AWS 3
Permanent Track Magnet

Index

1 General Information

1.1 Introduction

The AWS 3 permanent track magnet has been designed specifically for use in railway signalling. The magnets are commonly used in AWS, APC and Station Protection Systems.

1.2 Part Numbers

Part numbers for the AWS 3 Permanent Track Magnet are as follows.

Part Number	**Description of Unit**
AWS3	Permanent Magnet

1.3 Contact Information

MRD Rail Technologies Pty Ltd
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Cleveland Qld 4163
Phone: (07) 3821 5151
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1.4 Disclaimer

In issuing this document MRD makes no warranties, expressed or implied, that the compliance with all or any of the documents provided is sufficient on its own to ensure a safe system of work operation. Each user is reminded of its own responsibilities to ensure OH&S at work and its individual duties under the OH&S legislation.

2 Features and Benefits

2.1 Features

1) Low Profile
2) Waterproof
3) Powder coated
4) Corrosion protected
5) Made in Australia
6) Local support
7) Low maintenance costs

2.2 Warranty

The AWS3 unit is assured to live up to quality standards with a 10+ year life expectancy, backed up with a 2 year warranty. The unit is incredibly reliable with over 300 AWS3 units having been supplied since 1995 with absolutely no failures to date.

Any damage incurred during transport or due to incorrect storage or incorrect installation is not covered by this warranty and will be repaired at a quoted price after inspection.

2.3 Safety

The AWS3 unit is designed to be as safe as possible. This is backed up by the fact that with over 300 AWS3 units supplied to date since 1995 not a single safety incident has been reported.

2.4 Compliance

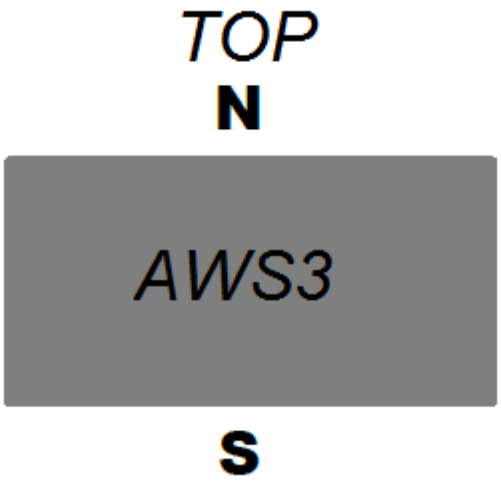
The AWS is designed to conform to all applicable and relevant standards. The unit conforms to ISO9001, AS3100-1990 and AS1874 and Group Standard GE/RT8035 (as detailed in section 3).

3 Technical Specifications

3.1 General Description of Operation

The AWS3 Permanent Track Magnet has a North Pole uppermost, as shown in Figure 1 below.

Figure 1 – Magnetic Field Polarity of AWS3



3.2 Operating Values

The AWS3 is a permanent magnet, meaning that it has a constant magnetic field which is not dependant on or supressed by an electrical current. Due to this, the AWS3 has no operating values as it does not need to be connected to a power source. The only viable way to supress an AWS3 is by putting a steel plate on top of the unit in order to cover the field and disallow it to interact with the train's sensors.

3.3 Magnetic Flux Densities

All AWS3 units are tested to be in compliance with section b9.1 of Group Standards GE/RT8035, as is shown below.

Magnet Type	Maximum Flux Density (Milli-Teslas)	Minimum Flux Density (milli-Teslas)	Distance in Dimension A in fig 2	Distance in Dimension B in fig 2	Distance in Dimension C in fig 2
Permanent Magnet (AWS3)	18mT	3.5mT	150mm	115mm	100mm

Figure 2 – Figure 5 of GE/RT8035

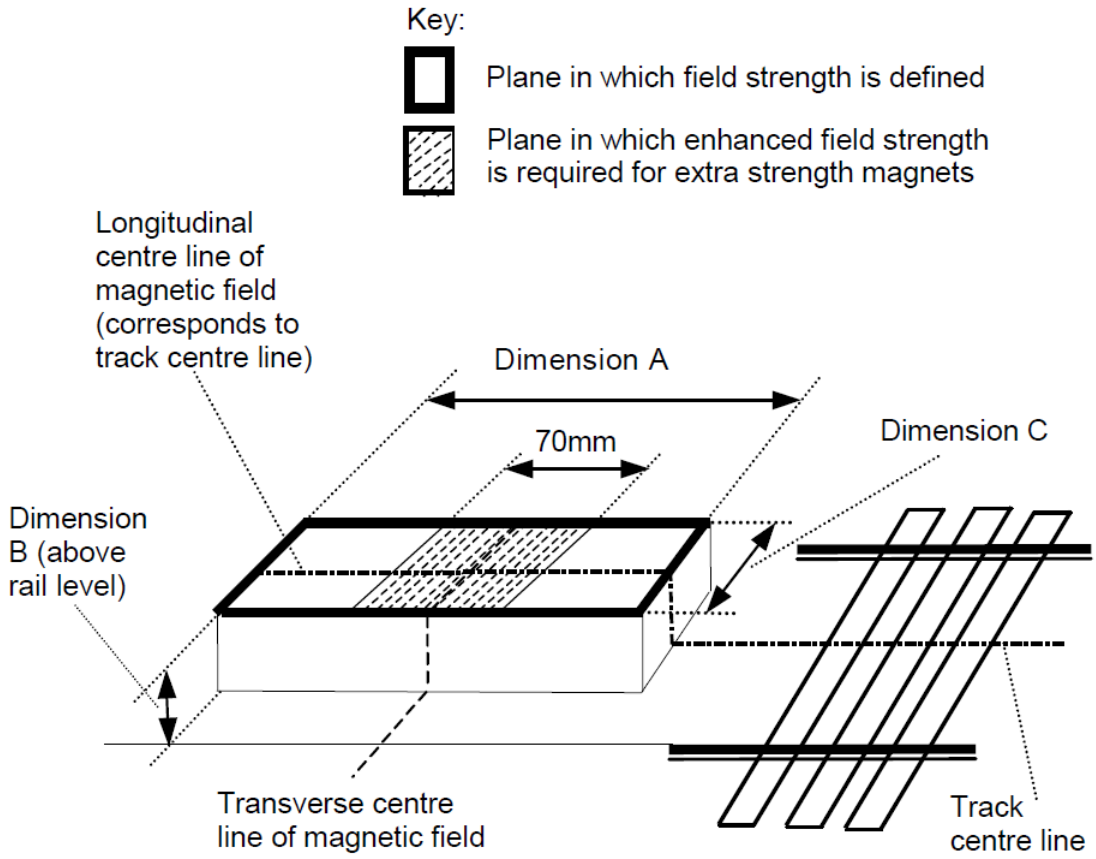


Figure 3 – AWS3 Field Strength Measurements

Note: Measurements taken 150mm above top of sample magnet, on a 50mm grid.

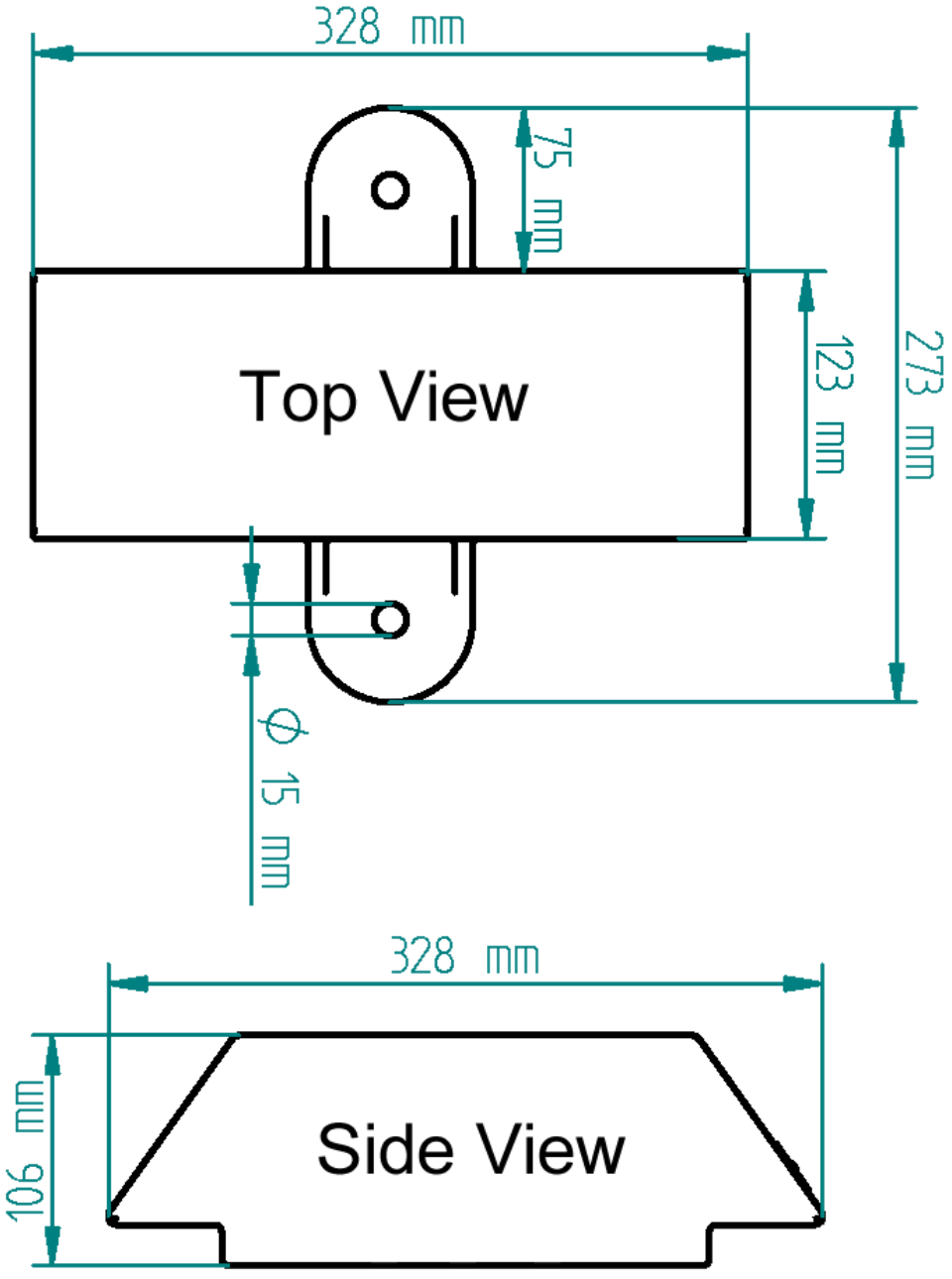
5.8mT 6.8mT	7mT 7mT 8.1mT 8.2mT	5.6mT 6.6mT
5.9mT	7.2mT 7.3mT	5.9mT

4 Physical Characteristics

4.1 Dimensions

The unit is approximately 273mm x 328mm and approximately 20kg, meaning that correct safety precautions must be taken into account when lifting it. The physical dimensions of the unit are displayed below, from a top and side view.

Figure 4 – AWS3 Dimensions



5 Material Specification

5.1 Enclosure

The enclosure is cast in Aluminium AS1874-1988 Grade AA601. Castings are powder coated, and once the magnets are fitted securely they are surrounded in an epoxy resin, water proofing the unit and protecting from vibrations and corrosion.

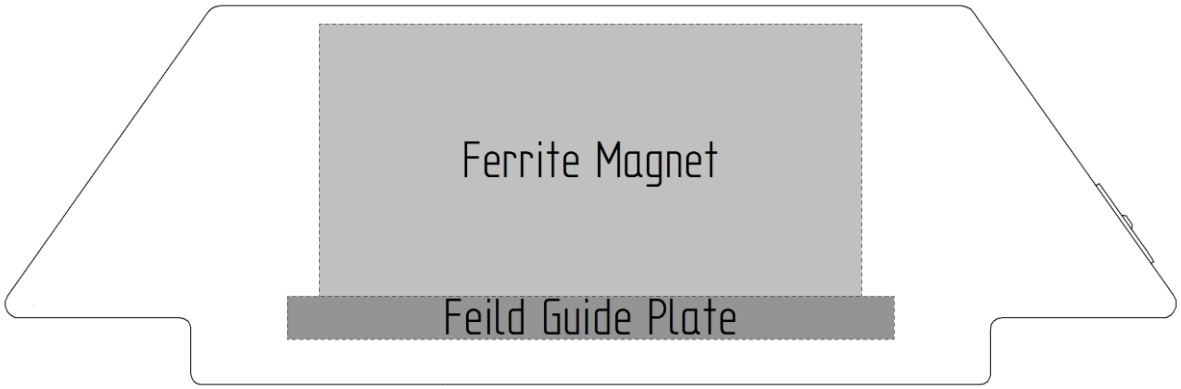
5.2 Mounting

Mounting is achieved via 2 holes in either side of the unit. They are cast into the aluminium in order to maintain their strength and integrity. 2 Carrier (Coach) bolts may be used to secure the unit using the mounting holes.

5.3 Magnets

The magnets used in the AWS3 are ferrite. They are mounted on top of a Field Guide Plate inside the unit's cavity which projects the field.

Figure 5 – AWS3 Magnet Position



6 Testing, Maintenance and Approval

6.1 Testing

The units are tested and comply with AS3100 – 1990 Approval and Test Specification – General requirements for electrical equipment.

6.2 Maintenance

Maintenance of the track magnet is minimal and consists of checking that all fixtures are tight and observing that the housing is undamaged. Also, regular tests of magnetic field strength must be carried out using a special instrument called a Strength and Polarity Indicator.

6.3 Approval

The AWS3 Permanent Magnet has been type approved and is currently in use by Queensland Rail and the South Australian Department of Transport, Energy and Infrastructure (The type approval certificate, for which, is on the next page as figure 6).

Figure 6 – AWS3 Approval Certificate from South Australian Department for Transport, Energy and Infrastructure

Government of South Australia
Department for Transport, Energy and Infrastructure

Doc No. PTS-009 Date: 04/09/2012

PTS Engineering & Maintenance

Provisional Type Approval

Title:	MRD AWS3 Permanent Inductor
Issue Date:	4th of September 2012
Reference Reports:	Queensland Rail Type Approval letter
	Queensland Rail Type Approval correspondence email
	AWS. Technical Manual V1.0 Rev: 1.
	AWS Maintenance Instruction V1.0 Rev: 1
	AWS Refurbishment Procedure V1.0 Rev: 1
	Drawing AWS 3 Enclosure V1.0
Equipment	AWS Permanent Inductor
Type:	AWS3
Make / Model:	AWS3
Manufacturer:	Manufacture Research Design Rail Technologies Pty Ltd. 235 South Street Cleveland Queensland 4163.
Supplier:	Manufacture Research Design Rail Technologies Pty Ltd.
Application	Automatic Warning System interface between rolling stock and Signalling System.

Describe function

The system provides an audible and visual indication in the driver cab in accordance with the signal aspect.

Describe proposed application

For replacement of existing ML AWS units for signals on the Adelaide Metropolitan Rail Network (AMPRN) and associated depots, sidings and yards.

Describe any limitations of use

Provisional type approval for use of the Adelaide Metropolitan Rail Network (AMPRN) for a period of evaluation for 1 year.

Public Transport Services reserves the right to revoke this provisional approval, withdrawal of approval would not be without due cause.

Any reported or observed adverse experiences from Queensland Rail must be communicated to Public Transport Services Signals Engineering Manager.

Recommended by :

Philip Keany

Signal Construction Inspector

Authorised by:

Mayank Jain

Signals and Communications Manager