SMPS
SCANNING MAGNET POWER

ìDynamics and precision characterize the best of EEI's low voltage power supplies, the power supplies for the scanning magnets, which provide very high performance for the "VOXEL" and "PAINTING" functions required in oncological hadron therapy applications.

A set of 4 quadrant power supplies, 600A-600V in switched mode was designed and delivered in 2015 to EBG MED AUSTRON. The power supplies feed the scanning magnets, support the "VOXEL MODE" and "PAINTING MODE" functions with variable current ramps, complete excursions of the voltage set in 30 µs and stabilization of the current flap top in less than 200 µs.

MODEL	EEI-SMPS
MAIN PARAMETERS	
Voxel mode cycle period - ms	6 to 10000
Delay from new set point to voltage ramp start - µs	12.5
Equivalent switching frequency - kHz	80
V ramp, voltage ramp time 0 to ± 100% -µs	30
du/dt nom. - kV/s	±20000
I ramp, current ramp time for step up to 5% - µs	100
Settling time to accuracy band - µs	200
Painting mode cycle period - ms	6 to 10000
Load inductance - mH	2.5
Load resistance - mΩ	21
Load time constant - ms	119
I nom - A	±600
di/dt nom.	±220
V nom	±600
MECHANICAL DATA	
Architecture	Cabinet
Dimensions (LxDxH)	upon customer specifications
Cooling	Water cooling
Acoustic noise at 1m	< 65 dBa
Ambient temperature	0 - 40°C
INTERFACE AND REGULATION	
Regulation mode	CC or CV mode, selectable
Displays	Touch-panel HMI; LED indications for failures
Interface analog	Analog interface for current & voltage measuring and setting
Interface digital	Digital interface for current & voltage measuring and setting, output ON/OFF with status; indication and reset of alarms; polarity indication
Ramp function	Programmable di/dt ramp function
DAC resolution	16 bit
ADC resolution	16 bit
OPERATION AND MAINTENANCE	
Total number of cycles	$> 10^8$
MTBF	> 50000 h
MTTR	< 4 h
MTTR (semiconductors and capacitors)	< 1 h