BRAKE RESISTORS FOR LOCOMOTIVES

Penbro Kelnick (Pty) Ltd is proud to be a part of South Africa’s largest ever locomotive project, supplying brake resistors, a critical component of the locomotive for Transnet and PRASA’s electric and diesel locomotives. More importantly, Penbro has supported significantly in the generation of employment and skills development by conforming to government’s local content requirements. See our “MANUFACTURING FACILITY” at the bottom of the page.

Penbro Kelnick diligently supplied resistors to Transnet and PRASA for more than 40 years! Now, with Penbro Kelnick proudly part of the Telema group we have adopted state-of-the-art technology and design techniques to offer a more modern and world-class product.

Note that Telema is well known worldwide among locomotive manufactures such as ALSTOM, BOMBARDIER, TOSHIBA, CHINA SOUTH AND NORTH RAIL, which therefore places Penbro Kelnick in a strategic and superior position to supply the African rail industry.

E21 LOCOMOTIVE
BRAKE RESISTOR SPECIFICATIONS:

- Resistance: 4x 10.2 ohms
- Voltage: 3000VDC
- Power: 2660kW
- Ventilation: Forced fan cooled
- Insulation: Double insulation
- Enclosure: All stainless steel construction

First E20 brake resistor proudly manufactured and installed into locomotive E20 001 at Transnet's Koedoespoort depot in Pretoria by Penbro Kelnick’s experienced staff.

E20 LOCOMOTIVE WITH BRAKE RESISTOR
ELECTRIC LOCOMOTIVE CLASS 22E - CHINA SOUTH RAIL

Location: Transnet Koedoespoort Depot, Pretoria.

COMPLETE BRAKE RESISTOR ENCLOSURE INSTALLED INSIDE THE CLASS 22E LOCOMOTIVE

BRAKE SPECIFICATIONS:

- Resistance: 3x 10.2 ohms
- Voltage: 3000VDC
- Power: 1995kW
- Ventilation: Forced fan cooled
- Insulation: Double insulation
- Enclosure: All stainless steel construction
LOCOMOTIVE CLASS 23E - BOMBARDIER TRANSPORTATION SOUTH AFRICA

BRAKE RESISTOR SPECIFICATIONS:
- Resistance: 2x 4.94 ohms
- Voltage: 3000VDC
- Power: 1710kW
- Ventilation: Forced fan cooled
- Insulation: Double insulation
- Enclosure: All stainless steel construction

NEW ELECTRIC LOCOMOTIVE FOR PRASA- ALSTOM / GIBELA RAIL.
**BRAKE RESISTOR SPECIFICATIONS:**
- Resistance 1x 9.8 ohms
- Voltage 3750VDC
- Power kW
- Ventilation Naturally cooled
- Insulation Double insulation
- Enclosure All stainless steel construction

**LOCOMOTIVE RESISTOR MANUFACTURING AT PENBRO KELNICK**
Upon receiving the well-deserved purchase orders for the supply of brake resistors, Penbro Kelnick invested, installed and commissioned a complete manufacturing facility to produce all resistors at our factory in Babalegi north of Pretoria, from the raw steel coil to finished resistor cubicle.

Equipment installed comprise:
- Steel coil de-coiling machine.
- Mechanized guillotine.
- Conveyor feeder.
- Automated punching and press-forming machine.
- Automated off loader and stacking machine.
- Automated spot welding machine.
RESISTOR ELEMENT AUTOMATED PUNCH-PRESS AT OUR FACTORY NORTH OF PRETORIA

AUTOMATIC CONVEYOR-FED SPOT WELDING MACHINE
QUALITY CONTROL
We comply to the ISO 9001 quality certification.

Stringent testing of mechanical integrity, electrical functionality and electrical insulation are applied to each resistor and documented to produce a test certificate for each unit.

Our manufacturing team is also trained to:

- **Welding**- Qualifying towards ISO 3834 and EN 15085 with the assistance of the Skills College and SANDE
- **Riveting**- training provided by Avlock International Fastening Systems
- **Torqueing**- Training provided by Snap-on Industrial South Africa

Manufacturing processes conform strictly to documentation:

- Process Flow Control Plan
- Routine Test Procedure
- 3.1 Certificate of Conformity to EN10204

**E20 BRAKE RESISTOR UNDERGOING VIBRATION AND FULL LOAD THERMAL TEST**

During the design phase all aspects of the real-world environment are thoroughly tested at our testing facility. Shock and vibration testing equipment is vigorous, to ensure our products long lasting reliability and performance.

**SHOCK AND VIBRATION FACILITY**

POWER SUPPLY: Max. 3 MW – Max. 3.000 V – Max. 3.000 A
THERMAL IMAGING TEST

The rated power, 3MW in this case and more is applied to the resistor while sensitive IR cameras capture images of the heat distribution, to ensure that the resistor can operate in the most extreme environments. As an example, this test simulates the actual environment in which the resistor would operate while the locomotive is passing through the well-known 4km Over-Vaal Tunnel between Ermelo and Piet Retief along the export coal line.