Base Load Power Hub (BLPH)

SG-100D1 - CURRENT and VOLTAGE TRANSFORMER SIZING CALCULATION and FUSE RATING

Document Number: 1723002197-EL-CAL-00014

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
Luca Moceri	01/08/2024

Document Class: 3

Rev.	Date	Description	Prepared	Reviewed	Approved
3	30/07/2024	Issue for Information (IFI)	Gambirasio	Flamminio	Sigismondi
2	01/07/2024	Issue for Information (IFI)	Gambirasio	Flamminio	Sigismondi
1	03/04/2024	Issue for Information (IFI)	Gambirasio	Flamminio	Sigismondi
0	15/03/2024	Issue for Information (IFI)	Gambirasio	Flamminio	Sigismondi

IMESA ELECTRICAL ENGINEERING IMESA Doc. 231115/SD/14

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Revision / Change Log

Rev.	Description
0	Issue for Information (IFI)
1	Issue for Information (IFI)
2	Issue for Information (IFI)
3	Issue for Information (IFI)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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CURRENT & VOLTAGE TRANSFORMER SIZING

SWB: SG-100D1

I_{sc} [kA]= **25**
U_n [kV]= **6.6**
f_n [Hz]= **50**

Document number: 22403-IMG-05-T

REV.:	DATE	DESCRIPTION
00	15/03/2024	First issue
01	29/03/2024	General revision

SELECTY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
USER ID	I_n [A]		TYPE OF EQUIP.	PROT. FUNCT.	I_{1n}/ V_{1n} [A/kV]	I_{2n}/ V_{2n} [A/V]	S_n [VA] / Vk [V]	CLASS	Fl /Fs Ft Iμ @Vk	R_{CT} max at 75° [Ω]	RELAY/INSTRUM. BURDEN [VA]	Rr/Istr. [Ω]	WIRING Type 2/4/6W	WIRING L [m]	WIRING S [mm²]	WIRING R_c [Ω]	LOADING RESISTOR [VA]	REAL LOAD [VA]	TOTAL LOAD %	CALCULATED F'l / F's V_k / S_n		REQUIRED F'l / F's V_k / S_{real}		ACCEPT.
7 MVA INCOMER	585.7		ABB REX640	50/51	600	1	5 VA	5P	20	5.24	0.02	0.020	6	4.0	2.5	0.0685		0.09	2%	Fl	38.4	F'l>	20.0	OK
			ABB REX640	50G	100	1	5 VA	5P	5	1.00	0.02	0.020	2	4.0	2.5	0.0685		0.09	2%	Fl	27.6	F'l>	20.0	OK
			ABB REX640		6.6:√3	0.11:√3	20 VA	Cl. 05+3P	1.9 / 8h		0.05									S_n	20.0	S_n>	0.1	OK
			Available		6.6:√3	0.11:√3	30 VA	Cl. 05+3P	1.9 / 8h											S_n	30.0	S_n>		
			Available		6.6:√3	0.11:3	30 VA	3P	1.9 / 8h											S_n	30.0	S_n>	0.0	OK
Measuring busbar			TBD		6.6:√3	0.11:√3	20 VA	Cl. 05+3P	1.9 / 8h		0.25									S_n	20.0	S_n>	0.3	OK
			TBD		6.6:√3	0.11:√3	30 VA	Cl. 05+3P	1.9 / 8h		1.00									S_n	30.0	S_n>	1.0	OK
			TBD		6.6:√3	0.11:3	30 VA	3P	1.9 / 8h											S_n	30.0	S_n>	0.0	OK
1.25 MVA BESS	109.3		ABB REX640	67	150	1	5 VA	5P	20	1.45	0.02	0.020	6	4.0	2.5	0.0685		0.09	2%	Fl	83.7	F'l>	20.0	OK
			ABB REX640	67G	100	1	5 VA	5P	5	1.00	0.02	0.020	2	4.0	2.5	0.0685		0.09	2%	Fl	27.6	F'l>	20.0	OK
			ABB REX640		6.6:√3	0.11:√3	20 VA	Cl. 05+3P	1.9 / 8h		0.05									S_n	20.0	S_n>	0.1	OK
			Available		6.6:√3	0.11:√3	30 VA	Cl. 05+3P	1.9 / 8h											S_n	30.0	S_n>		
			Available		6.6:√3	0.11:3	30 VA	3P	1.9 / 8h											S_n	30.0	S_n>	0.0	OK
1.25 MVA FUEL CELL	109.3		ABB REX640	67	150	1	5 VA	5P	20	1.45	0.02	0.020	6	4.0	2.5	0.0685		0.09	2%	Fl	83.7	F'l>	20.0	OK
			ABB REX640	67G	100	1	5 VA	5P	5	1.00	0.02	0.020	2	4.0	2.5	0.0685		0.09	2%	Fl	27.6	F'l>	20.0	OK
			ABB REX640		6.6:√3	0.11:√3	20 VA	Cl. 05+3P	1.9 / 8h		0.05									S_n	20.0	S_n>	0.1	OK
			Available		6.6:√3	0.11:√3	30 VA	Cl. 05+3P	1.9 / 8h		1.00									S_n	30.0	S_n>	1.0	OK
			Available		6.6:√3	0.11:3	30 VA	3P	1.9 / 8h											S_n	30.0	S_n>	0.0	OK
0.5 MVA SOLAR	43.7		ABB REX640	67	50	1	2.5 VA	5P	15	0.53	0.02	0.020	6	4.0	2.5	0.0685		0.09	4%	Fl	73.9	F'l>	20.0	OK
			ABB REX640	67G	100	1	5 VA	5P	5	1.00	0.02	0.020	2	4.0	2.5	0.0685		0.09	2%	Fl	27.6	F'l>	20.0	OK
			ABB REX640		6.6:√3	0.11:√3	20 VA	Cl. 05+3P	1.9 / 8h		0.05									S_n	20.0	S_n>	0.1	OK
			Available		6.6:√3	0.11:√3	30 VA	Cl. 05+3P	1.9 / 8h											S_n	30.0	S_n>		
			Available		6.6:√3	0.11:3	30 VA	3P	1.9 / 8h											S_n	30.0	S_n>	0.0	OK
1.6 MVA Transformer feeder	140.0		ABB REX640	50/51	200	1	5 VA	5P	20	1.90	0.02	0.020	6	4.0	2.5	0.0685		0.09	2%	Fl	69.5	F'l>	20.0	OK
			ABB REX640	50G	100	1	5 VA	5P	5	1.00	0.02	0.020	2	4.0	2.5	0.0685		0.09	2%	Fl	27.6	F'l>	20.0	OK
			ABB REX640	51G	2500	1	6 VA	5P	20	19.61	0.02	0.020	2	4.0	2.5	0.0685		0.09	1%	Fl	26.0	F'l>	20.0	OK

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CURRENT & VOLTAGE TRANSFORMER SIZING

SWB: SG-100D1

I_{sc} [kA]= 25
U_n [kV]= 6.6
f_n [Hz]= 50

Document number: 22403-IMG-05-T

SELECTY

REV.:	DATE	DESCRIPTION
00	15/03/2024	First issue
01	29/03/2024	General revision

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
USER ID	I_n [A]		TYPE OF EQUIP.	PROT. FUNCT.	I_{1n}/ V_{1n} [A/kV]	I_{2n}/ V_{2n} [A/V]	S_n [VA] / Vk [V]	CLASS	Fl /Fs Ft Iμ @Vk	R_{CT} max at 75° [Ω]	RELAY/INSTRUM. BURDEN [VA]	Rr/Istr. [Ω]	WIRING Type 2/4/6W	L [m]	S [mm²]	R_c [Ω]	LOADING RESISTOR [VA]	REAL LOAD [VA]	TOTAL LOAD %	CALCULATED Fl / Fs V_k / S_n	REQUIRED Fl / Fs V_k / S_{real}	ACCEPT.
ELECTROLYSER PACKAGE	279.9		ABB REX640	50/51	400	1	5 VA	5P	20	3.60	0.02	0.020	6	4.0	2.5	0.0685		0.09	2%	Fl 46.6	Fl> 20.0	OK
			ABB REX640	50G	100	1	5 VA	5P	5	1.00	0.02	0.020	2	4.0	2.5	0.0685		0.09	2%	Fl 27.6	Fl> 20.0	OK
			ABB REX640		6.6:√3	0.11:√3	20 VA	Cl. 05+3P	1.9 / 8h		0.05									S_n 20.0	S_n> 0.1	OK
			Available		6.6:√3	0.11:√3	30 VA	Cl. 05+3P	1.9 / 8h											S_n 30.0	S_n>	
			Available		6.6:√3	0.11:3	30 VA	3P	1.9 / 8h											S_n 30.0	S_n> 0.0	OK

Note: GREEN = in green are highlighted the estimated values / parameters

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MV fuses rating calculation

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SWB: SG-100D1

Document number 22403-IMG-05-F

SELECTY

	Sn [kVA]	Vn [kV]	In [A]	Zcc [%]	FUSE			Fuse Time current characteristics @100ms	@1s	@10s	@15s	@2s	Requirements Min @100ms	Min @1s	Min @10s	Min @15s	Max @2s	
TR FEEDER	1600	6.6	140.0	6%	ABB	CMF	250A	4000	2500	1500	1400	2100	1680	840	420	280	2333	OK
BESS	1250	6.6	109.3	6%	ABB	CEF	160A	1700	1050	690	620	900	1312	656	328	219	1822	OK
FUEL CELL	1250	6.6	109.3	6%	ABB	CEF	160A	1700	1050	690	620	900	1312	656	328	219	1822	OK
SOLAR	500	6.6	43.7	6%	ABB	CEF	63A	650	400	220	210	350	525	262	131	87	729	OK