Software Requirements Specification (SRS) for Purge Mode / Filter Cleaning

System Name: Direct Liquid Cooling (DLC) In-Row

Module: Purge Mode / Filter Cleaning

Version: 1.0

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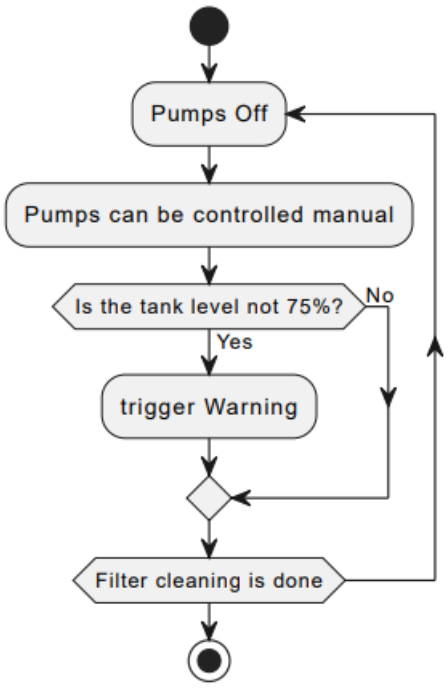
1. Introduction

Purge Mode / Filter Cleaning



1.1 Purpose

The purpose of this document is to define the software functionality for operating the **Purge Mode**, which is used to clean filters in the Direct Liquid Cooling (DLC) In-Row system.

1.2 Scope

This mode allows manual control of pumps while ensuring safe operational conditions (e.g., adequate tank level) during filter cleaning. It monitors tank level and issues warnings when required.

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2. Functional Requirements

FR1: Enter Purge Mode

- The system shall enter Purge Mode when triggered via software (e.g., Web Interface).

FR2: Stop All Pumps

- The system shall turn off all pumps before manual control is enabled.

FR3: Enable Manual Pump Control

- The system shall allow the user to manually control pumps (0–100% speed) via the UI.

FR4: Monitor Tank Level

- The system shall continuously monitor the coolant tank level.

FR5: Evaluate Tank Level Threshold

- If tank level is **not at 75%**, the system shall trigger a warning.

FR6: Continue Filter Cleaning

- Once tank level is 75%, the system shall allow filter cleaning to proceed.
- Monitor pressure gauge: Observe the pressure gauge attached to the CCU or secondary manifold to ensure it's within a safe range. (5 Bar dynamic)
- Both filters of the CDU have to be changed/cleaned until there is no more change in delta pressure for X hours. After that change over to any automatic mode of the users choice.

FR7: Exit Purge Mode

- The system shall allow the user to exit Purge Mode and mark **"Filter Cleaning is done."**

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3. Non-Functional Requirements

NFR1: Safety

- The system shall not allow pump operation unless tank level is validated.

NFR2: Responsiveness

- Tank level validation and warning must occur within 1 second of deviation detection.

NFR3: Usability

- Manual pump control must be clearly presented via the user interface with real-time feedback.

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4. System Interfaces

4.1 Hardware Interfaces

- Pump controllers
- Tank level sensor
- Warning indicators (e.g., UI alert)

4.2 Software Interfaces

- Web-based UI for manual pump control and Purge Mode activation
- Logging system to store tank level, user actions, and warnings

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5. Assumptions and Constraints

- Only authorized personnel can trigger or exit Purge Mode.
- Tank level sensor must be calibrated and functioning.
- Manual pump operation must not exceed predefined safety limits (e.g., speed (90%), time). (Have to be determined during testing)
