

Page 1 of 7	SPECIFICATION No. CLW/MS/3/159	ALT. 0
-------------	--------------------------------	--------

SPECIFICATION FOR TRANSITION DUCT ASSEMBLY FOR WAG-9, WAP-7 & WAP-5 3-PHASE ELECTRIC LOCOMOTIVES.

SPECIFICATION No. CLW/MS/3/159 ALT.0

ISSUE DATE: 22.01.2024

ISSUED BY:

DY. CHIEF ELECTRICAL ENGINEER/D-III.

CHITTARANJAN LOCOMOTIVE WORKS

P.O. CHITTARANJAN – 713331

DIST. BARDHAMAN (WEST), WEST BENGAL (INDIA)

PREPARED BY	CHECKED BY	APPROVED BY
Bikash Naik Digitally signed by Bikash Naik Date: 2024.01.22 16:56:17 +05'30' SSE/DRG&DGN	RAJEEV KUMAR Digitally signed by RAJEEV KUMAR Date: 2024.01.22 17:27:10 +05'30' SSE/DRG&DGN	AMIT AGGARWAL Digitally signed by AMIT AGGARWAL Date: 2024.01.22 17:46:05 +05'30' DY. CEE/D-III

Validity unknown
 Digitally signed by BHARAT CHANDRA BAL
 Date: 2024.01.24 12:14:04 IST
 Reason: MREPS-CRIS
 Location: New Delhi

Page 2 of 7	SPECIFICATION No. CLW/MS/3/159	ALT. 0
-------------	--------------------------------	--------

ALTERATION RECORD SHEET

ALT. NO.	DATE	DESCRIPTION	REASON	SIGNATURE

PREPARED BY	CHECKED BY	APPROVED BY
<div><div>Bikash Naik</div><div><div>Digitally signed by Bikash Naik</div><div>Date: 2024.01.22 16:56:45 +05'30'</div></div></div>	<div><div>RAJEEV KUMAR</div><div><div>Digitally signed by RAJEEV KUMAR</div><div>Date: 2024.01.22 17:27:59 +05'30'</div></div></div>	<div><div>AMIT AGGARWAL</div><div><div>Digitally signed by AMIT AGGARWAL</div><div>Date: 2024.01.22 17:47:07 +05'30'</div></div></div>
SSE/DRG&DGN	SSE/DRG&DGN	DY. CEE/D-III

Page 3 of 7	SPECIFICATION No. CLW/MS/3/159	ALT. 0
-------------	--------------------------------	--------

TABLE OF CONTENTS

SL. No.	Description of contents	Page No.
1.	Scope	4
2.	Scope of Supply	4
3.	General Information	4
4.	Climatic And Environmental Conditions	4
5.	Technical Requirements	5
6.	Inspection And Testing	6
7.	Quality Assurance	6
8.	Markings	6
9.	Warranty/Guarantee	7
10.	Packaging & Delivery	7

PREPARED BY	CHECKED BY	APPROVED BY
Bikash Naik Digitally signed by Bikash Naik Date: 2024.01.22 16:57:01 +05'30'	RAJEEV KUMAR Digitally signed by RAJEEV KUMAR Date: 2024.01.22 17:28:36 +05'30'	AMIT AGGARWAL Digitally signed by AMIT AGGARWAL Date: 2024.01.22 17:47:51 +05'30'
SSE/DRG&DGN	SSE/DRG&DGN	DY. CEE/D-III

Page 4 of 7	SPECIFICATION No. CLW/MS/3/159	ALT. 0
-------------	--------------------------------	--------

**SPECIFICATION FOR TRANSITION DUCT ASSEMBLY FOR USE ON 3-PHASE
ELECTRIC LOCOMOTIVE OF TYPE WAG-9, WAP-7 & WAP-5 FOR INDIAN RAILWAYS.**

1. SCOPE:

This specification covers the minimum requirement of design, manufacture and supply condition of Transition Duct Assembly for Machine Room Ventillation & Transition Duct Assembly for Oil Cooler Ventillation for use on electric locomotives manufactured for Indian Railways.

2. SCOPE OF SUPPLY:-

1(One) Set of Transition Duct Assembly shall consist of 2 (Two) Nos. Transition Duct Assembly for Machine Room Ventillation as per CLW Drg. No. 1209-11.244-024 ALT. latest and 2(Two) Nos. Transition Duct Assembly for Oil Cooler Ventillation as per CLW Drg. No. 1209-11.144-025 ALT. latest.

3. GENERAL INFORMATION:

- 3.1 Transition Duct Assembly for Oil Cooler ventilation:** This duct assly is fitted inside machine room of 3-Ph electric locomotives. It is attached at bottom side of OCU roof filter and over the OCU- blower motor. The oil cooling unit draws filtered & cooled air through it to remove heat from oil circulated through the Traction converter & Transformer. The centers of OCU-machine room roof filter and OCU-scavenge motor box is eccentric. Hence during manufacturing of Transition Duct Assembly for Oil Cooler ventilation, off-center dimensions are to be maintained within tolerance as per class medium of table-1 of IS:2102(part-1):1993
- 3.2 Transition Duct Assembly for Machine Room Ventillation:** The machine room blower serves the purpose of supplying cooled and filtered air to the machine room equipments to cool the electrical equipments to maintain their quality & life. Transition duct is fitted between Side wall Filter and Lobster Back Duct Assly of machine room blower. The incoming filtered & cooled air from Filter traverses through this transition duct to machine room equipments.

4. CLIMATIC AND ENVIRONMENTAL CONDITIONS:-

- 4.1. Maximum Atmospheric temperature : 80°C
- 4.2. Humidity : 60% to 100% saturation during rainy season.
- 4.3. Rain fall : Very Heavy in certain areas.
- 4.4. Coastal Area : Extremely dusty, humid and salt laden atmosphere.
- 4.5. Vibration : Shocks up to 50 m/s²

PREPARED BY	CHECKED BY	APPROVED BY
Bikash Naik Digitally signed by Bikash Naik Date: 2024.01.22 16:57:22 +05'30'	RAJEEV KUMAR Digitally signed by RAJEEV KUMAR Date: 2024.01.22 17:29:02 +05'30'	AMIT AGGARWAL Digitally signed by AMIT AGGARWAL Date: 2024.01.22 17:48:52 +05'30'
SSE/DRG&DGN	SSE/DRG&DGN	DY. CEE/D-III

Page 5 of 7	SPECIFICATION No. CLW/MS/3/159	ALT. 0
-------------	--------------------------------	--------

5. TECHNICAL REQUIREMENT:

- 5.1. Transition Duct Assly for Oil Cooler Ventillation & Transition Duct Assly for Machine Room Ventillation shall be of stainless steel conforming to specn. **ASTM-A 240 Grade 304L**.
- 5.2. Other components shall also conform to specification given on the drawing.
- 5.3. Stainless steel hardware items to be conformed to specific standards mentioned in the drawings
- 5.4. Welding to be done in accordance with IS:2811.
- 5.5. Dye penetration test of weld joints should be done according IS:822:1970.
- 5.6. Transition Duct Assly to be supplied as a complete unit including Hardwares at properly fitted condition.
- 5.7. Welding to be done properly with proper and requisite grade of stainless steel electrodes as per IS:5206. Edge preparation for weld joint wherever required, shall be done properly according to the requirement.
- 5.8. Welding done on the stainless steel sheet, plates, tubes etc. to be examined and tested before bulk fabrication to assure the permissible design stress.
- 5.9. Duct assly to be acid washed to remove internal weld burn marks.
- 5.10. Anti-Corrosive treatment should be done.
- 5.11. Metal shall not be effected/corroded when exposed in 100% relative humidity or max. ambient temperature 80° C or heavy rainfall.
- 5.12. Sharp edges & burrs to be removed.
- 5.13. Transition Duct shall be scratch free & polished.
- 5.14. Jig & Fixtures to be used to maintain the geometry of the Assembly, Holes etc.
- 5.15. Drawing & photo of calibrated jigs & fixtures should be provided during each inspection.
- 5.16. All dimensions on the respective drawing that include tolerances must be strictly adhered. For dimensions without specified tolerances, the guidelines outlined in IS:2102(Part-1), Table-1, Class-medium, should be followed to ensure consistency and prevent fitting issues.
- 5.17. It is important to maintain parallelism and flatness of rectangular and circular flanges, keeping them within a tolerance of $\pm 0.15\text{mm}$ to prevent air leakage through flange joints.
- 5.18. The edges and surfaces of straight flanges must be properly maintained, free from any deformations such as twisting, denting or bulging.
- 5.19. Hole center distances to be checked by calibrated template fixture.

PREPARED BY	CHECKED BY	APPROVED BY
Bikash Naik Digitally signed by Bikash Naik Date: 2024.01.22 16:57:41 +05'30'	RAJEEV KUMAR Digitally signed by RAJEEV KUMAR Date: 2024.01.22 17:29:25 +05'30'	AMIT AGGARWAL Digitally signed by AMIT AGGARWAL Date: 2024.01.22 17:49:54 +05'30'
SSE/DRG&DGN	SSE/DRG&DGN	DY. CEE/D-III

Page 6 of 7	SPECIFICATION No. CLW/MS/3/159	ALT. 0
-------------	--------------------------------	--------

6. INSPECTION AND TESTING:

6.1. Type Testing:

- (i) Suppliers are required to arrange vibration test as per IEC-77 or certificate to be produced.
- (ii) Material certificate for raw materials used from NABL accredited test house has to be produced during inspection and along with supplies.
- (iii) Certificate for fasteners used and their materials to be produced and supplied along with supplies.
- (iv) Welding to be checked properly as per an approved test plan.
- (v) For perfect inspection of item, surface bed, height gauge, radius gauge, vernier scale, steel tape, steel scale etc to be arranged and all instruments should be calibrated.

6.2. Routine Testing:

- (i) Suitable checking fixtures are to be made for checking the dimensions of the Transition Duct Assembly.
- (ii) For perfect inspection of item, surface bed, height gauge, radius gauge, vernier scale, steel tape, steel scale etc to be arranged and all instruments should be calibrated.
- (iii) Certificates for raw materials and fasteners to be provided.

- 6.3. (i) Prior to prototype inspection CLW's representative will be deputed to seal the sample piece of the material specified for test in the NABL accredited test lab. The lab test report should be produced at the time of prototype inspection.
- (ii) Standard fasteners shall be from IREPS approved sources.

7. QUALITY ASSURANCE:

Should be as per ISO-9000.

8. MARKINGS:

Each Transition Duct Assembly shall bear the following legible & indelible markings as shown at drawings..

- 8.1. Description of the item with drawing number.
- 8.2. Date, Month and Year of Manufacture.
- 8.3. Manufacturer's Name with Trade mark, Batch No. & P.O. No. to be embossed.

PREPARED BY	CHECKED BY	APPROVED BY
Bikash Naik Digitally signed by Bikash Naik Date: 2024.01.22 16:57:56 +05'30'	RAJEEV KUMAR Digitally signed by RAJEEV KUMAR Date: 2024.01.22 17:30:04 +05'30'	AMIT AGGARWAL Digitally signed by AMIT AGGARWAL Date: 2024.01.22 17:51:03 +05'30'
SSE/DRG&DGN	SSE/DRG&DGN	DY. CEE/D-III

Page 7 of 7	SPECIFICATION No. CLW/MS/3/159	ALT. 0
-------------	--------------------------------	--------

9. WARRANTY/GUARANTEE:

All aspects of design, workmanship and material quality will be covered by the warranty/guarantee of satisfactory performances of the product for 30 months from the date of supply or 24 months from the date of commissioning as per Para 3202 of latest IRS contract conditions September 2022 version 1.0 or latest.

10. PACKAGING & DELIVERY:

10.1 The Transition Duct Assembly must be securely packed inside wooden box using wooden blocks to prevent any harm, bending or twisting of flanges & denting at duct body during transportation and storage before installation.

10.2 Storage period of at least 24 months shall be considered.

PREPARED BY	CHECKED BY	APPROVED BY
Bikash Naik Digitally signed by Bikash Naik Date: 2024.01.22 16:58:56 +05'30'	RAJEEV KUMAR Digitally signed by RAJEEV KUMAR Date: 2024.01.22 17:30:43 +05'30'	AMIT AGGARWAL Digitally signed by AMIT AGGARWAL Date: 2024.01.22 17:51:55 +05'30'
SSE/DRG&DGN	SSE/DRG&DGN	DY. CEE/D-III