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Title:	**Project / System:**
Technical Specifications of Line Cooling System for cooling the EW Jammer Pod of the LCA Mk1A	Line Cooling System
	Model No. LIAPL/LCA-EW-LCS
	HAL ITEM CODE: 40503391

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Amendment History

Issue No.	Issue Date	Brief Description of Amendment	Change Request Ref.	Affected Pages	Affected Section	Change Effective From
01		Initial Issue	NA	NA	NA	ALL

List of Acronyms & Abbreviations:

Abbreviation /Acronyms	Definition
LIAPL	Laversab India Aviation Pvt Ltd
LCS	Line Cooling System
DGAQA	Directorate General of Aeronautical Quality Assurance
NDT	Non-Destructive Testing
HAL	Hindustan Aeronautics Limited
MDI	Master Drawing Index
MTBF	Mean time Between Failure
QTP	Qualification Test Procedure
ORDAQA	Office of the Regional Director Aeronautical Quality Assurance
RDAQA	Regional Director Aeronautical Quality Assurance

Table of Contents

1. Introduction.

The Line Cooling System (LCS) is required to cool the Jammer Pod fitted with LCA MKIA aircraft. The LCS is used while operating the Jammer Pod on aircraft during ground testing. It provides the air cooling of equipment through Suction air pressure.

This document establishes the technical requirements of Line Cooling System. It consists of physical dimensions, working principle with flow diagrams, material requirements including the specifications of vacuum pump. It also includes the technical specification of the Line Cooling System.

2. Scope.

This document establishes the technical requirements of Line Cooling System. It consists of physical dimensions, working principle with flow diagrams, material requirements including the specifications of vacuum pump. It also includes the technical specification of the Line Cooling System.

3. Equipment specification:

SL No	Item Description	Qty	Specification	Material
1	Structure / Vacuum chamber / Toolbox	As per Req.	#2 mm Thickness. Inlet filter size- 10micron	Mild steel (Grade E250)
2	Adapter	1No	101.2x197x355.6 In mm	Fiber body with rubber /foam gasket #2 mm.
3	Hose pipes	2 No's.	Dia 1.5 Inch #0.4 mm	PU flexible ducting hose (Should withstand 1 Bar pressure)
4	Vacuum pump Model YEBL-1-210 (Single Stage Turbine Blower)	1No	415V,50Hz, 3 phase. Power-1.6 Kw (2 HP) RPM: 2850 Min Vacuum –160 to 190 millibar / Pressure 200 milli bar Protection: IP55	Standard make / Maxima Resource
5	Caster wheels	4 No.	Dia 4 inch With stand 200 kg load	Standard Make / Poly urethane
6	Power cable	1 No's	Length :8 Mtrs 3 Phase + Neutral 2.5 Sq mm CoreCopper	Havels/Phenolex/Polycab

4. **Construction:** The unit designed as per the diagram at Fig.1. The diagram is for reference only to give an idea of the required structure for Line Cooling System refer the General Arrangement Drawing No: **LIAPL/LCS/MDWG/001-REV0/191124** for more details

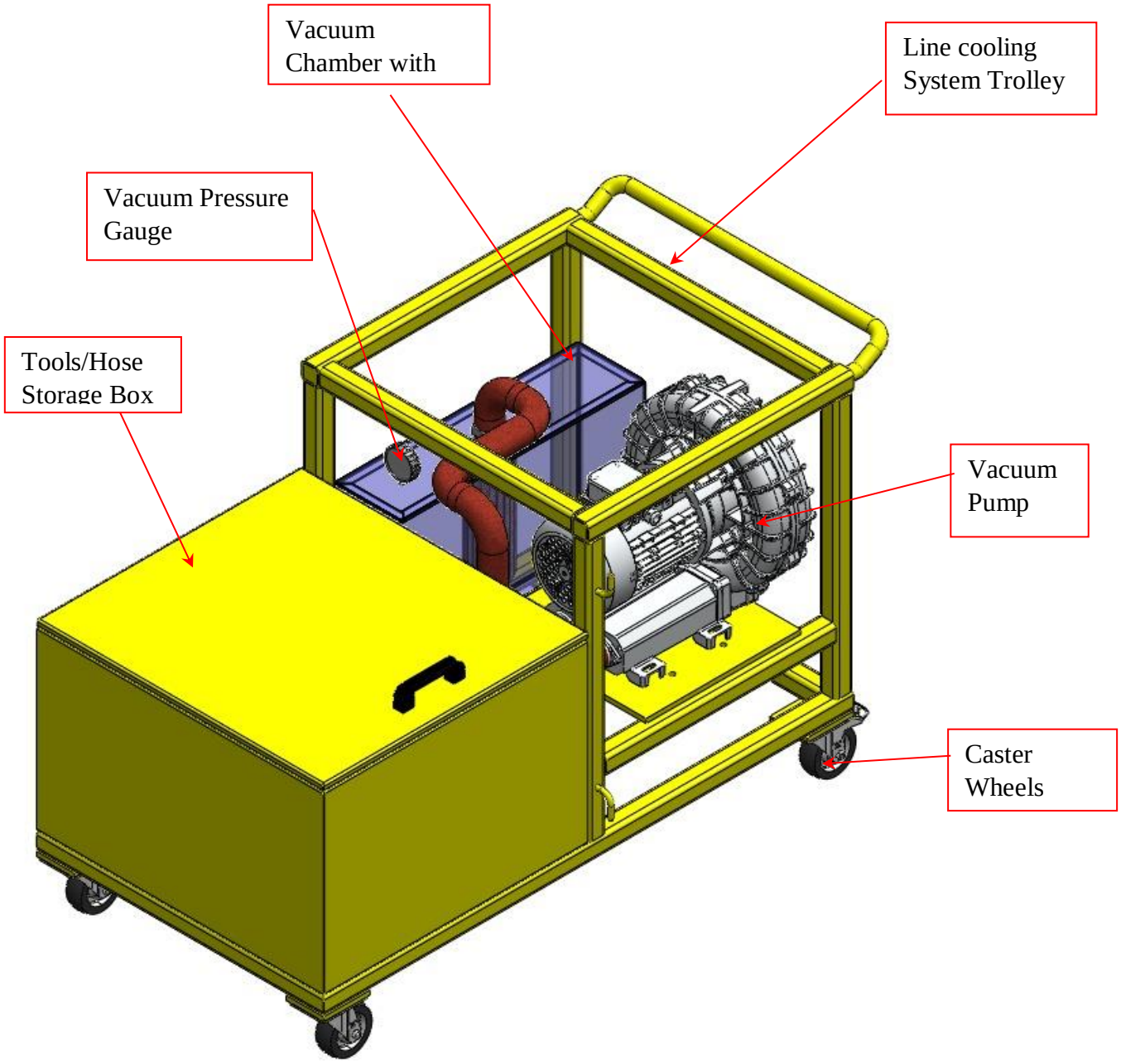

Fig.1: Overall view of construction

- The Pump placed on a platform with a suitable base as shown in Fig.1 and should have MS cover on the top.

- The Pump will have an ON/OFF switch, an indicator to show when it is running, and a safety relay having protection to prevent reverse-running of the Pump and overload.
- Power Cable Length of 8mtr provided with socket. Make: Havells/Polycab/Finolex.
- Power supply 415 V, 50 Hz 3 phase
- The Ducting Hose from the motor to the adapter has a length of 2 m and the OUT Hose 1 feet Long. The Out Hose points to the ground to let the air out.
- Handles provided for moving the unit as per Fig.1.
- The total unit shall be mounted on castor wheels with lock facility

5. Working Principle:

The Flow diagram at Fig.2 on the working of unit is attached for reference.

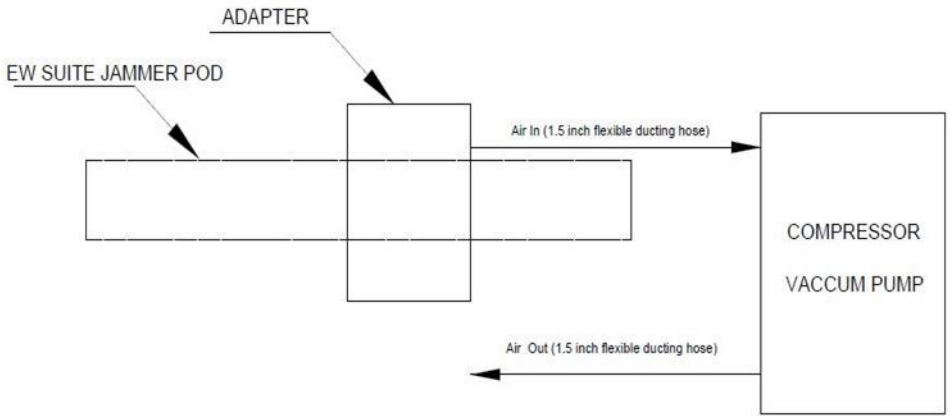

Fig-2: Flow diagram

Step 1: The adapter is fixed to the POD by strapping it with a belt.

Step 2: The vacuum/compressor pump is switched on to create a suction system which sucks the warm air from the POD through the attached adapter.

Step 3. Warm air moves out of the system through the adapter into the ducting hose to the vacuum pump and released to the atmosphere through the out-ducting hose.

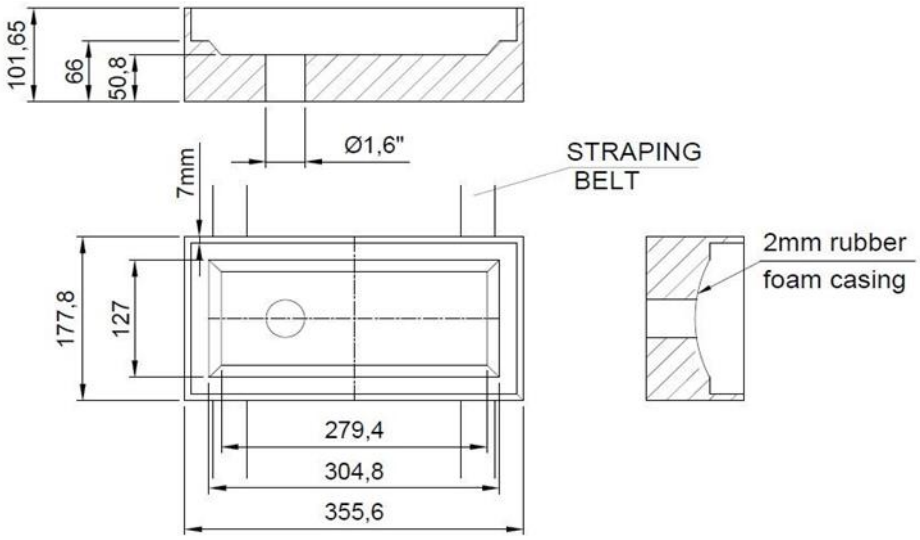

Fig-3: Adapter Details

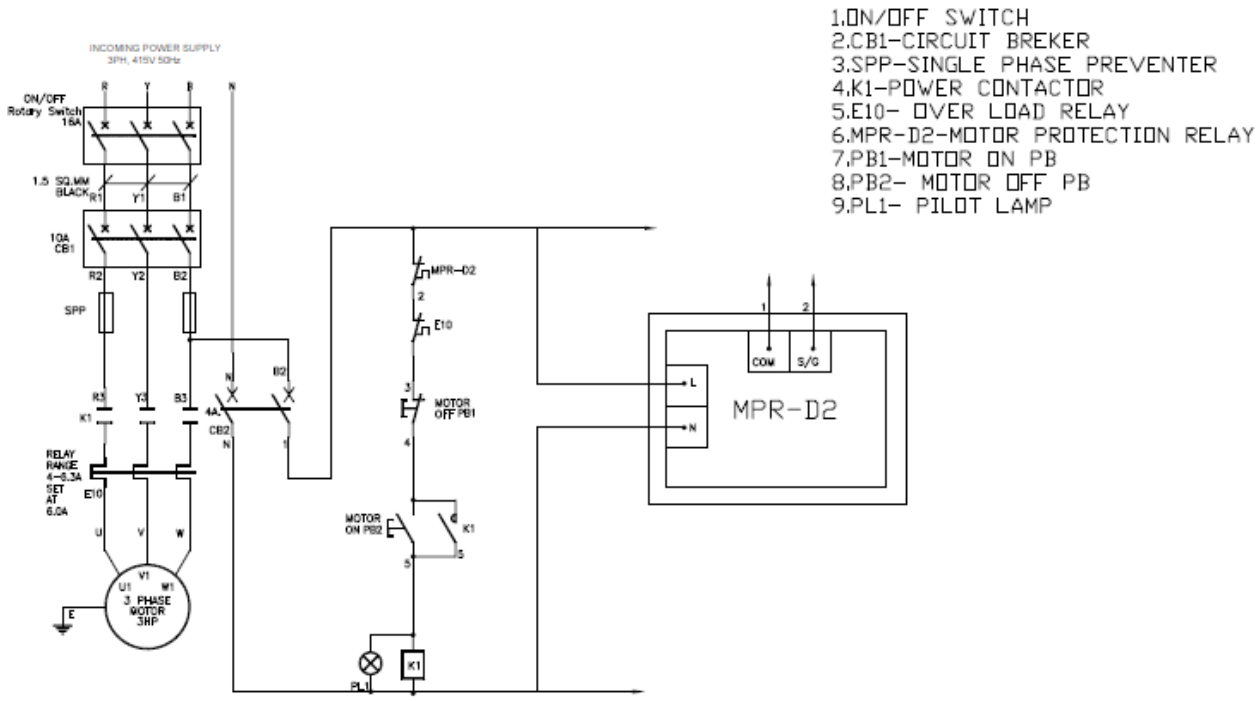

Fig-4: Electrical wiring Details

6. Documentations and others:

a) Documents:
- Operating & Maintenance manual: Should contains operating procedure, storage conditions, components details, Calibration details etc
- Calibration certificate: Should explain the procedure for doing the calibration and periodicity of calibration with agency addresses.
- Warranty certificate: For 12 months from the date of delivery
- Certificate of Conformity (COC)

b) Do's & Don't's & Operating procedures: Stickers of Do's & Don'ts, Operating procedures are to be pasted on equipment.

c) Spares: Manufacturer's recommended list of spares required for trouble-free maintenance of the equipment for a period of 5 years if any.

7. Qualification tests:

Refer the QTP document No: **06/LIAPL/LCS/QTP/001-Rev0/021224.**

8. Conclusions:

After successful completion of the tests mentioned in this document for the first manufactured unit, the PC (Provisional clearance) and BPC (Bulk production clearance) may be provided for bulk manufacturing.

9. Product, Parameter & Functional Tested

- Primary test will be conducted at vender place without Jammer Pod
- Secondary trial at HAL Aircraft division Bengalore with Jammer POD fitted on LCA MKIA aircraft as per customer requirement and report will be submitted.
- After the successful trial will be dispatched to HAL Hyderabad.

10. Maintenance Specification

User manual and working instructions will be submitted along with product

11. Packaging and storage

The Test Jig will be in a shock proof packing for transportation to prevent damage during transportation / handling. The test jig weight is minimal and does not require any special equipment for handling.

The storage of the test jig shall be in a normal room condition (cool and dry).

12. Marking

The following details will be marked on the casing of the Differential Pressure Sensor.

- Manufacturer Name.
- Unit name.
- Model Number / Serial Number / Year of manufacture.

13. Product Deliverables

a. Deliverable Documentation

Following is the detailed list of items that will be delivered to HAL

LIST OF ALL THE DOCUMENTS TO BE DELIVERD

SL. No	Description	Quantity to be delivered
1.	General Arrangement (GA) Drawing and Bill of Materials with Specifications	1 Set
2.	Operating & Maintenance manual	1 Set
3.	Calibration certificate	1 Set
4.	Certificate of Conformity (COC) & Warranty certificate	1 Set