

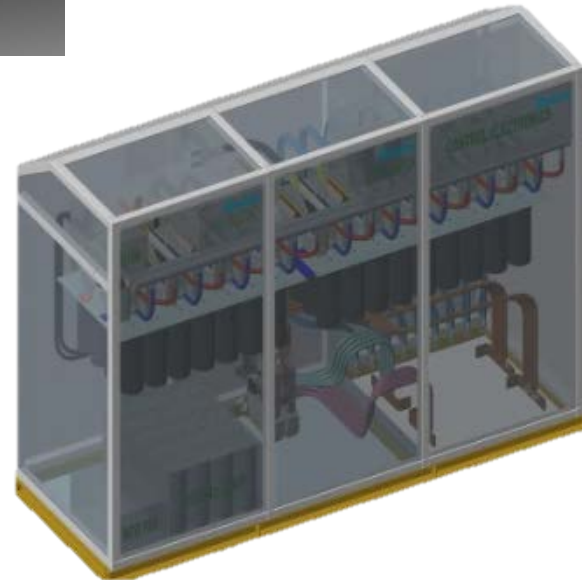


# Auxiliary Converters for Electric Locomotives



Input Rectifier	
Topology	Thyristor based half controlled asymmetrical rectifier
Nominal Voltage	1000 Vac @ 25 kV AC
Operating Frequency	50 Hz $\pm$ 8% (46 to 54 Hz)
Reduced power operating range	660 ....760 Vac (16.5 kV.....19.0 kV) AC
Input Power factor	0.8 or more at full load at OHE range 19 kV to 27.5 kV
THD (Total Harmonic distortion) Current	<5% up to 20 <sup>th</sup> harmonics
DC Link	
Nominal DC Link Voltage	650 Vdc
Output Inverter	
Topology	IGBT based 3 $\phi$ half bridge Inverter
Output voltage	3 phase 415V $\pm$ 5% Vac
Output frequency	50Hz $\pm$ 2 %
Output rated Power	130 KVA
Output rated current	180 Arms
Switching frequency	3150 Hz
Output voltage distortion (% V THD) @ rated load	< 10%
Multiple frequency selection	37 Hz, 47 Hz & 50 Hz
Starting of Loads	Soft start with V/f Control
Converter efficiency at rated input voltage and rated power	$\geq$ 92%

# Traction Converters for Electric Locomotives



Input Converter	
Nominal Input Voltage	1269 Vrms @ 25 KV
Input frequency	50 ± 8% Hz
Maximum phase current per line converter	1142 Arms
Pulse Pattern	PWM
Nominal DC link Voltage	2800 Vdc
Inverter	
Topology	2-Level/3- $\phi$ half bridge converter
Nominal output voltage range	0.....2180 Vrms
Nominal output frequency range	0.....170 Hz
Rated output current	370 Arms
Maximum output current short time	540 Arms
Efficiency at 22.5 KV and above at full power	~ 98%
Component	
Device type	IGBT
Nominal collector-emitter voltage (Vce)	4500 Volt
Nominal collector current (Ic)	1200 Amp
Cooling mode	Water + Ethylene glycol



## Benefits

### Energy Efficient

- Microprocessor controlled switching
- Design with in-built safety features
- MVB / Ethernet based communication interface
- > 92% efficiency

### Support over Complete lifecycle

- Full capability from design to manufacturing to after-sales
- Experienced Testing & Commissioning team to support customer at site.
- Personnel / Team available for support at maintenance sheds.

### Customized Design

- In-house testing facility available.
- In conformance to international standards
- Designed for Rolling Stock application
- In-built redundancies
- SS-304 construction

### Future-ready

- Adaptable for upgradation for future requirements
- Remote diagnostics capability