

LIM2000plus™

Line Isolation Monitor

Confirms the Integrity of Isolated Power Systems



UL File No. E 81789



Over 60 Years Experience with Electrical Safety Products

Electrical Safety in Hospitals



BENDER offers more than 60 years of experience with ELECTRICAL SAFETY products and the technology associated with “The Management of Line-to-Ground Faults” in power distribution systems. Active participation in committees of International and National Standards organizations has helped us develop ELECTRICAL SAFETY products that are in tune with the needs of the healthcare community.

Dependable operation of the essential electrical system is a must in operating theatres and intensive care areas where a single fault or a loss of power may be fatal. As surely as patients undergoing surgery rely on physicians, so do the physicians count on the reliability of the electrical system.

The availability of a secure isolated power supply and clear information about the fault status of medical equipment are of paramount importance in achieving this goal. At the heart of the electrical system is the LIM, which continuously monitors the system and connected medical apparatus for abnormalities that could lead to hazardous ground leakage currents for the patient and staff.

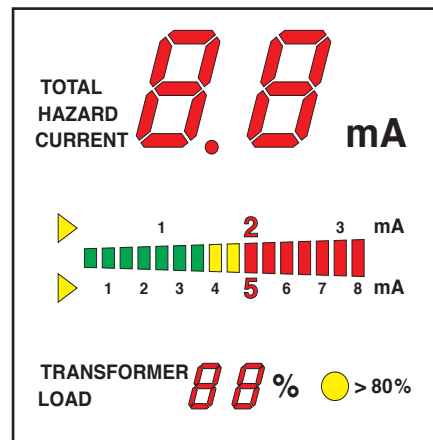
The LIM2000plus™

The dynamic non-switching LIM2000plus manufactured by BENDER can be used on single- and three-phase systems. Its operation is based on a patented principle. The Total Hazard Current (THC) signal is processed and routed by dual-channel circuitry to the display unit and output alarm relay.

Both balanced – as may occur from using equipment with RF filters – and unbalanced resistive and capacitive faults are detected by the LIM. As a bonus, the LIM also performs an automatic ground fault test on any cord-connected appliance that is plugged into one of the isolated power receptacles.

The Features

- No susceptibility to electrical noise
- Variety of remote indicator configurations
- Primary voltages up to 480V, 1- and 3-phase
- No interference with electrical equipment
- Special phase-locking circuitry for ultimate stability and repeatability
- Voltage-free SPDT contact for remote alarm
- LIM overload protection with automatic reset
- 2 or 5 mA response value
- Easy to clean rugged Lexan front foil
- Automatic self calibration and self check every twelve hours
- Optional load monitoring and indication; overload alarm
- Optional RS-485 data communication port
- Optional EDS system to automatically locate faulty branch circuits
- Optional local data logger; upload data to computer via RS-232 port



The Digital Display

- THC triangular analog bar graph
- THC digital LED indication
- THC threshold indication
- % rated load LCD indication
- overload LED indication



Accessories

Current Transformers

100A and 200A current transformers are available for the optional load monitoring function.

LT2000 Test Set

The test set is highly versatile. Packaged in a sturdy low-profile carrying case are several modules and accessories.



It is capable of being interconnected so as to perform a variety of compliance measurements dictated by NFPA 99, *Standard for Health Care Facilities*.

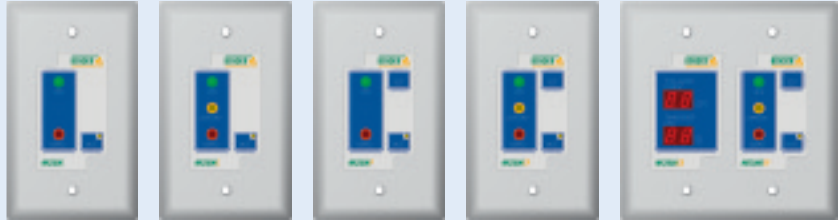
Remote Indicators

MK2000 Series Remote Indicator

There are five types of remote indicators.

- MK2000 with SAFE, HAZARD indications and MUTE function
- MK2000C with SAFE, HAZARD, OVERLOAD indications and MUTE function
- MK2000P with SAFE, HAZARD indications and TEST, MUTE functions
- MK2000CP with SAFE, HAZARD, OVERLOAD indications and TEST, MUTE functions
- MK2000CB, add-on module with THC digital LED indication and %-rated load LCD indication

All modules are available singly or in multiple configurations, and mounted on one- and multiple-gang S/S wallplates. They can also be mounted on a customized S/S front trim supplied with flush- or surface-mounted backbox.



MK2000

MK2000C

MK2000P

MK2000CP

MK2000CBP

Impedance of Isolated Wiring Acceptance of Isolated Power System installation is contingent on magnitude of measurements being above a specified threshold limit.

LIM Trip Point A fault hazard current of less than 3.7 mA must not cause the LIM to alarm.

Receptacle Testing in Patient Care Areas by Impedance Measurement The impedance must be less than 0.1 ohm as measured between the reference grounding point and the receptacle contact.

Grounding System Testing by Voltage Measurement The voltage limit must be less than 20mV as measured between the reference grounding point and exposed fixed electrical equipment with conductive surfaces. Included with the test set is a highly accurate, stand-alone 4-3/4 digit true RMS digital multimeter capable of making measurements at the microamp, microvolt and milliohm level.

The Ease of Retrofit

LIMs from the following manufacturers can easily be replaced with the BENDER LIM:

- Square D
- Federal Pioneer
- Stackpole
- Post Glover
- GE
- Amsco
- Edwards
- CES
- Russel Stoll
- Jefferson



Additional Electrical Safety Products Available from the BENDER Group

Technical Services

BENDER Inc. has experienced engineers and technicians available to serve your facility. They are experts in the fields of Electrical Safety and Isolated Power and can assist you in a variety of ways:

- Detailed inspections of all Isolated Power Systems
- Measurements of leakage current from panels, circuits and connected equipment
- The study of existing system problems
- The evaluation of projected system upgrades
- The development of plans and specifications for new or retrofit installations
- Everyday operational problems
- On-site training seminars

Clocks and Elapsed Timers



The ZT1490 dual Clock and Elapsed Timer display is highly visible and can be set and activated from the front. The ZT1491 large 2 1/2" display shows either time-of-day or elapsed time. It is activated from local or remote control

stations. In both cases, unique power backup circuitry eliminates the need for batteries. A Master/Slave clock configuration can easily be implemented.

Unimet 1000ST Electrical Safety Analyzer



Tests are conducted in accordance with ANSI/AAMI, IEC-1 and other National and International Standards. Available with bar code reader and PCMCIA card for virtually unlimited on-board data storage.

The data can be uploaded into a Windows-based PC for access by sophisticated but user-friendly equipment management software.

Warranty

3-year warranty for Line Isolation Monitors

Isolated Power Systems

Both ISOTROL SYSTEMS, a USA-based Medical Division of Bender Incorporated and ISOLATION SYSTEM Products, a Canadian-based company of the Bender Group offer you a complete line of Isolated Power Panels and accessories built and engineered to stringent quality control standards and in full compliance with UL and CSA requirements.

The product line includes:

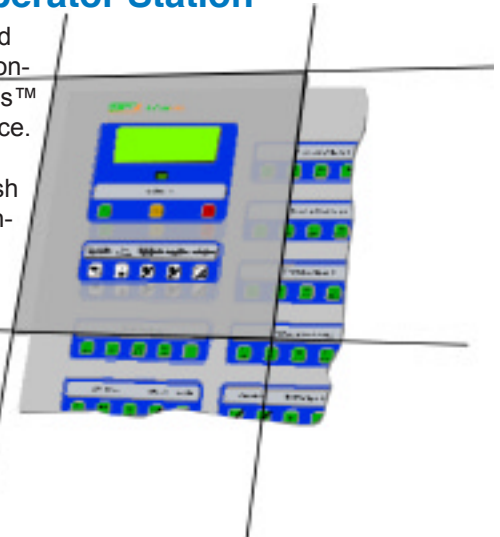
- Isolated Power Panels
- X-Ray & Laser Power Centers
- Surgical Facility Centers
- Overhead Ceiling Columns
- Patient Service Consoles
- Receptacle Ground Modules
- Other standard and custom accessories



BM1000

Indicator and Operator Station

The BM1000 indicator and operator station can be connected to the LIM2000plus™ via a serial RS485 interface. Error code information is displayed in simple English text and provides the technician with clear information as to the condition of the LIM and the steps to be taken to correct a situation that is abnormal.



EDS Fault Location Systems

For fault location, Isolated Power Systems can be equipped with an EDS system. Faulty branches can be indicated without power interruption.

Your Local Representative:



700 Fox Chase
Coatesville, PA 19320
Toll-free: (800)-356-4266
Fax: (610)-383-7100
Email: info@bender.org