MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 2

MPE PEOPLE

MPE wins Engineering Employers Federation's Business Growth Award

MPE has won the Business Growth category in the EEF Future Manufacturing Awards for the North-West England region, at a ceremony in the Salford City Stadium, Manchester.

Click for more details

Spotlight on Dave Rimmer

Design Engineer Dave Rimmer graduated in the summer of 2001 from the University of Central Lancashire (UCLan) at Preston with a BEng Honours degree in Electrical and Electronic Engineering.

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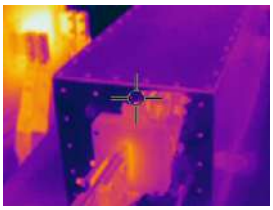
MPE TECHNOLOGY

New plug-in TEMPEST filters for your IT systems require no installation engineer

To prevent the covert interrogation of conducted lines, MPE has long specialised in the design and manufacture of TEMPEST specification filters, in both standard and custom formats, that offer high insertion loss performance across a very wide frequency spectrum.

Click for more details

Test report proves low heat rise of MPE HEMP filters



We reported in Issue 1 of the *MPE Company Bulletin* on MPE's ground-breaking, single-line, 1200A-rated, High-Altitude Electromagnetic Pulse (HEMP) powerline filters which are fully compliant with the 10A residual let-through current requirement of MIL-STD-188-125 Parts 1 and 2.

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MPE DISTRIBUTOR NEWS

New German distributor to promote MPE in fresh sectors

MPE has appointed Electrade as its new distributor covering the whole of Germany for both standard and customised products.

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Power Day attracts defence industry engineers from across Turkey

IMCA Elektronik, whom MPE appointed last year as its new distributor for Turkey (www.imca.com.tr), hosted a Power Day seminar in January at the Bilkent Hotel and Conference Center in the west of the city of Ankara.

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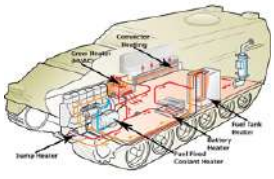
MPE APPLICATIONS

Warming & cooling vehicle crews



For over 20 years MPE has been the supplier of multi-line, custom EMC filter solutions for the HVAC systems designed and manufactured by Webasto Thermo & Comfort UK Ltd (www.webasto.com/gb).

Securing network communications

Since 1998 MPE has been a supplier to Barton Engineering & Export Ltd of 20 different types of custom powerline installation filters with high insertion loss performance, for TEMPEST-specification rack systems located in the

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screened areas of IT and communications, or command and control facilities, typically for the Ministry of Defence, Government agencies, Police and banks.

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FAST FACTS ON MPE LTD

- MPE has traded since 1925 and employs over 50 people.
- MPE has designed, manufactured and shipped more than 8,000,000 high-performance EMC, EMP and TEMPEST filters and feedthrough capacitors over the past 30 years.
- Many products have been in service for over 20 years with undiminished performance.
- MPE has a portfolio of over 20,000 custom product designs to meet all possible requirements.
- The MPE factory at Knowsley, Liverpool, is certified to the quality standard ISO 9001:2008, and its products meet all applicable defence standards.

For comprehensive information about MPE's products and services, contact the Sales and Marketing Department, MPE Ltd, Hammond Road, Knowsley Industrial Park, Liverpool, L33 7UL, U.K. Tel +44 (0)151 632 9100. Fax +44 (0)151 632 9112.
Email sales@mpe.co.uk. Website www.mpe.co.uk
If you have a friend or colleague who you think might find the MPE Company Bulletin informative, then why not forward it to them?

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 2

Presenting the North-West of England regional Business Growth Award at the EEF Future Manufacturing Awards are pictured, from left to right: Jill Davies – Chief Executive, Westfield Health (sponsors of this Award); Paul Currie – Sales and Marketing Director, MPE Ltd; David Seabury – Managing Director, MPE Ltd; Darrell Matthews – North-West Regional Director, Engineering Employers Federation (EEF).

At the EEF Future Manufacturing Awards for the North-West England region, MPE achieved second place in the Smart Product Award category for its new range of High-altitude ElectroMagnetic Pulse (HEMP) protection filters. Here, from left to right, are: Paul Tranter – Chief Executive, Pera Technology (sponsors of this Award); David Seabury – Managing Director, MPE Ltd; Paul Currie – Sales and Marketing Director, MPE Ltd; Darrell Matthews – North-West Regional Director, Engineering Employers Federation (EEF).

Staff at MPE in Liverpool, UK, celebrate the company's successes in the 2013 EEF Future Manufacturing Awards for the North-West England region. In the centre, left to right in shirt and tie, are: David Seabury – Managing Director and Jan Nalborczyk – Technical Director of MPE Ltd.

MPE wins Engineering Employers Federation's Business Growth Award

MPE has won the Business Growth category in the EEF Future Manufacturing Awards for the North-West England region, at a ceremony in the Salford City Stadium, Manchester. Prime application areas for the company's EMC filters extend widely – from military vehicles of all types, tactical shelters and ground installations, aerospace and naval equipment, to information and communications technology, EMC test houses, hospital scanners, process control, fire safety and railways.

These annual Awards are hosted by the Engineering Employers Federation (EEF), the manufacturers' organisation, to recognise excellence among UK manufacturers in enterprise, innovation, exports, environmental performance, skills development, health-and-safety and apprenticeships.

MPE won the coveted Business Growth Award sponsored by Westfield Health – which recognises manufacturers who have achieved dramatic business growth – for its expansion into South Korea and the USA. Export sales within these territories have grown significantly over the past two years, and more than 65% of MPE's total annual production is now exported.

Jill Davies, Chief Executive of Westfield Health, commented: "Congratulations to MPE Ltd on winning the regional Business Growth Award. Not only have they managed to defy today's difficult economic climate, they have also delivered impressive growth."

Highly commended in the Outstanding Export category, MPE was also runner-up for the Smart Product Award, sponsored by Pera Technology, for its development of High-altitude ElectroMagnetic Pulse (HEMP) protection filters compliant to MIL-STD-188-125. This Award recognises manufacturers who have designed and marketed ground-breaking new products over the last three years, fronting UK technological innovation.

Paul Tranter, Chief Executive of the Smart Product Award sponsor Pera Technology, summed up: "Having worked with more than 500 businesses on new product development programmes, I can safely say that MPE is a fantastic example of a truly innovative company. They have not only developed a revolutionary product line with their HEMP filters but also undergone full commercialisation – and are now profiting from significant market demand."

Link for High-altitude ElectroMagnetic Pulse (HEMP) protection filters www.mpe.co.uk/category/hemp

www.eef.org.uk
www.peratechnology.com
www.westfieldhealth.com

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 2

Dave Rimmer

Spotlight on Dave Rimmer

Design Engineer Dave Rimmer graduated in the summer of 2001 from the University of Central Lancashire (UCLan) at Preston with a BEng Honours degree in Electrical and Electronic Engineering. Then he became an engineer at an environmental monitoring consultancy north of Liverpool, where he helped to develop monitoring instrumentation for oxygen concentration, to warn of volatile atmospheres within large experimental areas.

In March 2003 he joined the MPE engineering team in his current pivotal role of Design Engineer. Accordingly, over the past 11 years Dave has acquired valuable experience and expertise designing high-performance EMC filters and capacitors of all types, for a host of defence applications in military vehicles, tactical shelters, building installations, surface vessels and submarines.

In particular he is a leading engineer in the field of HEMP filter design, applying his research and development skills with PSpice circuit simulation software to predict let-through pulse and optimise electrical circuitry to protect customer equipment from the High-altitude ElectroMagnetic Pulse threat.

Taking a leaf out of *The Motorcycle Diaries*, Dave Rimmer is a keen adventure motorcyclist, touring the UK and Isle of Man. He is also a proud supporter of Everton Football Club, watching many games with friends and family. What is more, he currently enjoys keeping fit by road cycling around the area where he lives in the Lancashire seaside town of Southport.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 2

New plug-in TEMPEST filters for your IT systems require no installation engineer

To prevent the covert interrogation of conducted lines, MPE has long specialised in the design and manufacture of TEMPEST specification filters, in both standard and custom formats, that offer high insertion loss performance across a very wide frequency spectrum. Now the company has launched a new range of convenient, plug-in TEMPEST filters in 1-, 2- and 4-socket and inline versions. They are designed to the IT equipment safety standard EN 60950-1. Requiring no electrical contractors for their installation, these filters could therefore not be quicker, easier or simpler to deploy to meet an immediate need.

Background

A longstanding concern of governments, armed forces, municipal authorities and companies has been the fact that electrical and electronic equipment such as computers and peripherals give off unintended electromagnetic emanations which can then be reconstructed as intelligible data. So, to maximise information security, countermeasures for TEMPEST – often regarded as an acronym for “Transient ElectroMagnetic Pulse Emanation Standard” – are aimed at preventing eavesdropping on data radiated as signals via conducting lines (such as power, telephone or control line cables).

Such a signal may be intercepted by an enemy’s intelligence services, or a competitor, rival or fraudster. Thus for instance, a classified signal from a laptop inadvertently picked up and transmitted down an unprotected telephone line could potentially be accessed by putting a clamp around a telephone cable many miles away. Just as susceptible are incoming power cables, which can be monitored over similarly long distances. Accordingly the danger is “clear and present”.

The new plug-in filters from MPE – an effective & convenient solution

Fully compliant with NATO SDIP-27 Levels B and C, MPE’s 250V AC, 50/60Hz, pluggable TEMPEST filters cater for 6A, 13A and 32A currents. The units provide EMI suppression across the full frequency spectrum. Accordingly they meet the TEMPEST protection standards applied to individual pieces of equipment of 60dB insertion loss performance over frequencies from 100kHz to 1GHz.

The 6A and 13A types of connection unit feature 3-pin plug input and socket outlets to BS 1363, whilst the 32A comes as standard with an IEC 60309 Commando connector input and BS 1363 socket outlets. Alternatively terminated filters, such as IEC, Powercon and Schuko, are easily supplied upon request.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 2

What is more, the new units, in smart and durable stainless steel enclosures, are significantly smaller and lighter than traditional TEMPEST filters. All components are manufactured by MPE in Liverpool under an ISO 9001 quality regime. There has been a zero failure rate on the many hundreds of MPE TEMPEST filters currently in service around the world, so that complete reliability over long service is their hallmark.

Download the datasheet giving part numbers and specifications for the new pluggable TEMPEST range from MPE. Enquiries for the product will receive the immediate attention of our technical sales team.

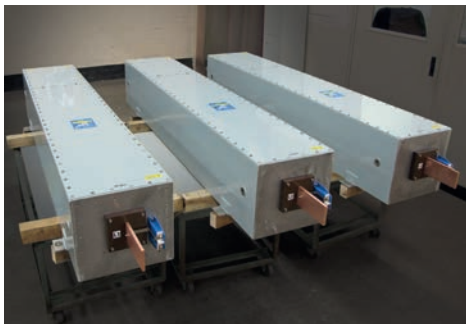
Download your copy of the datasheet here.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 2



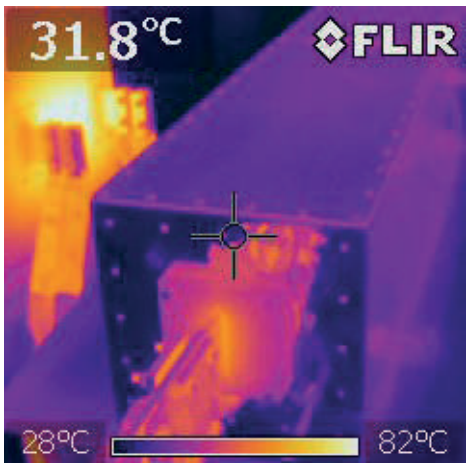
1200A MPE HEMP powerline filters ready for despatch

Test report proves low heat rise of MPE HEMP filters

We reported in Issue 1 of the *MPE Company Bulletin* on MPE's ground-breaking, single-line, 1200A-rated, High-Altitude Electromagnetic Pulse (HEMP) powerline filters which are fully compliant with the 10A residual let-through current requirement of MIL-STD-188-125 Parts 1 and 2.

Now MPE has taken its own independent measurements to prove that the temperature rise of the filter case, conductive busbar, inductor and capacitor under full load and specified overload currents over 24 hours is substantially below the design rule limit of 25°C. The test report is available upon request from MPE.

The maximum permissible heat rise for a filter is generally accepted as 25°C, as detailed in many applicable specifications including the UL-1283 Standard. In fact, in the worst case scenario, the heat rise of the MPE filter was measured at 18.4°C, and that was without subsequent mounting on site to the metal HEMP shield that acts as a large heat dissipating device.



This FLIR thermal image shows how the temperature on the endplate of the HEMP filter case stabilises at 31.8°C at an applied current of 1200A and ambient temperature of 24°C

The filters, based on a single 1200A circuit with no current-sharing elements, are specially designed by MPE to avoid overheating problems which commonly lead to filter failures owing to current imbalances.

Firstly, MPE avoids the paralleling of multiple lower current filters, which often results in a mismatch of paralleled filter elements leading to current overload in the lowest resistance filter. Even a filter imbalance as small as 10% represents a power overload of more than double that figure, because the power dissipated is based on I^2R. Should a parallel element fail, then the increased load placed on the remaining interconnected filters can potentially cause a disastrous cascade failure of the entire HEMP protection system.

Secondly, these MPE filters incorporate a design that ensures a low internal temperature rise of capacitor elements, inductors and current-carrying busbars. This design feature contributes significantly to increased reliability.

Thirdly, because the MPE filters are specifically designed to suit the pulse performance requirements of MIL-STD-188-125, there is no unnecessary overdesign for insertion loss performance. Therefore MPE filters are less susceptible to any harmonic content in the mains supply and, consequently, less prone to overheating introduced by harmonics.

Accordingly MPE's test report indicates a significant temperature safety margin, thus providing high reliability of the HEMP filters over a long service life. MPE prides itself on the absolute dependability of its filters, manufacturing the key components, carrying out the critical processes and employing a 100% final inspection of filters prior to shipment – all conducted in-house at MPE.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 2

MPE started designing and testing tailormade HEMP filters to meet the pulse current injection (PCI) requirements of MIL-STD 188-125-1 E1 and E2 pulses ten years ago, back in 2004. Right from the start MPE designed these filters for pulse performance rather than insertion loss and found that this approach gave results far superior to alternative solutions out in the marketplace.

In excess of 5,500 lines of MPE HEMP filter protection compliant with MIL-STD-188-125 have now been installed around the world, without any heat rise issues or electrical failures having been reported and hence achieving a zero returns rate.

Finally, reliability over a long service life avoids costly plant maintenance and system downtime.

The costs of replacement can be substantial – in terms of dismantling an equipment system to access and retrieve faulty filters from their locations and thereby putting critical facilities temporarily out of action, with unknown consequences. In general the health condition of thousands of installed filters becomes highly significant when most cannot be accessed easily to survey or replace – having been installed deep within the fabric of command posts, tactical shelters, satellite ground stations, anechoic chambers, shielded rooms, bunkers and so forth.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 2

Left to right: Dieter Muehlberger, Vice-President of Electrade GmbH and Erich Thomich, General Manager of Electrade GmbH, MPE's new distributor for Germany

Left to right: John Jephcott of MPE and Dieter Muehlberger of Electrade GmbH signing the distributor agreement for Germany

Dieter Muehlberger, Vice-President of Electrade GmbH

New German distributor to promote MPE in fresh sectors

MPE has appointed Electrade as its new distributor covering the whole of Germany for both standard and customised products.

MPE's products fill a gap in the portfolio of Electrade, who in turn maintain a technical team with a high level of engineering expertise and understanding. They can successfully promote the MPE brand in markets where it is less well known. Electrade's broad customer base comprises 40% mainstream commercial such as facilities management, process control, public utilities and transport, 30% defence and aerospace, and 30% information and communications technology (ICT) and the medical marketplace.

Established in 1992, Electrade, based at Graefelfing near Munich and with offices in Frankfurt-am-Main and Hannover, handles sales of high-technology products such as electronic materials, connectors, sensors, transducers and instrumentation from leading manufacturers which neatly complement MPE's solutions in many areas.

Paul Currie, Sales & Marketing Director of MPE Ltd, explains: "MPE has recognised that, whilst its product sales into German EMC test houses remain buoyant, there are many more applications and market sectors which MPE products can address yet remained untapped. MPE has therefore actively sought a new partner capable of penetrating such new areas, and in Electrade I am confident that MPE has found the ideal partner."

Dieter Muehlberger, Vice-President & co-owner of Electrade, comments: "Electrade have often been asked for high-performance EMC and EMP filters, but have previously had no solution to offer. The MPE product range provides Electrade with not only a solution for this requirement but also a technology which is very complementary to our other product offerings. Accordingly we look forward very much to working with MPE in the coming years."

www.electrade.com

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 2

At the Power Day hosted by IMCA in Ankara, MPE Account Manager John Parsons describes MPE's filter solutions to a new and fascinated audience of defence industry engineers

Power Day attracts defence industry engineers from across Turkey

IMCA Elektronik, whom MPE appointed last year as its new distributor for Turkey (www.imca.com.tr), hosted a Power Day seminar in January at the Bilkent Hotel and Conference Center in the west of the city of Ankara. The event was attended by over 50 engineers and senior technical representatives from various high-profile organisations operating in the Turkish defence industry.

Three of IMCA's principals – MPE, SynQor of Massachusetts and Exelsys of London – took part, each company delivering a lively and absorbing 90-minute presentation.

Sales and Marketing Director Paul Currie and Account Manager John Parsons travelled from Liverpool to participate on behalf of MPE, with John providing two highly detailed technical presentations covering the following subjects:

The principles of EMC and feedthrough capacitors

- The issues of capacitors of traditional construction
- Solving the issues with metallised plastic film capacitors
- Capacitor construction
- Capacitor insertion loss characteristics
- Capacitors in practice
- The capacitor within filter design
- Specifying power filters
- MPE's portfolio of products.

HEMP filters

- The HEMP threat
- HEMP filter solutions (shielding and filtering)
- Practical examples of HEMP filter installations
- HEMP filter design and its challenges
- The MPE range of HEMP filters.

The presentations were particularly well received by the engineering audience familiar with defence electronics, since they included a high degree of technical content. At the close of the seminar, MPE fielded a large number of questions on an individual basis, as well as several new business enquiries, some of which are now being addressed with the supply of prototype product.

Cemal Alpay, Managing Director of IMCA Elektronik, reviewed the Power Day event as follows: "The objective was to bring together key design engineers from our customers and our manufacturing principals. Rather than running a general seminar, for the first time IMCA decided to hold a focused seminar on Power Electronics.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 2

On the day, IMCA was very pleased with the quality and seniority of those people attending.

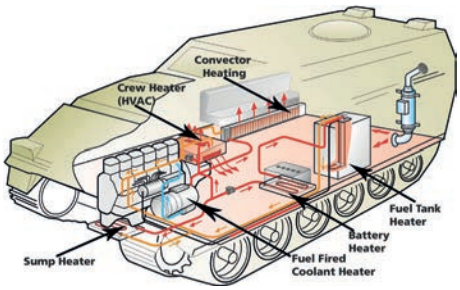
“The level of questions put to each supplier on a one-to-one basis also confirmed that the subject matter was relevant, and there has been a good level of feedback in the weeks following the presentations. The outcome of the Power Day has convinced IMCA to repeat this event in the future and to organise similar ones on other selected focus topics.”

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 2



Typical Webasto winterisation heating systems for a defence vehicle

Webasto Air Top Evo 5500 military air heater

Webasto Thermo 90 ST military water heater

Warming & cooling vehicle crews

For over 20 years MPE has been the supplier of multi-line, custom EMC filter solutions for the HVAC systems designed and manufactured by Webasto Thermo & Comfort UK Ltd (www.webasto.com/gb). The Doncaster branch in South Yorkshire is the global Centre of Excellence for defence market products for the whole Webasto Group, whose headquarters are located at Stockdorf in Upper Bavaria, Germany.

These high-specification filters suppress the natural electrical interference emanating from the motors and compressors on Webasto's fixed or portable air-conditioning, air heater and water heater units serving the crew, engine, cargo or auxiliary equipment. The suppression capability provided by MPE's custom filters for Webasto's applications – such as tactical military vehicles, construction equipment and mobile systems – assists individual pieces of equipment in meeting the MOD Standards DEF STAN 23-8 and DEF STAN 59-411, whether for heating (winterisation) or cooling (tropicalisation).

The broad and versatile product range offered by Webasto Thermo & Comfort UK Ltd includes the Air Top® range of air heaters and Thermo® range of water heaters, where necessary with waterproofing for fording operations. Air conditioners for crew cooling may be mounted above or below the vehicle roofline. Webasto designs fully integrated heating, ventilating and air-conditioning units with EMI/RFI suppression in partnership with well-known defence vehicle OEMs, to provide full climate control where required.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 2

A Barton Engineering TEMPEST rack with 10A MPE filter for filtering the electrical cable entering the cabinet

A small Barton Engineering rack showing a 10A MPE low-leakage, single-phase, powerline installation filter

16A MPE TEMPEST powerline installation filter, customised for mounting inside a Barton Engineering cabinet

Securing network communications

Since 1998 MPE has been a supplier to Barton Engineering & Export Ltd of 20 different types of custom powerline installation filters with high insertion loss performance, for TEMPEST-specification rack systems located in the screened areas of IT and communications, or command and control facilities, typically for the Ministry of Defence, Government agencies, Police and banks. Barton specifies MPE's resin-filled TEMPEST filters, with low earth leakage, in the range 10A to 63A, for filtering the electrical cable as it enters the cabinet. MPE supplies standard catalogue filters, as well as custom variants, to suit Barton's cabinet or other application-specific requirements such as for mounting and cable entry.

With a 20,000 sq ft metalworking, fabrication and finishing facility at Whitstable on the Kent coast, Barton Engineering is an engineering contractor who has specialised since 1958 in screened enclosures and 19in EMC equipment racks, TÜV tested as necessary and operating at frequencies of up to more than 10GHz, for defence and security customers.

In particular the company designs and manufactures TEMPEST rack systems to SDIP 29, generally incorporating a drilled attenuvent (an EMI-shielded, metal honeycomb panel for air ventilation, mounted in a steel frame) and a powerline installation filter from MPE.

Barton's other products include purpose-built TEMPEST containers to house datacryptors, as well as bespoke prototype screened cabinets and containers with performance specifications ranging from 15dB to over 100dB at frequencies up to 20GHz. In order to be fit for purpose, all these systems require integral EMC filter solutions.

Combinations of designs, either flat-packed or fully welded-up, are shipped around the World for both new build and upgrade projects. Typically, cabinets are transported easily in flat-pack form, assembled and installed on site by security-cleared personnel.

As might be expected in the current climate of heightened network security, Barton Engineering (www.bartoneng.co.uk) is kept very busy fulfilling orders for its feature-rich screened enclosures and EMC racks. The company's recent contracts have included a large consignment of 18GHz TEMPEST specification cabinets of different sizes – incorporating MPE filters of different amperages and highly sophisticated Mark 8 dial-locks to prevent unauthorised access.