Technical Specification for Environmental Tests for Liquid Cooling Unit

Bharat Heavy Electricals Limited
Corporate Research & Development Division
Vikasnagar, Hyderabad- 500093, India

Prepared by:	Checked by:	Approved by:	Date:
D Pavitran	A Sandeep	G R Rao	12-03-2022

1. Environmental Tests: As per MIL-STD-810F, Dimensions of Equipment under test (EUT) are: 218mm x 197mm x 276mm (LxWxH) and weight: 12.3 Kg. Refer Fig 5, 6, 7 & 8 for EUT.

Sl. No.	**TEST & PROCEDURE**	**SEVERITY**	**DURATION**	**REMARKS**
1	Random Vibration Test *Procedure:MIL-810F Method-514.5*	Random vibration spectrum as given in Annexure1 Figure -1	Random vibration test to be carried out as per profile give in Figure 1 in all 3 mutually perpendicular axes. Duration: 1 Hr per axis. Total duration approximately 6 hours (app) incl. setting up time	The test will be carried out with unit in ON condition.
2	High Temperature Storage cum Operational Test	From 35°C to 85°C, Duration 7 cycles, 24 Hrs each cycle as per profile given in Figure -2 in Annexure 1	Total duration including setting up time – 170 Hrs (app)	Operational check on unit as per test profile
3	Low Temperature Storage cum Operational Test	Ambient to -55°C, Duration one cycle as per profile given in Figure -3 in Annexure 1	Total Duration including setting up – 8 hrs (app)	Operational check on unit as per test profile
4	Mechanical Shock Test	Pulse Shape: Saw tooth pulse	No. of Shocks: 3 Shocks per axis on each of 6 directions. Total 18 Shocks	Unit will be in OFF condition during test
5	Low Pressure (Altitude Test)	Profile as per Figure – 4 in Annexure 1 18 Km (app 60,000 ft) Altitude	Total duration: 4-5 Hrs (app) Rate of Altitude change ≤ 10 m/sec.	Operational check on unit as per test profile

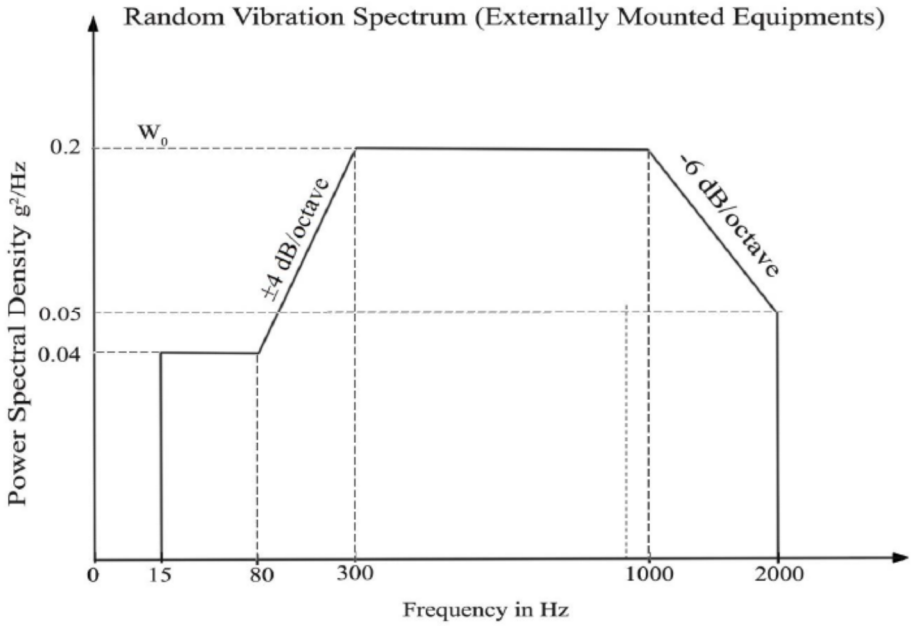


Figure 1: Vibration Test Profile

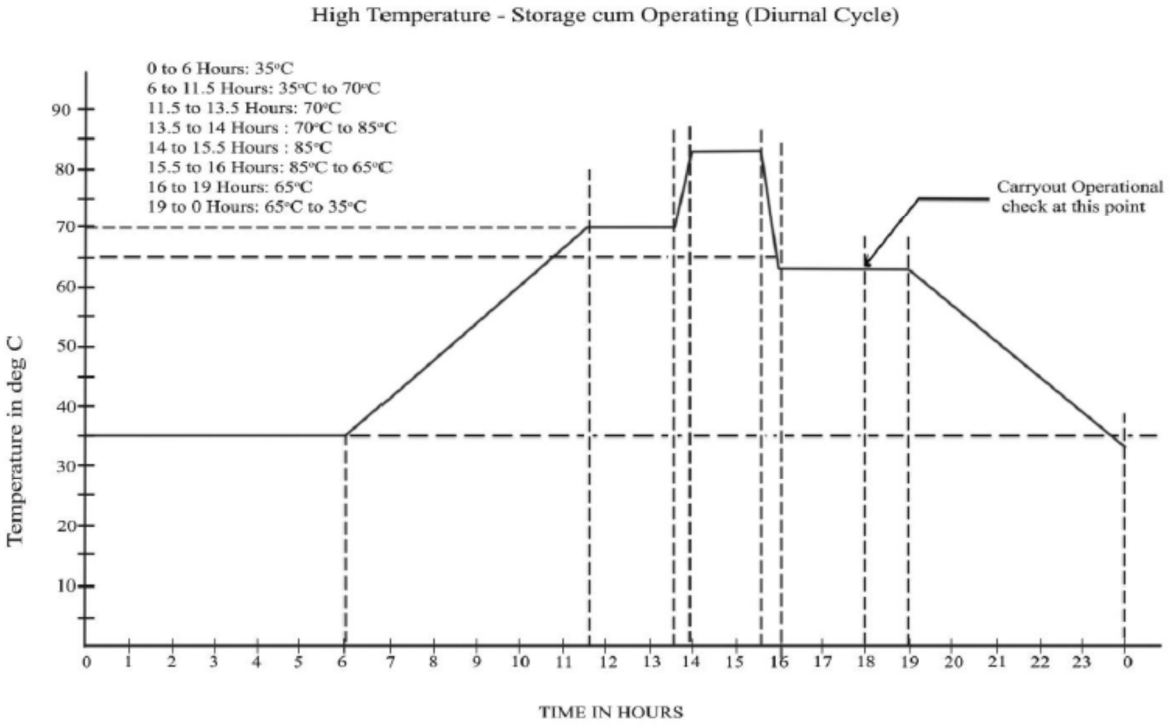


Figure 2: High Temperature Storage cum Operational Test

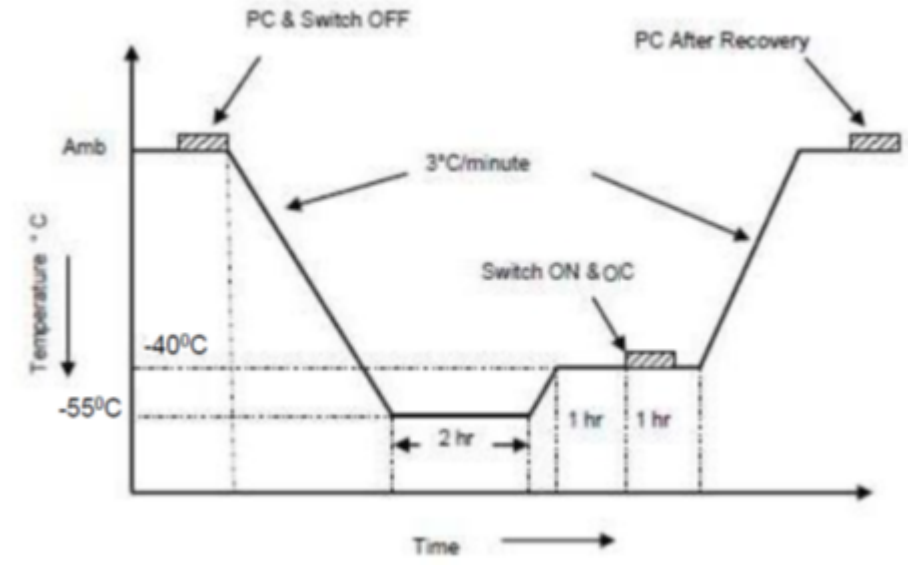


Figure 3: Low Temperature Storage cum Operational Test

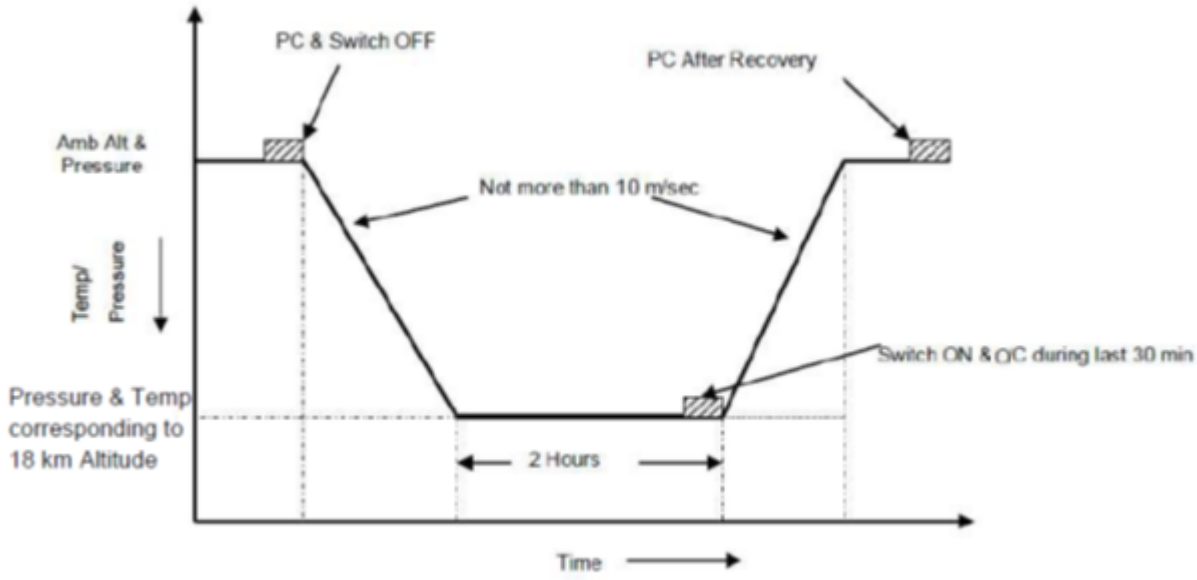
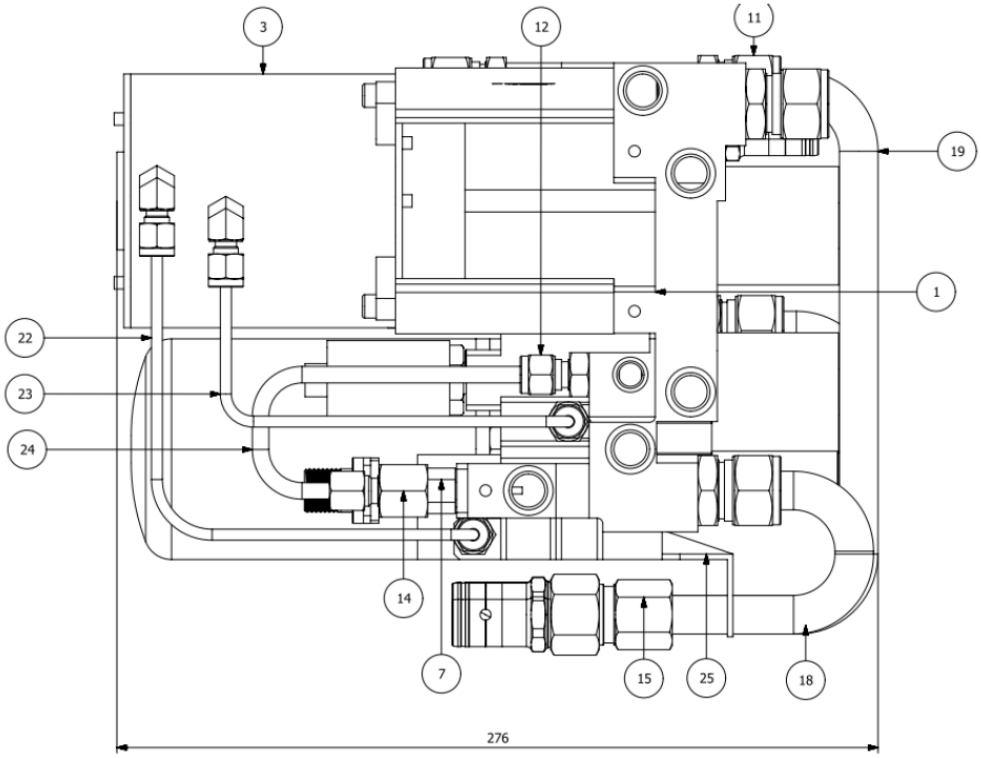


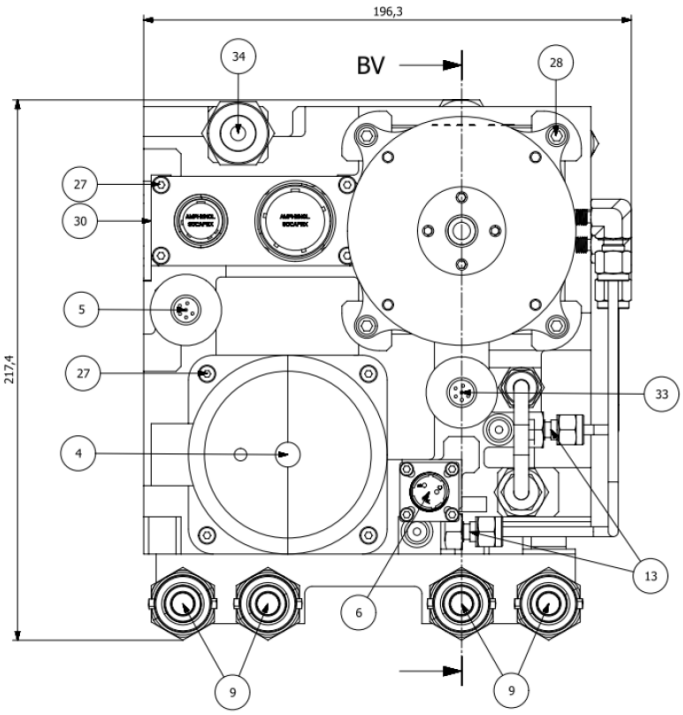
Figure 4. Low Pressure (Altitude) Test Profile

Note: OC – Operational check



Side View

Figure 5



Front View

Figure 6

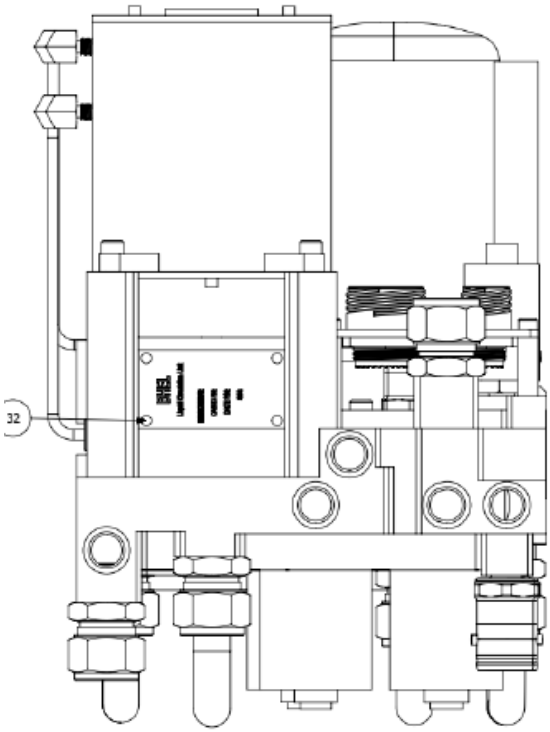


Figure 7

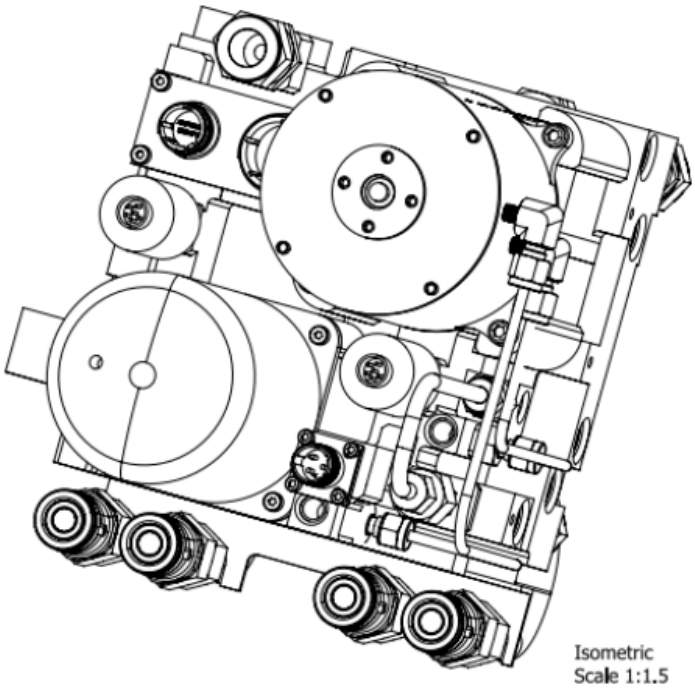


Figure 8

2. RECORD OF REVISIONS

REV.NO.	DATE	REVISION DETAILS	REVISED	APPROVED
00	12-03-2022	New Specification	D Pavitran	G R Rao