



Cutler-Hammer

Clipper Power System — Visor™ Series

Technical Data

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Clipper Power System — Visor Series



Visor Series — Retrofit and Integrated Versions

Applications

- The Visor can be integrated into Switchboards, Switchgear, Motor Control Centers, Panelboards and Busway.
- The Visor can also be externally mounted to existing distribution equipment.
- Standard NEMA 1/3R retrofit enclosure.
- NEMA 4X, Flushmount and NEMA 12 enclosure available as an option.
- Enclosures with disconnect switch available as an option.
- The Visor is available from 100 to 500 kA/phase units.

General Description

Cutler-Hammer's leading-edge surge suppression system for retrofit applications offers the widest variety of surge current rating, monitoring features, and enclosure options. The Visor Series is the most up to date and respected line of surge protection devices in the industry due to its exceptional technology and performance.

With over two decades of experience in the surge suppression industry and extensive R & D initiatives, Cutler-Hammer is considered a world leader in surge protective device (SPD) manufacturing.

When installing a surge suppressor in a retrofit environment, it is important to mount the suppressor as close to the electrical equipment as possible. Keep the wiring (lead length) between the electrical equipment and the suppressor as short as possible, and twist or wire tie the conductors to reduce inductive effects.

Installation lead length reduces the performance of any surge suppressor. For each inch of wiring (installation lead length), add 15 to 25 volts to the surge suppressor's published let-through value (e.g., suppressor let-through at 400V and installation of 3 feet of cable = 1000V installed rating).

Remote Mounting Kits

The monitoring display panel can be remotely mounted on the Visor using either ribbon cables or DB15 connector cable. Both optional kits can be ordered separately. Cable supplied in the kits comes in different lengths. Refer to Table 1.

Features, Functions and Benefits

Industry Leadership

- The Visor is an intelligent surge suppression device that offers advanced monitoring options.
- It offers improved safety and reliability from a new patent pending technology – Thermo-Dynamic Fusing™.
- Independently tested by lightning laboratories to ensure performance, long-term reliability, and quality standards are met.
- Installation flexibility for all low voltage distribution equipment.
- Worldwide customer, engineering, and application support.

Application Flexibility

- 100, 120, 160, 200, 250, 300, 400 and 500 kA/phase ratings are available.
- All units utilize our low impedance SurgePlane™ suppression platform to ensure surge currents are equally diverted to all suppression components, therefore extending life expectancy.

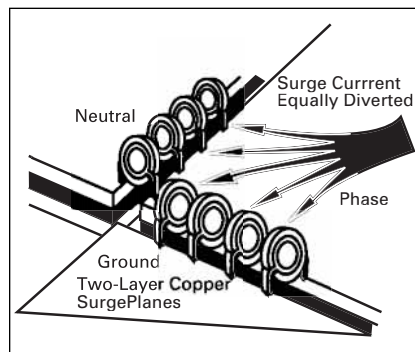


Figure 1. SurgePlane Technology

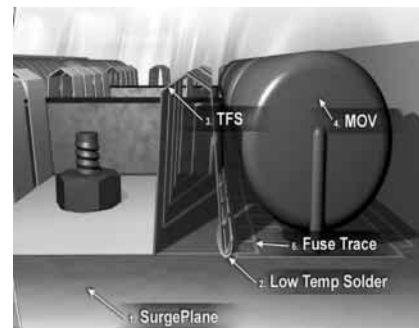
Comprehensive Diagnostics

- Maintenance-free surge suppression. (No external test set or routine maintenance required.)
- The NetVisor, our premium display, allows you to monitor your surge protective device from across the plant or across the world.
- AdVisor and SuperVisor monitoring display panels are completely removable and can be installed horizontally or vertically, offering four mounting positions.



Visor Monitoring Options

- Our patent pending Thermo-Dynamic Fusing System provides both safety and performance. This technology uses a fuse trace on each individual metal oxide varistor (MOV) that can sustain high surge currents and provide the necessary interruption of high fault currents (kAIC).
- Thermo-Dynamic Fusing System also includes a thermal fuse spring (TFS) that provides the needed disconnection from low level fault currents.



Components of the Thermo-Dynamic Fusing™ System

Standard Features

- 200 kAIC internal fusing system.
- Thermo-Dynamic Fusing System.
- Standard NEMA 1/3R enclosure.
- AdVisor monitoring package, which is loaded with features. An audible alarm with reset button, form C dry contacts and phase operating status lights.
- Remote mountable display panel.

Optional Features

- SuperVisor and NetVisor monitoring packages.
- Different enclosure packages.
- For OEM packages, contact factory.

Standards and Certifications

- All Clipper units have been tested by UL and meet the requirements under UL 1449 2nd Edition for surge suppression devices.
- All Clipper units have been tested as per NEMA LS-1 and ANSI/IEEE C62.45.
- Category A3 Ringwave (6 kV open circuit, 200A short circuit current at 100 kHz).
- Category B3 Ringwave (6 kV open circuit, 500A short circuit current at 100 kHz).
- Category C1 Combination Wave (6 kV 1.2/50us open circuits, 3 kA 8/20us short circuit current).
- Category C3 Combination Wave (20 kV 1.2/50us open circuits, 10 kA 8/20us short circuit current).
- UL 1020 (standard for safety for thermal cutoffs for use in electrical appliances and components).
- UL 1283 listed for EMI/RFI noise attenuation filtering (50 db at 100 kHz).
- CSA C22.2.

Standard Dimensions — Retrofit Only

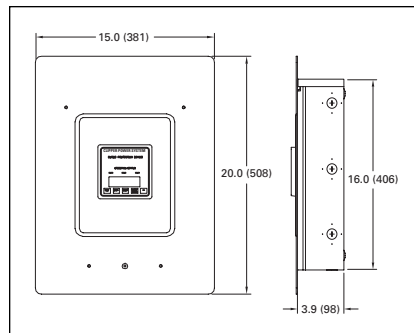


Figure 2. NEMA 1 — Flushmount up to 200 kA (480V or Less)

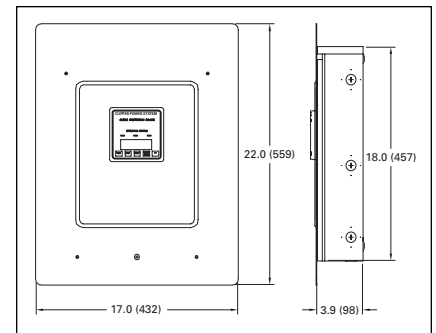


Figure 6. NEMA 1 — Flushmount 250 kA and up (480V or Less/600V, 100 kA – 500 kA)

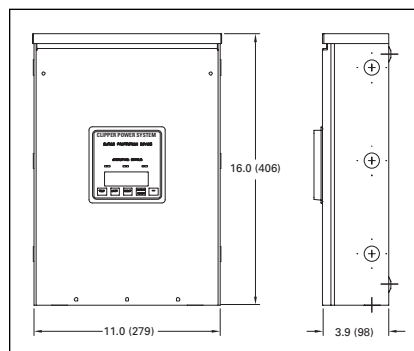


Figure 3. NEMA 1/3R up to 200 kA (480V or Less)

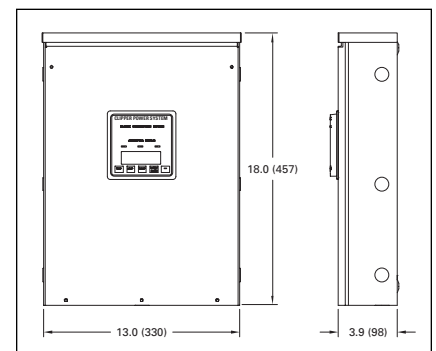


Figure 7. NEMA 1/3R 250 kA and up (480V or Less/600V, 100 kA – 500 kA)

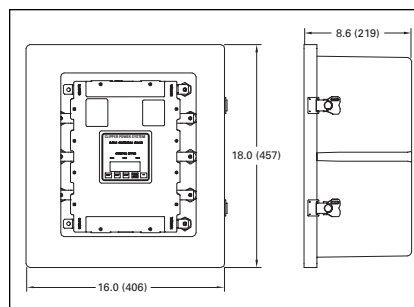


Figure 4. NEMA 4X up to 500 kA (All Voltages)

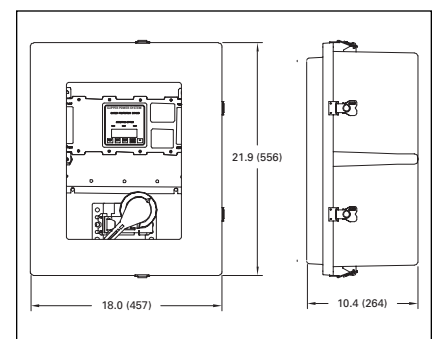


Figure 8. NEMA 4X c/w Disconnect Switch (Up to 500 kA/All Voltages)

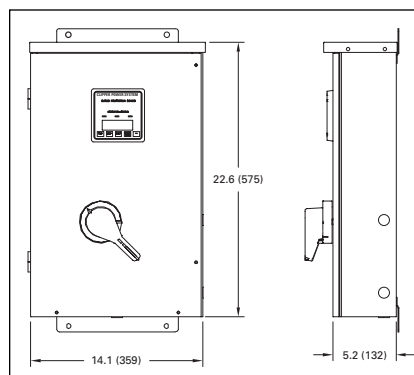


Figure 5. NEMA 1/3R c/w Disconnect Switch (Up to 500 kA/All Voltages)

Table 1. Remote Mounting Kits ^①

Style Number	Type
TBA	Ribbon cable
TBA	DB15 cable 4 ft.
TBA	DB15 cable 8 ft.

^① Consult factory for availability.

Product Information

Table 2. Visor Series – General Parameters

Description	Retrofit	Integrated
kA/mode	50 to 250	50 to 250
kA/phase	100 to 500	100 to 500
Split-Phase System	240 L, L, N, G	240 L, L, N, G
Wye System Voltages	120/208 277/480 347/600 L, L, L, N, G	120/208 277/480 347/600 L, L, L, N, G
Delta System Voltages	240 480 600 L, L, L, G	240 480 600 L, L, L, G
Intl. System Voltages	127/220 230/400 L, L, L, N, G Mexico, other	127/220 230/400 L, L, L, N, G Mexico, other
Monitoring	AdVisor SuperVisor NetVisor	AdVisor SuperVisor NetVisor
Enclosures	NEMA 1/3R Flushmount — NEMA 1 NEMA 4X NEMA 12	Panelboards (PRL1A, 2A, 3A, 4) Remote Monitor Device Panel (Switchboard, Switchgear, Busway, Replaces C1 & C2) MCC Version (Replaces M1, M2 & M3)
Remote Mounting Kits Ribbon Cable DB15 600V Class Cable	12 inches 4 ft. & 8 ft.	12 inches 4 ft. & 8 ft.
Enclosures c/w Disconnect Switch	NEMA 1/3R NEMA 4X NEMA 12	
Temperature Storage Operation	-40° C to +60° C -20° C to +60° C	-40° C to +60° C -20° C to +60° C
Humidity (Relative)	5 – 95%	5 – 95%
Warranty	10 years	10 years
Certifications/Listing	UL 1449 2nd Edition, CSA 22.2, UL 1283.	

Display Packages

Table 3. Visor Series

Description	AdVisor	SuperVisor	NetVisor
			

Diagnostics Package

Status Indicator Lights – Red/Green	✓	✓	✓
Form “C” Contacts	✓	✓	✓
Audible Alarm with Reset Button	✓	✓	✓
Transient Counter	✗	✓	✓
Push-to-Test Button	✗	✓	✓
Power Consumption in Watts	0.5W	1.2W	3.0W
Remote Mounting Kits			
Ribbon Cable	✓	✓	✓
DB15 Cable	✓	✓	✓
PQ Meter	✗	✓	✓
Adjustable Set-Points	✗	✗	✓
Non-Volatile Memory	✗	✓	✓
Web Enabled	✗	✗	✓
Date Stamped	—	—	✓
Communication Port	✗	✗	✓
Modbus and Ethernet	—	—	✓
Communication Speed (10 Base T)	—	—	✓
Temperature			
Storage	-40° C to +60° C	-40° C to +60° C	-40° C to +60° C
Operating	-40° C to +60° C	-20° C to +60° C	-20° C to +60° C
Humidity (Relative) = 5% – 95%	✓	✓	✓
Remote Mountable Display	✓	✓	✓
Dimensions (4.2” W x 4.2” H x 0.4” D)	✓	✓	✓

Power Quality (PQ) Metering

% Life Remaining	—	—	✓
% THD (Voltage)	—	—	✓
Event Storage (9999 Events)	—	✓	✓
LCD (2 x 16)	—	✓	✓
Event Capture		Counter:	Meter:
Sag	—	■ -10% System Voltage	■ User Defined Setpoints for Voltage Trigger
		■ 23 Cycles	■ 1 Cycle
		■ Fixed Setpoints	
Swell	—	Counter:	Meter:
		■ +10% System Voltage	■ User Defined Setpoints for Voltage Trigger
		■ One Cycle	■ 1 Cycle
		■ Fixed Setpoints	
Outage	—	Counter:	Meter:
		■ Zero Voltage	■ >10% System Voltage
		■ 2 Cycles	■ 1 Cycle
		■ Fixed Setpoints	■ Fixed Setpoint
Surge	—	Counter:	Meter:
		■ Sensitivity Minimum 10A	■ Sensitivity Minimum 10A
		■ 8x20 vs. Waveform	■ 8x20 vs. Waveform
Voltage Meter			
L – L	—	✓	✓
N – G	—	✗	✓
Accuracy	—	± 5%	± 2%
Resolution	—	8 bit	8 bit

Note: ✓ = Yes
✗ = No
— = Not Applicable

Retrofit Enclosure

Visor Series



**Standard Enclosure
Up to 200 kA**

- Up to 200 kA (480V or less).
- NEMA 1/3R enclosure.
- Dimension: 11.0 W x 16.0 H x 4.5 D inches (279.4 W x 406.4 H x 114.3 D mm)
- Weight: 15.8 lbs. (7.15 kg)



**Standard Enclosure
250 kA and up**

- 250 kA and up (480V or less/
100 kA – 500 kA at 600V).
- NEMA 1/3R enclosure.
- Dimension: 13.0 W x 18.0 H x 4.5 D inches (330.2 W x 457.2 H x 114.3 D mm)
- Weight: 19.6 lbs. (8.9 kg)



**Standard Enclosure
c/w Disconnect Switch**

- Up to 500 kA (all voltages).
- NEMA 1/3R enclosure.
- Dimension: 14.1 W x 25.0 H x 7.7 D inches (358.1 W x 635.0 H x 195.6 D mm)
- Weight: 40.0 lbs. (18.2 kg)

CPS Ordering Guidelines

Table 4. Retrofit

CPS 100 480Y S K				
Surge Ratings 100 = 100 kA/phase 120 = 120 kA/phase 160 = 160 kA/phase 200 = 200 kA/phase 250 = 250 kA/phase 300 = 300 kA/phase 400 = 400 kA/phase 500 = 500 kA/phase	Diagnostics Packages A = AdVisor c/w — Status indicator lights on each phase, Form "C", Audible Alarm — Enable/Disable. S = SuperVisor c/w — Status indicator lights on each phase, Form "C", Audible Alarm — Enable/Disable, Transient Counter, Push-to-Test, PQ Meter (no date stamp). N = NetVisor c/w — Status indicator lights on each phase, Form "C", Audible Alarm — Enable/Disable, Transient Counter, Push-to-Test, PQ Meter (date stamp), Modbus and Ethernet Communication Port, % Life Remaining, % Voltage THD.			
	Enclosure Cross Reference K = Standard (NEMA 1, 3R) L = Flushmount (NEMA 1) M = Standard (NEMA 1, 3R) c/w Disconnect Switch N = NEMA 4X O = NEMA 4X c/w Disconnect Switch P = NEMA 12 Q = NEMA 12 c/w Disconnect Switch			
	Voltage Code 120/208 127/220 240V 230/400 400V 277/480 480V 347/600 600V			
	220/127 Three-Phase Wye (4W+G) (Mexico) 120/240 Single Split Phase (3W+G) Three-Phase Delta High Leg (4W+G) Three-Phase Wye (4W+G) Three-Phase Delta (3W+G)			
	220Y 240S 240H 208Y 240D	400Y	480Y 480D	600Y 600D

Table 5. Integrated

CPS 100 480Y S C				
Surge Ratings 100 = 100 kA/phase 120 = 120 kA/phase 160 = 160 kA/phase 200 = 200 kA/phase 250 = 250 kA/phase 300 = 300 kA/phase 400 = 400 kA/phase 500 = 500 kA/phase	Diagnostics Packages A = AdVisor c/w — Status indicator lights on each phase, Form "C", Audible Alarm — Enable/Disable. S = SuperVisor c/w — Status indicator lights on each phase, Form "C", Audible Alarm — Enable/Disable, Transient Counter, Push-to-Test, PQ Meter (no date stamp). N = NetVisor c/w — Status indicator lights on each phase, Form "C", Audible Alarm — Enable/Disable, Transient Counter, Push-to-Test, PQ Meter (date stamp), Modbus and Ethernet Communication Port, % Life Remaining, % Voltage THD.			
	Enclosure Cross Reference A = Panelboards (PRL1A, 2A, 3A, 4) B = Remote Monitor Display (PRL4, Switchgear, Busway) C = MCC Version D – J = Warranty Versions, Consult Factory.			
	Voltage Code 120/208 127/220 240V 230/400 400V 277/480 480V 347/600 600V			
	220/127 Three-Phase Wye (4W+G) (Mexico) 120/240 Single Split Phase (3W+G) Three-Phase Delta High Leg (4W+G) Three-Phase Wye (4W+G) Three-Phase Delta (3W+G)			
	220Y 240S 240H 208Y 240D	400Y	480Y 480D	600Y 600D

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