Isolated Power Supply System

Safety behind the socket

starkstrom
a Progility company
Powering Healthcare

Starkstrom's Isolated Power Supply System

Designed to enhance the continuity of life-supporting electrical supply and reduce the likelihood of dangerous electrical shocks, so enhancing safety for patients and clinical staff in the critical areas of a hospital such as the operating room or intensive care unit.

Isolators for incoming electrical supplies are easily visible and accessible.

> A single compact unit contains several monitoring and communication functions making it easier for engineers to monitor and service power supplies. Starkstrom's IPS Systems help reduce costs through component and process efficiencies.

EDS400 continuously monitors and detects any insulation fault on the electrical system and triggers an alarm to identify the precise circuit (MCB) containing the fault. An alternative option is the IPM400 monitor.

Miniature Circuit Breakers (MCB) with optional MCB Trip Monitoring Module (MTMM) that monitors every circuit, raising an alarm and identifying the precise MCB, if it has tripped.

Medical Isolation Transformer isolates live and neutral from the earth, to ensure MCBs will not trip on the first earth-fault. Power to life supporting medical equipment is maintained.

Starkstrom Automatic Transfer Switch (SATS) provides a reliable changeover to an alternative power source within 0.5s in the event of the main power supply failing.

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Isolated Power System Monitor (IPM400)

Designed to continually monitor the insulation resistance of the unearthed connected electrical network. It will alarm when the insulation of the network drops below a set value, typically 250k ohms. The temperature and current of the Isolation Transformer are permanently monitored. If the windings become too hot or over-loaded, the appropriate alarm (over-temperature or over-current) is triggered to alert the user.

Benefits:

- Enhanced patient safety as the electrical network continues to operate as normal, giving time for completion of the surgical operation or removal of the faulty equipment.
- Improved work-flow efficiencies as alarms allow the engineer to plan for correction of fault.

IPM400

EDS400

SATS

Earth Fault Detection System (EDS400)

Designed to continually monitor the insulation resistance of the unearthed connected electrical network and automatically detect exactly which part of the IPS System contains the fault.

In the event of an earth fault, the EDS400 will automatically detect which circuit of the isolated power supply system contains the fault, and then indicate to the user via an alarm, which of the sockets within the hospital critical area, such as the operating room, is in fault. This may be due to a faulty cable, socket outlet or piece of equipment plugged into the socket outlet.

The EDS400 is used for searching earth faults in isolated AC power networks with a maximum of 96 searchable circuits, although 16 is usually sufficient for most installations. It also performs all the functions of the IPM400.

Benefits:

- Improved process of fault detection and correction, saving time and cost.
- Minimising patient disruption saving time and cost, as well as, enhancing safety.

Starkstrom's Automatic Transfer System (SATS)

Starkstrom's automatic transfer switches have been designed to enhance electrical supply resilience. SATS automatically switches the IPS load on to a reserve or backup supply, in the event that a main supply voltage fails or drops by 10%.

Two versions of SATS are available to meet specific performance and budget criteria:

- Standard – basic control and basic switching device suitable for most applications.
- Advanced – advanced control and advanced switching device allowing the engineer to configure exact values for various parameters, such as, voltage and transfer times.

Benefits:

- A more resilient electrical supply to the life supporting medical equipment ensuring that any surgical operation taking place can continue, saving cost from possible delayed treatment and enhancing patient safety.

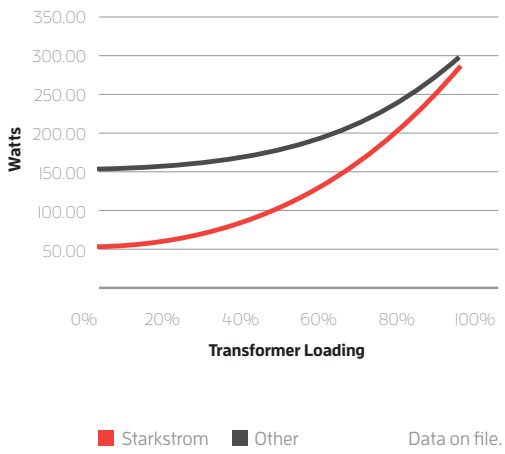
Medical Isolation Transformer

Designed, in accordance with IEC 61558-2-15 edition 2, to ensure MCBs do not trip on first earth-fault. Single-phase transformers are available with a rated output of between 0.5 – 10 kVA inclusive. Starkstrom standard transformers can generate energy savings of up to 63% compared to standard medical isolation transformers from other suppliers. (**see graph right**)

Benefits:

- Provides the electrical isolation needed for an IPS system to work correctly and enhance the electrical supply continuity.
- Starkstrom's energy efficient transformers result in reducing the direct energy cost and the cost of removing excess heat.

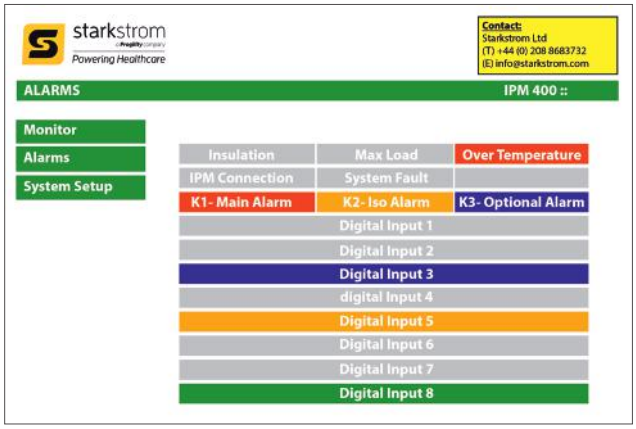
10 kVA Standard Transformer - Heat Losses



TCP/IP Web Server & Remote Alarms

Within each IPS System, an integrated TCP/IP (Transmission Control Protocol / Internet Protocol) Web Server is provided, so that all IPS information is accessible, without any additional equipment, across the hospital network using a standard browser such as MS Internet Explorer, Google Chrome.

For the various medical locations within a hospital (e.g. operating theatre, ITU, recovery) a range of audible and visual remote alarms are available to meet specific needs and allow the performance of the IPS System to be permanently monitored, alerting the clinical and engineering staff to any faults.



RA003

RA004

RA007

Remote Alarm Unit	Typical Location	Alerts
RA003 Programmable Text Alarm	Critical Areas, e.g. Recovery, ITU, HDU, SCBU	Reports faults on all IPS (and UPS) systems feeding the area. Shows exact location of the fault.
RA004 Isolated Power Alarm	Imaging Rooms, Single Patient Rooms	Reports faults on all IPS systems feeding the area. Permanently displays the insulation resistance and load of a single IPS system.
RA006 Clinical Alarm	Operating Theatre	Reports faults on all IPS (and UPS) systems feeding the area. To know status of the uninterruptible power supply (UPS) that is feeding the isolated power supply (IPS). Insulation, Over Temperature and Over Current can be monitored for the IPS system. Loss of Mains, Battery Low, Bypass Operation or other common alarms can be connected for the UPS system.
RA007 Clinical Alarm	Operating Theatre	Reports faults on all IPS systems feeding the area. Similar to the RA006 but has a Test Button which when pressed, will perform a self-test function of the connected IPS System monitoring relay.

Benefits:

- Enhances safety of patients and clinical staff by alerting the hospital team of any faults in the electrical network, and allowing appropriate action to be taken.
- Improves maintenance and ability to locate faults, through remote alarms and TCP/IP Web Server, resulting in process efficiencies and cost savings.

Technical Specification

1. Maximum panel dimensions (door closed) - 300w x 380d x 2000h (mm)
2. Gland plate dimensions - 230w x 140d (mm)
3. Fan & filter size - 105w x 105h (mm)
4. Weight of IPS system - 120kg (for 10kVA)
5. Maximum panel dimensions (door open) - 300w x 680d x 2000h (mm)
6. Standard transformer options - 3.15kVA, 4kVA, 6.3kVA, 8kVA, 10kVA
7. Material - 6112 grade mild steel. Finish - powder coated RAL7032W
8. IP54W Rating

Standards and Guidelines

1. Requirements for special installations – medical locations (HD 60364-7-710)
2. Requirements for electrical installations (BS 7671)
3. Electrical services supply and distribution (HTM 06-01)
4. IET guidance note 7 - special locations (Section 9)
5. Particular requirements and tests for isolating transformers (BS EN 61558-2-15)
6. Protective measures equipment – Part 2: Insulation resistance (BS EN 61557-2)
7. Protective measures equipment - Part 9: Insulation fault location in IT systems (BS EN 61557-9)

S-equiP™ Turnkey Solution

The *S-equiP™* Turnkey Solution is for critical areas in hospitals to improve patient outcomes and workflow efficiencies. By partnering with Starkstrom, you will be supported with a wide range of experts who will design, build, equip, commission and service care area facilities such as Hybrid ORs to meet the needs of stakeholders. To find out more about the *S-equiP™* Turnkey Solution, please contact us.

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