

ISO 9001-2015	Document No. TM/SM/318 Revision 01 of 2021	Version-01	Date effective from: 26/03/2021
Document Title: Specification of Gang / Work Site Remote Control Hooter			



**Specification of Gang / Worksite Remote Control Hooter
(No. TM/SM/318 Dated 21.05.2008)
(First Revision of 2021)**

Track Machines & Monitoring Directorate

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1.0 SCOPE:

- 1.1 This specification covers essential functional requirements, Technical features and testing method of Gang /Worksite Remote Control Hooter. During working on tracks, P. Way officials have to stand/walk on adjacent track, which is generally under normal traffic. Due to noise of the tools/machines used on track and concentration of workmen towards their work, they fail to see and respond to the approaching train. The Gang / Worksite Remote Control Hooter shall be able to warn the workmen about an approaching train. The Gang / Worksite Remote Control Hooter will be termed as “Hooter” in this specification.
- 1.2 Preference to make in India: compliance of the instruction contained in public procurement (preference to make in India) order -2017 “**Make in India**” or latest instructions issued on subject shall be ensured

2.0 REFERENCE DOCUMENTS:

Following standards/codes have been referred to in this specification. Updated copies of these standards/codes shall be available with the manufacturer.

- (i) IS: 14813 – 2000 (Reaffirmed 2016) Automotive vehicles – Air Horn – specification.
- (ii) IS: 9000 (Part-V/Sec.1 & 2) –1981 (Reaffirmed 2016) Basic Environmental testing Procedures for Electronic and Electrical Items.
- (iii) RDSO Specification no. MP.0.99.00.04 Technical specification for Air-operated horns for Diesel and electric loco motives.
- (iv) IS: 9000 (Part III/Sec.1 to 5) – 1977 (Reaffirmed 2016) Basic Environmental testing Procedures for Electronic and Electrical Items.
- (v) IS: 9000 (Part II/ sec1 to 4) – 1977 (Reaffirmed 2016) Basic Environmental testing Procedures for Electronic and Electrical Items.
- (vi) IS: 10250: 1982 (Reaffirmed 2016) Specifications for severities for Environmental Tests for Automotive Electrical Equipment.

3.0 MATERIAL:

The hooter shall be manufactured preferably from rust-resistant material. In case metallic surfaces are liable to rust formation, suitable treatment for resistance against corrosion and rust shall be provided.

4.0 FUNCTIONAL & TECHNICAL REQUIREMENTS:

- 4.1 The hooter shall be operable by remote control unit from a distance of at least 1200 m. The system shall work even if the remote switch and hooter are not in same line of collimation.
- 4.2 Lookout man standing at 1200 m from the working site shall operate the hooter by remote control unit in the event of an approaching train over the adjacent track/same track.
- 4.3 The intensity of the sound shall be between 100-120 dB (A) at a distance of 5 m (when measured in still air in a closed room).

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- 4.4 The hooting system shall work normally even when any physical obstruction (like curvature of track in tunnels, cuttings, hills, vegetation etc.) occurs in between the remote control unit and the hooting unit.
- 4.5 Individual handheld/pocket gadget shall be provided as an optional feature to give visual (blinking LED) /audible (beeping)/vibration warning to workmen within 200-300 meters of the Hoot Unit. This optional feature can be utilized by Railways to give additional warning to workmen who are working in high noise/traffic environment.

5.0 TECHNICAL FEATURES:

- 5.1 The hooting unit shall have a powerful horn to blow in two different tones (one low and one high). The frequency of the low tone sound shall be 370 ± 15 Hz and that of high tone sound shall be 660 ± 15 Hz. The sound intensity shall be 100-120 dB(A). The sound of the hooter shall be audible in all direction i.e. 360° .
- 5.2 Arrangement shall be there in both the remote switch and the hooter to keep alert the workmen concerned with the working of respective units. An intermittent/continuous 'beep' sound and/lighting small pilot lamp at a predetermined interval in seconds may be arranged for this purpose. The attendant standing at hooter shall always be made aware through some blinking light and sound about the connectivity with the remote and alertness of the remote operator.
- 5.3 The equipment shall be battery operated with a durable and good quality rechargeable battery as a power source. Fully charged battery shall be able to give hooting time of two hours and stand by time of two days. Overall life of the battery shall not be less than two years. Battery level indicator shall be provided on both Control Unit and Remote Unit to give indication of the exact level of battery on pressing a button.
- 5.4 The equipment shall have proper and sturdy carrying arrangement so that it can be easily carried to site. The equipment shall also have arrangement for proper fixing so that it can be easily installed on the walls of machine as per requirement.
- 5.5 The hooter shall be capable of working satisfactorily under service conditions mentioned below:
- (i) Temperature: Ambient temperature as under worst Indian climatic conditions.
 - (ii) Relative humidity: Up to 100%.
 - (iii) Ambient Conditions: The hooting system shall be capable of operating efficiently inspite of dust, dirt, moist, rains, heavy sand storms and radiant heat etc.
- 5.6 There shall be provision for Push to talk form master to slave and slave to master like walky-talky (**Optional**)

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5.7 The device shall be hand held and of light weight for easy handling. Maximum weight of Hooting unit shall be 7.5 kg and maximum weight of remote unit shall be 3.0 kg.

6.0 TESTS:

6.1 TYPE TESTS: Type tests shall be conducted on prototypes at the time of initial approval.

The manufacturer shall produce two prototype samples of the device for conducting following type tests:

- i) Visual Examination
- ii) Sound Intensity test
- iii) Operating range test
- iv) Damp test (cycling test)
- v) Corrosion Resistance test
- vi) Continuous Operation test
- vii) Thermal Stability test
- viii) Endurance test
- ix) Dust test

6.1.1 Visual Examination: Each sample shall be examined for external finish, dimensions and workmanship.

6.1.2 Sound Intensity Test: The Hooter shall be placed in such a manner that sound waves emitted from the hooter may be directed towards the microphone of the sound level meter in horizontal plane. The microphone shall be placed in such a way that it is on the axis of the radiating hooter. The distance between the hooter face and the center of microphone shall be 5 metres. The sound intensity, thus measured in above manner shall be between 100-120 dB(A). The test shall be carried out in still air and in a closed room.

6.1.3 Operating range Test:

(a) The hooting unit shall be placed on ground or at a height of 4 meter from the ground in prevailing atmospheric condition. The remote switch shall be operated at a distance of 1200 m from the hooting unit and the hooter shall produce sound with the specified sound intensity of 100-120 dB(A). The operation shall be repeated for ten times or as desired by the inspecting official. Communication between the two sites i.e. the hooting site and the remote control site may be established through walkie-talkie /cell phone or any other means.

(b) The above test shall be repeated by arranging an obstruction like earth work/building/high wall etc. in between the hooting unit and the remote control unit.

6.1.4 Damp heat (cyclic) test: The damp heat (cyclic) test shall be conducted according to IS: 9000 (part 5/ Sec. 1 & 2). The number of conditioning cycles and recovery period shall be

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07 and 24 hr. respectively. After completion of the test, the hooter shall be subjected to sound intensity test as per clause no. 6.1.2.

6.1.5 Corrosion Resistance test: The test for corrosion resistance of the hooter shall be carried out in the manner specified in clause 4.8 of IS: 10250. After removal from the salt spray chamber, the hooter shall not show any sign of corrosion or electrolytic action.

6.1.6 Continuous Operation: The hooter shall be operated continuously for 5 minutes and then allowed to cool to ambient temperature. The hooter shall then satisfy sound intensity test, which shall be within the specified range of 100-120 dB(A) as per clause no. 6.1.2.

6.1.7 Thermal Stability test (as per clause 7.9 of IS: 14813 –2000): The following tests shall be performed on prototypes:

a) Dry heat test and b) Cold test

a) Dry heat test: This test is intended to determine suitability of the equipment to withstand high temperature severities prevailing in hot days of summer. This test shall be conducted as specified in IS: 9000 (Part III/Section 5) at the following severity:

Group (heat-dissipating)

Temperature	70 ⁰ C
Duration	4 hrs.

b) Cold test: This test is intended to determine the suitability of the equipment at the specified low temperature likely to be encountered in coldest days of winter. The test shall be conducted as specified in IS: 9000 (Part-II/ sec 4) at the following severity:

Temperature	0 ⁰ C
Duration	4 hrs.

After the above mentioned tests, the equipment shall be tested for its functioning as per clause 6.1.2

6.1.8 Endurance test (as per IS : 14813 – 2000): The hooter shall be suitably mounted/held and operated continuously for 100 times without any change in volume and tone throughout the test with two seconds “ON” time and two seconds “OFF” time. The hooter after being subjected to this test, shall be tested for sound intensity test (as per clause 6.1.2). The change in sound level after the endurance test shall not exceed 5 dB (A) from that measured before and shall be within the range specified.

6.1.9 **Dust test** (as per IS: 14813 – 2000): The prototypes of the hooter with all screw holes/drain holes etc, closed shall be mounted in its normal operating position, 150 mm from the wall in a box measuring 900 mm x 900 mm x 900 mm, containing 5 kg of fine powdered cement. At intervals of 15 minutes, this dust shall be agitated by compressed air or fan blower by projecting blows of air for a two-second period in a downward direction into the dust in such a way that the dust shall be completely and uniformly diffused throughout

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the entire box. The dust is then allowed to settle. This test shall be continued for 5 hrs. After this test the exterior surface shall be cleaned and sound intensity test shall be carried out (as per clause 6.1.2). The deterioration of sound shall not exceed 5 dB (A) from that measured before this test.

7.0 INSPECTION:

7.1 Inspection of the device against zonal railways purchase order shall be carried out by purchaser zonal railway or any representative /agency authorized by CTE. The cost of inspection and testing shall be borne by the manufacturer/supplier. Copies of maker's test certificate guaranteeing the performance of the device shall be supplied in duplicate along with each device. Minimum level of inspecting official shall be SSE.

7.2 5% or minimum 2 numbers of the device per lot/PO (randomly selected) shall be inspected for their performance as mentioned in the clause 8.0. If the samples satisfy the entire tests prescribed as per acceptance criteria, the lot is accepted, otherwise the lot is rejected.

8.0 ACCEPTANCE TEST:

8.1 Acceptance tests shall be carried out as per following test sequences:

- i) Visual Examination (as per clause-6.1.1): Every device.
- ii) Sound Intensity test (as per clause-6.1.2): On randomly selected devices.
- iii) Operating range test (as per clause-6.1.3): On randomly selected devices.
- iv) Continuous operation test (as per clause-6.1.6): On randomly selected devices.

8.2 Before offering the device for inspection and testing, manufacturer shall satisfy himself regarding performance of the device and shall give a certificate specifically mentioning that he has checked and tested the hooters as per the relevant tests mentioned in this specification and it satisfies its provisions.

8.3 After the Gang / Worksite Remote Control Hooters have been supplied at consignee premises, the supply shall be considered as complete only after field training is provided by the supplier as per Clause 11.0.

9.0 WARRANTY:

The device shall be covered by a warranty for efficient working for a period of 12 months from the date of supply.

10.0 SERVICE FACILITY:

10.1 The supplier/manufacturer shall provide service of competent service engineers free of cost during commissioning and warranty period. The service engineer shall guide the operating and maintenance staff during commissioning and warranty period of the Gang / Worksite Remote Control Hooter for proper operation and handling.

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10.2 The manufacturers/supplier shall have good service network throughout the country for quick and easy access to the users. A prompt response to the call of the customers is expected in case of any problem experienced in field.

11.0 TRAINING:

Adequate training for operation and maintenance for the equipment shall be imparted to railway personnel by the manufacturer at their premises/at railway premises as mutually agreed at the rate of two men per unit.

12.0 SPARE PARTS:

12.1 The necessary spare parts required from time to time for trouble free operation of the hooter shall be listed in detail mentioning description, part no., source of procurement and expected life. The manufacturer/supplier shall be responsible for subsequent availability of spares for trouble free operation.

12.2 The manufacturer shall provide two copies of detailed instruction manual for installation, operation, maintenance and troubleshooting with each equipment.

12.3 The manufacturer shall supply detailed drawings exhibiting clearly all the relevant dimensions and circuits so that the user shall have a clear understanding of the equipment.

13.0 MARKING AND PACKAGING:

13.1 During supply each device shall be marked legibly with Manufacturer's name, trademark, month and year of manufacture.

13.2 During supply each device shall be packed in wooden/plastic/suitable carton with proper packaging as per best trade practices to avoid any damage during transportation and loading/unloading.

14.0 All the provisions contained in RDSO's ISO procedures laid down in Document No. QO-D-8.1-11 dated 12.09.2018 (titled Vendor – Changes in approved status"), subsequent versions / amendments thereof shall be binding, and applicable on the successful manufacturers/suppliers in the contracts floated by Railways to maintain quality of products supplied to Railways.

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