



LINE-COMMUTATED POWER CONVERTER

DATA SHEET OF POWER SECTION - CLASS1

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1. POWER CONVERTER DATA SHEET – CLASS1

GENERAL CHARACTERISTICS / AMBIENT CONDITIONS	
Standards	IEC 60146-1-1 IEC 60146-2
Access	Front/Rear
Installation	indoor
Enclosure / Ingress protection	IP00
Operating temperature range	5°C – 40°C (41°F – 104°F)
Storage temperature range (without coolant)	-20°C – 65°C (-4°F – 149°F)
Storage temperature range (with coolant)	5°C – 65°C (41°F – 149°F)
Humidity	5% – 95% without condensation
Altitude	<1000 m / <3280 ft
Efficiency	>98%
Losses (rms)	23,0 kW
Aux. power (thyristor firing units)	24Vdc (120W)
Insulation: DC to ground	10 kV
INPUT DATA	
Voltage	3AC 504 V (+/-10%)
Frequency	45 ...63 Hz
OUTPUT DATA	
Voltage ^(*1)	DC 0 – 748 V
Rated Current (continuous operation)	DC 10000 A
COOLING	
Cooling system ^(*2)	Water cooled (deionized water) (cooling water provided by additional cooling unit)
Water flow ^(*3)	72 l/min (19 gal/min)
max. inlet temperature	40°C (104 °F)
Water pressure	<6bar (< 87 psi)
DIMENSIONS WEIGHTS	
Width / Height / Depth	2200mm (7.22ft) / 2528mm (8.29ft) / 541mm (1.77ft)
Weight	805 kg (1775 lbs)
RECTIFIER STACK	
Semiconductor	Thyristor
Type	T2351N52
Number of thyristors per branch / total	4 / 24
Voltage safety factor	6,63
Current safety factor	2,45
Protection fuse / type	Semiconductor fuse - one per thyristor 4SBK2100A 1500VAC (EATON);
Fuse rated voltage	AC 1500 V
Fuse rated current - based on load cycle for special application within project TOKAMAK SPARC	2100 A
Fuse breaking current	200 kApeak
Temperature monitoring	Temp. measurement per thyristor

(*1) @no load / @110% grid voltage

(*2) deionized water – required conductivity <2µs/cm

(*3) two parallel cooling branches → 2x36l (2x9,5 gal/min) - for details see drawing D0103960

CLASS II (GE INTERNAL NON-CRITICAL)

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THYRISTOR FIRING	
Firing device	<div>Tiny TAE (one per thyristor)</div> <ul style="list-style-type: none">- fibre optic communication with IMP-panel ^(*4)- generation of firing impulse- temperature measurement- voltage measurement- bin. input for fuse monitoring

(*4) additional IMP panel needed for data transmission between Power Converter (power section) and control equipment
(see drawing IMP-panel_GA-210.01)

Power section CLASS1 is available as “forward” and “reverse” type.

“forward”→ DC+ at the top busbar

“reverse”→ DC+ at the bottom busbar

Construction of “forward” and “reverse” type is mirror-imaged, for easy configuration of antiparallel rectifier system.

For details see drawing D0103960.