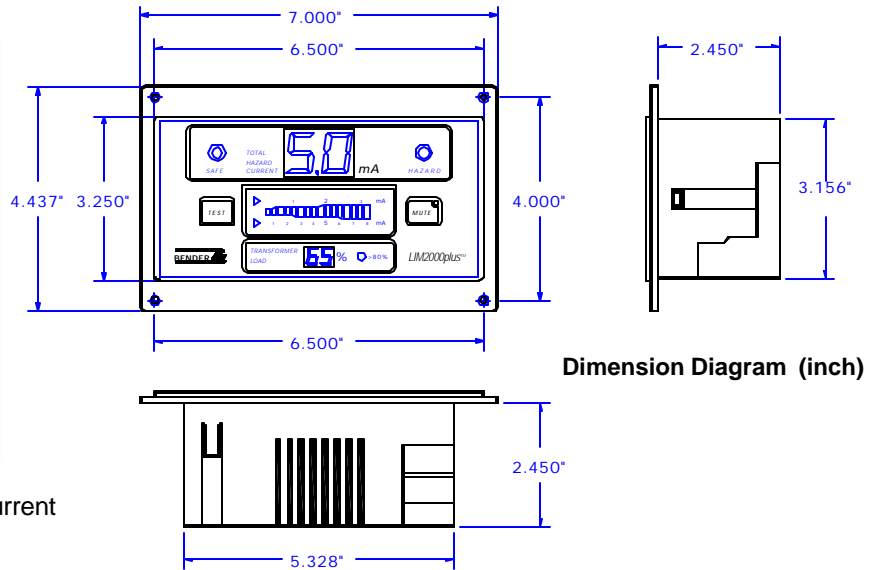


# Line Isolation Monitor for Single and Three Phase Systems

**LIM2000plus™**



Dimension Diagram (inch)

- Less than 35 microampere LIM hazard current
- No interference with electrical equipment
- Special phase-locking circuitry for ultimate stability and repeatability
- Voltage-free SPDT contact for external alarm
- Provision for remote indicators
- Internal overload protection with automatic reset
- Easy to clean rugged Lexan front foil
- Digital & analog bar graph display
- Automatic self calibration and self check
- Audible alarm volume is adjustable via menu
- Load Monitoring available
- RS485 communication output available

## Product Description

The Line Isolation Monitor (LIM) detects the total leakage impedance to ground in an isolated (ungrounded) AC power system. Based on this information, the maximum Total Hazard Current (THC) is determined and displayed on digital display and LED bar graph.

The LIM is available for operation in 50 to 60 Hz systems with AC voltages 100 to 240V. The supply voltage for the LIM is taken from the system to be monitored.

Two separate ground connections are provided. Each ground must be wired individually to the Reference Grounding Bus. A break in either connection will cause the LIM to alarm.

The BENDER LIM2000plus™ Series Line Isolation Monitor meets or exceeds all applicable U.S. and Canadian specifications. It complies with **NEC Article 517, NFPA 99, UL1022, CSA32.1** and is listed under UL file no. **E81789** and CSA file no. **LR60783-3**.

## Operational Information

Usually, there will be a different impedance between each isolated conductor and ground. Thus, there will be a different current flowing through a person making physical contact between any one of the isolated conductors and ground. The LIM function is to calculate and display the true maximum value of the Total Hazard Current (THC). The BENDER LIM accomplishes this using a patented measurement technique.

The THC is displayed on a seven segment digital display and a bar graph. Normally, the green "SAFE" LED is illuminated, the display shows a low leakage value and the bar graph is in the non-alarm, or safe, green zone. THC levels will increase as additional loads are connected to the system and/or when a line-to-ground fault has suddenly occurred or is slowly developing. There is a visual and audible alarm when the THC exceeds the LIM setting of either 2mA or 5mA. Relay output contacts are available which can be wired into a circuit to trigger an external alarm.

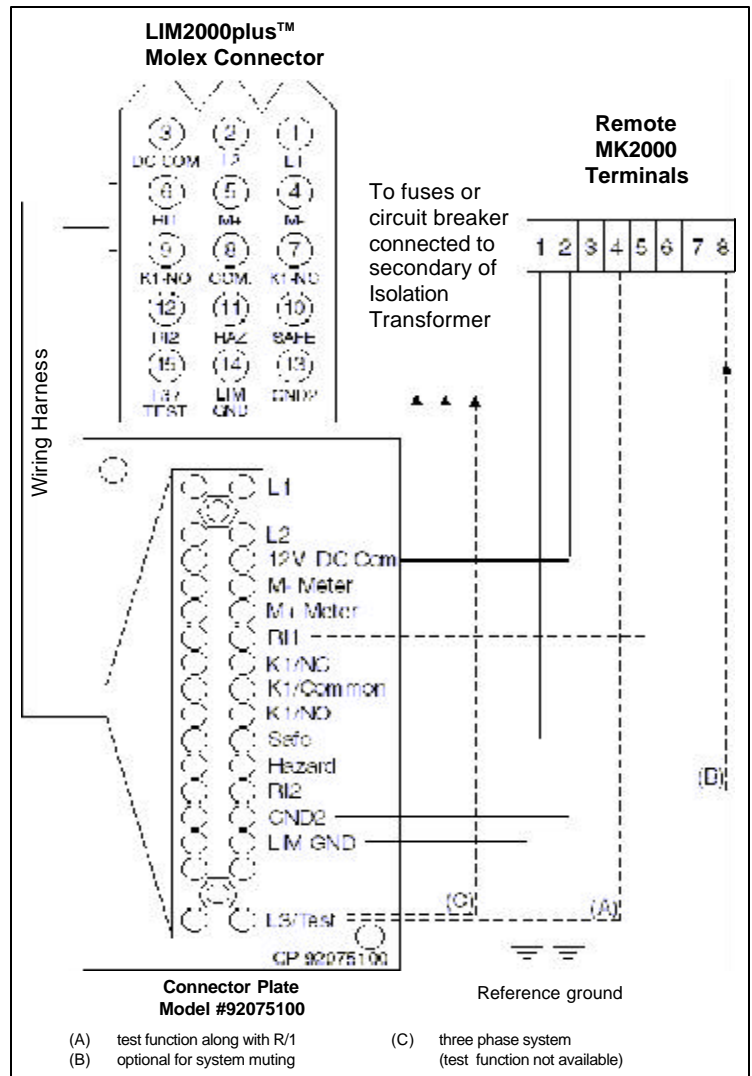
The visual alarm, red LED "HAZARD" remains illuminated for the duration of the fault. The audible alarm can, however, be silenced by pushing the MUTE button at any time, at the discretion of personnel in the vicinity of the LIM. When the MUTE button is activated, the amber LED in the mute button is illuminated to indicate a muted condition.

Activate the test button to check the LIM operation. Making this test does not add to the hazard current of a system in actual use, nor does the test include the effect of the line-to-ground stray impedance of the system.

The LIM has provisions for connecting one or more Remote Indicators, with or without analog or digital display meter. A Remote Indicator duplicates the LIM audible and visible alarm signals.

## LIM2000plus™

Rated insulation voltage	300 V
Insulation class in acc. to UL1022	
Dielectric voltage-withstand test	1500 V
Rated service rating	continuous operation
Rated mains voltage of $V_N$	100V - 120VAC / 200V - 240VAC 1ph. 200V - 240VAC 3ph.
Frequency range of $V_N$	50 to 60 Hz (+/- 5%)
Operating range of $V_N$	85 ... 110% of rated voltage
Max. power consumption	12.5 VA
Measuring current	max. 20 $\mu$ A
Monitor hazard current	max. 35 $\mu$ A
Min. internal impedance at 50/60 Hz	4.7 Meg Ohm
Nominal response value	5 mA changeable to 2 mA
Response tolerance	1.8 to 2 mA or 4.6 to 5 mA
Response retardation	< 4 sec.
Response hysteresis	20% of response value
Output contact assemblies	one voltage-free SPDT contact one 12 V DC, 200mA max Remote Indicator output analog and digital display indicator output
Rated contact voltage	250 V/24VDC
Make capacity	4A AC/ 4A DC
Break capacity at 24 V DC and L/R = 0	4 A
Switching life (240 V AC / 60 Hz)	10 <sup>5</sup> cycles
Operation mode	continuous
LIM overload protection	built-in thermal overload with automatic reset
Ambient temperature when operating	32°F...122°F 0°C...50°C
when stored	-13°F...158°F -25°C...+70°C
Mounting orientation	any
Connector	15 pin Molex, type 03-09-2152
Weight	approx. 1.53 lb



## Physical Details

The LIM is less than 2-1/2" deep. Cut-out required for panel mounting is 5-3/8" x 3-1/4" (+0,-1/32"). Mounting holes are on 4" and 6-1/2" centers.

A 15-pin female Molex connector is built into the back of the LIM2000plus™. A connector plate assembly with 15" cable and 15-pin male Molex connector is available to facilitate field wiring.

The audible alarm sound level adjustment is available via menu.

## Standards

The BENDER LIM2000plus™ Series Line Isolation Monitor meets or exceeds all applicable U.S. and Canadian specifications. It complies with **NEC Article 517**, **NFPA 99**, **UL1022**, **CSA32.1** and is UL and CSA recognized.

## Legend to Wiring Diagram

L1, L2:	To secondary of Isolation Transformer. Recommended circuit breaker, 10A, 2-pole
12V DC Com.:	Common connection of external Remote Indicator
Safe:	"Safe" LED
Hazard:	"Hazard" LED
M-, M+:	External analog mA meter (400 $\mu$ A)
RI1:	Test button common
RI2:	Local and system muting from LIM and Remote Indicator
K1/NC:	NC contact of the alarm relay K1
K1/Common:	Common contact of the alarm relay K1
K1/NO:	NO contact of the alarm relay K1
GND2, LIM GND:	Ground connections, if one is interrupted LIM will alarm
L3/Test:	Remote "Test" function or connection L3 in three phase systems

## Safety Instructions



Electrical equipment shall only be installed by qualified personnel in consideration of the applicable safety regulations.