

AC POWER LINE PROTECTION



MCG SURGE PROTECTION



UL Listed Versus UL Compliant: What's the Difference?

Important Information About UL You Need to Know

MCG Surge Protection, along with other manufacturers of TVSS equipment, have long complied with UL standards in order to be able to carry the UL mark – a universally recognized symbol of safety to industry, users, specifiers and the insurance companies that underwrite the protected facilities.

UL recently revised its standard for TVSS safety by mandating much more stringent testing. This revision is called: **UL 1449 3rd Ed. Listed**. Now TVSS manufacturers were faced with a dilemma – test to the new standard or lose the UL 1449, 3rd Ed. listing.

Sending an extensive product line to be tested is a costly, time-intensive project. As a result, some manufacturers pulled out of the TVSS business entirely. And not pee wee companies – big companies.

Some companies are relying on the customer not being aware of the new standard and continue to promote the outdated standard, simply – UL1449, 2nd Ed. Listed. There is a limited life span to this approach because UL will require that the statement be pulled. **Only products listed to the new standard can say “UL 1449 3rd Ed. Listed”.**

Other companies elected to bypass UL altogether and test to the new requirements using an independent, non-UL lab. Cost savings are substantial and turnaround is months better than UL. We were tempted to go this route ourselves. **Problem – testing to the standard and being compliant to the standard does not confer a UL listing. If there's no UL listing, there's no UL mark.** You won't see it on any of the units that are tested outside of UL.

Manufacturers who elected to use other labs are taking great care to make it look like they are UL-listed, or in the event a potential customer reads the fine print, to assure that UL compliant is the same as UL Listed. They use the words “Products Listed to new UL Requirements” and even wrap them in gold starbursts for authenticity.

Big Question: If TVSS (or any other electrical equipment) is not UL-listed, will the insurance company pay on a claim should a calamity, such as a fire or an explosion, occur?

Conclusion: Read the specs – UL listed means a unit may bear the UL mark. UL compliant units tested outside of UL will bear the mark of the independent testing lab, not the UL label.

MCG has invested the time and a significant amount of money in the UL Listing. We meet the specs and can legitimately display the UL mark.

See UL site for MCG's UL Listing at:

<http://database.ul.com/cgi-bin/XYV/cgifind.new/LISEXT/1FRAME/index.htm>

MCG – Not Just Compliant, UL Listed.



Christine Jelley
CEO
MCG Surge Protection



CONTENTS

Surge Suppression - A Users Guide

Page

UL Versus UL Compliant: What's the Difference?	2
Coordinated Protection Recommendations	4
Anatomy of a Lightning Strike	5
The Importance of Protection Redundancy	6
What Do You Really Need in a Surge Protector?	7
Q & A: Frequently Asked Questions	31

AC Power Line Surge Protectors

Building Entry Protection

402XT & 202XT	8
160MXT	10
560LS	12
300LS	14
200LS	16
160M / 120M	20

Mid-Building (Branch Panel) Protection

120LS	18
150M / 125M / 90M	22
PT250 / PT160 / PT120	24
PT160D	26

Local Service Panel Protection

PT80 & PT40	28
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Equipment Level Protection (OEM)

400 Series (407, 415, 416 & 417)	30
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See www.mcgsurge.com for Data Line and Direct Current Protection

Download **The Truth of the Matter** - our comprehensive, 28-page tutorial relating to a variety of AC power line surge suppression issues.

Data Line Surge Protection - These catalogs offer a wide range of MCG's protectors for applications including telecom, Cat. 5+6, 1000BASE-T, DIN Rail, and 19" rack protection.

MCG SURGE PROTECTION IS AN ISO-9001 REGISTERED COMPANY

MCG Surge Protection



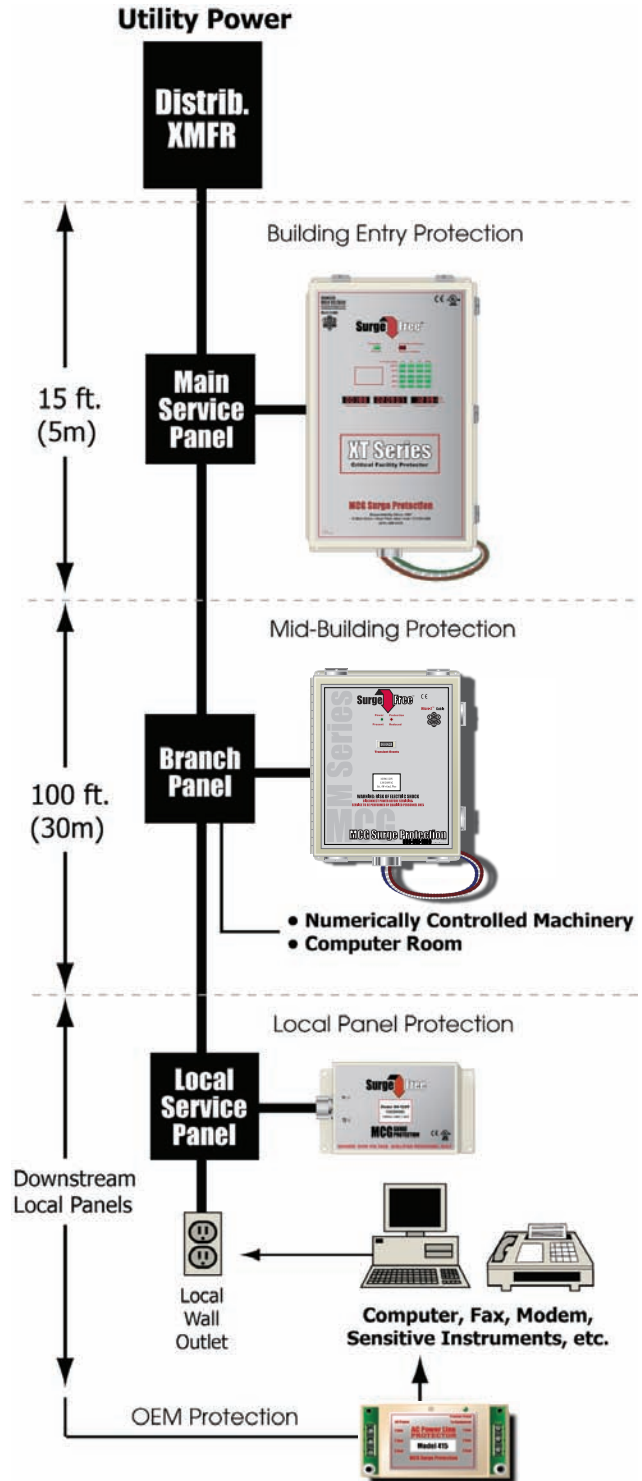
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Coordinated Protection Recommendations

This chart shows a typical power distribution system within a building and the appropriate protectors for use throughout.

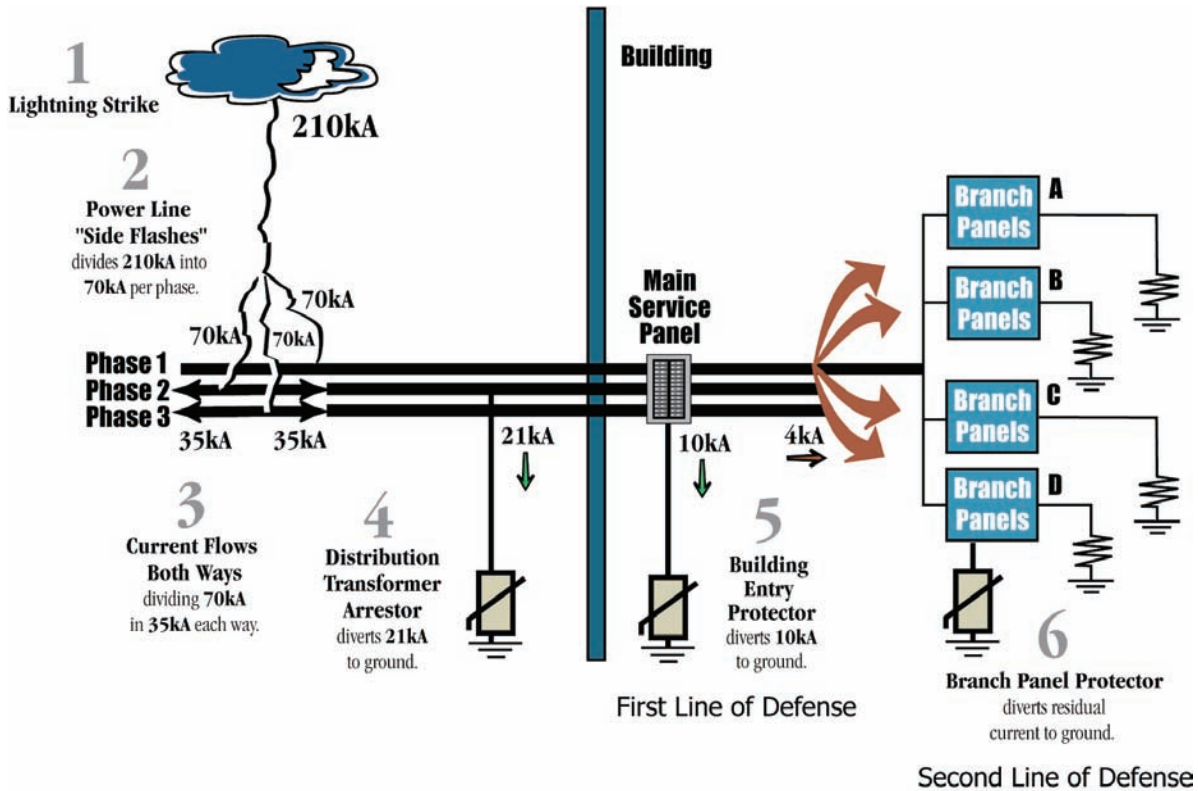
Heavy Exposure	General Exposure
C62.41 Cat. C IEC Class II 402XT 202XT 560LS 300LS	160MXT 200LS PT250 160M
C62.41 Cat. B IEC Class III 120LS 150M 120M PT160 PT160D	125M PT120
C62.41 Cat. A IEC Class III 90M PT80	PT40
OEM Applications	
	400 Series



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Anatomy of a Lightning Strike

How a 210kA Strike Becomes 10kA at the Building Entry



Your First Line of Defense - Building Entry Protection

One of the largest lightning transient currents recorded was 210kA with a duration in the tens of microseconds. By far, the greatest outside threat to sensitive equipment is from lightning strikes to overhead AC power lines which then couple the transient into your facility. Lightning strikes directly to the facility occur much less frequently.

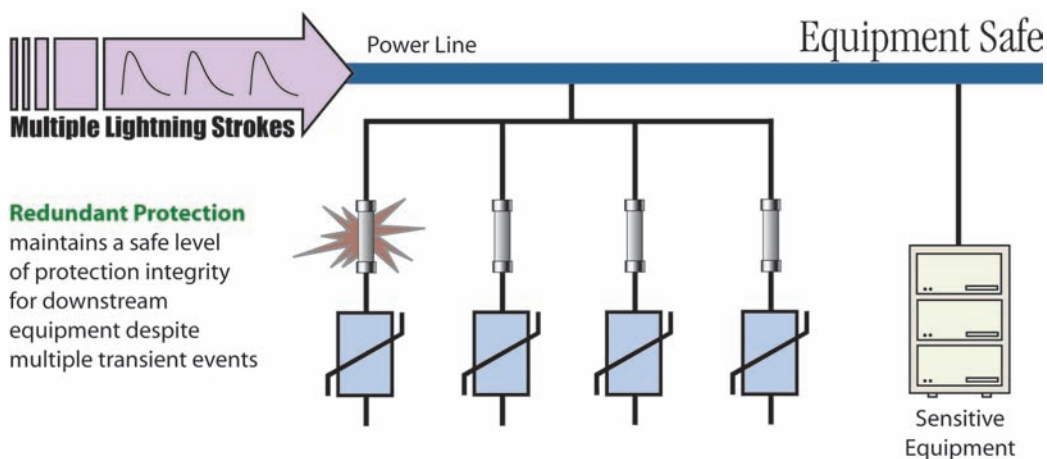
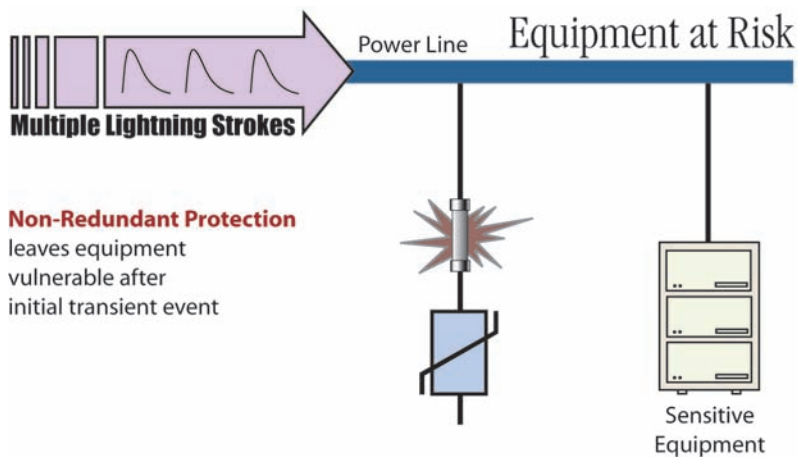
Your Second Line of Defense - Mid-Building Protection

Other very common sources of transient voltage spikes occur deep within a building and are caused by elevators, copiers, air conditioners, arc-welders etc. A suitably-sized surge protector located at the branch and local panels will very effectively suppress these locally-generated transients to safe voltage levels.

The Importance of Protection Redundancy

Multiple protection pathways to ground are critical. A lightning strike often consists of multiple current strokes to the power lines, or earth. As many as two to twenty strokes can occur in a single lightning event.

To provide proper system protection, the building entry surge protector needs to have at least two, and preferably several, independently-fused, parallel protection sections per phase. The failure of a single protection section in a redundant surge protector, in a severe lightning storm for example, would not be catastrophic. System protection would continue to be maintained.

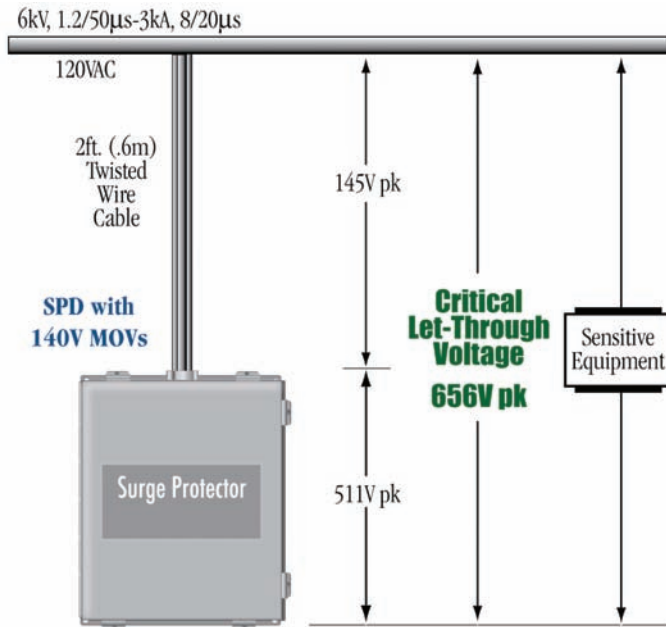


It is recommended that this redundant concept be continued at the mid-building/branch level, while the local service panel protectors can safely employ single protection approaches.

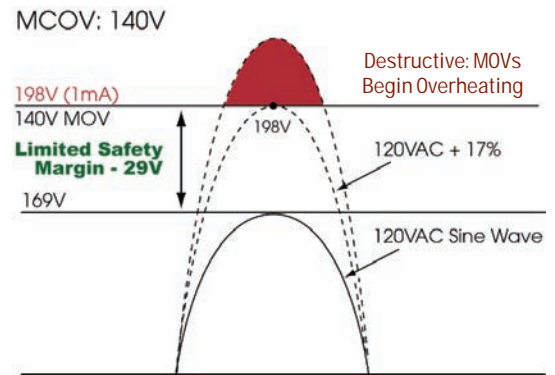
What Do You Really Need in a Surge Protector?

Improved Clamping + Increased Headroom: Micro-Z cabling forces a very efficient magnetic field cancellation within the cable. This results in a correspondingly low inductive voltage drop along the cable that is lower than what is achieved with conventional wiring.

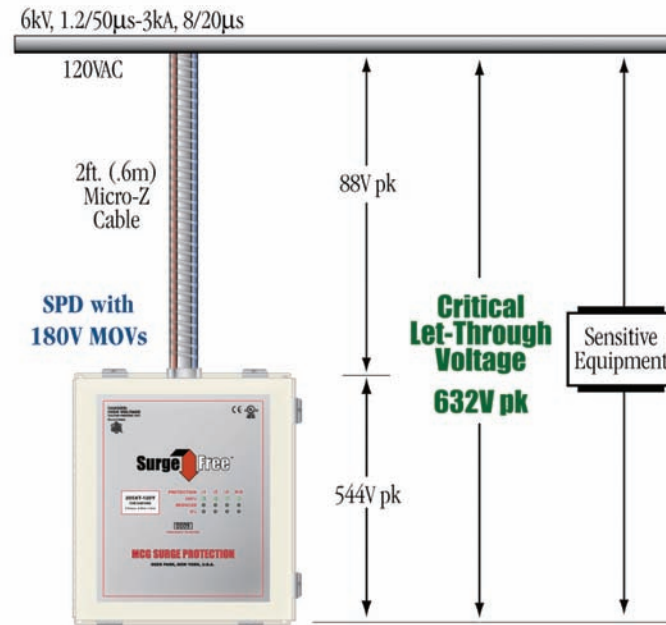
Conventional SPD Installation



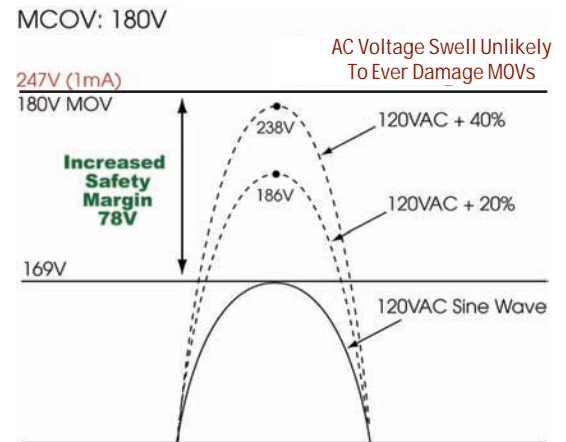
Transient: 6kV, 1.2/50µs - 3kA, 8/20µs
 MCOV: 140V rms
 Headroom: 17%
 "Let-Through" Voltage: 656V



SPD with Micro-Z Cable Installation



Transient: 6kV, 1.2/50µs - 3kA, 8/20µs
 MCOV: 180V rms
 Headroom: 50% (greatly improved)
 "Let-Through" Voltage: 632V (24V lower clamping)





SurgeFree™

MODELS

402XT • 202XT

Building Entry Protection

The Surge Free 402XT/202XT are brute force protectors designed for installation at the entrance of large, Cat. C facilities. Manufactured with the rock-solid reliability found in all MCG protectors, the XT series offers extraordinary performance in diverting damaging transients. All models include an internal disconnect switch and twenty-year warranty.

FEATURES

- 402XT: $I_p=400\text{kA}$, $8 \times 20\mu\text{s}$. 202XT: $I_p=200\text{kA}$, $8 \times 20\mu\text{s}$
- Independent lab tested modules. Rated at 200kA ($8 \times 20\mu\text{s}$ each.)
- Meets NEMA LS 1-1992
- Redundant modular protection withstands multiple lightning strikes. Uses 40kA MOVs.
- Solid copper bus bar construction for minimal impedance and enhanced current sharing.
- High performance, low inductance Micro-Z™ installed cable
- Field-replaceable protection modules for on-site maintenance
- Multiple, heavy-duty surge current pathways
- At-a-glance monitoring system: Transient event counter, time and date of last transient event, LED indicators show protection status, audible alarm with mute switch, and remote relay contacts (surge protected). Filtering standard
- on all XT models.
- NEMA 4, Powder Coated Steel Enclosure



UL 1449, 3rd Ed. Listed

20-Year Warranty
Lifetime Module Replacement

Filter Attenuation

MIL STD 220A (50 Ohm):	120VAC	240VAC	277VAC
-30db	25kHz	25kHz	50kHz
-40db	125kHz	180kHz	100kHz
-50db	210kHz	210kHz	180kHz
-60db	250kHz	250kHz	200kHz

SPD Type:	Type 2
I_n :	20kA
Maximum Continuous Operating VAC (MCOV):	115% Rated Line Voltage
Varistor MCOV:	125% Rated Line Voltage Minimum (standard models w/o "-xxxV" suffix)
Varistor MCOV:	115% Rated Line Voltage Minimum (models w/ "-xxxV" suffix)
SCCR:	Up to 100kA AIC
Surge Current/Phase (8/20 μs):	1 Event - 402XT: 400kA, 202XT: 200kA.
Surge Life/Phase (8/20 μs):	10,000 Events - 402XT: 15kA, 202XT: 10kA
Surge Current/Mode (8/20 μs), 402XT:	L-N: 240kA; L-G: 160kA; N-G: 120kA; L-L: 400kA
Surge Current/Mode (8/20 μs), 202XT:	L-N: 120kA; L-G: 80kA; N-G: 120kA; L-L: 200kA
Surge Current/Mode (8/20 μs), 402XT (Delta):	L-L: 400kA; L-G: 400kA
Surge Current/Mode (8/20 μs), 202XT (Delta):	L-L: 200kA; L-G: 200kA
Response Time:	<5ns
Status Indicators:	LED Bar Graph, Event Counter, Audible Alarm, Protected Dry Contacts
Operating Altitude:	13,000ft. (4000m)
Temp. (Operating/Storage):	-40° to +70°C/-40° to +85°C
Enclosure:	NEMA 4, 14 gauge steel, powder coated
Dimensions for 402XT & 202XT:	12" x 18" x 8.5" (305mm x 457mm x 216mm)
Mounting for 402XT & 202XT:	8" x 18.75"/.313" ID - 4 holes (203 x 476mm/8mm ID - 4 holes)
Micro-Z Cable Connection:	#10 AWG (5.27mm ²)/.128 OD (3.4mm) 8ft. length (2.43m)
Conduit Connector:	1" Rain tight hub
Weight:	402XT: 42 lbs., (19.1kg); 202XT: 39 lbs., (17.7kg)
UL File Number:	E322161
UL Certification:	UL Listed to 1449 3 rd Edition
	UL96A Lightning Protection Master Label Compliant
ARRA Certification:	Complies with ARRA 1605 requirements



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Specifications

- ANSI/IEEE C62.41-2002
- IEC 61643-1-1998
- UL 1449, 3rd Ed.

Model 402XT

Model	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	20kV, 1.2/50µs 10kA, 8/20µs L-N**
-120T -140	120/240VAC, 1φ, 3W+Gnd	800	800	700	1200	495
-120T	120/240VAC, 1φ, 3W+Gnd	900	900	700	1200	552
-120Y -140	120/208VAC, 3φ, 4W+Gnd, Wye	800	800	700	1200	495
-120Y	120/208VAC, 3φ, 4W+Gnd, Wye	900	900	700	1200	552
-240DCT*	240/120/120VAC, 3φ, 4W+Gnd	900/1500	900/1500	1200	1200/2500	552/1096
-220Y	220/380VAC, 3φ, 4W+Gnd, Wye	1500	1500	1200	2500	1096
-240Y	240/415VAC, 3φ, 4W+Gnd, Wye	1500	1500	1200	2500	1096
-277Y	277/480VAC, 3φ, 4W+Gnd, Wye	1500	1500	1200	2500	1096
-240D	240VAC, 3φ, 3W+Gnd, Delta	n/a	1500	n/a	2500	1096 (L-G)

* High-leg Delta Center Tapped
** Actual Measurements w/ 6" Lead Length

Energy Absorption (8/20µs) in joules: 19,000J - 108,000J

Model 202XT

Model	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	20kV, 1.2/50µs 10kA, 8/20µs L-N**
-120T -140	120/240VAC, 1φ, 3W+Gnd	800	900	700	1200	590
-120T	120/240VAC, 1φ, 3W+Gnd	800	900	700	1200	640
-120Y -140	120/208VAC, 3φ, 4W+Gnd, Wye	800	900	700	1200	590
-120Y	120/208VAC, 3φ, 4W+Gnd, Wye	800	900	700	1200	640
-240DCT*	240/120/120VAC, 3φ, 4W+Gnd	800/1500	900/1500	1200	1200/2500	640
-220Y	220/380VAC, 3φ, 4W+Gnd, Wye	1500	1500	1200	2500	640/1256
-240Y	240/415VAC, 3φ, 4W+Gnd, Wye	1500	1500	1200	2500	1256
-277Y	277/480VAC, 3φ, 4W+Gnd, Wye	1500	1500	1200	2500	1256
-240D	240VAC, 3φ, 3W+Gnd, Delta	n/a	1500	n/a	2500	1256 (L-G)

* High-leg Delta Center Tapped
** Actual Measurements w/ 6" Lead Length

Energy Absorption (8/20µs) in joules: 9,000J - 54,000J

A Note On Headroom A surge protector responds to increases in voltage. Surge protectors triggered by the nominal line voltage are undesirable, consequently headroom is always factored into surge protector design. Long duration voltage swells occur on power lines and can damage a surge protector, leaving facility equipment vulnerable. By employing higher headroom, continuity of surge protection is guaranteed. This feature is standard in MCG surge protectors. Higher headroom allows varistors to ride out voltage swells while ensuring that let-through voltage remains within CBEMA (now ITIC) guidelines. The CBEMA curve is the most accepted graph worldwide for equipment susceptibility analysis.

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SurgeFree™

MODEL

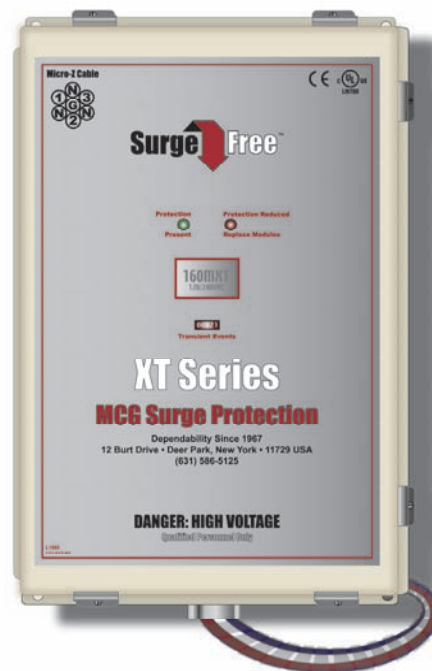
160MXT

Building Entry Protection

The 160MXT Series are brute force protectors designed for installation at the entrance of large to mid-sized facilities. The unit offers first-rate protection for 200kA applications at the main service panel. Redundant protection and complete diagnostics ensure continuous, reliable operation. All models include a twenty-year warranty on unit; lifetime on modules.

FEATURES

- 160MXT: $I_p=200kA$, $8 \times 20\mu s$
- Independent lab tested modules
- NEMA LS 1 - 1992
- Redundant modular protection withstands multiple lightning strikes. Uses 40mm MOVs
- Solid copper bus bar construction for minimal impedance and enhanced current sharing
- High performance, low inductance Micro-Z™ installed cable
- Field-replaceable protection modules for on-site maintenance
- At-a-glance monitoring system: Transient event counter, LED protection status indicators, audible alarm (with mute switch), and surge protected remote relay contacts
- Filtering standard on all XT models
- NEMA 4, Powder-Coated Steel Enclosure



$I_{peak}=200,000A$

UL 1449, 3rd Ed. Listed

20-Year Warranty
Lifetime Module Replacement

Filter Attenuation	120VAC	240VAC	277VAC	480VAC
MIL STD 220A (50 Ohm):	120VAC	240VAC	277VAC	480VAC
-30db	100kHz	25kHz	80kHz	80kHz
-40db	200kHz	100kHz	180kHz	180kHz
-50db	280kHz	180kHz	210kHz	250kHz
-60db	310kHz	200kHz	390kHz	390kHz

SPD Type: Type 2
I_n : 20kA
Maximum Continuous Operating VAC (MCOV): 115% Rated Line Voltage
Varistor MCOV: 125% Rated Line Voltage Minimum
SCCR: Up to 100kA AIC
Surge Current/Phase (8/20 μs): 1 Event: 200kA.
Surge Life/Phase (8/20 μs): 10,000 Events: 10kA
Surge Current/Mode (8/20 μs): L-N: 120kA; L-G: 80kA; N-G: 120kA; L-L: 200kA
Surge Current/Mode (8/20 μs), (Delta): L-L: 200kA; L-G: 200kA
Response Time: <5 ns
Status Indicators: LED Status Indicators, Event Counter, Audible Alarm, Protected Dry Contacts
Operating Altitude: 13,000ft. (4000m)
Temp. (Operating/Storage): -40° to +70°C/-40° to +85°C
Enclosure: NEMA 4, 14 gauge steel. powder coated
Dimensions: 12" x 15" x 5.5" (305mm x 381mm x 140mm)
Mounting: 8" x 15.75"/.313" ID - 4 holes (203 x 400mm/8mm ID - 4 holes)
Micro-Z Cable Connection: #10 AWG (5.27mm ²)/.128 OD (3.4mm) 8ft. length (2.43m)
Conduit Connector: 1" Rain tight hub
Weight: 35 lbs., (16.0kg)
UL File Number: E322161
UL Certification: UL Listed to 1449 3 rd Edition
UL96A Lightning Protection Master Label Compliant
ARRA Certification: Complies with ARRA 1605 requirements



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Specifications

- ANSI/IEEE C62.41-2002
- IEC 61643-1-1998
- UL 1449, 3rd Ed.

Building Entry Protection

Model 160MXT

Model	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	20kV, 1.2/50 μ s 10kA, 8/20 μ s L-N**
-120T	120/240VAC, 1 ϕ , 3W+Gnd	800	900	700	1200	550
-120Y	120/208VAC, 3 ϕ , 4W+Gnd, Wye	800	900	700	1200	550
-240DCT*	240/120/120VAC, 3 ϕ , 4W+Gnd	800/1500	900/1500	1200	1200/2500	550/1040
-220Y	220/380VAC, 3 ϕ , 4W+Gnd, Wye	1500	1500	1200	2500	1040
-240Y	240/415VAC, 3 ϕ , 4W+Gnd, Wye	1500	1500	1200	2500	1040
-277Y	277/480VAC, 3 ϕ , 4W+Gnd, Wye	1500	1500	1200	2500	1040
-240D	240VAC, 3 ϕ , 3W+Gnd, Delta	n/a	1500	n/a	2500	1040 (L-G)

* High-leg Delta Center Tapped
 ** Actual Measurements w/ 6" Lead Length

Energy Absorption (8/20 μ s) in joules: 11,000J - 43,200J

A Note On Headroom A surge protector responds to increases in voltage. Surge protectors triggered by the nominal line voltage are undesirable, consequently headroom is always factored into surge protector design. Long duration voltage swells occur on power lines and can damage a surge protector, leaving facility equipment vulnerable. By employing higher headroom, continuity of surge protection is guaranteed. This feature is standard in MCG surge protectors. Higher headroom allows varistors to ride out voltage swells while ensuring that let-through voltage remains within CBEMA (now ITIC) guidelines. The CBEMA curve is the most accepted graph worldwide for equipment susceptibility analysis.



SurgeFree™

MODEL

560LS

Service Entrance Protection

For uncompromising protection at the main service panel, choose the the 560LS AC power line protector. The unit offers 560kA/phase, 14 times redundant protection paths/phase and new 40kA varistors with built-in high speed thermal disconnect. You can't buy a stronger or safer SPD anywhere. Series features mix and match options for a customized protector at stock prices. (See below.)

FEATURES

- 560LS: I_{peak}=560,000A/Phase (8 x 20μs waveform)
- UL Listed 1449 3rd Ed., NEMA LS1-1992
- Fourteen times redundant protection paths per phase
- Employs new 40kA high headroom varistors with built-in high-speed thermal disconnect
- Solid copper bus bar construction
- Field-replaceable modules
- EMI/RFI noise filtering
- Continuously monitored protection circuits
- Internal and external status indicators
- NEMA 4, Powder Coated Steel Enclosure



I_{peak}=560,000A

UL 1449, 3rd Ed. Listed

20-Year Warranty
Lifetime Module Replacement

Filter Attenuation	MIL STD 220A (50 Ohm):	120VAC	220 VAC	240VAC	277VAC	347VAC	480VAC
-30db	25kHz	25kHz	25kHz	50kHz	50kHz	50kHz	50kHz
-40db	125kHz	180kHz	180kHz	100kHz	100kHz	100kHz	100kHz
-50db	210kHz	210kHz	210kHz	180kHz	170kHz	170kHz	170kHz
-60db	250kHz	250kHz	250kHz	200kHz	190kHz	190kHz	190kHz

Mix & Match!

Options Available: Disconnect Switch • Upgraded Front Panel: Surge Event Counter, Beeper, + Status Relay (1 Form C Contacts) • NEMA 4X Enclosure • Low Impedance Micro-Z cable (10AWG) • Flush mount kit

SPD Type:	Type 2
I _n :	20kA
Maximum Continuous Operating VAC (MCOV):	115% Rated Line Voltage
Varistor MCOV:	125% Rated Line Voltage Minimum
SCCR:	100kA AIC (All models except -240D, -480D, -600D, -277Y, and -347Y which are 5kAAIC)
Surge Current/Phase (8/20μs):	1 Event - 560kA.
Surge Life/Phase (8/20μs):	10,000 Events: 25kA.
Surge Current/Mode (8/20μs):	L-N: 320kA; L-G: 240kA; N-G: 240kA; L-L: 560kA
Surge Current/Mode, "D" Models (8/20μs):	L-G: 560kA; L-L: 560kA
Response Time:	<5 ns
Status Indicators:	LED Status Indicators (internal & external)
Modes of Protection:	L-N, L-G, L-L, N-G
Operating Altitude:	13,000ft. (4000m)
Temp. (Operating/Storage):	-40° to +70°C/-40° to +85°C
Enclosure:	NEMA 4, 14 gauge steel. powder coated
Dimensions:	17" x 15" x 6" (432 x 381 x 153mm)
Mounting:	17.75" x 13"/.313"ID - 4 holes, (451 x 330mm/7.9mm ID) - 4 holes
Conduit Fitting Hole:	1" trade size located at the bottom of enclosure
Weight:	47 lbs. (21.4 kg)
UL File Number:	E322161
UL Certification:	UL Listed to 1449 3rd Edition UL96A Lightning Protection Master Label Compliant
ARRA Certification:	Complies with ARRA 1605 requirements



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Specifications

Service Entrance Protection

- ANSI/IEEE C62.41-2002
- IEC 61643-1-1998
- UL 1449, 3rd Ed.

Model 560LS

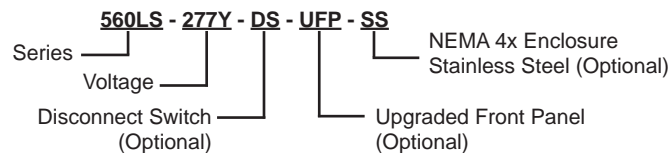
Model 560LS	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	6kV (1.2x50μs) 3kA (8x20μs) (L-N)***	20kV (1.2x50μs) 10kA (8x20μs) (L-N)***
-120S	120VAC, 1φ, 2W+Gnd	900	900	900	n/a	470	560
-120T	120/240VAC, 1φ, 3W+Gnd	900	900	900	1200	494	590
-120Y	120/208, 3φ, 4W+Gnd, Wye	900	900	900	1200	494	590
-220Y	220/380, 3φ, 4W+Gnd, Wye	1500	1500	1200	2000	976	1098
-220S	220VAC, 1φ, 2W+Gnd	1500	1500	1200	n/a	920	1040
-240Y	240/415, 3φ, 4W+Gnd, Wye	1500	1500	1200	2000	976	1098
-240S	240VAC, 1φ, 2W+Gnd	1500	1500	1200	n/a	920	1040
-277Y	277/480, 3φ, 4W+Gnd, Wye	1500	1500	1200	2000	976	1098
-347Y	347/600, 3φ, 4W+Gnd, Wye	1500	1500	1500	2500	1240	1368
-240DCT*	240/120/120, 3φ, 4W+Gnd	900/1500**	900/1500**	900	2000/1800** 1200/2000**	976/494	1098/590
-240D	240, 3φ, 3W+Gnd, Delta	n/a	1500	n/a	2000	976 (L-G)	1098
-480D	480, 3φ, 3W+Gnd, Delta	n/a	2000	n/a	4000	1532 (L-G)	1678
-600D	600, 3φ, 3W+Gnd, Delta	n/a	2000	n/a	4000	1736 (L-G)	1910

* High-leg Delta Center Tapped

** High-leg

*** Actual Measurements w/6" Lead Length

Model Ordering:



Note: Additional options: Low-impedance MZ cable (10AWG) and flush mount kit must be ordered as separate line items.
Energy Absorption (8/20μs) in joules: 35,328 - 151,200J

A Note On Headroom A surge protector responds to increases in voltage. Surge protectors triggered by the nominal line voltage are undesirable, consequently headroom is always factored into surge protector design. Long duration voltage swells occur on power lines and can damage a surge protector, leaving facility equipment vulnerable. By employing higher headroom, continuity of surge protection is guaranteed. This feature is standard in MCG surge protectors. Higher headroom allows varistors to ride out voltage swells while ensuring that let-through voltage remains within CBEMA (now ITIC) guidelines. The CBEMA curve is the most accepted graph worldwide for equipment susceptibility analysis.

A Note On LS Series VPR These VPR represent standard wiring plus the upstream overcurrent safety device (circuit breaker). For best performance, use MCG's Micro-Z Cable (optional).

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SurgeFree™

MODEL

300LS

Service Entrance Protection

The 300LS Series offer robust protection at the entrance of large facilities. The 300LS has an I_{peak} of 300,000A/phase (8 x 20microsecond waveform). Seven times redundant protection paths/phase ensures continuous protection, even in an unlikely fault situation. Twenty-year, no-nonsense warranty; free protection modules for life. Series features mix and match options for a customized protector at stock prices. (See below for options.)

FEATURES

- 300LS: I_{peak} =300,000A/Phase (8 x 20 μ s waveform)
- UL Listed 1449 3rd Ed., NEMA LS1-1992
- Seven times redundant protection paths per phase
- Employs new 40kA high headroom varistors with built-in high-speed thermal disconnect
- Solid copper bus bar construction
- Field-replaceable modules
- EMI/RFI noise filtering
- Continuously monitored protection circuits
- Internal and external status indicators
- NEMA 4, Powder Coated Steel Enclosure



I_{peak} =300,000A

UL 1449, 3rd Ed. Listed

20-Year Warranty
Lifetime Module Replacement

Filter Attenuation

MIL STD 220A (50 Ohm):	120VAC	220 VAC	240VAC	277VAC	347VAC	480VAC
-30db	25kHz	25kHz	25kHz	50kHz	50kHz	50kHz
-40db	125kHz	180kHz	180kHz	100kHz	100kHz	100kHz
-50db	210kHz	210kHz	210kHz	180kHz	170kHz	170kHz
-60db	250kHz	250kHz	250kHz	200kHz	190kHz	190kHz

Mix & Match!

Options Available: Disconnect Switch • Upgraded Front Panel: Surge Event Counter, Beeper, + Status Relay (1 Form C Contacts) • NEMA 4X Enclosure • Low Impedance Micro-Z cable (10AWG) • Flush mount kit

SPD Type:	Type 2
I_n :	20kA
Maximum Continuous Operating VAC (MCOV):	115% Rated Line Voltage
Varistor MCOV:	125% Rated Line Voltage Minimum
SCCR:	100kA AIC
Surge Current/Phase (8/20 μ s):	1 Event - 300kA.
Surge Life/Phase (8/20 μ s):	10,000 Events: 13kA.
Surge Current/Mode (8/20 μ s):	L-N: 170kA; L-G: 130kA; N-G: 120kA; L-L: 300kA
Surge Current/Mode, "D" Models (8/20 μ s):	L-G: 300kA; L-L: 300kA
Response Time:	<5 ns
Status Indicators:	LED Status Indicators (internal & external)
Modes of Protection:	L-N, L-G, L-L, N-G
Operating Altitude:	13,000ft. (4000m)
Temp. (Operating/Storage):	-40° to +70°C/-40° to +85°C
Enclosure:	NEMA 4, 14 gauge steel. powder coated
Dimensions:	17" x 15" x 6" (432 x 381 x 153mm)
Mounting:	17.75" x 13".313"ID - 4 holes, (451 x 330mm/7.9mm ID) - 4 holes
Conduit Fitting Hole:	1" trade size located at the bottom of enclosure
Weight:	35 lbs. (16.7 kg)
UL File Number:	E322161
UL Certification:	UL Listed to 1449 3rd Edition
	UL96A Lightning Protection Master Label Compliant
ARRA Certification:	Complies with ARRA 1605 requirements



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Specifications

Service Entrance Protection

- ANSI/IEEE C62.41-2002
- IEC 61643-1-1998
- UL 1449, 3rd Ed.

Model 300LS

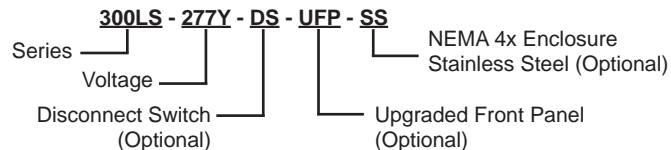
Model 300LS	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	6kV (1.2x50μs) 3kA (8x20μs) (L-N)***	20kV (1.2x50μs) 10kA (8x20μs) (L-N)***
-120S	120VAC, 1φ, 2W+Gnd	900	900	900	n/a	490	580
-120T	120/240VAC, 1φ, 3W+Gnd	900	900	900	1200	520	614
-120Y	120/208, 3φ, 4W+Gnd, Wye	900	900	900	1200	520	614
-220Y	220/380, 3φ, 4W+Gnd, Wye	1500	1500	1500	2000	1008	1164
-220S	220VAC, 1φ, 2W+Gnd	1500	1500	1500	n/a	960	1110
-240Y	240/415, 3φ, 4W+Gnd, Wye	1500	1500	1500	2000	1008	1164
-240S	240VAC, 1φ, 2W+Gnd	1500	1500	1500	n/a	960	1110
-277Y	277/480, 3φ, 4W+Gnd, Wye	1500	1500	1500	2000	1008	1164
-347Y	347/600, 3φ, 4W+Gnd, Wye	1500	1500	1500	2500	1280	1450
-240DCT*	240/120/120, 3φ, 4W+Gnd	900/1500**	900/1500**	900	2000/1800** 1200/2000**	1008/520	1164/614
-240D	240, 3φ, 3W+Gnd, Delta	n/a	1500	n/a	2000	1008 (L-G)	1164
-480D	480, 3φ, 3W+Gnd, Delta	n/a	2000	n/a	4000	1566 (L-G)	1766
-600D	600, 3φ, 3W+Gnd, Delta	n/a	2000	n/a	4000	1776 (L-G)	1970

* High-leg Delta Center Tapped

** High-leg

*** Actual Measurements w/6" Lead Length

Model Ordering:



Note: Additional options: Low-impedance MZ cable (10AWG) and flush mount kit must be ordered as separate line items.
Energy Absorption (8/20μs) in joules: 17,664 - 75,600J

A Note On Headroom A surge protector responds to increases in voltage. Surge protectors triggered by the nominal line voltage are undesirable, consequently headroom is always factored into surge protector design. Long duration voltage swells occur on power lines and can damage a surge protector, leaving facility equipment vulnerable. By employing higher headroom, continuity of surge protection is guaranteed. This feature is standard in MCG surge protectors. Higher headroom allows varistors to ride out voltage swells while ensuring that let-through voltage remains within CBEMA (now ITIC) guidelines. The CBEMA curve is the most accepted graph worldwide for equipment susceptibility analysis.

A Note On LS Series VPR These VPR represent standard wiring plus the upstream overcurrent safety device (circuit breaker). For best performance, use MCG's Micro-Z Cable (optional).

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SurgeFree™

MODEL

200LS

Main Service Panel Protection

The 200LS Series provides 200,000A of surge protection for rugged and reliable protection at the main service panel. Each phase is guarded by five times redundant protection paths – reassuring when sensitive equipment's continuous operation is at stake. Twenty-year, no-nonsense warranty; free protection modules for life. Series features mix and match options for a customized protector at stock prices.

FEATURES

- 200LS: I_{peak} =200,000A/Phase (8 x 20 μ s waveform)
- UL Listed 1449 3rd Ed., NEMA LS1-1992
- Five times redundant protection paths per phase
- Employs new 40kA high headroom varistors with built-in high-speed thermal disconnect
- Solid copper bus bar construction
- Field-replaceable modules
- EMI/RFI noise filtering
- Continuously monitored protection circuits
- Internal and external status indicators
- NEMA 4, Powder Coated Steel Enclosure

Mix & Match!

Options Available: Disconnect Switch • Upgraded Front Panel: Surge Event Counter, Beeper, + Status Relay (1 Form C Contacts) • NEMA 4X Enclosure • Low Impedance Micro-Z cable (10AWG) • Flush mount kit



I_{peak} =200,000A

UL 1449, 3rd Ed. Listed

20-Year Warranty
Lifetime Module Replacement

Filter Attenuation

MIL STD 220A (50 Ohm)	120VAC	220 VAC	240VAC	277VAC	347VAC	480VAC
-30db	25kHz	25kHz	25kHz	50kHz	50kHz	50kHz
-40db	125kHz	180kHz	180kHz	100kHz	100kHz	100kHz
-50db	210kHz	210kHz	210kHz	180kHz	170kHz	170kHz
-60db	250kHz	250kHz	250kHz	200kHz	190kHz	190kHz

SPD Type:	Type 2
I_n :	10kA
Maximum Continuous Operating VAC (MCOV):	115% Rated Line Voltage
Varistor MCOV:	125% Rated Line Voltage Minimum
SCCR:	100kA AIC
Surge Current/Phase (8/20 μ s):	1 Event - 200kA.
Surge Life/Phase (8/20 μ s):	10,000 Events: 10kA.
Surge Current/Mode (8/20 μ s):	L-N: 120kA; L-G: 80kA; N-G: 120kA; L-L: 200kA
Surge Current/Mode, "D" Models (8/20 μ s):	L-G: 200kA; L-L: 200kA
Response Time:	<5 ns
Status Indicators:	LED Status Indicators (internal & external)
Modes of Protection:	L-N, L-G, L-L, N-G
Operating Altitude:	13,000ft. (4000m)
Temp. (Operating/Storage):	-40° to +70°C/-40° to +85°C
Enclosure:	NEMA 4, 14 gauge steel. powder coated
Dimensions:	17" x 15" x 6" (432 x 381 x 153mm)
Mounting:	17.75" x 13".313"ID - 4 holes (451 x 330mm/7.9mm ID) - 4 holes
Conduit Fitting Hole:	1" trade size located at the bottom of enclosure
Weight:	33 lbs. (15.8 kg)
UL File Number:	E322161
UL Certification:	UL Listed to 1449 3rd Edition
ARRA Certification:	Complies with ARRA 1605 requirements



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Specifications

Main Service Panel Protection

- ANSI/IEEE C62.41-2002
- IEC 61643-1-1998
- UL 1449, 3rd Ed.

Model 200LS

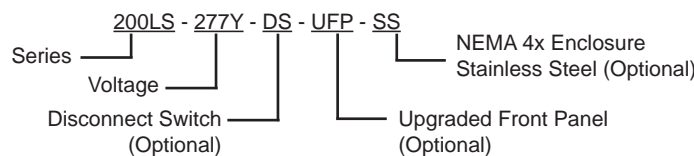
Model 200LS	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	6kV (1.2x50µs) 3kA (8x20µs) (L-N)***	20kV (1.2x50µs) 10kA (8x20µs) (L-N)***
-120S	120VAC, 1φ, 2W+Gnd	900	900	800	n/a	506	610
-120T	120/240VAC, 1φ, 3W+Gnd	900	900	800	1200	534	644
-120Y	120/208, 3φ, 4W+Gnd, Wye	900	900	800	1200	534	644
-220Y	220/380, 3φ, 4W+Gnd, Wye	1500	1500	1500	2000	1050	1212
-220S	220VAC, 1φ, 2W+Gnd	1500	1500	1500	n/a	994	1150
-240Y	240/415, 3φ, 4W+Gnd, Wye	1500	1500	1500	2000	1050	1212
-240S	240VAC, 1φ, 2W+Gnd	1500	1500	1500	n/a	994	1150
-277Y	277/480, 3φ, 4W+Gnd, Wye	1500	1500	1500	2000	1050	1212
-347Y	347/600, 3φ, 4W+Gnd, Wye	1800	1800	1500	2500	1320	1510
-240DCT*	240/120/120, 3φ, 4W+Gnd	900/1500**	900/1500**	800	2000/1800** 1200/2000**	1050/534	1212/644
-240D	240, 3φ, 3W+Gnd, Delta	n/a	1500	n/a	2000	1050 (L-G)	1212
-480D	480, 3φ, 3W+Gnd, Delta	n/a	2000	n/a	4000	1598 (L-G)	1800
-600D	600, 3φ, 3W+Gnd, Delta	n/a	2500	n/a	4000	1804 (L-G)	2020

* High-leg Delta Center Tapped

** High-leg

*** Actual Measurements w/6" Lead Length

Model Ordering:



Note: Additional options: Low-impedance MZ cable (10AWG) and flush mount kit must be ordered as separate line items.

Energy Absorption (8/20µs) in joules: 13,248 - 54,000J

A Note On Headroom A surge protector responds to increases in voltage. Surge protectors triggered by the nominal line voltage are undesirable, consequently headroom is always factored into surge protector design. Long duration voltage swells occur on power lines and can damage a surge protector, leaving facility equipment vulnerable. By employing higher headroom, continuity of surge protection is guaranteed. This feature is standard in MCG surge protectors. Higher headroom allows varistors to ride out voltage swells while ensuring that let-through voltage remains within CBEMA (now ITIC) guidelines. The CBEMA curve is the most accepted graph worldwide for equipment susceptibility analysis.

A Note On LS Series VPR These VPR represent standard wiring plus the upstream overcurrent safety device (circuit breaker). For best performance, use MCG's Micro-Z Cable (optional).

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SurgeFree™

MODEL

120LS

Branch Panel Protection

Protect branch panels with the 120kA/phase 120LS Series. The units offer three times redundant protection paths/phase and continuous monitoring of protection status. Sensitive equipment remains online and undamaged by transients, surges and lightning. Mix and match options for a customized protector.

FEATURES

- 120LS: I_{peak}=120,000A/Phase (8 x 20µs waveform)
- UL Listed 1449 3rd Ed., NEMA LS1-1992
- Three times redundant protection paths per phase
- Employs new 40kA high headroom varistors with built-in high-speed thermal disconnect
- Solid copper bus bar construction
- Field-replaceable modules
- EMI/RFI noise filtering
- Continuously monitored protection circuits
- Internal and external status indicators
- NEMA 4, Powder Coated Steel Enclosure



I_{peak} = 120,000A

UL 1449, 3rd Ed. Listed

20-Year Warranty
Lifetime Module Replacement

Mix & Match!

Options Available: Disconnect Switch • Upgraded Front Panel: Surge Event Counter, Beeper, + Status Relay (1 Form C Contacts) • NEMA 4X Enclosure • Low Impedance Micro-Z cable (10AWG) • Flush mount kit

Filter Attenuation	MIL STD 220A (50 Ohm):	120VAC	220 VAC	240VAC	277VAC	347VAC	480VAC
-30db	25kHz	25kHz	25kHz	50kHz	50kHz	50kHz	50kHz
-40db	125kHz	180kHz	180kHz	100kHz	100kHz	100kHz	100kHz
-50db	210kHz	210kHz	210kHz	180kHz	170kHz	170kHz	170kHz
-60db	250kHz	250kHz	250kHz	200kHz	190kHz	190kHz	190kHz

SPD Type: Type 2
I _n : 5kA
Maximum Continuous Operating VAC (MCOV): 115% Rated Line Voltage
Varistor MCOV: 125% Rated Line Voltage Minimum
SCCR: 100kA AIC
Surge Current/Phase (8/20µs): 1 Event - 120kA.
Surge Life/Phase (8/20µs): 10,000 Events: 6kA.
Surge Current/Mode (8/20µs): L-N: 80kA; L-G: 40kA; N-G: 120kA; L-L: 120kA
Surge Current/Mode, "D" Models (8/20µs): L-G: 120kA; L-L: 120kA
Response Time: <5 ns
Status Indicators: LED Status Indicators (internal & external)
Modes of Protection: L-N, L-G, L-L, N-G
Operating Altitude: 13,000ft. (4000m)
Temp. (Operating/Storage): -40° to +70°C/-40° to +85°C
Enclosure: NEMA 4, 14 gauge steel. powder coated
Dimensions: 17" x 15" x 6" (432 x 381 x 153mm)
Mounting: 17.75" x 13"/.313"ID - 4 holes (451 x 330mm/7.9mm ID) - 4 holes
Conduit Fitting Hole: 1" trade size located at the bottom of enclosure
Weight: 30 lbs. (14.4kg)
UL File Number: E322161
UL Certification: UL Listed to 1449 3rd Edition
ARRA Certification: Complies with ARRA 1605 requirements



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Specifications

Branch Panel Protection

- ANSI/IEEE C62.41-2002
- IEC 61643-1-1998
- UL 1449, 3rd Ed.

Model 120LS

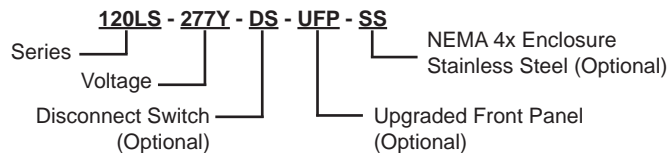
Model	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	6kV (1.2x50μs) 3kA (8x20μs) (L-N)***	20kV (1.2x50μs) 10kA (8x20μs) (L-N)***
-120S	120VAC, 1φ, 2W+Gnd	900	900	800	n/a	520	625
-120T	120/240VAC, 1φ, 3W+Gnd	900	900	800	1200	550	660
-120Y	120/208, 3φ, 4W+Gnd, Wye	900	900	800	1200	550	660
-220Y	220/380, 3φ, 4W+Gnd, Wye	1500	1500	1200	2000	1110	1270
-220S	220VAC, 1φ, 2W+Gnd	1500	1500	1200	n/a	1050	1190
-240Y	240/415, 3φ, 4W+Gnd, Wye	1500	1500	1200	2000	1110	1270
-240S	240VAC, 1φ, 2W+Gnd	1500	1500	1200	n/a	1050	1190
-277Y	277/480, 3φ, 4W+Gnd, Wye	1500	1500	1200	2000	1110	1270
-347Y	347/600, 3φ, 4W+Gnd, Wye	1800	1800	1500	2500	1350	1580
-240DCT*	240/120/120, 3φ, 4W+Gnd	900/1500**	900/1500**	800	2000/1800** 1200/2000**	1110/550	1270/660
-240D	240, 3φ, 3W+Gnd, Delta	n/a	1500	n/a	2000	1110 (L-G)	1270
-480D	480, 3φ, 3W+Gnd, Delta	n/a	2000	n/a	4000	1640 (L-G)	1890
-600D	600, 3φ, 3W+Gnd, Delta	n/a	2500	n/a	4000	1830 (L-G)	2410

* High-leg Delta Center Tapped

** High-leg

*** Actual Measurements w/6' Lead Length

Model Ordering:



Note: Additional options: Low-impedance MZ cable (10AWG) and flush mount kit must be ordered as separate line items.

Energy Absorption (8/20μs) in joules: 8,832 - 32,400J

A Note On Headroom A surge protector responds to increases in voltage. Surge protectors triggered by the nominal line voltage are undesirable, consequently headroom is always factored into surge protector design. Long duration voltage swells occur on power lines and can damage a surge protector, leaving facility equipment vulnerable. By employing higher headroom, continuity of surge protection is guaranteed. This feature is standard in MCG surge protectors. Higher headroom allows varistors to ride out voltage swells while ensuring that let-through voltage remains within CBEMA (now ITIC) guidelines. The CBEMA curve is the most accepted graph worldwide for equipment susceptibility analysis.

A Note On LS Series VPR These VPR represent standard wiring plus the upstream overcurrent safety device (circuit breaker). For best performance, use MCG's Micro-Z Cable (optional).

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SurgeFree™

MODELS

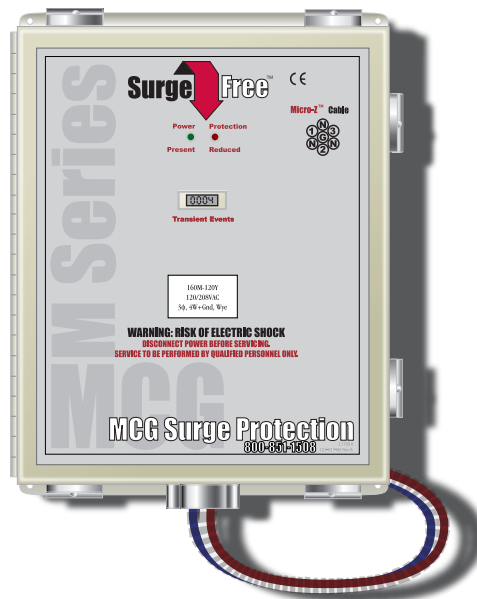
160M • 120M

Main/Branch Panel Protection

The Surge Free 160M and 120M offer powerful modular protection at the main or branch panels for most applications. Computers, sensitive business equipment and other high tech systems are guarded from the damage, errors and downtime that results from high speed transients. All models have extended headroom and a twenty-year warranty.

FEATURES

- Powerful, redundant surge handling capability:
Model 160M: $I_p=160kA$, Model 120M: $I_p=120kA$
- Field-replaceable, high capability 40mm protection modules
- High performance, low inductance Micro-Z™ installed cable
- Event counter and front panel LEDs for status indication
- LED internal diagnostics for on-site maintenance
- Audible fault alarm with mute switch
- Personnel safety deadfront disconnect. (Not available in Delta)
- Surge protected remote relay contacts
- All modes protected: L-G, L-N, L-L, N-G
- Filtering standard
- NEMA 4, Powder Coated Steel Enclosure



$I_{peak}=160,000A / 120,000A$

UL 1449, 3rd Ed. Listed

20-Year Warranty
Lifetime Module Replacement

Filter Attenuation	120VAC	240VAC	277VAC	480VAC
MIL STD 220A (50 Ohm):				
-30db	100kHz	25kHz	80kHz	80kHz
-40db	200kHz	100kHz	180kHz	180kHz
-50db	280kHz	180kHz	210kHz	250kHz
-60db	310kHz	200kHz	390kHz	390kHz

SPD Type:	Type 2
I_n :	10kA
Maximum Continuous Operating VAC (MCOV):	115% Rated Line Voltage
Varistor MCOV:	125% Rated Line Voltage Minimum
SCCR:	100kA AIC, 5kA AIC (Delta models only)
Surge Current/Phase (8/20 μ s):	1 Event - 160M: 160kA, 120M: 120kA.
Surge Life/Phase (8/20 μ s):	10,000 Events - 160M: 6kA, 120M: 4kA
Surge Current/Mode (8/20 μ s), 160M:	L-N: 80kA; L-G: 80kA; N-G: 80kA; L-L: 160kA
Surge Current/Mode (8/20 μ s), 120M:	L-N: 80kA; L-G: 40kA; N-G: 80kA; L-L: 120kA
Surge Current/Mode (8/20 μ s), 160M (Delta):	L-L: 160kA; L-G: 80kA
Surge Current/Mode (8/20 μ s), 120M (Delta):	L-L: 120kA; L-G: 80kA
Response Time:	<5 ns
Status Indicators:	LED Status Indicators, Remote Alarm, Event Counter, Audible Alarm, Protected Dry Contacts
Modes of Protection:	L-N, L-G, L-L, N-G
Operating Altitude:	13,000ft. (4000m)
Temp. (Operating/Storage):	-40° to +70°C/-40° to +85°C
Enclosure:	NEMA 4, 14 gauge steel, powder coated
Dimensions for 160M & 120M:	12" x 10" x 5" (305 x 254 x 127mm)
Mounting for 160M & 120M:	12.75" x 8", 313" ID - 4 holes, 324 x 203mm/7.9mm ID - 4 holes
Micro-Z Cable Connection:	#10 AWG Micro-Z Cable, 8ft. Provided
Conduit Connector:	1" Rain tight hub
Weight:	160M: 23 lbs., (11kg); 120M: 17 lbs., (7.7kg)
UL File Number:	E322161
UL Certification:	UL Listed to 1449 3rd Edition
ARRA Certification:	Complies with ARRA 1605 requirements



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Specifications

- ANSI/IEEE C62.41-2002
- IEC 61643-1-1998
- UL 1449, 3rd Ed.

Model 160M

Model	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	16kV, 8kA** Let-Thru V, L-N
-120Y	120/208VAC, 3 ϕ , 4W+Gnd	800	900	700	1500	704
-120T	120/240VAC, 1 ϕ , 3W+Gnd	800	900	700	1500	704
-120S	120VAC, 1 ϕ , 2W+Gnd	800	900	700	n/a	704
-220Y	220/380VAC, 3 ϕ , 4W+Gnd	1500	1500	1200	2500	1320
-220S	220VAC, 1 ϕ , 2W+Gnd	1500	1500	1200	n/a	1320
-240Y	240/415VAC, 3 ϕ , 4W+Gnd	1500	1500	1200	2500	1320
-240S	240VAC, 1 ϕ , 2W+Gnd	1500	1500	1200	n/a	1320
-240DCT*	240/120/120VAC, 3 ϕ , 4W+Gnd	800/1500	900/1500	700	1500/2500	704/1320
-277Y	277/480VAC, 3 ϕ , 4W+Gnd	1500	1500	1200	2500	1320
-277S	277VAC, 1 ϕ , 2W+Gnd	1500	1500	1200	n/a	1320
-240D	240VAC, 3 ϕ , 3W+Gnd	n/a	1500	n/a	1500	1320 (L-G)
-380D	380VAC, 3 ϕ , 3W+Gnd	n/a	1800	n/a	1800	1480 (L-G)
-480D	480VAC, 3 ϕ , 3W+Gnd	n/a	1800	n/a	2000	2080 (L-G)

* High-leg Delta Center Tapped

**Actual Measurements w/ 6" Lead Length

Energy Absorption (8/20 μ s) in joules: 10,300J - 37,400J

Model 120M

Model	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	10kV, 5kA** Let-Thru V, L-N
-120Y	120/208VAC, 3 ϕ , 4W+Gnd	800	900	700	1200	560
-120T	120/240VAC, 1 ϕ , 3W+Gnd	800	900	700	1200	560
-120S	120VAC, 1 ϕ , 2W+Gnd	800	900	700	n/a	560
-220Y	220/380VAC, 3 ϕ , 4W+Gnd	1500	1500	1200	2500	1140
-220S	220VAC, 1 ϕ , 2W+Gnd	1500	1500	1200	n/a	1140
-240Y	240/415VAC, 3 ϕ , 4W+Gnd	1500	1500	1200	2500	1140
-240S	240VAC, 1 ϕ , 2W+Gnd	1500	1500	1200	n/a	1140
-240DCT*	240/120/120VAC, 3 ϕ , 4W+Gnd	800/1500	900/1500	700	1200/2500	560/1140
-277Y	277/480VAC, 3 ϕ , 4W+Gnd	1500	1500	1200	2500	1140
-277S	277VAC, 1 ϕ , 2W+Gnd	1500	1500	1200	n/a	1140
-240D	240VAC, 3 ϕ , 3W+Gnd	n/a	1500	n/a	1500	1140 (L-G)
-380D	380VAC, 3 ϕ , 3W+Gnd	n/a	1800	n/a	1800	1280 (L-G)
-480D	480VAC, 3 ϕ , 3W+Gnd	n/a	1800	n/a	2000	1800 (L-G)

* High-leg Delta Center Tapped

**Actual Measurements w/ 6" Lead Length

Energy Absorption (8/20 μ s) in joules: 8,100J - 28,100J

A Note On Headroom A surge protector responds to increases in voltage. Surge protectors triggered by the nominal line voltage are undesirable, consequently headroom is always factored into surge protector design. Long duration voltage swells occur on power lines and can damage a surge protector, leaving facility equipment vulnerable. By employing higher headroom, continuity of surge protection is guaranteed. This feature is standard in MCG surge protectors. Higher headroom allows varistors to ride out voltage swells while ensuring that let-through voltage remains within CBEMA (now ITIC) guidelines. The CBEMA curve is the most accepted graph worldwide for equipment susceptibility analysis.

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SurgeFree™



MODELS

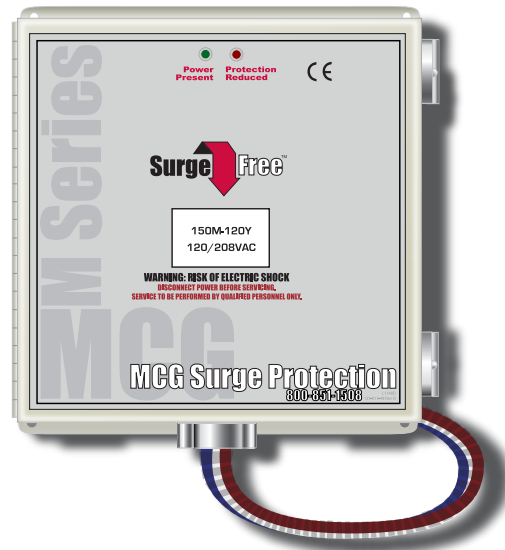
150M • 125M • 90M

Branch Panel Protection

The Surge Free 150M, 125M & 90M offer powerful modular protection at the branch panel. It is ideal when extensive diagnostics are not required but brute force is a #1 priority. These heavy-duty protectors are used when a room full of electronics or an entire floor of a facility is subject to damage, errors or downtime resulting from external, natural or man-made overvoltages. Twenty-year, no-nonsense warranty.

FEATURES

- I_{peak}: 160,000A/Phase (150M)
120,000A/Phase (125M)
80,000A/Phase (90M)
- Two times redundant surge paths per phase
- Field-replaceable modules
- Front panel LEDs for status indication
- Audible fault alarm with mute switch. (Optional)
- Easy installation - 30 minutes or less
- Surge protected remote relay contacts
- All modes protected: L-G, L-N, L-L, N-G
- NEMA 1, Powder Coated Steel Enclosure



I_{peak}=160,000A / 120,000A / 80,000A

UL 1449, 3rd Ed. Listed

20-Year Warranty
Lifetime Module Replacement

Filter Attenuation

MIL STD 220A (50 Ohm):	120VAC	240VAC	277VAC	480VAC
-30db	100kHz	25kHz	80kHz	80kHz
-40db	200kHz	100kHz	180kHz	180kHz
-50db	280kHz	180kHz	210kHz	250kHz
-60db	310kHz	200kHz	390kHz	390kHz

SPD Type: Type 2
I _n : 10kA
Maximum Continuous Operating VAC (MCOV): 115% Rated Line Voltage
Varistor MCOV: 125% Rated Line Voltage Minimum
SCCR: 100kA AIC
Surge Current/Phase (8/20μs): 1 Event - 150M: 160kA; 125M: 120kA; 90M: 80kA.
Surge Life/Phase (8/20μs): 10,000 Events - 150M: 6kA, 125M: 4kA, 90M: 2kA
Surge Current/Mode (8/20μs), 150M: L-N: 160kA; L-G: 80kA; N-G: 80kA; L-L: 160kA
Surge Current/Mode (8/20μs), 125M: L-N: 120kA; L-G: 80kA; N-G: 80kA; L-L: 120kA
Surge Current/Mode (8/20μs), 90M: L-N: 80kA; L-G: 80kA; N-G: 80kA; L-L: 80kA
Response Time: <5 ns
Status Indicators: LED Status Indicators, Protected Dry Contacts
Operating Altitude: 13,000ft. (4000m)
Temp. (Operating/Storage): -40° to +70°C/-40° to +85°C
Enclosure: NEMA 1, 14 gauge steel. powder coated
Dimensions: 8" x 8" x 4" (203mm x 203mm x 120mm)
Mounting: 8.75" x 6"/.313" ID - 4 holes, 222mm x 152mm/7.9mm ID - 4 holes
Cable Connection: #10 AWG Cable
Weight: 150M: 11 lbs., (5kg); 125M: 10 lbs., (4.58kg), 90M: 9 lbs., (4.1kg)
UL File Number: E322161
UL Certification: UL Listed to 1449 3 rd Edition
ARRA Certification: Complies with ARRA 1605 requirements



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Specifications

- ANSI/IEEE C62.41-2002
- IEC 61643-1-1998
- UL 1449, 3rd Ed.

Model 150M

Model	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	16kV, 1.2/50µs 8kA, 8/20µs**
-120Y	120/208VAC, 3φ, 4W+Gnd	700	1200	700	1200	584
-120T	120/240VAC, 1φ, 3W+Gnd	700	1200	700	1200	584
-120S	120VAC, 1φ, 2W+Gnd	700	1200	700	n/a	584
-220Y	220/380VAC, 3φ, 4W+Gnd	1200	2500	1200	2500	1096
-220S	220VAC, 1φ, 2W+Gnd	1200	2500	1200	n/a	1096
-240Y	240/415VAC, 3φ, 4W+Gnd	1200	2500	1200	2500	1096
-240S	240VAC, 1φ, 2W+Gnd	1200	2500	1200	n/a	1096
-240DCT*	240/120/120VAC, 3φ, 4W+Gnd	700/1200	1200/2500	700	1200/1800	1096/584
-277Y	277/480VAC, 3φ, 4W+Gnd	1200	2500	1200	2500	1096
-277S	277VAC, 1φ, 2W+Gnd	1200	2500	1200	n/a	1096

* High-leg Delta Center Tapped

**Actual Measurements w/ 6" Lead Length

Energy Absorption (8/20µs) in joules: 9,780J - 33,160J

Model 125M

Model	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	10kV, 1.2/50µs 5kA, 8/20µs**
-120Y	120/208VAC, 3φ, 4W+Gnd	700	1500	700	1200	490
-120T	120/240VAC, 1φ, 3W+Gnd	700	1500	700	1200	490
-120S	120VAC, 1φ, 2W+Gnd	700	1500	700	n/a	490
-220Y	220/380VAC, 3φ, 4W+Gnd	1200	2500	1200	2500	1050
-220S	220VAC, 1φ, 2W+Gnd	1200	2500	1200	n/a	1050
-240Y	240/415VAC, 3φ, 4W+Gnd	1200	2500	1200	2500	1050
-240S	240VAC, 1φ, 2W+Gnd	1200	2500	1200	n/a	1050
-240DCT*	240/120/120VAC, 3φ, 4W+Gnd	700/1200	1500/2500	700	1200/1800	1050/490
-277Y	277/480VAC, 3φ, 4W+Gnd	1200	2500	1200	2500	1050
-277S	277VAC, 1φ, 2W+Gnd	1200	2500	1200	n/a	1050

* High-leg Delta Center Tapped

**Actual Measurements w/ 6" Lead Length

Energy Absorption (8/20µs) in joules: 7,570J- 25,430J

Model 90M

Model	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	6kV, 1.2/50µs 3kA, 8/20µs**
-120Y	120/208VAC, 3φ, 4W+Gnd	700	1500	800	1200	520
-120T	120/240VAC, 1φ, 3W+Gnd	700	1500	800	1200	520
-120S	120VAC, 1φ, 2W+Gnd	700	1500	800	n/a	520
-220Y	220/380VAC, 3φ, 4W+Gnd	1200	2500	1200	2500	920
-220S	220VAC, 1φ, 2W+Gnd	1200	2500	1200	n/a	920
-240Y	240/415VAC, 3φ, 4W+Gnd	1200	2500	1200	2500	920
-240S	240VAC, 1φ, 2W+Gnd	1200	2500	1200	n/a	920
-240DCT*	240/120/120VAC, 3φ, 4W+Gnd	700/1200	1500/2500	800	1200/1800	520/920
-277Y	277/480VAC, 3φ, 4W+Gnd	1200	2500	1200	2500	920
-277S	277VAC, 1φ, 2W+Gnd	1200	2500	1200	n/a	920

* High-leg Delta Center Tapped

**Actual Measurements w/ 6" Lead Length

Energy Absorption (8/20µs) in joules: 5,370J- 17,700J

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MODELS

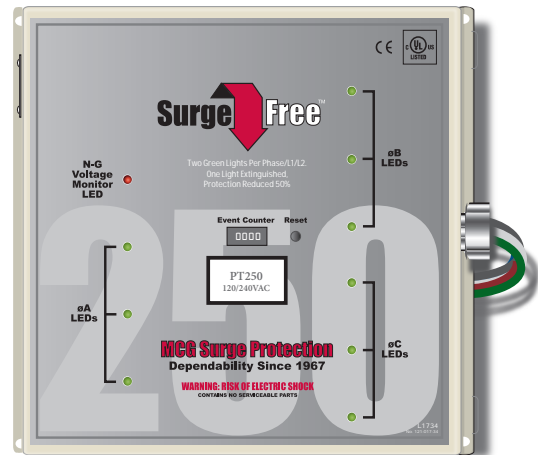
PT250 • PT160 • PT120

Critical Load Protection

Taking compact protectors to the next level, MCG's new PT Series is the most advanced non-modular protector money can buy. Within its small 10" x 10" enclosure, there are up to 20 high energy, thermally protected varistors packed inside. These high performance varistors are typically only found in much higher priced protectors. Guards small to medium panels.

FEATURES

- I peak: 250,000A/Phase (PT250)
160,000A/Phase (PT160)
120,000A/Phase (PT120)
- Redundancy: PT250 (Triple) ; PT160 & PT120 (Double)
- Thermally protected varistors with integral fuse element
- Surge event counter optional (Standard on PT250)
- Remote 1 Form C relay contacts with status LED
- Neutral - Ground Voltage Monitor LED
- All modes protected
- Front Panel Status Monitoring
- 10 AWG connection cable
- EMI/RFI filter
- NEMA 1, Powder-Coated Steel Enclosure
- DIN-Rail mounting kit available



I peak up to 250,000A

UL 1449, 3rd Ed. Listed

20-Year Warranty

Filter Attenuation

MIL STD 220A (50 Ohm):	120VAC	240VAC	277VAC
-30db	50kHz	50kHz	80kHz
-40db	130kHz	130kHz	180kHz
-50db	195kHz	195kHz	270kHz
-60db	230kHz	230kHz	300kHz

SPD Type: Type 2

I_n : 5kA

Maximum Continuous Operating VAC (MCOV): 115% Rated Line Voltage

Varistor MCOV: 125% Rated Line Voltage Minimum

SCCR: 100kA AIC (all models except PT250, 120VAC L-N models which are 5kA AIC)

Surge Current/Phase (8/20 μ s): PT250 1 Event: 250kA; PT160 1 Event: 160kA; PT120 1 Event: 120kA

Surge Life/Phase (8/20 μ s): PT250 10,000 Events: 12kA; PT160 10,000 Events: 6kA; PT120 10,000 Events: 4.5kA

Surge Current/Mode (8/20 μ s) PT250: L-N: 125kA; L-G: 125kA; N-G: 80kA; L-L: 250kA

Surge Current/Mode (8/20 μ s) PT160: L-N: 80kA; L-G: 80kA; N-G: 80kA; L-L: 160kA

Surge Current/Mode (8/20 μ s) PT120: L-N: 80kA; L-G: 40kA; N-G: 80kA; L-L: 120kA

Response Time: < 5ns

Status Indicators: LED Status Indicators

Modes of Protection: L-N, L-G, L-L, N-G

Operating Altitude: 13,000ft. (4000m)

Temp. (Operating/Storage): -40° to +70°C/-40° to +85°C

Enclosure: NEMA 1, 16 gauge steel (0.050" thick), powder coated

Cable Connection: 10 AWG (5.27mm²) cable, 3 ft. (91.4cm) provided

Dimensions: 10" x 10" x 4" (254 x 254 x 102mm)

Mounting: 10.75" x 8.5"/.220" ID - 4 holes, (273 x 216mm/5.6mm ID) - 4 holes

Conduit Connector: 3/4" Compression connector

Weight: PT250: 12 lbs. (5.5 kg); PT160: 11.40 lbs (5.2kg); PT120: 11.20 lbs (5.1kg)

UL File Number: E322161

UL Certification: UL Listed to 1449 3rd Edition

ARRA Certification: Complies with ARRA 1605 requirements



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Specifications

- ANSI/IEEE C62.41-2002
- IEC 61643-1-1998
- UL 1449 3rd Edition

Model PT250/PT160/PT120

Model	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	Cat. B3	Cat. C3
						6kV, 3kA Let-Thru V, L-N***	20kV, 10kA Let-Thru V, L-N***
PT250-120Y	120/208VAC, 3Ph., 4W+Gnd	800	800	700	1200	620	850
PT250-120T	120/240VAC, 1Ph., 3W+Gnd	800	800	700	1200	620	850
PT250-120S	120VAC, 1Ph., 2W+Gnd	800	800	700	N/A	620	850
PT250-220Y	220/380VAC, 3Ph., 4W+Gnd	1200	1200	1200	2000	1140	1470
PT250-220S	220VAC, 1Ph., 2W+Gnd	1200	1200	1200	N/A	1140	1470
PT250-240Y	240/415VAC, 3Ph., 4W+Gnd	1200	1200	1200	2000	1140	1470
PT250-240S	240VAC, 1Ph., 2W+Gnd	1200	1200	1200	N/A	1140	1470
PT250-240DCT*	240/120/120VAC, 3Ph., 4W+Gnd	800/1200	800/1200	700	1200/1800	620/1100	850/1430
PT250-277Y	277/480VAC, 3Ph., 4W+Gnd	1200	1200	1200	2000	1140	1470
PT250-277S	277VAC, 1Ph., 2W+Gnd	1200	1200	1200	N/A	1140	1470
PT250-347Y**	347/600VAC, 3Ph., 4W+Gnd	N/A	N/A	N/A	N/A	1190	1530
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PT160-120Y	120/208VAC, 3Ph., 4W+Gnd	800	800	700	1200	650	880
PT160-120T	120/240VAC, 1Ph., 3W+Gnd	800	800	700	1200	650	880
PT160-120S	120VAC, 1Ph., 2W+Gnd	800	800	700	N/A	650	880
PT160-220Y	220/380VAC, 3Ph., 4W+Gnd	1200	1200	1200	2000	1200	1530
PT160-220S	220VAC, 1Ph., 2W+Gnd	1200	1200	1200	N/A	1200	1530
PT160-240Y	240/415VAC, 3Ph., 4W+Gnd	1200	1200	1200	2000	1200	1530
PT160-240S	240VAC, 1Ph., 2W+Gnd	1200	1200	1200	N/A	1200	1530
PT160-240DCT*	240/120/120VAC, 3Ph., 4W+Gnd	800/1200	800/1200	700	1200/1800	650/1130	880/1500
PT160-277Y	277/480VAC, 3Ph., 4W+Gnd	1200	1200	1200	2000	1200	1530
PT160-277S	277VAC, 1Ph., 2W+Gnd	1200	1200	1200	N/A	1200	1530
PT160-347Y**	347/600VAC, 3Ph., 4W+Gnd	N/A	N/A	N/A	N/A	1240	1600
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PT120-120Y	120/208VAC, 3Ph., 4W+Gnd	800	800	700	1200	650	880
PT120-120T	120/240VAC, 1Ph., 3W+Gnd	800	800	700	1200	650	880
PT120-120S	120VAC, 1Ph., 2W+Gnd	800	800	700	N/A	650	880
PT120-220Y	220/380VAC, 3Ph., 4W+Gnd	1200	1500	1200	2000	1200	1530
PT120-220S	220VAC, 1Ph., 2W+Gnd	1200	1500	1200	N/A	1200	1530
PT120-240Y	240/415VAC, 3Ph., 4W+Gnd	1200	1500	1200	2000	1200	1530
PT120-240S	240VAC, 1Ph., 2W+Gnd	1200	1500	1200	N/A	1200	1530
PT120-240DCT*	240/120/120VAC, 3Ph., 4W+Gnd	800/1200	800/1500	700	1200/1800	650/1130	880/1500
PT120-277Y	277/480VAC, 3Ph., 4W+Gnd	1200	1500	1200	2000	1200	1530
PT120-277S	277VAC, 1Ph., 2W+Gnd	1200	1500	1200	N/A	1200	1530
PT120-347Y**	347/600VAC, 3Ph., 4W+Gnd	N/A	N/A	N/A	N/A	1240	1600

*High-Leg Delta Center Tapped **Not tested to UL1449 ***Actual Measurements w/ 6" Lead Length

A Note On Headroom A surge protector responds to increases in voltage. Surge protectors triggered by the nominal line voltage are undesirable, consequently headroom is always factored into surge protector design. Long duration voltage swells occur on power lines and can damage a surge protector, leaving facility equipment vulnerable. By employing higher headroom, continuity of surge protection is guaranteed. This feature is standard in MCG surge protectors. Higher headroom allows varistors to ride out voltage swells while ensuring that let-through voltage remains within CBEMA (now ITIC) guidelines. The CBEMA curve is the most accepted graph worldwide for equipment susceptibility analysis.

A Note on PT Series VPR: These VPR represent wiring plus the upstream overcurrent safety device (circuit breaker)

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SurgeFree™

MODEL

PT160 (Delta)

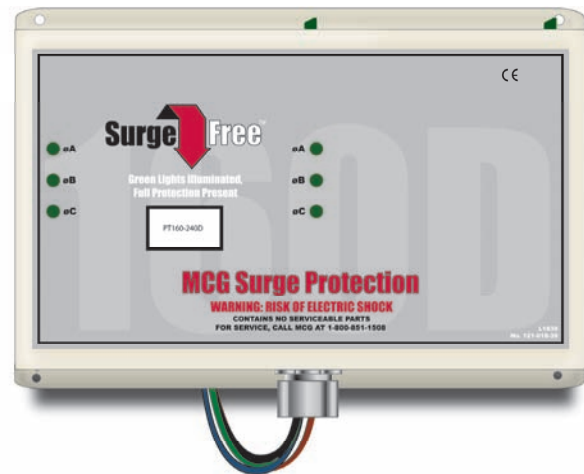
Main/Branch Panel Protection

The reliable PT160 Delta protector is designed to be used at the service entrance of small to medium sized facilities, in motor control centers, or dedicated to a single piece of critical equipment. The unit diverts lightning induced surges, utility surges, and everyday surges generated from loads within a facility. Units employ dual independent protection assemblies rated at 80kA per phase each, packed with 40kA thermally protected protection elements and high headroom varistors.

In the rare event that a protection element fails, protection is maintained due to redundancy. Comprehensive monitoring shows unit status. Comes with MCG's 20-year "No Nonsense" warranty.

FEATURES

- I peak: 160,000A/Phase
- Thermally Protected Varistors with Integral Fuse Element
- Redundant - Two Fused Surge Paths Per Phase
- Surge Event Counter Optional
- Dual Remote 1 Form C Relay Contacts with Status LED
- Front Panel Status Monitoring
- 10 AWG Connection Cable
- EM/RFI Filter Standard in the 240D and 480D
- NEMA 1, Powder Coated Steel Enclosure
- DIN-Rail Mounting Kit Available



I_{peak}: 160,000A

UL 1449, 3rd Ed. Listed

20-Year Warranty

Filter Attenuation

MIL STD 220A (50 Ohm):	120VAC	240VAC	277VAC
-30db	50kHz	50kHz	80kHz
-40db	130kHz	130kHz	180kHz
-50db	195kHz	195kHz	270kHz
-60db	230kHz	230kHz	300kHz

SPD Type:	Type 2
I _n :	5kA
Maximum Continuous Operating VAC (MCOV):	115% Rated Line Voltage
Varistor MCOV:	125% Rated Line Voltage Minimum
SCCR:	100kA AIC
Surge Current/Phase (8/20μs):	1 Event - 160kA.
Surge Life/Phase (8/20μs):	10,000 Events: 6kA.
Surge Current/Mode (8/20μs):	L-L: 160kA; L-G: 160kA
Response Time:	< 5ns
Status Indicators:	LED Status Indicators
Modes of Protection:	L-L, L-G
Operating Altitude:	13,000ft. (4000m)
Temp. (Operating/Storage):	-40° to +70°C/-40° to +85°C
Enclosure:	NEMA 1, 16 gauge steel (0.050" thick) powder coated
Cable Connection:	10 AWG (5.27mm ²) cable, 3 ft. (91.4cm) provided, except model -120D-400Hz, 8ft (243cm) cable included
Conduit Connector:	3/4" Compression Connector
Dimensions:	13.25" x 9.0" x 4.25" (336.55 x 228.60 x 107.95mm)
Mounting:	12.00" x 8.25"/.220"ID - 4 holes (304.80 x 209.55mm/5.6mm ID) - 4 holes
Weight:	10 lbs. (4.53 kg)
UL File Number:	E322161
UL Certification:	UL Listed to 1449 3rd Edition
ARRA Certification:	Complies with ARRA 1605 requirements



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Specifications

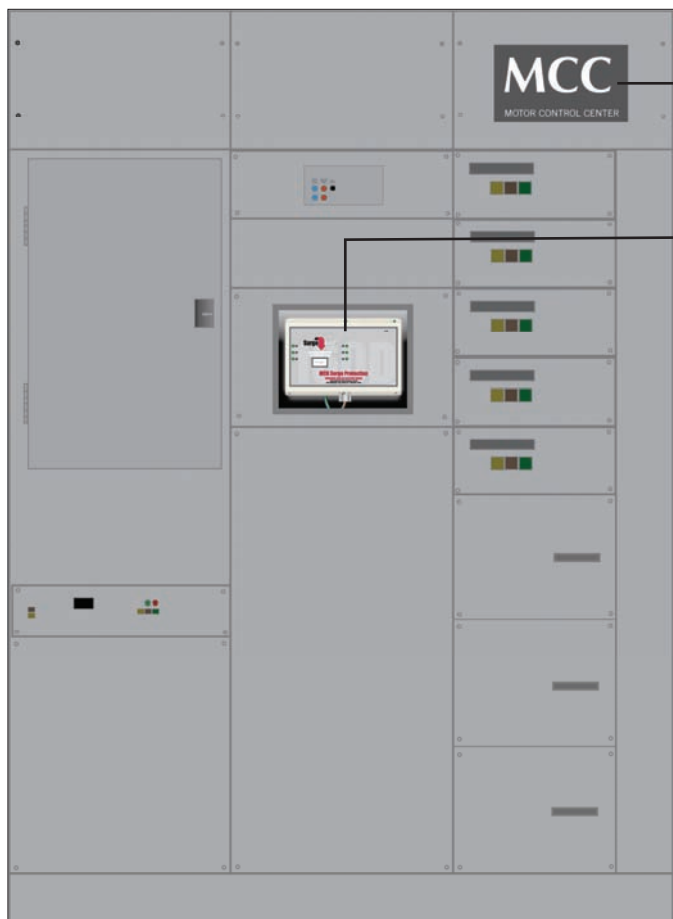
- ANSI/IEEE C62.41-2002
- IEC 61643-1-1998
- UL 1449, 3rd Ed.

Model PT160 Delta

Model	Service	MOV Voltage (MCOV) VAC	VPR L-G	VPR L-L	Cat. B3** 6kV, 3kA Let-Thru V L-G
PT160D					
-240	240, 3 ϕ , 3W+Gnd	390	1200	2000	960
-480	480, 3 ϕ , 3W+Gnd	620	1800	4000	1770
-600*	600, 3 ϕ , 3W+Gnd	750	n/a	n/a	1920
-120D-400Hz*	120, 3 ϕ , 3W+Gnd	140	n/a	n/a	630

* Not Tested to UL1449

**Note: All let-thru levels measured with 6" lead length.



Motor Control Center

MCG Protector

Shown to the left is a PT160 Delta protecting a motor control center. Often installed behind a clear panel, the protector's status LEDs (and optional surge event counter) can easily be viewed without having to open an access door. With redundancy and high headroom thermally protected varistors, the PT160 Delta offers reliability, performance, and safety in a compact package that is easy to install within motor control centers as well as other equipment.

A Note On Headroom A surge protector responds to increases in voltage. Surge protectors triggered by the nominal line voltage are undesirable, consequently headroom is always factored into surge protector design. Long duration voltage swells occur on power lines and can damage a surge protector, leaving facility equipment vulnerable. By employing higher headroom, continuity of surge protection is guaranteed. This feature is standard in MCG surge protectors. Higher headroom allows varistors to ride out voltage swells while ensuring that let-through voltage remains within CBEMA (now ITIC) guidelines. The CBEMA curve is the most accepted graph worldwide for equipment susceptibility analysis.

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SurgeFree™

MODELS

PT80 • PT40

Local Panel Protection

Small, yet packed with the latest technology available for transient voltage surge suppressors. The PT80 and PT40 contain high peak current fuses and large thermally-protected varistors that provide both reliable and safe protection for sensitive electronics. The units are ideal for use on local service panels, generators, transfer switches, dedicated equipment, OEM equipment and residential applications.

FEATURES

- I_{peak}: 80,000A/Phase (PT80)
40,000A/Phase (PT40)
- Thermally protected varistors with integral fuse element
- Surge event counter optional
- Remote 1 Form C relay contacts with status LED
- Neutral - Ground Voltage Monitor LED
- All modes protected
- Front Panel Status Monitoring
- 10 AWG connection cable
- EMI/RFI filter
- NEMA 1, Powder-Coated Steel Enclosure
- DIN-Rail mounting kit available



I_{peak} up to 80,000A

UL 1449, 3rd Ed. Listed

20-Year Warranty

Filter Attenuation

MIL STD 220A (50 Ohm):	120VAC	240VAC	277VAC
-30db	50kHz	50kHz	80kHz
-40db	130kHz	130kHz	180kHz
-50db	195kHz	195kHz	270kHz
-60db	230kHz	230kHz	300kHz

SPD Type: Type 2
I _n : 5kA
Maximum Continuous Operating VAC (MCOV): 115% Rated Line Voltage
Varistor MCOV: 125% Rated Line Voltage Minimum (standard models w/o "-xxxV" suffix)
Varistor MCOV: 115% Rated Line Voltage Minimum (models w/ "-xxxV" suffix)
SCCR: 100kA AIC
Surge Current/Phase (8/20μs): PT80 1 Event: 80kA; PT40 1 Event: 40kA.
Surge Life/Phase (8/20μs): PT80 10,000 Events: 3kA; PT40 10,000 Events: 2kA
Surge Current/Mode (8/20μs) PT80: L-N: 40kA; L-G: 40kA; N-G: 40kA; L-L: 80kA
Surge Current/Mode (8/20μs) PT40: L-N: 40kA; L-G: 40kA; N-G: 40kA; L-L: 40kA
Surge Current/Mode, "D" Models (8/20μs): PT80: L-G: 80kA; L-L: 80kA; PT40: L-G: 40kA; L-L: 40kA
Response Time: < 5ns
Status Indicators: LED Status Indicators
Modes of Protection: L-N, L-G, L-L, N-G
Operating Altitude: 13,000ft. (4000m)
Temp. (Operating/Storage): -40° to +70°C/-40° to +85°C
Enclosure: NEMA 1, 16 gauge steel (0.050" thick), powder coated
Cable Connection: 10 AWG (5.27mm ²) cable, 3 ft. (91.4cm) provided
Dimensions: 6.75" x 7.25" x 6" (171 x 184 x 108mm)
Mounting: 5.5" x 8.0"/.220" ID - 4 holes, (140 x 203mm/5.6mm ID) - 4 holes
Conduit Connector: 3/4" compression connector
Weight: PT80: 5.75 lbs. (2.61 kg); PT40: 5.40 lbs (2.45kg)
UL File Number: E322161
UL Certification: UL Listed to 1449 3rd Edition
ARRA Certification: Complies with ARRA 1605 requirements

MADE IN THE
USA

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Specifications

- ANSI/IEEE C62.41-2002
- IEC 61643-1-1998
- UL 1449, 3rd Ed.

Model PT80	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	L-N	6kV, 3kA Let-Thru V
-120Y	120/208VAC, 3 ϕ , 4W+Gnd	800	800	700	1200	630	
-120T	120/240VAC, 1 ϕ , 3W+Gnd	800	800	700	1200	630	
-120S	120VAC, 1 ϕ , 2W+Gnd	800	800	700	n/a	630	
-120Y-140V	120/208VAC, 3 ϕ , 4W+Gnd	700	800	600	1200	590	
-120T-140V	120/240VAC, 1 ϕ , 3W+Gnd	700	800	600	1200	590	
-120S-140V	120VAC, 1 ϕ , 2W+Gnd	700	800	600	n/a	590	
-220Y	220/380VAC, 3 ϕ , 4W+Gnd	1200	1500	1200	2500	1050	
-220S	220VAC, 1 ϕ , 2W+Gnd	1200	1500	1200	n/a	1050	
-240DCT	240/120/120VAC, 3 ϕ , 4W+Gnd	800/1200	800/1500	700	1200/1800	630/990	
-240DCT-140V	240/120/120VAC, 3 ϕ , 4W+Gnd	700/1200	800/1500	600	1200/1800	590/990	
-240Y	240/415VAC, 3 ϕ , 4W+Gnd	1200	1500	1200	2500	1050	
-240S	240VAC, 1 ϕ , 2W+Gnd	1200	1500	1200	n/a	1050	
-277Y	277/480VAC, 3 ϕ , 4W+Gnd	1200	1500	1200	2500	1050	
-277S	277VAC, 1 ϕ , 2W+Gnd	1200	1500	1200	n/a	1050	
-347Y*	347VAC, 3 ϕ , 4W+Gnd	n/a	n/a	n/a	n/a	1300	
-240Y-320V	240/415VAC, 3 ϕ , 4W+Gnd	1200	1200	1000	1800	990	
-240S-320V	240VAC, 1 ϕ , 2W+Gnd	1200	1200	1000	n/a	990	
-277Y-320V	277/480VAC, 3 ϕ , 4W+Gnd	1200	1200	1000	1800	990	
-277S-320V	277VAC, 1 ϕ , 2W+Gnd	1200	1200	1000	n/a	990	
-240D	240VAC, 3 ϕ , 3W+Gnd	n/a	1200	n/a	1800	990 (L-G)	
-480D	480VAC, 3 ϕ , 3W+Gnd	n/a	1800	n/a	4000	1790 (L-G)	
-600D*	600VAC, 3 ϕ , 3W+Gnd	n/a	n/a	n/a	n/a	1940 (L-G)	

Model PT40	Service	VPR L-N	VPR L-G	VPR N-G	VPR L-L	L-N	6kV, 3kA Let-Thru V
-120Y	120/208VAC, 3 ϕ , 4W+Gnd	800	1500	700	1500	630	
-120T	120/240VAC, 1 ϕ , 3W+Gnd	800	1500	700	1500	630	
-120S	120VAC, 1 ϕ , 2W+Gnd	800	1500	700	n/a	630	
-120Y-140V	120/208VAC, 3 ϕ , 4W+Gnd	700	1200	600	1500	590	
-120T-140V	120/240VAC, 1 ϕ , 3W+Gnd	700	1200	600	1500	590	
-120S-140V	120VAC, 1 ϕ , 2W+Gnd	700	1200	600	n/a	590	
-220Y	220/380VAC, 3 ϕ , 4W+Gnd	1200	2500	1200	2500	1050	
-220S	220VAC, 1 ϕ , 2W+Gnd	1200	2500	1200	n/a	1050	
-240DCT	240/120/120VAC, 3 ϕ , 4W+Gnd	800/1200	1500/2500	700	1500/1800	630/990	
-240DCT-140V	240/120/120VAC, 3 ϕ , 4W+Gnd	700/1200	1200/2500	600	1500/1800	590/990	
-240Y	240/415VAC, 3 ϕ , 4W+Gnd	1200	2500	1200	2500	1050	
-240S	240VAC, 1 ϕ , 2W+Gnd	1200	2500	1200	n/a	1050	
-277Y	277/480VAC, 3 ϕ , 4W+Gnd	1200	2500	1200	2500	1050	
-277S	277VAC, 1 ϕ , 2W+Gnd	1200	2500	1200	n/a	1050	
-347Y*	347VAC, 3 ϕ , 4W+Gnd	n/a	n/a	n/a	n/a	1300	
-240Y-320V	240/415VAC, 3 ϕ , 4W+Gnd	1200	2000	1000	2000	990	
-240S-320V	240VAC, 1 ϕ , 2W+Gnd	1200	2000	1000	n/a	990	
-277Y-320V	277/480VAC, 3 ϕ , 4W+Gnd	1200	2000	1000	2000	990	
-277S-320V	277VAC, 1 ϕ , 2W+Gnd	1200	2000	1000	n/a	990	
-240D	240VAC, 3 ϕ , 3W+Gnd	n/a	1200	n/a	2000	990 (L-G)	
-480D	480VAC, 3 ϕ , 3W+Gnd	n/a	2000	n/a	4000	1820 (L-G)	
-600D*	600VAC, 3 ϕ , 3W+Gnd	n/a	n/a	n/a	n/a	1960 (L-G)	

* Not tested to UL1449

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SurgeFree™

MODELS

400 Series

Equipment Level Protection

The 400 Series installed at or within a piece of equipment (PLCs, fire alarm monitoring systems, security controls, etc.) provides compact, heavy-duty surge suppression. Now with touch-safe terminal blocks, the units offer an elevated level of personnel protection. Employing a sophisticated combination of brute force surge protection and EMI/RFI filtering, they will prevent damage or malfunction to sensitive equipment. The 400 Series comes with a no-nonsense, twenty-year warranty.



20-Year Warranty

UL 1449 3rd. Ed. Recognized Component

The 400 Series	407	415	416	417
Rated Voltage (50/60Hz)	120VAC	120VAC	120VAC	240VAC
Rated Current (rms.) @25°C	15A	15A	23A	23A
Service (Phase)	1	1	1	1
Surge Current in kA (8/20 μ s)	10	10	10	10
Clamp Voltage (1mA DC)	270V	270V	270V	500V
UL1449 3rd Ed. VPR (L-N):	500V	500V	500V	900V
UL1449 3rd Ed. VPR (L-G):	600V	600V	600V	1000V
UL1449 3rd Ed. VPR (N-G):	600V	600V	600V	1000V
Surge Energy (Joules) 8/20 μ s	1460	1140	1140	2300
Filter Attenuation (50 ohm: -20db	30 kHz	30 kHz	30 kHz	30 kHz
-40db	300 kHz	300 kHz	300 kHz	260 kHz
-60db	1.4 MHz	1.4 MHz	1.0 MHz	700 kHz

SPD Type:	Type 4 for use in Type 2 applications
I_n :	3kA
Max. Continuous Operating VAC (MCOV):	115% Rated Line Voltage
Varistor MCOV:	150% (407/415/416); 130% (417) Rated Line Voltage
SCCR:	5kA AIC (with external encl. and OCP)
Response Time:	<5 Nanoseconds
Modes of Protection:	L-N, L-G, N-G
Surge Current (L-N, 8/20 μ s):	1 Event: 10kA, 100 Events: 2kA, 1000 Events: 1kA, 10,000 Events: 500A
Status Indicators:	Green LED
Wire Gauge Range:	26-10 AWG (0.13-5.27mm ²)
Operating Altitude:	13,000 ft. (4000m)
Temp. (Operating/Storage):	-40° to +70°C/-40° to +85°C
Enclosure:	High Impact Plastic
Dimensions:	4.95" x 2.85" x 1.25" (126 x 73 x 32mm)
Mounting:	4.20" x 2.25"/.185 ID - 4 holes (107 x 57mm/4.7mm)
Connection:	Screw Clamp Terminal Blocks
Screw Torque Max.	5.3in. lbs./0.6Nm
Weight:	<1 lb., (.45kg)
UL File Number:	E322161
Certification:	UL1449 3rd. Ed. Recognized Component

Note: For DIN-rail mount unit, add "-DIN" to model name i.e. 415-DIN



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Q & A

Frequently Asked Questions on Surge Protection

Why is surge protection needed?

Surge Protection Devices (SPD) prevent upset or damage to sensitive equipment, thereby preventing significant economic loss due to downtime.

Where do transients come from?

- Lightning: 9 to 20 million strikes a year in USA alone
- Utility generated switching surges
- Elevators, welding machines, copiers, air conditioners, etc.
- Scheduled test operation of equipment such as standby motor-generator sets

Where are surge protectors most helpful?

- Production lines - to ensure continuous operation
- Sensitive computer-controlled machinery
- Banks, investment firms, brokerages, etc.
- Critical military and emergency response sites
- Consulates, airports, malls, hospitals, etc.

Why is low “let-through” voltage critical for sensitive equipment?

Surge protectors divert very large transient surge currents to ground. However, sensitive equipment will be exposed to the SPD’s clamping voltage plus the voltage drop across its connecting cable. The equipment is not properly protected unless the “let-through” voltage is considered.

Are there other concerns regarding SPDs?

Yes. One should expect a useful life of more than 20 years. SPDs may fail from a direct lightning strike, but this is a rare occurrence. Internal MOV damage more frequently occurs due to excessive AC line voltages.

How is MCG addressing that problem?

MCG’s proprietary low voltage drop “Micro-Z” cable, when combined with higher voltage MOVs, provides a much greater safety margin (headroom) between the sine wave peak and the MOV’s “turn-on” threshold.

Transients Turn Us On

Over **40** *Years of*
Perfect Protection

Our application engineers are only a phone call away.

A five minute conversation with an MCG engineer
can save you hours of design time.

1-800-851-1508

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