Isolated Power Planning Guide

System configurations for isolated power in healthcare facilities

Design the future of energy

BENDER

Protect patients and staff with isolated power solutions

Standards such as NFPA 99 and CSA Z32 require isolated power systems in all areas deemed “wet procedure locations” in healthcare facilities. Isolated power systems offer an invaluable advantage - early detection of ground faults 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 technology, Bender equipment ensures that electrical ground faults are detected and located fast and automatically, in compliance with the latest standards and code requirements.

Bender provides advanced electrical safety technology to the healthcare industry, including:

The latest in line isolation monitoring technology, providing advanced warning of faults to help reduce downtime and increase operational efficiencies

Supplimental alarms including transformer load, temperature, and voltage to mitigate risk of electrical shock and fire

Branch location of ground faults, quickly and automatically - locate faulty equipment while the system remains online

Fast notification to facility staff with modern digital remotes and communication gateways to connect to Ethernet, Modbus, and BACnet networks*

Complete, modular panel solutions for ease of customization and installation

Equipment designed in strict compliance with many electrical codes and standards, including NFPA 99, NFPA 70, CSA Z32, UL 1047, and more

* Requires 3rd party gateway

Services for isolated power systems

Bender services for isolated power systems offer:

Complete services for new isolated power systems regardless of original manufacturer

Training for hospital staff to ensure proper understanding, use, and care of isolated power system

Testing performed utilizing Bender-developed, industry leading LT3000 test instrument

Electronic documentation provided as required by accredited agency compliance audits

Comprehensive testing and evaluation for annual and bi-annual testing required by NFPA 99, NEC and many accredited agencies

Software updates for LIM and accessories*

Testing and evaluation of your systems includes:

- Measurements of hazard current and calculations of system impedance
- Receptacle ground tension testing
- Ground continuity testing
- Receptacle polarity verification
- Touch voltage verification of exposed metal surfaces
- LIM functionality verification via external fault testing
- Torque testing at time of initial setup

Isolated Power System (IPS)

LIM2010 Line Isolation Monitor

- Ideal for retrofitting applications regardless of the current LIM’s make and model
- In most cases, no metal cutting is needed and simple instructions facilitate a fast changeover
- Automatic self-calibration, self-check, and digital display allow for yearly performance testing as opposed to bi-annual testing for analog LIMs (per NFPA 99)

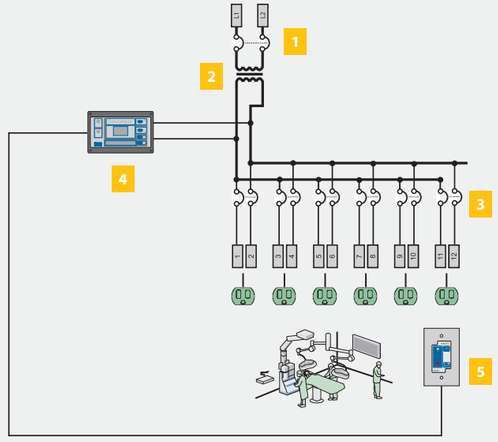
LT3000, an industry-leading testing instrument

* Software updates pertain only to qualifying Bender manufactured equipment

Basic Configuration

Includes required equipment for NFPA 99 compliance

Standard isolated power panel



Basic panel and system configuration

Key system components:

1. Primary circuit breaker
2. Isolation transformer
3. Secondary branch circuit breakers (provisionable up to 16 branches)
4. LIM2010 line isolation monitor
5. MK2000P remote indicator (with visual & audible indication, remote LIM test)

MK2000P-G1 remote indicator

System notes:

- Minimum equipment required for compliance with NFPA 99, if certain conditions are met
- Remote indication required when panel is not installed inside OR / ICU

Panel configuration:

- Standard panel configuration
- One (1) LIM2010 line isolation monitor
- Provisions for up to 16 branch circuit breakers
- Options for built-in hospital grade receptacles & ground jacks
- Option for PLC controlled circuit lockout

Sample part numbers:

(ex. 10 kVA, 208/120V, flush mounted)

- Transformer Kit: XMK10BA
- Backbox: B662408F
- Front trim: T6826R
- Interior: MIP10BASP

Additional equipment:

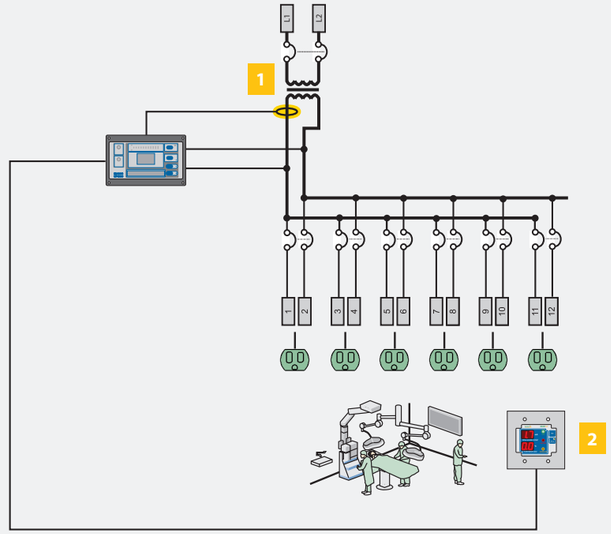
- MK2000P-G1 remote indicator

Load Monitoring

Includes capability of monitoring transformer load

STW3 current transformer

MK2000CBM digital remote indicator



Transformer load monitoring

System notes:

- Adds capability of system load monitoring (for entire system)
- Load monitoring indicated on both LIM2010 and MK2000CBM remote
- MK2000CBM provides digital readout of both THC and transformer load

Key additional components:

1. STW3 load monitoring current transformer
2. MK2000CBM digital remote indicator

Panel configuration:

- Standard panel configuration with integrated system load monitoring
- Options for built-in hospital grade receptacles and ground jacks
- Option for PLC controlled circuit lockout

Sample part numbers:

(ex. 10 kVA, 208/120V, flush mounted)

- Transformer Kit: XMK10BA
- Backbox: B662408F
- Front trim: T6826R
- Interior: MIP10BASP-LM

Additional equipment:

- MK2000CBM remote indicator

Branch ground fault location

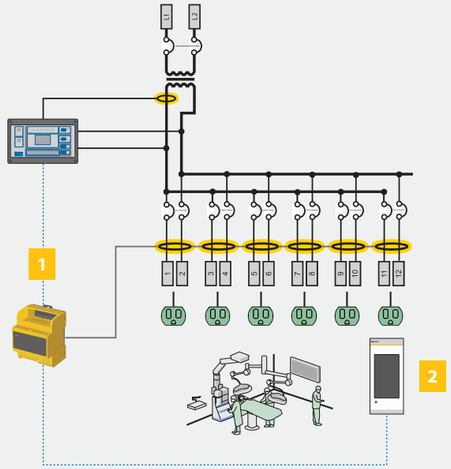
Includes automatic indication of individual branches with ground faults

Fault location expansion kit

CP305 remote indicating station

System notes:

- Automatic detection & indication of faulty branch circuit
- Digital display clearly shows faulty branch circuit
- Modular current transformer sizes allow for simple installation
- EDS module and current sensors can be built into the panel
- CP305 remote provides alarm indication for both LIM and EDS module
- Simple RS-485 connectivity between LIM, EDS, and remote
- CP305 can monitor multiple systems / panels
- Allows for future integration of other rooms and central nurses' desk monitoring



Addition of ground fault location and digital remote station

Key system components:

1. EDS441LNA-KIT-2 ground fault location expansion kit
2. CP305 remote indicating station

Included in panel beyond standard:

- Fault location expansion kit containing evalator modules, current transformer modules, and hardware

Sample part numbers:

(ex. 10 kVA, 208/120V, flush mounted)

- Transformer Kit: XMK10BA
- Backbox: B662408F
- Front trim: T6826R
- Interior: MIP10BASP-LM-D42

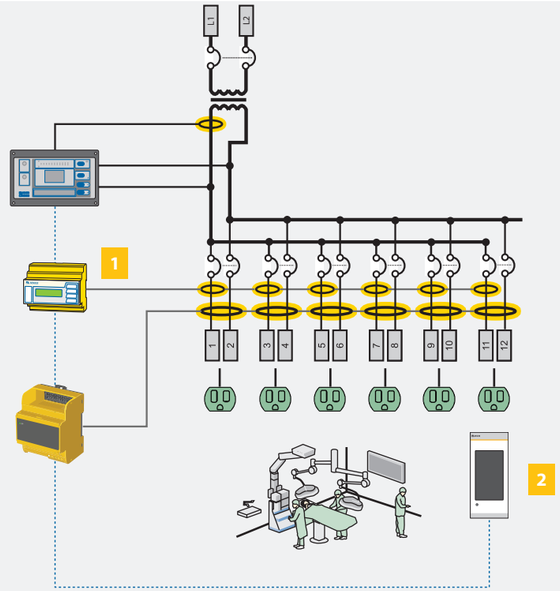
Branch load monitoring

Adds load monitoring for individual branch loads

Branch current monitoring expansion kit

System notes:

- Automatically detects and alarms on overload for individual branches
- Displays load current values in real-time on digital display
- Integrates into RS-485 network with other equipment
- Load current alarms also displayed on CP305 and CP9xx remote stations
- CMS460 information made available on communication bus



Addition of branch load current monitoring

Key additional components:

1. CMS460-KIT load monitoring expansion kit
2. CP305 remote indicating station

Included in panel beyond standard:

- Two (2) CMS460 load current modules
- Two (2) CTAC10/99 current transformer modules

Sample part numbers:

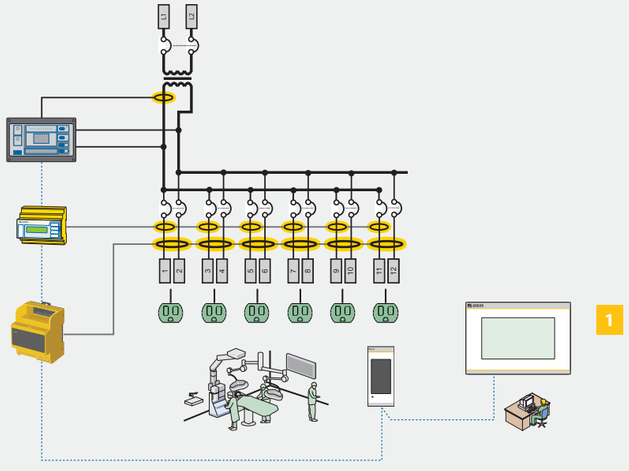
(ex. 10 kVA, 208/120V, flush mounted)

- Transformer Kit: XMK10BA
- Backbox: B662408F
- Front trim: T6826R
- Interior: MIP10BASP-LMC2-D42

Central monitoring station

Provides a central point for monitoring system alarms

CP9xx (as shown) remote station



Addition of central monitoring station at nurses' desk

Key system components:

1 CP9xx remote station

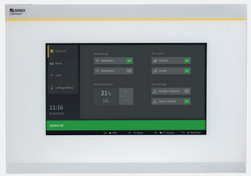
System notes:

- All components connected by same two-wire RS-485 network
- CP907 provides large screen for notification of alarms for hundreds of systems
- Nurses' desk able to see alarms from multiple rooms and a central point
- Compatible with any panel type

Technician visualization & remote integration

Includes advanced technical visualizations & communication

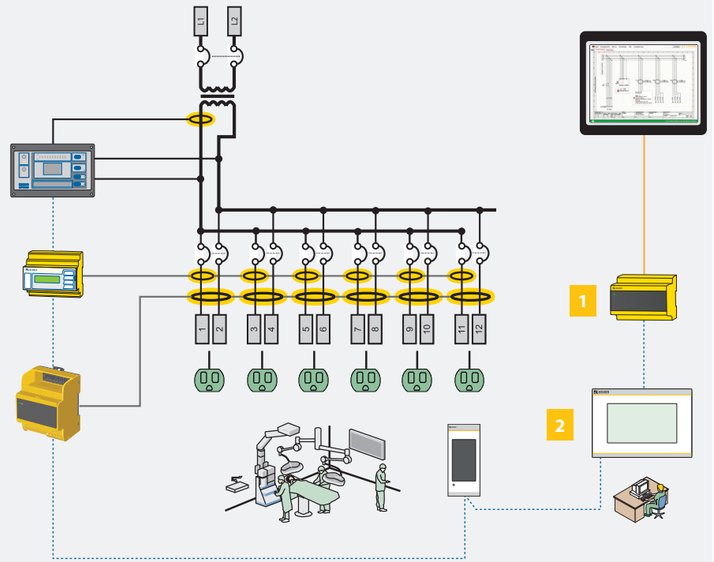
Communication expansion kit



CP907 HMI Station

System notes:

- All components connected by same two-wire RS-485 network
- Technicians view all systems from a centralized point
- COM465IP provides centralized, browser-based interface for viewing device status
- COM465IP provides integration into building management systems via Modbus/TCP
- CP907 series station provides advanced touchscreen visualizations of system
- One COM465IP can view up to 99 device addresses; additional COM465IP modules can be connected to view additional devices.



Addition of technician monitoring station for all systems

Key additional components:

1 COM465IP-KIT communication expansion kit

2 CP907 HMI Station

Included in panel beyond standard:

- Communication expansion kit, including COM465IP gateway and hardware

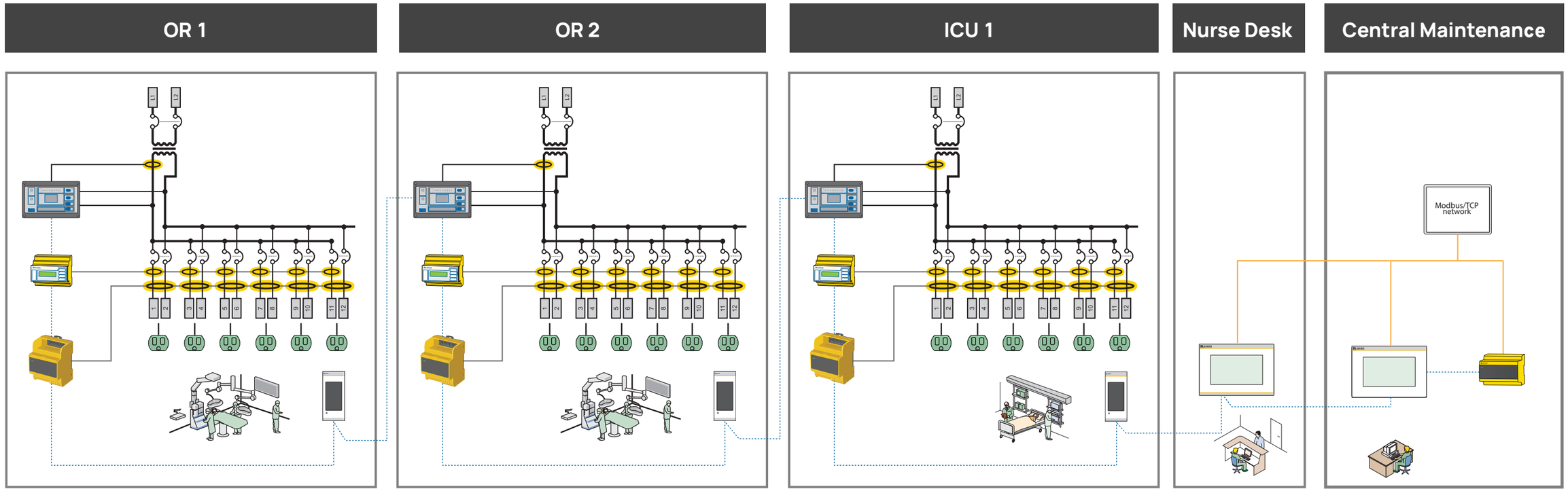
Sample part numbers:

(ex. 10 kVA, 208/120V, flush mounted)

- Transformer Kit: XMK10BA
- Backbox: B662408F
- Front trim: T6826R
- Interior: MIP10BASP-GW-LMC2-D42

Complete systems for multiple rooms

A complete solution for multiple operating rooms, centrally monitored



System notes:

- All systems connect to each other with simple, two-wire RS-485 network
- Nurses' desk monitors multiple systems from single location
- Integratable into existing Modbus/TCP networks
- Central visualizations for technicians and maintenance personnel for all systems

Sample part numbers:

(ex. 10 kVA, 208/120V, flush mounted)

- Transformer Kit: XMK10BA
- Backbox: B662408F
- Front trim: T6826R
- Interior: MIP10BASP-GW-LMC2-D42

Other equipment:

- 3x CP305
- 1x CP907 HMI Station

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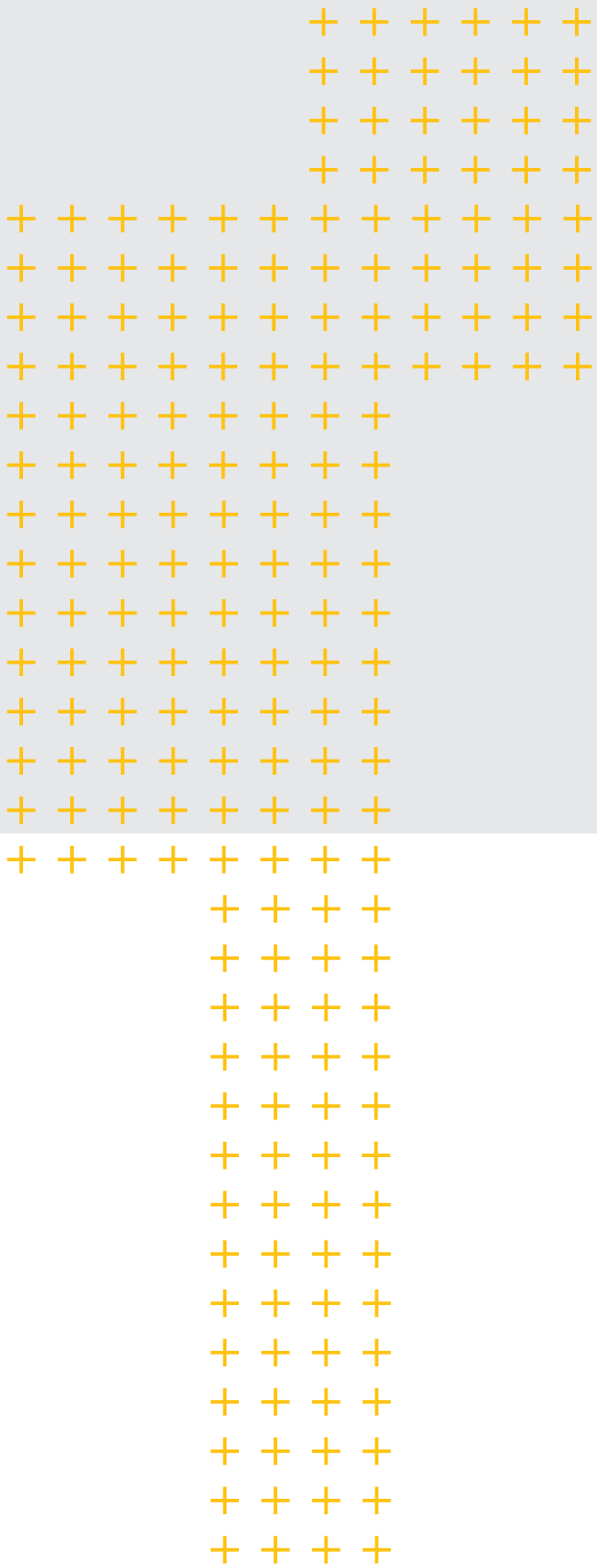

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