

IT MEDICAL SYSTEM



Protection

Hospital Electrical



CM COMANDOS LINEARES®

Innovation, quality, technology and reliability. Trademarks of CM Comandos Lineares solutions

ABOUT THE COMPANY

With over 32 years in operation, CM Comandos is one of the largest UPS manufacturers in Latin America.

Moreover, it is the sole leader in solutions for the corporate market. Certified by ISO-9001:2008 standards, CM Comandos stresses its commitment to excellence of its products and full clients satisfaction



USAGE

UPS of CM Comandos Lineares are suitable for critical-mission usage in all types of corporations,

providing protection against power disturbances, such as cuts, micro cuts, noise, harmonic distortion, spikes, transients, under and over voltage and frequency variations.

BENEFITS

CM Comandos equipment operates with greater precision, adds more features and are safer.

Features that create high reliability and productivity in many types of applications, diminish flaws and hence maintenance costs. In short, being a CM Comandos client means having the return on capital invested and guarantees that only a company with wide technical support can offer.

TECHNICAL SUPPORT

By choosing the brand CM Comandos Lineares you can count on the best technical support prior and post-sales from a company that has established itself over these 38 years as the market leader.

State-of-the-art instrumentation, highly skilled workers, with national coverage and 24-hour service, seven days a week, call center and certified processes ensure the excellence of our support services.



CM COMANDOS LINEARES®

Vital Protection Measures for Hospital Electrical Installations



Medical IT Grounding System

The Medical IT System is a system to supervise insulation failures in electrical installations applied to IT grounding networks, as provided for in ANVISA's standard NBR 13534:

This standard aims to guarantee the maintenance of life-sustaining appliances, even in case of first electrical insulation failure in the Health Care Facilities (EAS).

Using this protection is compulsory in the Group 2 hospital settings, which include the Surgical Rooms, ICUs, Neonatal ICUs and Hemodynamic Rooms.

OPERATION

Using the IT Medical System increases the safety for patient and clinical staff, since it avoids the interruption in the electric power supply in case of failure, because, even in a case of phase-to-ground short-circuit, for example, an electromedical equipment may be used to temporarily or permanently assist or replace a patient's vital functions.

Moreover, it leads to a reduction in leakage currents flowing through the protective conductor, what reduces the contact voltage and consequently the intensity of an accidental electric shock.

The System has an insulation monitoring device (IMD), a temperature monitoring device (TMD) and a current monitoring device (CMD), which measures the resistance between the power conductors and the protective conductor, by signaling audibly and visually when this resistance decreases to 50 K Ω .

Electrical Power Board - IT Medical System



BASIC COMPOSITION

The system consists of:

- Separation Transformer
- Insulation Monitoring Device (IMD)
- Temperature Monitoring Device (TMD)
- Current Monitoring Device (CMD)
- Annunciator Device
- Rack Mounting

Optional:

- BT-4000 Signal Generator
- BT-3000 Individual Failure Locator
- Human-Machine Interface (HMI)

SEPARATION TRANSFORMER

The Separation Transformer is designed and manufactured specifically for the power supply of medical systems. It has reinforced galvanic insulation, electrostatic shielding between primary and secondary windings, connected to a dedicated terminal with electrical and mechanical characteristics that guarantee its quality and reliability. It has PT-100 temperature sensors, which are connected to the TMD module for temperature monitoring. The transformer ensures the reliability of the electrical circuit's insulation conditions, being essential for the safety in surgical applications.



Separation Transformer

TECHNICAL CHARACTERISTICS

The Separation Transformer is manufactured in accordance with standards IEC 61558-2-15 and NBR 13534.

Insulation Category:
F (150°C)
Temperature Increase:
F (80°C)
Audible Noise:
≤ 40 dB @ 1 metro
Frequency :
60 Hz (Standard)
50 Hz (Optional)
Single Phase Power
Up to 10,0 kVA
Primary Voltage
Up to 1000 V

Secondary Voltage :
Up to 250 V
Short Circuit Voltage:
< 3%
No-Load Current:
< 3% x In
Electrical Connection:
Through terminals
Fastening:
Through metal base

DIMENSIONS OF THE SEPARATION TRANSFORMER

Simple cabinet

Model	Power kVA	Physical Dimensions height x width x depth (mm)			Weight kg
3000	3,0	600 X	550 X	390	120
5000	5,0	600 X	550 X	390	140
7500	7,5	600 X	550 X	390	160
10000	10,0	600 X	550 X	390	180

Double cabinet

All Powers	Physical Dimensions height x width x depth (mm)
Duplo	1130 X 384 X 474

INSULATION MONITORING DEVICE (IMD)

The IMD is the system's central command module and monitors continuously the insulation of the exclusive electrical network by injecting signals between the device's feed line and the grounding.

The injected signal comprises ohmic components suitable for a standard-based maximum level of total dispersion. If higher than normal levels occur, the monitoring device activates immediately a warning signal, allowing for intervention by the maintenance team.

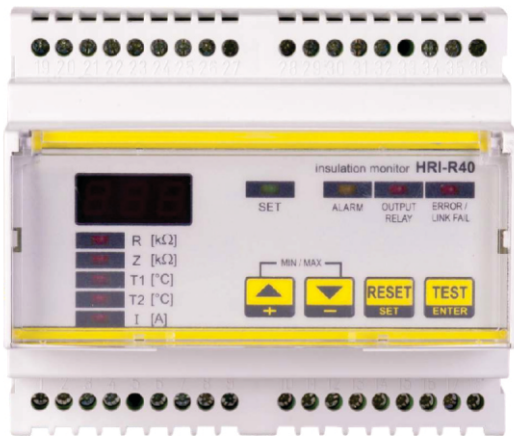
The IMD module has an internal microprocessor, Modbus communication via RS485 and is designed according to the most advanced technological criteria, being precise, safe and reliable - characteristics required for medical-hospital applications.

TECHNICAL CHARACTERISTICS

- Possibility of choosing a precise network insulation value of 0...999kΩ with 1kΩ resolution
- Monitoring of the separation transformer's secondary winding's temperature (T1)
- Possible use of a programmable contact for remote signaling in case of internal device failures, low insulation level, measuring high temperature values and reaching the maximum current adjustment
- Self-diagnosis test for eventual internal device failures, network connection check and operation control
- Injection into the circuit of coded control signals, which are not influenced by the DC components, sent by electrical devices for medical use
- RS485 serial output for MODBUS RTU communication

ELECTRICAL CHARACTERISTICS

Supply Voltage:
115V / 230V - 60Hz
Control Network's Voltage:
24 to 230VAC
Voltage Insulation:
2,5 kV in 1 minute
Maximum Measurable Current:
1mA



Insulation Monitoring Device (IMD)

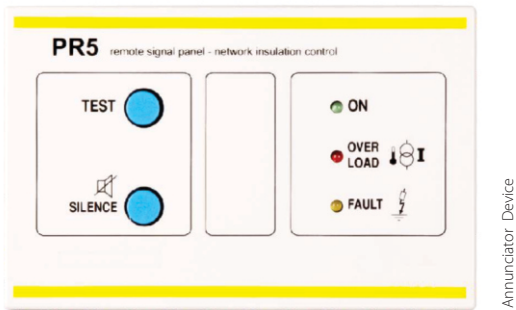
DEVICE ANNUNCIATOR

Alarms detected by the IMD / TMD / CMD Device are sent to the Annunciator Device, installed in strategic locations such as on-duty wards or doctors' rooms, and allow for immediate visual and audible signaling of alarm occurrences.
Up to 4 Annunciator Devices can be installed in multiple locations at the same time and do not require auxiliary power.

ELECTRICAL CHARACTERISTICS

To signal remote alarms, according to the NBR 13534 standard:

- Green LED: equipment connected
- Red LED: overload
- Yellow LED: failure signaling
- Mute button: to turn off the acoustic alarm on the remote signaling board, activated when the intervention level is exceeded
- Test button: to periodically check the device efficiency according to standard recommendations.
- Alarm Type: Audio



1mA - Bt4000 SIGNAL GENERATING DEVICE

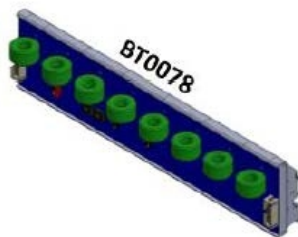
The BT4000 Signal-Generating Device is an individual insulation failure-locating device, allowing to identify in which bed the failure occurred, for example.
The Signal Generator injects a signal under 1mA, sufficient to detect the insulation failure, and works together with the Individual Failure-Locating Device and the IMD / TMD / CMD Device, pursuant to the specifications required by the IEC 61557 standard.

MECHANICAL SPECIFICATION

- Ideal for 18mm modular panel. It fills the space of a DIN-standard 3-pole circuit breaker.

FAULT LOCATOR DEVICE - BT0074 and Bt0078

The fault locator device BT0074 with 4 locator circuits) and (BT0078 with 8 locators) are intended for locating insulation faults in a Medical IT grounding system, in accordance with the characteristics required by the IEC61557 standard. The device is equipped with toroids that were specially designed for the detection of very low currents in the order of 0.5 mA and an electronic board that signals and emits a digital signal that can be connected, for example, to a PLC.



HUMAN MACHINE INTERFACE (HMI)

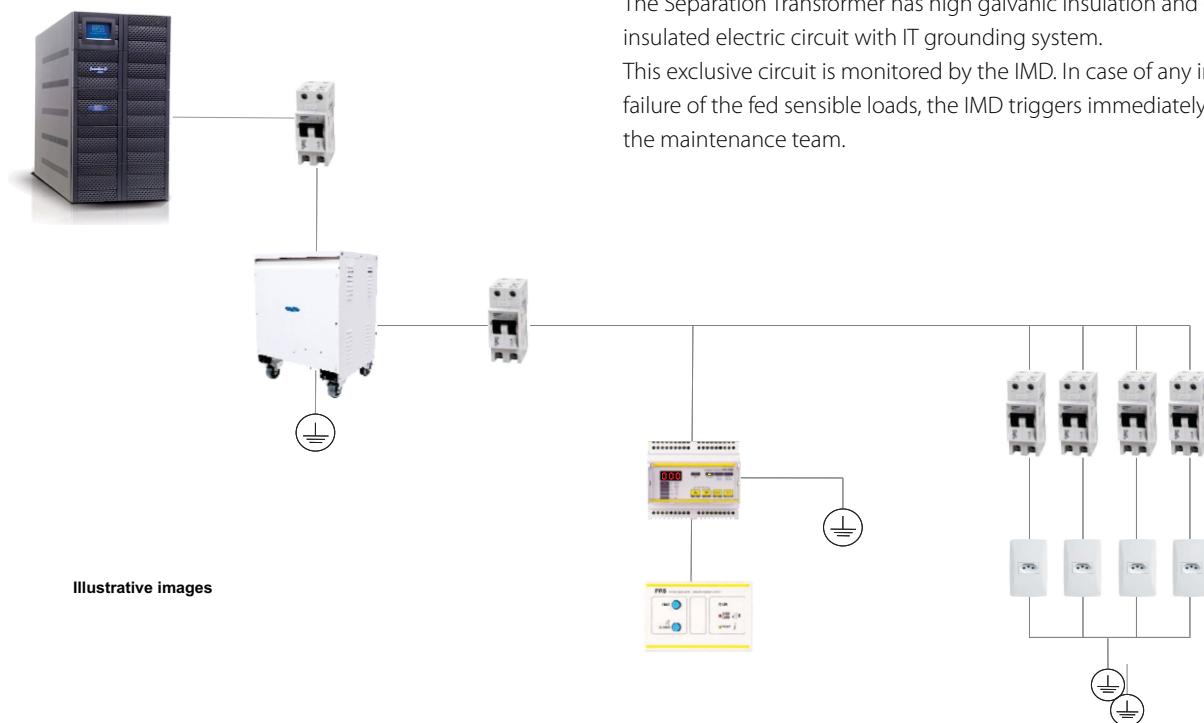
The HMI display / control panel allows to visualize pre-set insulation, temperature and current parameters in real time and is ideal for monitoring multiple IT systems facilities.

MAIN CHARACTERISTICS

- 7.0" Graphic touch screen
- Mobile text meters
- Alarm Handling
- Password Protection
- Ethernet and USB Port

VITAL PROTECTION MEASURES FOR HOSPITAL ELECTRICAL INSTALLATIONS

IT System

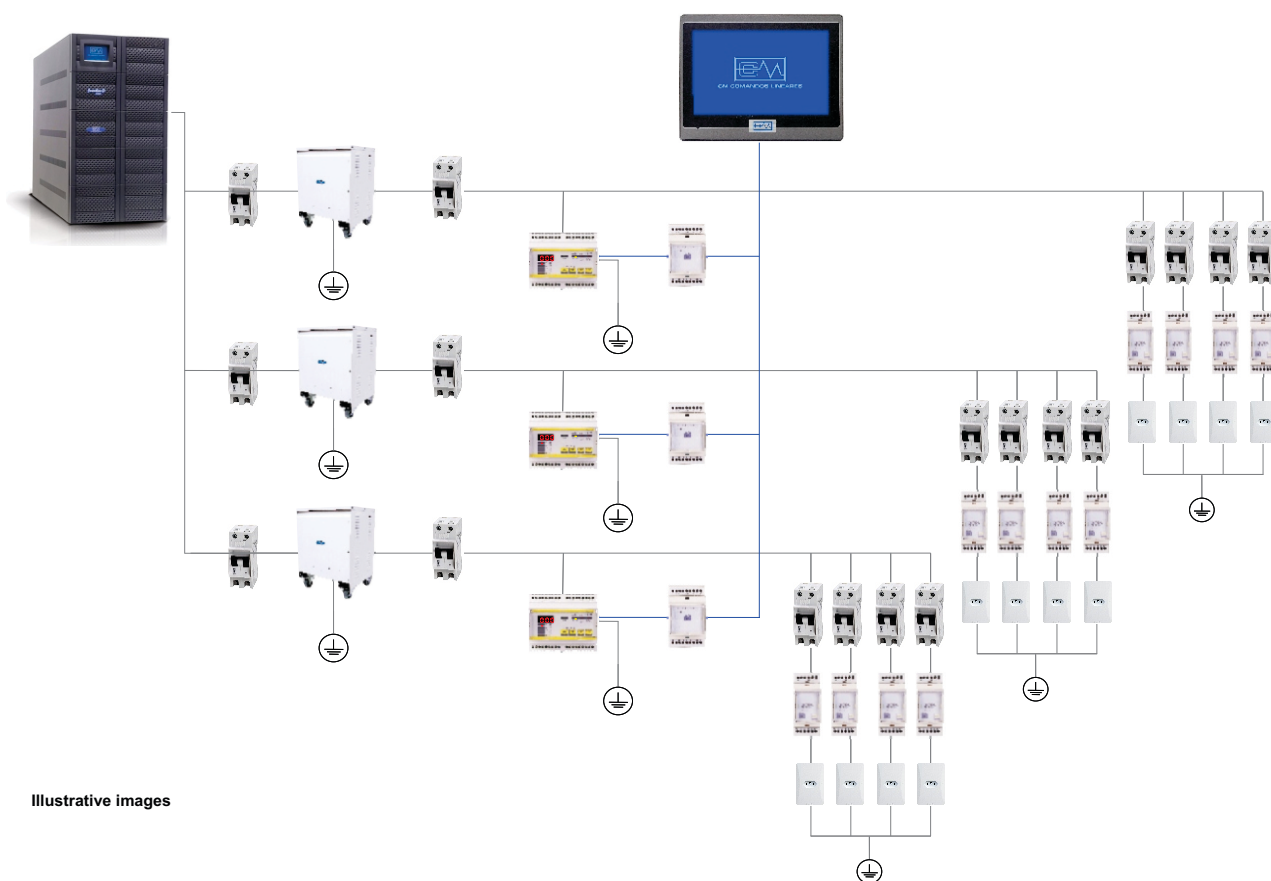


Illustrative images

Diagrams of Typical Applications

The Separation Transformer has high galvanic insulation and generates an insulated electric circuit with IT grounding system. This exclusive circuit is monitored by the IMD. In case of any insulation failure of the fed sensible loads, the IMD triggers immediately an alarm for the maintenance team.

IT System with HMI



Illustrative images



Audited
Sustainability System



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