

Isolated Power Systems Equipment

For Hospitals and Critical Care Areas



BENDER Isolated Power System Equipment

Isolated Power System with Line Isolation Monitor
for hospitals and other critical care areas

Isolated Power Systems

Isolated power systems offer an invaluable advantage: Early detection allows for critical systems to remain online in a single fault condition. BENDER Isolated Power Panels provide isolated power to electrical systems in operating rooms and other critical care areas. Utilizing the latest in line isolation monitoring technology, the LIM2010 provides advanced warning of faults to help reduce downtime and increase operational efficiencies. BENDER isolated power system equipment are designed in strict compliance with UL 1047, UL 1022, and UL 50.

LIM2010 Line Isolation Monitor

- No interference with electrical equipment
- Digital display showing THC in real-time
- Automatic self-calibration and self-check
- Audible and visual alarm indicators
- Many optional alarms, including load monitoring, over and under voltage, temperature monitoring, and more
- RS-485 communication interface
- Compatible with BENDER's advanced communication bus with several distribution options, including web-based viewing
- Compatible with BENDER's ground fault location system (EDS)



LIM2010 Line Isolation Monitor



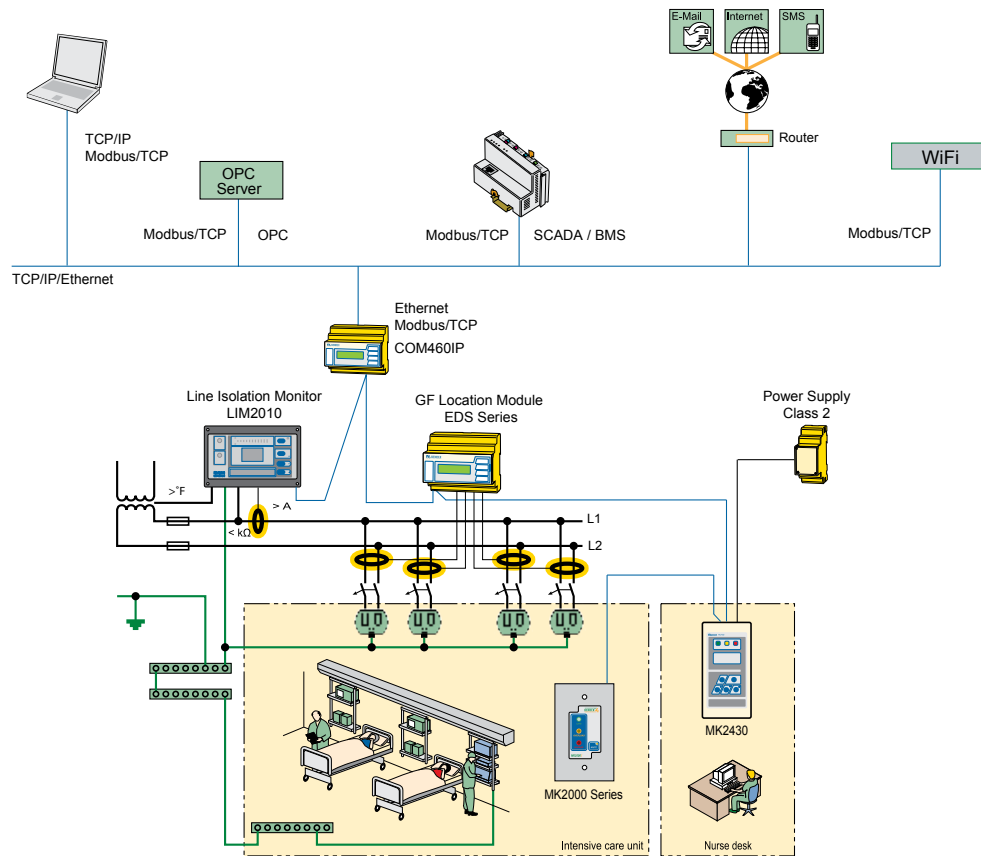
EDS491-D-2

Ground Fault Location Module

The EDS491/EDS461 series of ground fault location modules, combined with the LIM2010, create an installed ground fault location system for ungrounded AC and DC systems. Once a ground fault is detected, the test pulse generated by the LIM2010 is scanned by the EDS491/EDS461 to locate a ground fault down to the load level. Up to 12 separate current transformers may be connected to the device. A total of 90 EDS devices may be interconnected via RS-485. By utilizing the EDS series devices, the source of the fault in the isolated power system can be identified within seconds.

5 Year Warranty* on BENDER Isolated Power Panels and Line Isolation Monitors

*Note: 5 year warranty is issued when an initial startup checkout is performed by a Manufacturer Authorized Technician



Ethernet and Modbus/TCP Communication Modules

The COM460IP is a full-featured communication gateway for connecting BENDER devices to modern networks. The COM460IP connects via Ethernet connections to an existing communication network. The integrated web server displays the status of the entire network of BENDER devices, and may be viewed through the web browser (with Silverlight plugin installed) of any connected PC. No additional software is required. The COM460IP has many customizable options, including the ability to act as a Modbus/TCP gateway for status information.

Features

- Modular, expandable gateway between BENDER communication bus and TCP/IP
- Gateway between BENDER communications bus and Ethernet
- Optional Modular/TCP communication gateway for status information of BENDER devices
- Customizable features available through options
- Capability for remote access via LAN, WAN, and Internet



COM460IP

General Information:

A complete Isolated Power Panel is typically comprised of four assembly types :
Interior, Hospital grade transformers, Backbox (enclosure) and Front trim

Isolated Power Panels

BENDER's standard hospital panel provides isolated power service and protection to operating rooms and other critical care areas. The panel includes:

- Isolation transformer, rated to your requirements
- Primary circuit breaker
- Eight (8) 2-pole circuit breakers, field expandable to 16
- LIM2010 Line Isolation Monitor
- Compatible with BENDER's EDS ground fault location system



Isolated Power Panels with Receptacles and Ground Jacks

Including all of the features of standard panels, BENDER isolated power panels may also be provided with a section for hospital grade power receptacles and/or ground jacks. This panel configuration is ideally suited for having a centralized location for receptacles and ground jacks.

BENDER type HGC hospital grade ground cords are recommended for use with this configuration. See accessories for more information.

Isolated Power Panels for X-Ray / Laser Equipment

Isolated power panels may also be configured to feed x-ray and laser equipment at intervals up to 60 A (within the power rating of the panel). Panels are controlled by means of a PLC. This control may be customized to meet a particular system's requirements.

BENDER type XRM receptacles modules are recommended for use with this panel configuration. See accessories for more information.



Isolated Power Panels

Dual Voltage Isolated Power Panels

BENDER's dual voltage isolated power panels provide two different output voltages simultaneously using one isolation transformer. The typical configuration is provided with one side configured for 208 V or 240 V fixed at 15 kVA and the second side configured for 120 V at 5, 7.5, or 10 kVA.

Ideally suited for:

- Locations where space is limited
- Installations requiring power for both typical hospital equipment and x-ray / laser receptacles



Dual System Isolated Power Panels

BENDER dual system isolated power panels contain two complete isolated power systems. Both sides are independently configurable.

Ideally suited for:

- Locations where space is limited
- Renovations

Surgical Facility Centers

BENDER's custom designed surgical facility centers combine many key operating room components into one isolated power solution. Surgical facility centers provide isolated power protection while minimizing footprint and standardizing individual components required in the operating room.

Surgical facility centers typically include, but are not limited to:

- Surgical clock/timer
- Receptacle and/or ground jacks
- Film illuminators or Dry Erase Boards
- Audio system with speakers





MK2000 Series LIM Remote Indicator

MK Series remote indicators are designed for use with the BENDER LIM2010 Line Isolation Monitor. A remote indicator duplicates audible and visual alarm indications on the LIM. All remote indicators include a green "SAFE" LED, a red "HAZARD" LED, and a "MUTE" button with an integral amber LED. The "MUTE" button is used to silence the remote audible alarm. Optionally, it can also be used to silence all audible alarms in the system.

Models with additional features include:

- MK2000P:** Test button
- MK2000C:** Amber "OVERLOAD"* alarm LED
- MK2000CP:** Amber "OVERLOAD"* alarm LED and test button
- MK2000CBM:** Amber "OVERLOAD"* alarm LED, test button, and digital displays showing THC reading and % isolation transformer load* in real-time

RAS Remote Annunciator Station

RAS series remote annunciator stations utilize multiple MK series remote indicators, each connected to a line isolation monitor. Included remote indicators may feature a built-in test button and a transformer overload* LED. Each remote indicator is powered directly by the LIM2010 line isolation monitor, located at the isolated power panel.



Advanced MK Series Remote Indicators

The universal remote alarm indicators and operator panels MK2430/MK800 are intended for visual and audible indication of operating status and alarm messages from BENDER systems including the LIM2010 and EDS series ground fault location evaluators. The MK2430/MK800 displays information regarding each individual device, system, or room and can define custom labels based on each individual application. A LIM test may also be preferred from these devices.

Alarm and Display Features:

- Status and alarms are viewed on an easy-to-read LCD display. Features include:
- Normal operation indicator (green LED)
 - Total hazard current
 - Overload*
 - Over-temperature
 - Location of fault from EDS device
 - Connection monitoring alarms
 - Device errors
 - Test results
 - Measured values
 - Audible and visual indication

During normal operation, the MK2430/MK800 indicates the overall status of the system. The MK2430-11 features 12 digital inputs allowing messages from other technical equipment to be recorded and displayed.

* Note: Overload feature requires the use of BENDER STW series CTs installed in the Isolated Power Panel

Clocks, Timers, & Communication Solutions

Dual Display Digital Clock and Timer

The ZT1590 digital clock and timer is a complete, microprocessor-based device that displays both the time of day and elapsed time information. The ZT1590 has a dual-row, 7-segment display with large, red LED characters, easily read in high ambient light. All features, as well as the device setup, may be carried out with the four, onboard pushbuttons, or on an optionally connected MK1550 clock remote. No DIP switch configuration is required.



ZT1590RS (left) & MK1550 (right)

Digital Clock or Timer

The Clock/Elapsed timers are complete microprocessor based units that display either time of day or elapsed time information. The ZT1591 has a large 2-1/2" 7 segment display with large bright red LED characters that are easily read in high ambient light.

The BENDER ZT1591 operates independent of line frequency. This unit has unique power backup systems that requires no battery so there is no need for battery monitoring and replacement. In the event of power outage, both clock and timer functions will continue to work for at least 24 hours. However, the displays are not visible during this time interval.

The Timer may be activated from the remote control MK1550 or an external contact (code blue or other monitoring output). A count may be interrupted, resumed and reset at the remote control MK1550.



ZT1591

Surgical Chronometer

The ZT1594 surgical chronometer is a complete, microprocessor based system that displays time of day and three elapsed times. The system has four seven-segment displays with large, red LED characters easily read in high ambient light. All features, as well as device setup, are carried out on the connected MK1554 chronometer remote.



ZT1594

Isolated Power Systems Equipment and Accessories

GPM Series-Power and Ground Modules

BENDER power and ground modules provide a combination of hospital grade power receptacles and/or hospital grade ground jacks. Straight-blade single, straight-blade duplex, and twist-to-lock receptacles can be provided in a wide array of combinations. Also available are hospital grade ground jacks to facilitate implementation of an equal-potential environment.

Modules are provided on either stainless steel wall plates compatible with standard contractor supplied electrical gang boxes or stainless steel cover plates (as shown on the right) for use with ROHS compliant galvanized steel backboxes.



GPM-F4DR4



HGC-15C (left) & HGJ-1R (right)

HGC Series-Hospital Grade Ground Cords and Jacks

BENDER hospital grade ground cords are available in various lengths for implementing an equal-potential environment. Cords are highly flexible and available with either a heavy duty clip or lug on one end, and plug with rubber handle on the other.

XRM Series-X-Ray/Laser Receptacle Modules

Used in conjunction with circuit-controlling isolated power panels, XRM series modules provide a convenient source of power for portable x-ray and laser equipment. Typical configurations include an x-ray or laser power receptacle matching the NEMA plug configuration of the equipment. An "in-use" lamp and magnetic door switch ensure that the proper amounts of circuits are online simultaneously. The MK series LIM remote indicator may also be built into the module for displaying the status of the connected LIM.



XRM-8B2



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