Design Assist Materials Binder

Current Technology — Surge Protection

Product Selection Information		**Tab 1**
2 Pages	SPD Application Guide	
1 Page	Product Feature and Performance Differentiation Chart	
Main Panel/SES	**(SL3 Series) Temporary Overvoltage Protection (TOP) SPD**	**Tab 2**
1 Page	Application Guide: Line Side of the Main Breaker (Direct Bus Connection)	
1 Page	Application Guide: Load Side of the Main Breaker (Connection Thru a Breaker)	
1 Page	Application Guide: No CB Available or 6-Throw Rule (Direct Bus Connection)	
1 Page	Product Number Configuration Guide	
1 Page	Monitoring System Selection Guide	
Switchboards & Panelboards	**(TG3 Series) Protection Device with Thermally Protected MOVs**	**Tab 3**
1 Page	Application Guide: Load Side of the Main Breaker (Connection Thru a Breaker)	
1 Page	Application Guide: No CB Available or 6-Throw Rule (Direct Bus Connection)	
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Panel Extensions	**(PX3 Series) SPD Panelboard Application**	**Tab 4**
1 Page	Application Guide: (Connection thru a Breaker)	
1 Page	Product Number Configuration Guide	
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NEC Compliance, TI, Design Build	**(CG Series) Basic SPDs**	**Tab 5**
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Powersmiths International — Transformers Exceeding US DOE 2016 Requirements

Product Selection Information		**Tab 6**
2 Pages	Transformer Selection, Application and Specification Guide	
	OPAL (Optimized Performance for the Application Load) Transformers	
Typical Light Loading	**(OPAL ESaver-33L) K-7 Rated Transformers**	**Tab 7**
1 Page	Design Considerations Guide	
1 Page	Product Number Configuration Guide	
Heavy Loading	**(OPAL ESaver-25H) K-13 Rated Transformers**	**Tab 8**
1 Page	Design Considerations Guide	
1 Page	Product Number Configuration Guide	
Harmonic Rich Loading	**(OPAL T1000-30H) Harmonic Mitigating Transformers**	**Tab 9**
1 Page	Design Considerations Guide	
1 Page	Product Number Configuration Guide	
Alternate OPAL Transformers		**Tab 10**
2 Pages	(OPAL ESaver-80R) Aluminum Transformers	
2 Pages	(OPAL ESaver-EV) Transformer for Electric Vehicle Charger Systems	
2 Pages	(OPAL ESaver-SOL) Transformer for PhotoVoltaic Applications	
1 Page	Transformers with Integrated Circuit Breakers and Metering	

DSPM — UL 924 Lighting Inverters

Product Selection Information	**Product Characteristics & Model Number Configuration Chart**	**Appendix A**

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Tab 1

Current Technology

Surge Protection

Product Selection Information

2 Pages **SPD Application Guide**

1 Page **Product Feature and Performance Differentiation Chart**

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Current Technology

SPD Application Guide

Project Specific Application Chart

Source Current Rating	SL3 Series Service Entrance Section (SES), Main Panel		TG3 Series Switchboards, Panelboards		CG Series NEC Compliance, TI, Design Build
	Tested Surge Current Capacity per Mode (x2 per Phase)		Tested Surge Current Capacity per Mode (x2 per Phase)		Tested Surge Current Capacity per Mode (x2 per Phase)
	Single SES	Multiple SES*	W/O Upstream SPD	With Upstream SPD	
3000 A (and Above)	300 kA	200 kA	300 kA	150 kA	200 kA
2500 A	250 kA	200 kA	250 kA	125 kA	200 kA
2000 A	200 kA	150 kA	200 kA	100 kA	200 kA
1600 A	150 kA	125 kA	150 kA	80 kA	150 kA
1000 A - 1200 A	125 kA	125 kA	125 kA	80 kA	120 kA
800 A	100 kA	80 kA	100 kA	50 kA	100 kA
400 A - 600 A	80 kA	50 kA	80 kA	50 kA	80 KA
200 A	50 kA	50 kA	50 kA	50 kA	60 kA

*Multiple Service Entrances to be understood as one feed from a utility substation feeding multiple (i.e., more than one) utility transformers and/or utility meters for their respective Service Entrance sections.

Project Specific SPD Model Number Selection Guide

Surge Current Capacity (per Mode)	System Voltage*	SL3 Series	TG3 Series	CG Series	Connection Information	
					Circuit Breaker Size	Conductor Size
300 kA	480Y/277 V	SL33004803YMDTM4F	TG33004803YMDTM4F		100 A	#2
	208Y/120 V	SL33002083YMDTM4F	TG33002083YMDTM4F			
250 kA	480Y/277 V	SL32504803YMDTM4F	TG32504803YMDTM4F		100 A	#2
	208Y/120 V	SL32502083YMDTM4F	TG32502083YMDTM4F			
200 kA	480Y/277 V	SL32004803YMDTM4F	TG32004803YMDTM4F	CG2002774803GY	100 A	#2
	208Y/120 V	SL32002083YMDTM4F	TG32002083YMDTM4F	CG2001202083GY		
150 kA	480Y/277 V	SL31504803YMDTM4F	TG31504803YMDTM4F	CG1502774803GY	100 A	#2
	208Y/120 V	SL31502083YMDTM4F	TG31502083YMDTM4F	CG1501202083GY		
125 kA	480Y/277 V	SL31254803YMDTM4F	TG31254803YMDTM4F	CG1202774803GY	100 A	#2
	208Y/120 V	SL31252083YMDTM4F	TG31252083YMDTM4F	CG1201202083GY		
100 kA	480Y/277 V	SL31004803YMNTM4FHPI	TG31004803YPNTM4FHPI	CG1002774803GYHPI	60 A	#6 HPI
	208Y/120 V	SL31002083YMNTM4FHPI	TG31002083YPNTM4FHPI	CG1001202083GYHPI		
80 kA	480Y/277 V	SL30804803YMNTM4FHPI	TG30804803YPNTM4FHPI	CG0802774803GYHPI	60 A	#6 HPI
	208Y/120 V	SL30802083YMNTM4FHPI	TG30802083YPNTM4FHPI	CG0801202083GYHPI		
50 kA	480Y/277 V	SL30504803YMNTM4FHPI	TG30504803YPNTM4FHPI	CG0602774803GYHPI	30 A	#10 HPI
	208Y/120 V	SL30502083YMNTM4FHPI	TG30502083YPNTM4FHPI	CG0601202083GYHPI		

*For model numbers for other voltages and configurations, see the "Product Configuration Guides" for the respective series in the DAM Binder.

SPD Sheet Notes

SL3 Series	TG3 Series	CG Series
TEMPORARY OVERVOLTAGE PROTECTION SPD. UL1449 4TH EDITION LISTED, TYPE 1, $I_{nominal}$ = 20kA. INSTALL EXTERNAL TO GEAR. NEMA 4/12 ENCLOSURE. SURGE CURRENT RATING TO BE A TESTED VALUE. 20 YEAR WARRANTY. NETWORK-BASED MONITORING SYSTEM. INSTALLED TESTING WITH A PORTABLE SURGE GENERATOR-TEST SET. RECORD ALL LET-THRU VOLTAGES. SUBMIT A REPORT TO THE ENGINEER. CURRENT TECHNOLOGY (Insert model number).	SURGE PROTECTION DEVICE. UL1449 4TH EDITION LISTED, TYPE 1, $I_{nominal}$ = 20kA. INSTALL EXTERNAL TO GEAR. NEMA 4/12 ENCLOSURE. SURGE CURRENT RATING TO BE A TESTED VALUE. 15 YEAR WARRANTY. NETWORK-BASED MONITORING SYSTEM. INSTALLED TESTING WITH A PORTABLE SURGE GENERATOR-TEST SET. RECORD ALL LET-THRU VOLTAGES. SUBMIT A REPORT TO THE ENGINEER. CURRENT TECHNOLOGY (Insert model number).	SURGE PROTECTION DEVICE. UL1449 4TH EDITION LISTED, TYPE 1, $I_{nominal}$ = 20kA. INSTALL EXTERNAL TO GEAR. NEMA 4/12 ENCLOSURE. SURGE CURRENT RATING TO BE A TESTED VALUE. 10 YEAR WARRANTY. STATUS LIGHTS, FORM C CONTACTS, AUDIBLE ALARM. INSTALLED TESTING WITH A PORTABLE SURGE GENERATOR-TEST SET. RECORD ALL LET-THRU VOLTAGES. SUBMIT A REPORT TO THE ENGINEER. CURRENT TECHNOLOGY (Insert model number).

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Current Technology

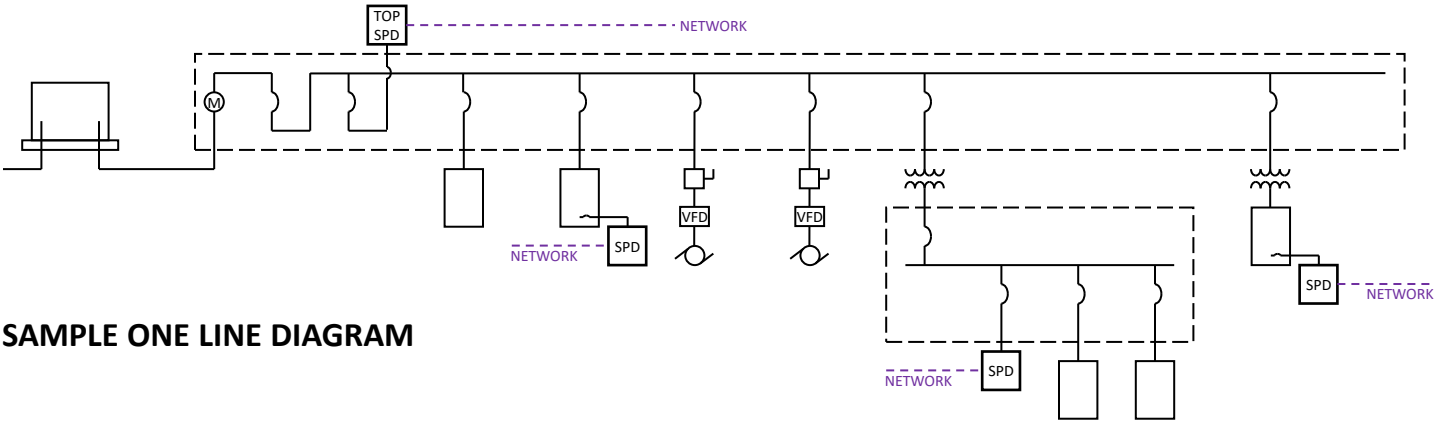
SPD Application Guide

SPD Product Performance/Differentiation Chart

Specification Parameter \ SPD Product	SL3 Series Service Entrance Section (SES)	TG3 Series Switchboards and Panelboards	CG Series NEC Compliance, TI, Design Build	Typical MOV-Only Based Devices
Protects from & survives temporary over voltages (Identified by all industry groups, e.g., IEEE, UL as the main cause of SPD failure.)	Yes	No	No	No
SPD has been tested to surge current rating (Confirms SPD's real surge current capacity. Not just a summation of ratings of components.)	Yes	Yes	Yes	No
SPD has been tested to repetitive impulse rating (Confirms product's capacity to provide long-term reliability for protection of equipment.)	Yes	Yes	Yes	No
Network-based monitoring system (To remotely quantify protection availability and to identify and document power-related events.)	Yes	Yes	No	No
High performance interconnect (HPI) cable (For best protection/lowest let-through voltage for equipment in the facility.)	Yes	Yes	Yes	No
Installed start-up and testing of SPD (Verifies installation, presence of a N-G bond and establishes baseline ratings of installed SPD.)	Yes	Yes	Yes	No
Integral Test Point (Provides ability to test component condition to identify degradation prior to, or at, end of life.)	Yes	Yes	Yes	No
Published Warranty	20 Years	15 Years	10 Years	10 Years

Dimensions and Weights (For SPD Products as Identified in the Selection Chart)

Surge Current Capacity (per Mode)	SL3 Series			TG3 Series			CG Series		
	Model	Dimensions (H X W x D)	Weight (lbs.)	Model	Dimensions (H X W x D)	Weight (lbs.)	Model	Dimensions (H X W x D)	Weight (lbs.)
300 KA	SL3300	32" x 22" x 12"	88	TG3300	24" x 16" x 9.2"	50			
250 KA	SL3250	32" x 22" x 12"	87	TG3250	24" x 16" x 9.2"	50			
200 KA	SL3200	32" x 22" x 12"	86	TG3200	24" x 16" x 9.2"	48	CG200	14" x 12.75" x 6.3"	40
150 KA	SL3150	32" x 22" x 12"	85	TG3150	24" x 16" x 9.2"	46	CG150	14" x 12.75" x 6.3"	40
125 KA	SL3125	32" x 22" x 12"	85	TG3125	24" x 16" x 9.2"	46	CG120	14" x 12.75" x 6.3"	40
100 KA	SL3100	16" x 16" X 9.2"	43	TG3100	14" x 12.75" x 6.6"	18	CG100	14" x 12.75" x 6.3"	40
80 KA	SL3080	16" x 16" X 9.2"	42	TG3080	14" x 12.75" x 6.6"	17	CG080	10" x 8.75" x 6.3"	30
50 KA	SL3050	16" x 16" X 9.2"	42	TG3050	14" x 12.75" x 6.6"	17	CG060	10" x 8.75" x 6.3"	30



SAMPLE ONE LINE DIAGRAM

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Current Technology – Surge Protection Devices
Product Feature and Performance Difference Guide

Service/ Source Size	Surge Current	Temporary Overvoltage Protection (TOP) SPD	Thermally Protected MOVs	UL 1449 4th Edition Listed	Product Series	Model Number	Status Lights & Form C Contacts	Surge Counter	Network-Based Monitoring System	Warranty	Warranty With Upstream SL3
3000 A (& above)	300 kA	X	X	X	SL3	SL3-300	Included	M2 Option	M4 Option	20 years	20 years
2500 A	250 kA	X	X	X	SL3	SL3-250	Included	M2 Option	M4 Option	20 years	20 years
2000 A	200 kA	X	X	X	SL3	SL3-200	Included	M2 Option	M4 Option	20 years	20 years
1600 A	150 kA	X	X	X	SL3	SL3-150	Included	M2 Option	M4 Option	20 years	20 years
1000 A - 1200 A	125 kA	X	X	X	SL3	SL3-125	Included	M2 Option	M4 Option	20 years	20 years
800 A	100 kA	X	X	X	SL3	SL3-100	Included	M2 Option	M4 Option	20 years	20 years
400 A - 600 A	80 kA	X	X	X	SL3	SL3-80	Included	M2 Option	M4 Option	20 years	20 years
200 A	50 kA	X	X	X	SL3	SL3-50	Included	M2 Option	M4 Option	20 years	20 years
3000 A (& above)	300 kA		X	X	TG3	TG3-300	Included	M2 Option	M4 Option	15 years	20 years
2500 A	250 kA		X	X	TG3	TG3-250	Included	M2 Option	M4 Option	15 years	20 years
2000 A	200 kA		X	X	TG3	TG3-200	Included	M2 Option	M4 Option	15 years	20 years
1600 A	150 kA		X	X	TG3	TG3-150	Included	M2 Option	M4 Option	15 years	20 years
1000 A - 1200 A	125 kA		X	X	TG3	TG3-125	Included	M2 Option	M4 Option	15 years	20 years
800 A	100 kA		X	X	TG3	TG3-100	Included	M2 Option	M4 Option	15 years	20 years
400 A - 600 A	80 kA		X	X	TG3	TG3-80	Included	M2 Option	M4 Option	15 years	20 years
200 A	50 kA		X	X	TG3	TG3-50	Included	M2 Option	M4 Option	15 years	20 years
2000 A	200 kA		X	X	PX3	PX3-200	Included	M2 Option	M4 Option	15 years	20 years
1600 A	150 kA		X	X	PX3	PX3-150	Included	M2 Option	M4 Option	15 years	20 years
1000 A - 1200 A	125 kA		X	X	PX3	PX3-125	Included	M2 Option	M4 Option	15 years	20 years
800 A	100 kA		X	X	PX3	PX3-100	Included	M2 Option	M4 Option	15 years	20 years
400 A - 600 A	80 kA		X	X	PX3	PX3-80	Included	M2 Option	M4 Option	15 years	20 years
200 A	50 kA		X	X	PX3	PX3-50	Included	M2 Option	M4 Option	15 years	20 years
2000 A (& above)	200 kA			X	CG Plus	CGP-200	Included	Included	N/A	15 years	20 years
1600 A	150 kA			X	CG Plus	CGP-150	Included	Included	N/A	15 years	20 years
1000 A - 1200 A	120 kA			X	CG Plus	CGP-120	Included	Included	N/A	15 years	20 years
800 A	100 kA			X	CG Plus	CGP-100	Included	Included	N/A	15 years	20 years
600 A	80 kA			X	CG Plus	CGP-80	Included	Included	N/A	15 years	20 years
400 A	60 kA			X	CG Plus	CGP-60	Included	Included	N/A	15 years	20 years
2000 A (& above)	200 kA			X	CG	CG-200	Included	N/A	N/A	10 years	20 years
1600 A	150 kA			X	CG	CG-150	Included	N/A	N/A	10 years	20 years
1000 A - 1200 A	120 kA			X	CG	CG-120	Included	N/A	N/A	10 years	20 years
800 A	100 kA			X	CG	CG-100	Included	N/A	N/A	10 years	20 years
600 A	80 kA			X	CG	CG-80	Included	N/A	N/A	10 years	20 years
400 A	60 kA			X	CG	CG-60	Included	N/A	N/A	10 years	20 years
200 A	40 kA			X	CG	CG-40	Included	N/A	N/A	10 years	20 years

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Tab 2

Current Technology

Surge Protection

Main Panel/SES

(SL3 Series) Temporary Overvoltage Protection (TOP) SPD

1 Page Application Guide: Line Side of the Main Breaker (Direct Bus Connection)

1 Page Application Guide: Load Side of the Main Breaker (Connection Thru a Breaker)

1 Page Application Guide: No CB Available or 6-Throw Rule (Direct Bus Connection)

1 Page Product Number Configuration Guide

1 Page Monitoring System Selection Guide

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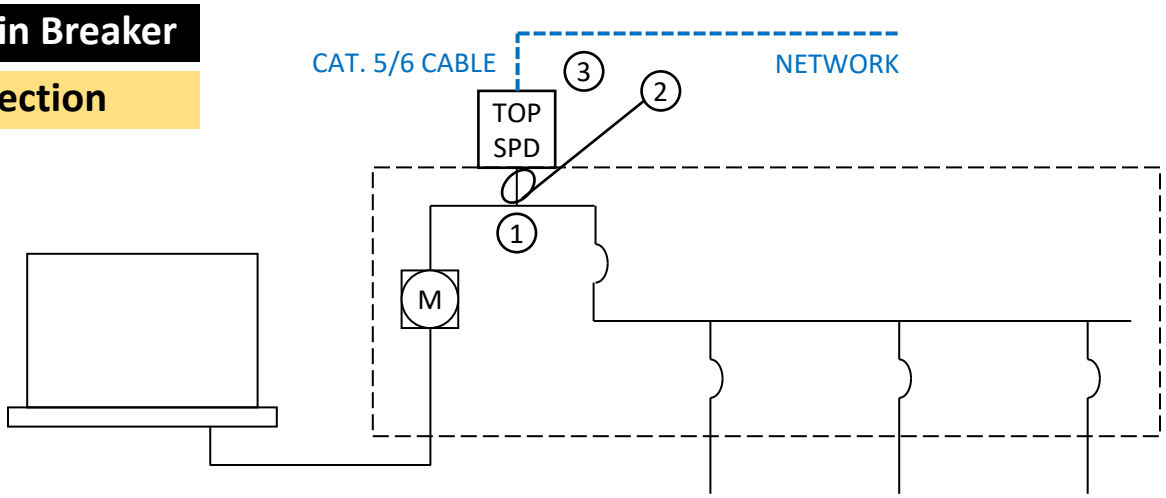
Select (SL3) for Temporary Overvoltage Protection (TOP) SPD for Main Panel/SES

Line Side of the Main Breaker

Direct Bus Connection



SHEET NOTES

1. SWITCHGEAR MANUFACTURER TO INSTALL #2 AWG TAP LUGS.
2. FOR SES 1000 A - 3000 A, USE 4 #2 AWG & 1 #2 AWG GROUND.
3. TEMPORARY OVERVOLTAGE PROTECTION SPD EXTERNALLY MOUNTED IN NEMA 4/12 ENCLOSURE WITH INTEGRAL DISCONNECT SWITCH. 20 YEAR WARRANTY.
   UL 1449 4TH EDITION LISTED, TYPE 1. $I_{NOMINAL}$ = 20 KA, MCOV AT LEAST 115% OF NOMINAL.
   TESTED PERFORMANCE PER MODE SHALL BE AS FOLLOWS.
   SURGE CURRENT CAPACITY: (Insert from Column A below).
   REPETITIVE IMPULSE CAPACITY: (Insert from Column B below).
   SUBMIT TESTING DOCUMENTATION: OVERVOLTAGE PROTECTION, SURGE CURRENT CAPACITY AND REPETITIVE IMPULSE CAPACITY.
   NETWORK-BASED MONITORING SYSTEM. STATUS, PERFORMANCE AND POWER QUALITY MONITORING THROUGH THE FACILITY'S NETWORK VIA A WEBSERVER. NO SOFTWARE IS REQUIRED.
   AFTER INSTALLATION, USE A PORTABLE SURGE GENERATOR/TEST SET TO CONFIRM THE OPERATILITY OF ALL SPD COMPONENTS AND THE PRESENCE OF A NEUTRAL-TO-GROUND BOND. MEASURE AND RECORD ALL LET-THRU VOLTAGES AND SUBMIT THE REPORT TO THE ENGINEER.
   CURRENT TECHNOLOGY MODEL (Insert from chart below).

Product Application		
Service Entrance Current Rating	**Surge Current Capacity per Mode (x2 per Phase)**	
	Single Service Entrance	**Multiple Service Entrances***
3000 A (and Above)	300 kA	200 kA
2500 A	250 kA	200 kA
2000 A	200 kA	150 kA
1600 A	150 kA	125 kA
1000 A - 1200 A	125 kA	125 kA

*** Multiple Service Entrances to be understood as one feed from a utility substation feeding multiple (i.e., more than one) utility transformers and/or utility meters for their respective Service Entrance sections.**

Application Specific Performance and Model Numbers			
COLUMN A	**COLUMN B**	**480Y/277 V Systems**	**208Y/120 V Systems**
Surge Current Capacity per Mode (x2 per phase)	Repetitive Impulse Capacity per Mode	Type 1 Direct Bus Connection	Type 1 Direct Bus Connection
300 KA	17,000	SL3-300-480-3Y-MDB-M4E	SL3-300-208-3Y-MDB-M4E
250 KA	16,000	SL3-250-480-3Y-MDB-M4E	SL3-250-208-3Y-MDB-M4E
200 KA	15,000	SL3-200-480-3Y-MDB-M4E	SL3-200-208-3Y-MDB-M4E
150 KA	14,500	SL3-150-480-3Y-MDB-M4E	SL3-150-208-3Y-MDB-M4E
125 KA	14,000	SL3-125-480-3Y-MDB-M4E	SL3-125-208-3Y-MDB-M4E
For other voltage configurations and options, see the SL3 Series Product Configuration Guide			

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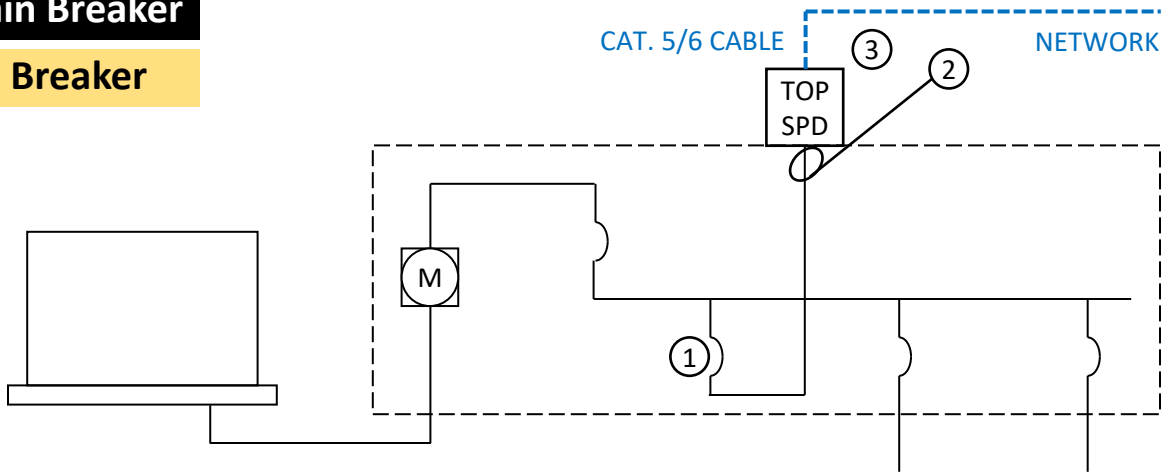
Select (SL3) for Temporary Overvoltage Protection (TOP) SPD for Main Panel/SES

Load Side of the Main Breaker

Connection Thru a Breaker



SHEET NOTES

1. FOR SES 1000 A - 3000 A, USE 100 A/3P BREAKER.
   FOR SES 200 A - 800 A, USE 60 A/3P BREAKER.

2. FOR SES 1000 A - 3000 A, USE 4 #2 AWG & 1 #2 AWG GROUND.
   FOR SES 200 A - 800 A, USE CURRENT TECHNOLOGY HPI-6Y.

3. TEMPORARY OVERVOLTAGE PROTECTION SPD EXTERNALLY MOUNTED IN NEMA 4/12 ENCLOSURE WITH INTEGRAL DISCONNECT SWITCH. 20 YEAR WARRANTY.
   UL 1449 4TH EDITION LISTED, TYPE 1. $I_{NOMINAL}$ = 20 KA, MCOV AT LEAST 115% OF NOMINAL.
   TESTED PERFORMANCE PER MODE SHALL BE AS FOLLOWS. SURGE CURRENT CAPACITY: (Insert from Column A below).
   REPETITIVE IMPULSE CAPACITY: (Insert from Column B below).
   SUBMIT TESTING DOCUMENTATION: OVERVOLTAGE PROTECTION, SURGE CURRENT CAPACITY AND REPETITIVE IMPULSE CAPACITY.
   NETWORK-BASED MONITORING SYSTEM. STATUS, PERFORMANCE AND POWER QUALITY MONITORING THROUGH THE FACILITY'S NETWORK VIA A WEBSERVER. NO SOFTWARE IS REQUIRED.
   AFTER INSTALLATION, USE A PORTABLE SURGE GENERATOR/TEST SET TO CONFIRM THE OPERATILITY OF ALL SPD COMPONENTS AND THE PRESENCE OF A NEUTRAL-TO-GROUND BOND. MEASURE AND RECORD ALL LET-THRU VOLTAGES AND SUBMIT THE REPORT TO THE ENGINEER.
   CURRENT TECHNOLOGY MODEL (Insert from chart below).

Product Application		
Service Entrance Current Rating	**Surge Current Capacity per Mode (x2 per Phase)**	
	Single Service Entrance	**Multiple Service Entrances***
3000 A (and Above)	300 kA	200 kA
2500 A	250 kA	200 kA
2000 A	200 kA	150 kA
1600 A	150 kA	125 kA
1000 A - 1200 A	125 kA	125 kA
800 A	100 kA	80 kA
400 A - 600 A	80 kA	50 kA
200 A	50 kA	50 kA

*** Multiple Service Entrances to be understood as one feed from a utility substation feeding multiple (i.e., more than one) utility transformers and/or utility meters for their respective Service Entrance sections.**

Application Specific Performance and Model Numbers

COLUMN A	COLUMN B	480Y/277 V Systems	208Y/120 V Systems
Surge Current Capacity per Mode (x2 per phase)	Repetitive Impulse Capacity per Mode	Type 1 Direct Bus Connection	Type 1 Direct Bus Connection
300 KA	17,000	SL3-300-480-3Y-MDB-M4E-F	SL3-300-208-3Y-MDB-M4E-F
250 KA	16,000	SL3-250-480-3Y-MDB-M4E-F	SL3-250-208-3Y-MDB-M4E-F
200 KA	15,000	SL3-200-480-3Y-MDB-M4E-F	SL3-200-208-3Y-MDB-M4E-F
150 KA	14,500	SL3-150-480-3Y-MDB-M4E-F	SL3-150-208-3Y-MDB-M4E-F
125 KA	14,000	SL3-125-480-3Y-MDB-M4E-F	SL3-125-208-3Y-MDB-M4E-F
100 KA	14,000	SL3-100-480-3Y-MNB-M4E-F	SL3-100-208-3Y-MNB-M4E-F
80 KA	12,000	SL3-080-480-3Y-MNB-M4E-F	SL3-080-208-3Y-MNB-M4E-F
50 KA	10,000	SL3-050-480-3Y-MNB-M4E-F	SL3-050-208-3Y-MNB-M4E-F

For other voltage configurations and options, see the SL3 Series Product Configuration Guide

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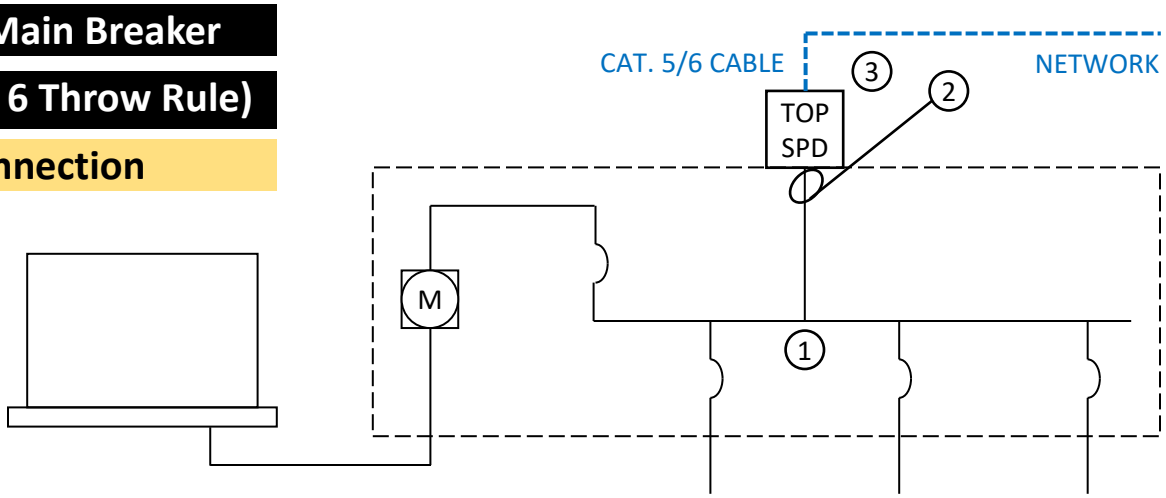
Select (SL3) for Temporary Overvoltage Protection (TOP) SPD for Main Panel/SES

Load Side of the Main Breaker

(No CB Available or 6 Throw Rule)

Direct Bus Connection



SHEET NOTES

1. SWITCHGEAR MANUFACTURER TO INSTALL #2 AWG TAP LUGS.
2. FOR SES 1000 A - 3000 A, USE 4 #2 AWG & 1 #2 AWG GROUND.
3. TEMPORARY OVERVOLTAGE PROTECTION SPD EXTERNALLY MOUNTED IN NEMA 4/12 ENCLOSURE WITH INTEGRAL DISCONNECT SWITCH. 20 YEAR WARRANTY.
   UL 1449 4TH EDITION LISTED, TYPE 1. $I_{NOMINAL}$ = 20 KA, MCOV AT LEAST 115% OF NOMINAL.
   TESTED PERFORMANCE PER MODE SHALL BE AS FOLLOWS.
   SURGE CURRENT CAPACITY: (Insert from Column A below).
   REPETITIVE IMPULSE CAPACITY: (Insert from Column B below).
   SUBMIT TESTING DOCUMENTATION: OVERVOLTAGE PROTECTION, SURGE CURRENT CAPACITY AND REPETITIVE IMPULSE CAPACITY.
   NETWORK-BASED MONITORING SYSTEM. STATUS, PERFORMANCE AND POWER QUALITY MONITORING THROUGH THE FACILITY'S NETWORK VIA A WEBSERVER. NO SOFTWARE IS REQUIRED.
   AFTER INSTALLATION, USE A PORTABLE SURGE GENERATOR/TEST SET TO CONFIRM THE OPERATILITY OF ALL SPD COMPONENTS AND THE PRESENCE OF A NEUTRAL-TO-GROUND BOND.
   MEASURE AND RECORD ALL LET-THRU VOLTAGES AND SUBMIT THE REPORT TO THE ENGINEER.
   CURRENT TECHNOLOGY MODEL (Insert from chart below).

Product Application		
Service Entrance Current Rating	**Surge Current Capacity per Mode (x2 per Phase)**	
	Single Service Entrance	**Multiple Service Entrances***
3000 A (and Above)	300 kA	200 kA
2500 A	250 kA	200 kA
2000 A	200 kA	150 kA
1600 A	150 kA	125 kA
1000 A - 1200 A	125 kA	125 kA

*** Multiple Service Entrances to be understood as one feed from a utility substation feeding multiple (i.e., more than one) utility transformers and/or utility meters for their respective Service Entrance sections.**

Application Specific Performance and Model Numbers

COLUMN A	COLUMN B	480Y/277 V Systems	208Y/120 V Systems
Surge Current Capacity per Mode (x2 per phase)	Repetitive Impulse Capacity per Mode	Type 1 Direct Bus Connection	Type 1 Direct Bus Connection
300 KA	17,000	SL3-300-480-3Y-MDB-M4E	SL3-300-208-3Y-MDB-M4E
250 KA	16,000	SL3-250-480-3Y-MDB-M4E	SL3-250-208-3Y-MDB-M4E
200 KA	15,000	SL3-200-480-3Y-MDB-M4E	SL3-200-208-3Y-MDB-M4E
150 KA	14,500	SL3-150-480-3Y-MDB-M4E	SL3-150-208-3Y-MDB-M4E
125 KA	14,000	SL3-125-480-3Y-MDB-M4E	SL3-125-208-3Y-MDB-M4E

For other voltage configurations and options, see the SL3 Series Product Configuration Guide

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SL3 Series

Temporary Overvoltage Protection (TOP) SPD For Main Panel/SES

Product Configuration Guide

Product Number Example:

S	L	3	-	2	0	0	-	4	8	0	-	3	Y	-	M	D	T	-	M	6	-	F	-	2

Product Series				Surge Current Rating				Voltage				Configuration			Enclosure		Feed		Monitoring			Filtering		Options
			-				-				-			-				-			-		-	

Product Series

"SL3" Select

Surge Current Rating

(per Mode rating is given. X2 for per Phase rating)

"050"*	50 kA
"080"*	80 kA
"100"*	100 kA
"125"	125 kA
"150"	150 kA
"200"	200 kA
"250"	250 kA
"300"	300 kA

* not available with disconnect

Voltage

"600"	600 V
"480"	480 V
"380"	380 V
"240"	240 V
"208"	208 V

Configuration

(All Systems Grounded)

"2G"	2 Ph., Split Phase
"3D"	3 Ph., Delta
"3Y"	3 Ph., Wye
"3H"	3 Ph., High Leg Delta
"3R"	3 Ph., High Resistance Ground

Enclosure

"MN"	Metal, No Disconnect
"MD"	Metal, With Disconnect
"SN"	Stainless Steel, No Disconnect
"SD"	Stainless Steel, With Disconnect

Feed

"T"	Top
"B"	Bottom

Monitoring

(See Monitoring Options sheet for illustrations)

"M0"	No Monitoring
"M1"	Visual, Audible Alarm, FCC
"M2"	M1 plus Surge Counter
"M3"	Advanced Monitoring, Graphics Display, ModBus RTU
"M4"	M3 plus Ethernet & Modbus TCP
"M5"	M3 plus Larger, Enhanced Display
"M6"	M5 plus Ethernet & Modbus TCP

Filtering

"F"	Type 2 Location
"N"	Type 1 Location

Options

"2"	Test Port
"4"	Large Selenium Cells (SL3)
"5"	Locking Cams

Blank Otherwise.

Dimensions				
SL3	50-100:	16"h x 16"w x	9.20"d	42 lbs.
SL3	125-300:	32"h x 22"w x	11.95"d	85 lbs.

Standard Enclosure: NEMA 4/12

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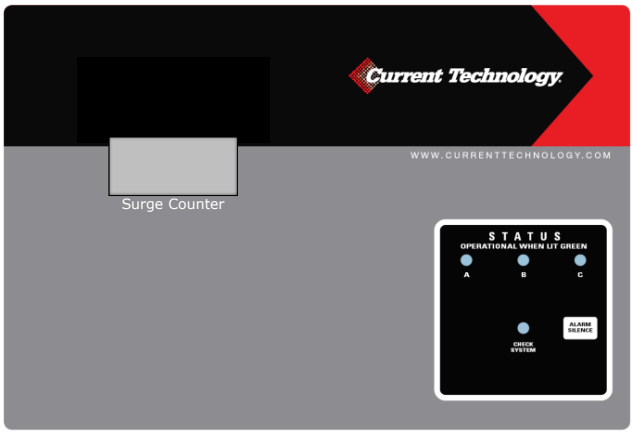
Current Technology Monitoring Options

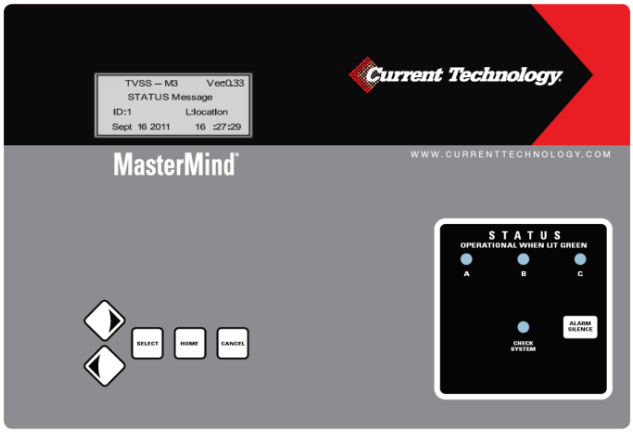
For SL3, TG3, PX3 (Thermally Protected MOV-Based) Series

M1: **Tri-Colored LED Indication per phase**
- **Green = 75% protection or greater**
- **Orange = 75% - 40%**
- **Red = 40% or less**
- **Extinguished = Loss of protection**

Audible alarm with alarm silence switch
2 sets of dry relay contacts



M2: **Includes all M1 monitoring features plus Surge Counter**



M3: **Includes all M1 monitoring features plus Tracking and Recording (User settable thresholds): Time/Date Stamp, Duration and Magnitude for Sags, Swells , Surges, Dropouts, Outages and THD , Frequency and Volts RMS anomalies**
Numerical indication of % protection remaining
Local character display
ModBus remote communications

M4: **All M3 monitoring features plus Ethernet connectivity w/ Webserver (No software needed)**

M5: **Includes all M1 monitoring features plus Tracking and Recording (User settable thresholds): Time/Date Stamp, Duration and Magnitude for Sags, Swells , Surges, Dropouts, Outages and THD , Frequency and Volts RMS anomalies**
Numerical indication of % protection remaining
Large graphical display
ModBus remote communications

M6: **All M5 monitoring features plus Ethernet connectivity w/ Webserver (No software needed)**

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Tab 3

Current Technology

Surge Protection

Switchboards & Panelboards

(TG3 Series) Protection Device-Thermally Protected MOVs

1 Page Application Guide: Load Side of the Main Breaker (Connection Thru a Breaker)

1 Page Application Guide: No CB Available or 6-Throw Rule (Direct Bus Connection)

1 Page Product Number Configuration Guide

1 Page Monitoring System Selection Guide

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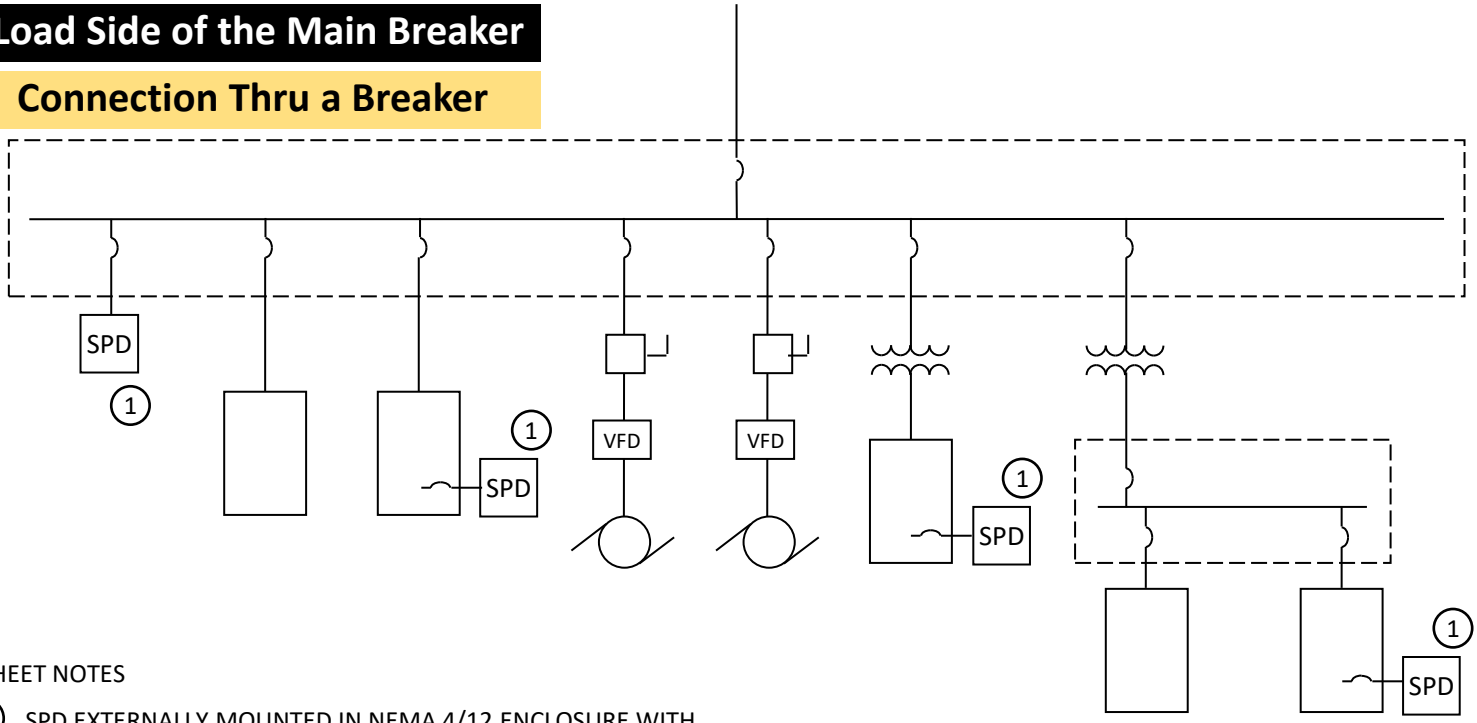
TransGuard (TG3) SPD for Switchboards & Panelboards

Load Side of the Main Breaker

Connection Thru a Breaker



SHEET NOTES

(1) SPD EXTERNALLY MOUNTED IN NEMA 4/12 ENCLOSURE WITH INTEGRAL DISCONNECT SWITCH. 15 YEAR WARRANTY.
UL 1449 4TH EDITION LISTED, TYPE 1. $I_{NOMINAL}$ = 20 KA, MCOV AT LEAST 115% OF NOMINAL.
TESTED PERFORMANCE PER MODE SHALL BE AS FOLLOWS. SURGE CURRENT CAPACITY: (Insert from Column A below).
REPETITIVE IMPULSE CAPACITY: (Insert from Column B below).
SUBMIT TESTING DOCUMENTATION: SURGE CURRENT CAPACITY AND REPETITIVE IMPULSE CAPACITY.
NETWORK-BASED MONITORING SYSTEM. STATUS, PERFORMANCE AND POWER QUALITY MONITORING THROUGH THE FACILITY'S NETWORK VIA A WEBSERVER. NO SOFTWARE IS REQUIRED.
AFTER INSTALLATION, USE A PORTABLE SURGE GENERATOR/TEST SET TO CONFIRM THE OPERATILITY OF ALL SPD COMPONENTS AND THE PRESENCE OF A NEUTRAL-TO-GROUND BOND. MEASURE AND RECORD ALL LET-THRU VOLTAGES AND SUBMIT THE REPORT TO THE ENGINEER.
CURRENT TECHNOLOGY MODEL (Insert from chart below).
FOR PANEL 1000 A - 3000 A, FEED SPD WITH A 100 A/3P BREAKER.
FOR PANEL 200 A - 800 A, FEED SPD WITH A 60 A/3P BREAKER.
FOR PANEL 1000 A - 3000 A, USE 4 #2 AWG & 1 #2 AWG GROUND.
FOR PANEL 200 A - 800 A, USE CURRENT TECHNOLOGY HPI-6Y.

Product Application		
Source Current Rating	Surge Current Capacity per Mode (x2 per Phase)	
	No Upstream SPD	With Upstream SPD
3000 A (and Above)	300 kA	150 kA
2500 A	250 kA	125 kA
2000 A	200 kA	100 kA
1600 A	150 kA	80 kA
1000 A - 1200 A	125 kA	180 kA
800 A	100 kA	50 kA
400 A - 600 A	80 kA	50 kA
200 A	50 kA	50 kA

Application Specific Performance and Model Numbers

COLUMN A	COLUMN B	480Y/277 V Systems	208Y/120 V Systems
Surge Current Capacity per Mode (x2 per phase)	Repetitive Impulse Capacity per Mode	Type 1 Direct Bus Connection	Type 1 Direct Bus Connection
300 KA	11,000	TG3-300-480-3Y-MDB-M4-F	TG3-300-208-3Y-MDB-M4-F
250 KA	10,000	TG3-250-480-3Y-MDB-M4-F	TG3-250-208-3Y-MDB-M4-F
200 KA	9,000	TG3-200-480-3Y-MDB-M4-F	TG3-200-208-3Y-MDB-M4-F
150 KA	8,000	TG3-150-480-3Y-MDB-M4-F	TG3-150-208-3Y-MDB-M4-F
125 KA	7,500	TG3-125-480-3Y-MDB-M4-F	TG3-125-208-3Y-MDB-M4-F
100 KA	7,000	TG3-100-480-3Y-MDB-M4-F	TG3-100-208-3Y-MDB-M4-F
80 KA	6,000	TG3-080-480-3Y-MDB-M4-F	TG3-080-208-3Y-MDB-M4-F
50 KA	5,000	TG3-050-480-3Y-MDB-M4-F	TG3-050-208-3Y-MDB-M4-F

For other voltage configurations and options, see the TG3 Series Product Configuration Guide

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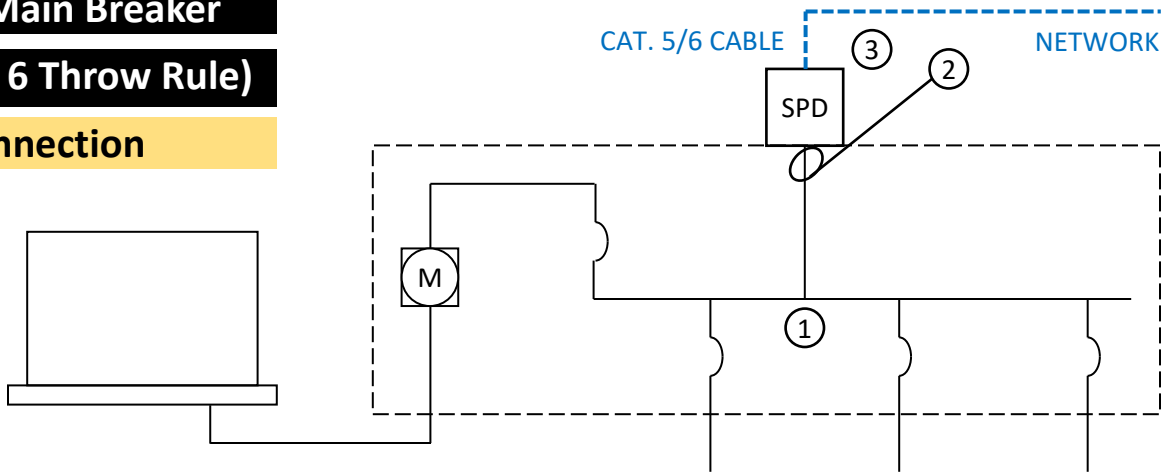
TransGuard (TG3) SPD for Switchboards & Panelboards

Load Side of the Main Breaker

(No CB Available or 6 Throw Rule)

Direct Bus Connection



SHEET NOTES

1. SWITCHGEAR MANUFACTURER TO INSTALL TAP LUGS AS FOLLOWS:
   FOR PANEL 1000 A - 3000 A, INSTALL #2 AWG TAP LUGS.
   FOR PANEL 200 A - 800 A, INSTALL #6 AWG TAP LUGS.
2. FOR PANEL 1000 A - 3000 A, USE 4 #2 AWG & 1 #2 AWG GROUND.
   FOR PANEL 200 A - 800 A, USE CURRENT TECHNOLOGY HPI-6Y.
3. SURGE PROTECTION DEVICE EXTERNALLY MOUNTED IN NEMA 4/12 ENCLOSURE WITH INTEGRAL DISCONNECT SWITCH. 15 YEAR WARRANTY.
   UL 1449 4TH EDITION LISTED, TYPE 1. $I_{NOMINAL}$ = 20 KA, MCOV AT LEAST 115% OF NOMINAL.
   TESTED PERFORMANCE PER MODE SHALL BE AS FOLLOWS. SURGE CURRENT CAPACITY: (Insert from Column A below).
   REPETITIVE IMPULSE CAPACITY: (Insert from Column B below).
   SUBMIT TESTING DOCUMENTATION: SURGE CURRENT CAPACITY AND REPETITIVE IMPULSE CAPACITY.
   NETWORK-BASED MONITORING SYSTEM. STATUS, PERFORMANCE AND POWER QUALITY MONITORING THROUGH THE FACILITY'S NETWORK VIA A WEBSERVER. NO SOFTWARE IS REQUIRED.
   AFTER INSTALLATION, USE A PORTABLE SURGE GENERATOR/TEST SET TO CONFIRM THE OPERATILITY OF ALL SPD COMPONENTS AND THE PRESENCE OF A NEUTRAL-TO-GROUND BOND. MEASURE AND RECORD ALL LET-THRU VOLTAGES AND SUBMIT THE REPORT TO THE ENGINEER.
   CURRENT TECHNOLOGY MODEL (Insert from chart below).

Product Application		
Source Current Rating	Surge Current Capacity per Mode (x2 per Phase)	
	Single Service Entrance	Multiple Service Entrances*
3000 A (and Above)	300 kA	200 kA
2500 A	250 kA	200 kA
2000 A	200 kA	150 kA
1600 A	150 kA	125 kA
1000 A - 1200 A	125 kA	125 kA
800 A	100 kA	80 kA
400 A - 600 A	80 kA	50 kA
200 A	50 kA	50 kA

* Multiple Service Entrances to be understood as one feed from a utility substation feeding multiple (i.e., more than one) utility transformers and/or utility meters for their respective Service Entrance sections.

Application Specific Performance and Model Numbers

COLUMN A	COLUMN B	480Y/277 V Systems	208Y/120 V Systems
Surge Current Capacity per Mode (x2 per phase)	Repetitive Impulse Capacity per Mode	Type 1 Direct Bus Connection	Type 1 Direct Bus Connection
300 KA	11,000	TG3-300-480-3Y-MDB-M4E-F	TG3-300-208-3Y-MDB-M4E-F
250 KA	10,000	TG3-250-480-3Y-MDB-M4E-F	TG3-250-208-3Y-MDB-M4E-F
200 KA	9,000	TG3-200-480-3Y-MDB-M4E-F	TG3-200-208-3Y-MDB-M4E-F
150 KA	8,000	TG3-150-480-3Y-MDB-M4E-F	TG3-150-208-3Y-MDB-M4E-F
125 KA	7,500	TG3-125-480-3Y-MDB-M4E-F	TG3-125-208-3Y-MDB-M4E-F
100 KA	7,000	TG3-100-480-3Y-MNB-M4E-F	TG3-100-208-3Y-MNB-M4E-F
80 KA	6,000	TG3-080-480-3Y-MNB-M4E-F	TG3-080-208-3Y-MNB-M4E-F
50 KA	5,000	TG3-050-480-3Y-MNB-M4E-F	TG3-050-208-3Y-MNB-M4E-F

For other voltage configurations and options, see the TG3 Series Product Configuration Guide

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TG3 Series

SPD with Thermally Protected MOVs for Switchboards & Panelboards

Product Configuration Guide

Product Number Example:

T	G	3	-	0	8	0	-	2	0	8	-	3	Y	-	P	N	B	-	M	4	-	F	-	2

Product Series			-	Surge Current Rating			-	Voltage			-	Configuration		-	Enclosure		Feed	-	Monitoring		-	Filtering	-	Options

Product Series

"TG3" Select

Surge Current Rating

(per Mode rating is given. X2 for per Phase rating)

"050"*	50 kA
"080"*	80 kA
"100"*	100 kA
"125"	125 kA
"150"	150 kA
"200"	200 kA
"250"	250 kA
"300"	300 kA

* not available with disconnect

Voltage

"600"	600 V
"480"	480 V
"380"	380 V
"240"	240 V
"208"	208 V

Configuration

(All Systems Grounded)

"2G"	2 Ph., Split Phase
"3D"	3 Ph., Delta
"3Y"	3 Ph., Wye
"3H"	3 Ph., High Leg Delta
"3R"	3 Ph., High Resistance Ground

Enclosure

"MN"	Metal, No Disconnect
"MD"	Metal, With Disconnect
"PN'	Plastic, No Disconnect
"SN"	Stainless Steel, No Disconnect
"SD"	Stainless Steel, With Disconnect

Feed

"T"	Top
"B"	Bottom

Monitoring

(See Monitoring Options sheet for illustrations)

"M0"	No Monitoring
"M1"	Visual, Audible Alarm, FCC
"M2"	M1 plus Surge Counter
"M3"	Advanced Monitoring, Graphics Display, ModBus RTU
"M4"	M3 plus Ethernet & Modbus TCP
"M5"	M3 plus Larger, Enhanced Display
"M6"	M5 plus Ethernet & Modbus TCP

Filtering

"F"	Type 2 Location
"N"	Type 1 Location

Options

"2"	Test Port
"5"	Locking Cams

Blank Otherwise.

Dimensions

	Metal Enclosure	Plastic Enclosure
TG3 50-100:	16"h x 16"w x 9.20"d 41 lbs.	14.00"h x 12.75"w x 6.7"d 18 lbs.
TG3 125-300:	24"h x 16"w x 9.20"d 50 lbs.	16.75"h x 14.75"w x 6.7"d 24 lbs.

Standard Enclosure: NEMA 4/12

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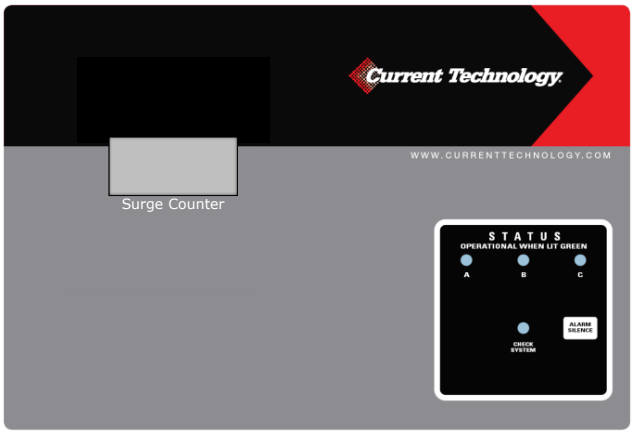
Current Technology Monitoring Options

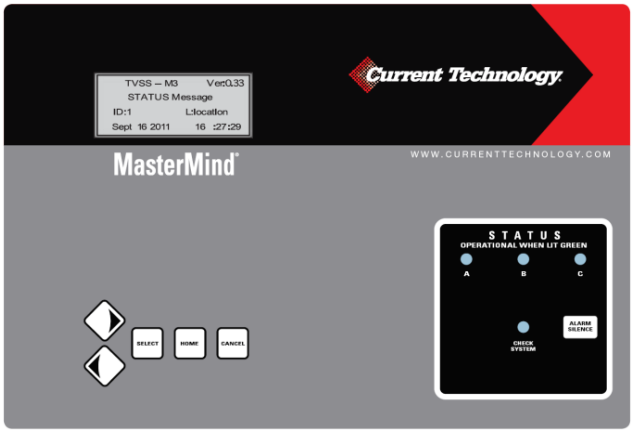
For SL3, TG3, PX3 (Thermally Protected MOV-Based) Series

M1: **Tri-Colored LED Indication per phase**
- **Green = 75% protection or greater**
- **Orange = 75% - 40%**
- **Red = 40% or less**
- **Extinguished = Loss of protection**

Audible alarm with alarm silence switch
2 sets of dry relay contacts



M2: **Includes all M1 monitoring features plus Surge Counter**



M3: **Includes all M1 monitoring features plus Tracking and Recording (User settable thresholds): Time/Date Stamp, Duration and Magnitude for Sags, Swells , Surges, Dropouts, Outages and THD , Frequency and Volts RMS anomalies**
Numerical indication of % protection remaining
Local character display
ModBus remote communications

M4: **All M3 monitoring features plus Ethernet connectivity w/ Webserver (No software needed)**

M5: **Includes all M1 monitoring features plus Tracking and Recording (User settable thresholds): Time/Date Stamp, Duration and Magnitude for Sags, Swells , Surges, Dropouts, Outages and THD , Frequency and Volts RMS anomalies**
Numerical indication of % protection remaining
Large graphical display
ModBus remote communications

M6: **All M5 monitoring features plus Ethernet connectivity w/ Webserver (No software needed)**

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Tab 4

Current Technology

Surge Protection

Panel Extensions

(PX3 Series) Panelboard Application

1 Page Application Guide: (Connection Thru a Breaker)

1 Page Product Number Configuration Guide

1 Page Monitoring System Selection Guide

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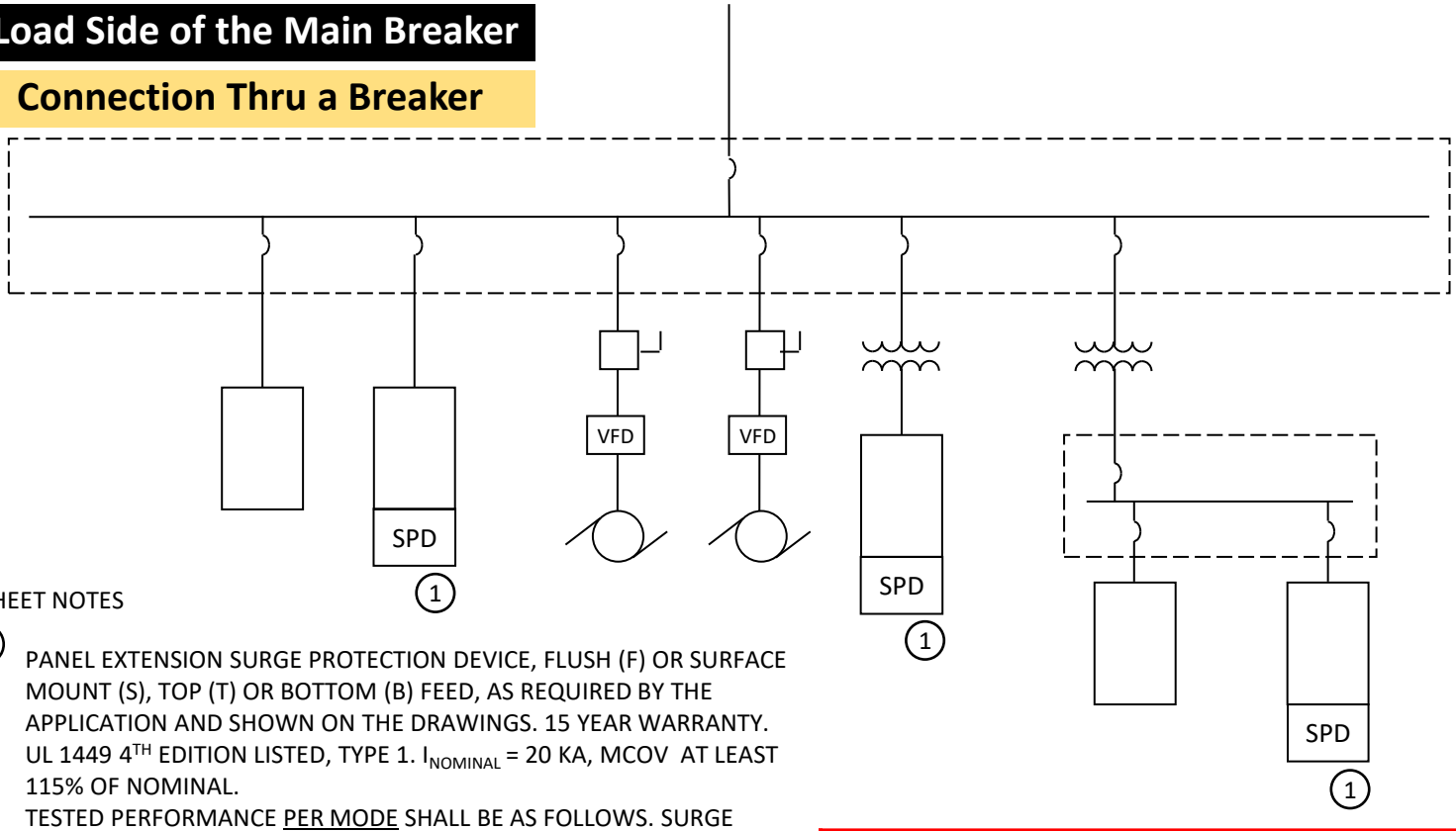
Panel Extension (PX3) SPD for Panelboards

Load Side of the Main Breaker

Connection Thru a Breaker



SHEET NOTES

(1) PANEL EXTENSION SURGE PROTECTION DEVICE, FLUSH (F) OR SURFACE MOUNT (S), TOP (T) OR BOTTOM (B) FEED, AS REQUIRED BY THE APPLICATION AND SHOWN ON THE DRAWINGS. 15 YEAR WARRANTY. UL 1449 4TH EDITION LISTED, TYPE 1. $I_{NOMINAL}$ = 20 KA, MCOV AT LEAST 115% OF NOMINAL.
TESTED PERFORMANCE PER MODE SHALL BE AS FOLLOWS. SURGE CURRENT CAPACITY: (Insert from Column A below).
REPETITIVE IMPULSE CAPACITY: (Insert from Column B below).
SUBMIT TESTING DOCUMENTATION: SURGE CURRENT CAPACITY AND REPETITIVE IMPULSE CAPACITY.
NETWORK-BASED MONITORING SYSTEM. STATUS, PERFORMANCE AND POWER QUALITY MONITORING THROUGH THE FACILITY'S NETWORK VIA A WEBSERVER. NO SOFTWARE IS REQUIRED.
AFTER INSTALLATION, USE A PORTABLE SURGE GENERATOR/TEST SET TO CONFIRM THE OPERATILITY OF ALL SPD COMPONENTS AND THE PRESENCE OF A NEUTRAL-TO-GROUND BOND. MEASURE AND RECORD ALL LET-THRU VOLTAGES AND SUBMIT THE REPORT TO THE ENGINEER.
CURRENT TECHNOLOGY MODEL (Insert from chart below).
FOR PANEL 1000 A - 2000 A, FEED SPD WITH A 100 A/3P BREAKER.
FOR PANEL 200 A - 800 A, FEED SPD WITH A 60 A/3P BREAKER.
FOR PANEL 1000 A - 2000 A, USE 4 #2 AWG & 1 #2 AWG GROUND.
FOR PANEL 200 A - 800 A, USE CURRENT TECHNOLOGY HPI-6Y.

Product Application		
Source Current Rating	Surge Current Capacity per Mode (x2 per Phase)	
	No Upstream SPD	With Upstream SPD
2000 A	200 kA	100 kA
1600 A	150 kA	80 kA
1000 A - 1200 A	125 kA	180 kA
800 A	100 kA	50 kA
400 A - 600 A	80 kA	50 kA
200 A	50 kA	50 kA

Application Specific Performance and Model Numbers

COLUMN A	COLUMN B	480Y/277 V Systems	208Y/120 V Systems
Surge Current Capacity per Mode (x2 per phase)	Repetitive Impulse Capacity per Mode	Type 2 Connection Thru Breaker	Type 2 Connection Thru Breaker
200 KA	9,000	PX3-200-480-3Y-M(F or S)(T or B)-M4-F	PX3-200-208-3Y-M(F or S)(T or B)-M4-F
150 KA	8,000	PX3-150-480-3Y-M(F or S)(T or B)-M4-F	PX3-150-208-3Y-M(F or S)(T or B)-M4-F
125 KA	7,500	PX3-125-480-3Y-M(F or S)(T or B)-M4-F	PX3-125-208-3Y-M(F or S)(T or B)-M4-F
100 KA	7,000	PX3-100-480-3Y-M(F or S)(T or B)-M4-F	PX3-100-208-3Y-M(F or S)(T or B)-M4-F
80 KA	6,000	PX3-080-480-3Y-M(F or S)(T or B)-M4-F	PX3-080-208-3Y-M(F or S)(T or B)-M4-F
50 KA	5,000	PX3-050-480-3Y-M(F or S)(T or B)-M4-F	PX3-050-208-3Y-M(F or S)(T or B)-M4-F

For other voltage configurations and options, see the PX3 Series Product Configuration Guide

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PX3 Series

Panel Extension SPD with Thermally Protected MOVs for Panelboards

Product Configuration Guide

Product Number Example:

P	X	3	-	1	0	0	-	2	0	8	-	3	Y	-	M	S	T	-	M	4	-	F	-	6

Product Series				Surge Current Rating				Voltage				Configuration			Enclosure		Feed		Monitoring			Filtering		Options
			-				-				-			-				-			-		-	

Product Series

"PX3" Select

Surge Current Rating

(per Mode rating is given. X2 for per Phase rating)

"050"	50 kA
"080"	80 kA
"100"	100 kA
"125"	125 kA
"150"	150 kA
"200"	200 kA

Voltage

"600"	600 V
"480"	480 V
"380"	380 V
"240"	240 V
"208"	208 V

Configuration

(All Systems Grounded)

"2G"	2 Ph., Split Phase
"3D"	3 Ph., Delta
"3Y"	3 Ph., Wye
"3H"	3 Ph., High Leg Delta
"3R"	3 Ph., High Resistance Ground

Enclosure

"MFT"	Metal, Flush Mount, Top Feed
"MFB"	Metal, Flush Mount, Bottom Feed
"MST"	Metal, Surface Mount, Top Feed
"MSB"	Metal, Surface Mount, Bottom Feed
"SFT"	Stainless, Flush Mount, Top Feed
"SFB"	Stainless, Flush Mount, Bottom Feed
"SST"	Stainless, Surface Mount, Top Feed
"SSB"	Stainless, Surface Mount, Bottom Feed

Monitoring

(See Monitoring Options sheet for illustrations)

"M0"	No Monitoring
"M1"	Visual, Audible Alarm, FCC
"M2"	M1 plus Surge Counter
"M3"	Advanced Monitoring, Graphics Display, ModBus RTU
"M4"	M3 plus Ethernet & Modbus TCP
"M5"	M3 plus Larger, Enhanced Display
"M6"	M5 plus Ethernet & Modbus TCP

Filtering

"F"	Type 2 Location
"N"	Type 1 Location

Options

"1"	Panel Mounted In-House
"2"	Test Port
"4"	Full Flush Cover
"5"	GE Version
"6"	Square D Version
"7"	Siemens, Eaton Cutler-Hammer

Dimensions

	No Disconnect	With Disconnect
PX3 50-100:	9"h x 20"w x 5.75"d 18 lbs.	14"h x 20"w x 5.75"d 20 lbs.
PX3 125-200:	14"h x 20"w x 5.75"d 20 lbs.	14"h x 20"w x 5.75"d 20 lbs.

Standard Enclosure: NEMA 1

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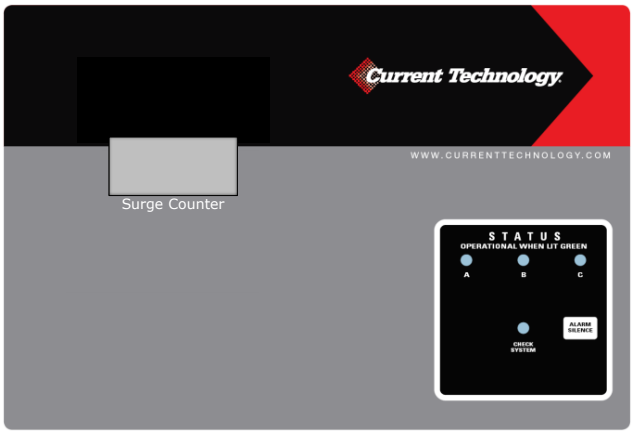
Current Technology Monitoring Options

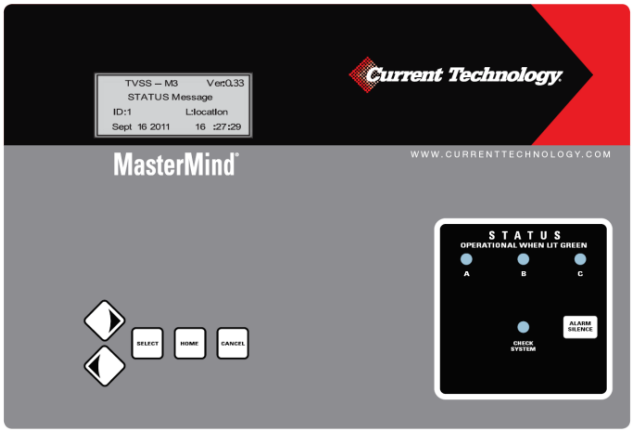
For SL3, TG3, PX3 (Thermally Protected MOV-Based) Series

M1: **Tri-Colored LED Indication per phase**
- **Green = 75% protection or greater**
- **Orange = 75% - 40%**
- **Red = 40% or less**
- **Extinguished = Loss of protection**

Audible alarm with alarm silence switch
2 sets of dry relay contacts



M2: **Includes all M1 monitoring features plus Surge Counter**



M3: **Includes all M1 monitoring features plus Tracking and Recording (User settable thresholds): Time/Date Stamp, Duration and Magnitude for Sags, Swells , Surges, Dropouts, Outages and THD , Frequency and Volts RMS anomalies**
Numerical indication of % protection remaining
Local character display
ModBus remote communications

M4: **All M3 monitoring features plus Ethernet connectivity w/ Webserver (No software needed)**

M5: **Includes all M1 monitoring features plus Tracking and Recording (User settable thresholds): Time/Date Stamp, Duration and Magnitude for Sags, Swells , Surges, Dropouts, Outages and THD , Frequency and Volts RMS anomalies**
Numerical indication of % protection remaining
Large graphical display
ModBus remote communications

M6: **All M5 monitoring features plus Ethernet connectivity w/ Webserver (No software needed)**

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Tab 5

Current Technology

Surge Protection

NEC Compliance, TI, Design Build

(CG Series) Basic SPDs

1 Page **Application Guide: (Connection Thru a Breaker)**

1 Page **Product Number Configuration Guide**

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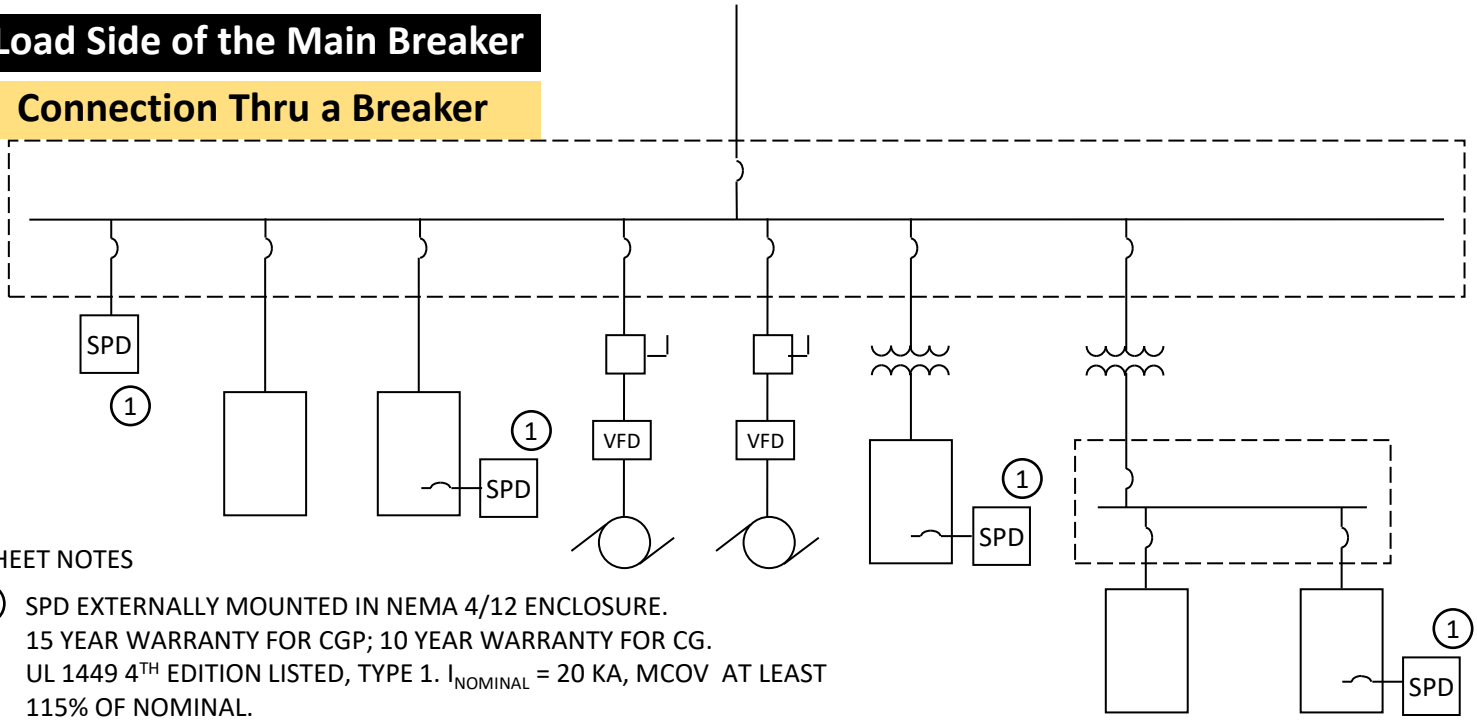
CurrentGuard (CG) SPD for Tenant Improvement, Design/Build & NEC Compliance

Load Side of the Main Breaker

Connection Thru a Breaker



SHEET NOTES

(1) SPD EXTERNALLY MOUNTED IN NEMA 4/12 ENCLOSURE.
15 YEAR WARRANTY FOR CGP; 10 YEAR WARRANTY FOR CG.
UL 1449 4TH EDITION LISTED, TYPE 1. $I_{NOMINAL}$ = 20 KA, MCOV AT LEAST 115% OF NOMINAL.
TESTED PERFORMANCE PER MODE SHALL BE AS FOLLOWS. SURGE CURRENT CAPACITY: (Insert from Column A below).
REPETITIVE IMPULSE CAPACITY: (Insert from Column B below).
SUBMIT TESTING DOCUMENTATION: SURGE CURRENT CAPACITY AND REPETITIVE IMPULSE CAPACITY.
AFTER INSTALLATION, USE A PORTABLE SURGE GENERATOR/TEST SET TO CONFIRM THE OPERATILITY OF ALL SPD COMPONENTS AND THE PRESENCE OF A NEUTRAL-TO-GROUND BOND. MEASURE AND RECORD ALL LET-THRU VOLTAGES AND SUBMIT THE REPORT TO THE ENGINEER.
CURRENT TECHNOLOGY MODEL (Insert from chart below).
FOR PANEL 1000 A - 3000 A, FEED SPD WITH A100 A/3P BREAKER.
FOR PANEL 200 A - 800 A, FEED SPD WITH A 60 A/3P BREAKER.
FOR PANEL 60 A - 100 A, FEED SPD WITH A 30 A/3P BREAKER.
FOR PANEL 1000 A - 3000 A, USE 4 #2 AWG & 1 #2 AWG GROUND.
FOR PANEL 200 A - 800 A, USE CURRENT TECHNOLOGY HPI-6Y.
FOR PANEL 60 A - 100 A, USE INCLUDED CONDUCTORS.

Product Application	
Source Current Rating	**Surge Current Capacity per Mode (x2 per Phase)**
2000 A (and Above)	200 kA
1600 A	150 kA
1000 A - 1200 A	120 kA
800 A	100 kA
400 A - 600 A	80 kA
200 A	60 kA
100 A	40 kA

Application Specific Performance and Model Numbers

Column A	Column B	480Y/277 V Systems		208Y/120 V Systems	
Surge Current Capacity per Mode (x2 per phase)	**Repetitive Impulses per Mode**	**With Surge Counter**	**W/O Surge Counter**	**With Surge Counter**	**W/O Surge Counter**
200 kA	6500	CGP-200-277/480-3GY	CG-200-277/480-3GY	CGP-200-120/208-3GY	CG-200-120/208-3GY
150 kA	5500	CGP-150-277/480-3GY	CG-150-277/480-3GY	CGP-150-120/208-3GY	CG-150-120/208-3GY
120 kA	5000	CGP-120-277/480-3GY	CG-120-277/480-3GY	CGP-120-120/208-3GY	CG-120-120/208-3GY
100 kA	4500	CGP-100-277/480-3GY	CG-100-277/480-3GY	CGP-100-120/208-3GY	CG-100-120/208-3GY
80 kA	4000	CGP-080-277/480-3GY	CG-080-277/480-3GY	CGP-080-120/208-3GY	CG-080-120/208-3GY
60 kA	3500	CGP-060-277/480-3GY	CG-060-277/480-3GY	CGP-060-120/208-3GY	CG-060-120/208-3GY
40 kA	3000		CG-040-277/480-3GY		CG-040-120/208-3GY

For other voltage configurations and options, see the CG Series Product Configuration Guide

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CG Series

Basic SPD for Tenant Improvement, Design/Build & NEC Compliance

Product Configuration Guide

Product Number Example:

C	G		-	0	6	0	-	120/208-3GY	-		-	

Product Series			-	Surge Current Rating			-	Voltage & Configuration	-		-	

Product Series

"CG-" CurrentGuard
"CGP" CurrentGuard Plus (With Surge Counter)
"CGC" CurrentGuard Compact
"CGF" CurrentGuard Flush

Surge Current Rating

(per Mode rating is given. X2 for per Phase rating)

"040"*	40 kA
"050"**	50 kA
"060"	60 kA
"080"	80 kA
"100"	100 kA
"120"	120 kA
"150"	150 kA
"200"	200 kA

* Only in CurrentGuard
** Only in CurrentGuard Compact

Voltage & Configuration

"220-1G"	220V, 1-Phase, 2-Wire + Ground
"230-1G"	230V, 1-Phase, 2-Wire + Ground
"240-1G"	240V, 1-Phase, 2-Wire + Ground
"120/240-2G"	120/240V, 2-Phase, 3-Wire + Ground
"120/208-3GY"	120/208V, 3-Phase Wye, 4-Wire + Ground
"220/380-3GY"	220/380V, 3-Phase Wye, 4-Wire + Ground
"230/400-3GY"	230/400V, 3-Phase Wye, 4-Wire + Ground
"277/480-3GY"	277/480V, 3-Phase Wye, 4-Wire + Ground
"347/600-3GY"	347/600V, 3-Phase Wye, 4-Wire + Ground
"120/240-3GHD"	120/240V, 3-Phase High-Leg Delta, 4-Wire + Ground (B-Phase must be 208V)
"240-3DG 240V"	3-Phase Delta, 3-Wire + Ground
"380-3DG 380V"	3-Phase Delta, 3-Wire + Ground
"480-3DG 480V"	3-Phase Delta, 3-Wire + Ground
"600-3DG 600V"	3-Phase Delta, 3-Wire + Ground

Options

"D" 200 kA External Disconnect
"S" Stainless Steel Enclosure
Blank Otherwise

Stand-Alone Options

Not provided as integral part of Product.

"CGC-FMP"	Flush Mount Plate Kit (For CGC-050)
"CGC FMP-40"	Flush Mount Plate Kit (For CGF-040)
"CGF-FMP-60/80"	Flush Mount Plate Kit (For CGF060 & CGF080)

Dimensions

CurrentGuard and CurrentGuard Plus:			
40 kA	8"h x 6.00"w x	6.00"d	20 lbs.
50 kA	6"h x 6.00"w x	4.16"d	15 lbs.
60 kA -80 kA	10"h x 8.00"w x	6.00"d	30 lbs.
100 kA -200 kA	14"h x 12.00"w x	6.00"d	40 lbs.
CurrentGuard Compact:			
50 kA	6"h x 6.00"w x	4.16"d	15 lbs.
CurrentGuard Flush:			
40 kA	8"h x 6.75"w x	4.20"d	20 lbs.
60 kA - 80 kA	10"h x 8.00"w x	4.20"d	30 lbs.

Standard Enclosure: NEMA 4/12

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Tab 6

Powersmiths International

Transformers Exceeding the US DOE 2016 Requirements

Product Selection Information

2 Pages Transformer Selection, Application and Specification Guide

OPAL (Optimized Performance for the Application Load) Transformers

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Transformer Application Guide

Transformer Selection by Application

OPAL Transformer	Loading	Application
ESaver-33L	Typical light loading	Office, education, healthcare, commercial, most institutional, residential
ESaver-25H	Heavy loading	Dedicated equipment (fans, pumps, elevators), labs, broadcast, datacenter, industrial
T1000-30H	Harmonic rich loading	Medical, computer rooms, casinos. To prevent voltage distortion from becoming excessive

OPAL (Optimized Performance for the Application Load) Transformer Information

Transformer	Optimized Load Range	Savings Beyond US DOE 2016 (Reduction in Losses)	Temperature Rise	Winding Material	Continuous Overload Capacity	K-Rating
ESaver-33L	0-25%	33%	<130°C	CU	5%	K7
ESaver-25H	75-100%	25%	<105°C	CU/AL	20%	K13
T1000-30H	50-100%	30%	<105°C	CU	20%	K20

Information applies to product(s) manufactured at time of printing and therefore is for general reference. Call for current product information for specific models being considered.

Full-Load Current & Protection Ratings for 3-Phase Transformers

kVA	Primary: 480 V Delta			Secondary: 208Y/120 V		
	Full-Load Amps	125% of Full-Load	250% of Full-Load	Full-Load Amps	125% of Full-Load	250% of Full-Load
15	18	23	45	42	52	104
20	24	30	60	56	69	139
25	30	38	75	69	87	174
30	36	45	90	83	104	208
45	54	68	135	125	156	313
50	60	75	151	139	174	347
63	76	95	190	175	219	438
75	90	113	226	208	261	521
100	120	151	301	278	347	695
112.5	135	169	337	311	389	778
125	151	188	376	347	434	868
150	181	226	452	417	521	1,042
175	211	263	527	486	608	1,216
200	241	301	602	556	695	1,390
225	271	339	677	625	782	1,563
250	301	376	753	695	868	1,737
300	361	452	903	834	1,042	2,084
400	482	602	1,204	1,112	1,390	2,779
450	542	677	1,355	1,251	1,563	3,126
500	602	753	1,505	1,390	1,737	3,474
600	723	903	1,806	1,667	2,084	4,169
750	903	1,129	2,258	2,084	2,605	5,211

DIMENSIONS

For All Opal Transformers

kVA	W	D	H
15	18”	17”	27”
20	26”	18”	30”
25	26”	18”	30”
30	26”	18”	30”
45	26”	18”	30”
50	32”	22”	40”
63	32”	22”	40”
75	32”	22”	40”
100	32”	22”	40”
112.5	32”	22”	40”
125	38”	27”	48”
150	38”	27”	48”
175	38”	27”	48”
200	38”	27”	48”
225	38”	32”	52”
250	38”	32”	52”
300	38”	32”	52”
400	52”	32”	61”
450	52”	38”	61”
500	52”	38”	61”
600	52”	38”	61”
750	64”	45”	67”

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Transformer Application Guide

From *The ESP Calculator™* (Powersmiths' Energy Savings & Payback Calculation Worksheet)

Esaver-33L Light Loading (K-7)

Equipment operating hrs/day & days/yr	14 hrs & 260 days	Calc Load kW	Annual kWh
Load during operating hours	25%	84	307,125
Load outside operating hours	10%	34	172,800
		Total Annual kWh:	479,925

	Status Quo	Powersmiths	
Annual Cost of feeding Building Load	$ 58,118	$ 58,118	
Annual Cost of Transformer Losses	$ 1,650	$ 735	
Annual Cost of Associated A/C	$ 820	$ 366	Reduction
Annual estimated Electrical Bill	$ 60,587	$ 59,218	2%

Peak kW reduction (normal op hours)	1.7	kW
Annual kWh reduction	11,647	kWh
Reduction in Air Cond. Load (on peak)	0.32	Tons

Operating Costs	Annual	20 years	32 years
Status Quo Transformers	$ 2,470	$ 85,742	$ 195,254
Powersmiths Transformers	$ 1,101	$ 38,215	$ 87,025
Savings with Powersmiths	**$ 1,369**	**$ 47,527**	**$ 108,230**

Cost of Powersmiths Transformers	$ 29,300	(Product costs are estimates that can vary
Cost of Status Quo Transformers	$ 16,900	significantly by manufacturer, project, model)
Payback on total cost	**9.06**	**Years @ $ 0.10/kWh and $ 10.00 Demand**
Cost of Energy Savings	$ 0.033	/kWh
Cost - Benefit Ratio	3.0	times less to save a kWh than to buy a kWh

ESaver-25H Heavy Loading (K-13)

Equipment operating hrs/day & days/yr	14 hrs & 260 days	Calc Load kW	Annual kWh
Load during operating hours	60%	203	737,100
Load outside operating hours	40%	135	691,200
		Total Annual kWh:	1,428,300

	Status Quo	Powersmiths	
Annual Cost of feeding Building Load	$ 167,130	$ 167,130	
Annual Cost of Transformer Losses	$ 4,227	$ 2,060	
Annual Cost of Associated A/C	$ 2,101	$ 1,024	Reduction
Annual estimated Electrical Bill	$ 173,458	$ 170,214	2%

Peak kW reduction (normal op hours)	5.4	kW
Annual kWh reduction	25,982	kWh
Reduction in Air Cond. Load (on peak)	1.02	tons

Operating Costs	Annual	20 years	32 years
Status Quo Transformers	$ 6,328	$ 219,700	$ 500,307
Powersmiths Transformers	$ 3,084	$ 107,063	$ 243,807
Savings with Powersmiths	**$ 3,244**	**$ 112,637**	**$ 256,499**

Cost of Powersmiths Transformers	$ 29,300	(Product costs are estimates that can vary
Cost of Status Quo Transformers	$ 18,300	significantly by manufacturer, project, model)
Payback on total cost	**3.39**	**Years @ $ 0.10/kWh and $10.00 Demand**
Cost of Energy Savings	$ 0.013	/kWh
Cost - Benefit Ratio	7.6	times less to save a kWh than to buy a kWh

T1000-30H Harmonic Mitigation (K-20)

Equipment operating hrs/day & days/yr	14 hrs & 260 days	Calc Load kW	Annual kWh
Load during operating hours	60%	203	737,100
Load outside operating hours	25%	84	432,000
		Total Annual kWh:	1,169,100

	Status Quo	Powersmiths	
Annual Cost of feeding Building Load	$ 141,210	$ 141,210	
Annual Cost of Transformer Losses	$ 4,197	$ 1,916	
Annual Cost of Associated A/C	$ 2,086	$ 953	Reduction
Annual estimated Electrical Bill	$ 147,493	$ 144,079	2%

Peak kW reduction (normal op hours)	6.4	kW
Annual kWh reduction	26,502	kWh
Reduction in Air Cond. Load (on peak)	1.21	tons

Operating Costs	Annual	20 years	32 years
Status Quo Transformers	$ 6,283	$ 218,147	$ 496,771
Powersmiths Transformers	$ 2,869	$ 99,611	$ 226,837
Savings with Powersmiths	**$ 3,414**	**$ 118,536**	**$ 269,934**

Cost of Powersmiths Transformers	$33,846	(Product costs are estimates that can vary
Cost of Status Quo Transformers	$26,900	significantly by manufacturer, project, model)
Payback on total cost	**2.03**	**Years @ $ 0.10/kWh and $10.00 Demand**
Cost of Energy Savings	$ 0.008	/kWh
Cost - Benefit Ratio	12.2	times less to save a kWh than to buy a kWh

kVA	BTUs-50%	BTUs-100%	Wt.
15	536	2,399	280
20	664	2,856	323
25	792	3,313	365
30	863	3,395	410
45	1,160	4,664	530
50	1,246	5,055	597
63	1,532	6,254	760
75	1,795	7,326	770
100	2,150	8,670	925
112.5	2,344	9,287	1,040
125	2,423	9,479	1,165
150	2,972	11,799	1,270
175	3,371	13,688	1,385
200	3,511	13,559	1,490
225	3,774	14,610	1,660
250	4,124	15,947	1,700
300	4,886	18,879	1,910
400	6,094	23,676	2,515
450	6,613	25,805	2,718
500	7,131	27,934	2,920
600	8,216	32,121	3,320
750	9,438	36,836	4,010
15	471	1,675	305
20	564	1,941	322
25	705	2,426	403
30	798	2,692	420
45	1,095	3,740	570
50	1,118	3,823	583
63	1,408	4,817	735
75	1,587	5,435	830
100	1,962	6,623	985
112.5	2,187	7,425	970
125	2,320	7,810	1,230
150	2,685	8,994	1,370
175	2,925	10,001	1,430
200	3,343	11,430	1,635
225	3,583	12,437	1,695
250	3,819	12,989	1,736
300	4,436	14,839	1,950
400	5,643	19,198	2,540
450	5,997	20,262	2,725
500	6,350	21,325	2,910
600	7,421	24,556	3,500
750	8,806	29,483	4,330
15	563	2,071	320
20	620	2,208	367
25	776	2,760	458
30	833	2,897	505
45	1,133	3,856	605
50	1,181	3,910	655
63	1,455	5,025	738
75	1,706	6,060	810
100	2,204	6,947	1,040
112.5	2,269	7,793	1,090
125	2,413	8,304	1,176
150	2,798	9,646	1,380
175	3,150	11,062	1,488
200	3,501	12,478	1,595
225	3,835	13,143	1,765
250	4,088	14,139	1,807
300	4,750	16,548	2,030
400	5,814	19,987	2,755
450	6,367	22,362	2,940
500	6,920	24,737	3,125
600	7,714	26,938	3,694
750	9,151	31,383	4,570

Sheet Note

ESaver-33L Light Loading

POWERSMITHS ESAVER-33L SERIES. UL 1561 LISTED. K-7 RATING. LOCKING HINGED DOORS. COPPER WINDINGS, 130° C RISE. IMPEDANCES 4.0%-5.8%. SIX 2 ½% VOLTAGE TAPS (2 ABOVE, 4 BELOW). SOUND LEVELS 3DB LESS THAN NEMA ST-20. 33% LESS LOSSES AT APPLICABLE LOADING. 5% CONTINUOUS OVERLOAD CAPABILITY. INSTALLATION TO WITHIN 2" OF REAR SURFACE. GUARANTEED COMPATIBILITY WITH 125% RATED UPSTREAM CIRCUIT BREAKER. PROVIDE ENERGY SAVINGS & PAYBACK CALCULATION AGAINST US DOE 2016 X-FMRS. PROVIDE A COPY OF ISO 17025 REGISTRATION. PROVIDE INTEGRAL LOAD POWER AND ENERGY DATA LOGGER WITH EXTERNAL USB ACCESS TO DATA. PROVIDE TEST REPORT, BY SERIAL NUMBER, OF EACH TRANSFORMER SUPPLIED WITH SOUND LEVEL AND NO LOAD LOSS PERFORMANCE. 32 YEAR WARRANTY.

ESaver-25H Heavy Loading

POWERSMITHS ESAVER-25H SERIES. UL 1561 LISTED. K-13 RATING. LOCKING HINGED DOORS. CU PRIMARY/AL SECONDARY, 105° C RISE. IMPEDANCES 4.0%-5.8%. SIX 2 ½% VOLTAGE TAPS (2 ABOVE, 4 BELOW). SOUND LEVELS 3DB LESS THAN NEMA ST-20. 25% LESS LOSSES AT APPLICABLE LOADING. 20% CONTINUOUS OVERLOAD CAPABILITY. INSTALLATION TO WITHIN 2" OF REAR SURFACE. GUARANTEED COMPATIBILITY WITH 125% RATED UPSTREAM CIRCUIT BREAKER. PROVIDE ENERGY SAVINGS & PAYBACK CALCULATION AGAINST US DOE 2016 X-FMRS. PROVIDE A COPY OF ISO 17025 REGISTRATION. PROVIDE INTEGRAL LOAD POWER AND ENERGY DATA LOGGER WITH EXTERNAL USB ACCESS TO DATA. PROVIDE TEST REPORT, BY SERIAL NUMBER, OF EACH TRANSFORMER SUPPLIED WITH SOUND LEVEL AND NO LOAD LOSS PERFORMANCE. 32 YEAR WARRANTY.

T1000-30H Harmonic Mitigation

POWERSMITHS T1000-30H HMT SERIES. UL 1561 LISTED. K-20 RATING. LOCKING HINGED DOORS. COPPER WINDINGS, 105° C RISE. IMPEDANCES 4.0%-5.8%. SIX 2 ½% VOLTAGE TAPS (2 ABOVE, 4 BELOW). SOUND LEVELS 3DB LESS THAN NEMA ST-20. 30% LESS LOSSES AT APPLICABLE LOADING. 20% CONTINUOUS OVERLOAD CAPABILITY. INSTALLATION TO WITHIN 2" OF REAR SURFACE. GUARANTEED COMPATIBILITY WITH 125% RATED UPSTREAM CIRCUIT BREAKER. PROVIDE ENERGY SAVINGS & PAYBACK CALCULATION AGAINST US DOE 2016 X-FMRS. PROVIDE A COPY OF ISO 17025 REGISTRATION. PROVIDE INTEGRAL LOAD POWER AND ENERGY DATA LOGGER WITH EXTERNAL USB ACCESS TO DATA. PROVIDE TEST REPORT, BY SERIAL NUMBER, OF EACH TRANSFORMER SUPPLIED WITH SOUND LEVEL AND NO LOAD LOSS PERFORMANCE. 32 YEAR WARRANTY.

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Tab 7

Powersmiths International

Transformers Exceeding the US DOE 2016 Requirements

Typical Light Loading

(OPAL ESaver-33L) K-7 Rated Transformers

1 Page **Design Considerations Guide**

1 Page **Product Number Configuration Guide**

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ESaver-33L Transformers for Typical Light Loading Applications

Transformer Selection by Application

OPAL Transformer	Loading	Application
ESaver-33L	Typical light loading	Office, education, healthcare, commercial, most institutional, residential

OPAL (Optimized Performance for the Application Load) Transformer Information

Transformer	Optimized Load Range	Savings Beyond US DOE 2016 (Reduction in Losses)	Temperature Rise	Winding Material	Continuous Overload Capacity	K-Rating
ESaver-33L	0-25%	33%	<130°C	CU	5%	K7

Information applies to product(s) manufactured at time of printing and therefore is for general reference. Call for current product information for specific models being considered.

SHEET NOTE

POWERSMITHS ESAVER-33L SERIES. UL 1561 LISTED. K-7 RATING. LOCKING HINGED DOORS. COPPER WINDINGS, 130° C RISE. IMPEDANCES 4.0%-5.8%. SIX 2 ½% VOLTAGE TAPS (2 ABOVE, 4 BELOW). SOUND LEVELS 3DB LESS THAN NEMA ST-20. 33% LESS LOSSES AT APPLICABLE LOADING. 5% CONTINUOUS OVERLOAD CAPABILITY. INSTALLATION TO WITHIN 2" OF REAR SURFACE. GUARANTEED COMPATIBILITY WITH 125% RATED UPSTREAM CIRCUIT BREAKER. PROVIDE ENERGY SAVINGS & PAYBACK CALCULATION AGAINST US DOE 2016 X-FMRS. PROVIDE A COPY OF ISO 17025 REGISTRATION. PROVIDE INTEGRAL LOAD POWER AND ENERGY DATA LOGGER WITH EXTERNAL USB ACCESS TO DATA. PROVIDE TEST REPORT, BY SERIAL NUMBER, OF EACH TRANSFORMER SUPPLIED WITH SOUND LEVEL AND NO LOAD LOSS PERFORMANCE. 32 YEAR WARRANTY.

kVA	No Load Losses (Watts)	Efficiency Information			BTUs/Hr.		Dimensions			
		Linear Profile		K-7 Profile	50% Load	100% Load	W (in.)	D (in.)	H (in.)	Wt. (lbs.)
		1/6 Load	35% Load	25% Load						
15	34	98.18	98.20	98.20	536	2,399	18	17	27	280
20	42	98.27	98.29	98.27	664	2,856	26	18	30	323
25	50	98.36	98.39	98.33	792	3,313	26	18	30	365
30	58	98.45	98.48	98.40	863	3,395	26	18	30	410
45	83	98.55	98.62	98.50	1,160	4,664	26	18	30	530
50	88	98.59	98.65	98.53	1,246	5,055	32	22	40	597
63	101	98.68	98.72	98.62	1,532	6,254	32	22	40	760
75	112	98.77	98.78	98.70	1,795	7,326	32	22	40	770
100	142	98.84	98.85	98.77	2,150	8,670	32	22	40	925
112.5	158	98.87	98.89	98.80	2,344	9,287	32	22	40	1,040
125	173	98.88	98.92	98.83	2,423	9,479	38	27	48	1,165
150	204	98.91	98.97	98.90	2,972	11,799	38	27	48	1,270
175	231	98.94	99.00	98.93	3,371	13,688	38	27	48	1,385
200	258	98.97	99.03	98.97	3,511	13,559	38	27	48	1,490
225	285	99.00	99.06	99.00	3,774	14,610	38	32	52	1,660
250	309	99.02	99.08	99.00	4,124	15,947	38	32	52	1,700
300	356	99.07	99.12	99.00	4,886	18,879	38	32	52	1,910
400	438	99.13	99.17	99.05	6,094	23,676	52	32	61	2,515
450	478	99.15	99.20	99.08	6,613	25,805	52	38	61	2,718
500	519	99.18	99.22	99.10	7,131	27,934	52	38	61	2,920
600	599	99.21	99.25	99.14	8,216	32,121	52	38	61	3,320
750	718	99.2%	99.29	99.20	9,438	36,836	64	45	67	4,010

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Tab 8

Powersmiths International

Transformers Exceeding the US DOE 2016 Requirements

Heavy Loading

(OPAL ESaver-25H) K-13 Rated Transformers

1 Page **Design Considerations Guide**

1 Page **Product Number Configuration Guide**

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ESaver-25H Transformers for Heavy Loading Applications

Transformer Selection by Application

OPAL Transformer	Loading	Application
ESaver-25H	Heavy loading	Dedicated equipment (fans, pumps, elevators), labs, broadcast, datacenter, industrial

OPAL (Optimized Performance for the Application Load) Transformer Information

Transformer	Optimized Load Range	Savings Beyond US DOE 2016 (Reduction in Losses)	Temperature Rise	Winding Material	Continuous Overload Capacity	K-Rating
ESaver-25H	75-100%	25%	<105ºC	CU/AL	20%	K13

Information applies to product(s) manufactured at time of printing and therefore is for general reference. Call for current product information for specific models being considered.

SHEET NOTE

POWERSMITHS ESAVER-25H SERIES. UL 1561 LISTED. K-13 RATING. LOCKING HINGED DOORS. CU PRIMARY/AL SECONDARY, 105º C RISE. IMPEDANCES 4.0%-5.8%. SIX 2 ½% VOLTAGE TAPS (2 ABOVE, 4 BELOW). SOUND LEVELS 3DB LESS THAN NEMA ST-20. 25% LESS LOSSES AT APPLICABLE LOADING. 20% CONTINUOUS OVERLOAD CAPABILITY. INSTALLATION TO WITHIN 2" OF REAR SURFACE. GUARANTEED COMPATIBILITY WITH 125% RATED UPSTREAM CIRCUIT BREAKER. PROVIDE ENERGY SAVINGS & PAYBACK CALCULATION AGAINST US DOE 2016 X-FMRS. PROVIDE A COPY OF ISO 17025 REGISTRATION. PROVIDE INTEGRAL LOAD POWER AND ENERGY DATA LOGGER WITH EXTERNAL USB ACCESS TO DATA. PROVIDE TEST REPORT, BY SERIAL NUMBER, OF EACH TRANSFORMER SUPPLIED WITH SOUND LEVEL AND NO LOAD LOSS PERFORMANCE. 32 YEAR WARRANTY.

kVA	No Load Losses (Watts)	Efficiency Information			BTUs/Hr.		Dimensions			
		Linear Profile		K-7 Profile	50% Load	100% Load	W (in.)	D (in.)	H (in.)	Wt. (lbs.)
		1/6 Load	35% Load	25% Load						
15	41	98.04	98.28	98.12	471	1,675	18	17	27	305
20	53	98.10	98.31	98.21	564	1,941	26	18	30	322
25	64	98.16	98.35	98.31	705	2,426	26	18	30	403
30	75	98.22	98.38	98.40	798	2,692	26	18	30	420
45	113	98.26	98.51	98.54	1,095	3,740	26	18	30	570
50	121	98.30	98.54	98.57	1,118	3,823	32	22	40	583
63	142	98.40	98.61	98.64	1,408	4,817	32	22	40	735
75	162	98.49	98.68	98.70	1,587	5,435	32	22	40	830
100	209	98.54	98.75	98.77	1,962	6,623	32	22	40	985
112.5	233	98.57	98.78	98.81	2,187	7,425	32	22	40	970
125	247	98.62	98.81	98.84	2,320	7,810	38	27	48	1,230
150	275	98.71	98.88	98.89	2,685	8,994	38	27	48	1,370
175	306	98.75	98.91	98.92	2,925	10,001	38	27	48	1,430
200	337	98.80	98.95	98.95	3,343	11,430	38	27	48	1,635
225	369	98.84	98.98	98.98	3,583	12,437	38	32	52	1,695
250	399	98.86	99.01	99.00	3,819	12,989	38	32	52	1,736
300	460	98.91	99.08	99.04	4,436	14,839	38	32	52	1,950
400	571	98.98	99.13	99.09	5,643	19,198	52	32	61	2,540
450	626	99.01	99.16	99.12	5,997	20,262	52	38	61	2,725
500	681	99.04	99.18	99.14	6,350	21,325	52	38	61	2,910
600	785	99.07	99.18	99.17	7,421	24,556	52	38	61	3,500
750	941	99.11	99.18	99.21	8,806	29,483	64	45	67	4,330

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Tab 9

Powersmiths International

Transformers Exceeding the US DOE 2016 Requirements

Harmonic Rich Loading

(OPAL T1000-30H) Harmonic Mitigating Transformers

1 Page **Design Considerations Guide**

1 Page **Product Number Configuration Guide**

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T1000-30H Transformers for Harmonic Rich Loading Applications

Transformer Selection by Application

OPAL Transformer	Loading	Application
T1000-30H	Harmonic rich loading	Medical, computer rooms, casinos. To prevent voltage distortion from becoming excessive

OPAL (Optimized Performance for the Application Load) Transformer Information

Transformer	Optimized Load Range	Savings Beyond US DOE 2016 (Reduction in Losses)	Temperature Rise	Winding Material	Continuous Overload Capacity	K-Rating
T1000-30H	50-100%	30%	<105°C	CU	20%	K20

Information applies to product(s) manufactured at time of printing and therefore is for general reference. Call for current product information for specific models being considered.

SHEET NOTE

POWERSMITHS T1000-30H HMT SERIES. UL 1561 LISTED. K-20 RATING. LOCKING HINGED DOORS. COPPER WINDINGS, 105° C RISE. IMPEDANCES 4.0%-5.8%. SIX 2 ½% VOLTAGE TAPS (2 ABOVE, 4 BELOW). SOUND LEVELS 3DB LESS THAN NEMA ST-20. 30% LESS LOSSES AT APPLICABLE LOADING. 20% CONTINUOUS OVERLOAD CAPABILITY. INSTALLATION TO WITHIN 2" OF REAR SURFACE. GUARANTEED COMPATIBILITY WITH 125% RATED UPSTREAM CIRCUIT BREAKER. PROVIDE ENERGY SAVINGS & PAYBACK CALCULATION AGAINST US DOE 2016 X-FMRS. PROVIDE A COPY OF ISO 17025 REGISTRATION. PROVIDE INTEGRAL LOAD POWER AND ENERGY DATA LOGGER WITH EXTERNAL USB ACCESS TO DATA. PROVIDE TEST REPORT, BY SERIAL NUMBER, OF EACH TRANSFORMER SUPPLIED WITH SOUND LEVEL AND NO LOAD LOSS PERFORMANCE. 32 YEAR WARRANTY.

kVA	No Load Losses (Watts)	Efficiency Information			BTUs/Hr.		Dimensions			
		Linear Profile		K-13 Profile	50% Load	100% Load	W (in.)	D (in.)	H (in.)	Wt. (lbs.)
		35% Load	50% Load	50% Load						
15	49	98.08	98.15	97.90	563	2,071	18	17	27	320
20	59	98.18	98.25	97.97	620	2,208	26	18	30	367
25	69	98.28	98.35	98.03	776	2,760	26	18	30	458
30	79	98.38	98.45	98.10	833	2,897	26	18	30	505
45	110	98.54	98.49	98.20	1,133	3,856	26	18	30	605
50	118	98.57	98.52	98.23	1,181	3,910	32	22	40	655
63	139	98.65	98.59	98.32	1,455	5,025	32	22	40	738
75	158	98.72	98.66	98.40	1,706	6,060	32	22	40	810
100	226	98.80	98.81	98.53	2,204	6,947	32	22	40	1,040
112.5	260	98.84	98.88	98.60	2,269	7,793	32	22	40	1,090
125	262	98.87	98.89	98.60	2,413	8,304	38	27	48	1,176
150	266	98.93	98.90	98.60	2,798	9,646	38	27	48	1,380
175	302	98.96	98.92	98.63	3,150	11,062	38	27	48	1,488
200	339	98.99	98.95	98.67	3,501	12,478	38	27	48	1,595
225	375	99.02	98.97	98.70	3,835	13,143	38	32	52	1,765
250	405	99.05	99.01	98.73	4,088	14,139	38	32	52	1,807
300	466	99.10	99.10	98.80	4,750	16,548	38	32	52	2,030
400	556	99.16	99.13	98.80	5,814	19,987	52	32	61	2,755
450	602	99.18	99.15	98.80	6,367	22,362	52	38	61	2,940
500	647	99.21	99.16	98.80	6,920	24,737	52	38	61	3,125
600	764	99.24	99.20	98.88	7,714	26,938	52	38	61	3,694
750	939	99.28	99.26	99.00	9,151	31,383	64	45	67	4,570

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Tab 10

Powersmiths International

Transformers Exceeding the US DOE 2016 Requirements

Alternate OPAL Transformers

2 Pages (OPAL ESaver-80R) Aluminum Transformers

2 Pages (OPAL ESaver-EV) Transformer for Electric Vehicle Charger Systems

2 Pages (OPAL ESaver-SOL) Transformer for PhotoVoltaic Applications

2 Pages Transformers with Integrated Circuit Breakers and Metering

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Transformers with Integrated Circuit Breakers and Metering

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Appendix **A**

DSPM

UL 924 Lighting Inverters

Product Selection Information

2 Pages Product Characteristics & Model Number Configuration Chart

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DSPM Eternalite Inverters (UL 924 Listed)

Single Phase Eternalite Inverters (Offering by Product Families)

Power Rating	On-Line Families				Stand-By Families		Max. Amps/ϕ				Dimensions (Indoor & Standy-By)*							Wt. (lbs.)	Max. No of Integral Output 1P/20A CBs
	Indoor	Outdoor	Harsh Env.	BTUs per Hr.	Harsh Env.	BTUs per Hr.	Input		Output		UPS Cabinet			Battery Cabinet					
	(OE Series)	(Fortress)	(Fortress M)		(SE Series)		120 V	277 V	120 V	277 V	W	H	D	No.	W	H	D		
75 W					SEMIC	2.55	0.9	0.4	0.6	0.3	17.5"	22.5"	8"	Not Required				45	N/A
100 W					SEMIC	3.40	1.25	0.5	0.8	0.4	17.5"	22.5"	8"	Not Required				48	N/A
125 W					SEMIC	4.25	1.6	0.7	1	0.4	17.5"	22.5"	8"	Not Required				48	N/A
200 W					SEMIC	6.80	2.5	1.1	1.7	0.7	17.5"	22.5"	8"	Not Required				54	N/A
300 W					SEMIC	10.20	3.75	1.6	2.5	1	17.5"	22.5"	8"	Not Required				66	N/A
375 W					SEMIC	12.75	4.7	2.05	3.15	1.35	17.5"	22.5"	8"	Not Required				79	N/A
350 W	OEMINI	FT1	FT1H	95.2	SEMINI	11.90	5.1	3.2	3	1.3	24"	26"	16"	Not Required				340	9
525 W	OEMINI			142.8	SEMINI	17.85	7.7	3.3	4.4	1.9	24"	26"	16"	Not Required				340	9
700 W	OEMINI	FT1	FT1H	190.4	SEMINI	23.80	10.2	4.4	5.8	2.5	24"	26"	16"	Not Required				370	9
750 W	OEMINI			204.0	SEMINI	25.50	11.0	4.8	6.3	2.7	24"	26"	16"	Not Required				370	9
875 W	OEMINI			238.0	SEMINI	29.75	12.8	5.5	7.3	3.2	24"	26"	16"	Not Required				370	9
1050 W	OEMINI	FT1	FT1H	285.6	SEMINI	35.70	15.3	6.6	8.8	3.8	24"	26"	16"	Not Required				440	9
1400 W	OEMINI			380.8	SEMINI	47.60	20.4	8.8	11.7	5.1	24"	26"	16"	Not Required				460	9
2000 W	OEMINI	FT1	FT1H	544.0	SEMINI	68.00	29.2	12.6	16.7	7.2	24"	26"	16"	Not Required				600	9
2.4 kW	OEPLUS			652.8	SEPLUS	81.6	35	15.2	20	8.7	26"	44"	26"	Not Required				700	16
2.6 kW	OEPLUS	FT1	FT1H	707.2	SEPLUS	88.4	38	16.5	21.7	9.4	26"	44"	26"	Not Required				700	16
3 kW	OEPLUS			816.0	SEPLUS	102.0	43.8	19	25	10.8	26"	44"	26"	Not Required				800	16
3.4 kW	OEPLUS	FT1	FT1H	924.8	SEPLUS	115.6	49.6	21.5	28.4	12.3	26"	44"	26"	Not Required				800	16
3.8 kW	OEPLUS			1033.6	SEPLUS	129.2	55.4	24	31.7	13.7	26"	44"	26"	Not Required				800	16
4.2 kW	OEPLUS	FT1	FT1H	1142.4	SEPLUS	142.8	61.3	26.6	35	15.2	26"	44"	26"	Not Required				920	16
4.7 kW	OE1	FT1	FT1H	1278.4	SE1	159.8	68.6	29.7	39.2	17	42"	71"	22.5"	Not Required				1200	30
5.25 kW	OE1	FT1	FT1H	1428.0	SE1	178.5	76.6	33.2	45.8	19	42"	71"	22.5"	Not Required				1200	30
7 kW	OE1	FT1	FT1H	1904.0	SE1	238.0	102.	44.3	58.4	25.3	42"	71"	22.5"	Not Required				1450	30
8 kW	OE1	FT1	FT1H	2176.0	SE1	272.0	116	50.6	66.7	29	42"	71"	22.5"	Not Required				1450	30
10 kW	OE1	FT1	FT1H	2720.0	SE1	340.0	146	63.2	83.4	36	42"	71"	22.5"	Not Required				1820	30
12 kW	OE1	FT1	FT1H	3264.0	SE1	408.0	175	76	100	43.4	42"	71"	22.5"	Not Required				2210	30
14 kW	OE1	FT1	FT1H	3808.0	SE1	476.0	204	88.5	116	50.6	42"	71"	22.5"	Not Required				2550	30
18 kW	OE1	FT1	FT1H	4896.0	SE1	612.0	262	114	150	65	42"	71"	22.5"	1	42"	71"	22.5"	3740	30
21 kW	OE1	FT1	FT1H	5712.0	SE1	714.0	306	132	175	75.5	42"	71"	22.5"	1	42"	71"	22.5"	4375	30

Three Phase Eternalite Inverters (Offering by Product Families)

Power Rating	On-Line Families				Stand-By Family		Max. Amps/ϕ				Dimensions (Indoor & Stand-By)*							Wt. (lbs.)	Max. No. of Integral Output 1P/20A CBs
	Indoor	Outdoor	Harsh Env.	BTUs per Hr.	Harsh Env.	BTUs per Hr.	Input		Output		UPS Cabinet			Battery Cabinet					
	(OE Series)	(Fortress)	(Fortress M)		(SE Series)		120 V	277 V	120 V	277 V	W	H	D	No.	W	H	D		
3 kW	OE3	FT3	FTH3	816	SE3	102	14.6	6.3	8.3	3.6	42"	71"	22.5"	Not Required				980	30
4.5 kW	OE3	FT3	FTH3	1224	SE3	153	21.9	9.5	12.5	5.4	42"	71"	22.5"	Not Required				1100	30
6 kW	OE3	FT3	FTH3	1632	SE3	204	29.2	12.6	16.7	7.2	42"	71"	22.5"	Not Required				1350	30
8 kW	OE3	FT3	FTH3	2176	SE3	272	39	16.9	22.5	9.6	42"	71"	22.5"	1	42"	71"	22.5"	1700	30
10 kW	OE3	FT3	FTH3	2720	SE3	340	48.6	21	27.8	12	42"	71"	22.5"	1	42"	71"	22.5"	2250	30
12 kW	OE3	FT3	FTH3	3264	SE3	408	58.4	25.3	33.3	14.5	42"	71"	22.5"	1	42"	71"	22.5"	2700	30
16 kW	OE3	FT3	FTH3	4352	SE3	544	77.8	33.7	44.5	19.3	42"	71"	22.5"	1	42"	71"	22.5"	2950	30
20 kW	OE3	FT3	FTH3	5440	SE3	680	97.3	42.1	55.6	24.1	42"	71"	22.5"	2	42"	71"	22.5"	3900	30
24 kW	OE3	FT3	FTH3	6528	SE3	816	116	50.6	66.7	28.9	42"	71"	22.5"	2	42"	71"	22.5"	4350	30
30 kW	OE3	FT3	FTH3	8160	SE3	1020	146	63.2	83.4	36.1	42"	71"	22.5"	2	42"	71"	22.5"	5100	30
40 kW	OE3	FT3	FTH3	10880	SE3	1360	195	84.2	112	48.2	42"	71"	22.5"	3	42"	71"	22.5"	6790	30

Consult factory for dimensions and data on all Outdoor and Harsh Environment and Three Phase inverters larger than 40 kVA.

***Front Access Only is Required.** Input and Output Circuit Breakers are Standard. 5 kAIC is Standard. (Other ratings are available.)

Specifying and Ordering Information (Fill in the yellow boxes with the required information):

DSPM ETERNALITE - [ ] - [ ] - [ ] - [ ] - 90 - [ ] - [ ]

Family (See Chart)

Power Rating (See Chart)

Input Voltage

1ϕ	3ϕ
120	208 D
208	208 Y
240	480 D
277	480 Y
480	

Output Voltage

1ϕ	3ϕ
120	208 Y
208	480 Y
277	
480	
120/240	
120/277	

Time (Min.)

Options-1

- 120 V Environmental Control Module: ECM120/qty.
- 277 V Environmental Control Module: ECM277/qty.
- Normally OFF output circuit: NOF/voltage/qty.
- Normally OFF "Hold ON": NOV/voltage/qty.
- Soft Start Circuit: SS/qty.
- Output circuit breakers: OCB/voltage/qty./amps
- Internal dimmer bypass: IDB
- External maintenance bypass switch: EMB

Options-2

- Emergency power off: EPO
- Remote indicator panel: RSSP
- SNMP Card: SNMP
- Form C Contacts: FC
- Seismic rated bracket: SRB
- Onsite start-up: STU1/3
- Extended Warranty: EW

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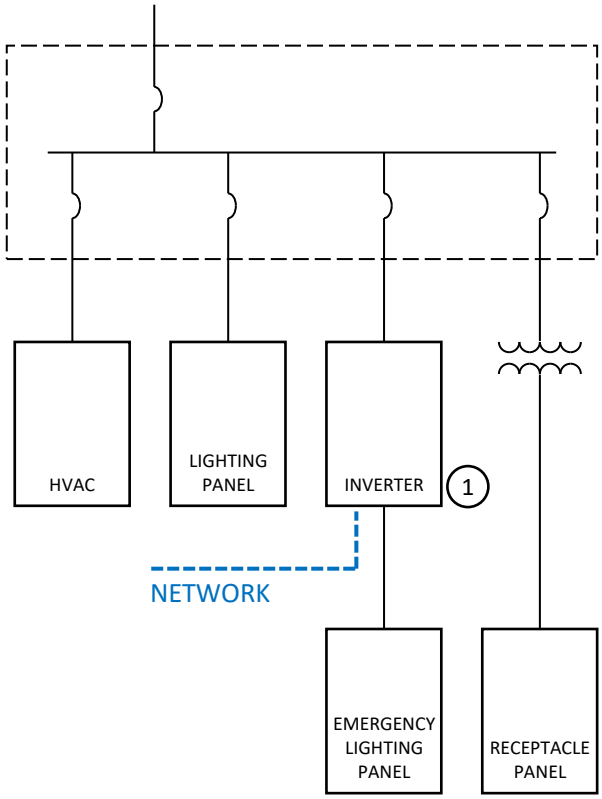
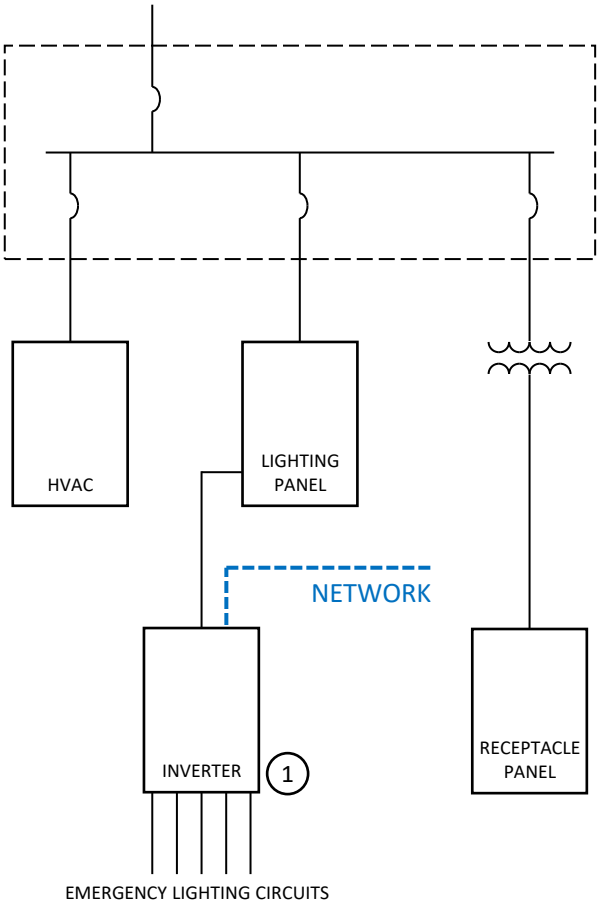
DSPM Eternalite Inverters (UL 924 Listed)





SHEET NOTES

(1) EMERGENCY LIGHTING INVERTER, LISTED TO UL 924.
INVERTER (AND BATTERY CABINETS) SHALL BE FRONT ACCESS ONLY.
PROVIDE ON-LINE DOUBLE CONVERSION TECHNOLOGY.
PROVIDE INPUT AND OUTPUT CIRCUIT BREAKERS.
PROVIDE SOFT START, LISTED TO UL 924, TO PROTECT FROM LED-DRIVER INRUSH CURRENTS.
PROVIDE EXTERNAL RELAY, LISTED TO UL 924, TO BYPASS/TRANSFER REMOTE LOADS TO EMERGENCY POWER.
PROVIDE AN INTEGRAL TEST CIRCUIT TO PERFORM THE MONTHLY AND YEARLY DIAGNOSTIC TESTS IN ACCORDANCE WITH 7.9.3.1.3 OF THE LIFE SAFETY HANDBOOK .
PROVIDE OUTPUT CIRCUIT BREAKERS IN THE QUANTITY, VOLTAGE AND AMPACITY AS REQUIRED.
DSPM MODEL NUMBER (FROM THE CONFIGURATION CHART).

(Example: DSPM ETERNALITE-OEMINI-1400 W-120-120-90-ECM120/2-OCB/120/8/20)

DSPM **Eternalite** Families:

OEMini
OEPlus
OE1
OE3

"OEMini" 350 W – 2000 W

(24" W x 26" H x 16" D)

"OEPlus" 2.4 KW - 4.2 KW

(26" W x 44" H x 26" D)

"OE1" 4.7 KW – 21 KW

(42" W x 71" H x 22.5" D)*

"OE3" 3 KW – 40 KW

(42" W x 71" H x 22.5" D)*

*See chart for battery cabinet requirements & sizes

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