



**SCHAFFLER**  
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## CONVERTER SETS



### **Battery Charger**

**Input: 415V AC 3-phase**

**Output: 280V DC batteries**

**Power: 6kW - 18kW**

### **Inverter**

**Input: 280V DC (nominal)**

**Output: 240V AC 1-phase  
or 415V AC 3-phase**

**Power: 4kW - 20kW**

In underground railway lines, maintenance wagons are used to transport workers and equipment to locations where maintenance is to be performed on the overhead catenary and railway lines. Because the maintenance takes place underground, the use of diesel generators is not preferred and is often prohibited. The maintenance wagons therefore contain large battery banks that are used as a power source for tools and lighting whilst the work is carried out.



SCHAFFLER Converter Sets are a combination battery charger/inverter system. The Inverter component provides power from battery banks to tools and devices that are normally powered from the mains. The Battery Charger component charges the battery banks.

Inverters are used to convert DC power from the battery banks to AC power. This may be single phase or three phase and it is used for devices such as drilling machines, angle grinders, welders, lighting, refrigerators, microwaves, computers, air conditioners and other general purposes.

When the maintenance shift is over, the maintenance wagon returns to the depot. The shore supply is connected to the converter set and the batteries undergo a recharging cycle. The battery charger in the converter set uses an optimum charging algorithm which is defined by constant current, constant voltage and float charge modes. During the charging cycle, the battery temperature is monitored and the charging levels are adjusted to compensate for the changing characteristics of the batteries at different temperatures. This is most important to ensure the longevity of the large and expensive battery banks.

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Battery Charger data	
Nominal battery voltage	280V DC
Supply voltage	415V AC 3-phase
Nominal battery voltage	280V DC
Power rating	6kW per module
Output regulation	< 5% ripple
Charging method	Constant Current, Constant Voltage, Float Charge
Equalisation mode	Yes
Battery temperature compensation	Yes, adjustable 0 to -6mV/°C/Cell
Ambient temperature	0 - 50°C
Noise level	< 55dBa
Efficiency	> 90%
Fault relay	Potential free change over contacts, 1A 30V DC
Fault diagnostics	Faults shown on display
Presentation	19" rackmount modules
Weight	19kg per module
Parallel Operation	Yes, multiple 6kW modules can be paralleled



Inverter Data	
Input voltage	230V DC - 350V DC (nominal 280V DC)
Output voltage	240V DC 1-phase OR 415V DC 3-phase
Power rating	4kW - 20kW
Harmonic distortion	<5%
Over temperature	70°C, unit restarts when temperature cools
Over current	130% for 30 seconds
Short circuit	Yes, unit restarts when fault clears
Under voltage	230V AC, unit restarts when voltage recovers
Over voltage	350V AC, unit restarts when voltage recovers

Standards	
I.S. EN 50121-3-2:2006	Railway applications - Electromagnetic compatibility - Rolling stock - Apparatus
I.S. EN 50155:2007	Railway Applications - Electronic Equipment Used on Rolling Stock
IEC 61000-4-3 Ed. 3.1	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test
IEC 61287-1 Ed. 2.0	Railway applications - Power converters installed on board rolling stock - Part 1: Characteristics and test methods
IEC 61373:1999	Railway application - Rolling stock equipment - Shock and vibration tests
AS/NZS 3000:2007	Wiring regulations

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