



A Division of Transnet SOC Limited

TECHNOLOGY MANAGEMENT SPECIFICATION

GAUSS METER INSTRUMENT

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1.0 SCOPE

This document specifies the design requirements of the gauss meter instrument to be used to visually indicate, and store the track magnet polarity (North or South Pole), and the magnetic flux density of each pole in mT (militesla). This measured value will then be used to determine the conformity to specification of the track magnet.

LEGAL REQUIREMENTS

In addition to the requirements of the referenced specifications and standards, the mandatory requirements of The Occupational Health and Safety Act and Regulations (Act No 85 of 1993) referred to as OHSA shall be adhered to.

PRECEDENCE

In the event of any conflict between the various submitted relevant documents, the order of precedence shall be, and in consultation with Transnet Freight Rail:

- a. Legal and safety requirements.
- b. This Specification.

TECHNICAL DEVIATIONS

No technical deviations from this specification or any other document forming part of the purchase submission shall be permitted unless approved in writing by Transnet Freight Rail (Technology Management).

2.0 NORMATIVE REFERENCES

- 2.1 Unless otherwise specified, all materials, equipment and testing methods shall comply with the current edition of the relevant IEC, EN, SANS or Transnet Freight Rail publications where applicable.
- 2.2 The following publications are referred to in this document:

International Organisation for Standardization

ISO 9001:2008 Quality management systems –Requirements

South African Nation Standard

SANS 60529:2001 Degrees of protection provided by enclosures (IP code)

Transnet publications

BBD6193 Maintenance manual, Track Magnet Test Instrument

CEE-TLE-7 Track Magnet Proposed assembly, 25kV AC locomotive
switching at phase breaks

3.0 ABBREVIATIONS AND DEFINITIONS

S	Track magnet south pole
N	Track magnet north pole
MF	Magnetic flux density
Polarity	These are permanent markings on the surface of the track magnet to indicate either the magnetic North or South Poles
Gauss Meter	A device that indicates the strength of a magnetic field

4.0 ENVIRONMENTAL CONDITIONS

The gauss meter instrument must be designed and rated for continuous operation under the following conditions:

Altitude:	0 – 1980m above sea level
Ambient temperature:	minus 10°C to plus 50°C
Relative humidity:	10% to 86%
pollution:	Heavily salt laden with industrial pollutants including diesel electric locomotive emissions

5.0 REQUIREMENTS

5.1 Technical requirements

The gauss meter instrument must have:

- 5.1.1 An ON/OFF power switch.
 - 5.1.1.1 An audible bleep must be designated to visually indicate when the gauss meter instrument is switched ON.
 - 5.1.1.2 Rechargeable batteries.
 - 5.1.1.3 Have a LCD graphics display screen to show the actual values of magnetic flux density for each pole individually in mT with an accuracy of $\pm 1\%$.
 - 5.1.1.4 A display which is clear and readable in direct sunlight.
 - 5.1.1.5 A range of ± 300 mT.
 - 5.1.1.6 A resolution of 100 μ T.
 - 5.1.1.7 The ability to measure a DC input as well as DC peak measurement capability.
 - 5.1.1.8 Retaining capabilities to store measurements when the instrument is switched off.
 - 5.1.1.9 A time keeping device so that the time that measurements were taken can also be recorded.
 - 5.1.1.10 USB ports that can be used to download data.
 - 5.1.1.11 Windows communication software that allows the user to download readings, stored data and control the instrument remotely.

5.1.1.12 Transverse hall probe as standard, the probe must be fitted with a push button enabling the operator to HOLD and STORE measurements and orientate the probe for polarity readings.

5.2 General requirements

The gauss meter instrument must:

- 5.2.1 Be provided with labels that indicate ON, OFF, ENTER, NEXT, MENU, RESET and RANGE, as required. These labels must be permanently marked with characters visible in a normal operating position.
- 5.2.2 Have the minimum protection level against the ingress of dust and moisture of IP65.
- 5.2.3 Be portable and easily carried. It must weigh not more than 500 g.
- 5.2.4 Use rechargeable battery and the battery must last for at least 15 hours when fully charged, with an auto power down function.
- 5.2.5 Work in harsh conditions and must withstand rough handling and vibrations during transportation to and from test site.
- 5.2.6 Be designed in accordance with ISO 9001. The manufacturer shall provide documentation that shows compliance with ISO 9001 upon request.
- 5.2.7 Any safety hazard with regards to operating the gauss meter instrument must be outlined with preventative measures thereof including the PPE requirements.

6.0 MAINTENANCE REQUIREMENTS

- 6.1 The manufacturer must indicate the maintenance required to ensure the gauss meter instrument functions satisfactorily.
- 6.1.1 The maintenance should include at least the time interval between calibration cycles, maintenance procedure and troubleshooting guide.
- 6.2 The manufacturer must offer after sale support for the gauss meter instrument.
- 6.3 The manufacturer must provide a one-year warranty of the gauss meter instrument.

7.0 DOCUMENTATION AND TRAINING

- 7.1 The manufacturer shall provide a gauss meter instrument user manual that describes how to use the gauss meter instrument.
- 7.2 All the required documentations must be written in English.
- 7.3 The Gauss meter must be supplied calibrated, with a calibration certificate.

8.0 PACKING AND SHIPMENT

- 8.1 The gauss meter instrument must be packed in a manner that will prevent damage and entry of dust/moisture during storage and transportation.
- 8.2 The gauss meter instrument container/casing must be marked with the manufacturer's name, device type and handling instructions.

END

ANNEXURE A
TECHNICAL DATA SHEET

(To be completed by the tenderers and submitted as part of their tender)

GAUSS METER INSTRUMENT

- | | | |
|------|---|----------|
| 1.0 | Tenderer: | |
| 2.0 | Gauss meter instrument hardware: | |
| 3.0 | Gauss meter instrument power supply: | |
| | a) Type of batteries used | |
| | b) Life span of the batteries | |
| 4.0 | Gauss meter instrument IP rating | |
| 5.0 | Gauss meter instrument portability: | |
| | a) Mass | |
| | b) Carry bag provided | Yes / No |
| 6.0 | Gauss meter instrument vibration resistance | g |
| 7.0 | Gauss meter range | |
| 8.0 | Gauss meter resolution | |
| 9.0 | Memory storage | Yes/No |
| 10.0 | Gauss meter probe supplied | |
| 11.0 | Gauss meter instrument gives a visual indication of the track magnet polarity (North or South Pole) | Yes / No |
| 12.0 | Gauss meter instrument comply with ISO 9001: | Yes / No |
| 13.0 | Gauss meter instrument documentation: | |
| | a) User manual is provided: | Yes / No |
| | b) Maintenance manual provided: | Yes / No |
| | c) Calibration certificates provided: | Yes / No |
| | d) List of spares provided: | Yes / No |
| 14.0 | Warranties of the gauss meter instrument are indicated on the user manual: | Yes / No |
| 15.0 | The Supplier will provide training to TFR personnel on the correct usage of the gauss meter instrument: | Yes / No |
| 16.0 | Supplier offer after sale support: | Yes / No |
| 17.0 | Additional information: | |

Tenderer's signature: _____ Date: _____