Product Brochure

Magnetiser M3000 series industrial range

The latest 4th generation M3000 (3000V) series industrial range of high-performance production magnetisers are designed to integrate into semi-automated and fully automated production lines. They are usually supplied with custom fixtures or production towers containing the fixture often with integrated fluxmeter feedback as part of the fixture tower. The 4th generation is fully modular with a magnetiser control tower containing the charger circuit, coil current sense system, a powerful RISC microcontroller with touch screen user interface and production interfaces plus capacitor bank towers which can be flexibly configured to the power needed.

4th generation M3000- 60kJ modular Magnetiser with 1 Magnetiser control tower (right of image) and 2 capacitor power bank towers (left of image).

Key benefits

- **High Power Magnetisers** –M3000 (3000V)- 20kJ, 40kJ, 60kJ, 80kJ and 100kJ
- **Industrial scale** – modular multi-tower magnetiser system.
- **Proven Reliability** – 4th generation launched in 2023 and previous generations used across the world since the 1980s.
- **Easy-to-use** - fixed or optional adjustable position 7" touch screen with admin programmable display and simple production interface (Dual Pulse switch, Emergency stop and Display showing status) or controllable as part of a fully automated production line.
- **Production software** – The latest v4 Hirst proprietary magnetiser production software. Intuitive easy to use and customisable to include multiple part programmes and pre-sets.
- **Multi- fixture** – Up to 4 magnetising fixtures can be multiplexed to a single M1000 or M3000.
- **Magnetising fixtures** –mostly supplied with custom fixtures in tower format for large magnetic parts.
- **Advanced monitoring for optimum process control** - peak current (via a high sensitivity Rogowski measurement coil) and waveform capture and display.
- **Communications** - A range of industry standard connectors two RS232 ports inc SCPI, CANopen and PLC interfaces connection to Hirst gaussmeters and Fluxmeters and PCs / Computers.
- **Advanced data collection and capture** – integration with SPC, SCADA and production databases.
- **Production line integration** – can be used in manual, semi-automated and fully automated production lines.
- **High Security** - Admin passcode lock for production applications to protect production setting from operator changes.
- **Safety** – Power Interlock and Emergency stop with internal protection circuits prevent damage (inc temperature on fixture and fixture plugged in, auto energy dump under emergency stop).

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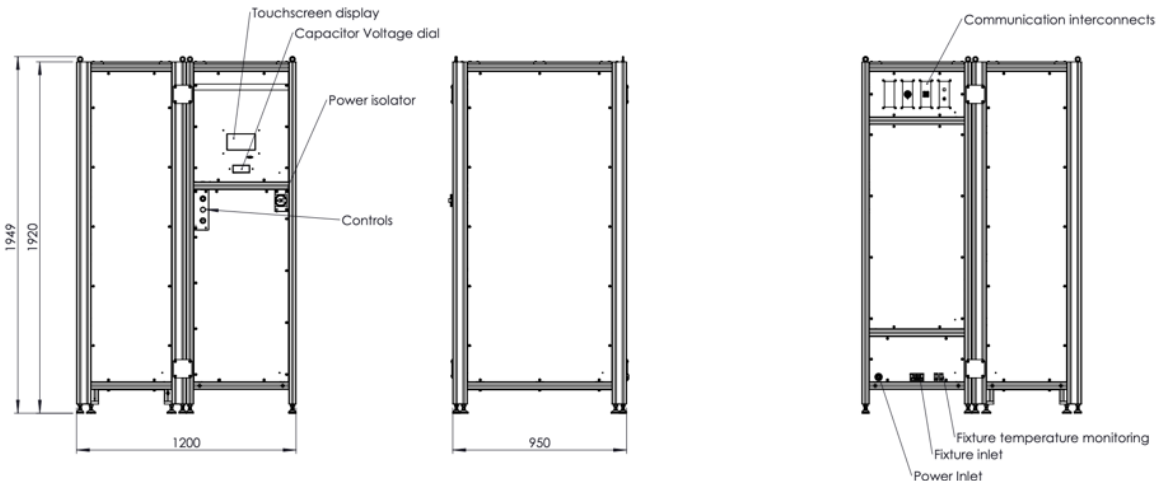
Applications

- Electric motors:
  - M3000 - 20kJ and 40kJ multi-shot magnetisation of small and medium motor assemblies IPM, SPM Axial flux motors
  - M3000 60kJ-80kJ single-shot magnetisation of medium and larger of SPM & IPM motors and multi-shot or step and repeat magnetisation of large Axial flux motors
  - M3000 100kJ single-shot magnetisation of large of SPM & IPM motors and multi-shot or step and repeat magnetisation of high-performance Axial flux motors (including highest AH grade of NdFeB).
- Audio – single shot magnetisation of large loudspeakers.

Technical Data

Modes	Industrial Magnetiser
Maximum voltage	M3000 – 3000V with 1V resolution
Magnetiser Energy	M3000 - 20kJ, 40kJ, 60kJ, 80kJ and 100kJ - larger upon request
Coil connections	HV connectors
Number of fixtures that can be connected	Up to 4 multiplexed fixtures
Output Configurations	Magnetiser or reverse polarity H-bridge option
Communications and interfaces	Serial connection - RS232 9 way 'D' inc SCPI and 1x 9 way 'D' CAN bus (CANopen), USB, PLC interface and 2 x Thermocouple inputs for fixture temperature monitoring.
Integration	Standalone and easy integration with Hirst GM08 gaussmeters, IFM06 fluxmeter and other automation systems.
Display	7" touch screen
Colours and materials	Steel and Aluminium case
Dimensions / Weight	1932x1135x880mm - M3000-20kJ & 40kJ / 1400kg 1932x1740x880mm - M3000 60kJ, 80kJ and 100kJ / 1970kg
Operating Temperature Range	+5° C to +40° C
Power Supply	M3000 up to 80kJ : Single Phase 220/240VAC 50-60Hz 32A or 110VAC option. Max 5m cable length. Three Phase option (below) M3000-100kJ :Three Phase 220/240VAC 50-60Hz 32A or 110VAC option Max 5m cable length



M3000-20kJ & 40kJ industrial magnetisers with 2 towers for up to 4 fixtures. Control tower plus, 1 capacitor bank tower.

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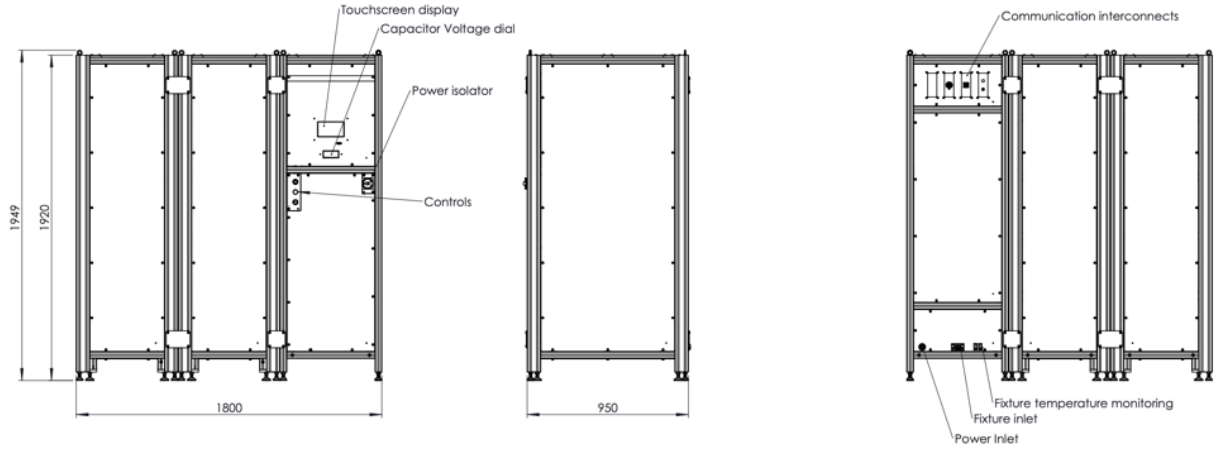

M3000-60kJ, 80kJ and 100kJ industrial magnetisers for up to 4 fixtures. Control tower plus, 2 capacitor bank towers.

Rear of M3000-60kJ - control tower plus 2 capacitor-bank towers with the safety panels removed highlighting the modular design approach.

The external analogue display of the capacitor voltage (shown above) is standard on all 4th generation M series magnetisers allowing capacitor charge state to be displayed in the event of a power outage for extra user or maintenance team safety.

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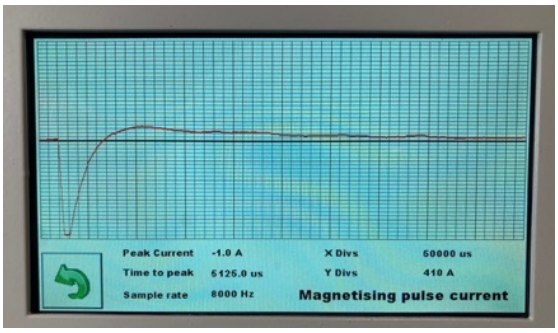

Above is a screen shot for the 7" touch screen interface running the latest v4 Hirst proprietary magnetiser production software which is intuitive and easy to use which is customisable to include multiple part programmes and pre-sets. The M3000 has advanced current monitoring for optimum process control with peak current and magnetiser waveform capture and display.

Remote user operation via external paddle controls on up to 4-meter cable (above), controls can also be integrated into production system. The USB interface allows connection to optional PC based Windows App for magnetiser monitoring, logging and control.

Warranty and Calibration

Supplied calibrated with 1 year warranty. A calibration is required every year to maintain the highest levels of performance – Hirst has a dedicated team of installation and service engineers, available to travel worldwide to install and support equipment, service contracts are available. See website for details.

All equipment complies with relevant safety standards and is UK CA or CE marked.

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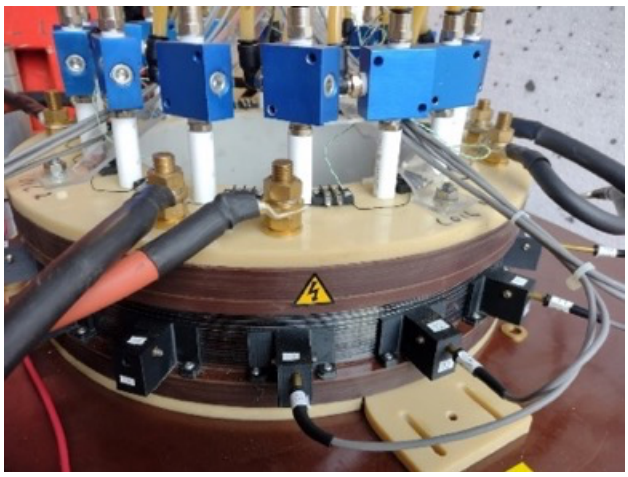
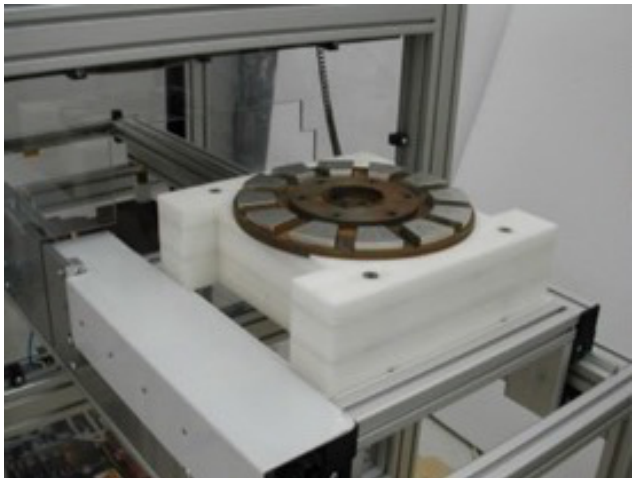
Accessories and Application examples

Custom Fixtures

A custom water-cooled fixture with temperature monitoring for actuator manufacture used with third generation M3000-20kJ magnetiser.



Custom Electric motor fixture - 16 pole fixture IPM configuration for an EV application with multiple Gaussmeter probes embedded into the fixture.



Custom Electric Motor fixture – Axial flux rotor (from 2005) being loaded into a production 12 pole custom fixture in a second-generation production tower M3000-80kJ.

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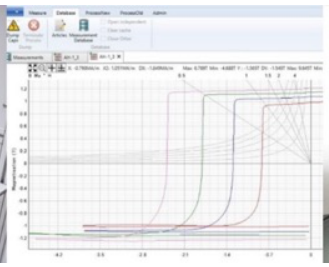
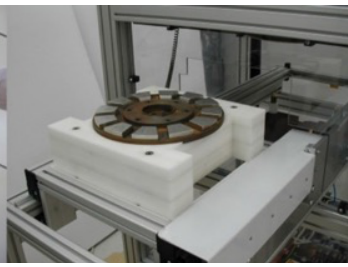
Application Examples

A third generation M3000- 40kJ Magnetiser with custom skewed multipole fixture for IPM motor applications with IFM06 fluxmeter and embedded Gaussmeter feedback.

Custom production enclosure containing a second generation M3000-100kJ magnetiser.





Hirst Magnetic Instruments has been active in providing solutions for 60 years in magnetics and magnetic measurement. Hirst manufactures precision hand-held gaussmeters, Fluxmeters, de-magnetisers, bench top & workstation industrial magnetisers, industrial production-line magnetisers, pulse field magnetometers (PFMs) for developing characterising magnetic materials and many custom projects.

Hirst Magnetic Instruments Ltd reserves the right to make changes to any specifications or performance implied in this product brochure without notice – please refer to www.hirst-magnetics.com for the latest version.

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