SPECIFICATION FOR 2 KG. PORTABLE CO_2 TYPE FIRE EXTINGUISHER FOR WAG-9 (Co-Co) / WAP-5 3-PHASE ELECTRIC LOCOMOTIVE OF INDIAN RAILWAYS.

SPECIFICATION No. CLW/MS/3/016 ALT.3

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ISSUED BY:
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ALTERATION RECORD SHEET

ALT. No.	DATE	DESCRIPTION	REASON	SIGNATURE
1	18.03.2002	CLAUSE 6.5 ADDED IN PARA 1.2, QTY/LOCO 02 Nos. WAS 04 Nos.	AS DECIDED BY COMPETENT AUTHORITY VIDE L/NO. C-D&D / TOT/111 DATED 18.02.2002. AS TWO Nos. FIRE EXTINGU - ISHING CO_2 GAS OF 22.5 KG. CAPACITY IS MOUNTED IN MACHINE ROOM.	S/d- 18.03.2002
2	13.01.2006	WAP-5 LOCO APPLICATION ADDED	TO MAKE THE ITEM APPLICABLE FOR WAP-5 LOCO ALSO.	S/d- 13.01.2006
3	_	ALT. OF DRG HAS BEEN CHANGED AT CLAUSE NO. 3.7 & 5.3. ALSO CLAUSE NO. 3.8, 3.10, 5.1, 5.2, 6.1, 6.4, 6.5(II) & 8.2 HAVE BEEN MODIFIED.	DRAWING & SPECIFICATION HAVE BEEN REVISED IN ACCORDANCE WITH THE LATEST INDIAN STANDARD AND FEEDBACK RECEIVED FROM FIRMS.	

Specification have been digitized and all alterations have been incorporated

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TECHNICAL SPECIFICATION FOR 2 KG. PORTABLE CO_2 TYPE FIRE EXTINGUISHER FOR USE ON WAG-9/WAP-5, 3-PHASE ELECTRIC LOCOMOTIVE OF INDIAN RAILWAYS

1. SCOPE:

1.1. This technical Specification covers the minimum requirement of inspection, testing, performance and supply conditions of 2 KG CO_2 type of fire extinguisher to be used for WAG-9, 3 phase electric locomotive. This is based on ABB Specification No. ES-1230 Rev.0.

1.2. 02 Nos. of fire extinguisher with bracket to be supplied.

2. GENERAL:

2.1. This CO_2 type of fire extinguisher of 2 KG. capacity each is suitable for extinguishing the fire involving carbonaceous solids, flammable and combustible liquids, oils, cables, plastics, rubber materials, fire due to short circuiting of electrical equipment which occurs in the loco. Two nos. of such fire extinguisher are installed in the machine component of the loco and one no. each in driver's cabin No. 1 & 2.

2.2. Use of CO_2 type of fire extinguisher in 3-phase Thysristor based WAG-9 locos, is justified because liquefied carbon dioxide when discharged, leaves no residues which may give adverse effect on electrical equipments.

2.3. The extinguisher with intermittent discharge, is installed in the loco and in order to gain access to awkward locations, it is fitted with short discharge hose and is electrically non-conductive.

The extinguisher shall be suitable for use on fires involving energized electrical equipment, the extinguishant be non-conductive electrically.

3. TECHNICAL REQUIREMNT:

3.1. This CO_2 type fire extinguisher shall be capable of extinguish the fire in the loco, when discharge, not less than 8 (eight) seconds.

3.2. The extinguisher shall be designed to operate in the normal upright position not less than 45˚ from the vertical.

3.3. The extinguisher shall be portable appliance to be carried by hand and has a mass not greater than 10 Kg. in working order.

3.4. The extinguisher shall be suitable for installation in loco include continuous vibration and shocks. The vehicle body may experience impact loads up to $5m/s^2$.

3.5. It should also designed to withstand without rupture a pressure of not less than 4 times the equilibrium pressure when operated at 65˚C temperature with the outlet blocked.

3.6. The extinguisher with intermittent discharge is preferred. An interrupted discharge cycle of 4 seconds 'open' 4 seconds 'shut' at a temperature of 27˚C ± 2˚C and shall discharge at least 95% of the contents.

3.7. Each fire extinguisher shall be supplied with spanner and a mounting bracket as per the drawing from where it can be readily removed. Refer to DRG. No. 1209-13.240-025 ALT.5 or latest.

3.8. The material used for body, internal discharge tube, valves, nozzle, discharge horn or hose, handle etc. and other conditions shall conform to ~~IS:2878-86~~ IS:15683:2018 or latest.

3.9. The shape of the body of extinguisher shall be cylindrical and external surface of body shall be coated or treated to resist atmospheric corrosion.

3.10. Liquified carbon dioxide gas used for extinguisher shall conform to ~~IS: 307-66~~ IS:15222 filled with filling ratio of 0.667 with a tolerance of +0 -0.017. The quantity shall be determined by weighing.

3.11. There shall be no leakage of carbon dioxide from valve or fittings during or before use of extinguisher.

3.12. A seal or device shall be fitted to indicate that the extinguisher has not been operated.

3.13. Operational method and inspection schedule shall be written on the body clearly in Hindi and English.

3.14. The extinguisher shall incorporate a safety device to prevent accidental operation, which will be a part of the actuating mechanism.

3.15. Period for refilling/checking should be clearly mentioned on the body.

4. PERFORMANCE REQUIREMENTS :

4.1. The design and construction of extinguisher shall be such that when operated at an angle of not more than 45˚ from the vertical and a temperature of 27˚ ± 2˚C, it shall expel not less than 95% of the contents in the form of a continuous discharge for minimum 8 seconds from the time of operating the valve.

5. MANUFACTURE:

5.1. Body of extinguisher shall be seamless steel cylinder manufacture to ~~IS: 2872~~ IS:7285 or later standard and shall be approved by Petroleum and Explosive Safety Organization (PESO) as per Gas Cylinder Rules 2016 or latest standard. The external surface of cylinder shall be treated to resist atmospheric corrosion.

5.2. Material used for manufacturing valve shall be conformed to IS:3224 and Material used for manufacturing internal discharge tube, nozzle and discharge horn, hose, handle etc. shall be conformed the condition laid down in ~~IS:2878-86~~ IS:15683:2018 or latest.

5.3. Each extinguisher shall be supplied with mounting brackets as per drawing No. 1209-13.240-025 ALT.5 or latest & Spanner.

6. INSPECTION AND TESTING:

~~**6.1.** Every extinguisher body shall be passed the hydraulic stage and pressure test according to IS:2872, which shall not be less than 1.5 times the equilibrium pressure 2.5 M Pa at 70˚C.~~

6.1. The cylinders shall be subjected to hydrostatic stretch test in accordance with IS: 5844 which shall not be less than 250$\mathrm{Kg/cm^2}$. The test pressure applied to the cylinder shall be retained for a period of not less than 30 seconds. The permanent stretch suffered by the cylinder due to application of test pressure shall not exceed 10% of the total stretch suffered during the test.

6.2. Sealing device of actuating mechanism shall be checked.

6.3. Discharge test to be conducted by the supplier to check the discharge time of liquefied gas, distance and residue during demonstration.

~~**6.4.** Hose assembly with its coupling shall be tested to the minimum working pressure of 315 Kg/cm^2 without failure.~~

6.4. The extinguisher Horn shall withstand crushing when 25 kg is appllied to its extremity for 5min immediately after having completely discharged the extinguisher through the horn as per Clause 9.13 of IS:15683:2018.

6.5. **(i)** Prior to prototype inspection CLW's representative will be deputed to seal the sample piece of the material specified for test in the government approved/RDSO approved on test lab. The Lab test report should be produced at the time of inspection.

(ii) Standard fasteners of M/s LPS, M/s UNBRAKO, M/s KUNDAN or CLW/BLW approved vendors shall be used in the assembly.

7. MARKING AND IDENTIFICATION :

Every extinguisher shall be marked with the following:

a) Instruction for operation.

b) The capacity in kilogram.

c) Name and Address of Manufacturer.

d) The working pressure in Kg/cm^2 or mega Pascal.

e) The overall weight of the extinguisher when full.

f) The year and month of manufacture.

g) Period for refilling/Checking.

8. PACKING & DELIVERY:

8.1. The extinguisher shall be supplied complete in all respect, properly protect from damage or deterioration and ready for successful operation.

8.2. For further condition refer tender ~~specification~~ documents.

9. DEFECT LIABILITY:

As per Bid Document.

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