Surge Protection
For *Business-Critical Continuity*™

Liebert® LM Series Surge Protective Device

Continuous Protection For Your Business

EMERSON
Network Power

The Liebert LM Series:

The Most Advanced, Cost-Effective Product Line In The Industry

The Liebert LM is a surge protective device (SPD) that offers continuous protection from damaging transients and electrical line noise. The Liebert LM utilizes patented circuitry to monitor the status of all protection modes, including neutral to ground. Should protection be unavailable in any mode, the green LED will be extinguished, and the red LED will be illuminated. In addition, high isolation form C dry contacts provide for remote monitoring of suppression system failure, under voltage, and phase and power loss. LM patented suppression integrity monitoring indicates failure for both shorted or opened suppression components.

Standard Liebert LM Series (SPD)

The Liebert LM Series can be a facility-wide product family and may be installed from service entrances to distribution panels to branch panels.

- Commercial buildings.
- Institutional facilities.
- Industrial plants.
- Any facility that has an environment with electronics-based equipment.

At A Glance

- Modular design allows for flexibility.
- Surge suppression range up to 500 kA per phase.
- Industry's highest surge current repeatability.
- Internal/external monitoring, including neutral to ground.
- UL rated 200k AIC with component level fusing for safe operation.
- All modes of protection standard, any combination optional.
- Sine wave tracking, EMI/RFI filtering
- ANSI/UL 1449 Third Edition Listed for Type 1 locations.
- ANSI/IEEE C62.11, C62.41, C62.45 categories A, B, and C3 tested.
- Tested to NEMA LS1.
- NEMA 12 enclosure with 3R, 4, and 4X options available.
- 5-year warranty.
- 2 sets of Form C dry contacts.
- Audible alarm.
- Choice of options:
  - Disconnect.
  - Transient counter.

Standard Features

Unit Status Indicators

The unit has an integral status circuit that monitors the operational status of all modes of protection, including Line to Neutral, Line to Ground, and Neutral to Ground. In the unlikely event that protection is reduced, the green LED will go out and the red LED will be lit. LED indication shall be provided internal and external to the product.

Enclosure

The unit is housed in a heavy duty, steel, NEMA 12 dust-tight, drip-tight enclosure.

Undervoltage Detection

System monitoring will indicate an undervoltage at 70% of nominal.

Phase and Power Loss Monitoring

System monitoring will indicate a loss of any phase or loss of power.

Noise Attentuation

The filter provides insertion loss up to 63 dB from 100 kHz to 100 MHz per 50 Ohm Insertion Loss Methodology from MIL Std. 220A.

Overcurrent Protection

All components are individually fused and unit is UL rated for 200k AIC for safe operation.

Audible Alarm

The system is equipped with an audible alarm activated when summary alarm contacts are activated. An ON/OFF button is provided to silence the alarm, and an alarm push-to-test button to test the alarm function. A visible LED confirms whether alarm is on or disabled. Both buttons and the audible alarm are located on the panel's front cover.

Agency Listing

The specified unit is ANSI/UL 1449 Third Edition (2009), UL 1283 (Type 2 locations), cUL.

Warranty

A full five-year parts warranty.

Form C Dry Contacts

Two sets of electronically isolated form C dry contacts are provided, (two normally open, two normally closed) for remote monitoring.

Life Cycle Testing

The system is life cycle tested to survive multiple 10kA, 20KV, IEEE C62.41 Category C3 transients with less than 5% degradation of clamping voltage. The minimum numbers of surges the unit shall be able to protect against are 8,000 per phase.

Optional Features

Integral Disconnect

A 200k AIC integral disconnect switch located within the system enclosure with an external manual operator.

Transient Counter

The system can be equipped with a transient counter which totals transient surges that deviate from the sine wave envelop by more than 125 volts. The counter is located on the unit's front cover and features an 8 digit LCD, lithium batteries (with 10-year life), and reset switches.

Specifications

Liebert LM Series

Maximum Continuous Operating Voltage (MCOV)	120V ±25%, all others ±15%
Fault Current Rating (AIC)	200kAIC
Location Type	Type 1
Nomimnal Discharge Current (In)	20kA
50 ohm EMI/RFI Attenuation	63dB max from 10kHz to 100MHz
Operating Frequency Range	47 - 63 Hz
Response Time	< 0.5 nanoseconds
Operating Humidity	0% to 95%
Status Indication	LEDs, Dry Contacts, Audible Alarm
Certifications	ANSI/UL 1449 Third Edition, UL 1283 (Type 2 locations), cUL Listed
Enclosure	NEMA 12
Warranty	5 Years Parts

Life Cycle Surge Testing *10kA, 20kV, IEEE, Cat. C3*

Unit	Per Mode	Per Phase
060-080	8,000	16,000
100-150	16,000	32,000
200-250	24,000	48,000

ANSI/UL 1449 Third Edition - Voltage Protection Ratings (VPRs)

System Voltage	L-N	L-G	L-L	N-G
120/208	800	900	1200	700
120/240	800	900	1200	700
346/600	1500	1500	2500	1200
277/480	1200	1200	2000	1000
480	X	1800	3000	X
600	X	2000	4000	X

How To Specify The Appropriate Model:
All Liebert LM Series model numbers begin with an LM prefix. Use **Chart A** to build your Leibert LM Series starting with the Surge Rating column. Moving left to right, choose the correct configurations from each column for your application. Your completed model number should look similar to the example below or LM250120YARCE. Refer to **Chart B** for Liebert LM Series dimensional data.

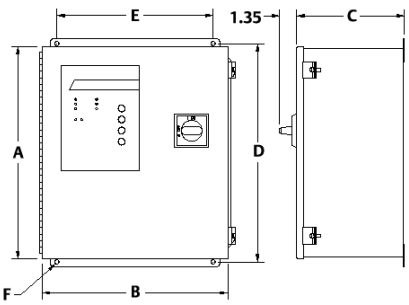
Chart A – Example

LM	250	120	Y	A	R	C	E

Model# Indicators		Surge Rating		L - G Voltage	Configuration		Modes of Protection		Connection Options		Monitoring Options		Enclosure	
L	M	60kA/mode	060	120-120V	Single Phase L-N, 2W+gnd	N	ALL	A	WireLug	N	Standard Monitoring System, LEDs, Audible Alarm, Dual Form C Contacts	S	NEMA 12 (Standard)	E
Low Cost	Modular	80kA/mode	080	208-208V	Single Phase L-L, 2W+gnd	L			Disconnect	R			NEMA 3R	R
		100kA/mode	100	220-220V	Split Phase, 3W+gnd	S							NEMA 4	T
		125kA/mode	125	230-230V	Three Phase Wye 4W+gnd	Y							NEMA 4X	X
		150kA/mode	150	240-240V	Three Phase Delta 3W+gnd	D					LEDs, Audible Alarm, Surge Counter, Dual Form C Contacts	C		
		200kA/mode	200	277-277V	Three Phase Delta Hi-leg 3W+gnd	H								
		225kA/mode	225	480-480V										
		250kA/mode	250	600-600V										

Chart B – Liebert LM Series Dimensional Data

		Dimensions (inches)						Approx. Weight
Unit	Options	A	B	C	D	E	F	
LM060 LM080 LM100 LM125 LM150	All	16	14	8	16.75	12.0	0.31	35
LM200 LM225 LM250	All	20	16	9	21.25	10	0.31	45



What is "Dirty Power?"

Utilities have generated and distributed electrical power the same way for decades. Unfortunately, this unconditioned electrical power can provide abnormalities in the electricity that runs in your facility. This is commonly referred to as "dirty power." But until the advent of sensitive electronic equipment, "clean power" was never an issue.

In today's world, almost every business depends on relatively fragile micro-electronics to run everything from computer networks to manufacturing lines. Which means that power disturbances can disrupt or cripple equipment, causing the loss of data, productivity, and money. In fact, downtime and damage caused by dirty power cost North American companies an estimated $26 billion a year.

Today's industries are looking for cost-effective ways to intercept transients, provide clean power in their facilities, and safeguard their businesses from the astronomical, and unnecessary, cost of dirty power. That's why Liebert designed the LM Series.

The causes of dirty power are as varied as the names used to describe it — dirty power, electronic rust, surge, spike, transient, fluctuation, interruption or noise. Fortunately, abnormalities typically fall into one of two categories — external or internal.

Hidden Problems Created By Dirty Power

- Unexplained system disruptions.
- Errors and shutdowns of data transmission, or scrambled and unreadable data.
- Numerous, unexplained server shutdowns and re-boots.
- Component failure, often well ahead of projected life span.

Causes Outside Your Facility

Lightning, natural disasters and inclement weather can cause high-transient power line voltages that can adversely affect your power supply. Utility switching and faults on the utility's distribution system can adversely affect the quality of your power before it even reaches your facility. Why? Many utility systems are aging and few power plants have been built over the last decade. With increased demand for power, their supply margins are dipping dangerously low. The farther away from the source of power, the greater the risk of power quality problems.

Causes Inside Your Facility

According to some studies, 3/4 of all power disturbances are caused by equipment inside your building. If your facility is more then a decade old, chances are the wiring was not designed to support the intensive use of electronic equipment. In industrial facilities, these problems are even more complex. In fact, any device that runs in cycles can create a drain or a surge when it switches on or off. The more power the equipment uses, the bigger the affect. Even something as small as a copier or a laser printer can cause problems in sensitive equipment that share the same line.

The Complete Protection Experts

Of course, you can't control how power is distributed. But you can protect the equipment in your facility from power surges and transients by installing equipment such as surge suppressors and filters. The issues affecting each industry are varied. In addition to the LM Series we offer a complete array of power conditioning solutions to meet a wide range of applications, locations, and budgets.

Ensuring The High Availability Of Mission-Critical Data And Applications.

Emerson Network Power, a business of Emerson (NYSE:EMR), is the global leader in enabling *Business- Critical Continuity™* from grid to chip for telecommunication networks, data centers, health care and industrial facilities. Emerson Network Power provides innovative solutions and expertise in areas including AC and DC power and precision cooling systems, embedded computing and power, integrated racks and enclosures, power switching and controls, monitoring, and connectivity. All solutions are supported globally by local Emerson Network Power service technicians. Liebert AC power, precision cooling and monitoring products and services from Emerson Network Power deliver Efficiency Without Compromise™ by helping customers optimize their data center infrastructure to reduce costs and deliver high availability.

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