# ZM150 Degauss Controller

## Pipe-end or weld joint degauss

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## Applications using Zeromag

- **High speed deployment of Zeromag in production scenarios**
- **Lay barge production, on shore or on ship**
- **Aluminium smelt· High speed pipe end degauss**
- **Plate edge degauss**
- **Machine parts degauss**



## Features

- **Simple jog wheel and 2 button operation**
- **Programmable current change rate**
- **Programmable hysteresis cycle reduction rate**
- **Direct display of magnetic field**
- **Simply plug into Zeromag and it takes control**
- **Saves user settings automatically**
- **Robust construction**

### Overview

ZEROMAG measures and neutralizes magnetic fields which may be present in the weld preparation region of mating steel components.

When working with pipes there are several ways of working. In normal operation, Zeromag is used to dynamically reduce the magnetism during welding. This works well but can hinder welding throughput. The ideal would be to degauss all the components completely, but the process is too long and cumbersome. There are also issues with penetration of ac degauss fields into the bulk of the material, leaving the core still magnetized.

The Zeromag degauss option undertakes degaussing of the end of the pipe only. This down cycling process is relatively quick - typically less than 3 minutes. The hysteresis loop time is typically 10 seconds allowing deep penetration of the degaussing field into the metal of the pipe end. The magnetism in the rest of the pipe remains unchanged, so, over time, the magnetism in the rest of the pipe will 'leak' back into the pipe end. This process is material dependent, but is typically about 1 hour.

A super fast degauss mode is supported. This is a two stage process in which, initially, the material is learnt and key parameters of the B-H curve are deduced. Then to degauss the pipe end, a single loop degauss is initiated based on the learnt data.

The Degauss option comprises a hand held unit that plugs into Zeromag. The user can program many aspects of the degauss process.

The effectiveness is dependent on the material of the pipe and the number of turns on the pipe end. Normal target for this would be 60 turns with 100m of cable.

- **Converts Zeromag to degaussing mode**
- **Simple user interface**
- **Robust and portable**
- **Can manually control Zeromag**

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# Technical overview

## Background

The Zeromag system finds its key application in arc welding. Magnetic fields may cause arc instability, and at worst can cause magnetic arc blow. The fields can be caused by induction of the earth's magnetic field in large structures and pipes. Alternatively, the steel may be magnetised at manufacture or by the use of magnetic clamps or magnetic pipe pigs.

The Zermag ZM100A is at the heart of the of the system  It is light, fast and simple to use. Simply the best way to remove magnetism for pipe welders.

This is the system favoured by many of the worlds leading pipe welders favoured for its 100% success record, excellent post sales support and a variety of options.

## Applications

There are applications where the use of Zeromag as the welding happens is not convenient. In these applications the ZM150 can be very useful, removing magnetism quickly with low power expenditure on site.

Typical applications are pipeline, spool base operations and lay barges. For pipelines, the fastest way to operate is to fit up the joint, use the ZM150 with clam coils, ZMCCClam, to wrap the whole joint and demagnetise it. Time taken is typically 2 minutes for a full downcycle and about 30 seconds for a smart single cycle degauss.

For spool base operations the need is similar to production where semi automated welding needs to work without magnetism worries. Using bobbins, ZMBOB, the system can be deployed to the end of the pipe and the magnetism removed.
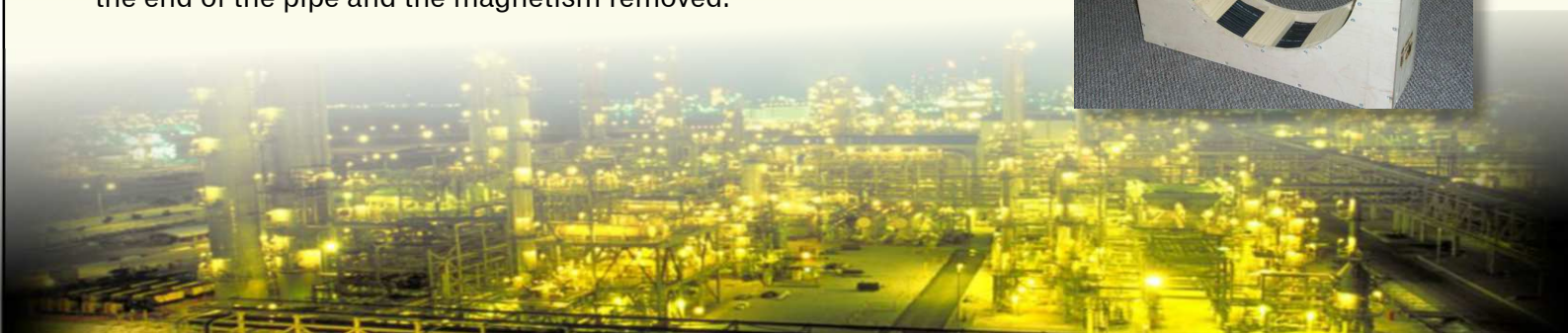


The success of demagnetising of the pipe end is dependent on the pipe material and the number of turns that can be applied. Note also that over time the magnetism in the rest of the pipe will re-establish itself in the pipe end. This occurs typically in 1-2 hours.

The degauss parameters can be set from the defaults supplied, or tuned during weld qualification and stored in the ZM150. The parameters are chosen to get the best practical balance between the efficacy of the demagnetisation and the speed of processing.

Clam coils used for joint degauss



Bobbins used for pipe end degauss

# ZM150: Performance Specification

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|---|---|
| Application | Must be used in conjunction with Zeromag ZM100A. The ZM150 provides current and polarity control to ZM100A, reading the magnetic field directly from the ZM100A magnetic probe. |
| Modes | Conventional hysteresis downcycle with the rate of change of current and the rate of the reduction factor per loop user controllable.<br>Novel single loop fast degauss<br>Material learn facility to descover what are the best parameters for single loop degauss<br>Manual control of Zeromag<br>Auto control of Zeromag |
| Current Output range: | 0A to +/-100A max. via Zeromag ZM100A |
| Deployment | Use either with bobbin on pipe end prior to fit up or with clam coil ZMCCCoil directly over weld joint |
| Current Output rate of change range: | 0.1 to 10A/s |
| Hysteresis reduction factor | 5% to 20% per loop |
| Demagnetisation time: | 3 minutes typical down cycling<br>30 sec typical single loop |
| Field Display | Magnitude and polarity 0-750 Gauss resolution 5 Gauss |
| Display | 4 line backlit LCD |
| Controls | 2 push buttons to accept or reject selections made using the jog wheel and the computer controlled menus |
| Cables | Supplied with extension cable to Zeromag |
| Weight | 1kg |
| Size | 30 x 20 x 3 cm plus cable |
| Power | Powered directly from Zeromag |
| Housing | Aluminium label top and stainless steel bottom. Delrin sides |
| Environmental | Temperature -20C to 50C<br>Humidity 0-90% non condensing<br>Not water proof so do not operate or store in a wet environment |
| Support | Call/email Diverse for support for use of clam coils for different weld scenarios |