DRAFT SPEFICIATION FOR ELECTRIC LIFTING BARRIER

Specification No. RDSO/SPN/208/2012

Version 2.0

Number of pages 22

Government of India

Ministry of Railways

Research Designs & Standards Organisation

Manak Nagar, Lucknow - 226011

DOCUMENT DATA SHEET

Document No. **RDSO/SPN/208/2012**			**Version** **2.0**
Title of Document Draft Specification for Electric Lifting Barrier			
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Abstract **This Document defines Draft Specification for Electric Lifting Barrier**			

Document Control sheet

Name	Organisation	Function	Level
T.K..Khare	RDSO	Member	Prepare
Mahesh Mangal	RDSO	Approval	

Amendments

Version	Chapter / Annexes	Amendments	Effective Date
1.0	-	First issue	06.04.05
1.1	Clause nos. 4.2, 5.25, 11.1, 11.4, 11.5, 16.19.2, 16.13.1, 16.13.2 modified	Amendment 1	22.12.05
2.0	Specification re-drafted	----------	

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Abbreviations used

IRS	Indian Railway Specification (Approved)
RDSO/SPN	RDSO Specification (Draft)
AC	Alternating Current
DC	Direct Current
IS	Indian Standard
BS	British Standard

Government of India
Ministry of Railways
(RDSO)

DRAFT SPECIFICATION FOR ELECTRIC LIFTING BARRIER

Specification No. RDSO/SPN/208/2012

0. FOREWORD

0.1 This specification is issued with the fixed Serial No. followed by the year of adoption as standard or in case of revision, the year of latest revision.

0.2 This specification is intended chiefly to cover the technical provisions and does not include all the necessary provisions of a contract.

1.0 OBJECTIVE & SCOPE

This specification covers the general , system & technical requirements and tests for Electric Lifting Barrier (both with & without hand generator) to be installed on Level crossing gates for correctness of its material, design, manufacture, electrical & mechanical characteristics and testing procedure.

2.0 REFERENCE SPECIFICATIONS

2.1 This specification requires reference to the following specifications -

Specification No.	Description
IRS: S10	Mechanical signalling and interlocking equipment
IRS: S23	Electrical Signalling & Interlocking Equipment.
IRS: S37	Motors for Electric Point machine
B.S: 376 Pt.2	Railway signalling symbols: Pt. 2 – Wiring symbols and written Circuits
IS: 1271	Classification of insulating materials for machinery and apparatus on the basis of thermal stability in service
RDSO/SPN/189/2004	Terminal blocks, Fuse terminal blocks & Miniature fuse links of International Standard for Railway Signalling

2.1 Wherever, in this specification, any of the above mentioned specifications is referred by number only without mentioning the year of issue, the latest issue of that specification is implied.

3. GENERAL REQUIREMENTS

3.1 Electric Lifting Barrier shall facilitate electrical operation of lifting barrier in normal condition when suitable AC/DC power supply is available and manual operation in case power supply is not available.

3.2 Electric lifting barrier shall be of two types –

a) Barrier without hand generator
b) Barrier with hand generator

3.3 This specification lays down the sequence of operation and the operating characteristics. It gives the requirement of the mechanism, motor, hand generator (where provided), wiring, terminals and general construction of the lifting barriers.

4. SYSTEM REQUIREMENTS

4.1 Electric lifting barrier shall have two booms, one across the road on either side of the level crossing extending across the full width of the road, operated by independent mechanism.

4.2 The operation of the Electric lifting barrier shall take place in the following sequence:

a) Open the detection contacts and simultaneously unlock the boom.
b) Move the boom.
c) Lock the boom in the full horizontal or vertical position and simultaneously close the detection contacts.

4.3 The Electric lifting barrier shall have modes of operation as given below -

4.3.1 For barriers without hand generator -

a) With push button switch in case power supply (110V AC or 24V/110V DC) is available.
b) With direct crank handle manually on one boom at a time in case of power supply failure. The insertion of this crank handle shall disconnect the power supply to the motor and it shall not be possible to reconnect the power supply to the motor until the hand crank is withdrawn.

4.3.2 For barriers with hand generator –

a) With push button switch in case power supply (24V/110V DC) is available.
b) With hand generator located in Gate Lodge/ Cabin for manual operation of both lifting barriers simultaneously.
c) With direct crank handle on one boom at a time in case of both power supply failure and hand generator failure. The insertion of this crank handle shall disconnect the power supply to the motor and it shall not be possible to reconnect the power supply to the motor until the hand crank is withdrawn.

4.4 Electric lifting barrier shall be so designed that it can be stopped, reversed or its movement obstructed at any point during operation without damage. During operation in reverse direction, a delay of atleast 2 seconds shall be provided to avoid excessive load on motor.

4.5 The operating mechanism shall be designed to prevent movement of the lifting barrier due to vibration or any external force applied to the mechanical connections or boom.

4.6 The design of operating mechanism shall be such and the boom so balanced that in case of failure of power supply, the barrier shall remain in the position last assumed.

4.7 The operating mechanism shall include a fail-safe locking arrangement to lock the lifting barrier boom in the vertical and horizontal positions.

4.8 The operating mechanism shall be so designed that if the boom is obstructed during operation, it shall stop and on removal of the obstruction shall assume the position corresponding to the control apparatus, unless protective devices have operated.

4.9 The movement of the lifting barrier shall be so arranged to prevent any undue shock on the operating mechanism. Suitable snubbing device, capable of operating efficiently in such a way that boom falls gradually under all weather conditions, shall be provided.

4.10 Means shall be provided to adjust the counter balance of the lifting barrier.

4.11 A separate fracture segment shall connect the boom with the mechanism near the pivot. Fracture segment mounting shall be of such a design that it can be replaced easily and quickly. In case of a mighty hit, it shall allow for the break of the segment without endangering mechanism itself. Any one section of the boom acts as fracture segment.

4.12 The raised or open position of the lifting barrier shall be within 85-90 deg. from the horizontal and the lowered or closed position shall be within 0-2 deg. from the horizontal.

5.0 TECHNICAL REQUIREMENTS

5.1 The rated voltage and normal operating current / maximum rated current of the motor of lifting barrier shall be as follows:

a) For barriers without hand generator -

Type	Rated Voltage	Normal (max.)Operating Current / barrier for boom length up to 9.76 m (≈10m)	Maximum rated current for each barrier for boom length up to 9.76 m (≈10m)
AC	110 V	2.5 Amps	4 Amps
DC	24V	4 Amps	7 Amps
DC	110V	1.0 Amps	1.8 Amps

b) For barriers with hand generator -

Type	Rated Voltage	Normal (max.)Operating Current / barrier for boom length up to 9.76 m (≈10m)	Maximum rated current for each barrier for boom length up to 9.76 m (≈10m)
DC	24V	3 Amps	5 Amp
DC	110V	0.7 Amps	1.2 Amp

5.2 For both types of Barriers, time of operation of the lifting barrier shall be less than 12 seconds at rated voltage and maximum 20 seconds at 75% of rated voltage at the motor terminals.

5.3 For Barriers with Hand Generator, the Hand generator should have rating of 2 times the rated current of each barrier motor so that both barriers of a gate can be powered by 1 hand generator simultaneously.

5.4 Lifting Barrier boom

5.4.1 The boom of the barrier shall be light in construction and extend across full width of the road. Its structure in successive sections of boom shall be such that it does not create any unbalance in the system and can withstand wind pressure.

5.4.2 The boom of the barrier shall be made of galvanized iron sheet and octagonal in shape with telescopic structure conforming to RDSO drg. No. RDSO/S 11600.

5.4.3 The total length of the boom shall be in maximum 4 sections (depending on total length). Each section shall be of 2.44 m (8 ft) joined by nuts and bolts for easy replacement. The length of the boom of the lifting barrier shall be 4.88/ 7.32/ 9.76m (16/24/32 ft) as specified by the purchaser.

5.4.4 The boom shall be painted alternately with 300-mm bands of black and yellow colour and additionally provided with luminous stripes (reflective tape) as per RDSO Drg. No. RDSO/S 11600.

5.4.5 The boom shall be operated using operating mechanism (pedestal) mounted on a base and a boom lock post mounted on a base shall be provided for supporting the tip of the boom in horizontal (closed) position and locking it in this position.

5.4.6 When the gate is closed to road traffic, clearance between the road surface and the boom shall be 0.8 to 1 metre. This shall be ensured by Railway at the time of installation of Electric lifting barrier. The road surface level shall be maintained as per para 904-Annexure 9/1 of IRPWM.

5.4.7 At the center of the boom, the lifting barrier shall be provided with a 600 mm dia red disc made from minimum 20 SWG GI Sheet with a vertical Stiffening “V” or “U” bend in the middle having red reflector buttons/ luminous stripes facing the road traffic.

The disc shall be marked with "STOP" sign of 50mm width in white luminous paint/ stripes (or similar signage in language specified by purchaser). LED type boom light having terminal with built-in fuse shall also be provided at the centre of boom.

5.4.8 Boom locking & detection arrangement in boom lock post –

5.4.8.1 In the boom lock post, either motorized or locking lever & solenoid based locking/ unlocking arrangement for boom shall be used with provision of redundant contacts for boom lock proving/closing.

5.4.8.2 Sturdy limit switches and/or magnet proximity switches and/or circuit controllers shall be used to achieve proper functioning of the arrangement including operation of lock & barrier opening/ closing in proper sequence as well as positive boom lock proving arrangement. In case of locking lever and solenoid based arrangement, provision of redundant magnet proximity switch shall be done.

5.4.8.3 It shall be ensured that once the boom is locked, positive boom locking proving contact does not break when the boom is displaced within the allowable play in the lock as per design.

5.4.8.4 In case of failure of the positive boom lock proving, provision shall be made on the control panel for emergency detection by using a separate redundant contact for proving closed position of the boom taken from closed position switch in the boom lock post.

5.5 **Mechanism Case (Pedestal, Lock post & Control panel)**

5.5.1 Mechanism case shall be of CRC sheets of minimum 1.6mm thickness. It should be of sufficient strength, weather proof and of adequate size to properly house without crowding the apparatus and wiring therein, suitably arranged for convenient and ready access.

5.5.2 A suitable gasket shall be provided between the mechanism case and its door to protect entry of water and dust inside the case.

5.5.3 Suitable locking arrangement shall be provided for preventing unauthorized interference in the mechanism case.

5.5.4 The door, when open, shall permit easy access to all parts.

5.5.5 Suitable rubber grommets of appropriate size shall be provided at the cable entrance in the mechanism case to ensure that metallic cover does not chaff insulation of cable.

5.5.6 Ducts or channels for internal wiring shall be of adequate size and form an integral part of the mechanism.

5.5.7 Limit Switch where used should be High precision, sturdy limit switch having expected life of atleast $10x10^6$ operations shall be used.

5.5.8 Electrical contacts shall be easily accessible and independently adjustable.

5.5.9 In addition to regular contacts for controlling the lifting barrier, a minimum of 4- additional contacts shall be provided for controlling the external circuits, unless otherwise specified by the purchaser.

5.5.10 Bearings shall be of adequate dimensions to ensure durability and conform to IRS specification number S 23 and shall be so constructed as to prevent entry of water.

5.5.11 Provision shall be made for proper lubrication at convenient locations of the bearing surfaces and moving parts of the machine wherever necessary. Suitable oil level indication should be provided in the gear box.

5.5.12 To ensure only authorized manual operation, It shall not be possible to insert the crank handle in the pedestal box or the unlocking key/ handle in the Boom lock post until a separate Lockable flap in these units is first opened using a special key. The key to open these flaps should be common, but different from the key used for opening the main door/s of the pedestal and lock post.

5.6 **Motor**

5.6.1 Motor (used in pedestal, Hand generator, lock post) shall be of totally enclosed type and shall comply with IRS:S 37 except in respect of scope, rated voltage, operating requirements and dimensions and shall be with class B insulation in accordance with IS: 1271 and short time 10 minute rating suitable for rotation in both directions. The rated voltage of the motor shall be 110V AC/24V DC / 110V DC as specified by the purchaser.

5.6.2 Motor enclosure shall be a strong metallic weather proof case the cover of which shall be equipped with suitable fastenings and when open shall permit access to terminals, commutator and brushes.

5.6.3 Motor shall be attached to and form an integral part of the mechanism and shall be readily removable there from.

5.6.4 Motor bearing shall be so designed that lubricants used cannot reach the brushes, commutator or windings.

5.6.5 The cable entry shall be of adequate size, conveniently located for access to the terminals and arranged to protect the cable from mechanical injury.

5.6.6 Motor, when connected to electric lifting barrier, shall comply with the operating requirements given under clause 5.1, 5.2 & 5.3 of the specification.

5.6.7 The motors of the barriers shall be compatible with the hand generator where provided.

5.6.8 Motor shall be protected against overload. Special motor protection type MCBs having built-in bimetallic overload protection shall be used.

5.7 **Hand generator (only for barriers with hand generator)**

5.7.1 The Hand generator of adequate capacity shall provide power simultaneously to both the motors of one set of barriers. The generator shall be coupled to a sealed type very low maintenance gear unit to multiply slow rate of approx. 50-70 rpm rotation of crank handle to approx. 1500 rpm to run the electrical motor.

5.7.2 The rotational speed of 1500 r.p.m of motor shall be translated into displacement for closing / opening of the barrier.

5.7.3 Rotating the crank handle of generator clockwise should close both barriers while anti-clockwise rotation should open the barriers. If cranking is stopped, the movement of barriers should also stop.

5.7.4 The generator unit should be of floor mounting type.

5.8 **Terminal**

5.8.1 Terminals shall be cage - clamp type of suitable capacity from recommended suppliers for Terminal Blocks as per RDSO/SPN/189/2004.

5.8.2 Terminals shall be marked for identification purposes in accordance with the diagram of connections.

5.8.3 Terminals for external connections shall, as far as practicable, be located near the cable entry.

5.9 **Wiring**

5.9.1 Internal wiring shall be neatly arranged and shall conform to IRS specification No. S 23.

5.9.2 The conductors for the internal wiring shall be insulated, stranded and be of copper having a cross sectional area not less than 2.5 Sq. mm and not less than three strands. Both ends of each separate conductor shall be labeled and provided with an eyelet of suitable type.

5.9.3 Common connections shall be capable of being disconnected readily for test purposes.

5.9.4 Wiring diagram with symbols of BS 376 Part 2 and explanations, if any, in English shall be securely attached to the inner face of the cover of the mechanism case.

5.10 **Control Panel**

5.10.1 The control panel shall consist of switches & Indications as follows:

a) For barrier without hand generator -

SN	Description	Nomenclature	Colour
1	One LED Indication indicating AC/DC power (indication shall lit when power supply is available)	POWER	Amber

SN	Description	Nomenclature	Colour
2	Two push button switches for closing / opening of the barrier. The barrier shall operate as long as corresponding button is pressed and shall stop when button is released.	CLOSE OPEN	Close-Green Open -Amber
3	One Push Button for Emergency clearing of Train Signal in case of failure of main detection contact	EMERGENCY	Red
4	Two LED Indications indicating positive boom lock proving of individual boom.	BARRIER A LOCKED BARRIER B LOCKED	Green Green
5	Two LED Indications indicating boom closed position of individual boom.	BARRIER A CLOSED BARRIER B CLOSED	Amber Amber

b) For barriers with hand generator –

SN	Description	Nomenclature	Colour
1	One LED Indication indicating AC/DC power (indication shall lit when power supply is available)	POWER	Amber
2	A selector switch to select hand generator operation / auto push button operation.	HAND GENT/ PUSH BUTTON	-
3	Two push button switches for closing / opening of the barrier. The barrier shall operate as long as corresponding button is pressed and shall stop when button is released.	CLOSE OPEN	Close-Green Open-Amber
4	One Push Button for Emergency operation for clearing of Signals in case of failure of positive boom lock proving.	EMERGENCY	Red
5	Two LED Indications indicating positive boom lock proving of individual boom.	BARRIER A LOCKED BARRIER B LOCKED	Green Green
6	Two LED Indications indicating boom closed position of individual boom.	BARRIER A CLOSED BARRIER B CLOSED	Amber Amber

5.10.2 The Push Buttons shall have thermal rated current of 10A & size 22.5 mm. The LED indications shall be of size 22.5mm.

5.10.3 For Barriers with Hand Generator, Control Panel & Hand generator may be integrated into one unit for ease of operation & maintenance. The switches/ buttons of the control panel may be provided on the door of the Hand Generator Unit.

5.10.4 The push button switches should operate respective contactor/s in panel which in turn should operate the barrier motor/s.

5.10.5 Suitable circuit should be provided to cut off supply to concerned barrier motor when operated barrier reaches fully open or closed positions.

5.10.6 Suitable protective devices shall be provided to disconnect the circuit in the case of over-loading of the motor.

5.10.7 Push button switches, selector switches having electrical & mechanical life of atleast one million operations shall be used.

6.0 MARKING & IDENTIFICATION

6.1 Marking and identification shall be in accordance with IRS specification no. S: 23. The nameplate of the lifting barrier shall also bear the following information pertaining to motor-

a) Manufacturers name
b) Serial number
c) Year of manufacture
d) Rated AC/DC voltage and current
e) H.P of the motor

7.0 FINISH

7.1 Finish of various parts shall be in accordance with IRS specification no. S: 10 and S: 23.

7.2 All the exposed parts of Electric Lifting Barrier i.e. Pedestal Box, Lock post, Control panel, boom & Counterbalance channels should be finished with powder coated painting. Minimum coating thickness should be 60 microns.

7.3 All nuts and bolts used in Electric lifting barrier shall be of stainless steel.

7.4 The Main shaft of barrier shall be hard chrome electroplated with minimum coating thickness of 10 microns or powder coated.

7.5 Suitable protective coating to prevent corrosion shall be provided on detector contacts, crank handle contacts and motor.

8.0 TEST & VERIFICATION

Inspection and tests shall be carried out to ensure that requirements of this specification are complied.

8.1 Routine Test

The following shall constitute routine test and it shall be conducted by the manufacturer on each lifting barrier. The result of Routine tests shall be submitted by the manufacturer to the inspecting authority at the time of inspection.

(a) Visual Inspection (Cl. 9.1)
(b) Applied high voltage test (Cl. 9.2)
(c) Insulation resistance test (Cl. 9.3)
(d) Performance test (Cl. 9.4)

8.2 Acceptance Test

The following shall comprise the Acceptance tests and shall be conducted on lifting barriers as per sampling plan given in Appendix ‘A’. For acceptance of the lot, no sample shall fail in the acceptance test.

(a) Visual inspection (Cl 9.1)
(b) Applied high voltage test (Cl.9.2)
(c) Insulation resistance test (Cl.9.3)
(d) Performance test (Cl.9.4)

8.3 **Type Test**

The following shall constitute type tests: -

(a) Visual inspection (Cl.9.1)
(b) Applied high voltage test (Cl. 9.2)
(c) Insulation resistance test (Cl.9.3)
(d) Performance test (Cl.9.4)
(e) Environmental test on motor (Cl.9.5) (It shall be conducted on Pedestal motor for Barriers without Hand Generator Backup & on Generator Motor for barriers with Hand Generator Backup)
(f) Life test (Cl.9.6)

8.4 **Initial type approval**

8.4.1 During initial type approval, the manufacturer shall submit samples of one set of lifting barrier as per options given below and the approval shall be given accordingly –

i) For getting approval only for Without hand generator type barrier, two samples i.e. 110V AC & 24V/110V DC should be submitted.
ii) For getting approval for both Without as well as With hand generator type barrier, two samples i.e. 110V AC without hand generator and 24V/110V DC with hand generator should be submitted.
iii) For getting approval only for With hand generator type barrier, one sample i.e. either 24V DC or 110V DC should be submitted.

The sample shall successfully pass all the type tests for proving conformity with this specification. In case of any failure during the type tests, the inspecting authority at his discretion may call for another sample of the same type and output rating and subject to all tests or to test(s) in which failure(s) had occurred. No failure shall be permitted in the repeat test(s).

8.4.2 Manufacturer shall furnish following information at the time of initial type approval.

a) Clause wise compliance report of the product as per specification for verification by the inspecting authority.
b) Bill of material alongwith data sheets.

8.5 **Maintenance type approval**

8.5.1 During maintenance type approval, one lifting barrier of each type for which vendor is approved shall be tested. It shall successfully pass all the type tests for proving conformity with this specification. In case of any failure during the

type tests, the inspecting authority at his discretion may call for another sample of the same type and output rating and subject to all tests or to test(s) in which failure(s) had occurred. No failure shall be permitted in the repeat test(s).

8.6.2 In case of design changes, RDSO may call for fresh sample in the intermediate stage. In such cases, manufacturers shall submit all the information as per clause 8.4.2.

9. TEST PROCEDURE

9.1 Visual inspection

9.1.1 The visual checks shall be carried out as laid down in IRS: S 23 in compliance to the relevant clauses of the specification. In addition, the detailed dimensional check and surface finish of all the parts shall be conducted.

9.2 Applied High Voltage Test

9.2.1 The insulation of an assembled barrier system shall withstand for one minute test voltage of 2000 V rms between all parts of electric circuits and other metallic parts insulated there from.

9.2.2 HV test for motor shall be carried out as follows:

SN	Description	Test Voltage	Duration
1	Between field winding and body with armature isolated	2000V AC (rms) at 50 Hz	1 minute for type test and between 5-10 secs for Acceptance & Routine test
2	Between armature and body with field isolated	1000V AC (rms) at 50 Hz	1 minute for type test and between 5-10 secs for Acceptance & Routine test

Note: In case of series wound motor, high voltage test shall be conducted between field winding and body only.

9.3 Insulation Resistance Test on Motor

9.3.1 This test shall be made before and after high voltage test at a potential of not less than 500 V DC and value obtain shall not be less than 10 Meg ohms.

9.3.2 For series wound motors, the terminals of field and armature winding shall be connected together and the insulation resistance measured between the common terminal and body. In case of permanent magnet DC motors, the insulation resistance shall be measured only between the terminals of armature winding and the body.

9.4 Performance test

Performance test shall be conducted to verify the following:

9.4.1 Lifting barrier shall be capable of operating satisfactorily between the limits of 75% and 125% of the rated voltage applied at its terminals as referred in Clause 5.1 & 5.2.

9.4.2 The lifting barrier shall operate uniformly and smoothly during opening and closing It shall be securely held in open position and securely locked in closed position. Effectiveness of positive boom lock proving and emergency operation in case of failure of positive boom locking shall be checked as per cl.5.4.8.

9.4.3 Performance test of AC/DC motor i.e. momentary overload and temperature rise shall be carried out as per IRS: S 37/82 during type testing and on one motor of the offered lot during Acceptance test.

9.5 **Environmental test on motor**

9.5.1 The environmental test shall be carried out on DC motor as per IRS:S 37 in the following sequence.

a) Dry heat test (85 deg. C ± 3 deg.C) as per IS: 9000 Pt.III/Sec.1 to 5 for 16 hours.
b) Cold test (-10 deg.C ± 3 deg.C) as per IS: 9000 Pt.II/Sec.1 to 4 for 16 hours.
c) Damp heat test (cycling) as per IS: 9000 Pt.V/Sec.1 & 2 for one cycle of 24 hours.
d) Salt mist test as per IS: 2106 Part XVIII.
e) Water spray test as per IS: 2106 Part XI.

Note:

1. After each of the tests mentioned above, it should be checked up that the motor rotates freely when connected electrically. In the cast of cold, damp heat, salt mist and water spray tests a recovery period of two hours should be allowed. The voltage should be increased gradually from Zero till the rotation sets in. The voltage should under no case exceed 40% of the rated voltage.

2. Insulation resistance values shall be measured after dry heat, cold and damp heat tests as per procedure given in clause 9.3. The value of the insulation resistance after the climatic test shall not be less than 5 Meg ohms.

9.6 **Life Test**

9.6.1 The system shall be installed and it shall be operated continuously for one-lakh cycles i.e. opening and closing at the rate of 1 or 2 cycles per minute. In case of Barriers with Hand Generator, the motor shall be tested in integrated manner alongwith barrier at nominal operating load of the barrier. Hand generator movement shall be simulated by using a motor and a gear box. No part of the lifting barrier shall show any sign of erratic behaviour and at the end of test, lifting barrier shall pass the test of operating characteristics as laid down in 5.1, 5.2 & 5.3. Also, no damage shall occur to the motor at the end of the test.

(During the test, for barrier normal maintenance of tightening of bolts, periodic lubrication, adjustments etc and the motor, normal maintenance of replacing carbon brushes, periodic lubrication, adjustment etc may be undertaken).

10. SPARES (OPTIONAL) & TOOL KIT TO BE SUPPLIED

10.1 Following spares shall be supplied alongwith each set (02 nos.) of Electric lifting barrier as per requirement of the purchaser-

i) GI boom - 1 no. complete.
ii) Belt - 1 no.
iii) Crank handle - 1 no.
iv) Motor Contactor - 1 no.
v) Motor protection MCB - 1 no.
vi) Push button complete - 2 nos.
vii) Limit switch - 3 nos. (1 lever type and 2 top roller type)
viii) Fuses used - 2 sets

10.2 Tool kit consisting of standard sizes of wrinch/ spanner and Allen keys should also be supplied with each set (02 nos.) of Electric Lifting barrier.

11.0 COMMISSIONING & WARRANTY

Electric Lifting barrier shall be commissioned only if the installation is certified fit by the OEM. Electric Lifting Barrier complete including its sub-systems shall be under warranty for a period of 24 months from date of supply or 12 months from the date of commissioning, whichever is earlier. Warranty will cover all defects in design, material, workmanship except damage of boom/ sub-system due to outside interference.

12.0 PACKING

12.1 The sub-systems of Electric lifting barrier shall be protected by Theromocol sheet on the corners and then packed with Bubble sheet to protect it against loss or damage during transit and storage etc.

13.0 INSTALLATION AND MAINTENANCE MANUAL

13.1 Two copies of Installation and Maintenance manual shall be supplied along with each system. The manual shall include the following information:

a) General information about the system.
b) Power supply requirement
c) Installation procedure.
d) Testing and adjustment procedure.
e) Maintenance and lubrication procedures and their periodicity.
f) Procedure for replacement of parts and periodicity of routine replacement of parts.
g) Tools required.

14.0 INFORMATION TO BE SUPPLIED BY THE PURCHASER

a) Type of Barrier (i.e. With or Without Hand Generator)
b) Length of the boom in metres with max. length 9.76m (≈10m)
c) Operating Voltage rating (110V AC/24V DC/ 110V DC)
d) Spares required or not required.
e) Requirement of additional number of contacts, if any.

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APPENDIX 'A'

SAMPLING PLAN

1. **Lot** :

All the lifting barrier of the same type (with /without hand generator and 110V AC/110V DC/ 24V DC) manufactured by the same factory during the same period shall constitute a lot.

2. On assembled barrier, Visual inspection, High Voltage test as per clause 9.2.1 and Performance test as per clause 9.4 shall be carried out as per the lot size and sample size given below -

SN	Lot Size	Sample size
1	1-4	25% (minimum 01)
2	5-20	15% (minimum 02)
3	21 & above	10% (minimum 03)

3. 100% inspection shall be done for the following tests –

a) High Voltage test on motor as per clause 9.2.2.
b) Insulation resistance test on motor as per clause 9.3.
c) Boom locking/ unlocking and detection arrangement in boom lock post on unassembled barriers using dummy boom.

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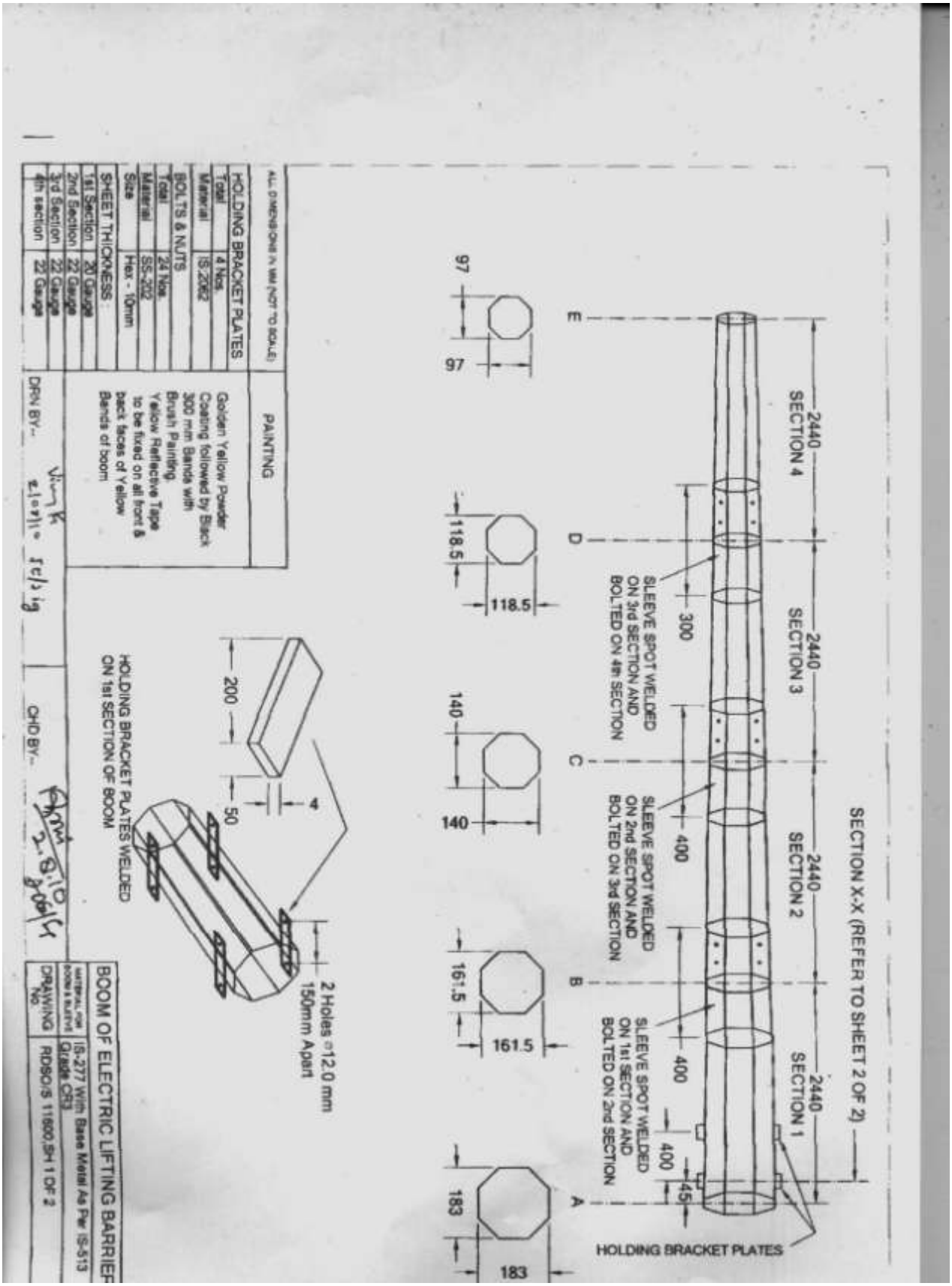
SECTION X-X (REFER TO SHEET 2 OF 2)
2440 SECTION 4
2440 SECTION 3
2440 SECTION 2
2440 SECTION 1
SLEEVE SPOT WELDED ON 3rd SECTION AND BOLTED ON 4th SECTION
SLEEVE SPOT WELDED ON 2nd SECTION AND BOLTED ON 3rd SECTION
SLEEVE SPOT WELDED ON 1st SECTION AND BOLTED ON 2nd SECTION
300
400
400
400
45
HOLDING BRACKET PLATES
E
D
C
B
A
97
97
118.5
118.5
140
140
161.5
161.5
183
183
HOLDING BRACKET PLATES WELDED ON 1st SECTION OF BOOM
200
50
4
2 Holes ø12.0 mm 150mm Apart
ALL DIMENSIONS IN MM (NOT TO SCALE)
HOLDING BRACKET PLATES
Total 4 Nos.
Material IS:2062
BOLTS & NUTS
Total 24 Nos.
Material SS-202
Size Hex - 10mm
SHEET THICKNESS
1st Section 20 Gauge
2nd Section 22 Gauge
3rd Section 22 Gauge
4th section 22 Gauge
PAINTING
Golden Yellow Powder Coating followed by Black 300 mm Bands with Brush Painting.
Yellow Reflective Tape to be fixed on all front & back faces of Yellow Bands of boom
DRN BY--
CHD BY--
BOOM OF ELECTRIC LIFTING BARRIER
IS-277 With Base Metal As Per IS-513 Grade CR3
DRAWING No
RDSO/S 11600,SH 1 OF 2

DETAILS OF SECTION JOINTS OF BOOM
SECTION X-X
200
150
20
2 Nos. -12 Holes In Each Flat For Bolting With Barrier Bracket
150
200
Spot Welding Along Full Length Of Overlap at approx 150mm distace apart
FIRST AND SECOND JOINT
Smaller Section Fixed To Jointing Sleeve By 8 Nos. SS-202 Hex Bolts 10mm For Each Joint
Octagonal Jointing Sleeve Spot Welded To Larger Section Fabricated From 20G GI Sheet
25
170
25
180
400
THIRD JOINT
TOLERANCE OF HOLE CENTERS ± 2mm
25
130
25
120
300
ALL DIMENSIONS IN MM (NOT TO SCALE)
DRN BY
CHD BY-
BOOM OF ELECTRIC LIFTING BARRIER
MATERIAL FOR BOOM & SLEEVE
IS-277 With Base Metal As Per IS-513 Grade CR3
DRAWING No.
RDSO/S 11600,SH 2 OF 2

Fax : 91-522-2452332, 032-42100(Rly)
Telephone : 91-522-2465761
Mobile : 09794863336
Rly. : 032-42666,
E-mail : dsig8rdso@ gmail.com

सत्यमेव जयते

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

No. STS/E/ELB Vol. -VIII

Date : 25th July 2017

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

Sub.: Amendment No. 1 to RDSO Specification No. RDSO/SPN/208/2012 Version 2.0, for "Draft Specification for Electric Lifting Barrier".

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In Compliance to Vigilance Cell/RDSO Letter No. 13/Vig/Policy dated 26.07.2016 & 08.09.2016, Amendment No. 1 to RDSO Specification No. RDSO/SPN/208/2012 Version 2.0, for "Draft Specification for Electric Lifting Barrier" is hereby issued with the approval of competent authority for information & implementation please.

Encl. : Amendment No. 1 to RDSO Specification No. RDSO/SPN/208/2012 Version 2.0, for "Draft Specification for Electric Lifting Barrier".

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

25/07/17

Copy to:

कार्यकारी निदेशक / गुणवत्ता आश्वासन / अ0अ0मा0सं0, लखनऊ	Executive Director/QA/S&T/RDSO/Lucknow
निदेशक / गुणवत्ता आश्वासन / सिगनल एवं दूरसंचार, / अ0अ0मा0सं0, निकट इरकॉट बिल्डिंग, शंकर मार्केट के पीछे, शिवाजी ब्रिज, नई दिल्ली – 110 001	Director/QA./S&T/RDSO, 1st Floor, Near IRCOT Building, Behind Shanker Market, Shivaji Bridge, New Delhi – 110 001
निदेशक / गुणवत्ता आश्वासन / संकेत एवं दूरसंचार, / अ0अ0मा0सं0, प्रथम तल, न्यू एनेक्सी बिल्डिंग, चर्चगेट, पश्चिम रेलवे, मुम्बई – 400 020	Director/QA./S&T/RDSO, 1st Floor, New Annexe Building., Western Railway, Churchgate, Mumbai – 400 020
निदेशक / गुणवत्ता आश्वासन / सिगनल एवं दूरसंचार, / अ0अ0मा0सं0, भूतल, डी0आर0एम0 ऑफिस, बंगलोर – 560 023	Director/QA./S&T/RDSO, Ground Floor, DRM Office, Bangalore – 560 023
निदेशक / गुणवत्ता आश्वासन / सिगनल एवं दूरसंचार, / अ0अ0मा0सं0, चौथी मंजिल, 17 एन.एस. रोड, वैस्ट विंग, फेयरली प्लेस, कोलकाता – 700 001	Director/QA./S&T/RDSO, 4th Floor, 17 N.S. Road, West Wing, Fairlie Place, Kolkata – 700 001
निदेशक / गुणवत्ता आश्वासन / सिगनल एवं दूरसंचार, / अ0अ0मा0सं0, हसनपुरा रोड, जयपुर – 302 006	Director/QA/S&T/RDSO,Hasanpura Road, In Front of Railway Hospital, JAIPUR – 302 006
M/s Heidz India Ltd., Office: 89, Hauz Khas Apartment, New Delhi – 16	
M/s Global Devices, B-212, Hari Nagar, Behind DDU Hospital, New Delhi – 110 064	
S&T Workshop, Mettuguda, Secunderabad – 500 017	
M/s Dasmesh Industries, 6/2, Kirti Nagar Industrial Area, New Delhi – 15	
M/s G.K. Engg. Works & Stores (P) Ltd., 4, Kings Road , Howrah – 711 101	
Signal & Telecom Workshop, Byculla, Central Railway, Mumbai – 400 027	
M/s AEW Automations (P) Ltd., 14, Khirode Chandra Ghose Road (Watkins Lane), Gokul Apartment, Near Howrah AC Market, Howrah – 711 101	
M/s Globe Scott Motors (P) Ltd., A-1/19, G.I.D.C Ind. Estate Killa Pardi Dist. Valsad – 396 125 (Gujarat)	
M/s Pragati Electrocom (P) Ltd., Plot No. 184/3, Phase –I, IMT Manesar, Gurgaon – 122 050 (Haryana)	
M/s Mani Electronics, 109/1, Beliaghata Main Road, Shed No. 15, Kolkata – 700 010	

Encl. : Amendment No. 1 to RDSO Specification No. RDSO/SPN/208/2012 Version 2.0, for "Draft Specification for Electric Lifting Barrier".

(V. K. Agarwal) 25/07/17
Jt. Director/Signal-VIII
for Director General/Signal

1331

Amendment No. 1

To

Specification No. RDSO/SPN/208/2012 Version 2.0

For

DRAFT SPECIFICATION FOR ELECTRIC LIFTING BARRIER

Following new clause is added to the Specification No. RDSO/SPN/208/2012 Version 2.0 .

Clause No. 15.0

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

End of Amendment No. 1