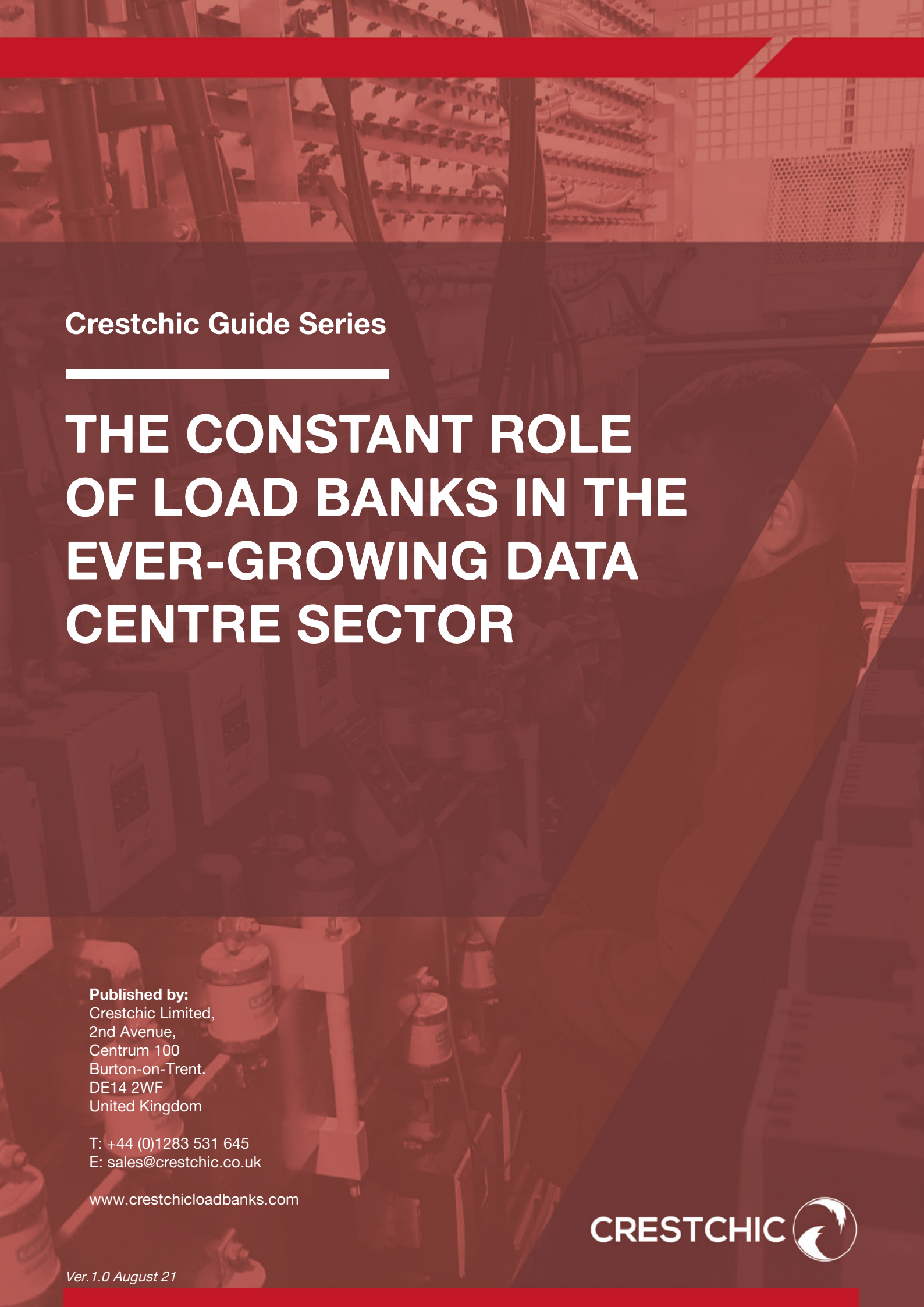

Crestchic Guide Series

THE CONSTANT ROLE OF LOAD BANKS IN THE EVER-GROWING DATA CENTRE SECTOR

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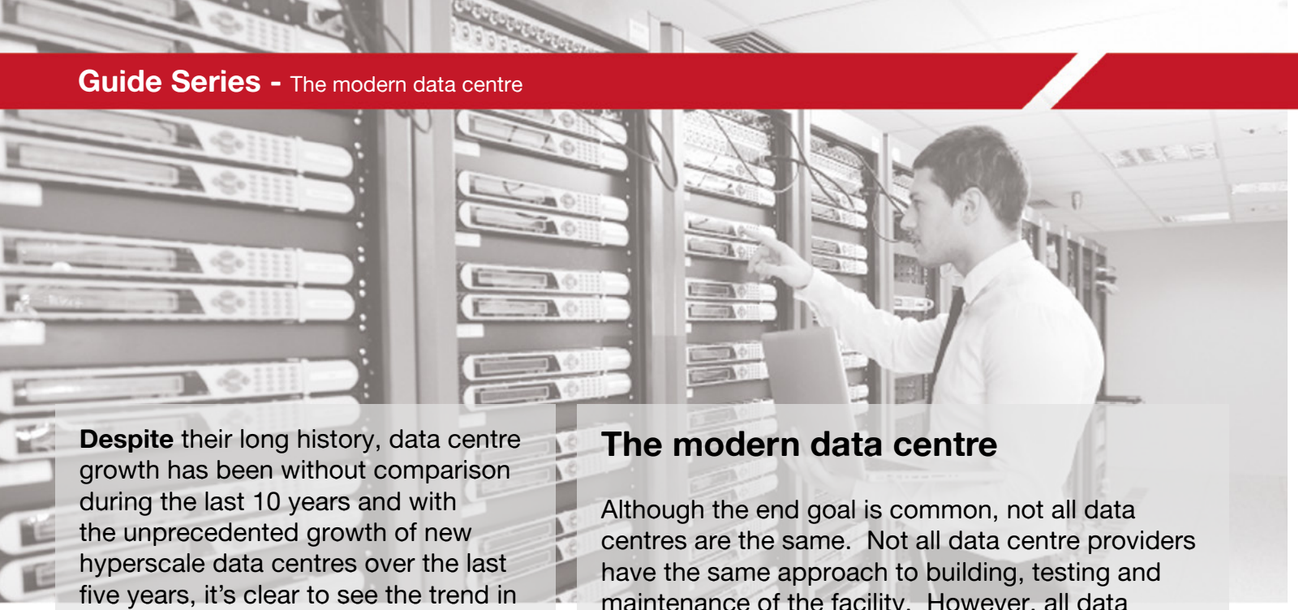

Despite their long history, data centre growth has been without comparison during the last 10 years and with the unprecedented growth of new hyperscale data centres over the last five years, it's clear to see the trend in data reliance is ever increasing*.

With an increase in remote working, streaming services and online retail, the need for reliable data has accelerated even more during the past year and is now more important than ever.

It is safe to assume that the role of the data centre will not diminish and will only become of even higher importance in the future.

The modern data centre

Although the end goal is common, not all data centres are the same. Not all data centre providers have the same approach to building, testing and maintenance of the facility. However, all data centre end users expect the same service – maximum uptime and minimum interruptions.

Data centre provider needs are bespoke, some favour highly sophisticated testing regimes, some prefer a more rudimentary approach.

All approaches have their value and relevance to the particular operation, and all get the job done. Whichever approach a data centre provider chooses, and whichever stage of the lifecycle the data centre is at, there is a load bank to suit.

The impact of the shift in power production and the need for testing back-up power systems

With a move from traditional power sources to more eco-friendly renewable power sources, a study by The Uptime Institute indicates that we are closer to power outages than ever before. Historically, power has been supplied by a small number of large power stations, such as coal, gas or nuclear. These huge power generation plants are inflexible, taking hours to shut down safely, reducing their ability to make any fast changes to supply. As supply evolves and the world switches towards greener and more sustainable sources of power, there is even more variability in supply - bringing with it further fluctuations along with an ability to be more responsive to change.

It stands to reason that brownouts or even blackouts are likely to occur when the demand for electricity exceeds supply. Conversely, too much electricity can also be a problem, causing the frequency of the grid to rise and potentially causing damage to infrastructure and problems on local energy grids. The combination of high levels of power generation and low demand can also reduce the energy system's resilience to sudden changes in frequency, which can lead to temporary blackouts. Back-up power systems have never been so important. And in turn, the role of load banks to test the back-up power systems has never been so critical.

*There are currently 600 hyperscale data centres in the world - twice as many as there were just five years ago.
Soucre Synergy Research Group 2021

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Different load banks to suit each stage of the data centre lifecycle

Some aspects of the data centre lifecycle require rental load banks, and some require permanently installed load banks.

Typically, the rental load banks used for the initial IST (integrated system testing) phase would include:

- *Resistive-only load banks typically up to 300kW for heat load testing*
- *Rack mounted server emulators for heat load-testing*
- *Capacitive load banks to test with the leading power factor often associated with servers*
- *Large multi-megawatt, medium voltage load bank packages to test and synchronise multi-genset systems on a common bus with a lagging power factor*
- *DC load banks to test UPS systems for close battery analysis and discharge performance*
- *Resistive-reactive load banks for testing the whole system operation in an emergency change-over scenario*

Crestchic Server Emulator Load Bank

It is unlikely that tests of this size or type would need to be repeated after the initial IST phase, therefore a rental package is the best fit for this. A rental package should include a full Risk Assessment and Method Statement, with dedicated transport for delivery, offloading and safe working, as well as fully trained installers and engineers to perform final electrical connections in line with local regulations and best practises, and to offer customer training and support.

Ongoing testing and maintenance of the back-up power systems is required throughout the lifecycle of the data centre. These applications are typically smaller and involve testing individual or pairs of generators at multiple locations across the data centre site.

It is usual for the data centre to purchase load banks for ongoing maintenance as they are used regularly. These 'products for life' can be permanently installed or, as is increasingly the case, fully transportable to test multi-control stations. Purchasing load banks from a manufacturer which also operates a rental business gives access to a wide fleet in the case where additional sets are needed for occasional increased capacity testing, one-off tests for different applications, or where space is an issue at build stage. Load banks should come with a warranty, after market care, and full training and support.

Using a load bank to commission or regularly test the back-up power system not only tests the prime movers and the battery but ensures all other components such as the alternator and change over switches are tested too. A load bank test not only proves that the UPS / generators will start, operate and run efficiently in the case of a power outage, but also that the sets can be safely turned off with no interruptions when mains power is restored. Resistive-reactive load banks actively test the alternator in conditions likely to be seen in a real world mains failure and therefore test the entire system, not just the genset.

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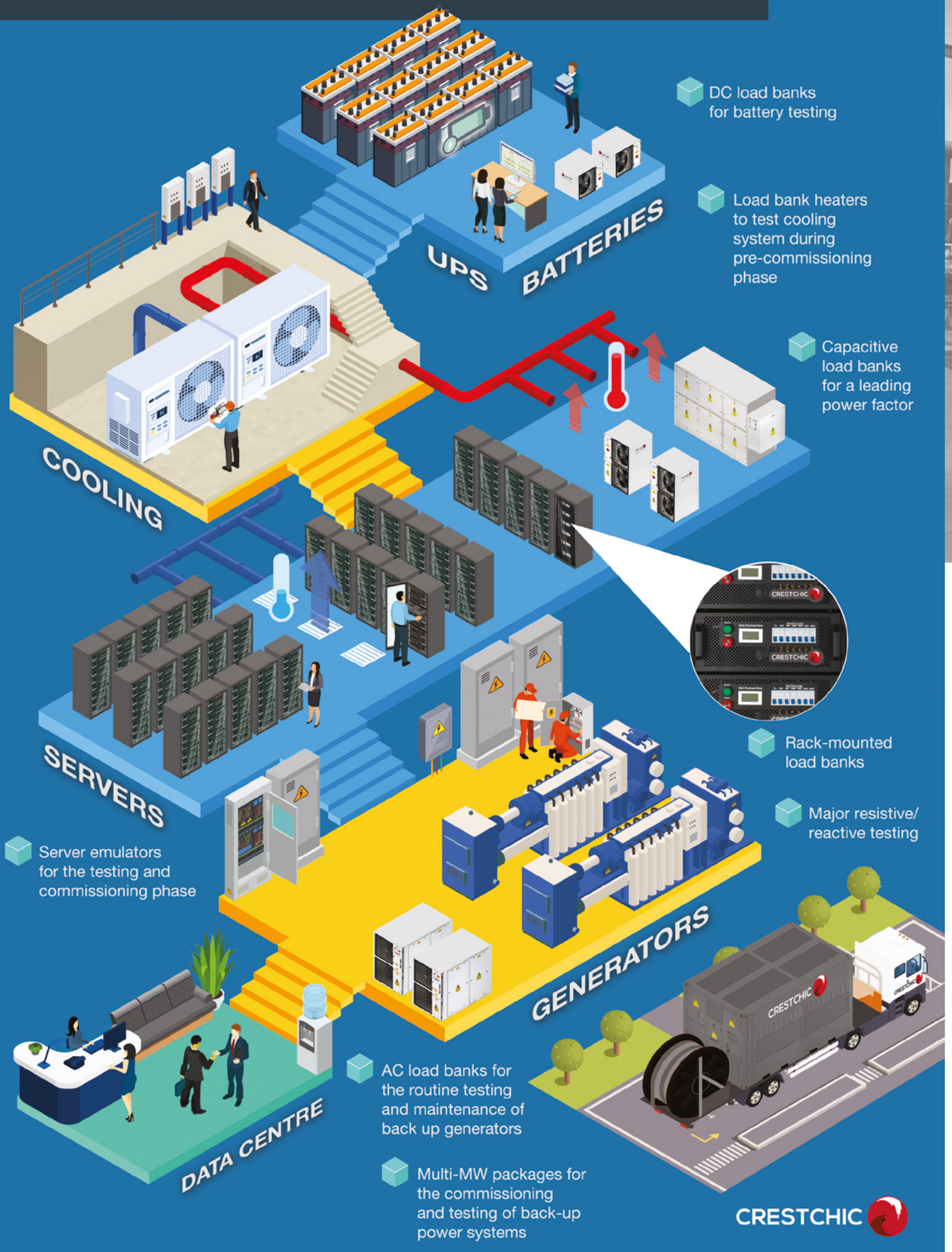
LOAD BANKS for DATA CENTRES



Guide Series - The future of power production

The future of power production

Although there has been a material change in power production the need for back-up power systems and the need to test them will never disappear, and as highlighted earlier, a shift to renewable methods of power production has led to more grid instability in the short term, whereas a shift in attitude and lifestyle means that users are increasingly unwilling to compromise on data speed, security, or availability. Future changes in power technology could lead to reduced consumption going forward meaning that back-up power systems bought based on current demand may become too large for purpose. Rather than replacing the whole system, a load bank can be used to apply additional load to the lightly loaded engines, which stabilises the system and can avoid wet stacking and generator damage. They can also be used in this way in the case of a phased opening, where back-up power systems are sized and purchased with a view to meeting the future full load of the data centre, rather than meeting the load at the time of opening.

Crestchic Loadbanks – Who we are and what we do

Crestchic is a global manufacturer of load banks, headquartered in the UK, with specialist rental divisions in the UK, France, Germany, Singapore, UAE, Ireland and China.

Since its incorporation in 1983, Crestchic Loadbanks has a developed a diverse range of products and does not believe in a ‘one size fits all’ approach.

As a manufacturer of bespoke products, with the largest global rental fleet, whichever stage of the of the data centre lifecycle you need to test, we can test it your way.

Crestchic has been working with data centres for over 30 years. Crestchic’s very first project was with Littlewoods initial data centre operations in Liverpool in the early 1980s; the company now has a project portfolio of over 3000 data centre installations.

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A load bank solution designed especially for data centres

In response to data centre requirements for more transportable load banks, Crestchic has developed a trailer mounted load bank solution.

Our self-contained, Data Centre Load Bank Trailer combines the powerful testing capability of Crestchic's resistive-only load banks with the flexibility of a heavy-duty trailer for site or road-going applications. With exceptional manoeuvrability, the DCT 3000 load bank trailer is ideal for data centres with generators in multiple locations that require regular testing across the site.

The trailer set-up allows for low level operation, the safety of a braked trailer, without the need for a large HGV-low loader style trailer. DCT 3000 can house both the load bank module and cable storage by means of a motorised reel. This load bank can be controlled by either Crestchic's dedicated LC80 rugged tablet controller or a standard PC over super-fast, interference free fibre optic cable. DCT 3000 also incorporates our new control system NOVA/ORION.

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