

RFD/RFW Number:

FLX-RFD-ALM-CU-0017

Issue

1.0

Spacecraft / Project	FLORIS	Originator's Name	Marco Lai	
System / Experiment / Model	FLEX	Signature / Date		
Sub-System		Request Type (Highlight applicable request)	Waiver (RFW)	Deviation (RFD)
Assembly	EQM/PFM	Organisation	Almatech	
Sub-Assembly	Calibration Unit	Ref. Doc. / Drwg No.	ALM-PRO-4175	
Item	-	References	-	
Serial No.	EQM, PFM			

RFW/RFD Title	Motor Power Consumption
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End Items(s) Affected (Hardware, Software)		
Name	CI-Number	Model(s)
Calibration Unit		EQM, PFM

Requirement / Interface Documents Affected				
Specification/Drawing Title	Number	Issue	Date	App. Paragraph
FLORIS Calibration Unit URD	FLX-RS-FNM-INS-0006	6D01.1	10.07.2018	5.3.5

Description of Deviation / Discrepancy / Non-Conformance

Requirement on the motor power consumption is:

FLO-CU-URD-REQ-0405 Verification: A,T

- Power adsorption of the CU unit shall be :
 - o Less than 9.2 W average for motor and 10W as peak (time less than 15 sec, including margins)
 - o Less than 1 W average for the other lines (including margins)

Parents: FLO-TRD-REQ-1310*

Motor power consumption is calculated considering the following parameters:

Rwindings: 54Ω +/- 10% → worst case 59.4 Ω

Tref: 22°C

Toperational_max: 28°C

$$\theta_{copper} := 0.004041 \frac{1}{K}$$

Variation of copper resistance with temperature:

$$R_{windings_Hot_Op} := R_{windings_nominal} \cdot (1 + \theta_{copper} \cdot DT_{op_max}) = 60.84 \, \Omega$$

$$P_{motor_singleStep_2PhaseON_HotT} := R_{windings_Hot_Op} \cdot (2 \cdot I_{max}^2) = 10.951 \, W$$

Which is higher than the 9.2W

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Other Items or Requirements (Potentially) Affected

None

Need for RFW/RFD and Rationale for Acceptance

The motor selected is the smallest that allow to have the ECSS motorization margin.

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RFD/RFD CLOSED	Name	Sign & Date	
		Approved	Rejected
Project Manager / Engineering: (Sub System)	Gianluigi Capo		
Engineering: (Almatech)	Marco Lai		
Product Assurance: (Almatech)	Thomas Gandy		
Project Manager: (Leonardo)			
Engineering: (Leonardo)			
Product Assurance: (Leonardo)			
Engineering (ESA)			
Contract Manager (ESA)			

Continuation sheet: