MCG Surge

AC MODEL: 400LS Executive

Main Service Panel AC Power Line Protection with Enhanced Power/Energy Metering

The 400LS Executive Series provides 400,000A of rugged surge protection at the main service panel along with new onboard, revenue-grade power and energy meter. Each phase is guarded by ten redundant protection paths – reassuring when sensitive equipment's continuous operation is at stake. Twenty-year, no-nonsense warranty (five-year warranty on power meter); free protection modules for life. Series features mix-and-match options for a customized protector at stock prices.

Ipeak = 400,000A

UL 1449. 3rd Ed. Listed

20-Year Protector Warranty
Lifetime Module Replacement

Features

- 400LS: I peak=400,000A/Phase (8 x 20µs waveform)
- Revenue-grade power and energy meter
- UL Listed 1449 3rd Ed., NEMA LS1-1992
- Ten times redundant protection paths per phase
- Dual modules per phase and N-G
- Employs new 40kA high headroom varistors with built-in high-speed thermal disconnect and dedicated cartridge fuse per surge path
- Solid copper bus bar construction
- Field-replaceable modules
- EMI/RFI noise filtering
- Continuously monitored protection circuits
- Internal and external status indicators
- Upgraded Front Panel with Surge Event Counter, beeper and status relay (1 form C contacts)
- NEMA 1, Powder Coated Steel Enclosure

Mix and Match Options

Options available: Disconnect Switch, Low Impedance Micro-Z cable (10 AWG), and Flush-mount Kit.

Made in the USA

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Filter Attenuation

MIL STD 220a (50 Ohm)	120VAC	220VAC	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

Model Ordering: 400LS - 277Y - DS - UFP - MX

SERIES - VOLTAGE - DISCONNECT SWITCH* - UPGRADED FRONT PANEL** - METER** (*optional, **standard)

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

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LS EXECUTIVE SERIES WITH ENHANCED POWER AND ENERGY METER

Most facilities incorporate surge protection devices and power/energy meters in tandem. MCG's new LS Executive series of AC Power Line Surge Protectors combine the brute force surge protection you know and trust along with a new onboard, revenue grade power and energy meter. The onboard meter is conveniently located on and accessed from the protector's front panel. Standard features include: protection redundancy (multiple fused surge paths per phase), thermally protected and 100% monitored varistors, modularity, bus bar construction, filtering, and powder coated steel enclosure.

The meter is factory prewired to the protector so once the protector is installed and wired, so is the meter. Once power is applied to the protector, the onboard meter automatically energizes. The LS Executive series with onboard meter safely and reliably protects and monitors your critical operation.

Along with the new onboard meter, MCG offers a complete line of high-quality current transducers (CTs). Most customers will want to utilize CTs for monitoring of advanced load current-based parameters like power and energy. Without the use of a current transducer, basic parameters are still monitored. These include primarily split core CTs, but we also offer solid core CTs and rope CTs. Simply order the protector with the particular meter you need, and order the CTs required for your application.

*Popular Meters: M1, M2, M3, M8, M9

METER SELECTION TABLE

		C.T. Compatibility										*
	Meter Suffix	Split or Solid Core CTs	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11
	Meter Suffix	Rope CTs	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22
MEASUREMENT COMPATIBILITY - FULL DATA SET													
Bi-directional Energy Measurements										●	●	●	●
Power (3-phase total and per phase): Real (kW) Reactive (kVAR), and Apparent (kVA)			●	●	●	●	●	●	●	●	●	●	●
Power Factor: 3-phase average & per phase			●	●	●	●	●	●	●	●	●	●	●
Present Power Demand: Real (kW), Reactive (kVAR), and Apparent (kVA)			●	●	●	●	●	●	●	●	●	●	●
Import and Export totals of Present Power Demand: Real (kW), Reactive (kVAR), & Apparent (kVA)										●	●	●	●
Peak Power Demand: Real (kW), Reactive (kVAR), and Apparent (kVA)			●	●	●	●	●	●	●	●	●	●	●
Current (3-phase average and per phase)			●	●	●	●	●	●	●	●	●	●	●
Voltage: Line-Line and Line-Neutral (3-phase average and per phase)			●	●	●	●	●	●	●	●	●	●	●
Frequency			●	●	●	●	●	●	●	●	●	●	●
ANSI C12.20 0.2% accuracy, IEC 62053-22 Class 0.2S			●	●	●	●	●	●	●	●	●	●	●
Accumulated Net Energy: Real (kWh), Reactive (kVARh), and Apparent (kVAh)			●	●	●	●	●	●	●	●	●	●	●
Accumulated Real Energy by phase (kWh)			●	●	●	●	●	●	●	●	●	●	●
Import and Export Accumulators of Real and Apparent Energy										●	●	●	●
Reactive Energy Accumulators by Quadrant (3-phase total & per phase)										●	●	●	●
Demand Interval Configuration: Fixed or Rolling Block			●	●	●	●	●	●	●	●	●	●	●
Demand Interval Configuration: External Sync to Comms				●	●	●	●	●	●	●	●	●	●
DATA LOGGING													
Data Logging: 10 16-Bit Configurable (can include Date/Time) Data Buffers					●						●		
Data Logging: 3 Timestamped 32-Bit Configurable Data Buffers							●		●				●
Store up to 60 days of readings at 15-minute intervals					●		●		●		●		●
OUTPUTS													
Alarm Output (N.C.)			●	●	●	●		●		●	●	●	
1 Pulse Output (N.O.)				●	●					●	●		
2 Pulse Outputs (N.O.)			●										
RS-485 Serial (Modbus RTU Protocol)				●	●					●	●		
RS-485 Serial (BACnet MS/TP Protocol)								●	●			●	●
LON FT Serial (LonTalk Protocol)						●	●						
INPUTS													
2 Pulse Contact Accumulator Inputs							●		●				●
1 Pulse Contact Accumulator Input						●		●				●	

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Current Transducer Options

Split Core 100A - 2400A (50/60 Hz Accuracy +/- 1% 10% to 100% (Rated Current))				
Popular Models	**CT Part Number**	**Window Size L x W**	**Physical Size L x W**	**Lead**
X	CT1-100A-.3V	1.2" x 1.3"	4.0" x 3.8"	6' Lead
X	CT1-200A-.3V	1.2" x 1.3"	4.0" x 3.8"	6' Lead
X	CT1-300A-.3V	1.2" x 1.3"	4.0" x 3.8"	6' Lead
	CT Part Number	**Window Size L x W**	**Physical Size L x W**	**Lead**
X	CT2-400A-.3V	2.9" x 2.5"	5.2" x 4.9"	6' Lead
X	CT2-600A-.3V	2.9" x 2.5"	5.2" x 4.9"	6' Lead
X	CT2-800A-.3V	2.9" x 2.5"	5.2" x 4.9"	6' Lead
	CT Part Number	**Window Size L x W**	**Physical Size L x W**	**Lead**
X	CT3-800A-.3V	5.5" x 2.5"	7.9" x 4.9"	6' Lead
X	CT3-1000A-.3V	5.5" x 2.5"	7.9" x 4.9"	6' Lead
X	CT3-1200A-.3V	5.5" x 2.5"	7.9" x 4.9"	6' Lead
X	CT3-1600A-.3V	5.5" x 2.5"	7.9" x 4.9"	6' Lead
X	CT3-2000A-.3V	5.5" x 2.5"	7.9" x 4.9"	6' Lead
X	CT3-2400A-.3V	5.5" x 2.5"	7.9" x 4.9"	6' Lead

0-5000 Amps (Accuracy +/-1% 50A to 5000A 50Hz to 1.5kHz)				
	CT Part Number	**Core**	**Opening**	**Lead**
X	CTA	12" Rope	3.85"	8' Lead
X	CTB	18" Rope	5.75"	8' Lead
X	CTC	24" Rope	7.65"	8' Lead
X	CTD	36" Rope	11.5"	8' Lead
	CT Part Number	**Core**	**Opening**	**Lead**
	CTE	12" Rope	3.85"	12' Lead
	CTF	18" Rope	5.75"	12' Lead
	CTG	24" Rope	7.65"	12' Lead
	CTH	36" Rope	11.5"	12' Lead

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Split Core 5A - 600A
(+/- 1% Accuracy 10% - 130% of Rated Current .333 VAC Output)

Popular Models	CT Part Number	Window Size L x W	Physical Size L x W	Lead
	CT4-5A-.3V	.75" X .75"	2.0" X 2.1"	8' Lead
	CT4-10A-.3V	.75" X .75"	2.0" X 2.1"	8' Lead
	CT4-30A-.3V	.75" X .75"	2.0" X 2.1"	8' Lead
	CT4-50A-.3V	.75" X .75"	2.0" X 2.1"	8' Lead
	CT4-70A-.3V	.75" X .75"	2.0" X 2.1"	8' Lead
	CT4-100A-.3V	.75" X .75"	2.0" X 2.1"	8' Lead
	CT4-150A-.3V	.75" X .75"	2.0" X 2.1"	8' Lead
	CT4-200A-.3V	.75" X .75"	2.0" X 2.1"	8' Lead

	CT Part Number	Window Size L x W	Physical Size L x W	Lead
	CT5-50A-.3V	1.25" x 1.25"	3.35" x 3.25"	8' Lead
	CT5-70A-.3V	1.25" x 1.25"	3.35" x 3.25"	8' Lead
	CT5-100A-.3V	1.25" x 1.25"	3.35" x 3.25"	8' Lead
	CT5-150A-.3V	1.25" x 1.25"	3.35" x 3.25"	8' Lead
	CT5-200A-.3V	1.25" x 1.25"	3.35" x 3.25"	8' Lead
	CT5-250A-.3V	1.25" x 1.25"	3.35" x 3.25"	8' Lead
	CT5-300A-.3V	1.25" x 1.25"	3.35" x 3.25"	8' Lead
	CT5-400A-.3V	1.25" x 1.25"	3.35" x 3.25"	8' Lead
	CT5-600A-.3V	1.25" x 1.25"	3.35" x 3.25"	8' Lead

Split Core
(1% Accuracy 10% to 100% of Rated Current
50/60Hz 50-200 Amp .333 VAC Output)

	CT Part Number	Window Size	Physical Size L x W	Lead
X	CT6-50A-.3V	.4" ID	1.6" x 1"	6' Lead
X	CT6-100A-.3V	.6" ID	2.1" x 1.5"	6' Lead
X	CT6-200A-.3V	1.25" ID	2.8" x 1.5"	6' Lead

Series Solid Core
(.5% Accuracy 5% to 120% of Rated Current
50/60Hz 50-400 Amp .333 VAC Output)

	CT Part Number	Window Size	Physical Size L x W	Lead
X	CT7-50A-.3V	.4" ID	1.5" x 1.3"	6' Lead
X	CT7-100A-.3V	.4" ID	1.5" x 1.3"	6' Lead
X	CT7-200A-.3V	1" ID	2.6" x 2.3"	6' Lead
X	CT7-400A-.3V	1.25" ID	3.2" x 2.8"	6' Lead

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Specifications

MCG Surge - 400LS Executive Series

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

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 (8/20µs):	1 Event - 400kA.
Surge Life/Phase(8/20µs):	10,000 Events: 19kA.
Surge Current/Mode (8/20µs):	L-N: 240kA; L-G: 160kA; N-G: 240kA; L-L: 400kA
Surge Current/Mode, "D" Models (8/20µs):	L-G: 400kA; L-L: 400kA
Response Time:	<5 ns
Energy Absorption (8/20µs) in Joules:	24,496 -108,000J
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):	0 degrees to +50 degrees C/-40 degrees to +85 degrees C
Enclosure:	NEMA 1, 14 gauge steel, powder coated
Dimensions:	17" x 15" x 7.75" (432 x 381 x 197mm)
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:	46 lbs. (20.8 kg)
UL File Number:	E322161
UL Certification:	UL Listed to 1449 3rd Edition, UL96A Compliant
ARRA Certification:	Complies with ARRA 1605 requirements

Model 400LS	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	480	570
-120T	120/240VAC, 1φ, 3W+Gnd	900	900	800	1200	505	600
-120Y	120/208, 3φ, 4W+Gnd, Wye	900	900	800	1200	505	600
-220Y	220/380, 3φ, 4W+Gnd, Wye	1500	1500	1500	2000	990	1130
-220S	220VAC, 1φ, 2W+Gnd	1500	1500	1500	n/a	940	1070
-240Y	240/415, 3φ, 4W+Gnd, Wye	1500	1500	1500	2000	970	1130
-240S	240VAC, 1φ, 2W+Gnd	1500	1500	1500	n/a	940	1070
-277Y	277/480, 3φ, 4W+Gnd, Wye	1500	1500	1500	2000	970	1130
-347Y	347/600, 3φ, 4W+Gnd, Wye	1500	1500	1500	2500	1260	1400
-240DCT*	240/120/120, 3φ, 4W+Gnd	900/1500**	900/1500**	900	2000/1800** 1200/2000**	970/505	1130/600
-240D	240, 3φ, 3W+Gnd, Delta	n/a	1500	n/a	2000	970 (L-G)	1130 (L-G)
-480D	480, 3φ, 3W+Gnd, Delta	n/a	2000	n/a	4000	1548 (L-G)	1720 (L-G)
-600D	600, 3φ, 3W+Gnd, Delta	n/a	2000	n/a	4000	1755 (L-G)	1930 (L-G)

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

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).

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.