Base Load Power Hub (BLPH)

DC UPS - FACTORY ACCEPTANCE TEST PROCEDURE

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3W power | a company of AEG POWER SOLUTIONS

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Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
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HOLDS LIST

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1	
2	
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4	

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Base Load Power Hub (BLPH)

DC UPS - TAG: UP-200F1
FACTORY ACCEPTANCE TEST PROCEDURE

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Project	Hollandse Kust Noord (HKN) wind farm
Client	ROSETTI MARINO
Equipment/s to be tested during FAT	1 x 2TPRE 110V 100A 10x FLG12-150 (CHARG.1) 1 x 2TPRE 110V 100A 10x FLG12-150 (CHARG.2)
Serial number	TPRE 3855/01 TPRE 3855/02
Order number	4400007526 (OV59193)

Participants:

TESTED BY	WITNESSED BY	DATE

Name	Company	Signature

☐ ACCEPTED ☐ ACCEPTED WITH COMMENTS ☐ REFUSED

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1. SCOPE

The scope of this document is to describe the test procedure to follow during the factory acceptance test of the system, and to record the values measured during the tests.

List of equipment within the scope of the PO:

EQUIPMENTS			
TAG	***Serial Number***	***Code***	***Description***
	TPRE3855/01	*ES521464A1*	*2x TPRE 110V 100A 10x FLG12-150 (CHARG.1)*
	TPRE3855/02	*ES521464A2*	*2x TPRE 110V 100A 10x FLG12-150 (CHARG.2)*
		ES521464R1	*SPARES 2x TPRE 110V 100A 10x FLG12-150*
		ES521464R2	*SPA.2YEARS 2x TPRE 110V 100A 10x FLG12-150*

List of equipment subjected to FAT:

EQUIPMENTS			
TAG	***Serial Number***	***Code***	***Description***
	TPRE3855/01	*ES521464A1*	*2x TPRE 110V 100A 10x FLG12-150 (CHARG.1)*
	TPRE3855/02	*ES521464A2*	*2x TPRE 110V 100A 10x FLG12-150 (CHARG.2)*

2. REFERENCE DOCUMENTS

ref. **1724000372-EL-DA-00003** DC UPS - GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS
ref. **1724000372-EL-DG-00006** DC UPS - SINGLE LINE DIAGRAM and INTERCONNECTING DIAGRAM
ref. **1724000372-EL-DG-00008** DC UPS - WIRING DIAGRAM & TERMINAL SCHEDULE

These documents include the electrical values, single line drawing, electrical drawing, internal mechanical layout and general arrangement drawing.

3. TESTING EQUIPMENT

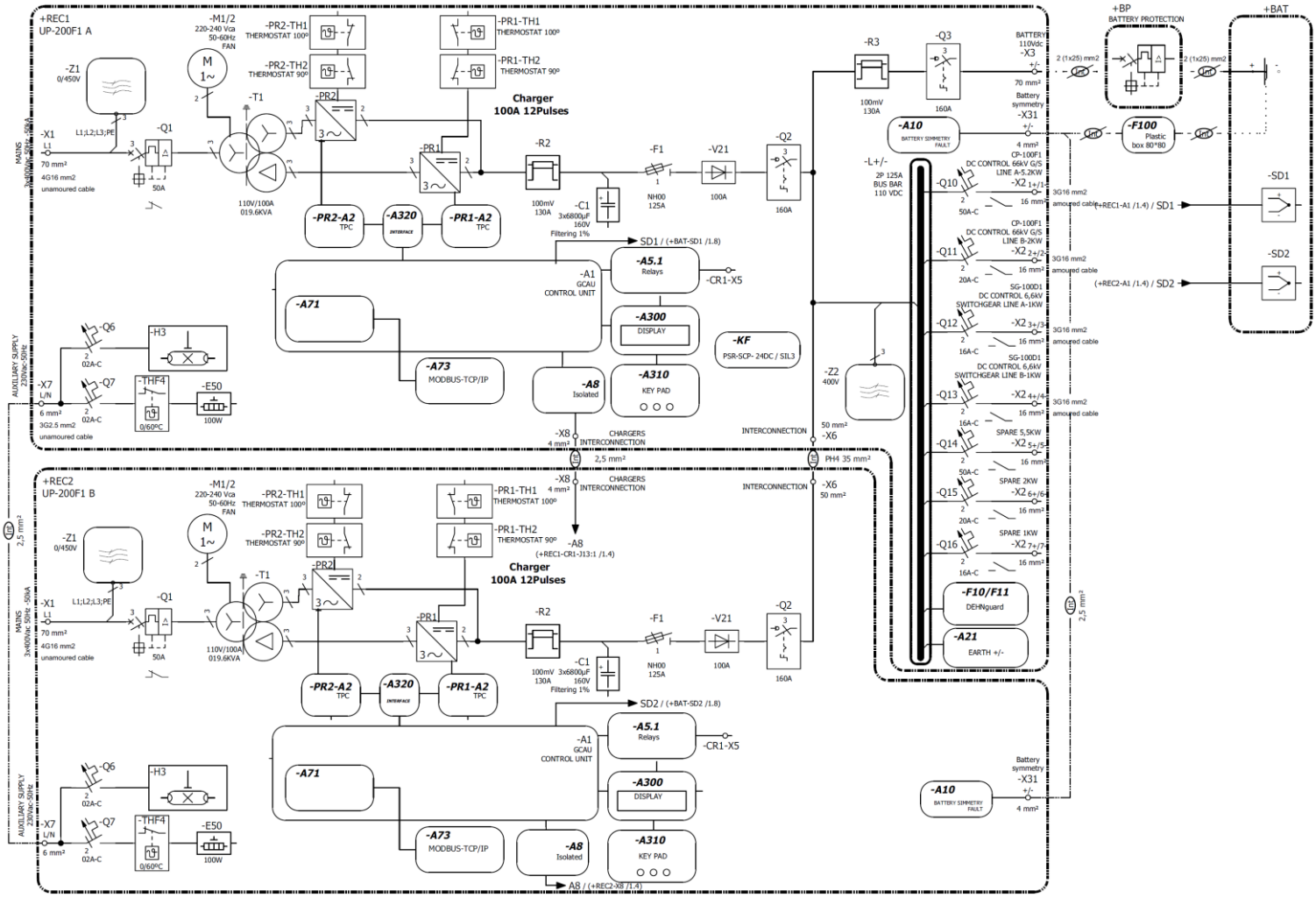
MEASURING DEVICE	SERIAL NUMBER	CALIBRATED UNTIL
MULTIMETER		
MULTIMETER		
CURRENT CLAMP		
OSCILLOSCOPE		
MAINS VOLTAGE VARIATOR		
RESISTIVE ADJUSTABLE LOAD		

AEG internal testing battery bank: The client's batteries are never subjected to tests. Therefore, they are never connected for FAT development.

Calibration certificates can be provided upon request for all testing equipment.

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4. CONNECTION DIAGRAM



5. VISUAL INSPECTION

5.1. General construction

Check	Conformity with drawings
Location and labelling components identifications	
Cabinet TAGs labelling	
Cabinet name plate	
Paint (RAL7035)	
Protection degree (IP43)	
Dimensional check	
Cabling (numbering, crimping) & assembly (connection torque)	

5.2. Protections

Check	Conformity with drawings
Mains protections	
Load protections	
Battery switch/Breaker/Fuse	
Auxiliary devices protections	
Provision for cabinet earthing (bar X0, ground cabling)	

6. FUNCTIONAL INSPECTION

6.1. Static test

Ambient temperature during the tests: ……. °C

6.2. Functional test

Initial state : Charger is OFF
Input circuit breaker Q1 is open
Output switch (Q2) and battery switch (Q3) are open

Starting : Charger is powered ON by closing the input circuit breaker Q1
Output switch (Q2) and battery switch (Q3) are closed
Only the charger subject to the test is ON
The mains is adjusted to its nominal value

Test description : The load is adjusted to 10, 50 and 100% of the system nominal load
The input and output electrical values are recorded and shall remain within the acceptance criteria
The tests are done in floating and high rate mode

Rectifier and load output voltage : CHARGER 1

Mode	Rectifier output power	AC mains voltage	Rectifier output current	Rectifier output voltage to obtain (VBAT)	Measured rectifier output voltage	Load output voltage to obtain (VBAT-V21)	Measured load output voltage	Conformity (Yes/No)
Floating	10%	3x400Vac	10A	136,8V +/-1%	V	136,1V+/-1%	V	
Floating	50%	3x400Vac	50A	136,8V +/-1%	V	136,1V+/-1%	V	
Floating	100%	3x400Vac	100A	136,8V +/-1%	V	136,1V+/-1%	V	
High rate	10%	3x400Vac	10A	136,8V +/-1%	V	136,1V+/-1%	V	
High rate	50%	3x400Vac	50A	136,8V +/-1%	V	136,1V+/-1%	V	
High rate	100%	3x400Vac	100A	136,8V +/-1%	V	136,1V+/-1%	V	

(*) The rectifier voltage shall be corrected with the temperature compensation ratio if applicable.

Rectifier output ripple voltage: CHARGER1

Mode	Rectifier output power	AC mains voltage	Rectifier output current	Ripple voltage to obtain	Measured ripple voltage	Conformity (Yes/No)
Floating	100%	3x400V	100A	<5% of U nominal DC without battery		

Rectifier and load output voltage : CHARGER 2

Mode	Rectifier output power	AC mains voltage	Rectifier output current	Rectifier output voltage to obtain (VBAT)	Measured rectifier output voltage	Load output voltage to obtain (VBAT-V21)	Measured load output voltage	Conformity (Yes/No)
Floating	10%	3x400Vac	10A	136,8V +/-1%	V	136,1V+/-1%	V	
Floating	50%	3x400Vac	50A	136,8V +/-1%	V	136,1V+/-1%	V	
Floating	100%	3x400Vac	100A	136,8V +/-1%	V	136,1V+/-1%	V	
High rate	10%	3x400Vac	10A	136,8V +/-1%	V	136,1V+/-1%	V	
High rate	50%	3x400Vac	50A	136,8V +/-1%	V	136,1V+/-1%	V	
High rate	100%	3x400Vac	100A	136,8V +/-1%	V	136,1V+/-1%	V	

(*) The rectifier voltage shall be corrected with the temperature compensation ratio if applicable.

Rectifier output ripple voltage: CHARGER 2

Mode	Rectifier output power	AC mains voltage	Rectifier output current	Ripple voltage to obtain	Measured ripple voltage	Conformity (Yes/No)
Floating	100%	3x400V	100A	<5% of U nominal DC without battery		

6.3. Alarm test

Description	*Relay*	*Display*	*LED Box*	*Result (OK/NOK/Not applicable)*	
				CH 1	**CH 2**
MAINS FAULT					
RECTIFIER FAULT					
HIGH VOLTAGE C.C					
LOW VOLTAGE D.C.					
BATTERY LOW VOLTAGE					
EARTH FAULT +					
EARTH FAULT -					
COMMON ALARM					

7. ADDITIONAL TESTS

7.1. Parallel redundancy tests

Initial state : Both chargers are OFF
Input breakers Q1 are open
Output switches (Q2) and battery switch (Q3) are open

Starting : Chargers are powered ON by closing input breakers Q1
Output switches Q1 are closed to put the two chargers in parallel
Battery switch Q3 remains open to simulate the worst condition (no battery)
The 2x chargers are now working and connected in parallel (floating mode)
The load is adjusted to 100% of the system nominal load
The mains is adjusted to its nominal value

Test description : To initiate the load transfer from redundant chargers to one charger, the relevant charger is stopped from mains
To initiate the load transfer to initial state, the relevant charger is turned ON from mains

Load transfer between the 2 chargers

Test	*Load transfer to charger 2*	*Recovery to initial state*	*Load transfer to charger 1*	*Recovery to initial state*
Acceptance criteria	No load supply interruption, the second charger takes 100% of the load	No load supply interruption. Return to dual redundant mode	No load supply interruption, the second charger takes 100% of the load	No load supply interruption. Return to dual redundant mode
Conclusion the test (OK/NOK)				

7.2. Performance tests

Check	Conformity with drawings
Insulation test (review of the routine test reports)	
Rectifier Current limitation	
Battery Current limitation	
Burn in test 24 hours to 1 charger	

8. COMMENTS

9. APPENDICES

Document	Document reference
CHARGER 1 routine test reports	
CHARGER 2 routine test reports	