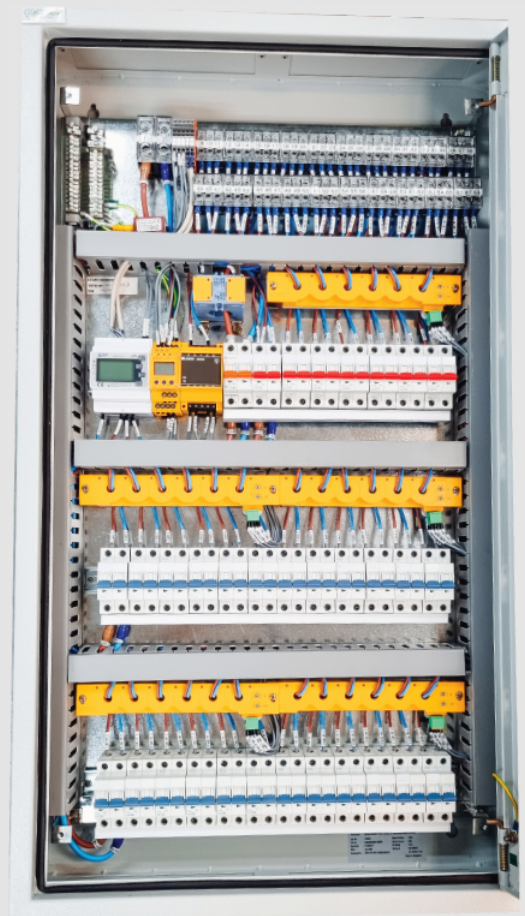


ELECTRICAL SAFETY  
POWER QUALITY  
ENERGY MANAGEMENT



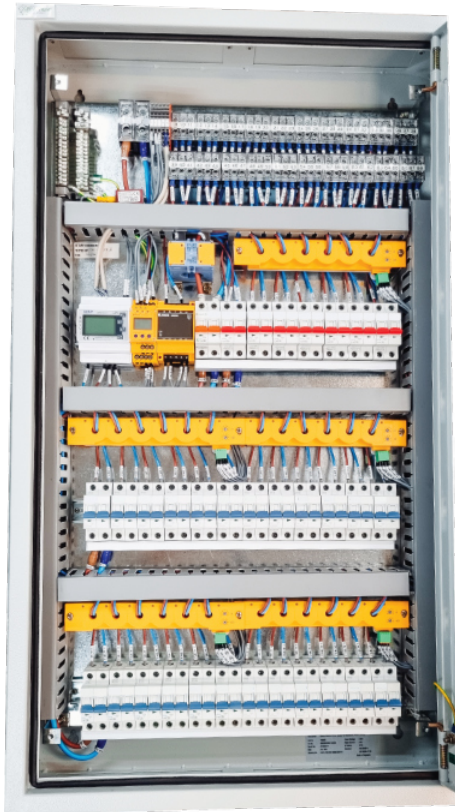
## Isolated Power System (IPS)

Isolated power system panels and transformer cabinets for all medical locations

- Latest Electrical Insulation Monitoring Technology
- Prompt Notification to Hospital Staff via Easily Readable Remote Alarm Indicator
- Continuous Fault Location of Ground Faults in Live Operation
- Modular Panel Design
- Compliant with IEC 60364-7-710:2021

# Isolated Power System (IPS)

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## Compliant. Safe. Reliable.

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Especially in medical locations, like operation theatres, a safe power supply is indispensable. Life is at stake which is why safe and reliable technology is essential.

Eetarp is acknowledged as the expert in the design and installation of power supply systems according to the international standard IEC 60364-7-710:2021 which defines the requirements for low-voltage electrical installations in a medical environment.

Isolated power system solutions from Eetarp provide an early detection of critical errors or insulation deteriorations in electrical systems and medical electrical equipment.

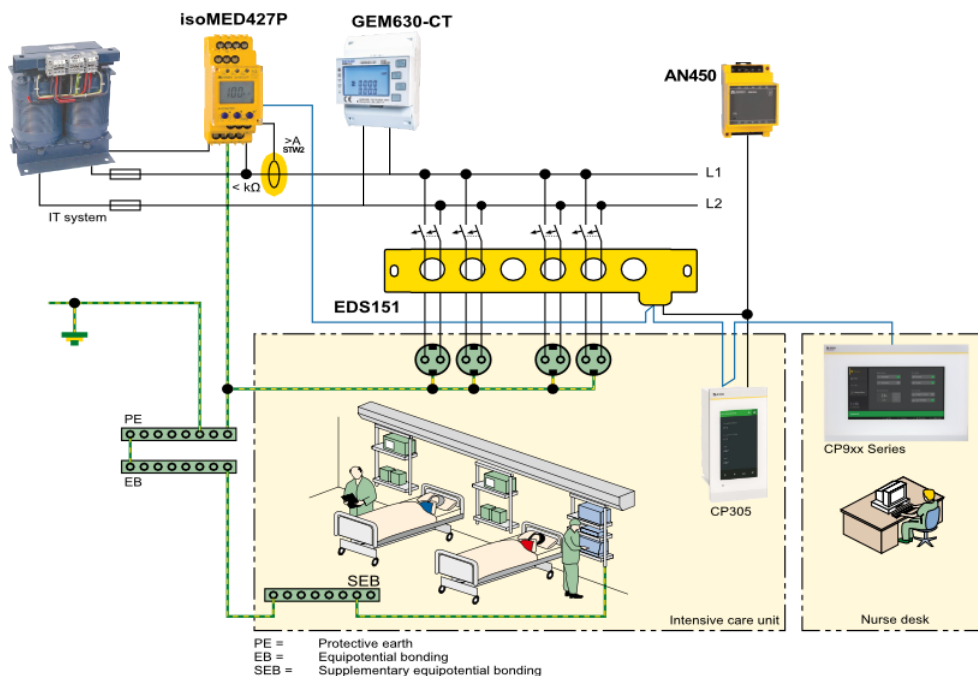
## Feature Overview

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- Complies with SS638 & IEC60364-7-710:2021
- 24x7 online insulation monitoring
- Continuous fault location system
- Monitoring of transformer parameters (load and temperature)
- Ready-to-go solution, fully assembled and tested
- Optional: Wall mounted with transparent front-Perspex
- Monitoring of insulation resistance, load current, temperature and PE connections
- Easy-to-clean front foil surface for alarm indicators
- Display of operating status, warning and alarm messages in accordance to standard

## Advantages

- The latest insulation monitoring technology, providing advanced warning of faults to help reduce downtime and increase operational efficiencies
- Fast localization of faulty circuits/equipment - locate faulty equipment while the system remains online
- Reduced maintenance costs
- Central indication for Hospital Staff via colourful touch screen display at remote alarm indicator and operator panels
- Easily retrofitting with existing installations due to the modular design
- Complete, modular panel solutions for ease of customization and installation equipment designed in strict compliance with many electrical codes and standards, including IEC 60364-7-710:2021



## Working principle

When a critical situation like an insulation fault starts to develop within the electrical system, the isoMED427P automatically starts the fault location by generating a test signal. Its amplitude and duration are defined and limited to ensure smooth and safe online monitoring 24/7 throughout the operation. The signal flows via the location of the insulation fault and through all measuring current transformers within the insulation fault path. The EDS151 system scans all measuring current transformers. The EDS151 with its LEDs or the central control and indicating device (e.g. MK2430, CP305) provides fault location information.

# IEC Standard to Enhance Patient Safety

Safety standards in medical locations according to IEC 60364-7-710: 2002-11, the medical procedures carried out in a room, define the group classifications of medical locations.

## **710.3.5 Group 0**

- Medical locations where no applied parts are intended to be used.

## **710.3.6 Group 1**

Medical locations where applied parts are intended to be used, as follows:

- Externally
- Invasively to any part of the body, but not to the heart, except where 710.3.7 applies.

## **710.3.7 Group 2**

Medical locations where applied parts are intended to be used in applications such as intracardiac procedures, operating theatres and vital treatment where failure of the supply can cause danger to life.

### **The highest demands are made in Group 2 medical locations**

A first fault must not result in power supply interruption and hence to failure of life-support equipment. IEC 60364-7-710: 2002-11 requires the IT system (unearthed system) for all Group 2 medical locations

## **710.413.1.5**

In Group 2 medical locations, the medical IT system shall be used for:

- Circuits supplying medical electrical equipment and systems intended for life-support or surgical applications
- Other technical equipment in the patient environment

### **The following rooms are of special concern:**

- Anaesthetic rooms
- Operating theatres
- Operating preparation rooms
- Operating recovery rooms
- Heart catheterization rooms
- Intensive care rooms
- Angiographic examination rooms
- Premature baby rooms

# Overview of IPS with all Products

## Accurate Power Meter

Allows to measure load consumption in order to control and measure the energy flow.

Products: GEM630-CT

## #1 Technology: ISOMETER®

The insulation monitoring device is a vital unit, which continuously monitors the insulation resistance.

Products: IR427, isoMED427P

## Reliable Power Supply

A reliable power supply ensures a long-lived of sensitive electrical components.

Product: AN450

## Transformer

Separates electrical systems, in order to avoid any negative influences or disturbances in sensitive areas like operation theatres.

Products:

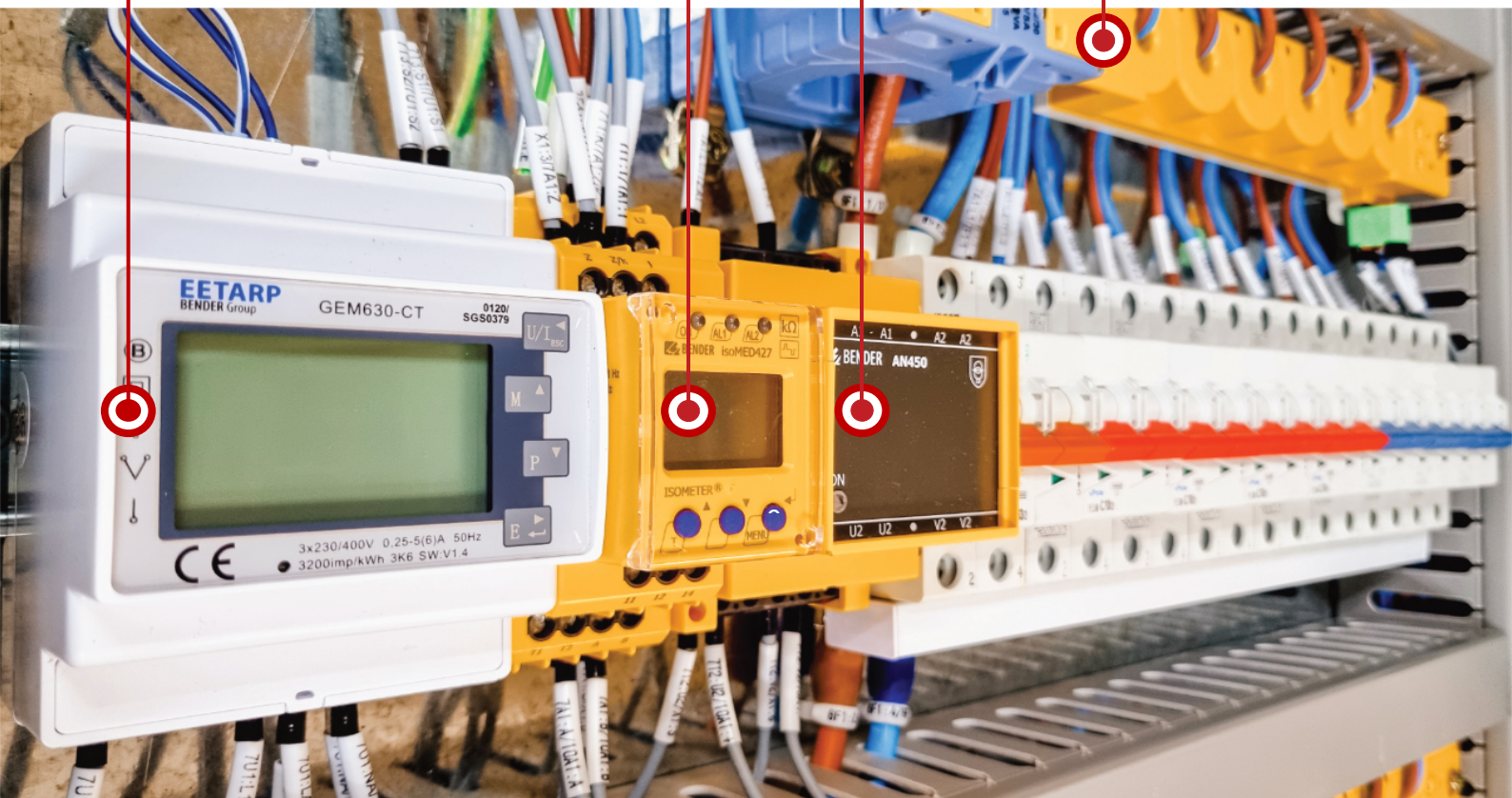
ES710 series/  
E-TX series



## 24/7 Fault location system

Detects abnormalities for individual loads by evaluating the system parameters.

Products: EDS151



# ISOMETER - The Heart of the IPS

## Overview

The ISOMETER® is the heart of the IPS and monitors the insulation resistance of unearthed AC circuits which may also contain DC components (medical "IT systems"). At the same time, the load current and temperature of the IT system transformer is monitored. There are two versions offered which work in combination with other components.

The **IR427** as an insulation monitoring device together with Remote alarm indicator and test combination MK7 provides the possibility to show and indicate an error at the place where it is needed.

The **isoMED427P** (with pulse generator) in combination with EDS151, works together with remote alarm indicator and test combination MK2430/CP350 provides information of faulty outgoings.



IR427 and isoMED427P  
Insulation Monitoring Device

## ISOMETER® IR427

- Insulation monitoring for medical IT systems
- Load and temperature monitoring for IT system transformers
- Adjustable response value for insulation monitoring
- Adjustable load current response value
- Integrated voltage monitoring for four alarm and test combinations MK7
- Temperature monitoring with PTC thermistor or bimetal switch
- Connection monitoring earth
- LEDs: Power On, Alarm 1, Alarm 2
- Internal/external test button
- Configurable alarm relay: N/O or N/C operation selectable
- Self-monitoring with automatic alarm
- Compact two-module enclosure (36 mm)
- Four-wire interface for four alarm indicator and test combinations MK7

## ISOMETER® isoMED427P

- Insulation monitoring for medical IT systems
- Adjustable response value for insulation monitoring
- Locating current injector for insulation fault location systems
- Load and temperature monitoring for IT system transformers
- Adjustable load current response value
- Temperature monitoring with PTC thermistor or bimetal switch
- Self-monitoring with automatic alarm
- PE connection monitoring
- Internal/external test button
- LEDs: Power On, Alarm 1, Alarm 2
- Configurable alarm relay: N/O or N/C operation selectable
- Compact two-module enclosure (36 mm)
- BMS interface

## Overview

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The insulation fault locator EDS151 in conjunction with the ISOMETER isoMED427P or the locating current injector PGH, are designed for insulation fault location in unearthed power supplies (IT systems). The locating current pulse generated by the ISOMETER isoMED427P or the locating current injector PGH are detected using the integrated measuring current transformers and evaluated by insulation fault locators. The integration of six measuring current transformers in an EDS151 permits all current-carrying conductors of an outgoing line to be routed through.



**EDS151**  
Insulation fault location system

## Device Features

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- Insulation fault location in AC, AC/DC and DC-IT systems
- 6 measuring channels with measuring current transformer per EDS151
- Response sensitivity 0.5 mA
- A response time of up to 8 s in the AC system according to IEC 61557-9
- RS-485 interface with BMS protocol
- LEDs: Power On, Alarm 1, Alarm 2
- BMS address range 3...90
- Cyclical self-test

# Alarm Indicator

## Overview

The remote alarm indicator and test combination duplicates fault, alarm and operating messages of monitoring devices at the place where it is needed in accordance with IEC 60364-7-710:2021.

The MK7 which is used in combination with the IR427 has an Easy-to-clean front foil surface, label field and can be flushed mounted (66mm) in the wall. The MK7 will be connected via Four-wire connection to the IR427.

The MK2430 is the universal remote alarm indicator and test combination MK2430 is intended for visual and audible indication of operating status and alarm messages from BENDER systems such as EDS, RCMS and MEDICS. In MEDICS monitoring systems, the MK2430 meets the requirements of IEC 60364-7-710 in respect of test functions for IT system monitoring and messages from changeover modules.

The CP305 provides touch screen display for medical staff with clear and concise information. Additional information for the technical staff can be retrieved by pressing a special button. A two-wire connection between the CP305 remote alarm indicators and the changeover and monitoring modules allows a time and cost-saving installation.



**MK7**

- Easy-to-clean front foil surface
- Label field
- Panel frame alpine white
- Alarm LEDs: Power On, insulation fault
- overload, overtemperature
- Test button, mute button
- Standard flush-mounting enclosure 66mm



**MK2430**

- Display of operating and alarm messages according to IEC60364-7-710 / DIN VDE 0100-710 and other standards
- Backlit clear LC text display (4 x 20 characters)
- Predefined standard texts in 20 languages
- 200 freely programmable message texts
- Bus technology for easy installation and reduced fire load
- Acoustic alarm with mute function
- Parameter setting via menu (German/English)
- Suitable for flush and surface-mounting
- Easy commissioning due to predefined message texts

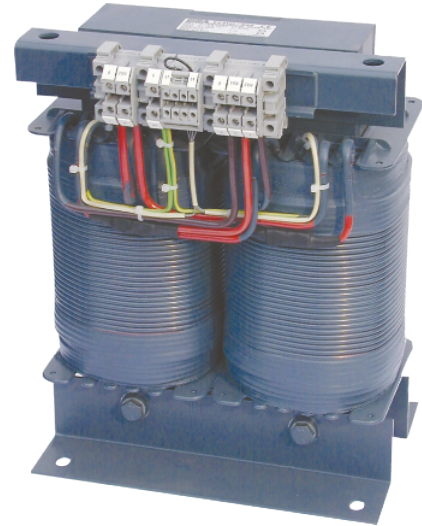


**CP305**

- The CP305 is a universal remote alarm indicator for Group 2 medical locations
- Messages and faults are displayed according to the requirements of IEC 60364-7-710 and DIN VDE 0100-710
- Necessary alarms are indicated visually and audibly
- 5" touch screen
- Parameter setting via web server, display or Bender Connect app
- Freely programmable alarm messages
- Flush-mounting and surface-mounting version

## Overview

The transformers of the E-TX/ES710 series have reinforced insulation and comply with the requirements of IEC 61558-1/DIN EN 61558-1 and IEC 61558-2-15/DIN EN 61558-2-15 : 2001-11. In addition, the transformers comply with the requirements of IEC 60364-7-710 : 202-11 for IT systems in medical locations. The windings are galvanically isolated. In order to minimize electrical interferences, an electrostatic screen is installed between the primary and secondary winding the lead out of which is connected to an insulated terminal for connection to the equipotential bonding. The fixing angles are isolated from the transformer core in order to guarantee an isolated installation to comply with the requirements of DIN VDE 0100-710 , para. 710.512.1.6.2).



**E-TX / ES710**

Transformer in compliance with Hospital standards

## Device Features

- Built-in temperature sensors acc. To DIN 44081 (120 °C)
- Screen winding with brought-out insulated connection terminal
- Insulated mounting angles
- Degree of protection, IP00 (open design)
- Degree of protection, IP23 (with enclosure)
- Protection class I
- Reinforced insulation
- Connections: screw terminals
- Noise level < 40 dB (A) (no-load and nominal load)
- Vector group: liO
- Primary voltage 400 V

# AN450 / GEM630

## Overview AN450

The power supply unit AN450 is designed to supply Bender devices with a supply voltage of AC 20 V and a total power consumption of maximum 9 VA. A maximum of 3 alarm indicator and test combinations CP305 can be supplied, for example.

### Device Features

- Power supply unit for the supply of Bender devices with AC 20V and a power consumption of maximum 9VA
- Supply of 3 CP305 alarm indicator and test combinations (for example)
- Protected secondary circuit



AN450

## Overview GEM630-CT

GEM630-CT is part of the new smart Graphene-Meter-Series and an advanced digital multi-function power meter, which can be connected via a current transformer to any system. The unit measures all important system values like active energy, reactive energy, current, voltage, power, power factor, frequency, demand, etc.

### Device Features

- Accuracy according to MID Class B
- Measures active energy, reactive energy, current, voltage, active power, apparent power, reactive power, power factor, frequency, demand, THDV, THDI, etc.
- Memory recording for energy, demand, max demand & max/min record



# Ordering Code



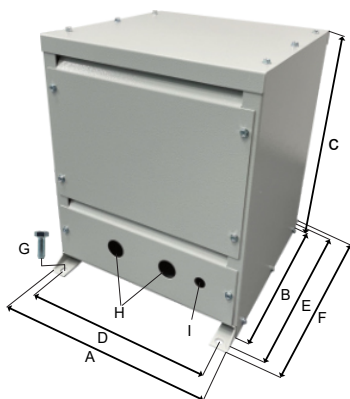
E	Fixed Product Code
9	Fixed Code
X	0 = without meter 5 = power meter 6 = energy meter
X	Remote indicator model: 1 = MK2430-12 2 = MK2430-12ESB 3 = MK7 4 = CP305
X	ISOMETER 3 = IR427-2 5 = isoMED427P with EDS151
X	Cable type: 0 = Flame retardant, low smoke, halogen free
X	Transformer Type: 1 = 3.15kVA, 2 = 4kVA, 3 = 5kVA, 4 = 6.3kVA, 5 = 8kVA, 6 = 10kVA, A = 3.15kVA, B = 4kVA, C = 5kVA, D = 6.3kVA, E = 8kVA, F = 10kVA, P = 3.15kVA, Q = 4kVA, R = 5kVA, S = 6.3kVA, T = 8kVA, U = 10kVA
X	MCB short circuits current rating: 0 = 6kA 9 = 10kA
-	Number of outgoing circuits (first digit)
X	Number of outgoing circuits (second digit)
X	S = without transparent window 0 = with transparent window
X	BLANK = earth clamp equal to quantity of outgoing + 3pcs M = fixed 10pcs of earth clamps
-	
X	Job Number (for customized design only)

E.g E901 50T 0120-12345 (MK2430-12, isoMED427P with EDS151, 8kVA transformer, 12 outgoing circuits, with transparent window, internal job number 12345)

# Transformer & Distribution Board Enclosure

## Transformer Enclosure

- Protection class IP23



E. G 1.5mm varnished in RAL7035

	Dimension (mm)
A	420
B	410
C	490
D	382
E	450
F	480
G	M10
H	Ø38
I	Ø22

## Type of IT Distribution board enclosure



Distribution board overview  
Material: E. G 1.5mm  
Color: RAL7035, Texture furnishing  
Protection class: IP 43

	A	B	C
E901, < 6 outgoing	590mm	525mm	130mm
E901, 7 - 18 outgoing	590mm	780mm	130mm
E901, 19 - 30 outgoing	590mm	1040mm	130mm
E903, < 6 outgoing	590mm	475mm	130mm
E903, 7 - 18 outgoing	590mm	660mm	130mm
E903, 19 - 30 outgoing	590mm	845mm	130mm



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