



SCHAFFLER



**POWER ELECTRONICS  
FOR THE RAIL INDUSTRY**

COMPANY OVERVIEW

[WWW.SCHAFFLER.COM](http://WWW.SCHAFFLER.COM)

## COMPANY SUMMARY

Schaffler is an Australian owned company that designs, manufactures and maintains electronic power control equipment for the rail industry globally.

There are three main aspects of the business, they are:

**1. Products** - The products are for auxiliary control systems and include intelligent battery chargers, converters and inverters for motor control on locomotives and electronic trains to drive compressors, radiator fans and other auxiliaries. We also have new and improved products which are available including:

- R5 Inverter which is a 22kW Single Phase Inverter
- Boost Chopper from single phase electric trains with unity power factor. Options for 8kW, 15kW or 22kW Converters.
- Intelligent Battery Charger with added protection and optimum algorithm for charging batteries which increase the battery life span by 3 or 4 times that of a battery charged by other battery chargers.
- Air conditioners for trams and locomotive cabs which include inverters operating off 74 Vdc, 110 Vdc, 600 Vdc and 750 Vdc.

**2. Services** - tailoring engineered design solutions to meet clients' needs for both new and existing products, maintenance and general repairs. With our philosophy of continual commitment to improvement we have recently made improvements in design and time efficiencies for all bespoke design requests

**3. Research and development of new technology**

- Schaffler has made a commitment to research and development of new and existing products to ensure continual improvement.

Schaffler is in a league of its own within the rail industry as its products are lighter, less expensive and far more energy efficient than any of our competitors. Schaffler's mission is to be recognised globally for its reliable, cost effective and energy efficient products. Our core values are integrity, reliability, sustainable solutions and commitment to new development.

Going forward, the company plans to expand its business into the UK, USA and South East Asia. There are fantastic opportunities for us to help locomotive owners and operators benefit from Schaffler products.

## PRODUCTS AND SERVICES

### PRODUCTS

Schaffler targets the products required on rail rolling stock where the existing products are inefficient, too heavy, and not available any longer or ridiculously out of date. Weight has become a major factor.

Heavy equipment will need to be carried for millions of kilometres during the life of the train. Every kilogram in weight saved means energy saved, providing a reduction in carbon emissions.

#### Schaffler's products include the following:

##### 1. INTELLIGENT BATTERY CHARGER

Our battery charger is able to detect the exact state of the batteries on a train. It then charges according to an algorithm that treats the batteries according to the environmental conditions such as temperature, state of discharge and electrical load. Our battery charger prolongs the life of batteries from 3 years to 8 years. This is significant considering that the batteries cost from \$15,000 to \$50,000 per service wagon, locomotive or DMU. Our most recently developed battery charger now weighs 35kg compared with our old battery charger that weighed 58kg.

##### 2. 600 PLATFORM

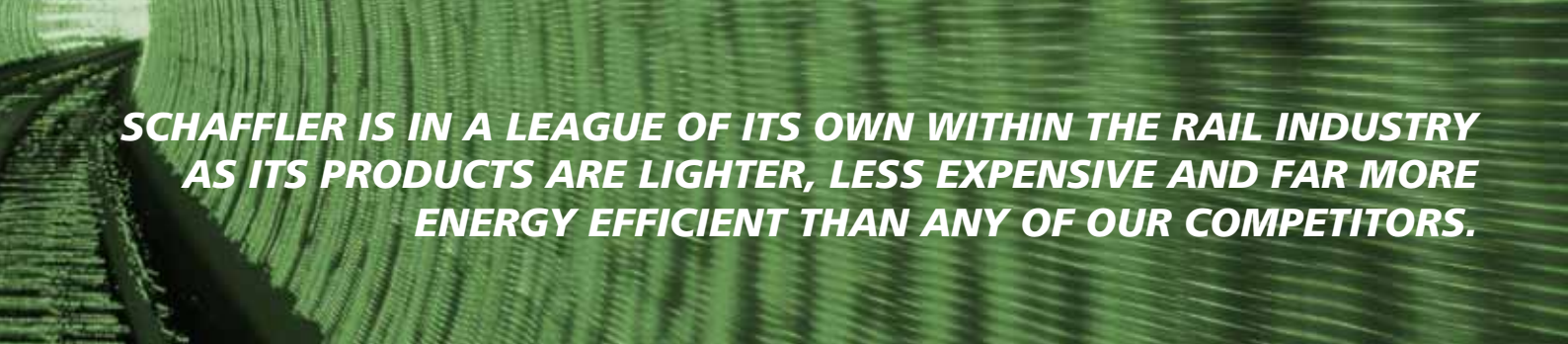
The 600 PLATFORM power electronic devices can either supply or make use of power at 600 volts DC. The input can either be boosted up to 600 volts dc from, as an example, a 74 volt battery or alternatively 1500 volts could be reduced down to 600 volts.

##### 3. DCFORMER

The SCHAFFLER DCFORMER is a fully isolated DC to DC converter for converting from 74V or 110V battery voltage to 600 DC output. The output may be used to feed Schaffler's other 600 Platform products such as three-phase variable frequency inverters for motors or single-phase 50Hz/60Hz inverters for general purposes.

##### 4. AIRCONVERTER

Supplies from 74 or 110 Vdc are converted to 600 Vdc. Inverters are provided to suit the air conditioner system. The compressor is separately driven by one inverter which can be speed controlled. A second smaller inverter is provided for the condenser fan and other switchboard facilities. An alternative for the condenser fan supply is to use our R3 inverter which provides a single phase output.



# **SCHAFFLER IS IN A LEAGUE OF ITS OWN WITHIN THE RAIL INDUSTRY AS ITS PRODUCTS ARE LIGHTER, LESS EXPENSIVE AND FAR MORE ENERGY EFFICIENT THAN ANY OF OUR COMPETITORS.**

## **5. SAVERTER**

The SAverter is a three phase inverter that operates off a dc supply. If supplied from 600 Vdc, the inverter will operate a 3-phase motor at constant torque in speed control. There is a SAverter that can operate off a variable dc supply. If the supply drops below 600 Vdc, the speed of the motor will be automatically reduced to maintain constant torque. This is particularly applicable to auxiliaries for diesel locomotives where the supply from the auxiliary or traction alternator varies according to the notch position.

## **6. HEADLIGHT CONTROLLER**

Locomotives and electric trains still use a large crude dropping resistor to dim the headlights on the train. Schaffler has developed an electronic headlight converter that is efficient and allows three levels of headlight brightness. Blown globe detection is reported. In addition it allows for the new regulation that when a train approaches a level crossing, the driver must sound the horn and the ditch lights must flash for a predetermined time. All these functions are controlled by software.

## **7. ACTIVERTER**

This product is a single phase to three phase converter with unity power factor. This product is used on EMUs where the catenary supply is 25 kV ac. All previous products supplied by others used a rectifier input creating a power factor of about 0.6. Our product has a power factor of 1 creating a significant power saving. Supplies accepted from catenaries fluctuate +30% to -25% according to whether the train is accelerating or braking.

## **8. SINGLE PHASE INVERTER**

Rail operators require the driver of locomotives to be allowed a 240 Vac power supply for a microwave, kettle, hand dryer and the ability to charge a mobile phone. All previous inverters available from us and others weighed 38kg. Our new inverter weighs 19kg and is supplied in USA and to most rail operators in Australia.

## **9. MODU CONVERTER**

Supplies from catenaries fluctuate +30% to -25% according to whether the train is accelerating or braking. The nominal 750 Vdc supply from street cars varies from 450 Vdc up to 1050 Vdc. The Moduconverter regulates this supply to a fixed 600 Vdc so that standard inverters can operate off this fixed supply.

## **SERVICES**

### **DESIGN**

Schaffler's design and engineering team is highly experienced in railway applications, with a reputation for supplying extremely reliable and rugged power control systems. Our well respected team tailors solutions to meet our clients' demanding specifications. They manage the entire design and manufacture process to ensure that the specifications fully comply.

### **MANUFACTURE**

Our manufacturing capabilities cover the entire spectrum of power control systems for rolling stock. Schaffler solutions are manufactured to exacting standards and have become the benchmark in reliability and excellence in performance. Products are shock and vibrated, environmentally and EMI tested to rail IEC standards. Our dedicated team believe that on time delivery is of paramount importance. Utilising state of the art technology, Schaffler have supplied solutions to clients throughout Australia and across the world.

### **MAINTENANCE**

At Schaffler, we focus on reliability, and therefore maintenance is a key factor in all Schaffler solutions. We like to partner with our clients in structuring a maintenance program that aims to avoid problems and maximises the returns on their assets.

## **RESEARCH AND DEVELOPMENT**

More recently Schaffler has identified a need within the industry to decrease carbon emissions and increase efficiencies of diesel locomotives through an ac traction control system with predictive wheel diameter compensation. Schaffler has met this need and has patented a design for an ac traction control system with predictive wheel diameter compensation. The system was designed by Bernard Schaffler the owner and Managing Director of Schaffler Pty Limited. Further information on the technical details and benefits of the system can be discussed by contacting us via our website [www.schaffler.com](http://www.schaffler.com)



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