

Applications overcoming arc blow

- Tripod and Balanced Frame construction
- Attachment of steel components to frame
- Applicable to root, intermediate and capping passes



Features

- Simple manual magnetic field control
- Fast 2 button automatic mode
- Built in gaussmeter
- Rugged air cooled stainless steel probe
- Zerozone magnetic amplifier
- Options for 50m x 2 demagnetising cable, bobbins, clam coils for specific pipe size
- Supplied in strong aluminium 4U case
- Calibration to NPL traceable standard
- Supplied with a protective shipping and storage cases

Kit Components

- Zeromag ZM100A demagnetizer
- Zerozone magnetic amplifier
- Air cooled magnetic probe
- Extended Zerozone link cables
- Magmeter MF300H+ gaussmeter
- Probe extension cable
- Storage and shipping cases

Overview

In the construction of tripod or balanced frame bases for wind turbines several tubular sections are brought together and welded. If the steel components are magnetised then the magnetic field concentrates in the weld preparation causing arc instability and arc blow which preventing reliable welding.

The Demagnetisers Kit for Wind Generators (DKWG) is a variant on the popular DKPW which is used extensively in pipe laying operations. The DKWG provides everything needed to overcome magnetic arc blow in one package. At its heart are the world leading Zeromag machine and Zerozone magnetic amplifier. These work together to measure and neutralize any magnetic field present in the weld preparation region of mating steel components. This is a portable machine that can be carried to the site where it is needed.

For large components used for turbine mounting frames, it is not practical to demagnetise each component so the dynamic nulling is used to reduce the field to zero where the welding is taking place. The Zerozone is used to bridge the magnetic circuit near the joint. Its coils are driven by the Zeromag system which monitors the magnetism and drives the net field to zero. Zeromag, working with Zerozone can provide the necessary reverse magnetic field for most frame welding scenarios. The Zeromag has a power output of 1.5KW and can be used with any ac supply from 90V to 265V. The combination of Zerozone and Zeromag can balance up to 1000G in steel components allowing welding to proceed without problem.

Other components of the kit include the MF300H+, the tool of choice for measuring in magnetism in weld preparations.

The ZM2PG air cooled probe is built from stainless steel and is sufficiently robust that it can be used close to active welding in the weld prep.

A full cable set of extension cables is provided to allow a reasonable working distance between the Zeromag and Zerozone.



DKWG: Performance Specification

Magnetic field reduction	Manual mode 0 Gauss. Auto, typically reduced >20x for most weld scenarios magnetic field reduced to <10 Gauss
Maximum static field that can be nulled	1800 Gauss (depends on material and geometry)
Range of tube sizes	Unlimited
Maximum/Minimum size of weld prep	120mm/ 2mm
Magnetic field nulling time	Less than 3 seconds typical
Space from weld position line to Zerozone	0.1m typical - Zerozone will be effective for some distance from its location depending on geometry
Weld passes	Always use on root pass - check field levels for additional passes
Materials	All ferritic steels, bonded lined pipes with stainless steel or inconel, high nickel or chrome steels
Material or wall thickness	This is geometry dependent. Thick material requires higher operating current and longer to get good nulling field penetration
Welding types	TIG, MIG, (GMAW), stick, FCAW
Auto welders/bots/robot welders	Deploy probe on the weld head
Pre-heat temperature	to 85C. For preheat a thin thermal insulating layer is required to provide a thermal break for Zerozone.
Environmental	-Temperature -20C to 50C For arctic operations there is a case heating option. Humidity 0-90% non condensing Not water proof so do not operate or store in a wet environment
Sub sea	The equipment is not hyperbaric - operation in sub sea dry environments to a maximum depth of 50 feet.
Support	Call/email Diverse for support for use of DKWG for different weld scenarios
Training	One day of training application and hands on training available

Components of the system

Zeromag ZM100A

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



In manual mode, the user has full control over the demagnetizing current allowing accurate trimming of the magnetic field to zero. In automatic mode Zeromag takes control of the reversing current. For the user there are just 2 operating buttons: GO and STOP!

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.

Zerozone ZMZN

Zerozone provides a magnetic coupling direct to the surface of the components to be welded. In effect it amplifies the field nulling effect allowing Zeromag to operate on large components.



Air cooled probe ZM2PG and extension cable

The probe senses the magnetic field close to where the welding takes place. This is a harsh environment and the Zeromag probe is up to the task. The sensitive element is embedded in stainless steel and the air cooling



system allows the probe to be kept at ambient temperature without placing any thermal compromise on the welding operation. The extension cable is used Zeromag is to be operated away from Zerozone. Additional extension cables can be added for larger distances.

Magmeter MF300H+

The MF300H+ is a gaussmeter, but it is not a delicate instrument. It is a robust handheld device with a strong slim stainless steel probe ideal for use at the root of weld preps. Key features include autoranging, a choice of measurement units and a robust carry case.



This is an ideal instrument to assess whether demagnetizing is required. Its tough slim probe can be used into the bottom of a 'V' or 'J' prep to give an accurate measurement of what field the welder will have.

Options

The DKWG is normally used as is on large frameworks. However for smaller pipe components such as pipelines it can be extended with the ZM150 degauss unit, clam coils and bobbins - see application discussion for Demagnetisers Kit for Pipe Welders (DKPW) for more information.



DKWG: Zeromag ZM100A Specification

Magnetic field reduction	Typically reduced 20x for most weld scenarios magnetic field reduced to <10 Gauss
Gaussmeter measurement range	0 to +/-1800 Gauss
Resolution	1 Gauss
Magnetic Probe Size	5mm x 20mm x 100mm long. Encased in stainless steel
Current Output range	0 to +/-100 Amps max
Output voltage range	0V to 15V
Magnetic field nulling time	3 seconds typical
Manual Control	-100A to +100A continuously variable with 10 turn control
Auto Control	Auto-tracking and nulling of magnetic field
Line Power	Line voltage range 90V - 265V ac 48 - 62Hz Power 1.8kVA
Temperature - operating	-20C to 50C
Temperature - storage	-40C to 85C
Humidity	0 - 90%, non-condensing
Weight	26kg
Dimensions WxLxH	520 x 220 x 550mm
Storage/shipping case dimensions Zeromag Accessories	WxLxH 62 x 26 x 63, weight 35kg WxLxH 62 x 26 x 53, weight 28kg
Calibration	Calibrated by Diverse to NPL traceable standard
Housing	Built into a carrying case to enable it to be used on site; 19" portable rack, 4U
Demagnetizing cable:	Options: demag cable, bobbins and clam coils
EMC	CE approved for emissions and immunity standards
Warranty	12 months



Zeromag



Zerozone



Magmeter

ZMZN: Zerozone Performance Specification

Turns	20 turns deployed on each arm
Operating misalignment allowance	Side arms and pole pieces adjustable allowing compensation for misaligned weld components
Range of pipe/plate sizes	Supplied with 2 pairs of pole pieces for plate (flat and corner) and for large diameter pipe. Pole pieces can be supplied for user defined sizes.
Deployment	Usually one deployed across the weld prep and the seam is welded between the jaws. Ratchet belts supplied to secure ZeroZone to local tie points.
Vertical deployment	Vertical mounting eyes on the assembly to allow hanging from post, crane or framework.
Cables to Zeromag	Supplied with extension cables to Zeromag
Weight	17kg
Size	30 x 26 x 17 cm plus cable
Operating temperature	Up to 85C. Extended temperature range as option.
Extended temperature range	For elevated temperature use and pre heat use a thermal break between Zerozone and the components.
Construction and material	Nickel plated steel with 120A connectors.
Storage	Supplied with wooden shipping and storage case
Working current	Up to 100A
Operational storage	It is important to keep the connector contacts clean.
Environmental	Temperature -20C to 50C Humidity 0-90% non condensing Do not operate or store in a wet environment
Support	Call/email Diverse for support for use of ZeroZone for different weld scenarios

DKWG Magmeter MF300H+ Specification

Manual Ranges: (Full scale)	0-19990 gauss in 3 ranges
Auto range:	Automatically adjusts range with field
Measurements modes	Average, absolute peak, bipolar peak, true RMS
Probe size	2.2mm x 6.5mm 100mm long
Probe cable length	1.5m typical
Power:	4 standard AA cells , typical lifetime 12 months. Continuous use 30 hours
Instrument size:	165 x 100 x 50mm
Weight in case:	1.1kg
Environmental:	-20 to 50C operating, -20 to 80C storage
Humidity	0-90% non condensing
Warranty	12 months