND NOTCHES SHALL BE COVERED WITH 1MM. THICK FIRE RETARDANT SLEEVES AND DULY SECURED WITH THE HELP OF ITEM-14.
- WIRING TO BE DONE WITH 1.0 SQ. MM. PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
- ITEMNO. -2 & 3 TO BE DULL ANODIZED TO IS:1868, GR-AC 5.
- TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHOENIX MAKE AS INDICATED IN THE TABLE-1.
- ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 *IFB WHITE* OF M/S BERGER OR SIMILAR IN M/S ASIAN / M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
- ONLY TIG WELDING SHALL BE DONE AS PER REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
- FRAMED MOUNTING DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
- ALL DIMENSIONS IN MM.

NOTE: -

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 MDG0008 DATE OF FIRST ISSUE 20/05/2016

ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
α	01/08/2019	9-E	1.ITEM NO-7 PART NO. CHANGED FROM 25.126.3501.00 TO 25.106.3501.00. 2.ITEM NO-8 PART NO. 40.31.15.20.00 OF M/S WERNER MAKE ADDED & DRAWING MODIFIED ACCORDINGLY.	DIC.NO. EDI90008

19	PHILIPS HD.CKS.TAPPING SCREW ST4.2X25-C	4	IS: 1769(LATEST) TY-C	ISO: 1483(LATEST)	SEE NOTE-12
18	PLAIN WASHER DIA3.5	3	IS: 2016(LATEST) T-2, TY-A	IS: 1367(LATEST) P-14, A2-70	NIL
17	FIRE RETARDANT SLEEVE ID=3.5, OD=4.0	1	NIL	NIL	AS REQUIRED
16	HEX.HD.NUT M3	1	IS: 1364(LATEST) 4.8, T-1	IS: 1367(LATEST) P-14, A2-70	NIL
15	CHEESE HD.SCREW M3X5	1	IS: 1366(LATEST) TAB-4	IS: 1367(LATEST) P-14, A2-70	NIL
14	P-CLAMP	1	LW76109	NIL	ITEM-9
13	BRACKET	1	LW76109	NIL	ITEM-8
12	SCREWING PIECE Ø 8X4	3	IS: 1079(LATEST) FE-410	NIL	NIL
11	STEEL SPRING	3	NIL	IS: 7906(LATEST)	NIL
10	CHEESE HD.SCREW M3X16	3	IS: 1366(LATEST) TAB-4	IS: 1367(LATEST) P-14, A2-70	NIL
9	TERMINAL CONNECTOR CAGE CLAMP TYPE	1	NIL	NIL	SEE NOTE-5
8	PUSH BUTTON (PUSH ON-PUSH OFF)	1	NIL	NIL	ITEM-6
7	LED CONNECTOR	1	M/S VOSSLOH-SCHWABE REF.NO.100539 / M/S BJB -PART NO.	NIL	ITEM-5
6	LED WITH CIRCUIT MODULE WITH (INTEGRATED TYPE)LED & HEAT SINK	1	NIL	NIL	SEE NOTE-9
5	HOLDING RING	1	LW76109	NIL	ITEM-7
4	TUBE ASSEMBLY	1	LW76109	NIL	ITEM-6
3	LAMP HOLDING RING	1	LW76109	NIL	ITEM-2
2	SPOT UNIT	1	LW76109	NIL	ITEM-1
1	FRONT COVER	1	LW76110	NIL	NIL

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	OPASSLY	DETAIL DRG.	MATL. & SPEC.	REMARKS
NIL	M	GROUP	ELECTRICAL	SUPERSEDES:	lw76093.prt	
WEIGHT	FILE	D:\bikram\led light\lw7609a3.prt				
NIL	KG	LED LIGHT FITTING FOR BERTH READING LIGHT (LONGITUDINAL) FOR LHB COACHES, TYPE-F1 (2W) (AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016,REV.1)				
S.AREA						
NIL	M ²					
LENGTH / DIA						
NIL	M					
WIDTH / THICK						
NIL	M					
HEIGHT						
NIL	M					

रेल कोच फेक्टरी कपूरथला

IRS

PL NO. NIL

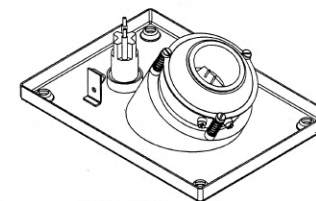
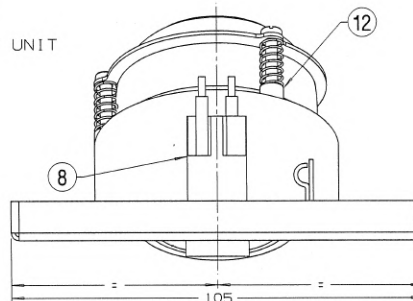
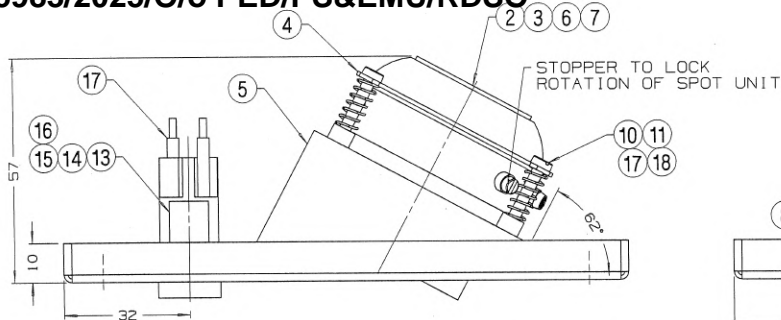
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SEE/D&D

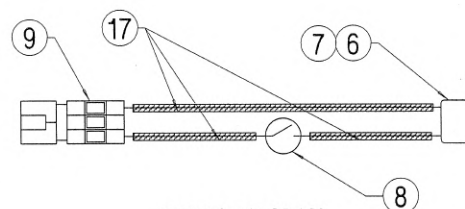
DATE/D&D

ALT. α SIZE A2 SHEET 1/1

4175983/2025/O/o PED/PS&EMU/RDSO



ISO-VIEW



WIRING DIAGRAM

TABLE-1
DETAILS OF TERMINAL CONNECTOR

DESCRIPTION	CAT.NO.	QTY/FITTING
MALE CONNECTOR WITH CAGE CLAMP	(721-603) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1
FEMALE CONNECTOR WITH CAGE CLAMP	(721-103/026-000) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1

BOTTOM - VIEW

- ITEM-19 SHALL BE COLOUR ANODIZED TO MATCH WITH THE COLOUR SHADE OF THE FITTING AND SHALL BE SUPPLIED LOOSE FOR EACH FITTING.
- SUITABLE STOPPER TO BE PROVIDED TO LOCK CLOCK/ANTI-CLOCK ROTATION OF THE SPOT UNIT.
- ADEQUATE HEAT SINK WITH PROPER THERMAL MANAGEMENT SHALL BE PROVIDED WITH LED MODULE.
- LED CIRCUIT MODULE SHALL BE THE PART OF THE LED (INTEGRATED TYPE) MADE OF NON-METALLIC PBT MATERIAL AND UNIVERSAL DESIGN SUITABLE FOR 110V AC/DC SUPPLY. THE OPERATING VOLTAGE SHALL VARY FROM 90V TO 140V WITH 15% RIPPLE.
- ENTIRE WIRING AND NOTCHES SHALL BE COVERED WITH 1MM. THICK FIRE RETARDANT SLEEVES AND DULY SECURED WITH THE HELP OF ITEM-14.
- WIRING TO BE DONE WITH 1.0 SQ.MM. PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
- ITEM NO.-2 & 3 TO BE DULL ANODIZED TO IS:1868, GR-AC 5.
- TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHOENIX MAKE AS INDICATED IN TABLE-1.
- ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 "IFB WHIT" OF M/S BERGER OR SIMILAR IN M/S ASIAN / M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
- ONLY TIG WELDING SHALL BE DONE AS PER REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
- FRAMED MOUNTING DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
- ALL DIMENSIONS IN MM.

NOTE:-

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

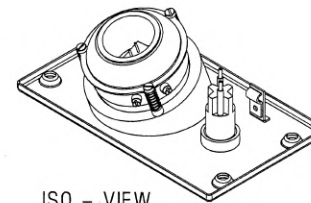
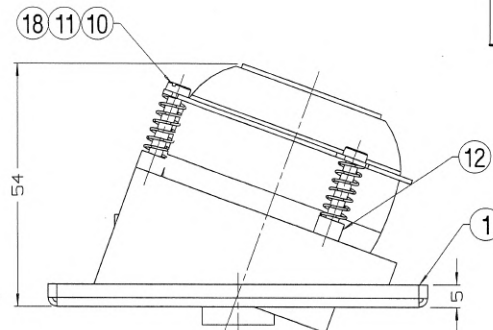
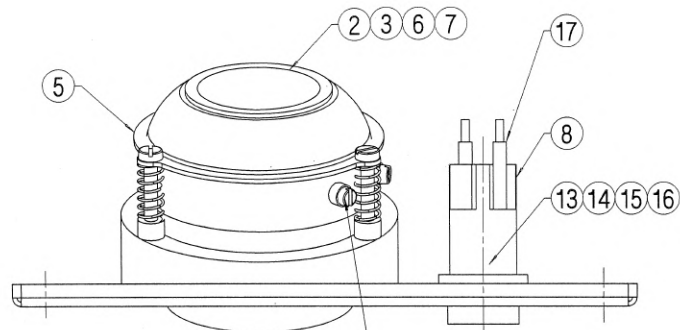
FOR UNTOLERANCED DIMENSIONS REFER MDG0008 DATE OF FIRST ISSUE 20/05/2016

ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
0	01/08/2019	9-F	1. ITEM NO-7 PART NO. CHANGED FROM 25.126.3501.00 TO 25.106.3501.00. 2. ITEM NO-8 PART NO. 40.31.15.20.00 OF M/S WERNER MAKE ADDED & DRAWING MODIFIED ACCORDINGLY.	DIC.NO. ED190008

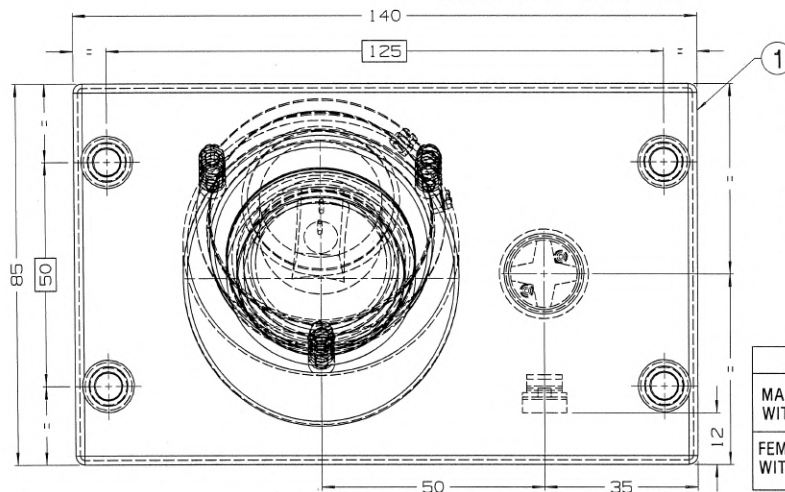
19	PHILLIP HEAD COUNTERSUNK TAPPING SCREW ST4.2X25-C	4	IS: 1769(LATEST) TY-C	ISO: 1483(LATEST)	SEE NOTE-12
18	PLAIN WASHER Ø 3.5	3	IS: 2016(LATEST) T-2, TY-A	NIL	NIL
17	FIRE RETARDANT SLEEVE ID=3.5, OD=4.0	1	NIL	NIL	AS REQUIRED
16	HEX. HD. NUT M3	1	IS: 1364(LATEST) 4.8, T-1	IS: 1367(LATEST) P-14, A2-70	NIL
15	CHEESE HD. SCREW M3X5	1	IS: 1366(LATEST) TAB-4	IS: 1367(LATEST) P-14, A2-70	NIL
14	P-CLAMP	1	LW76109	IS: 1079(LATEST) FE-410	ITEM-9
13	BRACKET	1	LW76109	IS: 1079(LATEST) FE-410	ITEM-8
12	SCREWING PIECE Ø 6X4	3	IS: 1079(LATEST) FE-410	NIL	NIL
11	STEEL SPRING ID=4.5	3	NIL	IS: 7906(LATEST)	STAINLESS SPRING STEEL
10	CHEESE HD. SCREW M3X16	3	IS: 1366(LATEST) TAB-4	IS: 1367(LATEST) P-14, A2-70	NIL
9	TERMINAL CONNECTOR CAGE CLAMP TYPE	1	NIL	NIL	SEE NOTE-5
8	PUSH BUTTON (PUSH ON - PUSH OFF) WITH TERMINAL COVER	1	NIL	NIL	IS: 46.54 OF IDC OR 40.31.15.20.00 OF M/S WERNER MAKE OR ANY OTHER APPROVED MAKE
7	LED CONNECTOR	1	M/S VOSSLAH-SCHWABE - REF. NO. 100939 / M/S SJB - PART NO.	NIL	25.106.3501.00 OR ANY OTHER APPROVED MAKE
6	LED WITH CIRCUIT MODULE WITH INTEGRATED TYPE LED & HEAT SINK	1	NIL	NIL	SEE NOTE-9
5	TUBE ASSEMBLY	1	LW76109	NIL	ITEM-5
4	HOLDING RING	1	LW76109	NIL	ITEM-4
3	LAMP HOLDING RING	1	LW76109	NIL	ITEM-2
2	SPOT UNIT	1	LW76109	NIL	ITEM-1
1	FRONT COVER	1	LW76111	NIL	NIL

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	OPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	ELECTRICAL		SUPERSEDES: lw76094.prt		
WEIGHT	FILE	D:\bikram\ledlight\lw76094a.prt				
NIL	KG	LED LIGHT FITTING FOR BERTH READING LIGHT (UPPER BERTH) FOR LHB COACHES, TYPE-F2 (2W) (AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016, REV.1)			SCALE	SSE/ED
S.AREA					CHD	
NIL	M2				DRN	LOGN
LENGTH / DIA					REF.DRG.NG.	NIL
NIL	M	RAIL COACH FACTORY, KAPURTHALA			PL NO.	NIL
WIDTH / THICK					DRG.NO.	LW76094
NIL	M	रेलकोच फैक्टरी कपूरथला			ALT.	0
HEIGHT					SIZE	A2 SHEET
NIL	M				DATE	01/08/2019

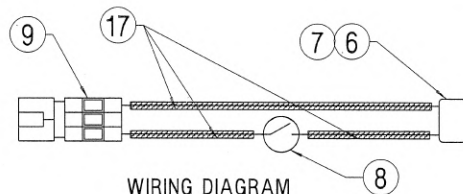
4175983/2025/O/o PED/PS&EMU/RDSO



ISO - VIEW



BOTTOM - VIEW



WIRING DIAGRAM

TABLE-1
DETAILS OF TERMINAL CONNECTOR

DESCRIPTION	CAT.NO.	QTY/FITTING
MALE CONNECTOR WITH CAGE CLAMP	(721-603) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1
FEMALE CONNECTOR WITH CAGE CLAMP	(721-103/026-000) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1

- ITEM-19 SHALL BE COLOUR ANODIZED TO MATCH WITH THE COLOUR SHADE OF THE FITTING AND SHALL BE SUPPLIED LOOSE FOR EACH FITTING.
- SUITABLE STOPPER TO BE PROVIDED TO LOCK CLOCK/ANTI-CLOCK ROTATION OF THE SPOT UNIT.
- ADEQUATE HEAT SINK WITH PROPER THERMAL MANAGEMENT SHALL BE PROVIDED WITH LED MODULE.
- LED CIRCUIT MODULE SHALL BE THE PART OF THE LED (INTEGRATED TYPE) MADE OF NON-METALIC PBT MATERIAL AND UNIVERSAL DESIGN SUITABLE FOR 110V AC/DC SUPPLY. THE OPERATING VOLTAGE SHALL VARY FROM 90V TO 140V WITH 15% RIPPLE.
- ENTIRE WIRING AND NOTCHES SHALL BE COVERED WITH 1MM. THICK FIRE RETARDANT SLEEVES AND DULY SECURED WITH THE HELP OF ITEM-14.
- WIRING TO BE DONE WITH 1.0 SQ. MM. PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
- ITEMNO. -2 & 3 TO BE DULL ANODIZED TO IS:1868, GR-AC 5.
- TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHOENIX AS INDICATED IN TABLE-1.
- ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 "IFB WHITE" OF M/S BERGER OR SIMILAR IN M/S ASIAN / M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
- ONLY TIG WELDING SHALL BE DONE AS PER REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
- FRAMED MOUNTING DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
- ALL DIMENSIONS IN MM.

NOTE:

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

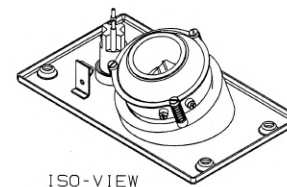
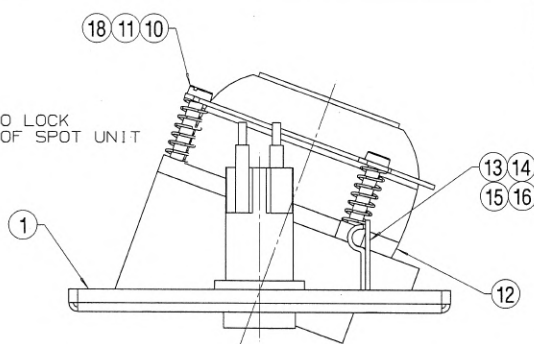
FOR UNTOLERANCED DIMENSIONS REFER MDG0008 DATE OF FIRST ISSUE 20/05/2016

ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
0	01/08/2019	9-F	1. ITEM NO-7 PART NO. CHANGED FROM 25.126.3501.00 TO 25.106.3501.00. 2. ITEM NO-8 PART NO. 40.31.15.20.00 OF M/S WERNER MAKE ADDED & DRAWING MODIFIED ACCORDINGLY.	DIC.NO. ED190008

19	PHILLIP HD.CSK.TAPPING SCREW ST 4.2X25-C	4	IS: 1769(LATEST) TY-C	ISO: 1483(LATEST)	SEE NOTE-12
18	PLAIN WASHER Ø 3.5	3	IS: 2016(LATEST) T-2, TY-A	IS: 1367(LATEST) P-14, A2-70	NIL
17	FIRE RETARDANT SLEEVE ID=3.5, OD=4.0	1	NIL	NIL	AS REQUIRED
16	HEX. HD. NUT M3	1	IS: 1364(LATEST) 4.8, T-1	IS: 1367(LATEST) P-14, A2-70	NIL
15	CHEESE HD. SCREW M3X5	1	IS: 1366(LATEST) TAB-4	IS: 1367(LATEST) P-14, A2-70	NIL
14	P-CLAMP	1	LW76109	NIL	ITEM-9
13	BRACKET	1	LW76109	NIL	ITEM-8
12	SCREWING PIECE Ø 6X4	3	IS: 1079(LATEST) FE-410	NIL	NIL
11	STEEL SPRING ID=4.5	3	NIL	IS: 7906(LATEST)	STAINLESS SPRING STEEL
10	CHEESE HD. SCREW M3X16	3	IS: 1366(LATEST) TAB-4	IS: 1367(LATEST) P-14, A2-70	NIL
9	TERMINAL CONNECTOR CAGE CLAMP TYPE	1	NIL	NIL	SEE NOTE-5
8	PUSH BUTTON (PUSH ON-PUSH OFF) WITH TERMINAL COVER	1	NIL	NIL	100.46.6A OF IEEE OR 40.31.15.20.00 OF M/S WERNER MAKE OR ANY OTHER APPROVED MAKE.
7	LED CONNECTOR	1	M/S VOSSLOH-SCHMIDT REF. NO. 100939 / M/S BJB -PART NO.	NIL	25.106.3501.00 OR ANY OTHER APPROVED MAKE
6	LED WITH CIRCUIT MODULE WITH (INTEGRATED TYPE) LED & HEAT SINK	1	NIL	NIL	SEE NOTE-9
5	HOLDING RING	1	LW76109	NIL	ITEM-4
4	TUBE ASSEMBLY	1	LW76109	NIL	ITEM-3
3	LAMP HOLDING RING	1	LW76109	NIL	ITEM-2
2	SPOT UNIT	1	LW76109	NIL	ITEM-1
1	FRONT COVER	1	LW76112	NIL	NIL

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	OPASSLY	DETAIL DRG	MAT'L. & SPEC.	REMARKS
NIL	M	GROUP	ELECTRICAL	SUPERSEDES: lw76095.prt		
WEIGHT	FILE	D:\bikrom\lw76095a.prt				
NIL	KG	LED LIGHT FITTING FOR BERTH READING LIGHT				
S. AREA	m ²	(TRANSVERSE LOWER BERTH)RHS FOR LHB COACHES, TYPE-F3(2W)				
LENGTH	m	(AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016, REV.1)				
NIL	M	RAIL COACH FACTORY, KAPURTHALA				
WIDTH	M	रेलकोच फैक्टरी कपूरथला				
NIL	M	SEE/D&D				
HEIGHT	M	DR/SEE/D&D				
NIL	M					

SCALE	SSE/ED	CHD	DRN	LODM
REF.DRG.NO.	NIL	PL NO.	NIL	DRG.NO. LW76095
ALT.	0	SIZE/A2	SHEET	1/1



ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
a	01/08/2019	NIL	1.ITEM NO-7 PART NO.CHANGED FROM 25.126.3501.00 TO 106.3501.00 2.ITEM NO-8 PART NO.40.31.15.20.00 OF M/S WERNER MAKE ADDED & DRAWING MODIFIED ACCORDINGLY.	DIC NO. ED190008

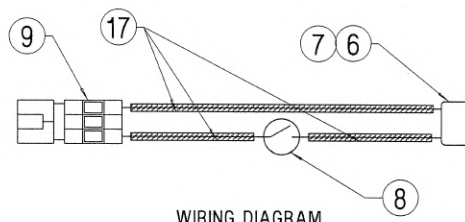
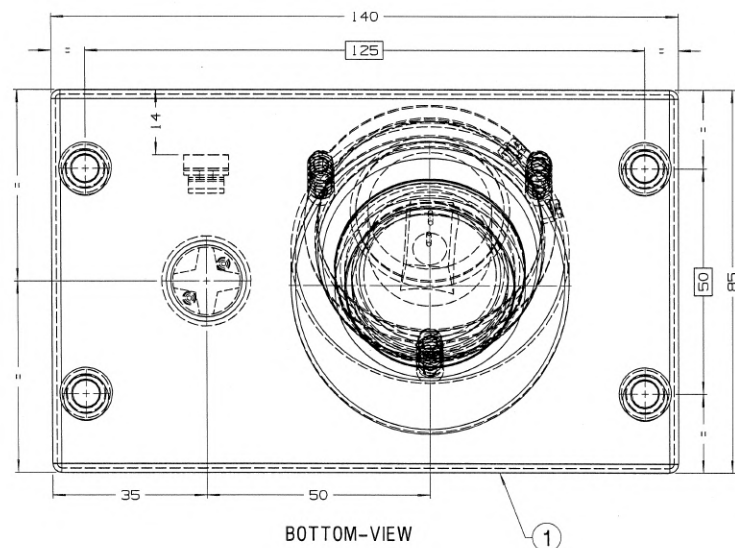


TABLE-1
DETAILS OF TERMINAL CONNECTOR

DESCRIPTION	CAT.NO.	QTY/FITTING
MALE CONNECTOR WITH CAGE CLAMP	(721-603) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1
FEMALE CONNECTOR WITH CAGE CLAMP	(721-103/026-000) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1

19	PHILLIP HEAD COUNTERSUNK TAPPING SCREW ST4.2X25-C	4	IS: 1769(LATEST) TY-C	IS: 1483(LATEST)	SEE NOTE-12
18	PLAIN WASHER Ø 3.5	3	IS: 2016(LATEST) T-2, TY-A	IS: 1367(LATEST) P-14, A2-70	NIL
17	FIRE RETARDANT SLEEVE ID=3.5, OD=4.0	3	NIL	NIL	AS REQUIRED
16	HEX.HD.NUT M3	1	IS: 1364(LATEST) 4.8, T-1	IS: 1367(LATEST) P-14, A2-70	NIL
15	CHEESE HD.SCREW M3X5	1	IS: 1366(LATEST) TAB-4	IS: 1367(LATEST) P-14, A2-70	NIL
14	P-CLAMP	1	LW76109	NIL	ITEM-9
13	BRACKET	1	LW76109	NIL	ITEM-8
12	SCREWING PIECE Ø 6X4	3	IS: 1079(LATEST) FE-410	NIL	NIL
11	STEEL SPRING ID=4.5	3	NIL	IS: 7906(LATEST)	STAINLESS SPRING STEEL
10	CHEESE HD.SCREW M3X16	3	IS: 1366(LATEST) TAB-4	IS: 1367(LATEST) P-14, A2-70	NIL
9	TERMINAL CONNECTOR CAGE CLAMP TYPE	1	NIL	NIL	SEE NOTE-5
8	PUSH BUTTON (PUSH ON PUSH-OFF) WITH TERMINAL COVER	1	NIL	NIL	10C, AB, BA OF 100C OR 21, 31, 41 OF 100C WINNER MAKE OR ANY OTHER APPROVED MAKE.
7	LED CONNECTOR	1	M/S VOSSLER-SCHWADE -REF.NO.100939 / M/S BJB -PART NO.	NIL	ZS.106-3501.00 OR ANY OTHER APPROVED MAKE
6	LED WITH CIRCUIT MODULE WITH (INTEGRATED TYPE)LED & HEAT SINK	1	NIL	NIL	SEE NOTE-9
5	HOLDING RING	1	LW76109	NIL	ITEM-4
4	TUBE ASSEMBLY	1	LW76109	NIL	ITEM-3
3	LAMP HOLDING RING	1	LW76109	NIL	ITEM-2
2	SPOT UNIT	1	LW76109	NIL	ITEM-1
1	FRONT COVER	1	LW76113	NIL	NIL

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	OPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	GROUP ELECTRICAL	SUPERSEDES: lw76096.prt			
WEIGHT	FILE	D:\bikram\lw\lw76096a.prt				
NIL	KG	LED LIGHT FITTING FOR BERTH READING LIGHT			SCALE	SSE/ED
S.AREA		(TRANSVERSE LOWER BERTH)LHS FOR LHB COACHES, TYPE-F4(2W)			CHD	
NIL	m ²	(AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016,REV.1)			DRN	
LENGTH / DIA					LOIN	
NIL	M	RAIL COACH FACTORY, KAPURTHALA			REF.DRG.No.	NIL
WIDTH / THICK		रेल कोच फैक्टरी कपूरथला			PL NO.	NIL
NIL	M				DRG.NO. LW76096	
HEIGHT					ALT.	SIZE/A2 SHEET
NIL	M	SEE/D&D			BY DFE/D&D	

12. ITEM-19 SHALL BE COLOUR ANODIZED TO MATCH WITH THE COLOUR SHADE OF THE FITTING AND SHALL BE SUPPLIED LOOSE FOR EACH FITTING.
11. SUITABLE STOPPER TO BE PROVIDED TO LOCK CLOCK/ANTI-CLOCK ROTATION OF THE SPOT UNIT.
10. ADEQUATE HEAT SINK WITH PROPER THERMAL MANAGEMENT SHALL BE PROVIDED WITH LED MODULE.
9. LED CIRCUIT MODULE SHALL BE THE PART OF THE LED (INTEGRATED TYPE) MADE OF NON-METALIC PBT MATERIAL AND UNIVERSAL DESIGN SUITABLE FOR 110V AC/DC SUPPLY. THE OPERATING VOLTAGE SHALL VARY FROM 90V TO 140V WITH 15% RIPPLE.
8. ENTIRE WIRING AND NOTCHES SHALL BE COVERED WITH 1MM. THICK FIRE RETARDANT SLEEVES AND DULY SECURED WITH THE HELP OF ITEM-14.
7. WIRING TO BE DONE WITH 1.0 SQ.MM. PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
6. ITEMNO. -2 & 3 TO BE DULL ANODIZED TO IS:1868, GR-AC 5.
5. TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHOENIX MAKE AS INDICATED IN TABLE-1.
4. ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI- CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 "IFB WHITE" OF M/S BERGER OR SIMILAR IN M/S ASIAN. / M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
3. ONLY TIG WELDING SHALL BE DONE AS PER REQUIREMENT.NO OTHER WELDING IS ACCEPTABLE.
2. FRAMED MOUNTING DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
1. ALL DIMENSIONS IN MM.

NOTE:

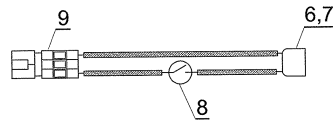
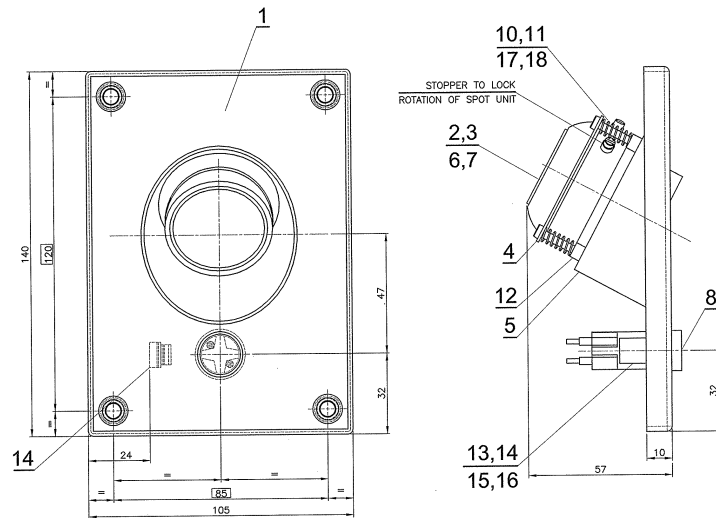
DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE

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FOR UNTOLERANCED DIMENSIONS REFER MDG0008

DATE OF FIRST ISSUE	20/05/2016
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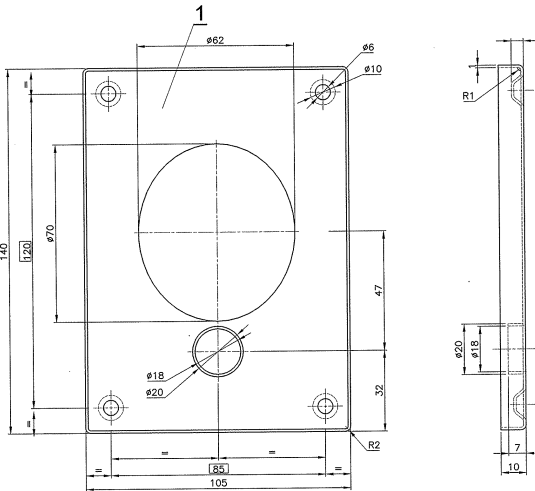
4175983/2025/0 PED/PS&EMU/RDSO



WIRING DIAGRAM

NOTE:

1. ALL DIMENSIONS IN MM.
2. FRAMED DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PINCHING.
3. ONLY TIG WELDING SHALL BE DONE AS PER REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
4. ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 'IFB WHITE' OF M/S BERGER OR SIMILAR IN M/S ASIAN, M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
5. TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHONEIX MAKE AS INDICATED IN TABLE-1.
6. ITEMS-1 SHOULD BE DEEP DRAWN AND NOT FABRICATED.
7. ITEM-2 & 3 TO BE DULL ANODISED TO IS:1868, CR-AC 5.
8. WIRING TO BE DONE WITH 1.0 SQ.MM PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
9. ENTIRE WIRING AND NOTCHES SHALL BE COVERED WITH 1MM. THICK FIRE RETARDANT SLEEVES AND DULY SECURED WITH THE HELP OF ITEM-14.
10. LED CIRCUIT MODULE SHALL BE THE PART OF THE LED (INTEGRATED TYPE) MADE OF NON-METALIC PBT MATERIAL AND UNIVERSAL DESIGN SUITABLE FOR 110V AC/DC SUPPLY. THE OPERATING VOLTAGE SHALL VARY FROM 90V TO 140V WITH 15% RIPPLE.
11. ADEQUATE HEAT SINK WITH PROPER THERMAL MANAGEMENT SHALL BE PROVIDED WITH LED MODULE.
12. SUITABLE STOPPER TO BE PROVIDED TO LOCK CLOCK/ANTI-CLOCK ROTATION OF THE SPOT UNIT.
13. ITEM-19 SHALL BE COLOUR ANODIZED TO MATCH WITH THE COLOUR SHADE OF THE FITTING AND SHALL BE SUPPLIED LOOSE FOR EACH FITTING.
14. IF SUPPLIER WISHES TO OFFER MODIFICATIONS OR CHANGES TO THE GIVEN ARRANGEMENT, THEY SHALL TAKE PRIOR APPROVAL BEFORE SUBMISSION OF PROTOTYPE SAMPLE.
15. ONE PROTOTYPE SAMPLE SHALL BE SUBMITTED FOR APPROVAL BEFORE MANUFACTURING/EFFECTING BULK SUPPLY.

TABLE-1
DETAILS OF TERMINAL CONNECTOR

DESCRIPTION	CAT.NO & QTY.	QTY/FITTING
MALE CONNECTOR WITH CAGE CLAMP	(721-603) OF M/S WAGO OR SIMILAR IN PHONEIX MAKE	1
FEMALE CONNECTOR WITH CAGE CLAMP	(721-103/026-000) OF M/S WAGO OR SIMILAR IN PHONEIX MAKE	1

4	PHILIPS HEAD COUNTERSUNK SCREW SIZE 4.2x25-0	19	IS:1786(LATEST) TT-5	ISQ:1483(LATEST)	SEE NOTE-13
3	PLAIN WASHER #3.5	18	IS:2016(LATEST) T-2,TT-A		
1	FIRE RETARDANT SLEEVE ID-3.5,OD-4	17	IS:1367(LATEST) 4.8,T-1	IS:1367(LATEST) P-14A2-70	
1	HEX. NUT M3	16	IS:1366(LATEST) T80-4	IS:1367(LATEST) P-14A2-70	
1	CHEESE HD, SCREW M3x5	15	IS:1079(LATEST) FE-410		ITEM-9
1	P-CLAMP	14	LW76109	IS:1079(LATEST) FE-410	ITEM-8
1	BRACKET	13	LW76109	IS:1079(LATEST) FE-410	
3	SCREWING PIECE #6x4	12		IS:1079(LATEST) FE-410	STAINLESS STEEL
3	STEEL SPRING ID-4.5	11		IS:7906(LATEST)	
3	CHEESE HD, SCREW M3x16	10	IS:1366(LATEST) TAB-4	IS:1367(LATEST) P-14A2-70	SEE NOTE-5
1	TERMINAL CONNECTOR WITH CAGE CLAMP	9			IS:1366(LATEST) TAB-4
1	PUSH BUTTON (PUSH ON-PUSH-OFF) WITH TERMINAL COVER	8			IS:1366(LATEST) TAB-4
1	LED CONNECTOR	7			IS:1366(LATEST) TAB-4
1	LED CIRCUIT MODULE WITH (INTEGRATED TYPE) LED & HEAT SINK	6			IS:1366(LATEST) TAB-4
1	TUBE ASSEMBLY	5	LW76109		ITEM-5
1	HOLDING RING	4	LW76109		ITEM-4
1	LAMP HOLDING RING	3	LW76109		ITEM-2
1	SPOT UNIT	2	LW76109		ITEM-1
1	FRONT COVER 1MM	1		IS:13-LATEST GRADE-00	
NO. OFF DESCRIPTION & DIMENSIONS ITEM REF. DRG. MAT. & SPECN. WEIGHT/UNIT REMARKS					
GROUP: 7-6					
LED LIGHT FITTING, TYPE-F5 (2W)					
FOR BERTH READING LIGHT FOR CONVENTIONAL AC COACH (AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016, REV.1)					
SUPERSEDED BY: ICF/STD-7-6-051/ALT-1					
SCALE: 1:1					
SSE/D: RATHARAJA					
CHD: RATHARAJA					
ALT: RATHARAJA					
DRN: RATHARAJA					
SHEET 1 OF 1					
INTEGRAL COACH FACTORY CHENNAI - 38					
ICF/STD-7-6-051					
FORM IR A1 840-000					

ASSEMBLY DRAWINGS			
DATA	25-05-2017	20-05-2016	3
CODE NO.	140		
ALT.	DATE OF LATEST ALT.	DATE OF FIRST ISSUE	DY.CEE/D

CAD FILE: ED-CAD/140 7-6 051-SAOO.DWG
INDIAN RAILWAY
STANDARDS

SHEET
1 OF 1

4175983/2025/001-ED/PS&EMU/RDSO

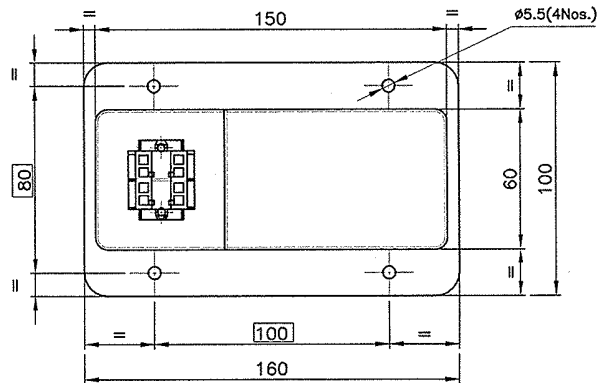
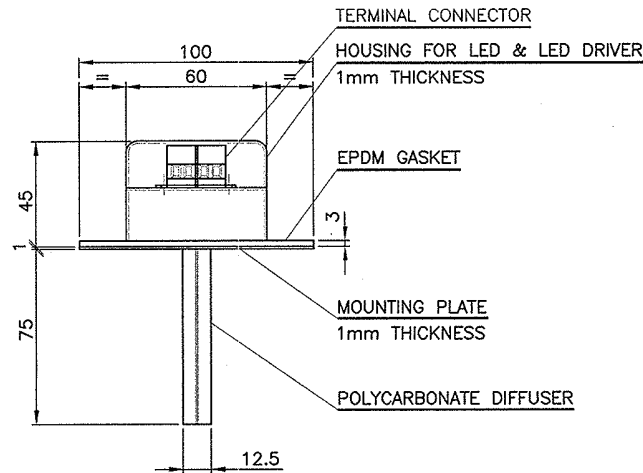
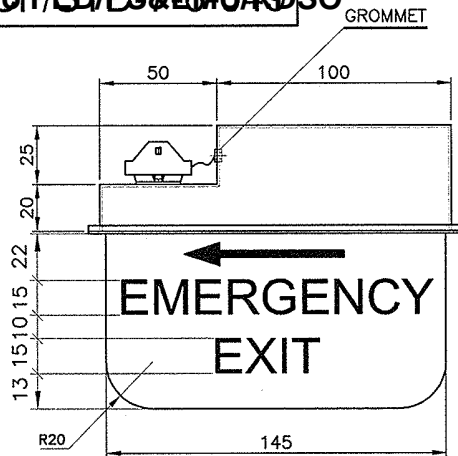


TABLE-1
DETAILS OF TERMINAL CONNECTOR

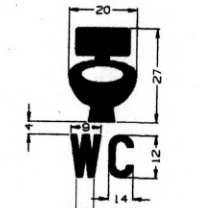
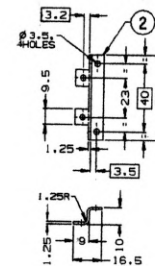
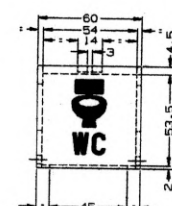
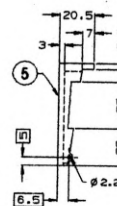
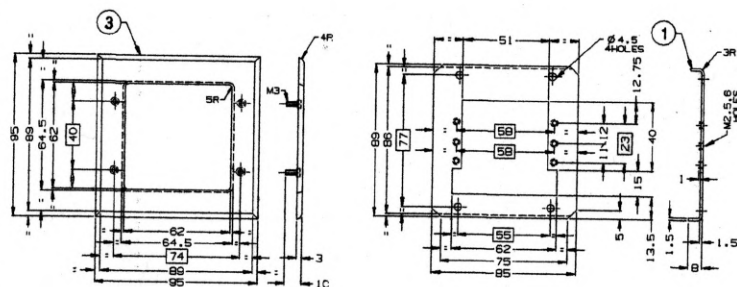
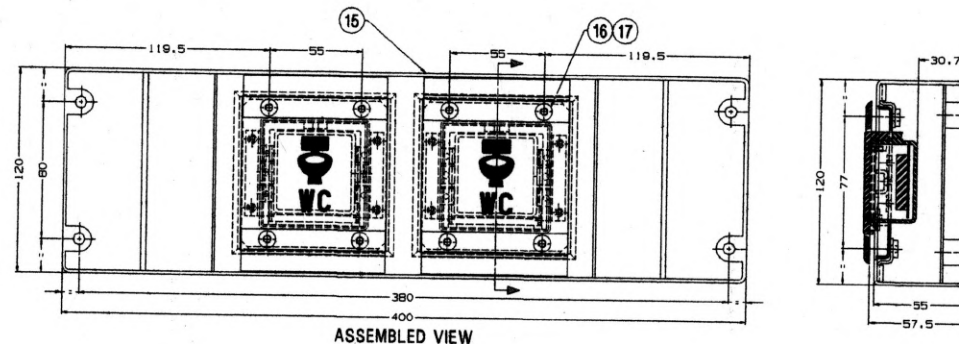
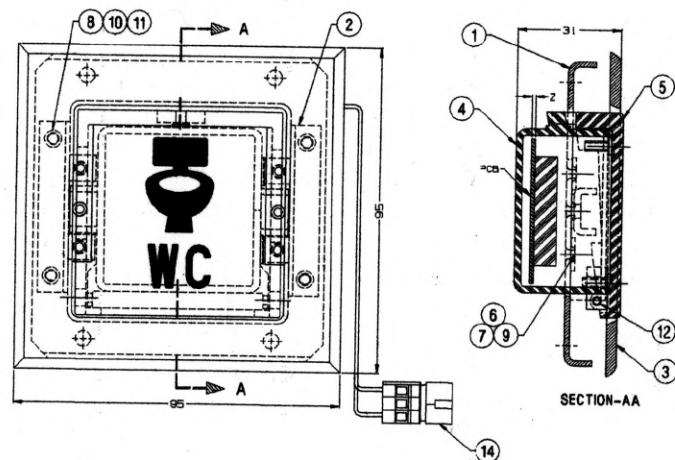
DESCRIPTION	CAT.NO & QTY.	QTY/FITTING
FOUR CONDUCTOR TERMINAL BLOCK	261-202 OF M/S WAGO OR SIMILAR IN PHOENIX MAKE	1

NOTE:

1. ALL DIMENSIONS IN MM.
2. FRAMED DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PINCHING.
3. ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 'IFB WHITE' OF M/S BERGER OR SIMILAR IN M/S ASIAN, M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
4. TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHONEIX MAKE AS INDICATED IN TABLE-1.
5. ONLY TIG/SPOT WELDING SHALL BE DONE AS PER THE REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
6. 3mm. EPDM GASKET MAY BE IN SINGLE PIECE TO BE GLUED ALL AROUND LOCATIONS INDICATED ON DRAWING.
7. SUITABLE GROMMETS TO BE PROVIDED FOR CABLE TRAVERSING TO THE LED DRIVER.
8. HOUSING FOR LED, LED DRIVER & MOUNTING PLATE SHOULD BE DEEP DRAWN AND NOT FABRICATED.
9. SCHEMATIC DIAGRAM, MANUFACTURER'S INSIGNIA, PURCHASE ORDER AND SERIAL NO. SHALL BE SCREEN PRINTED ON HOUSING. SERIAL NO. IN THE FORM OF 'YYYYMMNNN' WHERE 'YYYY' STAND FOR YEAR 'MM' STAND FOR MONTH AND 'NNN' STAND FOR RUNNING SERIAL NO.
10. WIRING TO BE DONE WITH 1.0 SQ.MM PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
11. EMERGENCY EXIT AND ARROW INSCRIPTION SHOULD BE BOTH SIDES. FRONT AND BACK ARROW HEADS SHOULD BE IN SAME DIRECTION.
12. IF SUPPLIER WISHES TO OFFER MODIFICATIONS OR CHANGES TO THE GIVEN ARRANGEMENT, THEY SHALL TAKE PRIOR APPROVAL BEFORE SUBMISSION OF PROTOTYPE SAMPLE.
13. ONE PROTOTYPE SAMPLE SHALL BE SUBMITTED FOR APPROVAL BEFORE MANUFACTURING/EFFECTING BULK SUPPLY.

IV III II I				GROUP: 7-6		SUPERSEDED BY:	
				LED LIGHT FITTING, TYPE-G (1W)		SUPERSEDES: ICF/STD-7-6-049, ALT-/-	
				FOR EMERGENCY EXIT INDICATION		SCALE: 1:2	
				(AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016, REV.1)		SSE/D: <i>[Signature]</i>	
				CAD FILE: ED-CAD\140 7-6 049---00.DWG		CHD: <i>[Signature]</i>	
				DATA CODE NO. 140		ALT: RATHARAJA	
				INDIAN RAILWAY STANDARDS		DRN: <i>[Signature]</i>	
				SHEET 1 OF 1		ALT: <i>[Signature]</i>	
				ICF/STD-7-6-049		INTEGRAL COACH FACTORY CHENNAI - 38	

4175983/2025/O/O PED/PS&EMU/RDSO



15. LED LIGHT BAR OF RS COMPONENTS PART NO. 109-359 OR LED'S OF M/S NICHIA/OSRAM/SAMSUNG/LUMILDS/CREE/AVAGO MAKE AS PER RDSO SPECIFICATION NO. RDSO/PE/SPEC/TL/0091-2016,REV-1. THE LUX LEVEL SHALL BE MAINTAINED AS 0.5 LUX AT 500 MM FOR STANDARDISATION OF VISIBILITY.
16. ALL ITEMS (EXCLUDING STEEL & HARDWARE) SHALL BE FIRE RETARDANT.
17. THE LIGHT FITTING SHALL BE SUPPLIED IN ASSEMBLED CONDITION AND READY TO FIT IN COACH.
18. ENTIRE WIRING SHALL BE COVERED WITH FIRE RETARDANT PVC SLEEVES.
19. WIRING TO BE DONE WITH 1.0 SQ.MM. PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
20. TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE OF WAGO/PHENIX MAKE AS INDICATED IN TABLE-1.
21. FINISH OF THE FITTING SHALL BE EXCELLENT WITHOUT ANY UNDOULATED/WAVING IN THE COMPONENTS.
22. ITEM-5 SHALL BE MADE OF POLYCARBONATE MATERIAL (UL94, V-0 GRADE) IN SUCH A MANNER THAT 'SYMBOL' IS INDICATED IN LIGHT RED AND REST IS OPAQUE DARK RED FIELD.
23. POWER CIRCUIT SHALL BE ARRANGED IN SUCH A MANNER THAT IN CASE ONE LIGHT BAR IS DEFECTIVE, THE OTHER LIGHT BAR KEEP ON FUNCTIONING.
24. LED BASED SQUARE LIGHT BARS SHALL BE STACKED TOGETHER AS SHOWN IN ITEM-4 FOR ILLUMINATION. ADEQUATE RATING SHALL BE PROVIDED ON LACQUER COATED PCB, NECESSARY RESISTANCE AND DIODES OF 24V DC (3X RIPPLE) FROM DC-DC CONVERTER.
25. ITEM-3 SHALL BE DUAL MODIFIED TO IS-1989-B2 GR. AC 5.
26. SCHEMATIC DIAGRAM, MANUFACTURER'S INSIGNIA SHALL BE SCREEN PRINTED ON AL. PLATE AND P.O. NO. & S.NO. IN THE FORM OF 'YYYYMMNN' WHERE 'YYYY' STANDS FOR YEAR, 'MM' STANDS FOR MONTH AND 'NN' STANDS FOR RUNNING S.NO. SHALL BE PUNCHED ON IT AND RIVETED AT THE BACK SIDE OF THE FITTING.
27. ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 50 MICRONS TO WHITE COLOUR (SHADE NO.042 "1FB WHITE" OF M/S BERGER OR SIMILAR IN M/S ASIAN, / M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
28. FRAMED MOUNTING DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
- NOTE-1: ALL DIMENSIONS IN MM.

TABLE-1
DETAILS OF TERMINAL CONNECTOR

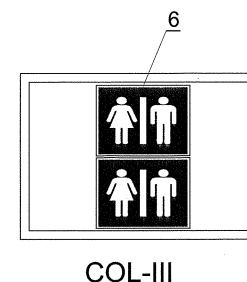
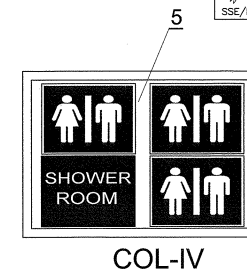
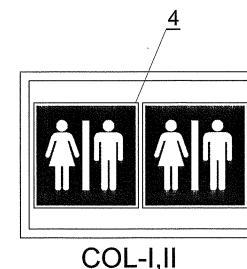
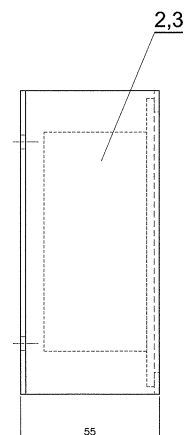
DESCRIPTION	CAT.NO.	QTY/FITTING
MALE CONNECTOR WITH CAGE CLAMP	1721-6031 OF M/S WAGO OR SIMILAR IN PHENIX MAKE	2
FEMALE CONNECTOR WITH CAGE CLAMP	1721-103/C26-0001 OF M/S WAGO OR SIMILAR IN PHENIX MAKE	2

ITEM NO.	DESCRIPTION & DIMENSIONS	QTY/UNIT	UNIT & SPEC.	REMARKS
17	PLAIN WASHER Ø 4	8	IS: 2016 LATEST	IS: 1357 LATEST
16	CH. HD. SCREW M4X10	8	IS: 1361 LATEST	IS: 1357 LATEST
15	FRP BRACKET ASSEMBLY	1	LW76114	NIL
14	TERMINAL CONNECTOR CAGE CLAMP TYPE	1	NIL	SEE NOTE-10
13	LED LIGHT BAR	18	NIL	SEE NOTE-15
12	ALUMINIUM PLAT HD RIVET Ø 3	4	IS: 2006 LATEST	NIL
11	HEX HD NUT M3	8	IS: 1361 LATEST	IS: 1357 LATEST
10	SPRING WASHER M3	8	IS: 3006 LATEST	NIL
9	SPRING WASHER M2.5	12	IS: 3006 LATEST	NIL
8	PLAIN WASHER Ø 5	8	IS: 2016 LATEST	IS: 1357 LATEST
7	PLAIN WASHER Ø 3	12	IS: 2016 LATEST	IS: 1357 LATEST
6	CH. HD. SCREW M2.5X15	12	IS: 1361 LATEST	IS: 1357 LATEST
5	TOP COVER OF PCB HOUSING	2	NIL	PBT
4	PCB HOUSING	2	NIL	PBT
3	TOP FRAME	2	NIL	IS: 731 LATEST
2	BRACKET 1.25X2.4X50	4	IS: 1076 LATEST	NIL
1	BRACKET 1.5X8X100	2	IS: 1076 LATEST	NIL

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.
FOR UNTOLERANCED DIMENSIONS REFER MDG0008

DETAIL DROS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.

DATE OF FIRST ISSUE 20/05/2001

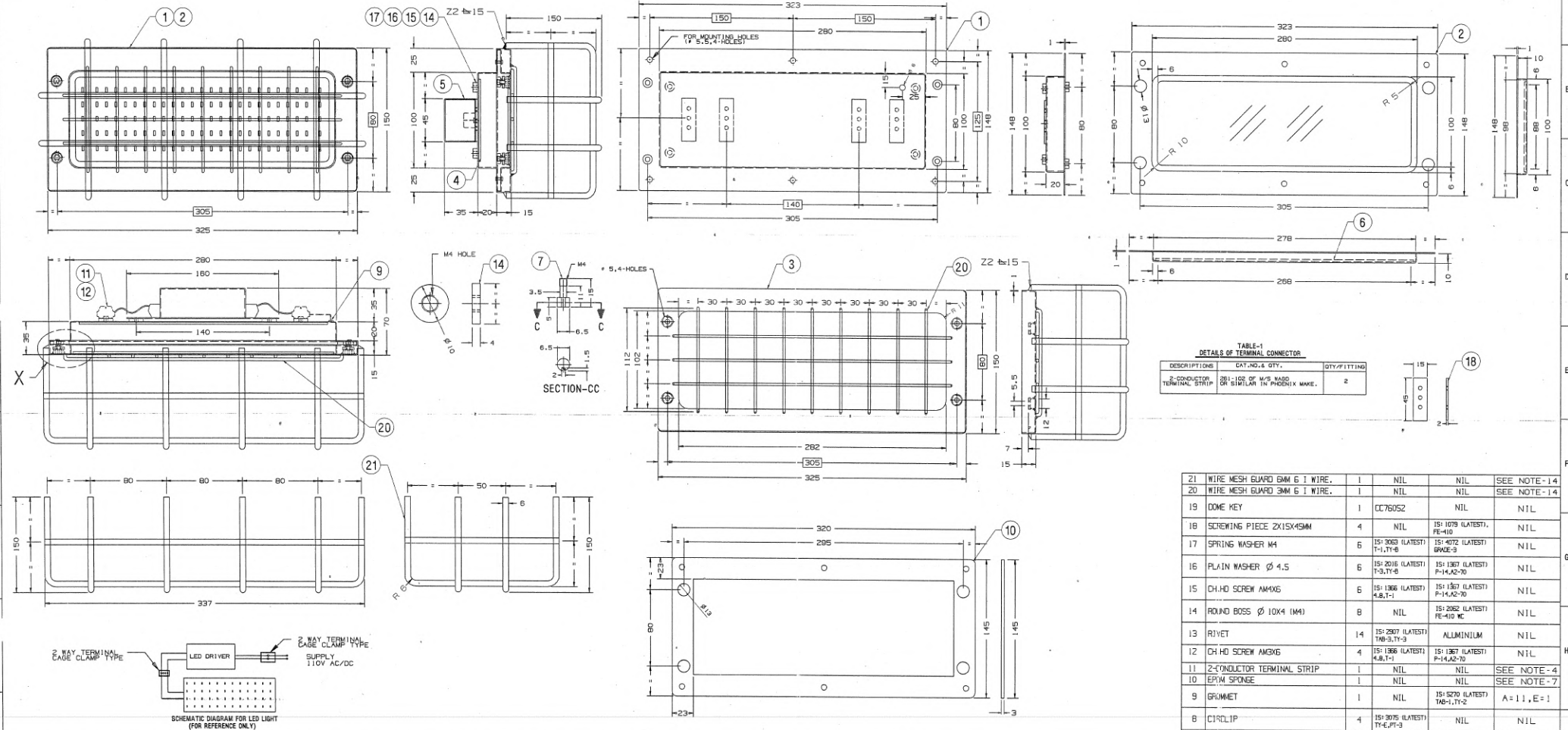


1. ALL DIMENSIONS IN MM.
2. FRAMED DIMENSIONS ARE TO BE STRICTLY ADHERED TO.
3. ITEMS-4 TO 7 SHALL BE MADE OF POLYCARBONATE MATERIAL (UL 94 V-0 GRADE) WITH PICTURES.
4. ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 '1F8 WHITE' OF M/S BERGER OR SIMILAR IN M/S ASIAN, M/S HEROLAC MAKE PAINT) WITH GLOSSY FINISH.
5. THE LED DISPLAY BOARD, LED CIRCUIT MODULE & FOUR CONSUMER TERMINAL SHALL BE ASSEMBLED IN SINGLE MODULE AND THIS ASSEMBLY SHALL BE MOUNTED ON THE BRACKET (ITEM-1).
6. OCCUPATION AND VACANT STATUS (RED & GREEN) DISPLAY OVER THE PICTURES SHOULD WORK WITH ONE POSITIVE CABLE FROM LAVATORY TO THE INDICATION BOX.
7. TERMINAL CONNECTOR SHALL BE CAGE CLAMP TYPE WAGO/PHOENIX MAKE AS INDICATED IN TABLE-1.
8. ONLY TIG/SPOT WELDING SHALL BE DONE AS PER THE REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
9. SCHEMATIC DIAGRAM, MANUFACTURER'S INSIGNIA SHALL BE SCREEN PRINTED ON ALUMINIUM PLATE AND PURCHASE ORDER AND S.N.O. IN THE FORM OF 'YYYYMMNN' WHERE 'YYYY' STAND FOR YEAR 'MM' STAND FOR MONTH AND 'NN' STAND FOR RUNNING SERIAL NO. SHALL BE PUNCHED ON IT AS SHOWN IN LEGEND PLATE AND RIVETED AT THE BACK SIDE OF THE FITTING.
10. WIRING TO BE DONE WITH 1.0 SQ.MM PTFE CABLE OR E-BEAM CABLE OF RD50 APPROVED MAKE ONLY.
11. IF SUPPLIER WISHES TO MAKE MODIFICATIONS OR CHANGES TO THE GIVEN ARRANGEMENT, THEY SHALL TAKE PRIOR APPROVAL BEFORE SUBMISSION OF PROTOTYPE SAMPLE.
12. ONE PROTOTYPE SAMPLE SHALL BE SUBMITTED FOR APPROVAL BEFORE MANUFACTURING/EFFECTING BULK SUPPLY.

DESCRIPTION	CAT.NO & QTY.	QTY/FITTING
FOUR CONDUCTOR TERMINAL BLOCK	(261-106) OF M/S WAGO OR SIMILAR IN PHOENIX MAKE	1

	1	-	-	-	-	DISPLAY BOARD	t=3mm	7				SEE NOTE-3					
	-	1	-	-	-	DISPLAY BOARD	t=3mm	6				SEE NOTE-3					
	-	1	-	-	-	DISPLAY BOARD	t=3mm	5				SEE NOTE-3					
	-	-	1	1	1	DISPLAY BOARD	t=3mm	4				SEE NOTE-3					
	1	1	1	1	1	FOUR CONDUCTOR TERMINAL STRIP		3				SEE NOTE-7					
	1	1	1	1	1	LED CIRCUIT MODULE		2				SEE NOTE-5					
	1	1	1	1	1	TOILET OCCUPIED STATUS INDICATION BRACKET		1		IS-513-LATEST GRADE-00							
NO. OFF.									DESCRIPTION & DIMENSIONS			ITEM	REF. DRG.	MAT. & SPECN.	WEIGHT/LUNIT	REMARKS	
V	I	V	I	II	III	GROUP:- 7-6								SUPERSEDED BY: SUPERSEDES/IDP/STD/-E-052/ALT. g/-			
LED LIGHT FITTING, TYPE - H2 (1W)																	
FOR TOILET INDICATION IN CONV. AC COACHES (AS PER SPEC. NO. ROSOP/E/SPEC/CT/U0091-2016, REV.1)																	
PER ASSY.	PER ASSY.	PER ASSY.	PER ASSY.	PER ASSY.	PER ASSY.												
										SCALE		SSE/D/ CHD.	RATHARAJA				
										1:2.5		ALT. DRN					
										ALT		a					
CAD FILE:- ED-CAD\140 7-6 052-SBDO-DWG.										SHEET		INTEGRAL COACH FACTORY, CHENNAI - 38					
DATA CODE NO. 140										INDIAN RAILWAY STANDARDS		1 OF 1		ICF/STD-7-6-052			

4175983/2025/O/o PED/PS&EMU/RDSO



- WIRE MESH GUARD SHALL BE MADE FROM 6 MM DIA G.I. WIRE IN OUTER SIDE AND 3 MM DIA G.I. WIRE IN INNER SIDE.
- DIFFUSER MATERIAL SHALL BE CONFORMING TO UL 94V0 & MADE FROM "LEXAN SP24-492X" FIRE RETARDANT POLYCARBONATE MATERIAL OF BE PLASTIC/SABIC MAKE OR EQUIVALENT WITH PRIOR APPROVAL OF CEE. DIFFUSER THICKNESS SHALL NOT BE LESS THAN 1.5MM. AND SHALL BE FREE FROM SCRATCHES, AIR BUBBLES, HOLES AND ULTRA-VIOLET STABILIZER.
- HOUSING OF THE LED DRIVER SHALL BE MADE FROM 1MM THICK ALUMINUM SHEET/FIRE RETARDANT POLYCARBONATE OR FIBER SHEET MATERIAL WITH DIMENSIONS FOR MAIN LED DRIVER (160X45X35MM, MAX.) AND MOUNTING DIMENSIONS FIXED TO 140MM.
- WIRING TO BE DONE WITH 1.0 SQ.MM. PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
- SCHEMATIC DIAGRAM, MANUFACTURER'S INSIGNIA SHALL BE SCREEN PRINTED ON ALUMINUM PLATE AND PURCHASE ORDER AND SERIAL NO. IN THE FORM OF "YYYYMMNN" WHERE "YYYY" STAND FOR YEAR "MM" STAND FOR MONTH AND "NN" STAND FOR RUNNING SERIAL NO. SHALL BE PUNCHED ON IT AS SHOWN IN LEGEND PLATE AND RIVETTED AT THE BACK SIDE OF THE FITTING.
- ITEM-1, 2 & 3 SHOULD BE DEEP DRAWN AND NOT FABRICATED.
- SUITABLE GROMMETS TO BE PROVIDED FOR CABLE TRAVERSING TO THE LED DRIVER.
- 3mm. EPDM SPONGE MAY BE IN SINGLE PIECE TO BE GLUED ALL AROUND AT LOCATIONS INDICATED ON DRAWING.
- ONLY TIG/SPOT WELDING SHALL BE DONE AS PER THE REQUIREMENT, NO OTHER WELDING IS ACCEPTABLE.
- DOVE KEY SHALL BE SUPPLIED ONE NUMBER FOR EVERY 10 FITTINGS AS PER DRG.NO.CC76052.
- TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHOENIX MAKE AS INDICATED IN TABLE-1.
- ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042) IFB-WHITE OF M/S BERGER OR SIMILAR IN M/S ASIAN, M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
- FRAMED DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
- ALL DIMENSIONS IN MM.

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008

DATE OF FIRST ISSUE 20/05/2016

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	SPACELY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	H	ELECTRICAL			NIL	
WEIGHT	FILE	D:\B\kram\cc\cc76457s1a.prt				
NIL	KG					
S.AREA						
NIL	M2					
LENGTH/DIA						
NIL	M					
WIDTH/THICK.						
NIL	M					
HEIGHT						
NIL	M					

LED LIGHT FITTING FOR SLR COACH, TYPE-J1 (SW)
(AS PER SPEC.NO.RDSO/PE/SPEC/TL/0091-2016;REV.1)

RAIL COACH FACTORY, KAPURTHALA

PL NO. NIL

DRG.NO. CC76457

SCALE: S5E/ED

CHK: [Signature]

DR: [Signature]

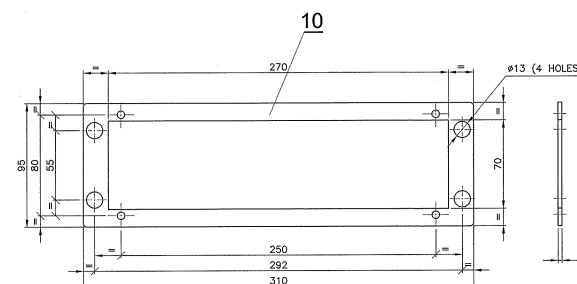
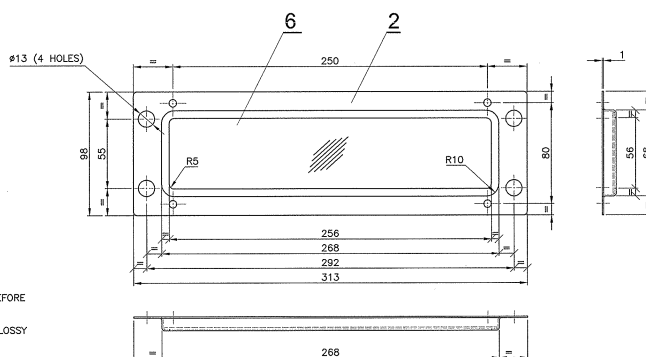
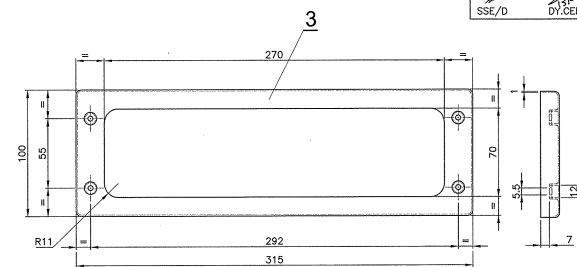
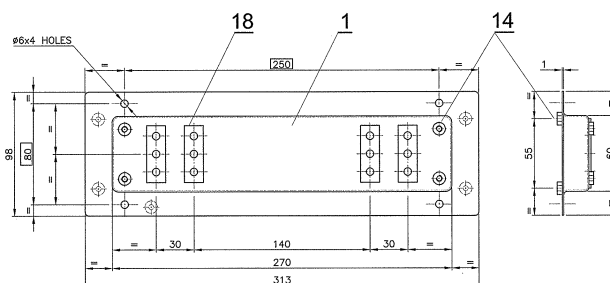
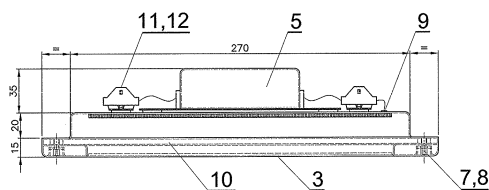
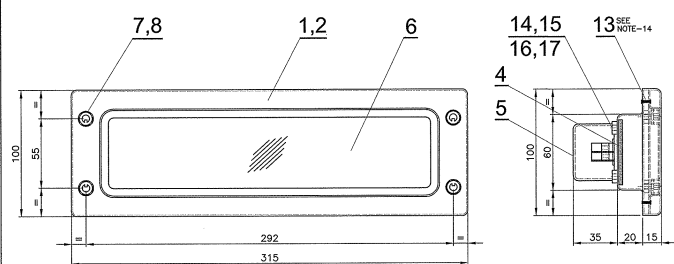
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4175983/2025/O/o PED/PS&EMU/RDSO

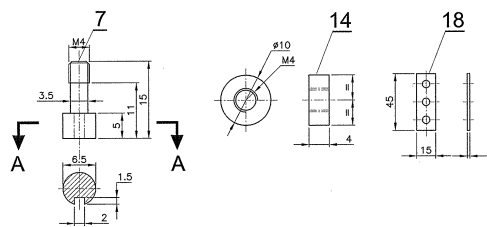
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ALTERATIONS
 05/2017
 DRAWING REVISED &
 REDRAWN
 SSE/D
 DY.CEE/D

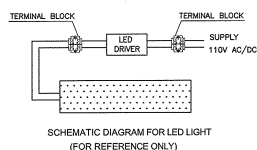


NOTE:

- ALL DIMENSIONS IN MM.
- FRAMED DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PINCHING.
- ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 'YFB WHITE' OF M/S BERGER OR SIMILAR IN M/S ASIAN, M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
- TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHONEIX MAKE AS INDICATED IN TABLE-1.
- DOME KEY SHALL BE SUPPLIED ONE NUMBER FOR EVERY 10 FITTINGS AS PER DRG. NO:CC76052.
- ONLY TIG/SPOT WELDING SHALL BE DONE AS PER THE REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
- 3mm. EPDM GASKET MAY BE IN SINGLE PIECE TO BE GLUED ALL AROUND LOCATIONS INDICATED ON DRAWING.
- SUITABLE GROMMETS TO BE PROVIDED FOR CABLE TRAVERSING TO THE LED DRIVER.
- ITEMS-1,2 & 3 SHOULD BE DEEP DRAWN AND NOT FABRICATED.
- SCHEMATIC DIAGRAM, MANUFACTURER'S INSIGNA SHALL BE SCREEN PRINTED ON ALUMINIUM PLATE AND PURCHASE ORDER AND S.NO. IN THE FORM OF 'YYYYMMNN' WHERE 'YYYY' STAND FOR YEAR 'MM' STAND FOR MONTH AND 'NNN' STAND FOR RUNNING SERIAL NO. SHALL BE PINCHED ON IT AS SHOWN IN LEGEND PLATE AND RIVETTED AT THE BACK SIDE OF THE FITTING.
- WIRING TO BE DONE WITH 1.0 SQ.MM PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
- HOUSING OF LED DRIVER SHALL BE MADE FROM 1MM THICK ALUMINIUM SHEET/FIRE RETARDANT POLYCARBONATE OR FIBER SHEET MATERIAL.
- DIFFUSER MATERIAL SHALL BE CONFORMING TO UL 94V0 & MADE FROM 'LEXAN SP24-492X' FIRE RETARDANT POLYCARBONATE MATERIAL OF GE PLASTIC/SABIC MAKE OR EQUIVALENT WITH PRIOR APPROVAL OF CEE/ICF. DIFFUSER THICKNESS SHALL NOT BE LESS THAN 1.5MM AND SHALL BE FREE FROM SCRATCHES, AIR BUBBLES, HOLES AND ULTRA-VIOLET STABILIZER.
- AFTER RIVETING SURFACE SHALL BE FLAT FINISH WITHOUT ANY PROJECTION.
- IF SUPPLIER WISHES TO OFFER MODIFICATIONS OR CHANGES TO THE GIVEN ARRANGEMENT, THEY SHALL TAKE PRIOR APPROVAL BEFORE SUBMISSION OF PROTOTYPE SAMPLE.
- ONE PROTOTYPE SAMPLE SHALL BE SUBMITTED FOR APPROVAL BEFORE MANUFACTURING/EFFECTING BULK SUPPLY.



SECTION-AA

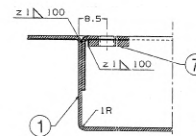
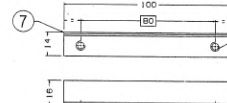
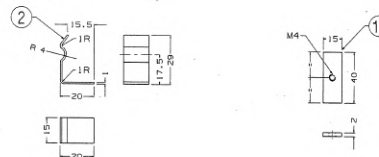
TABLE-1
DETAILS OF TERMINAL CONNECTOR

DESCRIPTION	CAT.NO & QTY.	QTY/FITTING
TWO CONDUCTOR TERMINAL BLOCK	(261-301)X2 OF M/S WAGO OR SIMILAR IN PHONEIX MAKE	2
END PLATE	(261-361) OF M/S WAGO OR SIMILAR IN PHONEIX MAKE	2

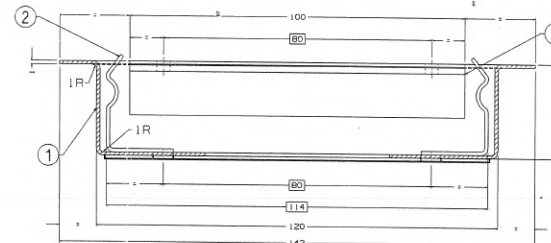
1	DOME KEY	19	CC76052	IS1079-LATEST FE-410	LOOSE SUPPLY
4	SCREWING PIECE 2x15x45	18		IS3063-LATEST TAB-1.17-B	
6	SPRING WASHER M4	17		IS4072-LATEST GRADE-3	
6	PLAIN WASHER #4.5	16		IS2016-LATEST TAB-3.17-B	
6	CH. HD. SCREW AM4 x 6	15		IS1367-LATEST P-14A2-70	
8	ROUND BOSS #10x4 (M4)	14		IS1367-LATEST P-14A2-70	
4	RIVET	13		IS2963-LATEST FE-410 WC	
4	CH. HD. SCREW AM3 x 6	12		IS2907-LATEST TAB-3.17-3	
2	TWO CONDUCTOR TERMINAL BLOCK	11		IS1367-LATEST P-14A2-70	SEE NOTE-4
1	EPDM GASKET	10			SEE NOTE-7
1	GROMMET	9		IS2070-LATEST TAB-1.17-2	A=11,E=1
4	CIRCLIP	8		IS3075-LATEST TAB-E.PT-3	
1	CAPTIVE SCREW	7		IS2065-LATEST FE-410 WC	
1	DIFFUSER 1.5MM	6			SEE NOTE-13
1	LED DRIVER	5			SEE NOTE-12
1	PCB FOR LED	4			
1	BOTTOM COVER FRAME 1MM	3		IS513-LATEST GRADE-DD	
1	DIFFUSER COVER FRAME 1MM	2		IS513-LATEST GRADE-DD	
1	TOP FRAME 1MM	1		IS513-LATEST GRADE-DD	
NO. OFF DESCRIPTION & DIMENSIONS ITEM REF. DRG. MAT. & SPECN. WEIGHT/UNIT REMARKS					
IV III II I GROUP - 7-6					
LED LIGHT FITTING, TYPE-K (9W) FOR ENTRANCE DOORWAY AREA (AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016, REV.1)					
SUPERSEDED BY: SCALE 1:2 SSE/D CHD. ALT CAD RATHARAJA ICF/STD-7-6-048					
CAD FILE: ED-CAD\140 7-6 048-SAO.DWG DATA CODE NO. 140 INDIAN RAILWAY STANDARDS SHEET 1 OF 1 ICF/STD-7-6-048					
FORM SIZE A1 (600x840)					

4175983/2025/O/p PED/PS&EMU/RDSO

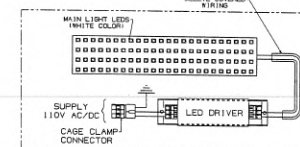
ALT. NO.	ALT. DATE	ZONE	ALTERATIONS	AUTHORITY
b	17/07/2020	6-12	1. DIMENSION OF 132MM CHANGED TO 142MM.	CHANGE REQUEST NO. ED/CR/2020-0009



SECTION-BB



SECTION-AA

SCHEMATIC DIAGRAM FOR LED LIGHT
(FOR REFERENCE ONLY)

LEGEND PLATE

MANU. INSIGNIA	DATE:	SCHMATIC DIAGRAM
P.O. NO.	S.N.O.	

TABLE-1
DETAILS OF TERMINAL CONNECTOR

DESCRIPTIONS	CAT. NO.	QTY/FITTING
MALE CONNECTOR WITH CAGE CLAMP	1721-8031 OF M/S WAGO OR SIMILAR IN PHOENIX MAKE	1
FEMALE CONNECTOR WITH CAGE CLAMP	1721-103/028-0001 OF M/S WAGO OR SIMILAR IN PHOENIX MAKE	1

14. DIFFUSER MATERIAL SHALL BE CONFORMING TO UL 94V-0 & MADE FROM 'LEXAN SP24-492X' FIRE RETARDANT POLYCARBONATE MATERIAL OF 3.0 SE PLASTIC/SABIC MAKE OR EQUIVALENT WITH PRIOR APPROVAL OF DEE. DIFFUSER THICKNESS SHALL NOT BE LESS THAN 1.5MM. AND SHALL BE FREE FROM SCRATCHES, AIR BUBBLES, HOLES AND ULTRA-VIOLET STABILIZED.
13. HOUSING OF THE LED DRIVER SHALL BE MADE FROM 1MM. THICK ALUMINUM SHEET/FIRE RETARDANT POLYCARBONATE OR FIBER SHEET MATERIAL WITH DIMENSIONS FOR MAIN LED DRIVER (180X45X35MM. MAX.) AND MOUNTING DIMENSIONS FIXED TO 140MM.
12. TAPPING IN ITEM NO.-11 SHALL BE DONE AFTER WELDING SUITABLE WITH ITEM NO.-3.
11. ENTIRE WIRING AND NOTCHES SHALL BE COVERED WITH 1MM. THICK FIRE RETARDANT SLEEVES.
10. ITEM NO.-2 SHALL NOT GET LOOSE/DEFORMED/LACK ITS PHYSICAL PROPERTIES WHILE IN USE FOR ROLLING STOCK APPLICATION.
9. ITEM NO.-2 SHALL BE WELDED WITH ITEM NO.-1 TO SUIT PROPER CLAMPING OF ITEM NO.-17.
8. ONLY TIG-SPOT WELDING SHALL BE DONE AS PER THE REQUIREMENT AND OTHER WELDING IS ACCEPTABLE.
7. SCHEMATIC DIAGRAM, MANUFACTURER'S INSIGNIA SHALL BE SCREEN PRINTED ON AL PLATE AND P.O. NO. & S.N.O. IN THE FORM OF 'YYYYMMNN' WHERE 'YYYY' STANDS FOR YEAR, 'MM' STANDS FOR MONTH AND 'NNNN' STANDS FOR RUNNING S.N.O. SHALL BE PUNCHED ON IT AS SHOWN IN LEGEND PLATE AND RIVETED AT THE BACK SIDE OF THE FITTING.
6. WIRING TO BE DONE WITH 1.0 SQ. MM. PTFE CABLE OR ET-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
5. TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHOENIX MAKE AS INDICATED IN TABLE-1.
4. ITEM NO.-1 & 3 SHALL BE DEEP DRAWN AND NOT FABRICATED.
3. ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 50 MICRONS TO WHITE COLOUR (SHADE NO.042 "17B WHITE" OF M/S BERGER OR SIMILAR I M/S ASIAN/ M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
2. FRAMED MOUNTING DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
1. ALL DIMENSIONS IN MM.

NOTE-1: ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.

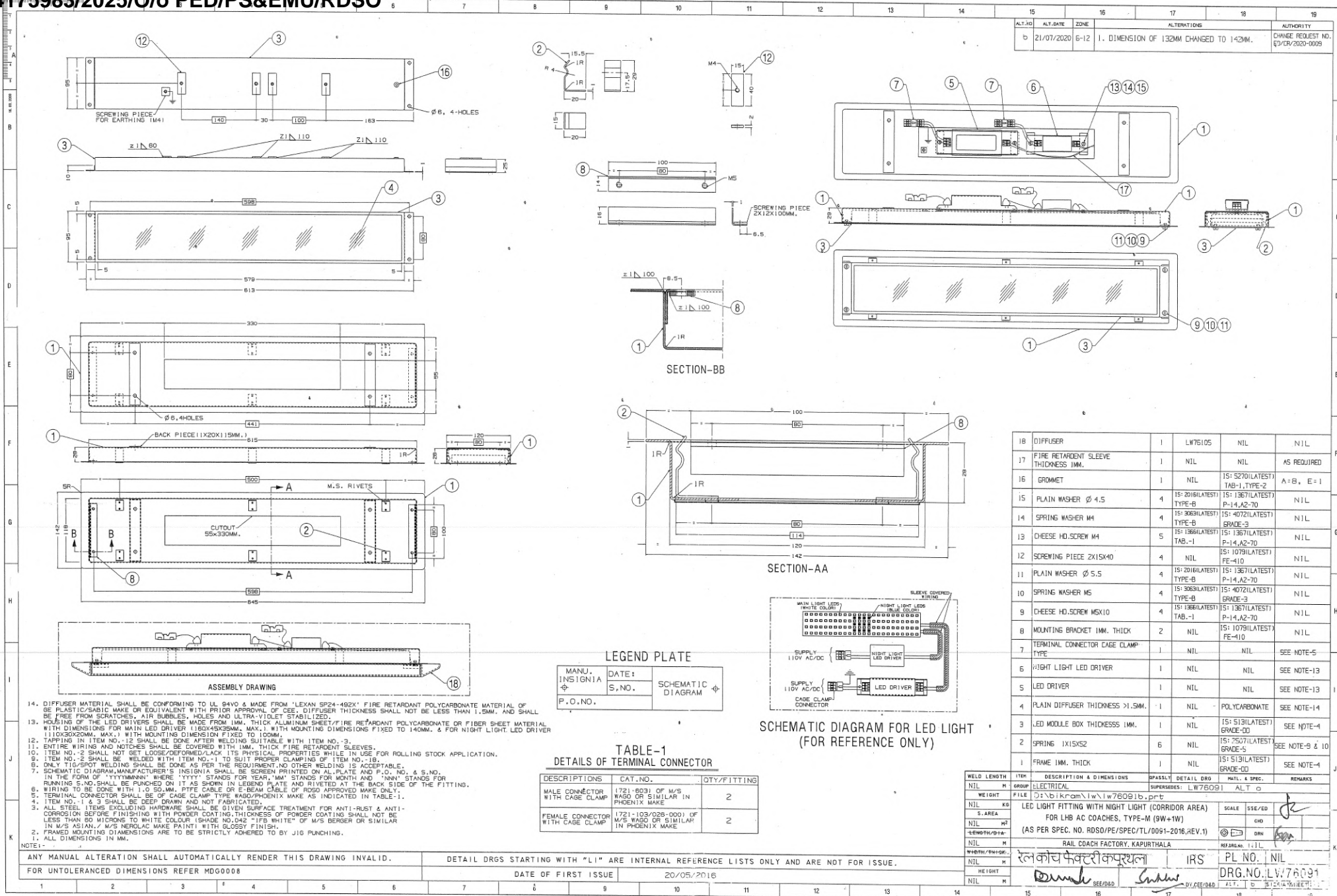
DATE OF FIRST ISSUE 20/05/2016

FOR UNTOLERANCED DIMENSIONS REFER MDG0008

17	DIFFUSER	1	LW76105	NIL	NIL
16	FIRE RETARDANT SLEEVE THICKNESS 1MM.	1	NIL	NIL	AS REQUIRED
15	GROMMET	1	NIL	IS: 5270(LATEST) TAB-1, TYPE-2	A=B, E=1
14	PLAIN WASHER Ø 4.5	2	IS: 2016(LATEST) TYPE-B	IS: 1367(LATEST) P-14, A2-70	NIL
13	SPRING WASHER M4	2	IS: 3063(LATEST) TYPE-B	IS: 4072(LATEST) GRADE-3	NIL
12	CHEESE HD.SCREW M4	3	IS: 1366(LATEST) TAB.-1	IS: 1367(LATEST) P-14, A2-70	NIL
11	SCREWING PIECE 2X15X40	4	NIL	IS: 1079(LATEST) FE-110	NIL
10	PLAIN WASHER Ø 5.5	4	IS: 2016(LATEST) TYPE-B	IS: 1367(LATEST) P-14, A2-70	NIL
9	SPRING WASHER M5	4	IS: 3063(LATEST) TYPE-B	IS: 4072(LATEST) GRADE-3	NIL
8	CHEESE HD.SCREW M5X10	4	IS: 1366(LATEST) TAB.-1	IS: 1367(LATEST) P-14, A2-70	NIL
7	MOUNTING BRACKET 1MM. THICK	2	NIL	IS: 1079(LATEST) FE-110	NIL
6	TERMINAL CONNECTOR CAGE CLAMP TYPE	1	NIL	NIL	SEE NOTE-5
5	LED DRIVER	1	NIL	NIL	SEE NOTE-13
4	PLAIN DIFFUSER THICKNESS >1.5MM.	1	NIL	POLYCARBONATE	SEE NOTE-14
3	LED MODULE BOX THICKNESS 1MM.	1	NIL	IS: 513(LATEST) GRADE-00	SEE NOTE-4
2	SPRING 1X15X52	6	NIL	IS: 2507(LATEST) GRADE-5	SEE NOTE-9 & 10
1	FRAME 1MM. THICK	1	NIL	IS: 513(LATEST) GRADE 00	SEE NOTE-4

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	ASSEMBLY DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	ELECTRICAL	FILE D:\Bikram\lw\lw76090b.prt	ALT	
WGT	KG	LED LIGHT FITTING FOR PASSENGER AREA (CABIN) FOR LHB AC COACHES, TYPE-L (18W) (AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016,REV.1)		SCALE	SSE/ED
S. AREA	M2			CHD	
LENGTH	M			DRN	
WIDTH	M	RAIL COACH FACTORY, KAPURTHALA		REFS	NIL
DEPTH	M				
NO. OF LIGHT	M	रेलकोच फैक्ट्री कपूरथला		PL. NO.	NIL
		DRG. NO.	LW76090		

4175983/2025/O/o PED/PS&EMU/RDSO



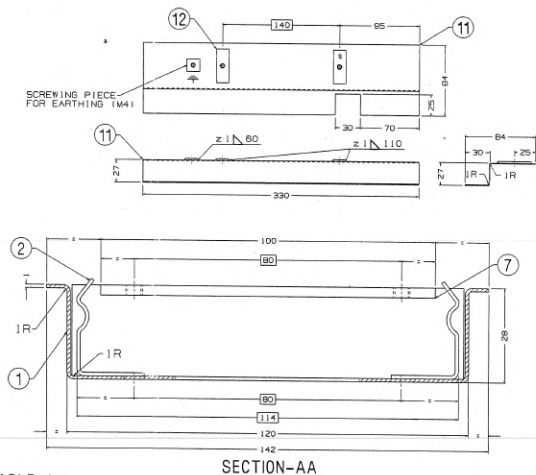
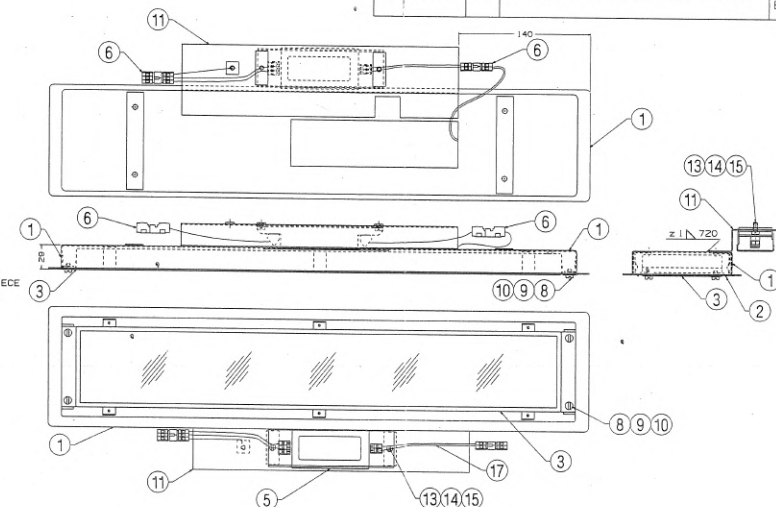
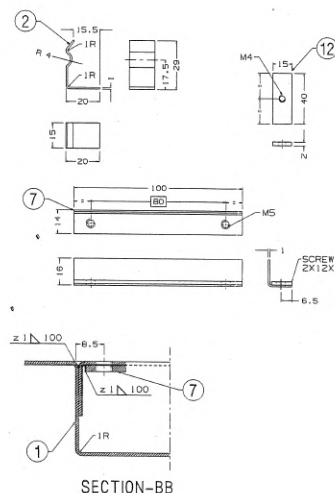


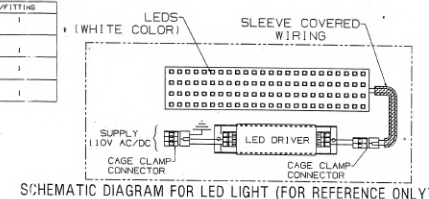
TABLE-1

DETAILS OF TERMINAL CONNECTOR

DESCRIPTIONS	CAT.NO.	QTY/FITTING
MALE CONNECTOR WITH CASE CLAMP	1721-(803) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1
FEMALE CONNECTOR WITH CASE CLAMP	1721-(103/026-000) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1
MALE CONNECTOR WITH CASE CLAMP	1721-(802) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1
FEMALE CONNECTOR WITH CASE CLAMP	1721-(102/026-000) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1

LEGEND PLATE

MANU. INSIGNIA ✱	DATE:	SCHEMATIC DIAGRAM ✱
P.O. NO.	S.NO.	



18	DIFFUSER	1	LW76105	NIL	NIL
17	FIRE RETARDANT SLEEVE THICKNESS IMM.	1	NIL	NIL	AS REQUIRED
16	GROMMET	1	NIL	IS: 5270(LATEST) TAB-1, TYPE-2	A=B, E=1
15	PLAIN WASHER Ø 4.5	2	IS: 2016(LATEST) TYPE-B	IS: 1367(LATEST) P-1, A2-70	NIL
14	SPRING WASHER M4	2	IS: 3063(LATEST) TYPE-B	IS: 4072(LATEST) GRADE-3	NIL
13	CHEESE HD.SCREW M4X10	3	IS: 1366(LATEST) TAB.-1	IS: 1367(LATEST) P-1, A2-70	NIL
12	SCREWING PIECE 2X15X40	2	NIL	IS: 1079(LATEST) FE-410	SEE NOTE-12
11	BRACKET 1X10X330	1	NIL	IS: 1079(LATEST) FE-410	NIL
10	PLAIN WASHER Ø 5.5	4	IS: 2016(LATEST) TYPE-B	IS: 1367(LATEST) P-1, A2-70	NIL
9	SPRING WASHER M5	4	IS: 3063(LATEST) TYPE-B	IS: 4072(LATEST) GRADE-3	NIL
8	CHEESE HD.SCREW M5X10	4	IS: 1366(LATEST) TAB.-1	IS: 1367(LATEST) P-1, A2-70	NIL
7	MOUNTING BRACKET IMM. THICK	2	NIL	IS: 1079(LATEST) FE-410	NIL
6	TERMINAL CONNECTOR CAGE CLAMP TYPE	1	NIL	NIL	SEE NOTE-5
5	LED DRIVER	1	NIL	NIL	SEE NOTE-13
4	PLAIN DIFFUSER THICKNESS > 5MM.	1	NIL	POLYCARBONATE	SEE NOTE-14
3	LED MODULE BOX THICKNESS IMM.	1	NIL	IS: 5131(LATEST) GRADE-00	SEE NOTE-4
2	SPRING 1X15X52	6	NIL	IS: 2507(LATEST) GRADE-5	SEE NOTE-9 & 10
1	FRAME IMM. THICK	1	NIL	IS: 5131(LATEST)	SEE NOTE-4

WELD LENGTH		ITEM	DESCRIPTION & DIMENSIONS		SPECIALLY DETAIL DRG.		GRADE - ED	REMARKS
NIL	M	GROUP	ELECTRICAL		SUPERSEDES: L7W6099		ALT	
WEIGHT		FILE	D:\b\k\k\m\l\w\l7w6099b.prp					
NIL	KG		LED LIGHT FITTING FOR DOORWAY/GANGWAY AREA					
S. AREA		FOR LHB AC COACHES, TYPE-N (9W)						
NIL	m ²							
LENGTH/DIAG.		(AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016.REV.1)						
NIL	M	RAIL COACH FACTORY, KAPURTHALA						
MATERIAL/REMARKS		रेल कोच फैक्टरी कपूरथला			IRS	PL NO. NIL		
NIL	M	DRG. NO. L7W6099						
WEIGHT		SPE/DWG			SIGNED		DATE	
NIL	M							

14. DIFFUSER MATERIAL SHALL CONFORMING TO UL 94V0 & MADE FROM "LEXAN SP24-92K" FIRE RETARDANT POLYCARBONATE MATERIAL OF BE PLASTIC/SABIC MAKE OR EQUIVALENT WITH PRIOR APPROVAL OF CEE. DIFFUSER THICKNESS SHALL NOT BE LESS THAN 1.5MM. AND SHALL BE FREE FROM SCRATCHES, AIR BUBBLES, HOLES AND ULTRA-VIOLET STABILIZED. 15. HOLES TO BE DRILLED SHALL BE MADE WITH 1.5MM DIA. DRILL. MATERIAL SHALL BE OF POLYCARBONATE OR FIBER SHEET MATERIAL WITH DIMENSIONS FOR MAIN LED DRIVER (160X45X3MM. MAX.) AND MOUNTING DIMENSIONS TO 140MM. 16. MOUNT 1 ITEM NO. 12 TO 13 SHALL BE STABLE WITH ITEM NO. 11. 17. ENTIRE WIRING AND NOTCHES SHALL BE COVERED WITH 1MM THICK FIRE RETARDANT TAPE. 18. ITEM NO. 2 SHALL NOT GET LOOSE/DEFORMED/LACK ITS PHYSICAL PROPERTIES WHILE IN USE FOR ROLLING STOCK APPLICATION. 19. ITEM NO. 2 SHALL BE STABLE WITH ITEM NO. 11. 20. ONLY TIG/SPOT WELDING SHALL BE DONE AS PER THE REQUIREMENT NO OTHER WELDING IS ACCEPTABLE. 21. SCHEMATIC DIAGRAM/MANUFACTURER'S INSIGNIA SHALL BE SCREEN PRINTED ON AL-PLATE AND P.O. NO. & S.N.O. SHALL BE SCREEN PRINTED ON AL-PLATE. 22. ITEM NO. 1 SHALL BE STABLE WITH ITEM NO. 11. 23. STANDS RUNNING S.N.O. SHALL BE PUNCHED ON IT AS SHOWN IN LEGEND PLATE AND RIVETED AT THE BACK SIDE OF THE FITTING. 24. ITEM NO. 2 SHALL BE OF 100 SQ. MM. AREA. 25. ITEM NO. 3 SHALL BE OF 100 SQ. MM. OF ROUGH SURFACE. 26. TERMINAL CONNECTOR SHALL BE OF CASE CLAMP TYPE WAGO/PHENIX MAKE AS INDICATED IN TABLE-1. 27. ITEM NO. 1 & 3 SHALL BE DEEP DRAWN AND NOT FABRICATED. 28. ITEM NO. 1 & 3 SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR. ISHRAE NO. 042 "1B" WHITE OF M/S BERGER OR SIMILAR IN COMPLIANCE WITH M/S BERGER MAKE PAINTS. 29. ITEM NO. 1 & 3 SHALL BE GIVEN POLYURETHANE FINISH. 30. FRAMED MOUNTING DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.
FOR UNTOLERANCED DIMENSIONS REFER MDG0008

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE

DATE OF FIRST ISSUE	20/05/2016
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SCHEMATIC DIAGRAM FOR LED LIGHT (FOR REFERENCE ONLY)

ALT. NO.	ALT. DATE	ZONE	ALTERATIONS	AUTHORITY
0	02/08/2019	ALL	1. ITEM-1&2 MODIFIED.	DIC. NO. ED190008

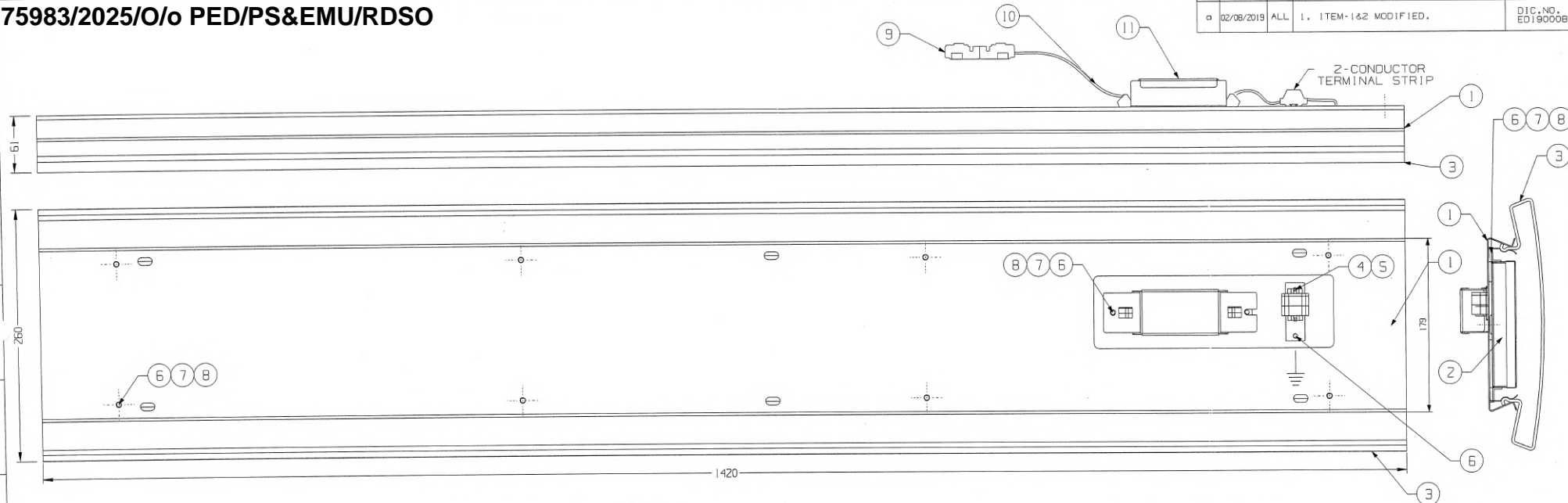


TABLE-1

DETAILS OF TERMINAL CONNECTOR

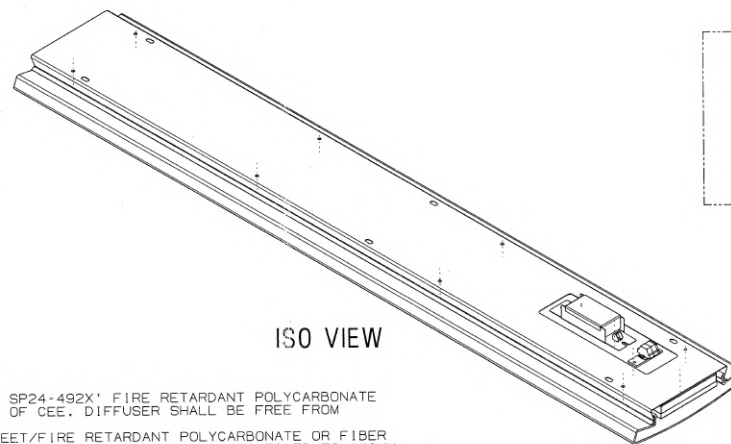
DESCRIPTION	CAT. NO.	QTY./FITTING
MALE CONNECTOR WITH CAGE CLAMP	(721-603) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1
FEMALE CONNECTOR WITH CAGE CLAMP	(721-103/026-000) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1
2-CONDUCTOR TERMINAL STRIP	(260-102) OF M/S WAGO AND SIMILAR IN PHOENIX MAKE	1

QPC/COACH SET

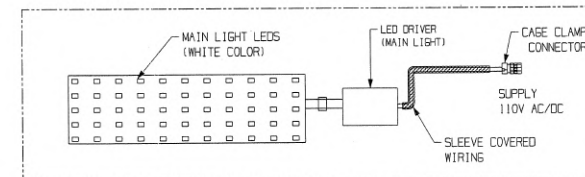
DRG. NO.	QPC.
LW76100, ALT-NIL	11
LW76101, ALT-NIL	2

LEGEND PLATE

MENU INSIGNIA	DATE S.NO.	SCHEMATIC DIAGRAM
P.O. NO.		



ISO VIEW

SCHEMATIC DIAGRAM FOR LED LIGHT
(FOR REFERENCE ONLY)

- DIFFUSER MATERIAL SHALL BE CONFORMING TO UL 94V0 & MADE FROM 'LEXAN SP24-492X' FIRE RETARDANT POLYCARBONATE MATERIAL OF GE PLASTIC/SABIC MAKE OR EQUIVALENT WITH PRIOR APPROVAL OF CEE. DIFFUSER SHALL BE FREE FROM SCRATCHES, AIR BUBBLES, HOLES AND ULTRA-VIOLET STABILIZED.
- HOUSING OF THE LED DRIVER SHALL BE MADE FROM 1MM. THICK ALUMINUM SHEET/FIRE RETARDANT POLYCARBONATE OR FIBER SHEET MATERIAL WITH DIMENSIONS FOR MAIN LED DRIVER (160x45x35MM. MAX.) AND MOUNTING DIMENSIONS FIXED TO 140MM.
- ENTIRE WIRING AND NOTCHES SHALL BE COVERED WITH 1MM. THICK FIRE RETARDANT SLEEVES.
- SCHEMATIC DIAGRAM, MANUFACTURER'S INSIGNIA SHALL BE SCREEN PRINTED ON AL. PLATE AND P.O. NO. & S.NO. IN THE FORM OF 'YYYYMMNNN' WHERE 'YYYY' STANDS FOR YEAR, 'MM' STANDS FOR MONTH AND 'NNN' STANDS FOR RUNNING S.NO. SHALL BE PUNCHED ON IT AS SHOWN IN LEGEND PLATE AND RIVETED AT THE BACK SIDE OF THE FITTING.
- WIRING TO BE DONE WITH 1.0 SQ.MM. PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
- TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHOENIX MAKE AS INDICATED IN TABLE-1.
- ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 "IFB WHITE" OF M/S BERGER OR SIMILAR IN M/S ASIAN./ M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
- FRAMED MOUNTING DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
- ALL DIMENSIONS IN MM.

NOTE :-

ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER THIS DRAWING INVALID.

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008

DATE OF FIRST ISSUE

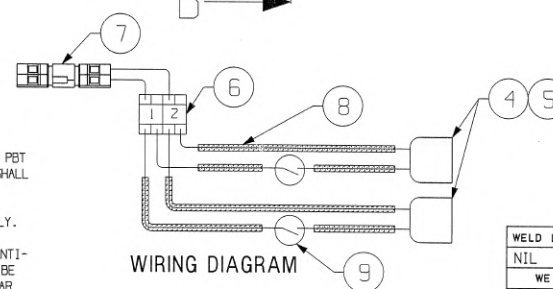
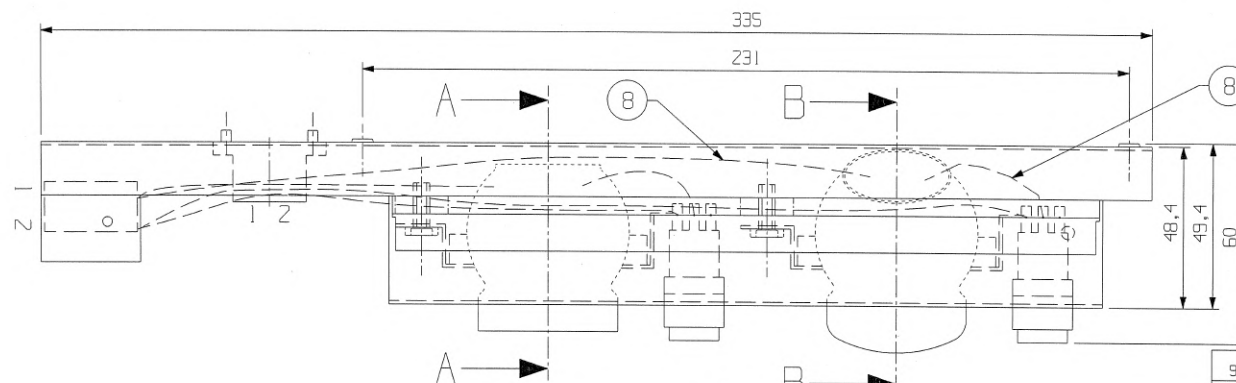
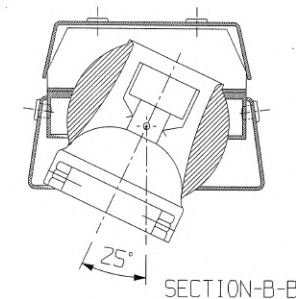
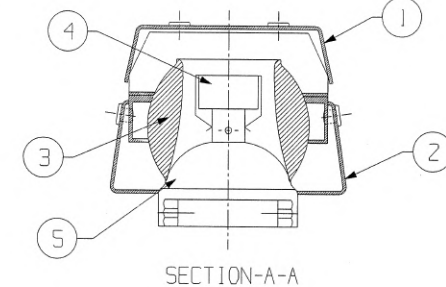
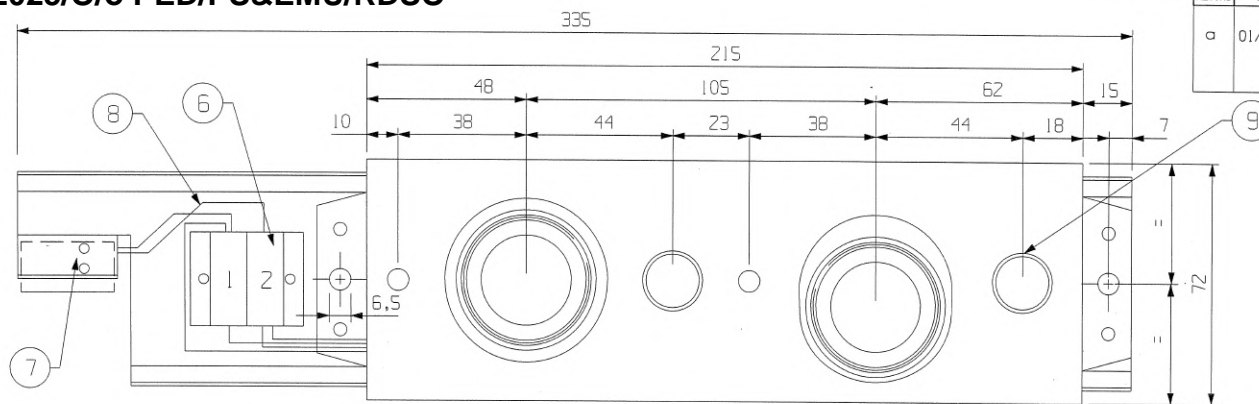
20/05/2015

ITEM	DESCRIPTION	QTY.	ALT.	REMARKS
12	DUMMY FITTING	2	LW76101	NIL
11	LED DRIVER	1	NIL	SEE NOTE-8
10	FIRE RETARDANT SLEEVE THICKNESS 1MM.	1	NIL	AS REQUIRED
9	TERMINAL CONNECTOR	1	NIL	SEE NOTE-4
8	SPRING WASHER M5	10	IS: 3081LATEST TYPE-B	NIL
7	PLAIN WASHER Ø5	10	IS: 2018LATEST TYPE-B	NIL
6	CHEESE HD. SCREW M5X5	11	IS: 3661LATEST TYPE-B	NIL
5	SPRING WASHER M3	1	IS: 3081LATEST TYPE-B	NIL
4	CHEESE HD. SCREW M3X5	1	IS: 3661LATEST TYPE-B	NIL
3	DIFFUSER (LENGTH=1420MM.)	1	3087703	SEE NOTE-9
2	LED MODULE BOX	1	LW76107	NIL
1	FRAME	1	LW76106	NIL

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	DETAIL DRG	PATL. & SPEC.	REMARKS
NIL	M	GROUP ELECTRICAL	SUPERSEDES: LW76100	ALT NIL	
NIL	KG	FILE D:\Vb\Kp\001\lw76100c.dwg			
NIL	KG	LED LIGHT FITTING FOR PASSANGER AREA OF LHB TYPE AC CHAIR CAR, TYPE-0 (18W) (AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016.REV.1)	SCALE	SSR/ED	
NIL	M	RAIL COACH FACTORY, KAPURTHALA	DRN		
NIL	M	रेल कोच फैक्टरी कपूरथला	REF. NO. NIL		
NIL	M		PL NO. NIL		
NIL	M		DRG. NO. LW76100		
NIL	M		SEE/DAD		

4175983/2025/O/o PED/PS&EMU/RDSO

ALT. NO	ALT. DATE	ZONE	ALTERATIONS	AUTHORITY
0	01/08/2019	9-F	1. ITEM NO-4 PART NO. CHANGED FROM 25.126.3501.00 TO 25.106.3501.00. 2. ITEM NO-9 PART NO. 40.31.15.20.00 OF M/S WERNER MAKE ADDED & DRAWING MODIFIED ACCORDINGLY.	DIC NO. ED190008



ITEM	DESCRIPTION & DIMENSIONS	QTY	DETAIL DRG	MATL. & SPEC.	REMARKS
9.	PUSH BUTTON (PUSH ON-PUSH OFF) WITH TERMINAL COVER	2	NIL		LOC. AS SHOWN IN LISTS OR AS REQUIRED
8.	FIRE RETARDANT SLEEVE (THICKNESS 1MM.)	1	NIL		AS REQUIRED
7.	CONNECTOR	1	PART NO. 721-602	NIL	OF M/S WAGO OR SIMILAR OF M/S PHOENIX MAKE
6.	CONNECTOR	1	PART NO. 250-202	NIL	OF M/S WAGO OR SIMILAR OF M/S PHOENIX MAKE
5.	LED WITH CIRCUIT MODULE WITH INTEGRATED TYPE LED & HEAT SINK	2	NIL	NIL	SEE NOTE-B
4.	LAMP HOLDER WITH PTFE/E-BEAM CABLE	2	M/S VOSSLOH-SCHNABE REF. NO. 100939/ M/S BUBI PART NO.	NIL	25.106.3501.00 OR ANY OTHER APPROVED MAKE
3.	SPOT UNIT	2	NIL	IS: 733(LATEST)	NIL
2.	FRONT PANEL (1MM)	1	NIL	ALUMINIUM GREY/GRAU	NIL
1.	FRAME (1MM)	1	NIL	AL 1.0	NIL

WELD LENGTH	ITEM	GROUP	FILE	SUPERSEDES	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	ELECTRICAL	D:\bikram\led light\lw76102a.prt	lw76102a.prt			

WEIGHT	SCALE	SSE/EO	CHD	DRN	LOGIN
NIL	KG				
S. AREA					
NIL	M2				
LENGTH / - Ø + A					
NIL	M				
WIDTH / THICK					
NIL	M				
HEIGHT					
NIL	M				

LED LIGHT FITTING FOR READING LIGHT
FOR LHB AC CHAIR CAR (2 SEATER), TYPE-Q1(2W EACH)
(AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016, REV.1)

RAIL COACH FACTORY, KAPURTHALA

रेलकोच फैक्ट्री कपूरथला

IP\$

REF. DRG. NO.	PL NO.	DRG. NO.	ALT.	SIZE	SHEET
NIL	NIL	LW76102	0	A2	1/1

SEE D/D

DY. DES. D/D

10. SUITABLE STOPPER TO BE PROVIDED TO LOCK CLOCK/ANTI-CLOCK ROTATION OF THE SPOT UNIT.
9. ADEQUATE HEAT SINK WITH PROPER THERMAL MANAGEMENT SHALL BE PROVIDED WITH LED MODULE.
8. LED CIRCUIT MODULE SHALL BE THE PART OF THE LED (INTEGRATED TYPE) MADE OF NON-METALLIC PBT MATERIAL AND UNIVERSAL DESIGN SUITABLE FOR 110V AC/DC SUPPLY. THE OPERATING VOLTAGE SHALL VARY FROM 90V TO 140V WITH 15% RIPPLE.
7. ENTIRE WIRING AND NOTCHES SHALL BE COVERED WITH 1MM. THICK FIRE RETARDANT SLEEVES.
6. WIRING TO BE DONE WITH 1.0 SQ.MM. PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
5. ITEM NO.-3 TO BE DULL ANODIZED TO 154968, GR-AC 5.
4. ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 "IFB WHITE" OF M/S BERGER OR SIMILAR IN M/S ASIAN./ M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
3. ONLY TIG WELDING SHALL BE DONE AS PER REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
2. FRAMED MOUNTING DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
1. ALL DIMENSIONS IN MM.

NOTE: -

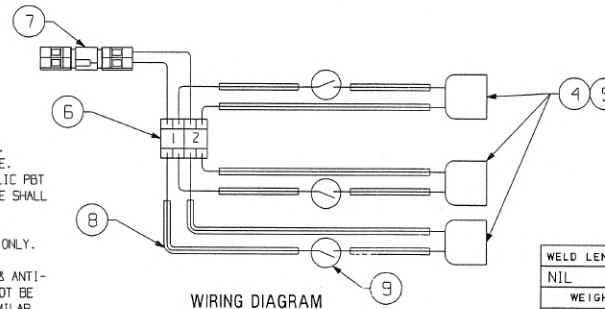
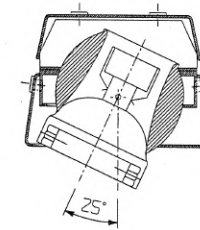
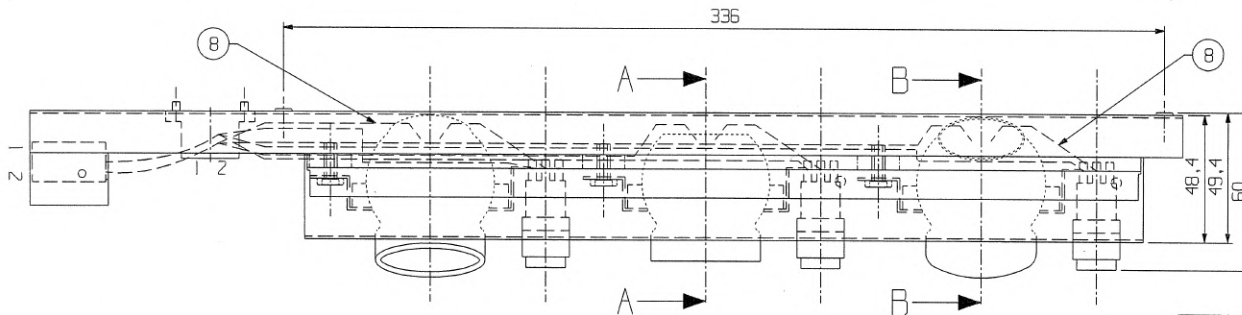
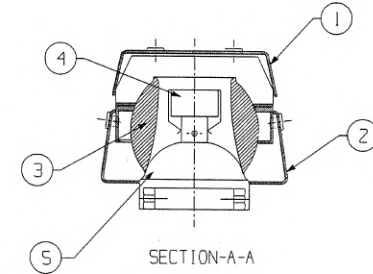
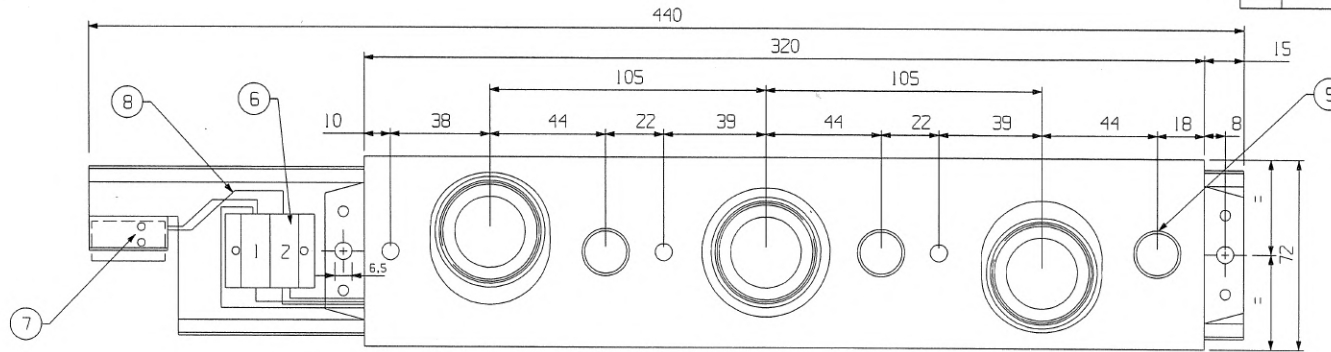
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FOR UNTOLERANCED DIMENSIONS REFER MDG0008 DATE OF FIRST ISSUE 20/05/2016

4175983/2025/O/o PED/PS&EMU/RDSO

ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
0	01/08/2019	9-F	1.ITEM NO-4 PART NO.CHANGED FROM 25.126.3501.00 TO 25.106.3501.00. 2.ITEM NO-9 PART NO.40.31.15.20.00 OF M/S WERNER MAKE ADDED & DRAWING MODIFIED ACCORDINGLY.	DIC NO. ED190008



10. SUITABLE STOPPER TO BE PROVIDED TO LOCK CLOCK/ANTI-CLOCK ROTATION OF THE SPOT UNIT.
9. ADEQUATE HEAT SINK WITH PROPER THERMAL MANAGEMENT SHALL BE PROVIDED WITH LED MODULE.
8. LED CIRCUIT MODULE SHALL BE THE PART OF THE LED (INTEGRATED TYPE) MADE OF NON-METALIC PBT MATERIAL AND UNIVERSAL DESIGN SUITABLE FOR 110V AC/DC SUPPLY. THE OPERATING VOLTAGE SHALL VARY FROM 90V TO 140V WITH 15% RIPPLE.
7. ENTIRE WIRING AND NOTCHES SHALL BE COVERED WITH 1MM. THICK FIRE RETARDANT SLEEVES.
6. WIRING TO BE DONE WITH 1.0 50.0MM. PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
5. ITEM NO.-3 TO BE DULL ANODIZED TO IS:1868, GR-AC 5.
4. ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 "1FB WHITE" OF M/S BERGER OR SIMILAR IN M/S ASIAN./ M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
3. ONLY TIG WELDING SHALL BE DONE AS PER REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
2. FRAMED MOUNTING DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
1. ALL DIMENSIONS IN MM.

NOTE: -

WIRING DIAGRAM

ITEM	DESCRIPTION & DIMENSIONS	QTY	UNIT	REMARKS
9.	PUSH BUTTON (PUSH ON-PUSH OFF) WITH TERMINAL COVER	3	NIL	DIC NO. 51 OF ITEM OF NO. 31.15.20.00 OF M/S WERNER MAKE OR ANY OTHER APPROVED MAKE.
8.	FIRE RETARDANT SLEEVE (THICKNESS 1MM.)	1	NIL	AS REQUIRED
7.	CONNECTOR	1	PART NO.721-602	OF M/S MAGDOR SIMILAR OF M/S PHOENIX MAKE
6.	CONNECTOR	1	PART NO.260-202	OF M/S MAGDOR SIMILAR OF M/S PHOENIX MAKE
5.	LED WITH CIRCUIT MODULE WITH (INTEGRATED TYPE)LED & HEAT SINK	3	NIL	SEE NOTE-B
4.	LAMP HOLDER WITH PTFE/E-BEAM CABLE	3	M/S VOSSLOH-SCHWABE REF.NO.100939 / M/S ELSA PART NO.	25.106.3501.00 OR ANY OTHER APPROVED MAKE.
3.	SPOT UNIT	3	NIL	IS: 733(LATEST)
2.	FRONT PANEL (1MM)	1	NIL	ALUMINIUM GREY/GRAY
1.	FRAME (1MM)	1	NIL	AL 1.0

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QTY	UNIT	REMARKS
NIL	M	GROUP ELECTRICAL			
WEIGHT	FILE	D:\bikram\led light\lw76103.prt			
NIL	KG				
S. AREA					
NIL	M2				
LENGTH / -D+A-					
NIL	M				
WIDTH / TH+GK					
NIL	M				
HEIGHT					
NIL	M				

LED LIGHT FITTING FOR READING LIGHT
FOR LHB AC CHAIR CAR (3 SEATER), TYPE-Q2 (2 EACH)
(AS PER SPEC. NO. RDSO/PE/SPEC/TL/0091-2016,REV.1)

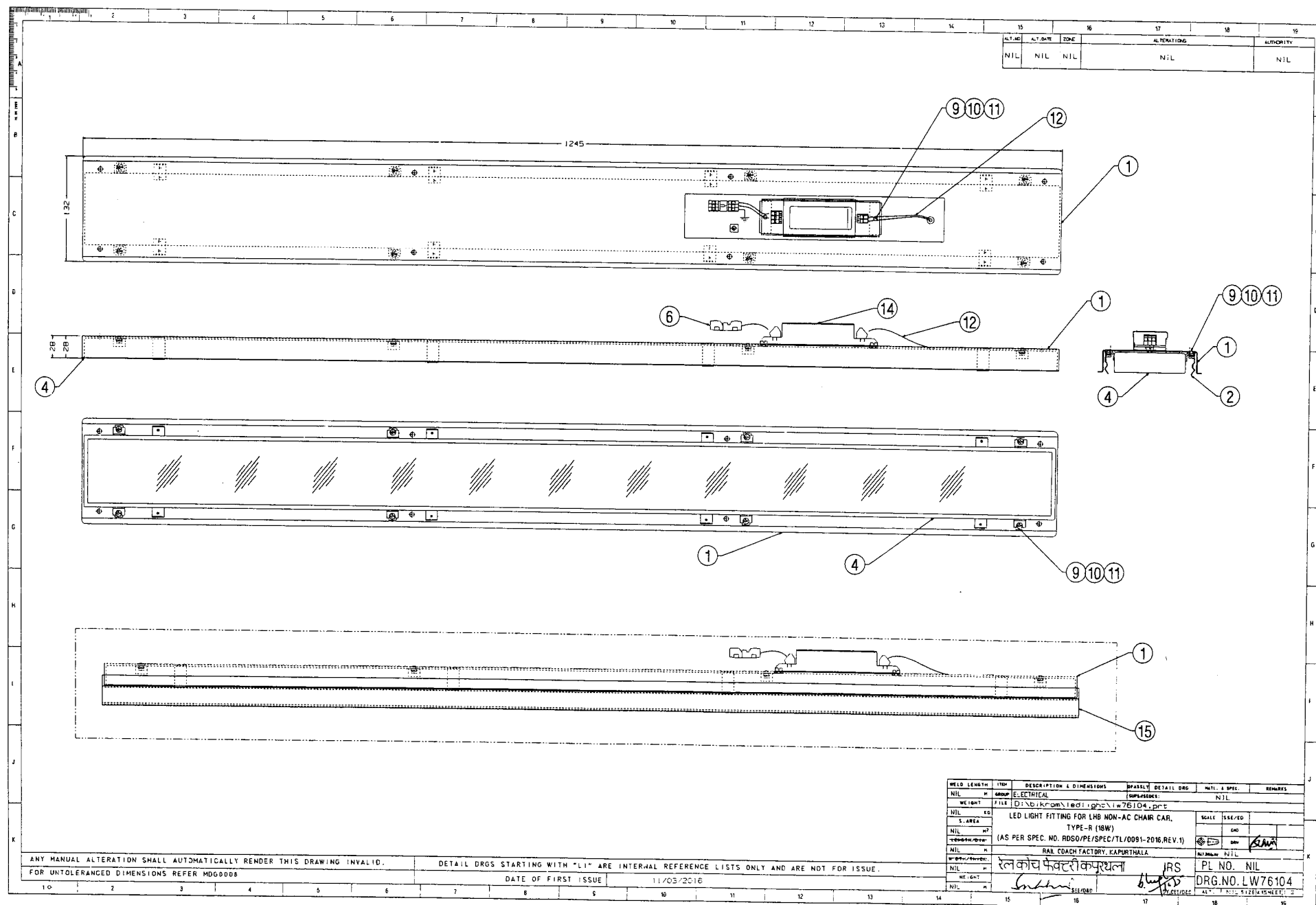
RAIL COACH FACTORY, KAPURTHALA

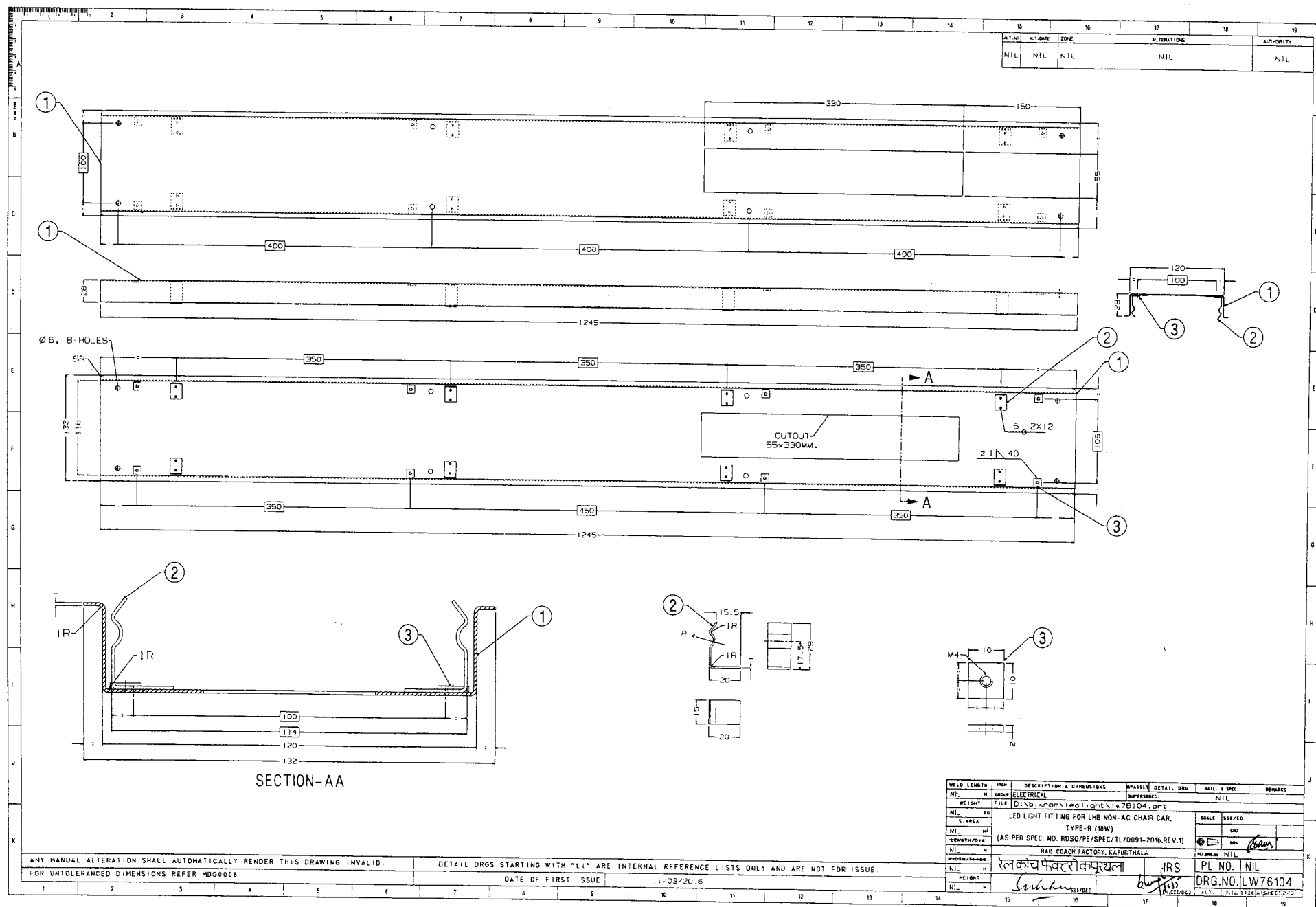
रेल कोच फैक्टरी कपूरथला

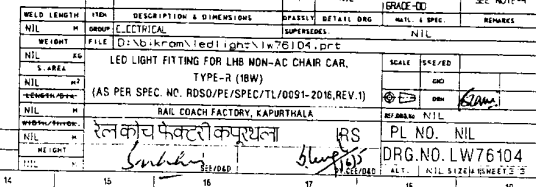
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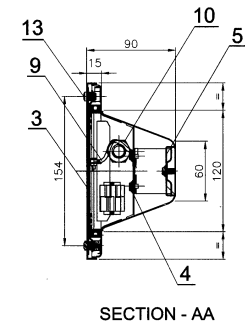
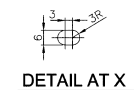
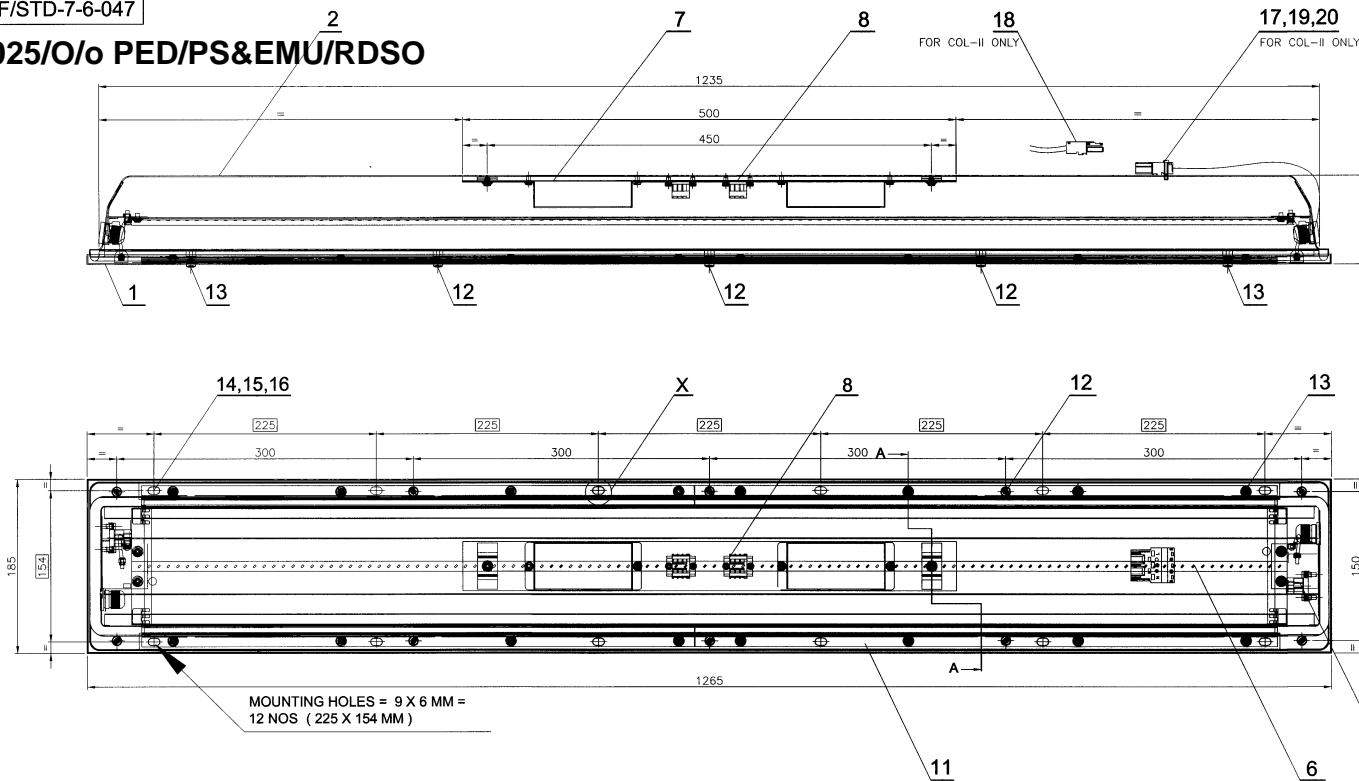
PL NO. NIL
DRG.NO. LW76103

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FOR UNTOLERANCED DIMENSIONS REFER MDG0008 DATE OF FIRST ISSUE 20/05/2016



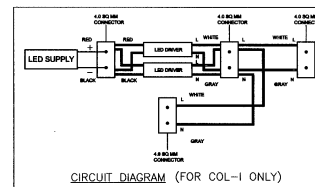
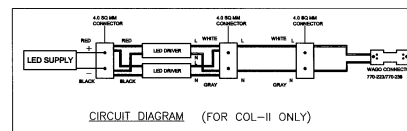






NOTE:

- ALL DIMENSIONS ARE IN MM.
- FRAMED DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PINCHING.
- ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 'F8 WHITE' OF M/S BERGER OR SIMILAR IN M/S ASIAN, M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
- TERMINAL CONNECTOR SHALL BE OF CAGE CLAMP TYPE WAGO/PHONEIX MAKE.
- FELT TO BE USED IN DIFFUSER FIXING CLAMPS TO AVOID DAMAGE WHILE TIGHTENING WITH POLY CARBONATE DIFFUSER. FELT SHOULD HAVE CIRCULAR HOLES AT ALL LOCATION OF HOLES IN DIFFUSER HOLDING FRAME.
- SUITABLE GEAR TRAY PROVIDED IN THE HOUSING FOR MOUNTING LED DRIVER AND WAGO CONNECTOR.
- ONLY TIG/SPOT WELDING SHALL BE DONE AS PER THE REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
- SUITABLE GROMMETS TO BE PROVIDED FOR CABLE TRAVERSING TO THE LED DRIVER.
- ITEMS-1 & 2 SHOULD BE DEEP DRAWN AND NOT FABRICATED.
- SCHEMATIC DIAGRAM, MANUFACTURER'S INSIGNA SHALL BE SCREEN PRINTED ON ALUMINIUM PLATE AND PURCHASE ORDER AND S.NO. IN THE FORM OF 'YYYYMMNN' WHERE 'YYYY' STAND FOR YEAR 'MM' STAND FOR MONTH AND 'NN' STAND FOR RUNNING SERIAL NO. SHALL BE PINCHED ON IT AS SHOWN IN LEGEND PLATE AND RIVETED AT THE BACK SIDE OF THE FITTING.
- WIRING TO BE DONE WITH 1.5 SQ.MM PTFE CABLE OR E-BEAM CABLE OF RDSO APPROVED MAKE ONLY.
- HOUSING OF LED DRIVER SHALL BE MADE FROM 1MM. THICK ALUMINIUM SHEET/FIRE RETARDANT POLYCARBONATE OR FIBER SHEET MATERIAL.
- DIFFUSER MATERIAL SHALL BE CONFORMING TO UL 94VO & MADE FROM 'LEXAN SP24-492X' FIRE RETARDANT POLYCARBONATE MATERIAL OF GE PLASTIC/SABIC MAKE OR EQUIVALENT WITH PRIOR APPROVAL OF CEE/ICF. DIFFUSER THICKNESS SHALL NOT BE LESS THAN 1.5MM AND SHALL BE FREE FROM SCRATCHES, AIR BUBBLES, HOLES AND ULTRA-VIOLET STABILIZED.
- IF SUPPLIER WISHES TO OFFER MODIFICATIONS OR CHANGES TO THE GIVEN ARRANGEMENT, THEY SHALL TAKE PRIOR APPROVAL BEFORE SUBMISSION OF PROTOTYPE SAMPLE.
- ONE PROTOTYPE SAMPLE SHALL BE SUBMITTED FOR APPROVAL BEFORE MANUFACTURING/EFFECTING BULK SUPPLY.

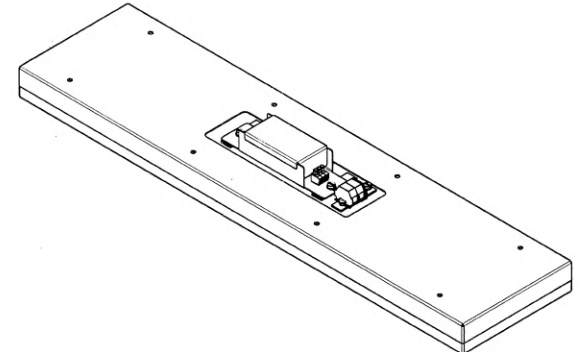
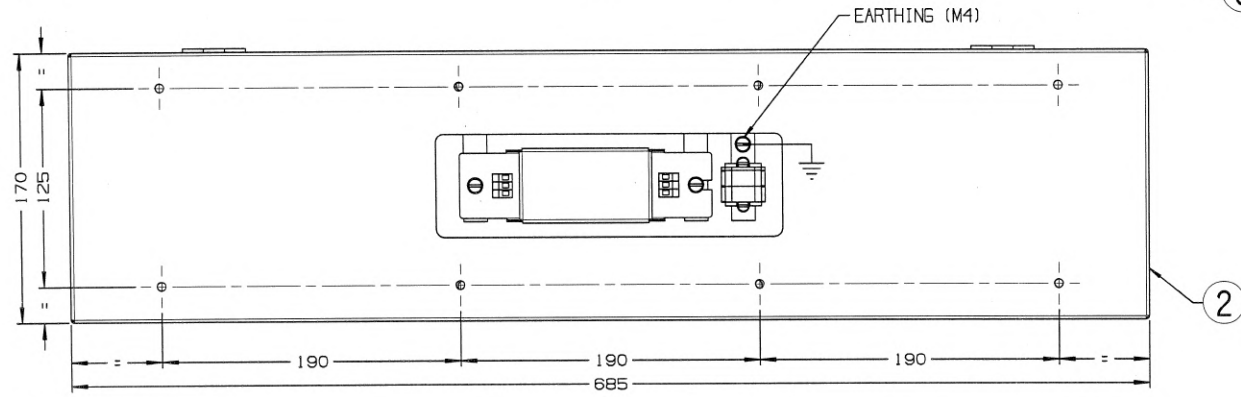
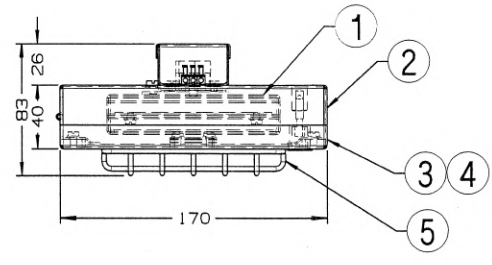
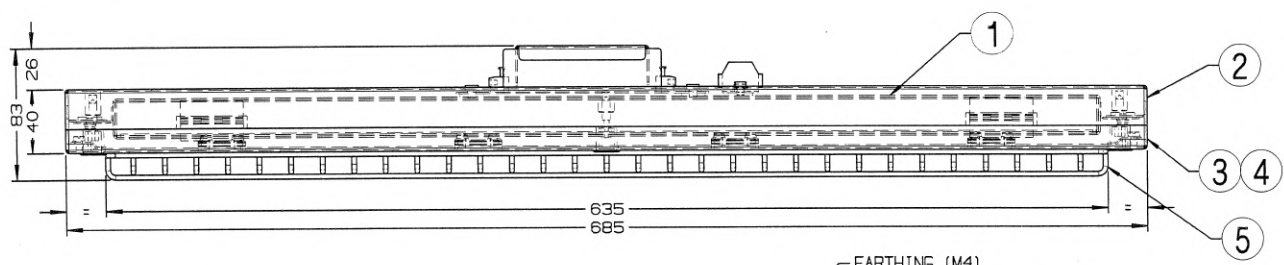


NO. OFF	DESCRIPTION & DIMENSIONS	ITEM	REF. DRG.	MAT. & SPECN.	WEIGHT/UNIT	REMARKS
2	CH. HD. SCREW M3x15	20	IS:1387(P-14)	CRCA		STAINLESS STEEL
1	SCREWING PIECE 3x15x45	19				
1	WAGO SOCKET CONNECTOR	18				WAGO PART NO. 770-223
1	WAGO PLUG CONNECTOR	17				WAGO PART NO. 770-233
12	PLAIN WASHER 5.5	16	IS:3063(LATEST)	ISI-3063(LATEST)		
12	SPRING WASHER M5	15	IS:1367(P-14)	ISI-1367(P-14)		
12	CH. HD. SCREW M5x35	14	IS:1387(P-14)	ISI-1387(P-14)		
4	ANTI THEFT SCREW	13	IS:2063-LATEST	ISI-2063-LATEST		STAINLESS STEEL
6	PAN HD. SCREW M4x12	12	IS:2063-LATEST	ISI-2063-LATEST		
1	SILICON GASKET	11				
2	PG 9 CABLE GLAND	10				
2	WIRE ROPE (S.S)	9		S.S		
4	FOUR CONDUCTOR TERMINAL BLOCK	8				REFER NOTE-4
2	LED DRIVER	7				REFER NOTE-12
1	LED PCB	6				
1	GEAR TRAY	5				REFER NOTE-8
1	REFLECTOR	4		ALUMINIUM		
1	POLYCARBONATE DIFFUSER	3				REFER NOTE-13
1	TOP HOUSING 1MM	2		IS:513-LATEST		DEEP DRAWN
1	DIFFUSER HOLDING FRAME 1MM	1		IS:513-LATEST		
NO. OFF DESCRIPTION & DIMENSIONS ITEM REF. DRG. MAT. & SPECN. WEIGHT/UNIT REMARKS						
IV III I	GROUP - 7-6					
LED LIGHT FITTING, TYPE-S (18W)						
FOR CONV. AC CHAIR CAR & EMU COACHES						
(AS PER SPEC. NO. RDSO/PE/SPEC/TL0091-2016, REV.1)						
SUPERSEDED BY: SCALE SSE/D 1:5 CHD. 1:2 ALT. 1:1 DRN. RATHARAJA						
CAD FILE: ED-CAD\140 7-6 047-SB00.DWG						
DATA CODE NO. 140 INDIAN RAILWAY STANDARDS						
SHEET 1 OF 1 ICF/STD-7-6-047						
FORM SIZE A1 (840x600)						

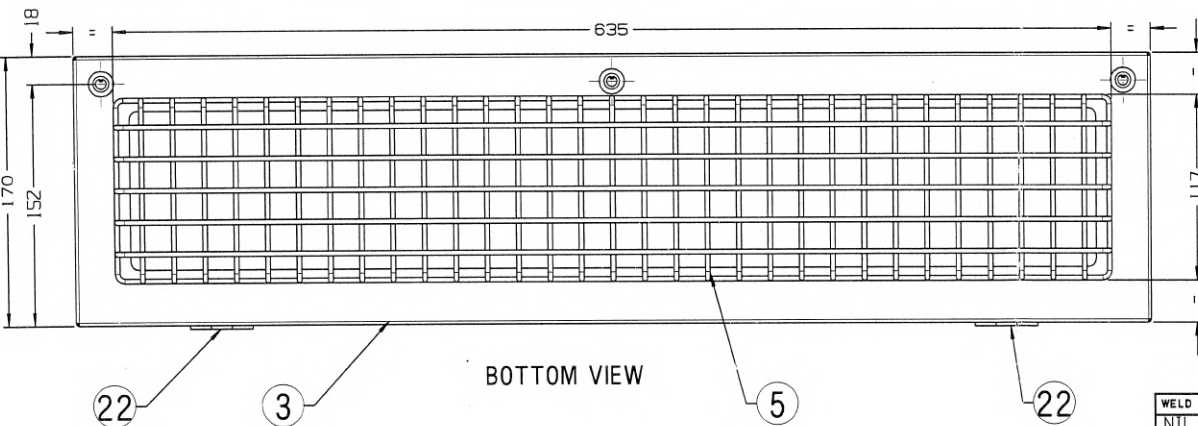
ASSEMBLY DRAWINGS

16-05-2022 20-05-2016

ALT. DATE OF LATEST ALT. DATE OF FIRST ISSUE DY.CEE/D-II



ISO-VIEW



BOTTOM VIEW

NOTE: 1. ALL DIMENSIONS IN MM.

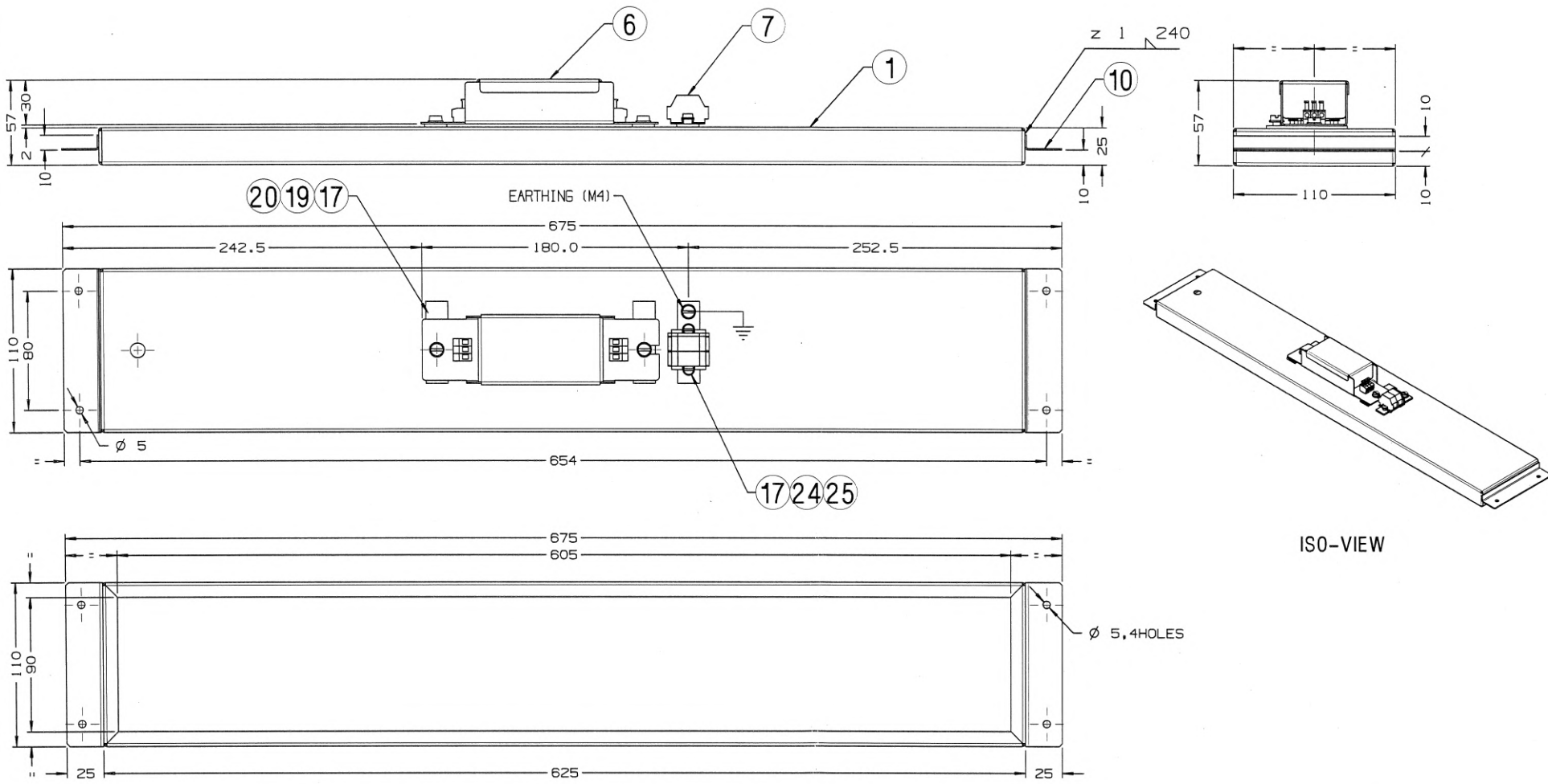
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FOR UNTOLERANCED DIMENSIONS REFER MDG0008 DATE OF FIRST ISSUE 31/03/2005

WELD LENGTH	ITEM	GROUP	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	GROUP	ELECTRICAL				
WEIGHT	FILE		\\10.12.17.2\elec\PAVN\DMC\2016\cc76460s1.prt				
NIL	KG		LED LIGHT FITTING			SCALE	SSE/ED
S.AREA			FOR MEMU COACHES (DMC/TC) TYPE-T (18W)			CHD	
NIL	M2		(AS PER SPEC.NO. RDSO/PE/SPEC/TL/0091-2016.REV-1)			DRN	
LENGTH / DIA			RAIL COACH FACTORY, KAPURTHALA			REF.DRG.NO.	NIL
NIL	M		रेल कोच फैक्टरी कपूरथला			PL NO.	NIL
WIDTH / THICK						DRG.NO.	CC76460
NIL	M					ALT.	
HEIGHT						SHEET	1/1
NIL	M						

G

G



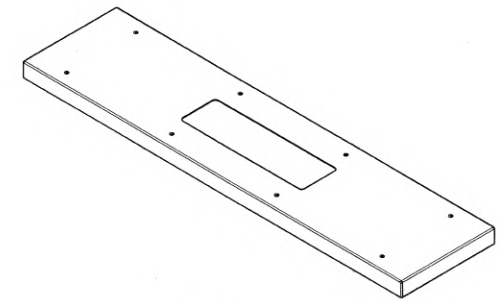
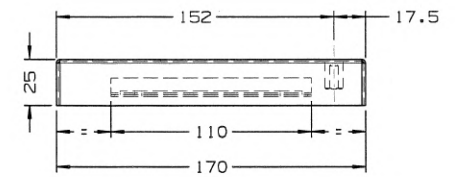
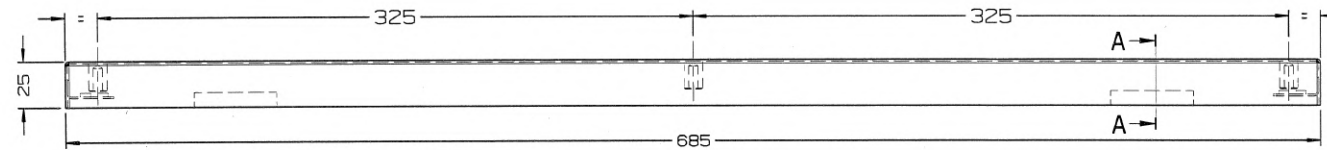
NOTE: 1. ALL DIMENSIONS IN MM.

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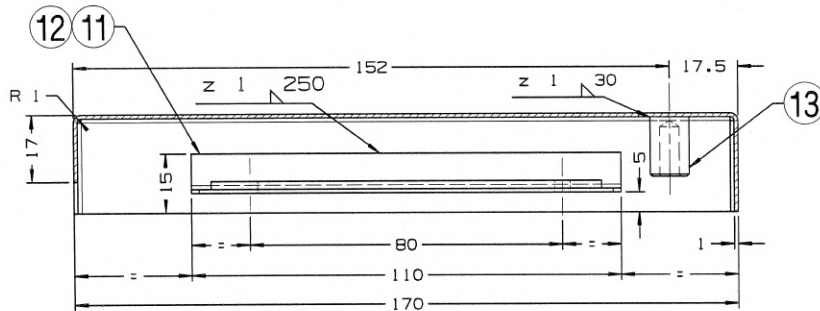
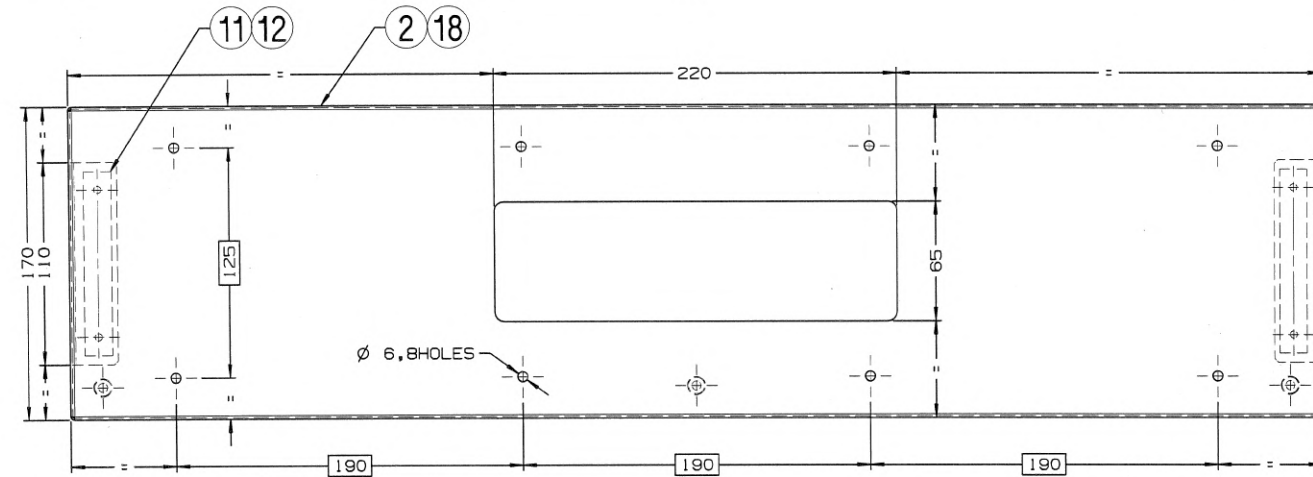
FOR UNTOLERANCED DIMENSIONS REFER MDG0008 DATE OF FIRST ISSUE 31/03/2005

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	GROUP ELECTRICAL				
WEIGHT	FILE	10.12.17.2\elec\PAVN\DMC\2016\cc76460s1.prt				
NIL	KG					
S. AREA						
NIL	M2					
LENGTH / DIA						
NIL	M					
WIDTH / THICK						
NIL	M					
HEIGHT						
NIL	M					

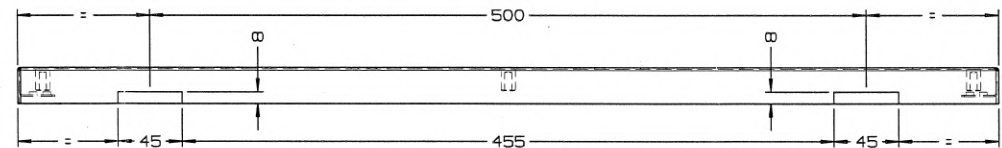
LED MODULE BOX WITH DIFFUSER WITH 18W,110V-140V AC/DC DRIVER LED LIGHT FITTING FOR MEMU COACHES (DMC/TC) TYPE-T(18W)	SCALE	SSE/ED	
	CHD		
	DRN		
RAIL COACH FACTORY, KAPURTHALA	REF. DRG. NO.	NIL	
रेलकोच फैक्टरी कपूरथला	PL NO.	NIL	
	DRG. NO.	CC76460	
SEE/D&D	DY. CES/D&D	ALT. 1	SIZE A2 SHEET 12/9



ISO-VIEW



SECTION A-A



CUT OUT SIZE FOR HINGE (BACK VIEW)

NOTE: 1. ALL DIMENSIONS IN MM.

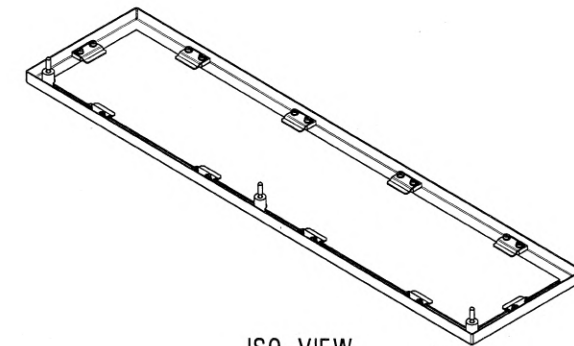
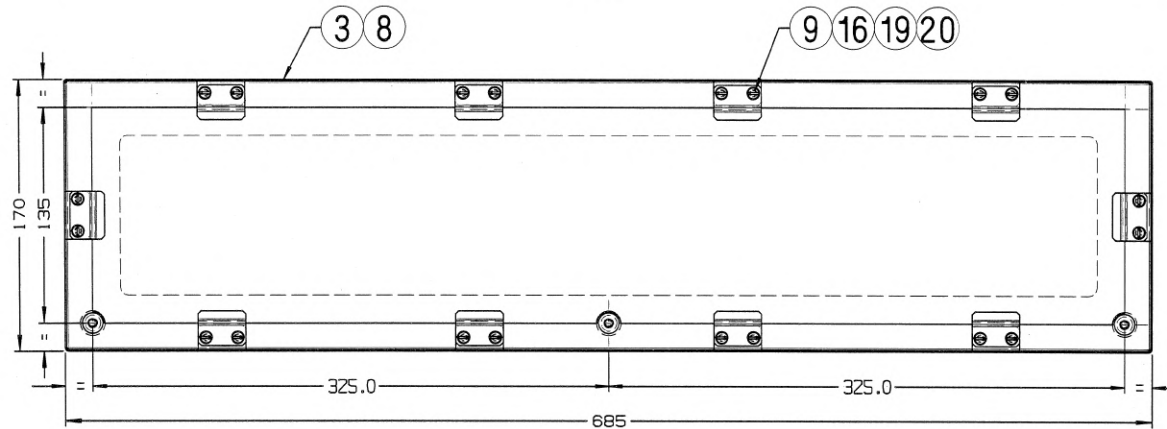
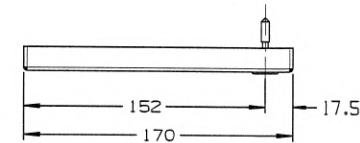
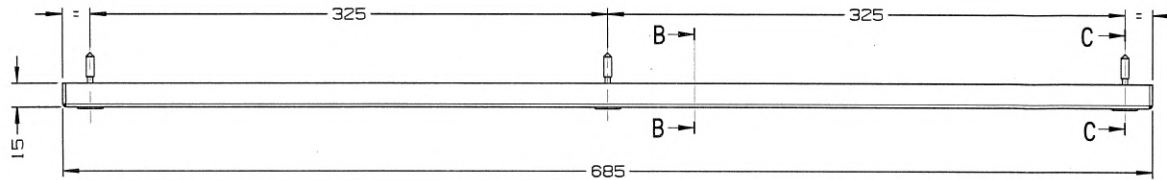
DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.

THIS IS A COMPUTER GENERATED DRAWING. ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER IT INVALID.

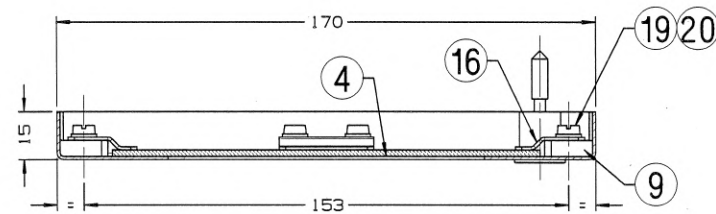
FOR UNTOLERANCED DIMENSIONS REFER MDG0008 DATE OF FIRST ISSUE 31/03/2005

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	OPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	GROUP ELECTRICAL		SUPERSEDES: CC76460 ALT NIL		
WEIGHT	FILE	\\10.12.17.2\elec\PAVN\DMC\2016\cc76460s1.prt				
NIL	KG	UPPER COVER COMPLETE				
S.AREA	M2	LED LIGHT FITTING FOR MEMU COACHES				
NIL	M	(DMC/TC) TYPE-T (18W)				
LENGTH / DIA	M	RAIL COACH FACTORY, KAPURTHALA				
WIDTH / THICK	M	रेलकोच फैक्टरी कपूरथला				
NIL	M	IRS				
HEIGHT	M	PL NO. NIL				
NIL	M	DRG.NO. CC76460				
		SEE/D&D	DY.SEE/D&D	ALT.	SIZE A3	SHEET 3/3

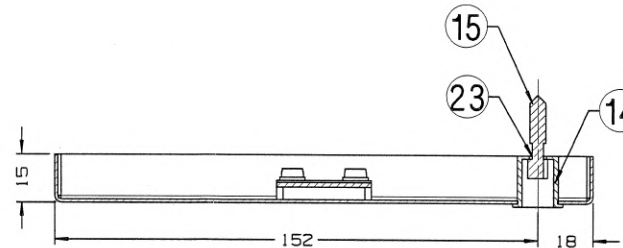
ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY



ISO-VIEW



SECTION B-B



SECTION C-C

NOTE: 1. ALL DIMENSIONS IN MM.

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.
THIS IS A COMPUTER GENERATED DRAWING. ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER IT INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008 DATE OF FIRST ISSUE 31/03/2005

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QPASSLT	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	ELECTRICAL				
WEIGHT	FILE	\\10.12.17.2\elec\PAVN\DMC\2016\cc76460s1.prt				
NIL	KG	BOTTOM COVER COMPLETE				
S. AREA	M ²	WITH DIFFUSER LED LIGHT FITTING FOR MEMU				
LENGTH / DIA	M	COACHES (DMC/TC) TYPE-T (18W)				
NIL	M	RAIL COACH FACTORY, KAPURTHALA				
WIDTH / THICK	M	रेल कोच फैक्टरी कपूरथला				
NIL	M	IRS				
HEIGHT	M					
NIL	M					

SCALE SSE/ED

CHD

DRN

REF. DRG. NO. NIL

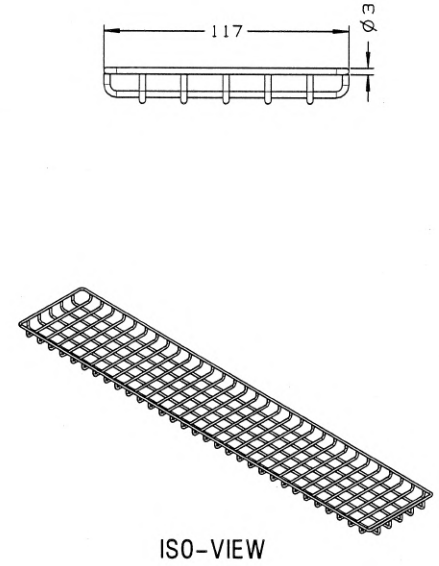
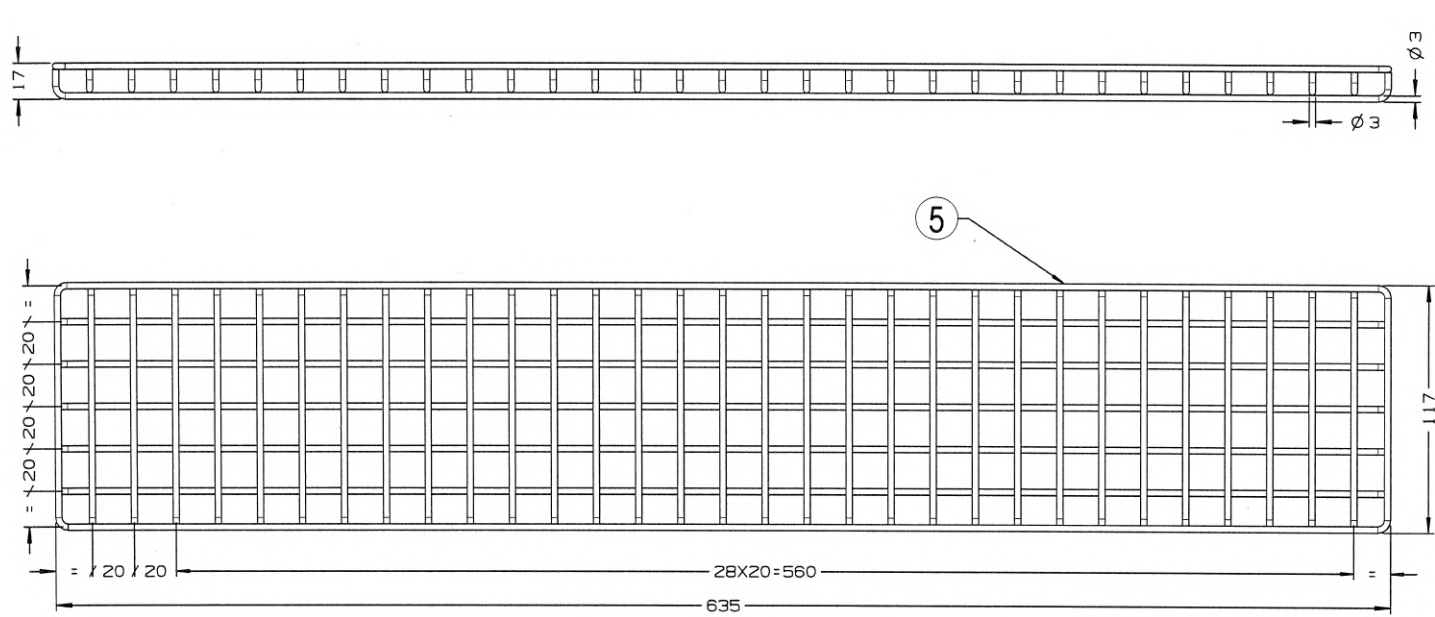
PL NO. NIL

DRG. NO. CC76460

ALT. a SIZE A3 SHEET 4/9

SEE/D&D

DY.CEE/D&D



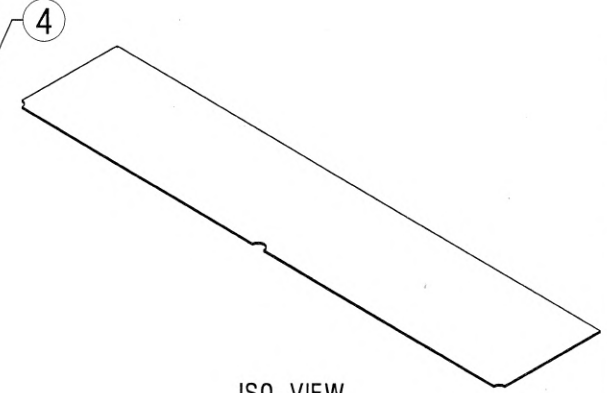
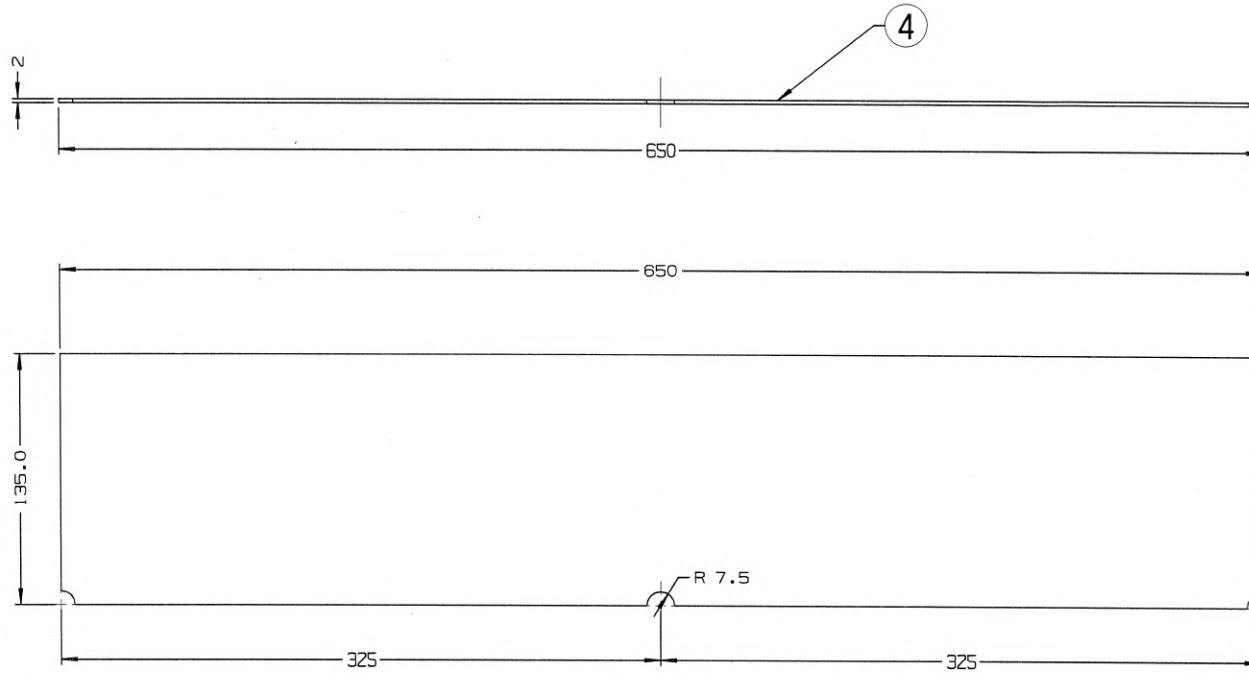
NOTE:1. ALL DIMENSIONS IN MM.

DETAIL DRGS STARTING WITH "L1" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.
THIS IS A COMPUTER GENERATED DRAWING. ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER IT INVALID.
FOR UNTOLERANCED DIMENSIONS REFER MDG0008 DATE OF FIRST ISSUE 31/03/2005

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	GPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	GROUP ELECTRICAL			SUPERSEDES: CC76460 ALT NIL	
WEIGHT	FILE	\\\\10.12.17.2\\elec\\PAVN\\DMC\\2016\\cc76460s1.prt				
NIL	KG	WIRE MESH GUARD			SCALE	SSE/ED
S.AREA		LED LIGHT FITTING FOR MEMU COACHES			CHD	
NIL	M2	(DMC/TC) TYPE-T (18W)			DRN	
LENGTH /-DIA		RAIL COACH FACTORY, KAPURTHALA			REF.ORG. NO.	NIL
NIL	M	रेल कोच फैक्टरी कपूरथला			PL NO.	NIL
WIDTH /-THICK					DRG.NO.	CC76460
NIL	M				ALT.	1
HEIGHT					SIZE	A3
NIL	M				SHEET	5/9

4175983/2025/O/o PED/PS&EMU/RDSO

ALT.NO	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY



ISO-VIEW

NOTE: 1. ALL DIMENSIONS IN MM.

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.

THIS IS A COMPUTER GENERATED DRAWING. ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER IT INVALID.

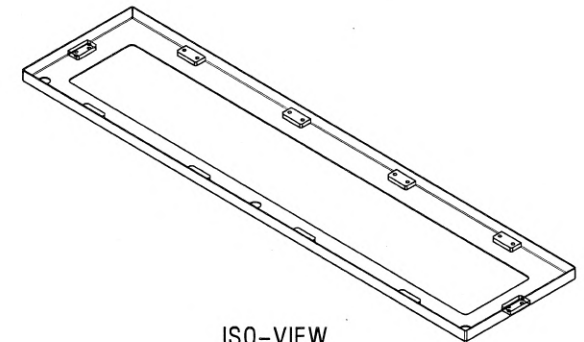
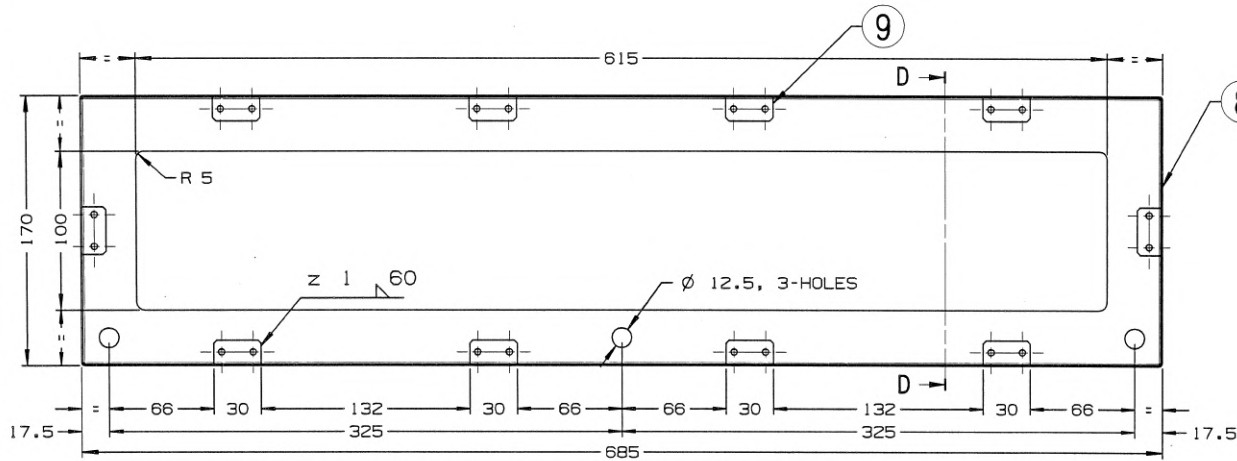
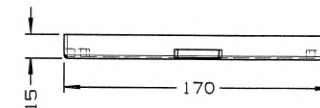
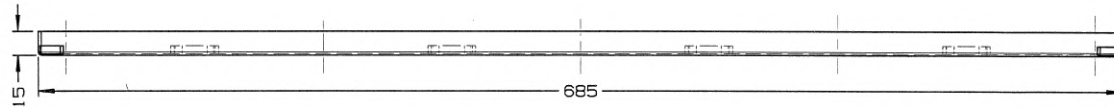
FOR UNTOLERANCED DIMENSIONS REFER MDG0008 DATE OF FIRST ISSUE 31/03/2005

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	GROUP ELECTRICAL				
WEIGHT	FILE	\\10.12.17.2\elec\PAVN\DMC\2016\cc76460s1.prt				
NIL	KG					
S.AREA						
NIL	M2					
LENGTH /-DIA						
NIL	M					
WIDTH /-THICK						
NIL	M					
HEIGHT						
NIL	M					

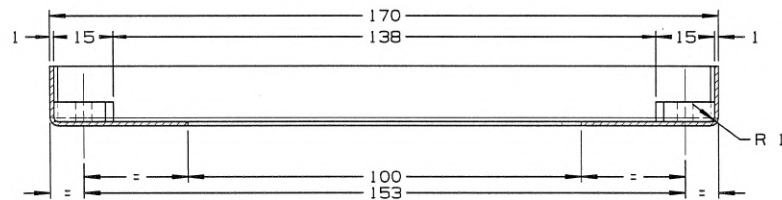
DIFFUSER	SCALE	SSE/ED	
LED LIGHT FITTING FOR MEMU COACHES		CHD	
(DMC/TC) TYPE-T (18W)		DRN	
RAIL COACH FACTORY, KAPURTHALA	REF.DRG.NO	NIL	
रेल कोच फैक्टरी कपूरथला	PL NO.	NIL	
SEE/D&D	DRG.NO.	CC76460	
DIY/SEE/D&D	ALT.	g	SIZE A3 SHEET 6/9

4175983/2025/O/o PED/PS&EMU/RDSO

ALT. NO.	ALT. DATE	ZONE	ALTERATIONS	AUTHORITY



ISO-VIEW



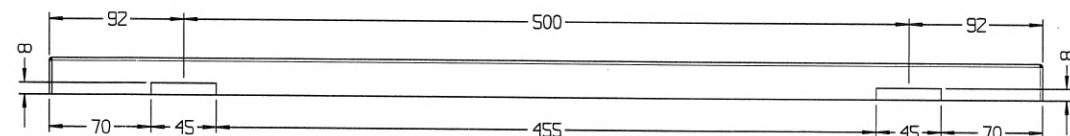
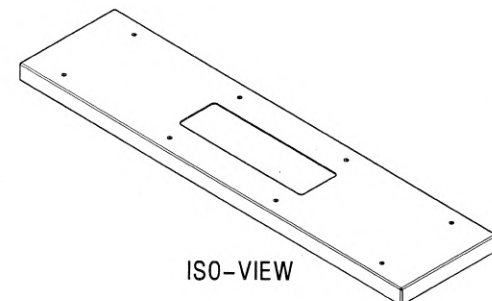
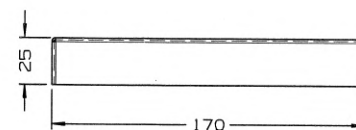
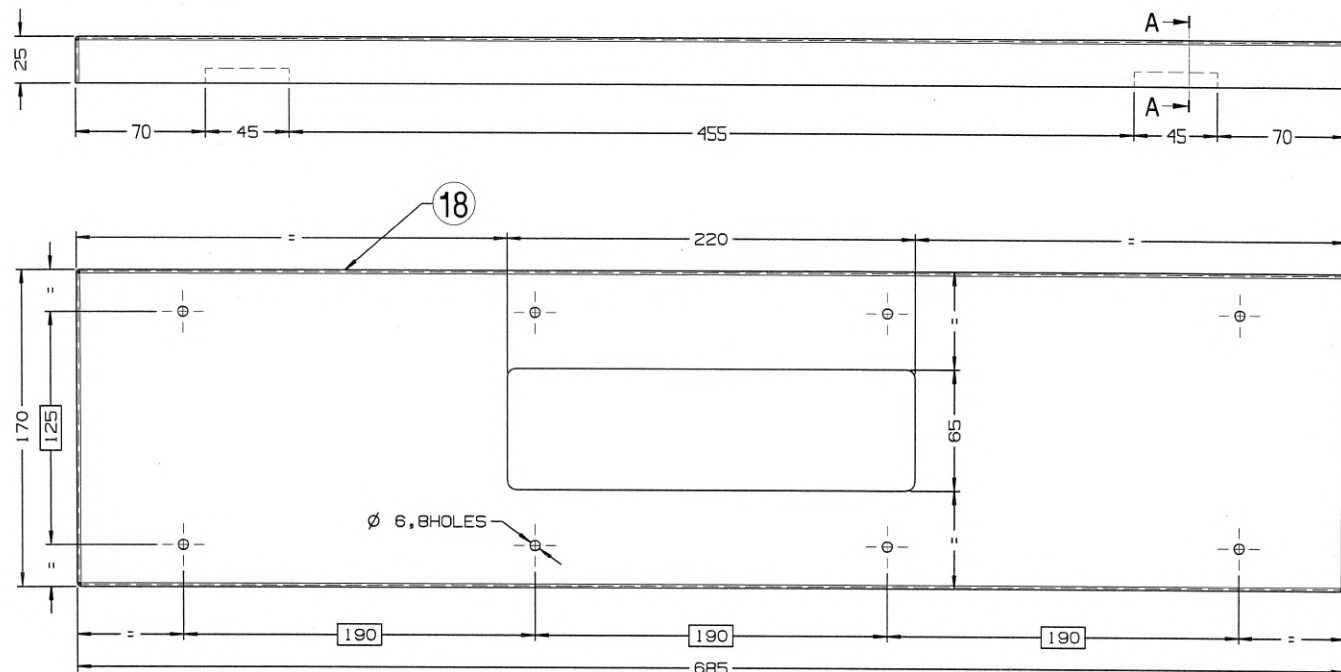
SECTION D-D

NOTE: 1. ALL DIMENSIONS IN MM.

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.
THIS IS A COMPUTER GENERATED DRAWING. ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER IT INVALID.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008 DATE OF FIRST ISSUE 31/03/2005

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	GROUP	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	ELECTRICAL	GROUP	SUPERSEDES: CC76460	ALT NIL	
WEIGHT	FILE	\\10.12.17.2\elec\PAVN\DMC\2016\cc76460s1.prt				
NIL	KG	BOTTOM COVER				SCALE
S. AREA		LED LIGHT FITTING FOR MEMU COACHES				SSE/ED
NIL	M ²	(DMC/TC) TYPE-T (18W)				CHD
LENGTH / DIA		RAIL COACH FACTORY, KAPURTHALA				DRN
NIL	M					REF. DRG. NO.
WIDTH / THICK		रेल कोच फैक्टरी कपूरथला				NIL
NIL	M	IRS				PL NO.
HEIGHT						NIL
NIL	M					DRG. NO.
						CC76460
		SEE/D&D				ALT.
		DY. CHG/D&D				SIZE
						A3
						SHEET
						7/9



SECTION A-A

NOTE: 1. ALL DIMENSIONS IN MM.

DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.

THIS IS A COMPUTER GENERATED DRAWING. ANY MANUAL ALTERATION SHALL AUTOMATICALLY RENDER IT INVALID.

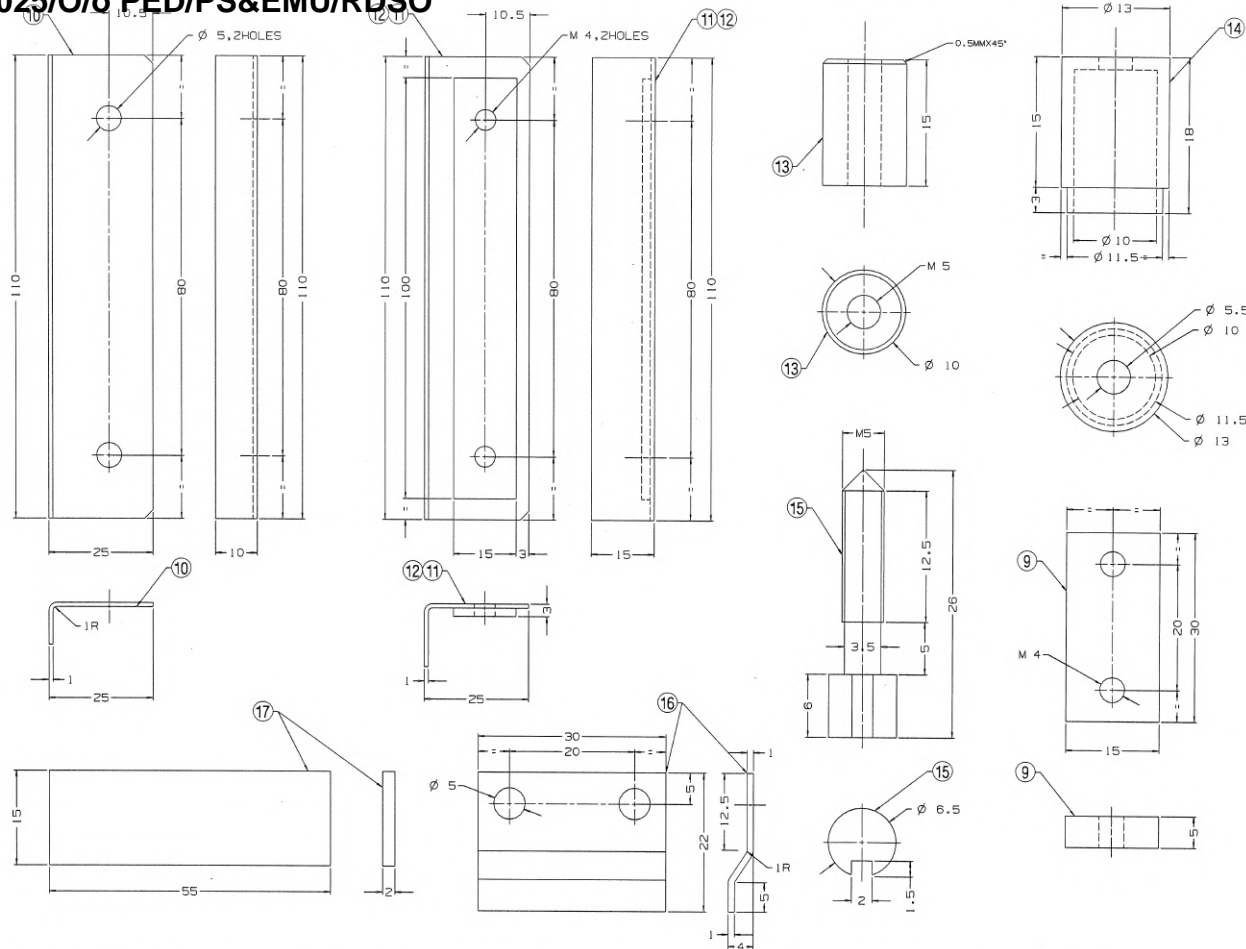
FOR UNTOLERANCED DIMENSIONS REFER MDG0008 DATE OF FIRST ISSUE 31/03/2005

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QPASSLY	DETAIL DRG	MATL. & SPEC.	REMARKS
NIL	M	GROUP ELECTRICAL				
WEIGHT	FILE	\\10.12.17.2\elec\PAVN\DMC\2016\cc76460s1.prt				
NIL	KG	UPPER COVER			SCALE	SSE/ED
S.AREA	M2	LED LIGHT FITTING FOR MEMU COACHES			CHD	
LENGTH /-DIA	M	(DMC/TC) TYPE-T (18W)			DRN	
NIL	M	RAIL COACH FACTORY, KAPURTHALA			REF.DRG.NO.	NIL
WIDTH /-THICK	M	रेलकोच फैक्टरी कपूरथला		IRS	PL NO.	NIL
HEIGHT	M				DRG.NO.	CC76460
NIL	M				ALT.	SIZE A3 SHEET 8/9

SEE/D&D

DY/CEE/D&D

4175983/2025/O/O PED/PS&EMU/RDSO



11. EPDM RUBBER BEEDING (BLACK COLOR) SHALL BE PROVIDED ON THE BASE & COVER OF THE FITTING FOR PROPER CEILING AND PROTECTION ARRANGEMENT TO AVOID INGRESS OF DUST.
10. DIFFUSER MATERIAL SHALL CONFORMING TO UL 94V0 & MADE FROM 'LEXAN SP24-492X' FIRE RETARDANT POLYCARBONATE MATERIAL OF GE PLASTIC/SABIC MAKE OR EQUIVALENT WITH PRIOR APPROVAL OF CEE. DIFFUSER THICKNESS SHALL NOT BE LESS THAN 1.5MM AND SHALL BE FREE FROM SCRATCHES, AIR BUBBLES, HOLES, ULTRA-VIOLETA STABILIZED.
9. HOUSING FOR THE LED DRIVER SHALL BE 1 MM. ALUMINUM SHEET/FIRE RETARDANT POLYCARBONATE OR FIBER SHEET MATERIAL WITH DIMENSION 116X45X35MM, MAX. 1 AND MOUNTING DIMENSION FIXED TO 140MM.
8. SCHEMATIC DIAGRAM, MANUFACTURER'S INSIGNIA SHALL BE SCREEN PRINTED ON ALUMINIUM PLATE AND PURCHASE ORDER ANDS.NO. IN THE FORM OF 'YYYYMMNN' WHERE 'YYYY' STAND FOR YEAR 'MM' STAND FOR MONTH AND 'NN' STAND FOR RUNNING SERIAL NO. SHALL BE PUNCHED ON IT AS SHOWN IN LEGEND PLATE AND RIVETTED AT THE BACK SIDE OF THE FITTING.
7. ITEM 8 & 19 SHOULD BE DEEP DRAWN AND NOT FABRICATED.
6. SUITABLE GROMMETS TO BE PROVIDED FOR CABLE TRAVERSING TO THE LED DRIVER.
5. ONLY TIG/SPOT WELDING SHALL BE DONE AS PER THE REQUIREMENT, NO OTHER WELDING IS ACCEPTABLE.
4. DOME KEY SHALL BE SUPPLIED ONE NUMBER FOR EVERY 10 FITTINGS AS PER DRG.NO. CC76052.
3. ALL STEEL ITEMS EXCLUDING HARDWARE SHALL BE GIVEN SURFACE TREATMENT FOR ANTI-RUST & ANTI-CORROSION BEFORE FINISHING WITH POWDER COATING. THICKNESS OF POWDER COATING SHALL NOT BE LESS THAN 60 MICRONS TO WHITE COLOUR (SHADE NO.042 'IFB-WHITE' OF M/S BERGER OR SIMILAR IN M/S ASIAN/ M/S NEROLAC MAKE PAINT) WITH GLOSSY FINISH.
2. FRAMED DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
1. ALL DIMENSIONS IN MM.

NOTE:

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DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008

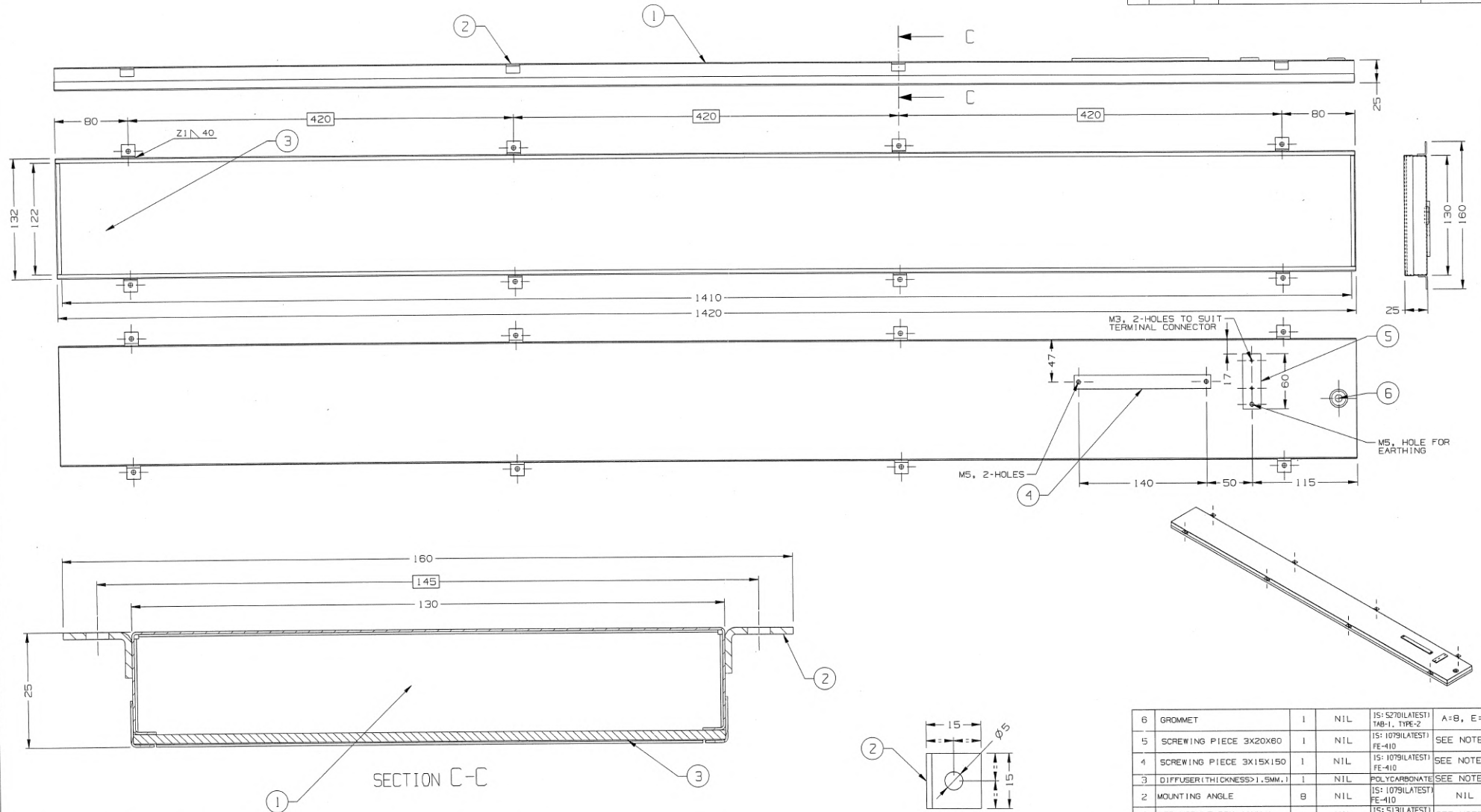
DATE OF FIRST ISSUE 31/03/2005

ALT. NO.	ALT. DATE	ZONE	ALTERATIONS	AUTHORITY
02/06/2019	ALL	1.	DETAIL DRG. OF ITEM NO-7 CHANGED FROM CAT.NO. 261-301 TO CAT.NO. 261-202 /	DIC. NO. - ED190008
	ALL	2.	OPC OF ITEM NO.-	
	ALL	3.	9,13,14,15,16,19,20 REVISED.	
	ALL	4.	ITEM NO.-22 TO 25 ADDED.	
	ALL	5.	ITEM NO.-13 HOLE M4 IS CHANGED TO M5.	
	ALL	6.	IN ITEM NO.-14 HOLE Ø 4.5 IS CHANGED TO Ø 5.5.	
	ALL	7.	IN ITEM NO.-15 CAPTIVE SCREW SIZE M4 IS CHANGED TO M5.	
	ALL	8.	IN NOTE-10 LEXAN 'SP24-452X' IS CHANGED TO 'SP24-492X'.	
	ALL	9.	NOTE NO.-11 ADDED.	

25	SPRING WASHER M3	2	IS: 3052-94 TAB-1A, TY-B	IS: 4072-75 GRADE-3	NIL
24	OH.D. SCREW M3X8	2	IS: 1366-02 4.8, TAB-1	IS: 367-84 P-14, A2-70	NIL
23	CIRCLIP	2	IS: 3075-86 TY-E, PT-3	NIL	NIL
22	HINSE 40MM	2	IS: 1341-82 TAB-2, F16-1	STEEL	NIL
21	DOM KEY	1	CC76052	NIL	LOSE SUPPLY
20	PLAIN WASHER Ø 5	27	IS: 2016-67 T-3, TY-B	IS: 1367-02 P-14, A2-70	NIL
19	CHEESE HD SCREW M4X6MM	27	IS: 1366-02 4.8, T-1	IS: 1367-02 P-14, A2-70	NIL
18	UPPER COVER	1	NIL	IS: 513-94	NIL
17	SCREWING PIECE FOR MODULE BOX	3	NIL	IS: 1079-94 GR.-00	NIL
16	CLAMP FOR HOLDING DIFFUSER	10	NIL	IS: 1079-94 GR.-00	NIL
15	CAPTIVE SCREW	3	NIL	IS: 2062-06 FE-410WC	NIL
14	RIVETED SHOUL FOR CAPTIVE SCREW	3	NIL	IS: 2062-06 FE-410WC	NIL
13	ROUND BOSS FOR UPPER COVER	3	NIL	IS: 2062-06 FE-410WC	NIL
12	SCREWING PIECE FOR UPPER COVER	2	NIL	IS: 1079-94 GR.-00	NIL
11	ANGLE FOR UPPER COVER	2	NIL	IS: 1079-94 GR.-00	NIL
10	ANGLE FOR LED MODULE BOX	2	NIL	IS: 1079-94 GR.-00	NIL
9	SCREWING PIESE FOR BOTTOM COVER	10	NIL	IS: 1079-94 GR.-00	NIL
8	BOTTOM COVER	1	NIL	IS: 1079-94 GR.-00	NIL
7	4-CONDUCTOR TERMINAL BLOCK	1	CAT.NO.-261-202	NIL	OF M/S
6	LED DRIVER	1	NIL	NIL	NIL
5	WIRE MESH 6/50	1	NIL	IS: 4948-08 APP-A, NO.-7	NIL
4	DIFFUSER 2X135X65MM.	1	NIL	POLYCARBONATE	NIL
3	BOTTOM COVER COMPLETE WITH DIFFUSER	1	NIL	NIL	NIL
2	UPPER COVER COMPLETE	1	NIL	NIL	NIL
1	LED MODULE BOX COMPLETE	1	NIL	NIL	NIL

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	SPACED	DETAIL DRG.	MAT. & SPC.	REMARKS
NIL	M	ELECTRICAL	SUPERSEDES:	CC76460	ALT NIL	
WEIGHT	FILE	\\10.12.17.2\elec\PAVN\memu-DMC2016\cc76460s1.pr				
S. AREA	KG	COMPONENTS DETAIL				
NIL	MM	LED LIGHT FITTING FOR MEMU COACHES				
LENGTH/DIA	MM	(DMC/TC) TYPE-T (18W)				
NIL	M	RAIL COACH FACTORY, KAPURTHALA				
WIDTH/THICK	MM	REL कोच फैक्टरी कपूरथला				
HEIGHT	MM	PL NO. NIL				
NIL	M	DRG.NO. CC76460				
		ALT: 1 G 12/04/2019				

ALT.NO.	ALT.DATE	ZONE	ALTERATIONS	AUTHORITY
0	02/08/2019	ALL	1. ITEM-4,5 7 8 ADDED.	DIC.NO. ED190008



6. TAPPING IN ITEM NO.-4 & 5 SHALL BE DONE AFTER WELDING SUITABLE WITH ITEM NO.-1.
 5. DIFFUSER MATERIAL SHALL BE CONFORMING TO UL 94V0 & MADE FROM 'LEXAN SP24-492X' FIRE RETARDANT POLYCARBONATE MATERIAL OF GE PLASTIC/SABIC MAKE OR EQUIVALENT WITH PRIOR APPROVAL OF CEE. DIFFUSER THICKNESS SHALL NOT BE LESS THAN 1.5MM. AND SHALL BE FREE FROM SCRATCHES, AIR BUBBLES, HOLES AND ULTRA-VIOLET STABILIZED.
 4. ITEM NO.-1 SHALL BE DEEP DRAWN AND NOT FABRICATED.
 3. ONLY TIG/SPOT WELDING SHALL BE DONE AS PER THE REQUIREMENT. NO OTHER WELDING IS ACCEPTABLE.
 2. FEAMED DIMENSIONS ARE TO BE STRICTLY ADHERED TO BY JIG PUNCHING.
 1. ALL DIMENSIONS IN MM.

NOTE:-

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DETAIL DRGS STARTING WITH "LI" ARE INTERNAL REFERENCE LISTS ONLY AND ARE NOT FOR ISSUE.

FOR UNTOLERANCED DIMENSIONS REFER MDG0008

DATE OF FIRST ISSUE

20/05/2016

ITEM	DESCRIPTION & DIMENSIONS	QTY	UNIT	REMARKS
6	GROMMET	1	NIL	IS: 5270(LATEST) TAB-1, TYPE-2
5	SCREWING PIECE 3X20X60	1	NIL	IS: 1079(LATEST) FE-410 SEE NOTE-6
4	SCREWING PIECE 3X15X150	1	NIL	IS: 1079(LATEST) FE-410 SEE NOTE-6
3	DIFFUSER (THICKNESS > 1.5MM)	1	NIL	POLYCARBONATE IS: 1079(LATEST) FE-410 SEE NOTE-5
2	MOUNTING ANGLE	8	NIL	IS: 1079(LATEST) FE-410 NIL
1	LED MODULE BOX (11MM)	1	NIL	IS: 5131(LATEST) GRADE-10 SEE NOTE-4

WELD LENGTH	ITEM	DESCRIPTION & DIMENSIONS	QTY	UNIT	REMARKS
NIL	GROUP	ELECTRICAL			
FILE		D:\b\kram\lw\lw761076.prt			
NIL	WEIGHT	KG			
NIL	S. AREA	M ²			
NIL	LENGTH/DIAG.	M			
NIL	WIDTH/THICK.	M			
NIL	HEIGHT	M			

LED MODULE BOX WITH DIFFUSER

RAIL COACH FACTORY, KAPURTHALA

रल कोच फैक्टरी कपूरथला

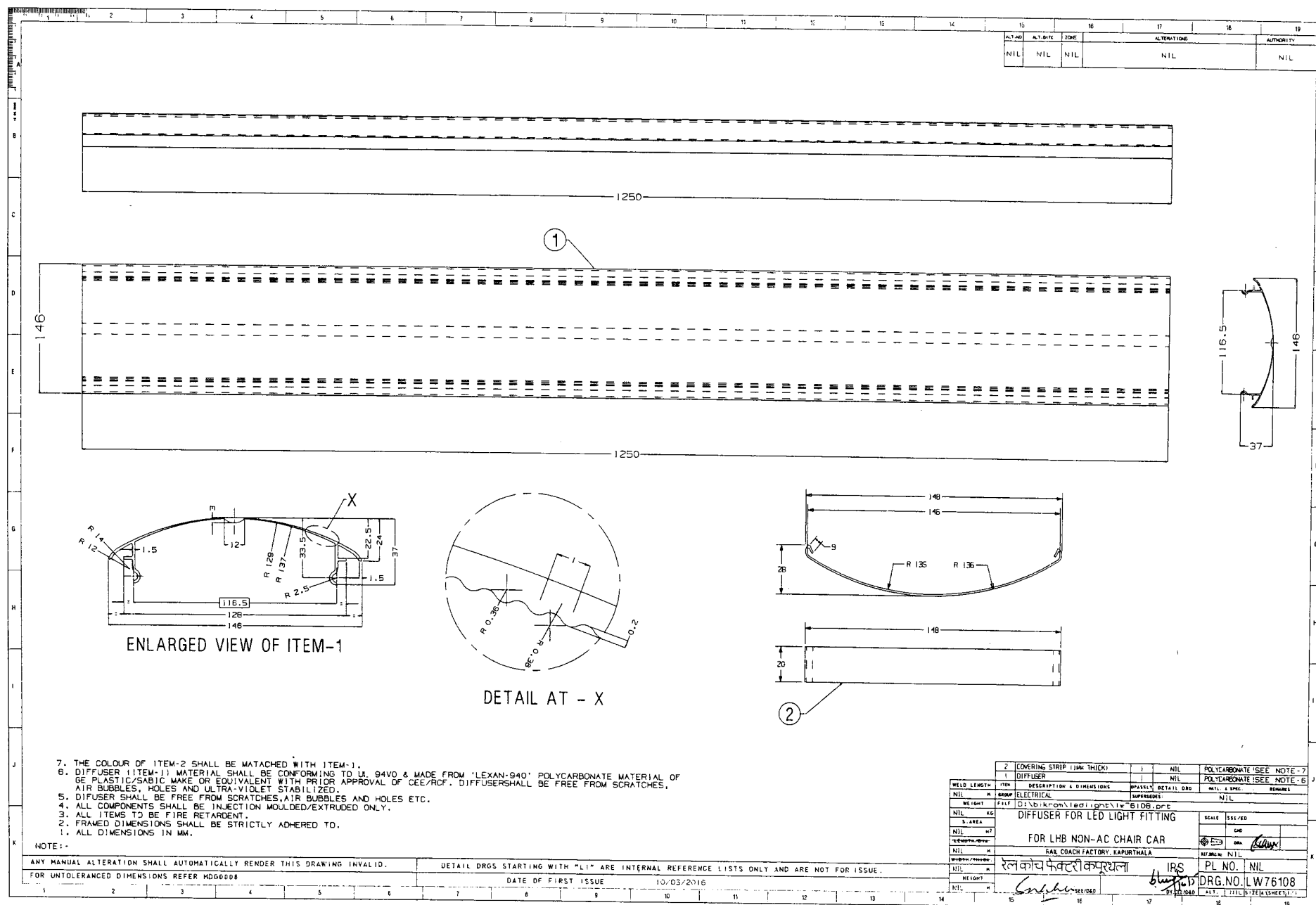
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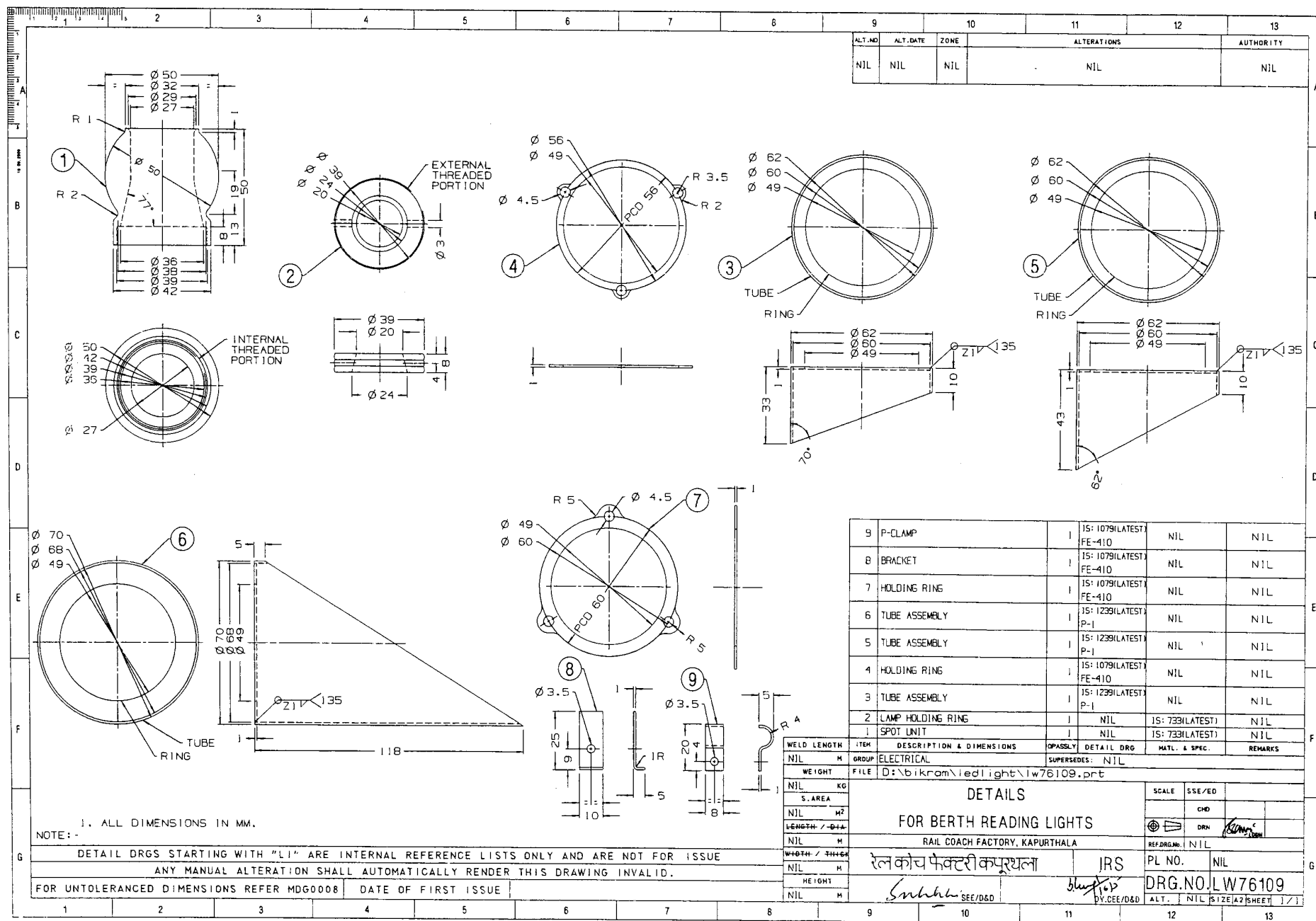
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A.T. 10 12/12/2016

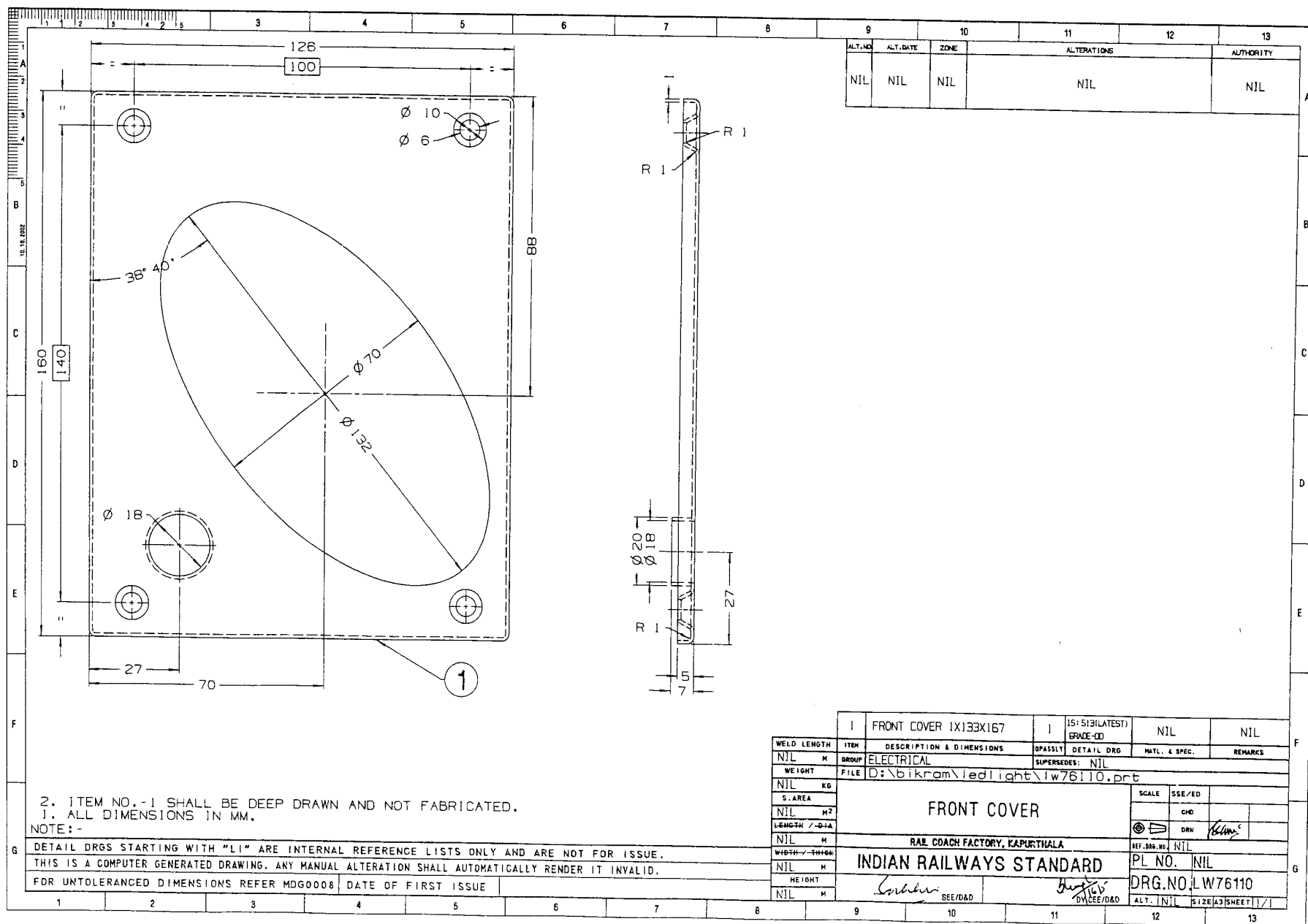
SEE/DAD



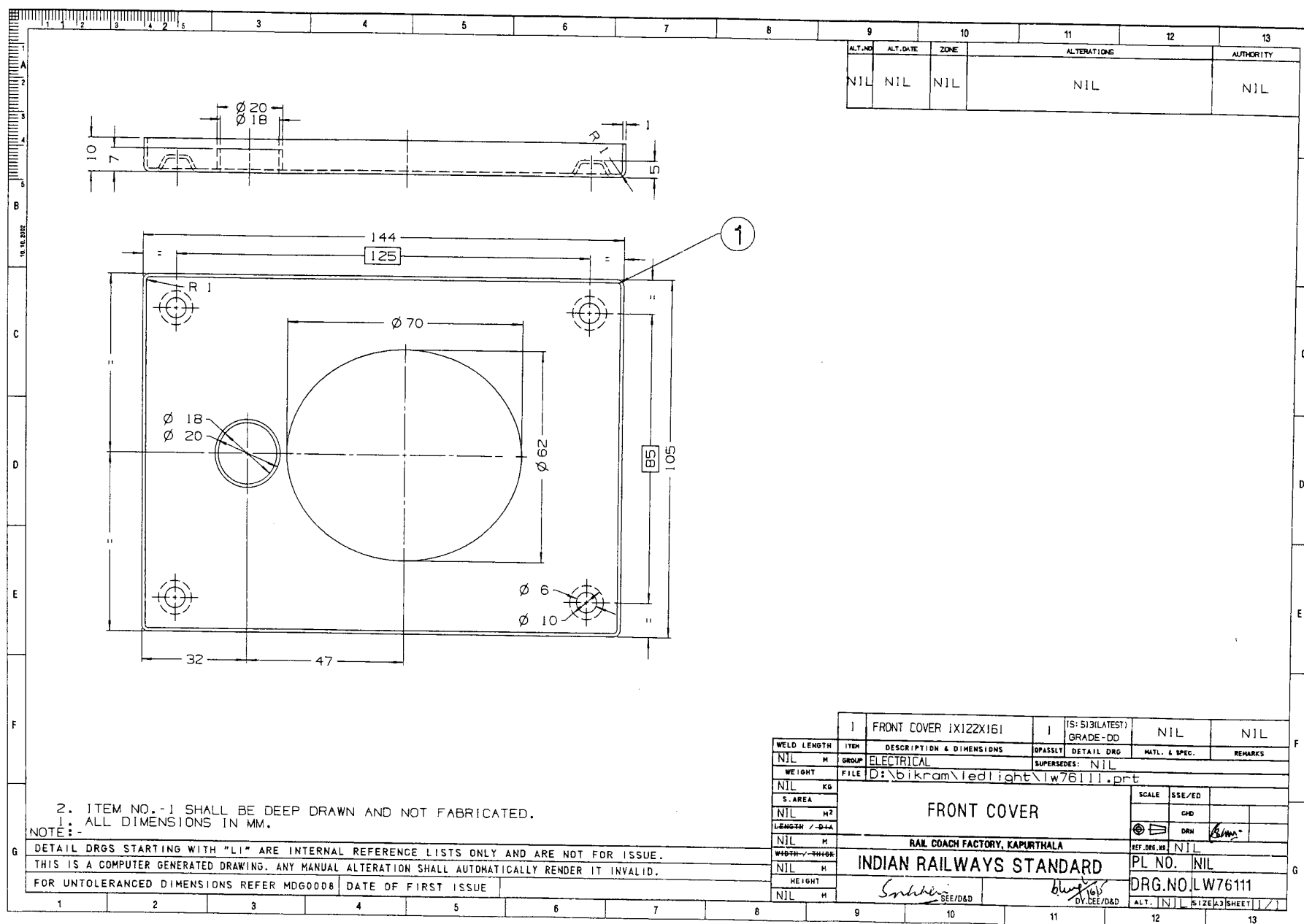
4175983/2025/O/o PED/PS&EMU/RDSO



4175983/2025/O/o PED/PS&EMU/RDSO



4175983/2025/O/o PED/PS&EMU/RDSO



4175983/2025/O/o PED/PS&EMU/RDSO

