



FLORIS Calibration Unit

CIDL

Doc :	FLX-LI-ALM-CU-0008
Issue:	4:0
Date :	01.02.2019
DRD Code :	PM-25, PM-26

Almatech SA
EPFL – Innovation Park D
1015 Lausanne
Suisse

Tel : +41 21 555 3000
Tel : +41 21 555 3001
www.almatech.ch info@almatech.ch

Approval Sheet

Name

Date

Signature

Prepared by: T. Gandy

Approved by: M. Lai

Approved by: G Capo

Distribution List

Internal reference: ALM-PRO-3503

Person	Organization	Distribution
L. Blecha	Almatech	C
G. Capo	Almatech	O
T. Gandy	Almatech	C
M. Lai	Almatech	C
M. François	ESA	C
A. Capanni	Leonardo	A

A = Approval
C = Copy
I = Information
O = Original
R = Review

Change Record

Modification	Page	Iss.	Rev.	Date
First Issue	all	1	0	29.01.2018
Updated for PDR	all	2	0	04.09.2018
Updated for STM & CUIS MRR	all	3	0	20.11.2018
Updated for EQM MRR	all	4	0	01.02.2019

Contents

1	Introduction	6
1.1	Project Overview	6
1.2	Scope of the Document	7
2	Applicable and Reference Documents	8
2.1	Applicable Documents	8
2.2	Reference Documents	9
2.3	Acronyms and Abbreviations	9
3	List of documents	10
4	EQM & PFM List of Drawing and family tree	14
5	STM List of Drawing and family tree	22
6	CUIS List of Drawing and family tree	22
7	NCR/RFD/RFW/RFA STATUS	25

1 Introduction

1.1 Project Overview

The Earth Explorer - Fluorescence Explorer (FLEX) mission will map vegetation fluorescence to quantify photosynthetic activity.

The conversion of atmospheric carbon dioxide and sunlight into energy-rich carbohydrates through photosynthesis is one of the most fundamental processes on Earth – and one on which we all depend.

Information from FLEX will improve our understanding of the way carbon moves between plants and the atmosphere and how photosynthesis affects the carbon and water cycles.

In addition, information from FLEX will lead to better insight into plant health and stress. This is of particular relevance since the growing global population is placing increasing demands on the production of food and animal feed. At the moment, photosynthetic activity cannot be measured from space, but FLEX's novel sensor will observe this faint glow.

The FLEX satellite will orbit in tandem with one of the Copernicus Sentinel-3 satellites, taking advantage of its optical and thermal sensors to provide an integrated package of measurements.

Mission objectives can therefore summarized as follows:

- To assess the quality of fluorescence-derived photosynthesis data against classical optically-based methods (i.e. from fraction of absorbed photosynthetically active radiation times Light Use Efficiency).
- To address in more detail temporal and spatial scaling issues (from towers to satellite footprints).
- To identify and characterize the effects of different types of stress on fluorescence and photosynthesis (especially drought and freezing air temperatures).
- To indicate potential applications of the novel fluorescence observations.

Mission orbit:

- Orbit: Sun-synchronous
- Measurement altitude: 815 km

The FLEX Space Segment consists of a single satellite carrying the FLuORescence Imaging Spectrometer (FLORIS) push-broom instrument. This high-resolution imaging spectrometer will acquire data in the 500– 780 nm spectral range, with a sampling of 0.1 nm in the oxygen bands (759–769 nm and 686–697 nm) and 0.5–2.0 nm in the red edge, chlorophyll absorption and Photochemical Reflectance Index bands.

The monthly global maps will have an on-ground spatial resolution of 300 × 300 m² with a swath width of 150 km.

1.2 Scope of the Document

This document is the configuration items data list and will be updated during the different phases of the project to reflect the actual configuration.

2 Applicable and Reference Documents

2.1 Applicable Documents

Ref.	Title	Reference	Iss.
AD 105	Cover Letter	FLX-LET-FNM-INS-0003	3
AD 106	Special Condition of Tender	FLX-OF-FNM-INS-0001	4
AD 100	Contract for FLEX Unit/sub-system	Draft Contract	
AD 101	Generic Statement of Work for FLEX Unit/sub-system	FLX-SOW-FNM-INS-0001	2
AD 102	Specific Statement of Work	FLX-SOW-FNM-INS-0005	2
AD 103	Floris Calibration Unit User Requirement Specification	FLX-RS-FNM-INS-0006	5
AD 201	FLORIS Radiation Environment RS	FLX-RS-FNM-INS-0016	4
AD 202	FLEX FEMM Requirements Specification	FLX-RS-FNM-INS-0023	1
AD 203	FLEX GMM &TMM Requirements Specification	FLX-RS-FNM-INS-0024	1
AD 204	FLEX CAD Model Requirements Specification	FLX-RS-FNM-INS-0025	1
AD 205	FLEX Cleanliness Requirements for Sub-contractors	FLX-RS-FNM-INS-0028	3
AD 206	FLEX Instrument General Design Interface Requirements	FLX-RS-FNM-INS-0029	3
AD 208	FLEX PA Requirements for Subcontractors	FLX-RS-FNM-INS-0021	2
AD 209	FLEX PA SW Requirements for Subcontractors	FLX-RS-FNM-INS-0022	1
AD 210	FLEX Configuration Control and Documentation Management Plan	FLX-PL-FNM-INS-0001	3
AD 211	FLEX List of Acronyms and Abbreviations	FLX-LI-FNM-INS-0003	2

2.2 Reference Documents

Ref.	Title	Reference	Iss.	Date
[RD01]	FLORIS Calibration Unit Almatech Proposal	17-10S-225	1.0	15.06.2017
[RD02]	Leonardo Clarification Letter	FLX-LET-FNM-INS-0009	--	18.10.2017
[RD03]	Floris CU Negotiation Meeting #1 between Leonardo and Almatech	FLX-MIN-FNM-INS-0041		15.11.2017

2.3 Acronyms and Abbreviations

The abbreviations and acronyms used in this document are in accordance with [AD 211].

3 List of documents

Almatech Number	Title	Project Identification	Issue	Issue Date
Specification				
ALM-PRO-2941	Phytron Motor Requirement Specifications	FLX-RS-ALM-CU-0004	2	01.10.2018
ALM-PRO-2942	Harmonic Drive Procurement specifications	FLX-RS-ALM-CU-0003	1	20.04.2018
ALM-PRO-2943	Ball bearing procurement specifications	FLX-RS-ALM-CU-0002	1	13.04.2018
ALM-PRO-3469	Calibration Unit Design Specifications	FLX-DS-ALM-CU-0001	2	03.09.2018
ALM-PRO-3571	EGSE Procurement Specifications	FLX-RS-ALM-CU-0005	2	19.11.2018
ALM-PRO-3684	Sun Diffuser Procurement Specification	FLX-RS-ALM-CU-0006	1	29.05.2018
Quality				
ALM-PRO-3056	Cleanliness and contamination control plan	FLX-PL-ALM-CU-0005	4	23.01.2019
ALM-PRO-3385	Flex CU EQSL	FLX-LI-ALM-CU-0005	3	18.07.2018
ALM-PRO-3453	Product Assurance and Safety Plan	FLX-PL-ALM-CU-0004	3	12.07.2018
ALM-PRO-3459	Long Lead Item List (LLI)	FLX-LI-ALM-CU-0006	4	17.01.2019
ALM-PRO-3460	Critical Item List (CIL)	FLX-LI-ALM-CU-0003	3	19.07.2018
ALM-PRO-3487	Compliance Matrices Collection	FLX-MX-ALM-CU-0010	3	31.08.2018
ALM-PRO-3499	Alert Status List	FLX-LI-ALM-CU-0007	1	26.01.2018
ALM-PRO-3798	Audit Plan	FLX-PL-ALM-CU-0009	2	16.01.2019
ALM-PRO-3799	MIP / KIP List	FLX-LI-ALM-CU-0009	2	17.01.2019
ALM-PRO-3801	Reliability, Availability, FMEA, worst case analysis	FLX-RP-ALM-CU-0006	2	20.11.2018
ALM-PRO-3810	Radiation Analysis Report	FLX-RP-ALM-CU-0007	1	30.08.2018
ALM-PRO-3870	Part Deration Analysis Report	FLX-RP-ALM-CU-0008	1	30.08.2018
ALM-PRO-3874	Declared lists DML DPL DMPL	FLX-LI-ALM-CU-0012	2	22.01.2019
ALM-PRO-3879	Declared component list	FLX-LI-ALM-CU-0013	2	17.01.2019
ALM-PRO-3881	OTS list & suitability file	FLX-LI-ALM-CU-0014	1	31.08.2018
ALM-PRO-4021	STM & CUIS simplified Declared lists DML DPL DMPL	FLX-LI-ALM-CU-0017	1	12.11.2018
ALM-PRO-4031	STM & CUIS simplified Declared component list	FLX-LI-ALM-CU-0018	2	14.01.2019
ALM-PRO-4050	Compliance matrix to AD06 issue 1.3	FLX-MX-ALM-CU-0007	1	21.11.2018

Almatech Number	Title	Project Identification	Issue	Issue Date
Design				
ALM-PRO-3361	FLORIS Calibration Unit Design Report	FLX-DR-ALM-CU-0001	4	01.02.2019
ALM-PRO-3480	Design Justification file	FLX-RP-ALM-CU-0004	3	27.07.2018
Interface				
ALM-PRO-3362	Calibration Unit EICD	FLX-ICD-ALM-CU-0002	5	01.02.2019
ALM-PRO-3975	Calibration Unit MICD (Flight)	FLX-ICD-ALM-CU-0001	E	12.01.2019
ALM-PRO-3977	Calibration Unit MICD (STM)	FLX-ICD-ALM-CU-0004	A	22.10.2018
ALM-PRO-3978	Calibration Unit MICD (CUIS)	FLX-ICD-ALM-CU-0003	A	23.10.2018
Technical Documents				
ALM-PRO-3383	Calibration unit AIT plan	FLX-PL-ALM-CU-0006	4	20.11.2018
ALM-PRO-3386	Calibration unit Structural Analysis Report	FLX-RP-ALM-CU-0001	3	06.12.2018
ALM-PRO-3387	Calibration Unit Functional Analysis Report	FLX-RP-ALM-CU-0002	3	20.11.2018
ALM-PRO-3388	Calibration Unit Thermal Analysis Report	FLX-RP-ALM-CU-0003	2.1	19.11.2018
ALM-PRO-3467	Design, Development and Verification Plan	FLX-PL-ALM-CU-0007	3	20.11.2018
ALM-PRO-3481	CU datainput to I-CCDB and I-ODB	FLX-DB-ALM-CU-0001	2	25.07.2018
ALM-PRO-3482	CU requirement traceability database	FLX-DB-ALM-CU-0002	2	03.09.2018
ALM-PRO-3498	File list	FLX-FI-ALM-CU-0001	2	31.08.2018
ALM-PRO-3527	FLORIS CU Detailed Assembly Procedure	FLX-PR-ALM-CU-0001	1	24.08.2018
ALM-PRO-3630	Reduced Thermal Model Report	FLX-RP-ALM-CU-0005	1	30.08.2018
ALM-PRO-3823	Input to Instrument Flight Operation Manual (I-FOM)	FLX-OD-ALM-CU-0001	1	27.07.2018
ALM-PRO-3889	CU random notch proposition	FLX-RP-ALM-CU-0009	1	05.09.2018
ALM-PRO-3992	CU IF Screws Analysis and Proposition		1	02.11.2018
ALM-PRO-4093	FLORIS CU STM Test Plan/Procedure	FLX-PR-ALM-CU-0009	1	01.02.2019

Almatech Number	Title	Project Identification	Issue	Issue Date
Project Management				
ALM-PRO-3448	Floris Calibration Unit Risk Register	FLX-LI-ALM-CU-0002	6	08.01.2019
ALM-PRO-3449	Acronym & Abb	FLX-LI-ALM-CU-0004	1	13.06.2017
ALM-PRO-3451	Project Management Plan	FLX-PL-ALM-CU-0001	2	09.07.2018
ALM-PRO-3452	Risk Assessment and Management Plan	FLX-PL-ALM-CU-0003	1	01.06.2017
ALM-PRO-3454	Compliance Matrix against AD103 URD	FLX-VCD-ALM-CU-0001	6	01.02.2019
ALM-PRO-3455	Compliance Matrix against AD206 GDIR	FLX-VCD-ALM-CU-0002	7	01.02.2019
ALM-PRO-3506	FLORIS CU PLANNING	FLX-SCH-ALM-CU-0001	5	31.08.2018
ALM-PRO-3883	Export regulation	FLX-LI-ALM-CU-0015	2	17.01.2019
ALM-PRO-3888	PDR Delivery Documents	FLX-LI-ALM-CU-0016	1	03.09.2018
ALM-PRO-3924	PDR	FLX-MN-ALM-CU-0005	1	26.09.2018
ALM-PRO-4059	Contract Change Notice	FLX-CCN-ALM-CU-0001	1	27.11.2018
ALM-PRO-4074	Contract Change Notice	FLX-CCN-ALM-CU-0002	1	06.12.2018
Tests				
ALM-PRO-3667	Black Coating Test Plan	FLX-PL-ALM-CU-0008	1	26.04.2018
ALM-PRO-3887	Black Coatings Optical Test (TIS) Report	FLX-TRR-ALM-CU-0001	2	13.11.2018

Almatech Number	Title	Project Identification	Issue	Issue Date
RFD/RFA/PAD				
ALM-PRO-3820	PAD Hall sensors	FLX-PAD-ALM-CU-0001	2	03.08.2018
ALM-PRO-4136	PAD Microswitch	FLX-PAD-ALM-CU-0002	1	21.01.2019
ALM-PRO-4048	RFD for the Number of IF screws on the STM	FLX-RFD-ALM-CU-0001	1	22.11.2018
ALM-PRO-4137	RFD for the wires used on the CU	FLX-RFD-ALM-CU-0002	1	22.01.2019
ALM-PRO-4152	RFD knowledge of position : Observation and black target position	FLX-RFD-ALM-CU-0003	1	25.01.2019
ALM-PRO-4157	RFD Enveloppe	FLX-RFD-ALM-CU-0004	1	30.01.2019
ALM-PRO-4158	RFD for the Number of IF screws on the EQM & PFM	FLX-RFD-ALM-CU-0005	1	30.01.2019
ALM-PRO-4162	RFD for cleanroom conditions	FLX-RFD-ALM-CU-0006	1	31.01.2019
ALM-PRO-4163	RFD for Silicone	FLX-RFD-ALM-CU-0007	1	31.01.2019
ALM-PRO-4164	RFD for wrap on harness	FLX-RFD-ALM-CU-0008	1	31.01.2019
ALM-PRO-4165	RFD for CU Mass	FLX-RFD-ALM-CU-0009	1	31.01.2019
ALM-PRO-4168	RFD for use of extenders on torque wrenches	FLX-RFD-ALM-CU-0010	1	31.01.2019
ALM-PRO-4169	RFD for flaking materials	FLX-RFD-ALM-CU-0011	1	31.01.2019
ALM-PRO-4170	RFD for Coating performance measurement at operational conditions	FLX-RFD-ALM-CU-0012	1	31.01.2019
ALM-PRO-4171	RFD for Aperture oversizing	FLX-RFD-ALM-CU-0013	1	31.01.2019
ALM-PRO-4172	RFD for Single point failure	FLX-RFD-ALM-CU-0014	1	31.01.2019
ALM-PRO-4173	RFD for CU CoG position	FLX-RFD-ALM-CU-0015	1	31.01.2019
ALM-PRO-4174	RFD Optical Cube	FLX-RFD-ALM-CU-0016	1	31.01.2019
ALM-PRO-4175	RFD Motor Power consumption	FLX-RFD-ALM-CU-0017	1	01.02.2019
ALM-PRO-4182	RFD Random level notch	FLX-RFD-ALM-CU-0018	1	01.02.2019

4 EQM & PFM List of Drawing and family tree

Type	Part Number	Revision	Title
Assembly	ALM-DES-225-0002	A	FLEX FLORIS Calibration Unit EQM - Assy
Part	ALM-STB-2794		Washer, LN 9016, M3
Part	ALM-STA-4242	A	Screw, Cheese H, double Hex socket, LN29949_Mod, MJ3x0.5x10
Part	ALM-STB-1087		Washer M6 LN 9016-06 L
Part	ALM-STA-4241	A	Screw, Cheese H, double Hex socket, LN29949_Mod, MJ6x1x14
	Bill of Material: ALM-DES-225-0002		
Type	Part Number	Revision	Title
Assembly	ALM-DES-225-0100	A	CU Stator - Assy
Assembly	ALM-DES-225-0200	A	CU Rotor - Assy
Part	ALM-DES-225-0016	A	Spacer
Part	ALM-DES-225-0017	A	Spacer
Part	ALM-DES-225-0010	A	Entry Nadir Cover
Part	ALM-DES-225-0011	A	Exit Nadir Cover
Part	ALM-DES-225-0012	A	Entry Sun Cover
Part	ALM-DES-225-0015	A	Black Target Cover
Part	ALM-STB-4170	-	High-Purity Check Valve
Part	ALM-COT-3160	-	Plug, hex head screw, DIN910, G1/4
Part	ALM-STA-4089	A	Washer, M2, (Ø2.2x4.5x0.3)
Part	ALM-STA-4269	A	Screw, Low head, Torx socket, ISO 14580_Mod, MJ2x0.4x6
Part	ALM-STA-4268	A	Screw, Low head, Torx socket, ISO 14580_Mod, MJ2x0.4x5
	Bill of Material: ALM-DES-225-0100		
Type	Part Number	Revision	Title
Part	ALM-DES-225-0101	A	Base support
Part	ALM-DES-225-0102	A	Housing
Part	ALM-DES-225-0103	A	Stator Interbaffle
Part	ALM-DES-225-0104	A	Baffle 1
Part	ALM-DES-225-0107	A	Baffle 0
Part	ALM-DES-225-0108	A	Housing Junction Instrument Aperture
Part	ALM-DES-225-0109	A	Baffle 7
Part	ALM-DES-225-0110	A	Adapter

Assembly	ALM-DES-225-0120	A	Switch Support Sun Target - Assy
Assembly	ALM-DES-225-0111	A	Switch Support Reset Target - Assy
Part	ALM-DES-225-0113	A	Potting cover
Part	ALM-DES-225-0114	A	Housing Junction Earth Aperture
Part	ALM-DES-225-0115	A	Potting base
Part	ALM-DES-225-0117	A	Bonding stud
Assembly	ALM-DES-225-0122	A	Hall Sensor Support - Assy
Assembly	ALM-DES-225-0129	A	Harmonic Drive - Assy
Part	ALM-DES-225-0137	A	End Stop
Assembly	ALM-DES-225-0400	A	Sun Baffle - Assy
Assembly	ALM-DES-225-0500	A	Electronique composants - Assy
Part	ALM-COT-0039	-	Helicoil, Free running, DIN8140, M3x1.5D
Part	ALM-COT-0288	-	Helicoil, Free running, DIN8140, M3x1D
Part	ALM-COT-0729	-	Helicoil, Free running, DIN8140, M6x1D
Part	ALM-COT-0287	-	Helicoil, Free running, DIN8140, M2x1D
Part	ALM-STB-4104	-	Pin, Parallel, Hardened, Ø2x6
Part	ALM-STA-4089	A	Washer, M2, (Ø2.2x4.5x0.3)
Part	ALM-STA-4168	A	Nut, Hex, M2, 0.5xd
Part	ALM-STA-4269	A	Screw, Low head, Torx socket, ISO 14580_Mod, MJ2x0.4x6
Part	ALM-STB-2794		Washer, LN 9016, M3
Part	ALM-STA-4263	A	Screw, Cheese H, double Hex socket, LN29949_Mod, MJ3x0.5x6
Part	ALM-STA-4261	A	Screw, Cheese H, double Hex socket, LN29949_Mod, MJ3x0.5x12
Part	ALM-STA-4262	A	Screw, Cheese H, double Hex socket, LN29949_Mod, MJ3x0.5x8
Part	ALM-STA-4242	A	Screw, Cheese H, double Hex socket, LN29949_Mod, MJ3x0.5x10
Part	ALM-STA-4268	A	Screw, Low head, Torx socket, ISO 14580_Mod, MJ2x0.4x5
Part	ALM-STA-4273	A	Screw, Low head, Torx socket, ISO 14580_Mod, MJ2x0.4x5
Part	ALM-STA-4274	A	Washer, LN9016_Mod, M1.6 (Ø4x1.7x0.3)
Part	ALM-STA-4272	A	Screw, countersunk head, Slotted flat, ISO2009_Mod, M1.6x5
Part	ALM-STA-4267	A	Screw, cyl head, 6P socket, F. threaded, ISO4762_Mod, M1.6x4
Part	ALM-STB-0626		Scotch-Weld EC-2216

	Bill of Material: ALM-DES-225-0120		
Type	Part Number	Revision	Title
Part	ALM-DES-225-0116	A	Switch Support
Part	ALM-DES-225-0132	A	Switch Locker
Part	ALM-COT-0287	-	Helicoil, Free running, DIN8140, M2x1D
Part	ALM-DES-225-0112	A	Locking pad
Part	ALM-STA-4265	A	Screw, countersunk head, torx socket, ISO14581_Mod, MJ2x0.4x4
Part	ALM-DES-225-0121	A	Switch shim sun target
	Bill of Material: ALM-DES-225-0111		
Type	Part Number	Revision	Title
Part	ALM-DES-225-0116	A	Switch Support
Part	ALM-DES-225-0132	A	Switch Locker
Part	ALM-COT-0287	-	Helicoil, Free running, DIN8140, M2x1D
Part	ALM-DES-225-0112	A	Locking pad
Part	ALM-STA-4265	A	Screw, countersunk head, torx socket, ISO14581_Mod, MJ2x0.4x4
Part	ALM-DES-225-0119	A	Switch shim reset target
	Bill of Material: ALM-DES-225-0122		
Type	Part Number	Revision	Title
Part	ALM-DES-225-0123	A	Hall support
Part	ALM-DES-225-0124	A	Micro-pin
Part	ALM-DES-225-0125	A	Right-threaded block
Part	ALM-DES-225-0126	A	Adjusting screw
Part	ALM-DES-225-0130	A	Left-threaded block
Part	ALM-DES-225-0131	A	Locker screw
Part	ALM-DES-225-0135	A	Hall sensor shielding
Part	ALM-COT-0268	-	Helicoil, Free running, DIN8140, M2x1.5D
Part	ALM-STB-0626		Scotch-Weld EC-2216
Part	ALM-DES-225-0133	A	Hall Sensor Shim
	Bill of Material: ALM-DES-225-0129		
Type	Part Number	Revision	Title

Part	ALM-STB-4250	-	Harmonic Drive CPL-14A-100-2A-SP
Part	ALM-DES-225-0127	A	Harmonic Drive Adapter
Part	ALM-DES-225-0128	A	Harmonic Drive Reverse Adapter
Part	ALM-COT-0039	-	Helicoil, Free running, DIN8140, M3x1.5D
Part	ALM-STB-2794		Washer, LN 9016, M3
Part	ALM-STA-4262	A	Screw, Cheese H, double Hex socket, LN29949_Mod, MJ3x0.5x8
Part	ALM-COT-0288	-	Helicoil, Free running, DIN8140, M3x1D
	Bill of Material: ALM-DES-225-0400		
Type	Part Number	Revision	Title
Part	ALM-DES-225-0401	A	Sun Baffle 0
Part	ALM-DES-225-0402	A	Sun Baffle 1
Part	ALM-DES-225-0403	A	Sun Baffle 2
Part	ALM-DES-225-0404	A	Sun Baffle 3
Part	ALM-DES-225-0405	A	Sun Baffle 4
Part	ALM-DES-225-0406	A	Sun Baffle 5
Part	ALM-DES-225-0407	A	Sun Baffle 6
Part	ALM-DES-225-0408	A	Sun Baffle 7
Part	ALM-DES-225-0409	A	Sun Baffle 8
Part	ALM-DES-225-0410	A	Sun Interbaffle 1
Part	ALM-DES-225-0411	A	Sun Interbaffle 2
Part	ALM-DES-225-0412	A	Sun Interbaffle 3
Part	ALM-DES-225-0413	A	Sun Interbaffle 4
Part	ALM-DES-225-0414	A	Sun Interbaffle 5
Part	ALM-DES-225-0415	A	Sun Interbaffle 6
Part	ALM-DES-225-0416	A	Sun Interbaffle 7
Part	ALM-DES-225-0417	A	Sun Interbaffle 8
Part	ALM-STB-4104	-	Pin, Parallel, Hardened, Ø2x6
Part	ALM-STA-4089	A	Washer, M2, (Ø2.2x4.5x0.3)
Part	ALM-STA-4268	A	Screw, Low head, Torx socket, ISO 14580_Mod, MJ2x0.4x5
Part	ALM-STA-4168	A	Nut, Hex, M2, 0.5xd
Part	ALM-COT-0287	-	Helicoil, Free running, DIN8140, M2x1D
Part	ALM-STA-4269	A	Screw, Low head, Torx socket, ISO 14580_Mod, MJ2x0.4x6
	Bill of Material: ALM-DES-225-0500		

Type	Part Number	Revision	Title
Part	ALM-STB-4249	-	Thermistor PT1000
Part	ALM-STB-4246	-	Connector 340100102B DBM 44S NMB
Part	ALM-STB-4247	-	Connector 340100101B DAM 15P NMB
Part	ALM-STB-4259	-	Backshells connector 15P
Part	ALM-STB-4260	-	Backshells connector 44P
Part	ALM-STB-4169	-	Motor PhySpace 42
Part	ALM-STB-4171	-	Hall-Effect Sensor OMH090S
Part	ALM-STB-4248	-	Ruag switch
Part	ALM-DES-225-0134	A	Hall Sensor PCB
Part	ALM-DES-225-0502	A	Wire Hall sensor to PCB [50mm]
Part	ALM-DES-225-0503	A	Wire PCB 4 Main [280mm]
Part	ALM-DES-225-0504	A	Wire PCB 2 Main [360mm]
Part	ALM-DES-225-0505	A	Wire PCB 1 Main [320mm]
Part	ALM-DES-225-0506	A	Wire Switch 4 [300mm]
Part	ALM-DES-225-0507	A	Wire Switch 2 [300mm]
Part	ALM-DES-225-0508	A	Wire Switch 3 [400mm]
Part	ALM-DES-225-0509	A	Wire Switch 1 [400mm]
Part	ALM-DES-225-0510	A	Wire Thermistor 1 [300mm]
Part	ALM-DES-225-0511	A	Wire Thermistor 2 [350mm]
Part	ALM-DES-225-0514	A	Wire Motor Thermistor Redundant [350mm]
Part	ALM-DES-225-0520	A	Wire Motor Thermistor Main [350mm]
Part	ALM-DES-225-0513	A	Wire Motor A Main [350mm]
Part	ALM-DES-225-0519	A	Wire Motor B Main [350mm]
Part	ALM-DES-225-0521	A	Wire Motor A Redundant [350mm]
Part	ALM-DES-225-0522	A	Wire Motor B Redundant [350mm]
Part	ALM-DES-225-0523	A	Wire PCB 2 Redundant [360mm]
Part	ALM-DES-225-0524	A	Wire PCB 4 Redundant [280mm]
Part	ALM-DES-225-0525	A	Wire PCB 1 Redundant [320mm]
	Bill of Material: ALM-DES-225-0200		
Type	Part Number	Revision	Title
Part	ALM-DES-225-0201	A	Carousel
Part	ALM-DES-225-0204	A	Black Mirror
Part	ALM-DES-225-0206	A	Bearing cover
Part	ALM-DES-225-0207	A	Reflective Round wall
Part	ALM-DES-225-0211	A	Balancing Mass

Part	ALM-DES-225-0213	A	Super duplex ball bearing
Part	ALM-DES-225-0215	A	Stiffener 1
Part	ALM-DES-225-0216	A	Stiffener 2
Assembly	ALM-DES-225-0220	A	Magnet - Assy
Assembly	ALM-DES-225-0210	A	Sun diffuser - Assy
Part	ALM-DES-225-0225	A	Nadir shim foot 1
Part	ALM-DES-225-0226	A	Nadir shim foot 2
Part	ALM-DES-225-0227	A	Nadir shim foot 3
Part	ALM-DES-225-0228	A	Nadir shim foot 4
Part	ALM-DES-225-0229	A	Stiffener shim Nadir 1
Part	ALM-DES-225-0230	A	Stiffener shim Nadir 2
Part	ALM-DES-225-0231	A	Stiffener shim Nadir 3
Part	ALM-DES-225-0232	A	Stiffener shim Nadir 4
Part	ALM-DES-225-0233	A	Stiffener shim Nadir 5
Part	ALM-DES-225-0234	A	Stiffener shim Nadir 6
Part	ALM-DES-225-0235	A	Nadir shim round wall 1
Part	ALM-DES-225-0236	A	Nadir shim round wall 2
Part	ALM-DES-225-0237	A	Carousel shim round wall
Part	ALM-DES-225-0238	A	End Stop
Part	ALM-DES-225-0239	A	Carousel shim bearing
Assembly	ALM-DES-225-0300	A	Nadir Baffle - Assy
Part	ALM-STB-0746		Washer M4 LN 9016
Part	ALM-STB-2794		Washer, LN 9016, M3
Part	ALM-STA-4242	A	Screw, Cheese H, double Hex socket, LN29949_Mod, MJ3x0.5x10
Part	ALM-STA-4275	A	Screw, Cheese H, double Hex socket, LN29949_Mod, MJ4x0.7x10
Part	ALM-COT-0509	-	Helicoil, Free running, DIN8140, M4x1D
Part	ALM-COT-0288	-	Helicoil, Free running, DIN8140, M3x1D
Part	ALM-COT-0039	-	Helicoil, Free running, DIN8140, M3x1.5D
Part	ALM-STA-4262	A	Screw, Cheese H, double Hex socket, LN29949_Mod, MJ3x0.5x8
Part	ALM-COT-0287	-	Helicoil, Free running, DIN8140, M2x1D
Part	ALM-STA-4089	A	Washer, M2, (Ø2.2x4.5x0.3)
Part	ALM-STB-4104	-	Pin, Parallel, Hardened, Ø2x6
Part	ALM-STA-4268	A	Screw, Low head, Torx socket, ISO 14580_Mod, MJ2x0.4x5
Part	ALM-STA-4269	A	Screw, Low head, Torx socket, ISO 14580_Mod, MJ2x0.4x6

Part	ALM-COT-0268	-	Helicoil, Free running, DIN8140, M2x1.5D
Part	ALM-STA-4270	A	Screw, Low head, Torx socket, ISO 14580_Mod, MJ2x0.4x8
Part	ALM-STA-4261	A	Screw, Cheese H, double Hex socket, LN29949_Mod, MJ3x0.5x12
	Bill of Material: ALM-DES-225-0220		
Type	Part Number	Revision	Title
Part	ALM-DES-225-0221	A	Magnet
Part	ALM-DES-225-0222	B	Magnet support
Part	ALM-DES-225-0223	A	Tip
Part	ALM-DES-225-0224	A	Magnet stop
Part	ALM-STB-0626		Scotch-Weld EC-2216
	Bill of Material: ALM-DES-225-0210		
Type	Part Number	Revision	Title
Part	ALM-DES-225-0014	A	Sun Diffuser Cover
Part	ALM-DES-225-0203	A	Sun Diffuser
Part	ALM-DES-225-0202	A	Sun Diffuser Frame
Part	ALM-DES-225-0205	A	Sun Diffuser Clamping
Part	ALM-DES-225-0212	A	Shim
Part	ALM-DES-225-0214	A	Round shim
Part	ALM-DES-225-0217	A	Ajustable support
Part	ALM-DES-225-0218	A	Cache
Part	ALM-STA-4266	A	Screw, countersunk head, torx socket, ISO14581_Mod, MJ2x0.4x6
Part	ALM-STA-4271	A	Screw, countersunk head, torx socket, ISO14581_Mod, MJ2x0.4x12
Part	ALM-STA-4272	A	Screw, countersunk head, Slotted flat, ISO2009_Mod, M1.6x5
Part	ALM-COT-0268	-	Helicoil, Free running, DIN8140, M2x1.5D
Part	ALM-COT-0287	-	Helicoil, Free running, DIN8140, M2x1D
Part	ALM-COT-4229	-	Unlosable Screw, cyl head, 6P socket, P. threaded, M2x10
Part	ALM-COT-2033	-	Washer, ISO7089, M2 (Ø2.2x5x0.3)
Part	ALM-DES-225-0219	A	Special screw M1.6x5
	Bill of Material: ALM-DES-225-0300		

Type	Part Number	Revision	Title
Part	ALM-DES-225-0310	A	Baffle Junction 1
Part	ALM-DES-225-0314	A	Baffle 2
Part	ALM-DES-225-0315	A	Interbaffle 1
Part	ALM-DES-225-0302	A	Baffle 3
Part	ALM-DES-225-0307	A	Interbaffle 2
Part	ALM-DES-225-0303	A	Baffle 4
Part	ALM-DES-225-0308	A	Interbaffle 3
Part	ALM-DES-225-0304	A	Baffle 5
Part	ALM-DES-225-0309	A	Interbaffle 4
Part	ALM-DES-225-0316	A	Baffle 6
Part	ALM-DES-225-0311	A	Baffle Junction 2
Part	ALM-STB-4104	-	Pin, Parallel, Hardened, Ø2x6
Part	ALM-STA-4089	A	Washer, M2, (Ø2.2x4.5x0.3)
Part	ALM-STA-4168	A	Nut, Hex, M2, 0.5xd
Part	ALM-STA-4268	A	Screw, Low head, Torx socket, ISO 14580_Mod, MJ2x0.4x5
Part	ALM-COT-0287	-	Helicoil, Free running, DIN8140, M2x1D
Part	ALM-COT-0288	-	Helicoil, Free running, DIN8140, M3x1D

5 STM List of Drawing and family tree

Type	Part Number	Revision	Title
Assembly	ALM-DES-225-1000	C	FLEX FLORIS Calibration Unit STM - Assy
Part	ALM-DES-225-1001	A	FLEX FLORIS Calibration Unit Dummy
Part	ALM-DES-225-1002	A	Motor Heat tape
Part	ALM-DES-225-1003	A	Sensor Heat tape
Part	ALM-DES-225-1005	A	Electrical wires for Heaters (AWG-26 / 40m)
Part	ALM-COT-4253	A	Connector 340100101B DAM 15P NMB
Part	ALM-COT-4251	A	Thermistor PT1000
Part	ALM-COT-0288	-	Helicoil, Free running, DIN8140, M3x1D
Part	ALM-COT-0729	-	Helicoil, Free running, DIN8140, M6x1D
Part	ALM-STB-1087	-	Washer M6 LN 9016-06 L
Part	ALM-STB-2794	-	Washer, LN 9016, M3
Part	ALM-STB-4245	-	Screw, Cheese H, double Hex socket, LN29949, MJ6x1x14
Part	ALM-STB-4242	A	Screw, Cheese H, double Hex socket, LN29950, MJ3x0.5x10
Part	ALM-STB-0626	-	Scotch-Weld EC-2216
Part	ALM-COT-4255	-	Backshells connector 15P

6 CUIS List of Drawing and family tree

Type	Part Number	Revision	Title
Assembly	ALM-DES-225-2000	B	FLEX FLORIS Calibration Unit CUIS - Assy
Assembly	ALM-DES-225-2001	B	FLEX FLORIS Calibration Unit CUIS - Assy
Assembly	ALM-DES-225-2100	A	CU Stator - Assy
Part	ALM-DES-225-2101	A	Base support
Part	ALM-DES-225-2110	A	Adapter
Part	ALM-DES-225-2130	A	Base support bearing adapter
Part	ALM-COT-0039	-	Helicoil, Free running, DIN8140, M3x1.5D
Part	ALM-COT-0102	-	Washer, ISO7092, M3 (Ø3.2x6x0.5)
Part	ALM-COT-0289	-	Screw, low head, Torx socket, ISO14580, M3x12

Type	Part Number	Revision	Title
Part	ALM-COT-0462	-	Screw, low head, Torx socket, ISO14580, M3x8
Part	ALM-COT-0099	-	Screw, low head, Torx socket, ISO14580, M3x10
Part	ALM-COT-0229	-	Screw, low head, Torx socket, ISO14580, M2x5
Part	ALM-COT-0122	-	Washer, ISO7089, M8 (Ø8.4x16x1.6)
Part	ALM-COT-2141	-	Screw, hex head, ISO4017, M8x80
Part	ALM-COT-4238	-	Levelling foot Ø40x25
Part	ALM-COT-0087	-	Nut, Hex, ISO4032, M8, 0.8xd
Part	ALM-COT-4146	-	Poignée Tubulaire
Part	ALM-COT-0711	-	Screw, hex head, ISO4017, M8x20
Part	ALM-DES-225-2136	A	Location indicator
Part	ALM-COT-0509	-	Helicoil, Free running, DIN8140, M4x1D
Part	ALM-COT-0957	-	Washer, ISO7089, M4 (Ø4.3x9x0.8)
Part	ALM-COT-1865	-	Screw, pan head, Torx socket, ISO14583, M4x10
Part	ALM-COT-0288	-	Helicoil, Free running, DIN8140, M3x1D
Part	ALM-COT-0121	-	Washer, ISO7089, M2 (Ø2.2x5x0.3)
Part	ALM-COT-0409	-	Screw, low head, Torx socket, ISO14580, M2x12
Part	ALM-COT-1064	-	Screw, low head, Torx socket, ISO14580, M3x16
Part	ALM-DES-225-2139	A	Mechanical stop
Part	ALM-COT-4258	-	Earth Strap
Part	ALM-COT-2131	-	Screw, hex head, ISO4017, M8x10
Assembly	ALM-DES-225-0111	A	Switch Support Reset Target - Assy
Part	ALM-DES-225-0116	A	Switch Support
Part	ALM-DES-225-0132	A	Switch Locker
Part	ALM-COT-0287	-	Helicoil, Free running, DIN8140, M2x1D
Part	ALM-DES-225-0112	A	Locking pad
Part	ALM-STA-4207	A	Screw, countersunk head, torx socket, ISO14581, M2x4
Part	ALM-DES-225-0119	A	Switch shim reset target
Assembly	ALM-DES-225-0122	A	Hall Sensor Support
Part	ALM-DES-225-0123	A	Hall support
Part	ALM-DES-225-0124	A	Micro-pin
Part	ALM-DES-225-0125	A	Right-threaded block
Part	ALM-DES-225-0126	A	Adjusting screw
Part	ALM-DES-225-0130	A	Left-threaded block
Part	ALM-DES-225-0131	A	Locker screw

Type	Part Number	Revision	Title
Part	ALM-DES-225-0135	A	Hall sensor shielding
Part	ALM-COT-0287	-	Helicoil, Free running, DIN8140, M2x1D
Part	ALM-STB-0626	-	Scotch-Weld EC-2216
Part	ALM-DES-225-0133	A	Hall Sensor Shim
Assembly	ALM-DES-225-2129	A	Harmonic Drive - Assy
Part	ALM-COT-4257	A	Harmonic Drive CPL-14A-100-2A-1
Part	ALM-DES-225-2127	A	Harmonic Drive Adapter
Part	ALM-DES-225-2128	A	Harmonic Drive Reverse Adapter
Part	ALM-STA-4089	A	Washer, M2, (Ø2.2x4.5x0.3)
Part	ALM-STA-4077	A	Screw, Low head, Torx socket, MJ2x0.4x6
Part	ALM-COT-0287	-	Helicoil, Free running, DIN8140, M2x1D
Part	ALM-COT-0288	-	Helicoil, Free running, DIN8140, M3x1D
Assembly	ALM-DES-225-2500	A	Electronique composants - Assy
Part	ALM-COT-0131	-	Switch Baumer B75_80
Part	ALM-COT-4251	A	Thermistor PT1000
Part	ALM-COT-4252	A	Connector 340100102B DBM 44S NMB
Part	ALM-COT-4253	A	Connector 340100101B DAM 15P NMB
Part	ALM-COT-4254	-	Hall-Effect Sensor OMH090
Part	ALM-STB-4169	-	Motor VSS 42
Part	ALM-DES-225-0134	A	Hall Sensor PCB
Part	ALM-COT-4256	-	Backshells connector 44P
Part	ALM-COT-4255	-	Backshells connector 15P

Assembly	ALM-DES-225-2200	A	CU Rotor - Assy
----------	------------------	---	-----------------

Part	ALM-DES-225-2201	A	Carousel
Part	ALM-DES-225-2206	A	Bearing cover
Part	ALM-DES-225-0213	A	Super duplex ball bearing
Part	ALM-DES-225-2136	A	Location indicator
Part	ALM-DES-225-2137	A	Location indicator 1°
Part	ALM-DES-225-2230	A	Switch end stop
Part	ALM-COT-0102	-	Washer, ISO7092, M3 (Ø3.2x6x0.5)
Part	ALM-COT-0039	-	Helicoil, Free running, DIN8140, M3x1.5D
Part	ALM-COT-0462	-	Screw, low head, Torx socket, ISO14580, M3x8
Part	ALM-COT-0099	-	Screw, low head, Torx socket, ISO14580, M3x10
Part	ALM-COT-1865	-	Screw, pan head, Torx socket, ISO14583, M4x10

Type	Part Number	Revision	Title
Part	ALM-COT-0509	-	Helicoil, Free running, DIN8140, M4x1D
Part	ALM-COT-2062	-	Washer, ISO7093, M4 (Ø4.3x12x1)
Part	ALM-COT-0957	-	Washer, ISO7089, M4 (Ø4.3x9x0.8)
Part	ALM-COT-4244	-	Pin, Parallel, Ø0.8±0.002x5
Part	ALM-COT-0507	-	Helicoil, Free running, DIN8140, M2x2D
Part	ALM-DES-225-2235	A	Support incoder
Part	ALM-COT-1867	-	Screw, pan head, Torx socket, ISO14583, M4x16
Part	ALM-COT-1014	-	Nut, Hex, ISO4035, M4, 0.5xd
Part	ALM-COT-0267	-	Screw, low head, Torx socket, ISO14580, M2x8
Assembly	ALM-DES-225-0220	A	Magnet - Assy
Part	ALM-DES-225-0221	A	Magnet
Part	ALM-DES-225-0222	A	Magnet support
Part	ALM-DES-225-0223	A	Tip
Part	ALM-DES-225-0224	A	Magnet stop
Part	ALM-STB-0626	-	Scotch-Weld EC-2216
Assembly	ALM-DES-225-2231	A	Dummy Round Wall - Assy
Part	ALM-DES-225-2207	A	Dummy Round Wall Tube
Part	ALM-DES-225-2232	A	Dummy Round Wall Support Plate
Part	ALM-DES-225-2233	A	Dummy Round Wall Upper Plate

7 NCR/RFD/RFW/RFA STATUS

Described in a separate document FLX-LI-ALM-CU-0011.