STARKSTROM
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Medical IT System Cabinet (Isolated Power Supply) ASATS

Product Description

Medical IT systems provide safe delivery of electrical power as referenced in BS:7671 (18th Edition 2018 amendment 2) for group 2 locations and HTM06-01:2017 for clinical risk category 5 areas.

Medical IT systems provide continuity of supply in the instance of the first insulation fault. Medical IT systems also offer additional protection from electrical leakage currents.

Starkstrom have designed the Isolated Power Supply to comply with International and UK standards for areas that are classified as Group 2 medical locations.

The Isolated Power Supply consists of a floor standing Monitoring and Distribution Panel

The Floor Standing Monitoring and Distribution Panel includes:

2 x	Main Isolator (incoming supply)
1 x	Starkstrom Automatic Transfer System – ASATS
1 x	Medical isolation transformer
1 x	Integrated Insulation Monitor and Automatic Earth Fault Detection System
6 x	Volt free contacts
1 x	Load current transformer
-- x	20A “B type” DP Miniature Circuit Breakers (MCB) – up to 18
-- x	Circuit identification current transformers – up to 18
1 x	Terminals for Alarm Annunciator & field wiring
1 x	Equipotential Earth Bar
1 x	Thermostatically controlled ventilation fan
2 x	Surge Protection Devices
2 x	In-rush limiter

Options

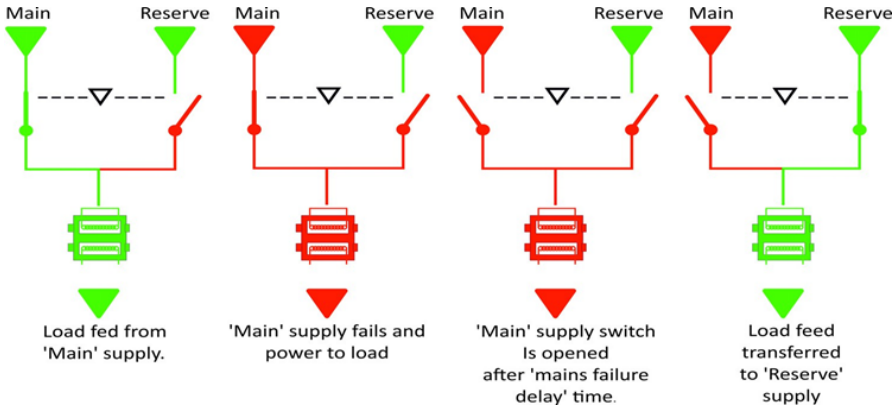
- MCB Trip Monitoring Module (MTMM)
- Kilowatt hour meter (BREEAM).

Advanced Starkstrom Automatic Transfer System (ASATS)

The Auto Transfer System automatically switches a load on to a reserve or backup supply, in the event that the main supply fails below 90% of the nominal voltage.

International and UK standards requires a safety power supply source, with a changeover time of less than 0.5s, to be available in Group 2 medical locations. This can be achieved using a Starkstrom Automatic Transfer System (ASATS).

The ASATS system has been assessed, certified and is considered capable for use in a high demand safety function up to and including SIL2.



Benefits

- Where a UPS is not installed with the IPS, then the ASATS will allow power from a reserve source to be restored in less than 0.5s.
- The ASATS moves the potential single point of failure closer to the user, as there is only the IPS transformer and final circuit remaining as a single path.
- Where many IPS systems are supplied from a single source, a delay can be set, to sequence the supply return changeover to avoid multiple simultaneous in-rush currents.

Medical Isolation Transformer

Transformers are manufactured in accordance with IEC 61558-2-15 edition 2, with the following additions:

- The leakage current of the output winding to earth does not exceed 0.5mA
- Single phase transformers are only available with a rated output between 4kVA, 6.3kVA, 8kVA and 10kVA.
- The medical isolation transformers are installed into the IPS panels at the manufacturer's facility. The IPS system is then tested, shipped, installed, and commissioned as a complete system without any subsequent transformer removal and re-installation.

Size	No load heat losses	Full load heat losses	Efficiency
4 kVA	37W	146W	96%
6.3 kVA	53W	254W	96%
8 kVA	50W	270W	97%
10 kVA	56W	345W	97%

Heat Losses Per Transformer

Starkstrom medical isolation transformers have been engineered to give a maximum of 8 times in-rush. We would suggest considering the following MCB's to allow adequate circuit protection. However, this must be confirmed with your project electrical designer.

- 4kVA Transformer 25 Amp 'D' Curve
- 6.3kVA Transformer 40 Amp 'D' Curve
- 8kVA Transformer 50 Amp 'D' Curve
- 10kVA Transformer 50 Amp 'D' Curve

Insulation Monitor (IPM)

Each IPS is fitted with a single integrated insulation monitor. The IPM is designed to monitor ohmic insulation resistance between line/neutral and earth in isolated power systems up to 240VAC/300VDC.

The IPM is designed to meet EN61557-8 requirements for insulation monitors in industrial and medical environments.

The device is able to detect AC and DC faults in AC or DC power systems (Type AC/DC). This includes failure detection in AC pow-er systems with rectifiers and failure detection in DC power systems with inverters.

The IPM has several additional features like included search current generator for failure location detection (additional device for localisation required), one change over relay contact, two NO-Solid-State-Relays contacts, four digital inputs, transformer load monitoring, transformer temperature monitoring, one RS485 with ModBus-Protocol for reading device measurement values and alarms and one RS485 to communicate with fault localisation devices.

The IPM shows current measurement values, status and alarms to the user with an 1,6" full colour screen. Additionally, four LEDs displaying actual device status for a fast check. The user can access password secured menu to change device settings with 4 integrated buttons.

Earth-fault Detection System (EDS)

The EDS is designed to localise earth-faults detected from the IPM in isolated power systems up to 240VAC/300VDC. Designed to meet EN61557-9 requirements the device can monitor up to 18 circuits.

Useable in combination with an IPM. Communication between the IPM and the EDS is via an RS485 interface. Maximum 5 devices can be connected to one insulation monitor. The device has 20 LEDs to show its system status.

Installation Requirements

Earthing

An earth conductor of a minimum 4 or 6mm^2 is required to connect all earth potentials to the earth bonding bar. Site specific calculations must be carried out to determine the cable size. The maximum permissible resistance of the earth conductor between any given socket or extraneous metalwork and the EBB (Equipotential Bonding Busbar) shall not exceed 0.1Ω.

Wiring and Sockets

For IPS circuits, both conductors should be coloured brown and identified as L1 and L2. In composite cables, conductors can be sleeved brown. This applies to conductors in the field as well as within the IPS panel. All socket outlets should be wired in a radial fashion from the IPS panel, such that each bed or patient area is supplied by at least two circuits. Blue unswitched sockets, engraved in white lettering 'Medical equipment only' are recommended for all IPS socket outlets.

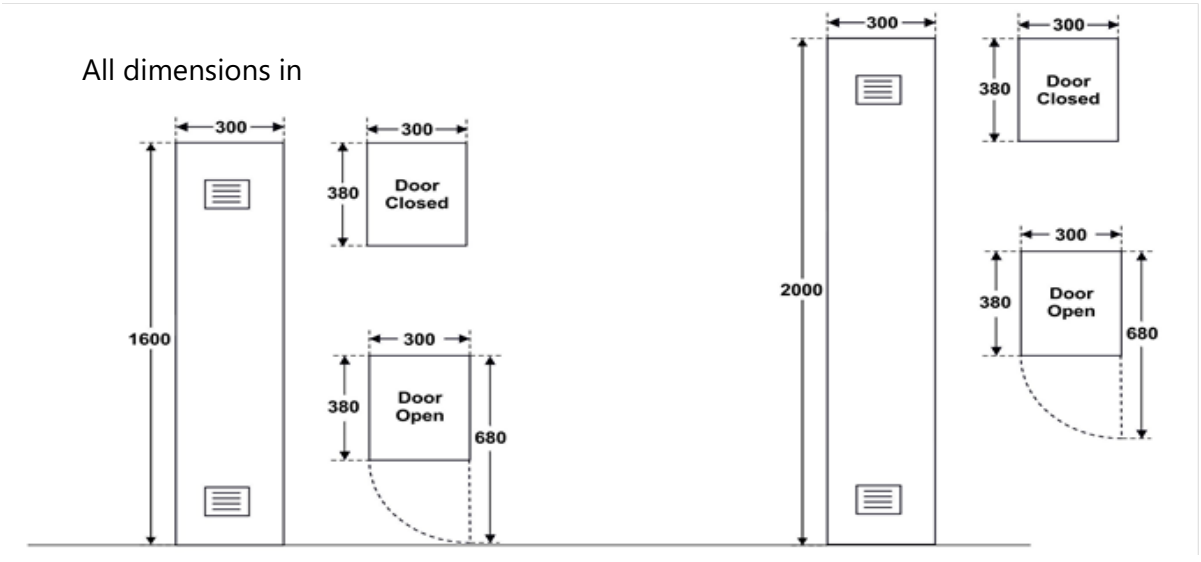
Commissioning

All field wiring should be fully proven, tested (to the relevant standards) and documented by the contractor. The contractor shall then employ the equipment supplier to commission the IPS system.

Construction and Dimensions

Enclosure Construction

Maximum Dimensions	2000mm(H) x 300mm(W) x 380mm(D) (door closed) 2000mm(H) x 300mm(W) x 680mm(D) (door open)
IP Rating	IP21
Material	6112 Grade Mild Steel
Finish	RAL7004 Matt Finish (Powder Coated)
Front Door Fixing	Lockable Handle Mechanism
Fan and Vent arrangement	Upper Fan Unit, Lower Vent
Fan Size	105mm x 105mm
Gland Plate Top Mounted	140mm x 230mm
Copper Earth Bar (Cross Section)	15mm x 3mm (with MS threaded connections)



Standard IPS Enclosure

High-Capacity IP Enclosure

Product legislation and standards of conformity

EU Ref	EU Title	UK Ref	UK Title
2014/ 35/EU	Low Voltage Directive	2016/ 1101	Electrical Equipment (Safety) Regulations 2016
2014/ 30/EU	Electromagnetic Compatibility Directive	2016/ 1091	Electromagnetic Compatibility Regulations 2016
2011/ 65/EU	Restriction of Hazardous Substances (RoHS) Directive	2012/ 3032	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012
2009/125/EU	Eco-design Directive	2010/ 2617	The Eco-design for Energy-Related Products Regulations 2010

Reference	Title	Edition
EN IEC 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use - General requirements.	2010+A1:2019
EN IEC 61558-1	Safety of transformers, reactors, power supply units and combinations thereof - General requirements and tests	2019
EN 61558-2-15	Safety of transformers, reactors, power supply units and combinations thereof - Particular requirements and tests for isolating transformers for the supply of medical locations	2012
EN IEC 61326-1	Electrical equipment for measurement, control, and laboratory use. EMC requirements - General requirements.	2013
EN IEC 63000	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances	2018
HTM 06-01	Health Technical Memorandum 06-01 Electrical services supply and distribution.	2017