

Annexure-I**LIST OF CONTENTS**

Sl.No.	Title
1.	Introduction
2.	Scope
3.	Specification of Air Flow
4.	Display & control module
5.	Input power supply
6.	Safety feature
7.	Factory setting in the controller
8.	Documents
9.	Additional requirements

1. Introduction

The Digital Flight Control Computer (DFCC) of LCA AF MK2 & AMCA generates lot of heat during its operation. To maintain the temperature of the DFCC it is essential to use a forced air cooling system. The cooler shall not carry any humidity to DFCC during the operation.

2. Scope

This document describes the Forced air cooling system requirement specification & its envelop requirement. This unit is used for designer level evaluation purpose & not for any others usage. The scope of the Forced air cooling system shall be limited to all development activities for IFCS and the rig shall not be deliverable to squadron activities. However all quality assurance norms have to be followed for development of test rigs/facilities. No qualification and ESS test shall be applicable for rig. The test facility shall be designed as per IMTAR 21 (DDPMAS V1.0) Guidelines document.

3.0 Specification of air flow

Forced air cooling system is required to supply compressed & cold air to DFCC at a mass flow rate of 1.175 lb/min (13.2 g/sec) at -10°C to 2.2lb/min (16.6 g/sec) at +15°C, at any other temperature in between the flow rate will vary linearly. This system shall comprise of single unit consisting of Compressor, Dryer, Blower and control panel with display unit which is mounted on a mobile trolley.

The compressed air is passed through a refrigerant to cool to the required levels & the same air is passed through humidity controller / dryer for removing moisture and sent to DFCC for cooling.

4. Display/ Control module

The cooling system shall have the following controls in front panel to set the values by user.

1. Display and control module (PLC) is used to control the cooling system and to take care of interlocks.

2. The display module shall required controls to set user defined pressure value and indicate the same on display (to display air pressure at the outlet of the trolley),
3. The display module shall required controls to set user defined lower and higher Temperature limits and indicate the same on display (to display air temperature at the outlet of the trolley).

5. Input powersupply

The unit shall run with single phase Power Supply of 230V, 50 Hz AC with required current rating. The internal system & sub system controls to be derived from the same input power supply.

6. Safety Features

The following safety features shall be provided along with interlocks. Once the interlocks are set the system shall have hooter sound indication for operator alert.,

1. Air Temperature high (Hooter alarm).
2. Air pressure low (Hooter alarm)
3. Compressor, blower, cooling fan & overload (Hooter alarm)

7. Factory Settings in the controller

The unit to be supplied along with following factory settings. However the settings can be altered by operator as required with in the limit specified in section 3.0

1. Temperature: High Temperature set at > 15 degC.
2. Temperature Band: - -10 to +15 degC.

8. Documents

- a. Hardware Design Document for the DFCC Forced Air cooling system
- b. COC from OEM/test reports for items used in the system.
- c. MDI (master drawing index) / BOM (bill of the materials) of DFCC Forced Air cooling system to be provided.
- d. Electrical Interface Documents to be provided.
- e. Acceptance Test Plan / Procedure (ATP) for the system to be provided.
- f. Acceptance Test Results (ATR) to be submitted.

- g. User Manuals / Maintenance Manuals to be provided.

9. Additional Requirements

- a. Eco-friendly coolant should be used for refrigeration.
- b. Factory acceptance test will be carried out at vendor place.
- c. Installation & commissioning by the vendor at ADE.
- d. Equipment to be mounted on castor wheels for ease of transport.
- e. Vendor shall demonstrate all safety feature & interlocks.
- f. Size of the unit shall be restricted to Length: 900mm, Width: 900mm & Height : 900mm
- g. Minimum of 4 meters insulated flexible hose to be supplied along with required clamps for hose pipe
- h. The vendor should supply manuals, certificate of conformance/test reports for off the shelf items, design document/electrical drawings for circuitry employed in the system, data sheets for the components used in the system, Cable loom documents, ATP and ATR of the system
- i. Vendor shall carryout ATP at his premises in the presence of QA, RD-AQA and representatives from end user of ADA, hereafter called as ADA. Vendor shall submit the ATP Results document (ATR) duly coordinated by QA, RD-AQA and representatives from ADA along with delivery of the equipment to Stores.
- j. The single phase power cable to be provided with Industrial plug and socket to connect the system at site
- k. The unit shall have closed bottom tray to remove any water accumulation.
- l. Minimum 1 Year standard warranty from the date of supply.