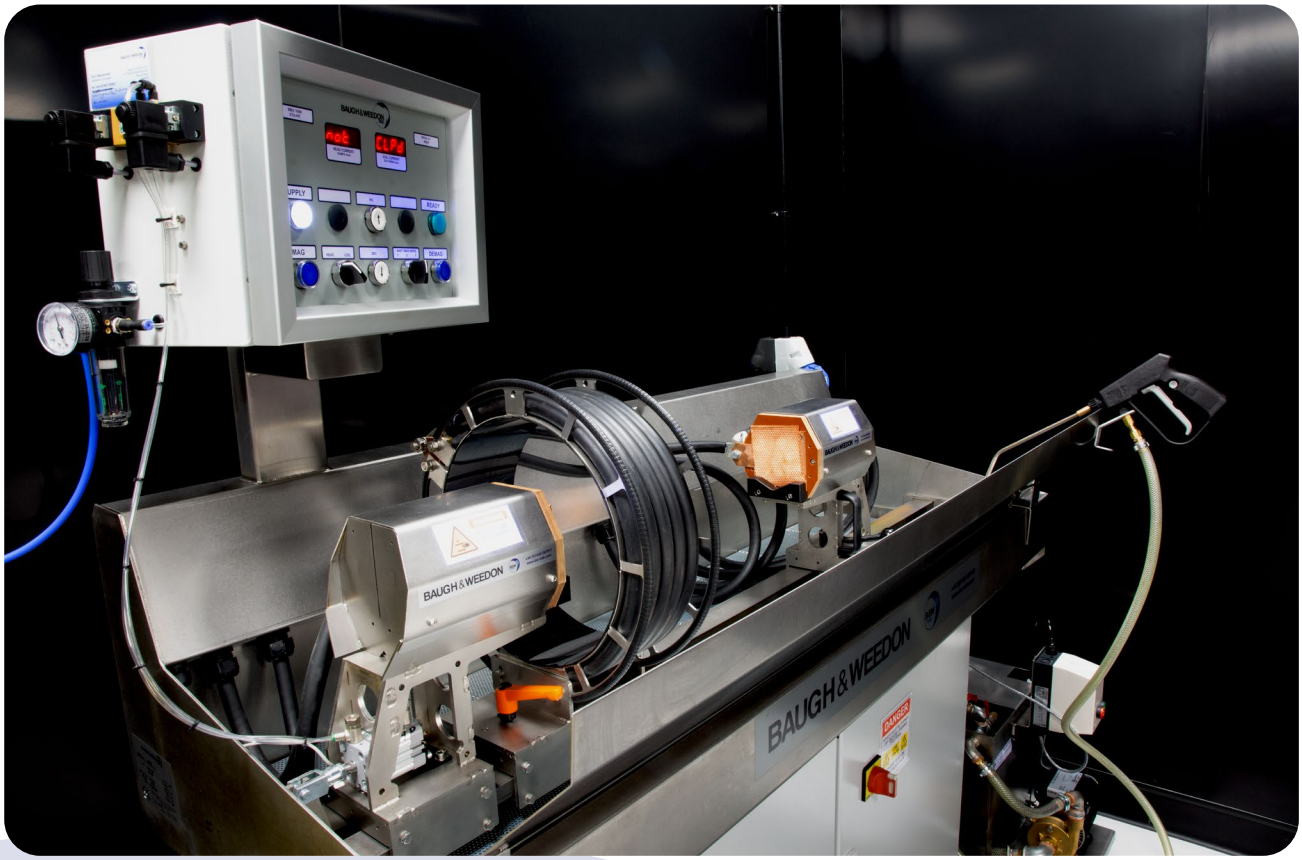
BAUGH & WEEDON NDE

MAGAZON SBU SERIES

MAGNETIC PARTICLE INSPECTION (MPI) BENCHES



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Baugh & Weedon Ltd is a trusted supplier of MPI equipment to the NDT industry. Their Magazon Series of benches have a proven track record for reliability and durability, and are in daily use by most of the leading UK Aerospace companies. Designed and produced in Hereford, UK, the Magazon series offers testing for components of all sizes that require substantial magnetising currents.

Our benches are available in varying sizes, a wide range of magnetising modes and current waveforms with a variety of accessories and ancillary equipment.

MPI Bench designs from Baugh & Weedon allow the freedom to build and configure benches to individual specifications offering the optimum combination of technical and commercial satisfaction.

Construction

The Magazon SBU MPI Bench is fitted with a stainless steel drain tank, incorporating the fixed position headstock and moveable tailstock. The Power Pack is integrally mounted underneath encased in a heavy duty steel cabinet. The cabinet itself is then fitted to a steel plinth that means the whole bench can be easily moved with a fork lift truck.

On the Magazon SBU the clamping pressure can be reduced, which affords the protection of delicate components. A “small piece device” can also be fitted, which enables the rotation of components for easy viewing. For heavier test pieces support rollers mounted on the bed bars are available.

Controls & Metering

The SBU and its larger counterpart, the EBU, share the same control and digital ammeters. The control panel is designed to reflect your application, with buttons being assigned to work in conjunction with your needs. Digital metering is standard on all units and can be calibrated to display the output current in PEAK, RMS, or 2xMEAN. Two meters are provided, each with independent control. One meter displays HEAD current, and the other displays FLUX/COIL current.

The Magazon SBU has a universal, microprocessor based, electronic system which allows many additional features to be incorporated including current pre-selection and built-in memory for up to 99 sets of test parameters.

Power Packs

For the Magazon SBU, a nominal 2500A power pack provides AC, with HWDC (half wave rectified) and single phase, or 3-phase FWDC (full wave rectified) waveforms as options. The provision of HWDC (half wave rectified) or FWDC (full wave rectified) waveforms can also be accommodated.

On standard models infinitely variable current control is achieved using thyristors resulting in a complex current waveform. However, where a sinusoidal waveform is required for compliance with some test specifications, the option of variable transformer control is available for both the Magazon SBU and EBU.

Inline Operation

Where an SBU MPI Bench is required as part of a production line with a high volume of components to inspect there are additional options that can be added to a standard bench to assist with this:

- **Multi-directional magnetising or "Swinging Field"** allows two magnetising circuits to operate simultaneously, eliminating the need for multiple "shots". Defects in any orientation are highlighted in a single operation and consequently only one viewing is necessary.
- **Automatic Sequencing** provides a degree of automation which can be selected depending on the application. A semi-automated sequence would limit operator involvement to loading the test piece, initiating the cycle and unloading. The normal sequence of clamping, inking, magnetising and unclamping can be achieved automatically. During this process the operator has time to inspect the previously magnetised component.

Ink Application & Inspection

The Magazon Series is suitable for use with either kerosene or water based magnetic particle inspection inks. Ink is applied to the test-piece by a manually controlled spray or from an overhead shower, with timed control related to the magnetising shot. Excess ink drains to a separate free standing stainless steel reservoir, fitted with an integral pumped recirculation system which maintains the particles in suspension. The inking system is a self contained unit with its own controls mounted on the reservoir to assist emptying and cleaning.

Where fluorescent inks are specified, inspection conditions are critical. To satisfy specified lighting requirements ultraviolet lamps and a viewing canopy are available. The free standing canopy consists of a metal frame covered in a heavy flame-resistant material with front opening curtains, and can enclose a sufficient area to include an inspection station or a supply of test pieces. The canopy has an extractor fan, white light and power point for the ultraviolet lamp, fitted as standard.

Optional Features

A wide range of additional equipment may be fitted to or powered by a Magazon EBU series bench to extend its capability.

• **Encircling Coils**. A range of interchangeable encircling coils is available. The coil carriage is track mounted at the rear of the bench and is adjustable in height. It can accommodate coils with internal diameters between 300mm and 600mm, while maintaining the centre of the contact pads in line with the coil centre. Head and tailstock design allows coil "parking" behind the faceplate affording clear access to a testpiece. If the coil is not in use it can be folded back, out of the way. Round or square split coils, mounted directly to the bedbars, can also be supplied.

• **Flux Coils.** Magnetising coils with laminated cores built into the head and tailstock provide the "x Flow" or "Mag Flow".

• **Special Coils.** Alternative coils to meet special applications can be supplied, either mounted on the bench, or on a separate free-standing frame. These include spiral or "pancake" coils, encircling coils with laminated cores and split coils, or knife switch coils, with a turntable to rotate the testpiece.

• **Remote Magnetising**. Components which are difficult to load because of their size or shape can be magnetised off the bench. Output sockets allow the bench power supply to be connected to prods, leeches or wrapped cables.

• **Test-piece Supports.** V-block supports are fitted to the head and tailstock as standard. Adjustable support rollers fitted to the head or tailstock, or mounted on the bed bars, can be supplied. A small piece device affords protection to delicate components is also available.

SPECIFICATIONS

	Standard Models	Options & Alternatives
Power Pack	AC waveform with rated output current of 2500A (RMS)	HWDC (half wave rectified) and single phase FWDC (full wave rectified)) waveforms.
Current Flow Magnetising	Max output nominal 3500 AC (peak), measured through a standard shunt.	Max output nominal 2500 A HWDC (2xMEAN), single phase FWDC 2500 A (MEAN), 3 phase FWDC 2500 A (MEAN)
Encircling Coil Magnetising	Carriage mounted, 5 turn, 300 mm ID coil, length 100 mm. Nominal maximum output / centre field strength in an empty coil. 4200 AT AC (RMS). Coil can be parked at either head or tailstock.	Smaller ID coils for clamping between head and tailstock. Option of higher outputs on request.
Flux Flow Magnetising	n/a	Head and tailstock integral flux coils powered by single phase FWDC nominal 20000 AT.
Multi-Directional Magnetising	n/a	Swinging Field: Simultaneous operation of two magnetising circuits, to produce a “swinging field” or rotating vector.
Current Control System	Variable thyristor, with resulting complex waveform.	A variable transformer can be fitted to provide a sinusoidal current waveform.
Working Range	Current range: 10% to 100% of maximum output.	Extended working range down to 100 AC (RMS) minimum.
Metering	Digital metering, calibrated to display PEAK or RMS to within 5% over working range to meet customer requirements.	HWDC and FWDC outputs displayed as peak or MEAN to meet customer requirements.
Shot Time	Pre-set single shot of 1, 2 or 3 seconds (other timings can be accommodated).	Any shot-time combination can be catered for, including multiple shots.
Duty Cycle	Dynamic duty cycle from 20% at maximum output, to 100% at around 900A RMS.	n/a
Max “ON” Time	3 seconds at 20% duty cycle.	n/a
Demagnetising	Automatic decaying AC DEMAG.	On FWDC demag cycle is low frequency, reversing polarity, with current step down to zero.
Headstock	Pneumatically operated, manual control. Clamping stroke: 25mm. Contact pads: 100mm x 100mm.	Foot switch operation. Spring incorporated to reduce pressure..
Tailstock	Fully adjustable, manual positioning over entire bed length. Manual quick release locking mechanism	n/a
Testpiece Support	V-blocks on head and tailstocks.	Removable small piece device with manual rotation for components up to 15 mm diameter. Bed bar mounted adjustable support.
Inking System	Ink Tank: 50 litre stainless steel (covered) reservoir with recirculating pump, manual application & integral controls.	Automatic inking as part of the automated process sequence.
Services: Power Supply	230V 50 Hz, 1-phase + neutral + earth, current drawn approx 60 A. 415V 50Hz, 3-phase + neutral + earth, current drawn approx 30A.	The multi-directional magnetising option requires 415 V, 50 Hz, 3 phase + neutral + earth: Current drawn approx. 65 max.
Air Supply	6 bar. (FR unit fitted as standard).	n/a

Specification subject to change without notice.

Max Testpiece:	800	1000	1200
Length, mm:	800	1000	1200
Weight, kg:	25	25	25
Equipment Dimensions:			
Width, mm:	1400	1600	1800
Depth, mm:	650	650	650
Height to bed bar, mm:	975	975	975
Bed to pad centre, mm:	200	200	200

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