

Sistema di alimentazione dei muoni di ATLAS

II riunione sulle alimentazioni per LHC fase 2

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Upgrade dei muoni di ATLAS

- Il TDR e' sotto votazione del CB di ATLAS, e sara' approvato entro il 1 dicembre 2017. Un capitolo e' dedicato alla sostituzione di tutti gli alimentatori dei tre rivelatori, MDT, RPC e TGC (i CSC saranno sostituiti dalle NSW);
- L'ultimo incontro con l'UCG e' per martedi' 28 novembre 2017. Si discuteranno le richieste finanziarie e le schedule delle attivita' riportate nel TDR;
- L'approvazione finale e' prevista per la riunione LHCC del prossimo febbraio.
- La richiesta finanziaria per la sostituzione delle alimentazioni e' di 10.8 M€, di cui 60% in CORE e 40% su M&O;
- I punti salienti della schedula sono:
 - specifiche del sistema pronte per novembre 2018;
 - dimostratori realizzati dall'industria entro la fine del 2020;
 - FDR del sistema previsto per la fine del 2021;
 - La gara per assegnare la commessa dovrebbe prendere la maggior parte del 2022;
 - Il PRR e' previsto per la meta' del 2023;
 - la produzione iniziera' a meta' 2023 e si concludera' entro il 2028.

Dettaglio del sistema di alimentazione

CAEN module type	Function	Installed	Additional BI-RPC	Additional NSW-STGC	Module price (€)	MDT modules	RPC/LVL1 modules	TGC modules	MDT total cost (€)	RPC/LVL1 total cost (€)	TGC total cost (€)	Overall cost
A3000NF	3-phase notch filter	15			3.534	11	2	2	38.874	7.068	7.068	53.010
A3009	12 channels 8V/9A/45W	92	69		7.733		161			1.245.013		1.245.013
A3016B	6 channels 8V/16A/90W	32			6.943	32			222.176			222.176
A3025A	4 channels 8V/25A/150W	25			5.996		25			149.900		149.900
A3025B	4 channels 8V/25A/150W	212			5.996	126	86		755.496	515.656		1.271.152
A3025D	4 channels 8V/25A/150W	79			5.996			79			473.684	473.684
A3050D	2 channels/25-80A/150-450W	30			5.839			30			175.170	175.170
A3100D	1 channel 8V/100A/600W	84			5.682			84			477.288	477.288
A3485	2 channels 3-phase 400VAC-48VDC	35	2	2	6.392	26	4	9	166.192	25.568	57.528	249.288
A3486	2 channels 3-phase 400VAC-48VDC	60	6	2	12.953		33	35		427.449	453.355	880.804
A3512A	6 channels 12kV/1mA	89	68		8.444		157			1.325.708		1.325.708
A3535A	32 channels 3.5kV/0.5mA	156		22	11.473			178			2.042.194	2.042.194
A3540A	12 channels 4kV/1mA	221			7.970	221			1.761.370			1.761.370
A3801	128 channels ADC	58	17		3.273		75			245.475		245.475
A3802	128 channels DAC	32	102		3.273		134			438.582		438.582
A1676A	EASY Branch Controller	59	8		1.470	18	32	17	26.460	47.040	24.990	98.490
EASY3000	RPC and TGC Crate	116	40	4	2.802		128	32		358.656	89.664	448.320
EASY3000M	TGC special crate	26			2.802			26			72.852	72.852
EASY3000R	TGC special crate	12			2.802			12			33.624	33.624
EASY3000S	MDT crate	72			2.802	72			201.744			201.744
SY4527A	Mainframe	17	2	8	7.407	7	8	12	51.849	59.256	88.884	199.989
Totals		1.522	314	38		513	845	516	3.224.161	4.845.371	3.996.301,00	12.065.833,00
			1.874				1.874			12.065.833		

La tabella mostra tutto l'hardware usato dal sistema di alimentazione dei muoni ed il relativo costo, stimato su base Cern 2017 per l'acquisto del singolo modulo.

Moduli HV

MDT A3540



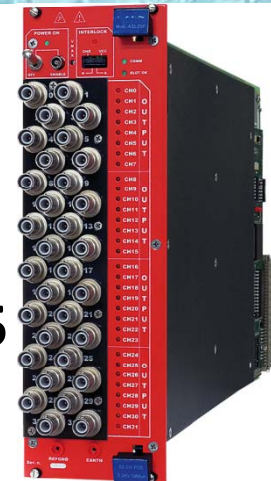
Polarity	Positive (A3540P) or Negative (A3540N), with ir other)
Output Voltage	0 ÷ 4 kV (connector output)
Max. Output Current	1 mA
Voltage Set/Monitor Resolution	500 mV
Current Set/Monitor Resolution	100 nA
VMAX hardware	0 ÷ 4 kV
VMAX hardware accuracy	± 2% of FSR
VMAX software	0 ÷ 4 kV
VMAX software resolution	500 mV
Voltage Ripple	< 30 mV pp From 10 Hz to 20 MHz at full load
Voltage Monitor vs. Output Voltage Accuracy	typical: ± 0.3% of reading ± 2.5 V maximum: ± 0.3% of reading ± 5 V
Voltage Set vs. Output Voltage Accuracy	typical: ± 0.3% of setting ± 2.5 V maximum: ± 0.3% of setting ± 5 V
Current Monitor vs. Output Current Accuracy	typical: ± 2% of reading ± 1 µA maximum: ± 2% of reading ± 2 µA
Current Set vs. Output Current Accuracy	typical: ± 2% of setting ± 1 µA maximum: ± 2% of setting ± 2 µA
Weight	2.7kg

Polarity	Positive (A3512P) or Negative (A3512N)
Output Voltage	0 ÷ 12 kV (connector output)
Max. Output Current	1 mA
Voltage Set/Monitor Resolution	1 V
Current Set/Monitor Resolution	100 nA
VMAX hardware	0 ÷ 12 kV
VMAX hardware accuracy	± 2% of FSR
VMAX software	0 ÷ 12 kV
VMAX software resolution	1 V
Voltage Ripple	< 50 mV pp
Voltage Monitor vs. Output Voltage Accuracy	typical: ± 0.3% of reading ± 5 V maximum: ± 0.3% of reading ± 10 V
Voltage Set vs. Output Voltage Accuracy	typical: ± 0.3% of setting ± 5 V maximum: ± 0.3% of setting ± 10 V
Current Monitor vs. Output Current Accuracy	typical: ± 2% of reading ± 1 µA maximum: ± 2% of reading ± 2 µA
Current Set vs. Output Current Accuracy	typical: ± 2% of setting ± 1 µA maximum: ± 2% of setting ± 2 µA
Weight	3.5kg

RPC A3512



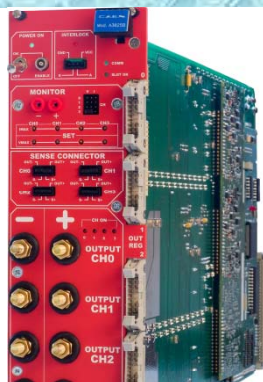
TGC A3535



Polarity	Positive / Negative depending on purchased ve
Output Voltage	0 ÷ 3.2 kV (connector output)
Max. Output Current	0.5 mA
Maximum Output Power	1.1 W per channel
Voltage Set/Monitor Resolution	500 mV
Current Set/Monitor Resolution	100 nA
VMAX hardware	0 ÷ 3.2 kV
VMAX hardware accuracy	± 2% of FSR
VMAX software	0 ÷ 3.5 kV
VMAX software resolution	500 mV
Voltage Ripple	< 50 mV pp From 10 Hz to 15 MHz at full load
Voltage Monitor vs. Output Voltage Accuracy	± 0.3% of reading ± 1 V
Voltage Set vs. Output Voltage Accuracy	± 0.3% of setting ± 1 V
Current Monitor vs. Output Current Accuracy	± 2% of reading ± 0.3 µA
Current Set vs. Output Current Accuracy	± 2% of setting ± 1 µA
Weight	3.2kg

Principali moduli LV

MDT e LVL1 A3025B



Polarity	Reversible
Output Voltage	$2 \div 8$ V (connector output)
Max. Output Current	25 A
Voltage Set/Monitor Resolution	10 mV
Current Set/Monitor Resolution	10 mA
VMAX hardware	$2 \div 8$ V
VMAX software	$2 \div 8$ V
VMAX software resolution	5 mV
Voltage Ripple	< 10 mV pp (@ full load)
Voltage Monitor vs. Output Voltage Accuracy	max. ± 50 mV $\pm 0.3\%$ of reading
Voltage Set vs. Output Voltage Accuracy	max. ± 50 mV $\pm 0.3\%$ of reading
Current Monitor vs. Output Current Accuracy	$\pm 1A \pm 2\%$ of reading
Current Set vs. Output Current Accuracy	$\pm 1A \pm 2\%$ of reading
Load Regulation	$\pm 0.3\%$ (with sense wires) $\pm 2\%$ (without sense wires)
Output Power (per Channel)	150 W
Test Set Up	cable: length = 30m; diam.= 8mm test load: >600W load capacitance: 10 μ F electrolyti
Weight	6kg

Polarity	Reversible
Output Voltage	$1.5 \div 8$ V (connector output)
Max. Output Current	9 A
Voltage Set/Monitor Resolution	5 mV
Current Set/Monitor Resolution	10 mA
VMAX hardware	$1.5 \div 8$ V
VMAX software	$1.5 \div 8$ V
VMAX software resolution	5 mV
Voltage Ripple	<20mV pp on 10 μ F //0.1 μ F 10Hz-15MHz
Voltage Monitor vs. Output Voltage Accuracy	max. ± 30 mV $\pm 0.3\%$ of reading
Voltage Set vs. Output Voltage Accuracy	max. ± 30 mV $\pm 0.3\%$ of reading
Current Monitor vs. Output Current Accuracy	$\pm 0.05A \pm 2\%$ of reading
Current Set vs. Output Current Accuracy	$\pm 0.05A \pm 2\%$ of reading
Load Regulation	$\pm 0.3\%$ (with sense wires) $\pm 2\%$ (without sense wires)
Output Power (per Channel)	45 W
Test Set Up	cable: length = 20-30m; diam.= 10mm (for test load: 250-2000 W (nominal) load capacitance: 100 μ F electrolytic // 100
Weight	5.5kg

RPC A3009



TGC A3100



Polarity	Reversible
Output Voltage	$2 \div 8$ V (connector output)
Max. Output Current	100 A
Voltage Set/Monitor Resolution	10 mV
Current Set/Monitor Resolution	100 mA
VMAX software	$2 \div 8$ V
VMAX software resolution	5 mV
Voltage Ripple	< 10 mV pp (@ full load)
Voltage Monitor vs. Output Voltage Accuracy	max. ± 50 mV $\pm 0.3\%$ of reading
Voltage Set vs. Output Voltage Accuracy	max. ± 50 mV $\pm 0.3\%$ of reading
Current Monitor vs. Output Current Accuracy	$\pm 1A \pm 2\%$ of reading
Current Set vs. Output Current Accuracy	$\pm 1A \pm 2\%$ of reading
Test set up	cable: length = 30m; diam.= 8mm test load: >600W load capacitance: 10 μ F electrolytic
Load Regulation	$\pm 0.3\%$ (with sense wires) $\pm 2\%$ (without sense wires)
Output Power	600 W
Weight	6kg

Generatori primari

**MDT power e
service,
RPC – TGC
service
A3485**



Output Polarity	Positive
Voltage	44 ÷ 52 V adjustable via software
Max. Output Power	5 kW
Voltage Ripple	< 100 mV pp
AC input	3-phase 400 V; 400 Hz
Packaging	19"-wide, 3U-high Euro-mechanics rack; Depth: 50 cm. weight: 28kg

Da ridisegnare

Non sostituibile direttamente.
Potrebbe essere composto da due
stadi, l'AC/DC e il DC/DC

Packaging	19"-wide, 3U-high Euro-mechanics rack; Depth: 50 cm.
Polarity	Positive; common floating ground; DC insulation vs. Earth >4KOhm; max Vcm (common mode) : ±10 V
AC input	3-phase 400 V / 50 Hz (see label below)
DC input	2A @ 48V (see label below)
Output Voltage	44 ÷ 52 V adjustable via software
Max. Output Power	4000 W
Max. Input Power	5000 W
Voltage Ripple	<100mVpp measured on 10Hz to 20MHz bandwidth
Voltage Monitor vs. Output Voltage Accuracy:	max. ±0.5%
Voltage Set vs. Output Voltage Accuracy:	max. ±0.5%
Current Monitor vs. Output Current Accuracy:	± 1A ± 2% of reading
Current Set vs. Output Current Accuracy:	± 1A ± 2% of setting
Test Set Up:	cable: length = 2m; Ø= 10mm (for both output and return) test load: 250÷2000 W (nominal) load capacitance: 100µF electrolytic // 100nF ceramic (// to the load)

**RPC e
TGC
Service
A3486**

