Surge Protective Devices

OVERVIEW CATALOG

JOSLYN

Thomas&Betts

A Member of the ABB Group

Joslyn Surge Protection – Over 60 years of Leadership

In the 1950s, the US government and Bell Telephone Company reached out to Joslyn to resolve power quality issues they were experiencing as they transitioned from electro-mechanical systems to electronic equipment. Today, when electronic equipment users have power quality requirements they continue to turn to Joslyn. Joslyn products are suitable for remote sites such as cell sites or environmental monitoring, telecommunication installations, renewable energy, or utilities. Joslyn products have been installed in more than 130 countries and continue to be the leader in global surge protection providing innovative design, technology, manufacturing and distribution for over 60 years.

Professional Standards

Thomas and Betts, manufacturer of **Joslyn** surge protection products, owns and operates one of the most complete testing laboratories in the Surge Protective Device (SPD) industry. The lab features a high power lightning generator, medium current fault generator, limited current fault generator, three Keytek surge generators and three high speed LeCroy oscilloscopes. The laboratory is Client Test Data certified by UL. This ensures that Joslyn products can meet or exceed the UL 1449 4th Edition standards. Additionally, the top rated laboratory is supported by a staff of engineering professionals who can evaluate your applications and make product recommendations specific to your surge suppression needs.

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JOSLYN®

Where **Surge Protective Devices** Are Applied

	Application	Recommended SPD	Alternative SPD
Red	Service Entrances	• JSP 400kA – 240kA	• JSP 200kA – 120kA • Surgitron I Series
Yellow	Mid-Level Distribution	• JSP 240kA – 120kA • Surgitron I Series	• JSP 120kA – 80kA • Surgitron III Series • TransEnd 100kA – 50kA
Blue	Panel Board Distribution	• JSP 120kA – 60kA • TransEnd 80kA – 25kA	• Surgitron III Series • LDP • 1000 Series • DIN-Rail Series

Surge Protective Devices are designed to protect against transient surge conditions. Large single surge events, such as lightning, can reach hundreds of thousands of volts and can cause immediate or intermittent equipment failure. However, lightning and utility power anomalies only account for 20% of transient surges, while the other 80% are produced internally in a facility. Though these surges may be smaller in size, they are higher in occurrence and continued exposure can degrade expensive equipment within the facility. Equipment failures cannot always be attributed to a single power quality event, however, are more often the result of many events over a period of time.

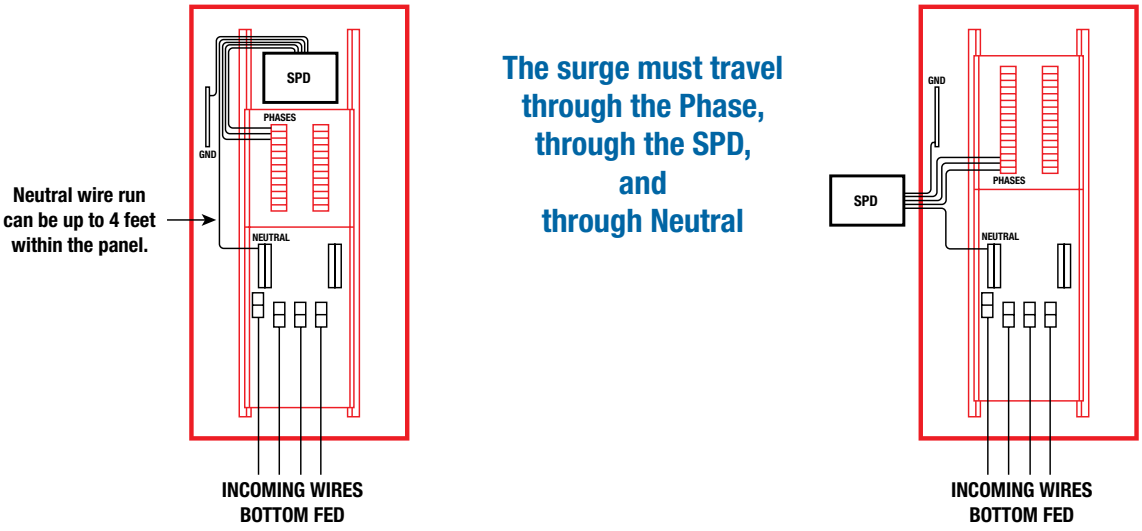
	Protected Equipment Examples
Red	• Electrical switchgear • Switchboard • Distribution • MCCs • Emergency power backup • Transfer switch • UPS system
Yellow	• Emergency power backup • Transfer switches • Control boxes • Switchgear • Generators • Computer servers • Building management systems • Surveillance equipment • Security systems • HVAC • Building management systems • Fire alarm panels • Copiers • Telephone systems • Fax machines
Blue	• X-Ray • CAT-Scan • Life support equipment • Medical instrumentation • Computer servers • Elevators • Parking lot lighting • Printers • Communication systems • Motors • Pumps • Drives

See page 6 for **additional applications**

Internal vs External SPD

DOES AN INTERNALLY MOUNTED SURGE PROTECTIVE DEVICE REALLY HAVE A SHORTER LEAD LENGTH?

For years, panelboard manufacturers have been touting that their panel-integrated Surge Protective Devices outperform externally mounted SPDs because they have the shortest lead lengths. In fact, all SPD manufacturers suggest in their installation instructions to keep the lead length as short as possible. Extra lead length has a negative effect on the performance of the surge protective device by increasing clamping levels. Internally mounted SPDs are typically integrated at the top or bottom of a panelboard. Due to space constraints within the panel, the Neutral and Ground buses for those panels are typically installed on the opposite end of the SPD. The clamping characteristics of the SPD are not isolated to how long the SPDs connection to the Phase conductors are, but must also include how long the connections are to the Neutral and Ground. The clamping level of an SPD is determined by mode, which could be a Line to Neutral mode or a Line to Ground mode. So, the clamping level of an internally mounted SPD must take into account the length of the Phase connection and take into account how long the connection is to the Neutral and Ground. With the Neutral and Ground buses at the opposite end of the panel, the overall system lead length for an integrated SPD can in some cases be longer than a side mounted external SPD. The two installation diagrams below show the difference between the conductor lengths of an internally mounted and externally mounted SPD. The longer the length, the higher the clamping voltage and in turn the less the protection.



Phase length + Neutral length = SPD clamping voltage

IS AN INTERNALLY MOUNTED SPD SAFE TO OPERATE?

IEEE Standard 1100-2006 (Emerald Book) Section 8.4.2.5, "... when an SPD is located inside switchboards or panelboards, there is a concern that failure of the SPD can cause collateral damage to the switchboard or panelboards, including compromising the insulation system with subsequent L-L and L-G faults... Locating the SPD external to the switchboard or panelboard allows the disconnecting means to be located outside the switchboard or panelboard and does not require access to the switchboard or panelboard interior when servicing the SPD."

There are two consequences that represent risk when considering an internal SPD in power distribution equipment:

- Contamination caused by failure of the SPD within the equipment
- Unnecessary shut down or exposure to repair/replace SPD

In both cases above the integrated SPD will need to be replaced or repaired which will require the following:

- Do nothing and have no protection
- Shut down power and de-energize connected loads
- Repair SPD on live load with appropriate PPE per NFPA 70E due to Arc Flash

Which SPD is best for your application?

	JSP	Surgitron® I	TransEnd®	Surgitron® III	LDP	1000 Series (DC)	DIN-Rail
SPD Type							
Type 1	■	■		■	■		
Type 2			■	■		■	
Type 4							■
Certifications							
UL 1449 4th Ed • UL	■		■	■			■
UL 1449 4th Ed • ETL	■	■			■		
CE	■						■
NEMA 4 (outdoor rated)	■	■	■				
RoHS	■		■	■	■		■
Surge Ratings (per Phase)							
10–30					■	■	■
40–60	■		■	■		■	■
80–120	■	■	■	■			
160–240	■	■	■				
300–400	■						
Features							
Thermal Fusing				■	■	■	
Overcurrent Fusing	■	■		■	■	■	
Modular Design		■					■
EMI Filter	■		■				
Monitoring Options							
Surge Counter	■	■					
LED(s)	■	■	■	■	■	■	
Dry Relay Contacts	■	■	■	■			■
Audible Alarm	■						
Alarm Silence	■						
Warranty							
10-years	■						
5-years		■	■				
3-years				■	■	■	
1-year							■

■ **All products meet this requirment**
■ **Some products meet this requirment**

SPD TYPES

Type 1 – Permanently connected SPD installed between the secondary of the service transformed and the line side of the service disconnect.
Type 2 – Permanently connected SPD installed on the load side of the main service disconnect.
Type 3 – Installed a minimum of 10 meters (30 feet) from the panel, cord connected, direct plug in, or receptacle types.
Type 4 and 5 – Components SPD, including discrete components as well as component assemblies.

Applications

WASTEWATER

As the demand for clean water and the reduction of carbon footprint increase, wastewater treatment facilities are utilizing additional technologies to monitor and ensure clean water efficiently. Increasing facility security requires surveillance equipment to maintain facility integrity against hostile acts. Surge protection devices are necessary to provide confidence and reliability in today's personnel restricted environments.

- Computer equipment
- Panelboards
- Generator
- Variable frequency drives
- Servo drives
- Robotics
- Conveyer belts
- Motor pumps

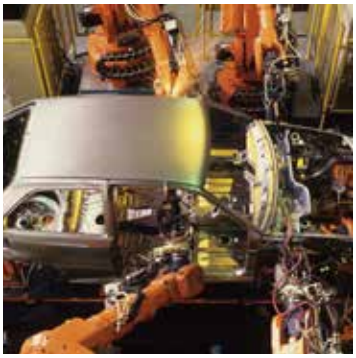
HEALTHCARE

Almost every piece of modern medical equipment depends on electrical power. The invisible side effects are the power anomalies that can have disastrous effects on costly life preserving clinical equipment. The more sophisticated the technology, the more susceptible it is to the devastating effects of transient surge events.

- X-Ray
- CAT-Scan
- Life support equipment
- Medical instrumentation
- Computer servers
- Elevators
- Parking lot lighting

MANUFACTURING/INDUSTRIAL

Improvements to manufacturing devices have migrated manufacturers to human machine combinations for maximizing the manufacturing output capacities of facilities. Surge protection devices protect this equipment from damage caused by large variations in the current and voltage, thus ensuring uptime in manufacturing production.



- Computer equipment
- Panelboards
- Generator
- Human interface panels
- PLCs
- Robotics
- Conveyer belts
- Welding equipment
- Motor pumps

EDUCATION

As we strive to provide future generations with the best education, schools have turned to computer technology to aid educators and students. Most school systems utilize state of the art multi-media outlets which result in more computers in the classrooms. Keeping classrooms up and running, keeps growing minds energized!

- Emergency power backup
- Transfer switch
- UPS system
- TVs
- VCRs
- Computer servers
- Printers
- Communication systems

For more information go to **tnbpowersolutions.com/joslynsurge**

COMMERCIAL/RETAIL

Many retail and commercial facilities are adopting innovative ways to help reduce the demand for power. New energy efficient ballasts, dimmers, and integrated renewable energy systems are just a few examples. These new technologies require sophisticated circuitry which is more susceptible to power quality events, resulting in a decrease in power demand, but an increase in maintenance costs.

- Surveillance equipment
- Security systems
- HVAC
- Building management systems
- Fire alarm panels
- Copiers
- Telephone systems
- Fax machines

RENEWABLE ENERGY

Today's technologies are rapidly developing innovative ways to harvest electricity. Wind farms, solar panels and solar collectors are technologies currently being developed that allow us to create energy from readily available natural resources. Due to their location on the electrical grid, these advanced technologies are typically installed in remote locations and are more susceptible to lightning and power quality anomalies caused by switching on the grid.

- Emergency power backup
- Transfer switches
- Control boxes
- Switchgear
- Generators
- Computer servers
- Building management systems

TRANSPORTATION

Air traffic controls, radar systems, weather stations, electronic highway signs, and outside security cameras are among a handful of the critical loads that require protection from the devastating effects of transient surge events.

- Airport tower
- Runway lights
- Traffic signals
- Train track signals
- Electrical switchgear
- Distribution panels
- Communications equipment
- Radar and satellite equipment
- Surveillance equipment

INFORMATION/DATA MANAGEMENT

Data centers typically require an enormous amount of power equipment from transfer switches, to multiple remote power panels providing power to processing equipment. The downtime cost of an average company has been estimated at $330,000 per outage.*

**Source: Paper written by Dave Patterson, EECS Department, UC Berkeley "A simple way to estimate the cost of downtime"*

- Electrical switchgear
- Switchboard
- Distribution
- MCCs
- Emergency power backup
- Transfer switch
- UPS system
- Computer servers
- Printers
- Communication systems

JSP

HEAVY DUTY FOR SERVICE ENTRANCE APPLICATIONS

FEATURES AND BENEFITS

- Listed to UL 1449 4th Edition for a Type 1 and Type 2 SPD application.
- Fail-safe design with individually fused Metal Oxide Varistors (MOVs) eliminating single point failure, protecting against both overcurrent and overvoltage events.
- 200kAIC short circuit rating permits direct bus connection to most electrical services.
- Low let through voltage ensured by the lowest possible impedance path to ground and equal current sharing during surge events.
- All weather sealed, powder-coated NEMA 4/IP65 housing is designed for any orientation and indoor/outdoor applications.
- 10-year standard warranty with optional 15-year extended warranty.

AVAILABLE CONFIGURATIONS

Model Number	Voltage	Configuration
JSPxxx-1P120	120V	1-Phase, 2-Wire + Ground
JSPxxx-1P240	240V	1-Phase, 2-Wire + Ground
JSPxxx-1S240	120/240V	2-Phase, 3-Wire + Ground
JSPxxx-3Y208	120/208V	3-Phase Wye, 4-Wire + Ground
JSPxxx-3Y380	220/380V	3-Phase Wye, 4-Wire + Ground
JSPxxx-3Y415	240/415V	3-Phase Wye, 4-Wire + Ground
JSPxxx-3Y480	277/480V	3-Phase Wye, 4-Wire + Ground
JSPxxx-3H240	120/240V	3-Phase High-Leg, 4-Wire + Ground
JSPxxx-3D240	240V	3-Phase Delta, 3-Wire + Ground
JSPxxx-3D380*	380V	3-Phase Delta, 3-Wire + Ground
JSPxxx-3D480*	480V	3-Phase Delta, 3-Wire + Ground
JSPxxx-3Y600*	600V	3-Phase Wye, 4-Wire + Ground
JSPxxx-3D600*	600V	3-Phase Delta, 4-Wire + Ground

**Not available in all kA*
Where xxx = 60, 80, 100, 120, 160, 200, 240, 300, 400kA per Phase
Above are the most popular configurations.

Warranty

10-years (Optional 15-years)

Available Options

Advanced Monitoring	Add suffix -M (available in 60, 80, 100kA only)
Surge Counter	Add suffix -B (available in 120kA or higher only)
Transient Filter	Add suffix -F
Stainless Steel Enclosure	Add suffix -S

Recessed Option *(to be ordered as a Separate Item)*

JSPR	Compact design to allow the SPD to be recessed into the wall. (available in 120, 160kA only in all voltage configurations. Optional surge counter not available.)

Flush-Mount Options *(to be ordered as a Separate Item)*

JSP-FMP	Flush-Mount Plate Kit (available in 60, 80, 100kA only)
JSPR-FMP-120/160	Flush-Mount Plate Kit (available in 120, 160kA JSPR only)

PRODUCT SPECIFICATIONS

Electrical

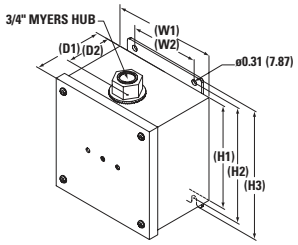
Nominal Discharge Current Rating (I-n)	60, 80, 100kA – 10kA 120kA or higher – 20kA
Operating Frequency	47–63Hz
Connection Method	Parallel to electrical distribution system Pre-wired with 36 inches of #10 AWG conductor (JSPR only)
Response Time	Less than 1 nanosecond
Standard Monitoring	60–100kA and JSPR only – LED status indicator lights (one per phase) 120kA or higher LED status indicator lights (one per phase) Standard Dry (From C) Relay Contacts Audible Alarm with Silence Button

Mechanical

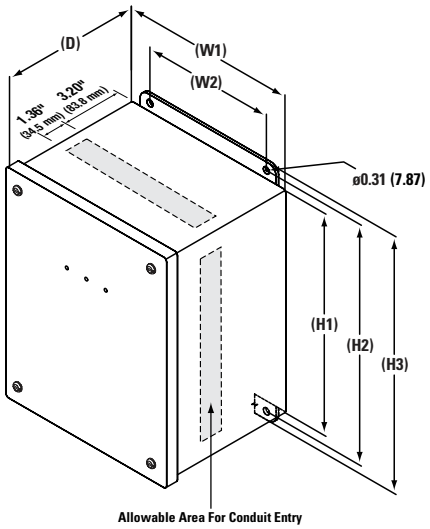
Weight	60–100 10 lbs. (4.5 kg) 120–160 20 lbs. (9 kg) 200–400 40 lbs. (18.2 kg)
Enclosure Type	Powder-coated, impact-resistance steel, weather-proof NEMA 4
Installation Location	Indoor/Outdoor
Operating Environment	-40° to +185°F (-40° to +70°C)
Altitude	Up to 13,000 ft. (4000 m)
Product Design	Parallel design with individually fused MOVs

Regulatory

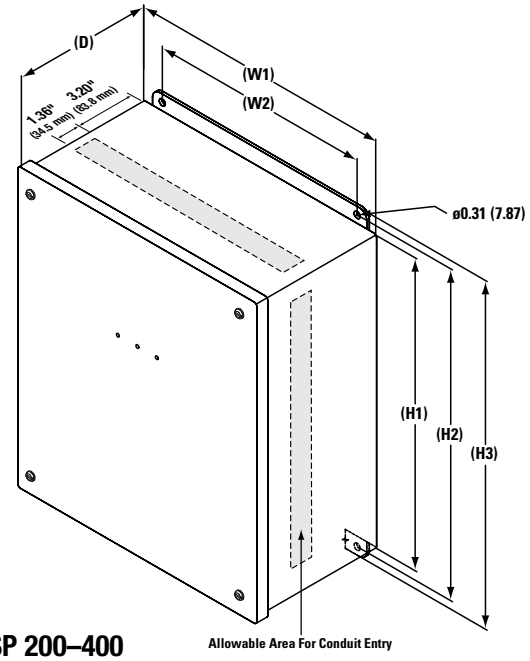
UL 1449 4th Edition Type	Type 1
UL 1283	Yes
IEEE C62.41.1, .2, C62.45	Yes
Listed By	ETL 60–100kA models only UL 120–400kA models only CE 120–400kA models only



JSP 60–100



JSP 120–160



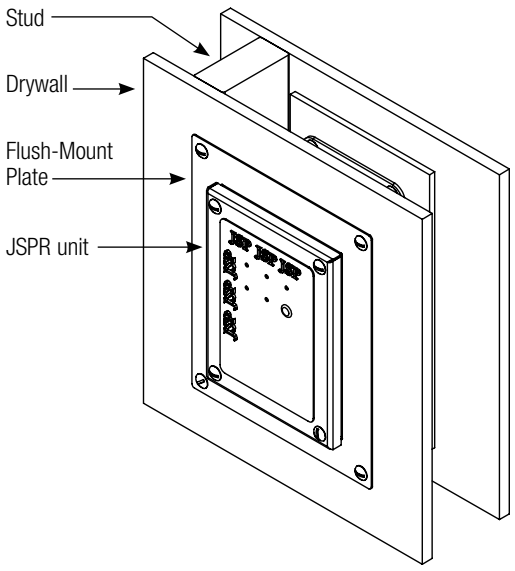
JSP 200–400

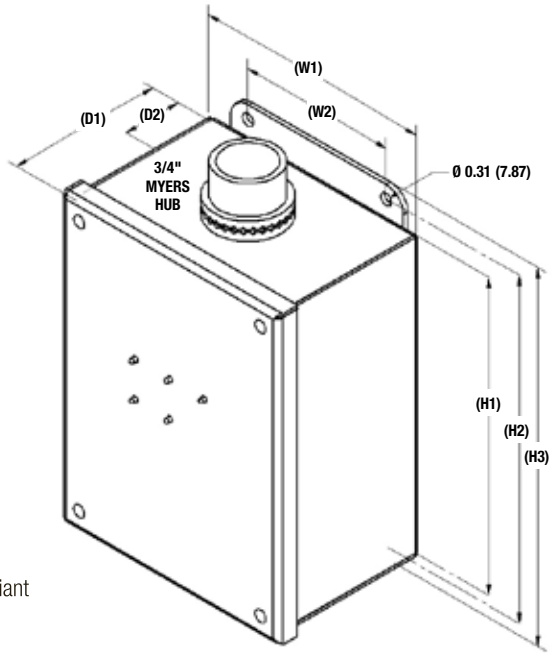
DIMENSIONAL SPECIFICATIONS

Dim	JSP 60, 80, 100	JSP 120, 160	JSP 200, 240, 300, 400
H1	6.00 (152.4)	10.00 (254.0)	14.00 (355.6)
H2	6.75 (171.5)	10.75 (273.1)	14.75 (374.7)
H3	7.50 (190.5)	11.50 (292.1)	15.50 (393.7)
W1	6.00 (152.4)	8.00 (203.2)	12.00 (304.8)
W2	4.00 (101.6)	6.00 (152.4)	10.00 (254.0)
D	–	6.20 (157.5)	6.20 (157.5)
D1	4.16 (105.7)	–	–
D2	2.00 (50.8)	–	–

All measurements in inches (mm)

JSPR





DIMENSIONS

Dim	JSPR
H1	10.00 (254.0)
H2	10.75 (273.1)
H3	11.50 (292.1)
W1	8.00 (203.2)
W2	6.00 (152.4)
D1	4.20 (106.9)
D2	2.00 (50.8)

All measurements in inches (mm)

c UL us LISTED

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CE

RoHS Compliant

MADE IN U. S. A.

JOSLYN

Surgitron® I

HEAVY DUTY SERVICE ENTRANCE APPLICATIONS
MODULAR DESIGN

AVAILABLE CONFIGURATIONS

Model Number	kA Per Phase	Voltage	Configuration
1260-45/85	120kA	120V	1-Phase, 2-Wire + Ground
1261-45/85	120kA	230V	1-Phase, 2-Wire + Ground
1265-45/85	120kA	120/240V	1-Phase, 3-Wire + Ground
1265-85-M*/MN*	240kA	120/240V	1-Phase, 3-Wire + Ground
1455-45/80/85	120kA	120/208V	3-Phase Wye, 4-Wire + Ground
1455-85-M*/MN*	240kA	120/208V	3-Phase Wye, 4-Wire + Ground
1457-45/80/85	120kA	230/400V	3-Phase Wye, 4-Wire + Ground
1456-45/80/85	120kA	277/480V	3-Phase Wye, 4-Wire + Ground
1456-85-M*/MN*	240kA	277/480V	3-Phase Wye, 4-Wire + Ground
1456-85-L	240kA	277/480V	3-Phase, 4-Wire + Ground
1450-85	120kA	220-240V	3-Phase, 3-Wire Ungrounded Delta
1266-85	120kA	240V	3-Phase Delta, 3-Wire + Corner Grounded
1452-80/85	120kA	120/240V	3-Phase High-Leg Delta, 4-Wire + Ground
1451-85	120kA	440/480V	3-Phase, 3-Wire Ungrounded

**M = L-N only*
**MN = L-N, N-G only*

Warranty

5-years

Available Options

Surge Counter	Add suffix -S
Stainless Steel NEMA 4X enclosure	Add suffix -4X
Dry Relay Contacts available on select models.	

Stand Alone Option

Remote Monitor	1260-97 (available on select models)

FEATURES AND BENEFITS

- Listed by ETL to UL 1449 4th Edition for a Type 1 SPD application.
- Matrix of individually fused Metal Oxide Varistors (MOVs) housed in replaceable modules.
- Cover lights indicate status of modules.

PRODUCT SPECIFICATIONS

Electrical

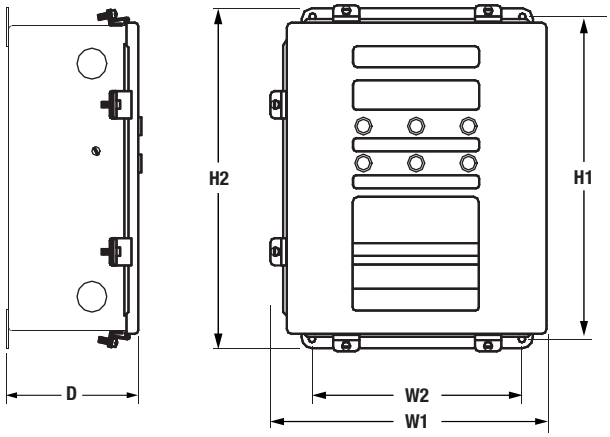
Nominal Discharge Current Rating (I-n)	20kA
Operating Frequency	50–60Hz
Connection Methods	Parallel to Load (shunt) Lugs #14–#2 Directly connect or through 60A (min) breaker
Response Time	Less than 1 nanosecond (one per phase)
Standard Monitoring	LED status indicator lights (one per phase)

Mechanical

Weight	Model dependent
Enclosure Type	Model dependent
Installation Location	Indoor/Outdoor
Operating Environment	-40° to +185°F (-40° to +85°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	Individually fused MOVs Overcurrent Fusing

Regulatory

UL 1449 4th Edition Type	Type 1
UL 1283	No
IEEE C62.41.1, .2, C62.45	Yes
Listed By	ETL



DIMENSIONAL SPECIFICATIONS

Dim	1265-45/85, 1265-85-M/MN, 1266-85	1450-85, 1451-85, 1452-80/85, 1455-45/80/85, 1455-85-M/MN, 1456-45/80/85, 1456-85-L, 1456-85-M/MN, 1457-45/80/85	1260-45/85, 1261-45/85
H1	12.75 (323.9)	14.75 (374.7)	10.75 (273.1)
H2	13.50 (342.9)	15.50 (393.7)	11.50 (292.1)
W1	10.90 (276.9)	12.90 (327.7)	8.90 (226.1)
W2	8.00 (203.2)	10.00 (254.0)	6.00 (152.4)
D	5.20 (132.1)	6.20 (157.5)	4.20 (106.7)

All measurements in inches (mm)

MADE IN U. S. A.

Intertek

For more information go to **tnbpowersolutions.com/joslynsurge**

TransEnd®

MEDIUM DUTY FOR DISTRIBUTION APPLICATIONS

FEATURES AND BENEFITS

- Listed to UL 1449 4th Edition for a Type 2 SPD application.
- Protects facilities and equipment against the harmful effects of lightning strikes and internally generated electrical transients.
- Includes pre-wired pigtail conductors to streamline installation.
- Features internal copper bus conduction path to minimize system impedances, lowering clamping voltage and increasing protection.

AVAILABLE CONFIGURATIONS

Model Number	Voltage	Configuration
XNxx-120/240-2G	120/240V	1-Phase, 3-Wire + Ground
XNxx-120/208-3GY	120/208V	3-Phase Wye, 4-Wire + Ground
XNxx-220/380-3GY	220/380V	3-Phase Wye, 4-Wire + Ground
XNxx-120/240-3GHD	120/240V	3-Phase High-Leg Delta, 4-Wire + Ground
XNxx-277/480-3GY	277/480V	3-Phase Wye, 4-Wire + Ground
XNxxx-240-3DG	240V	3-Phase, 3-Wire + Ground
XNxxx-380-3DG	380V	3-Phase, 3-Wire + Ground
XNxxx-480-3DG	480V	3-Phase, 3-Wire + Ground

Where XX = 25, 50, 80, 100kA Per Mode

Warranty

5-years

Available Options

Dry Form "C" Relay Contacts	Add suffix -FC

Stand Alone Options *(To be ordered as a Seperate Item)*

Option A	
XN Metallic Conduit Kit	Metallic conduit installation kit has a 3/4" (.019 m) x 3" (.076 m) metallic nipple and all associated hardware required to complete the TransEnd installation
Option B	
XN Plastic Conduit Kit	Flexible plastic conduit installation kit, including 18" (.457 m) flexible conduit and all associated hardware required to complete the TransEnd installation

c UL us LISTED

RoHS Compliant

MADE IN U. S. A.

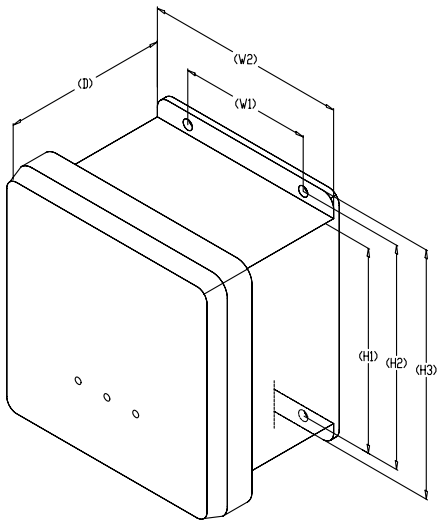
PRODUCT SPECIFICATIONS

Electrical	
Nominal Discharge Current Rating (I-n)	20kA
Operating Frequency	47–63Hz
Connection Methods	Parallel to Load (shunt) 24" #10 AWG wires Through 20A (max) breaker
Response Time	Less than 1 nanosecond (one per phase)
Standard Monitoring	LED status indicator lights

Mechanical	
Weight	12.7 lbs. (5.8 kg)
Enclosure Type	NEMA 4X fiberglass-reinforced polyester (FRP) surface-mount, non-removable cover
Installation Location	Indoor/Outdoor
Operating Environment	-40° to +140°F (-40° to +60°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	No internal fusing

Regulatory	
UL 1449 4th Edition Type	Type 2
UL 1283	Yes
IEEE C62.41.1, .2, C62.45	Yes
Listed By	UL

DIMENSIONAL SPECIFICATIONS



Dim	TransEnd
H1	6.17 (156.7)
H2	6.75 (171.5)
H3	7.50 (190.4)
W1	4.01 (101.9)
W2	6.12 (155.4)
D	5.01 (127.5)

All measurements in inches (mm)

JOSLYN

Surgitron® III -21 Series

MEDIUM DUTY
FOR RESIDENTIAL OR INDUSTRIAL APPLICATIONS

FEATURES AND BENEFITS

- Listed to UL 1449 4th Edition for a Type 1 or Type 2 SPD application.
- Individual fusing for each Metal Oxide Varistors (MOVs).
- LED indicates proper functioning of L-N and N-G MOVs

PRODUCT SPECIFICATIONS

Electrical	
Nominal Discharge Current Rating (I-n)	20kA
Operating Frequency	47–63Hz
Connection Methods	Parallel to Load (shunt) #14 AWG wires
Response Time	Less than 1 nanosecond (one per phase)
Standard Monitoring	LED status indicator lights

Mechanical	
Weight	2 lbs. (.9 kg)
Enclosure Type	NEMA 1, Non-metallic
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	Individually fused MOVs

Regulatory	
UL 1449 4th Edition Type	Model dependent
UL 1283	No
IEEE C62.41.1, .2, C62.45	Yes
Listed By	UL

AVAILABLE CONFIGURATIONS

TYPE 1

Model Number	kA Per Phase	Voltage	Configuration
1260-21	40kA	120V	1-Phase, 2-Wire +Ground
1265-21	40kA	120/240V	2-Phase, 3-Wire + Ground
1265-21-G	40kA	120/240V	2-Phase, 3-Wire + Ground
1455-21	40kA	120/208V	3-Phase, 4-Wire + Ground
1455-21-A	40kA	120/208V	3-Phase, 4-Wire + Ground
1455-21-D	40kA	230/240V	3-Phase Delta, 3-Wire + Ground

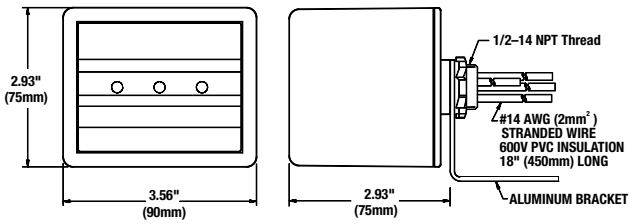
TYPE 2

Model Number	kA Per Phase	Voltage	Configuration
1261-21-xx	40kA	230V	1-Phase, 2-Wire + Ground
1261-21	40kA	277V	1-Phase, 2-Wire + Ground
1263-21	40kA	480V	1-Phase, 2-Wire
1452-21	40kA	120/240V	3-Phase High-Leg Delta, 4-Wire + Ground
1456-21	40kA	277/480V	3-Phase, 4-Wire + Ground
1456-21-D	40kA	480V	3-Phase, 3-Wire + Ground
1457-21	40kA	230/400V	3-Phase, 4-Wire + Ground

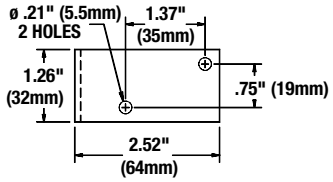
xx = -TNG, -TMS, -TT, -IT, -IT-L
Bracket comes standard with all models

Warranty
3-years

DIMENSIONAL SPECIFICATIONS



Bracket Detail



c UL us LISTED RoHS Compliant

MADE IN U. S. A.

For more information go to **tnbpowersolutions.com/joslynsurge**

Surgitron® III -49 Series

MEDIUM DUTY
FOR RESIDENTIAL OR INDUSTRIAL APPLICATIONS

AVAILABLE CONFIGURATIONS

TYPE 1

Model Number	kA Per Phase	Voltage	Configuration
1260-49	40kA	120V	1-Phase, 2-Wire + Ground
1260-49-C	40kA	120V	1-Phase, 2-Wire + Ground
1261-49-C	40kA	240V	1-Phase, 2-Wire + Ground
1265-49	40kA	120/240V	2-Phase, 3-Wire + Ground
1265-49-C	40kA	120/240V	2-Phase, 3-Wire + Ground
1450-49	40kA	240V	3-Phase Delta, 4-Wire + Ground
1455-49	40kA	120/208V	3-Phase Delta, 4-Wire + Ground

TYPE 2

Model Number	kA Per Phase	Voltage	Configuration
1261-49	40kA	240V	1-Phase, 2-Wire + Ground
1451-49	40kA	480V	3-Phase Delta, 3-Wire + Ground
1452-49	40kA	120/240V	3-Phase High-Leg Delta, 4-Wire + Ground
1456-49	40kA	277/480V	3-Phase, 4-Wire + Ground
1457-49	40kA	230-400V	3-Phase, 4-Wire + Ground

-CF Model *(Contains UL 1283 listed filter)*

Model Number	kA Per Phase	Voltage	Configuration
1265-49-CF*	80kA	120/240V	2-Phase, 3 Wire + Ground

**Dry Relay Contacts not available.*

Warranty

3-years

Options *(Not available on 1265-49-CF model)*

1 Set of Dry Relay Contacts (All Models)	Add suffix -R
1 Set of Dry Relay Contacts + Mounting Bracket xx-RB Option only Available on 1261 and 1457 models	Add suffix -RB

FEATURES AND BENEFITS

- Listed to UL 1449 4th Edition for a Type 1 or Type 2 SPD application.
- Individual fusing for each Metal Oxide Varistors (MOVs).
- LED indicates proper function of individual MOVs

PRODUCT SPECIFICATIONS

Electrical

Nominal Discharge Current Rating (I-n)	20kA
Operating Frequency	47–63Hz
Connection Methods	Parallel to Load (shunt) #14 AWG wires
Response Time	Less than 1 nanosecond (one per phase)
Standard Monitoring	LED status indicator lights

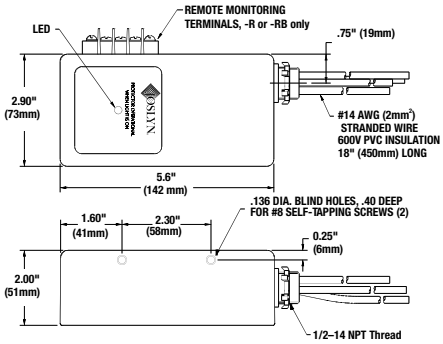
Mechanical

Weight	2 lbs. (.9 kg)
Enclosure Type	NEMA 1, Non-metallic
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	Individually fused MOVs

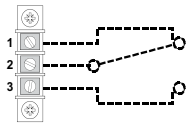
Regulatory

UL 1449 4th Edition Type	Model dependent
UL 1283	No (Except for 1265-49-CF model)
IEEE C62.41.1, .2, C62.45	Yes
Listed By	UL

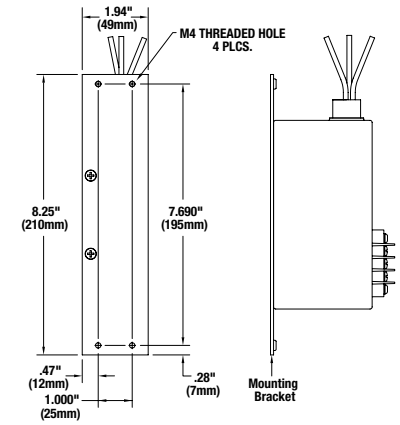
DIMENSIONAL SPECIFICATIONS



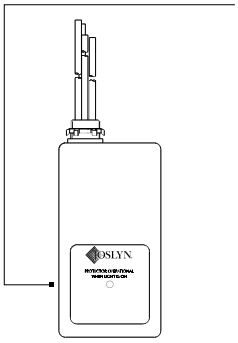
Alarm Relay Contacts (-R and -RB Models) Shown with Power On



-RB MODEL ONLY



1265-49-CF MODEL SAME DIMENSIONS AS -R WITH NO DRY RELAY CONTACTS



Surgitron® III -22 Series

MEDIUM DUTY FOR RESIDENTIAL OR INDUSTRIAL APPLICATIONS

FEATURES AND BENEFITS

- Listed to UL 1449 4th Edition for Type 2 SPD application.
- Multiple Metal Oxide Varistors (MOVs) with individual and overcurrent protection.
- LED indicates proper function of individual MOVs.

AVAILABLE CONFIGURATIONS

Model Number	kA Per Phase	Voltage	Configuration
1265-22-80-F1	80kA	120/240V	1-Phase, 3-Wire
1265-22-60-F1	60kA	120/240V	1-Phase, 3-Wire
1265-22-40-F1	40kA	120/240V	1-Phase, 3-Wire

Warranty

3-years

Stand Alone Option *(To be ordered as a Separate Item)*

Flush-Mount Plate Kit	22-FMP-KIT

PRODUCT SPECIFICATIONS

Electrical

Nominal Discharge Current Rating (I-n)	Model dependent
Operating Frequency	50–60Hz
Connection Methods	#14 AWG wires 30A Max Breaker
Response Time	Less than 1 nanosecond (one per phase)
Standard Monitoring	LED Status Indicator light

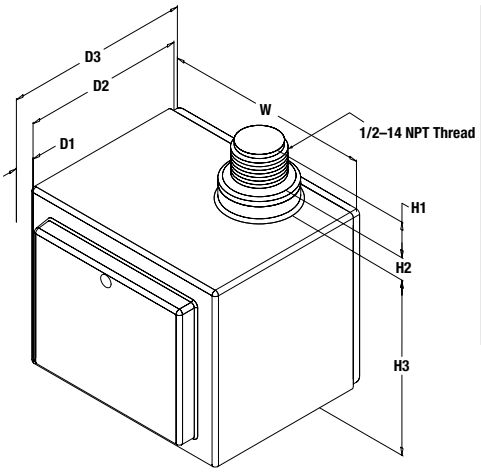
Mechanical

Weight	2 lbs. (.9 kg)
Enclosure Type	NEMA 1, Non-metallic
Installation Location	Indoor
Operating Environment	-40° to +185°F (-40° to +85°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	Individually fused MOVs

Regulatory

UL 1449 4th Edition Type	Type 2
UL 1283	No
IEEE C62.41.1, .2, C62.45	Yes
Listed By	UL

DIMENSIONAL SPECIFICATIONS



H1	.75 (19.1)
H2	.25 (6.4)
H3	2.93 (74.4)
W	3.56 (90.4)
D1	.32 (8.1)
D2	2.78 (70.6)
D3	3.10 (78.7)
All measurements in inches (mm)	

Schematic shown in horizontal position. (Photo shown in vertical position)

c UL us LISTED

RoHS Compliant

MADE IN U. S. A.

For more information go to **tnbpowersolutions.com/joslynsurge**

LDP

LIGHT DUTY FOR AC APPLICATIONS

FEATURES AND BENEFITS

- Listed by ETL to UL 1449 4th Edition for a Type 1 SPD application.
- Multiple Metal Oxide Varistors (MOVs), with individual current fusing and thermal disconnects for each MOV.
- LED indicates proper functioning of L-N MOVs.
- Intended for use on U.S., TN-C, TN-C-S and TNS grounded systems.

PRODUCT SPECIFICATIONS

Electrical	
Nominal Discharge Current Rating (I-n)	10kA
Operating Frequency	47–63Hz
Connection Methods	Parallel to Load (shunt) 18" #14 AWG wires Direct connect or Breaker
Response Time	Less than 1 nanosecond
Standard Monitoring	LED status indicator lights (one per phase)

Mechanical	
Weight	1 lb. (.5kg)
Enclosure Type	NEMA 1, Non-metallic
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	Individually fused MOVs Overcurrent Fusing Thermal Fusing

Regulatory	
UL 1449 4th Edition Type	Type 1
UL 1283	No
IEEE C62.41.1, .2, C62.45	Yes
Listed By	ETL

AVAILABLE CONFIGURATIONS

MODEL NUMBER SCHEME

	kA Rating		Voltage		Modes Protected	
LDP	XX	–	YYY	–	Z	
	20		120		1 L1-N, N-G	(1 LED)
	25		127		2 L1-N, L2-N	(2 LEDs)
	30		230		3 L1-G, L2-G	(2 LEDs)
			277		4 L1-G, N-G	(1 LED)
					5 L1-N, L1-G	(2 LEDs)
					6 L1-N	(1 LED)
					7 L1-G	(1 LED)
					8 N-G	(0 LEDs)
					9 L1-L2	(1 LED)

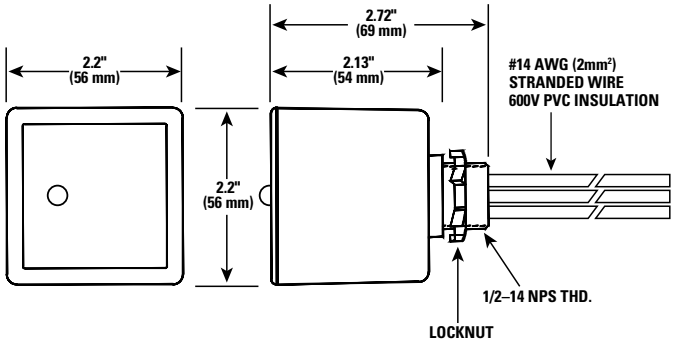
Example: **LDP30-120-1**
30kA device suitable for **120V** systems, designed to protect **L1-N and N-G mode**

A dedicated breaker should be ≥20A at main panel or ≥10A at subpanel.

Warranty
3-years

Available Options	
Mounting Bracket	Add suffix -B

DIMENSIONAL SPECIFICATIONS



Intertek

RoHS Compliant

MADE IN U. S. A.

1000 Series

LIGHT DUTY FOR DC APPLICATIONS

FEATURES AND BENEFITS

- Full weather permanently connected.
- Individually fused Metal Oxide Varistors (MOVs).
- May be used on grounded (+ or -) or floating power systems, for DC or low voltage AC (up to 400Hz).
- LED indicates proper functioning of L-L and L-G MOVs.

AVAILABLE CONFIGURATIONS

Model Number	kA Per Phase	DC Voltage	AC Voltage
1020-30	25kA	30Vdc	25Vac
1020-60	50kA	60Vdc	45Vac
1020-90	50kA	90Vdc	65Vac
1020-150*	50kA	150Vdc	110Vac

**Model 1020-150 is not intended for use on 110/120 Vac power system.*

Mounting bracket standard on all units

Warranty

3-years

PRODUCT SPECIFICATIONS

Electrical

Nominal Discharge Current Rating (I-n)	None
Operating Frequency	AC/DC 0–400 Hz
Connection Methods	Mounts through 1/2" knockout or by its bracket Connects in parallel with load
Modes of Protection	L-L, L-G
Response Time	Less than 1 nanosecond
Standard Monitoring	LED status indicator lights (one per line)

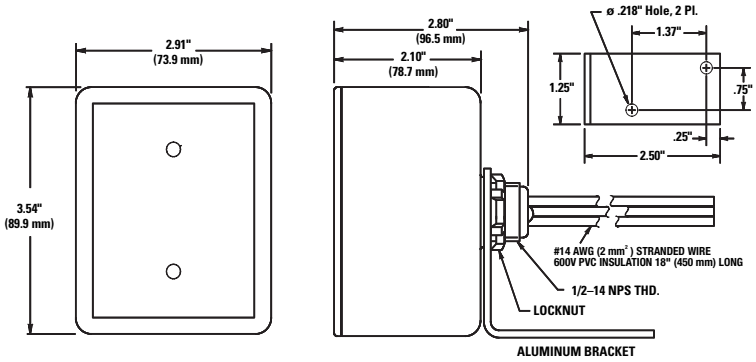
Mechanical

Weight	1.5 lbs. (.7kg)
Enclosure Type	NEMA 1
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 16,400 ft. (5000 m)
Product Design	Individually fused MOVs Overcurrent Fusing Thermal Fusing

Regulatory

Requirements are discretionary and respective to the product application

DIMENSIONAL SPECIFICATIONS



Schematic shown in vertical position. (Photo shown in horizontal position)

MADE IN U. S. A.

For more information go to **tnbpowersolutions.com/joslynsurge**

DIN-Rail
Component protection

The ABB family of surge protective devices now includes Joslyn and ABB DIN-Rail products, bringing a more comprehensive selection of devices for safeguarding equipment in virtually any application.

– All DIN-Rail surge protectors are suitable for use at the main electrical panel, sub-panels or point of use.
– The OVR DIN-Rail surge protectors come standard with an end of life indicator and utilize pluggable cartridges.
– More detailed information can be found on the pages that follow.

DIN-Rail Neutral

MEDIUM DUTY FOR CONTROL PANEL APPLICATIONS

Neutral Pole

FEATURES AND BENEFITS

- Certified to UL 1449 4th Edition as a recognized component
- Type 4 SPD suitable for use in Type 2 locations
- Replaceable cartidges for ease of maintenance

PRODUCT SPECIFICATIONS

Electrical

Nominal Discharge Current Rating (I-n)	20kA
Operating Frequency	50–60 Hz
Connection Methods	Screw Terminal #4 – #14 AWG
Response Time	Less than 25 nanosecond
Standard Monitoring	N/A

Mechanical

Weight	0.25 lb. (0.1 kg)
Enclosure Type	IP20
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 6562 ft. (2000 m)
Product Design	Integrated Thermal Disconnect

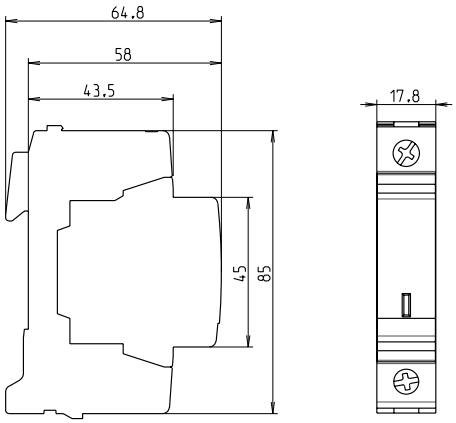
Regulatory

UL 1449 4th Edition Type	Type 4 for Type 2 locations
UL 1283	No
IEEE C62.41.1, .2, C62.45	No
Listed by	UL
CE	Yes

AVAILABLE CONFIGURATIONS

Neutral Pole				
Model Number	**kA Per Phase**	**Service Voltage**	**Remote Monitoring**	**Replacement Cartridge**
OVRT270NPU	70	HLD, Single Phase, Split Phase and Wye	No	OVRT270NCU

DIMENSIONAL SPECIFICATIONS



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DIN-Rail Data Line

DATA AND TELECOM APPLICATIONS

One Pole

AVAILABLE CONFIGURATIONS

One Pole		
Model Number	**Maximum continuous operating voltage (Uc)**	**kA Per Phase**
OVRTC06V	7	10
OVRTC12V	14	10
OVRTC24V	27	10
OVRTC48V	53	10
OVRTC200V*	220	10
OVRTC200FR	220	10

* Connection type is parallel. All other parts, series

FEATURES AND BENEFITS

- 10kA maximum discharge current
- Nominal voltage: 6, 12, 24, 48 and 200 VDC
- End of Life Indicator
- UL 497B approved

PRODUCT SPECIFICATIONS

Electrical	
Nominal Discharge Current Rating (I-n)	5kA
Connection Methods	Screw Terminal #4 – #14 AWG
Response Time	Less than 25 nanosecond
Standard Monitoring	N/A

Mechanical	
Weight	0.25 lb. (.1 Kg)
Enclosure Type	IP20
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 6562 ft. (2000 m)
Product Design	Integrated Thermal Disconnect

Regulatory	
UL 497B	Yes
IEEE C62.41.1, .2, C62.45	No
Listed by	UL
CE	Yes

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DIN-Rail One Pole

MEDIUM DUTY FOR CONTROL PANEL APPLICATIONS

One pole

One pole with contact

One pole plus neutral

One pole plus neutral with contact

AVAILABLE CONFIGURATIONS

One Pole				
Model Number	**kA Per Phase**	**Service Voltage**[1]	**Remote Monitoring**	**Replacement Cartridge**
OVRT215150PU	15	120V Single Phase, 240/120V Split Phase, 208/120V Wye	No	OVRT215150CU
OVRT215320PU	15	240/120V HLD, 240V Delta, 240V Single Phase, 277V Single Phase, 480/240V Split Phase, 480/277V Wye	No	OVRT215320CU
OVRT240150PU	40	120V Single Phase, 240/120V Split Phase, 208/120V Wye	No	OVRT240150CU
OVRT240150PTSU	40	120V Single Phase, 240/120V Split Phase, 208/120V Wye	Yes	OVRT240150CU
OVRT240320PU	40	240/120V HLD, 240V Delta, 240V Single Phase, 277V Single Phase, 480/240V Split Phase, 480/277V Wye	No	OVRT240320CU
OVRT240320PTSU	40	240/120V HLD, 240V Delta, 240V Single Phase, 277V Single Phase, 480/240V Split Phase, 480/277V Wye	Yes	OVRT240320CU
OVRT240440PTSU	40	600/347V Wye	Yes	OVRT240440CU
OVRT240550PTSU	40	480V Delta	Yes	OVRT240550CU
OVRT240660PTSU	40	600V Delta	Yes	OVRT240660CU
One Pole plus Neutral				
Model Number	**kA Per Phase**	**Service Voltage**[1]	**Remote Monitoring**	**Replacement Cartridge**[2]
OVRT21N15150PU	15	120V Single Phase, 240/120V Split Phase, 208/120V Wye	No	OVRT215150CU, OVRT270NCU
OVRT21N15320PU	15	240/120V HLD, 240V Single Phase, 277V Single Phase, 480/240V Split Phase, 480/277V Wye	No	OVRT215320CU, OVRT270NCU
OVRT21N40150PTSU	40	120V Single Phase, 240/120V Split Phase, 208/120V Wye	Yes	OVRT240150CU, OVRT270NCU
OVRT21N40320PTSU	40	240/120V HLD, 240V Single Phase, 277V Single Phase, 480/240V Split Phase, 480/277V Wye	Yes	OVRT240320CU, OVRT270NCU
OVRT21N40440PTSU	40	600/347V Wye	Yes	OVRT240440CU, OVRT270NCU
OVRT21N40550PTSU	40	600/347V Wye	Yes	OVRT240550CU, OVRT270NCU
OVRT21N40660PTSU	40	600/347V Wye	Yes	OVRT240660CU, OVRT270NCU

1) May require multiple SPDs
2) May require up to one Phase and one neutral replacement cartridges

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For more information go to **abb.com/low-voltage**

FEATURES AND BENEFITS

- Certified to UL 1449 4th Edition as a recognized component
- Type 4 SPD suitable for use in Type 2 locations
- Capable of protecting AC networks up to 600V
- Replaceable cartidges for ease of maintenance
- End of Life Indicator

PRODUCT SPECIFICATIONS

Electrical

Nominal Discharge Current Rating (I-n)	Model Dependent
Operating Frequency	50–60 Hz
Connection Methods	Screw Terminal #4 – #14 AWG
Response Time	Less than 25 nanosecond
Monitoring	Standard–Visual • Remote–Optional

Mechanical

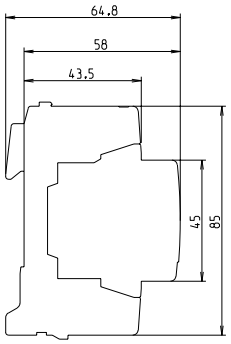
Weight	0.25 – 0.5 lb. (0.1 – 0.25 Kg)
Enclosure Type	IP20
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 6562 ft. (2000 m)
Product Design	Integrated Thermal Disconnect

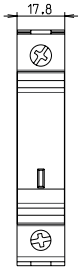
Regulatory

UL 1449 4th Edition Type	Type 4 for Type 2 locations
UL 1283	No
IEEE C62.41.1, .2, C62.45	No
Listed by	UL
CE	Yes

DIMENSIONAL SPECIFICATIONS

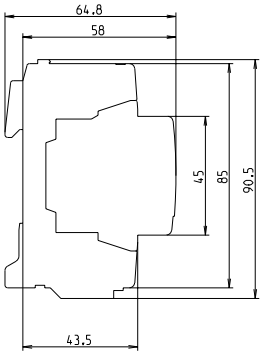
One Pole

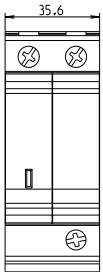




OVRT215150PU
OVRT215320PU
OVRT240150PU
OVRT240320PU

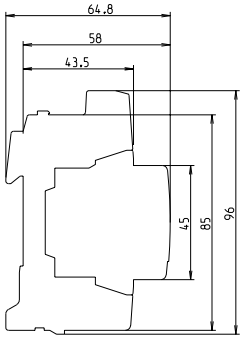
One Pole plus Neutral

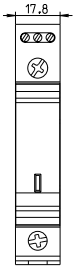




OVRT21N15150PU
OVRT21N15320PU

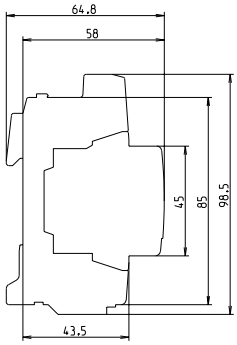
One Pole with Contact

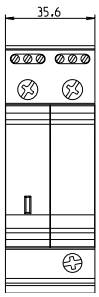




OVRT240150PTSU
OVRT240320PTSU
OVRT240440PTSU
OVRT240550PTSU
OVRT240660PTSU

One Pole plus Neutral with Contact





OVRT21N40150PTSU
OVRT21N40320PTSU
OVRT21N40440PTSU
OVRT21N40550PTSU
OVRT21N40660PTSU

DIN-Rail Two Pole

MEDIUM DUTY FOR CONTROL PANEL APPLICATIONS

Two pole

Two pole with contact

Two pole plus neutral

Two pole plus neutral with contact

AVAILABLE CONFIGURATIONS

Two Pole				
Model Number	**kA Per Phase**	**Service Voltage**[1]	**Remote Monitoring**	**Replacement Cartridge**[2]
OVRT22L15150PU	15	120V Single Phase, 240/120V Split Phase, 208/120V Wye	No	OVRT215150CU
OVRT22L15320PU	15	240/120V HLD, 240V Delta, 240V Single Phase, 277V Single Phase, 480/240V Split Phase, 480/277V Wye	No	OVRT215320CU
OVRT22L40150PTSU	40	120V Single Phase, 240/120V Split Phase, 208/120V Wye	Yes	OVRT240150CU
OVRT22L40320PTSU	40	240/120V HLD, 240V Delta, 240V Single Phase, 277V Single Phase, 480/240V Split Phase, 480/277V Wye	Yes	OVRT240320CU
Two Pole plus Neutral				
Model Number	**kA Per Phase**	**Service Voltage**[1]	**Remote Monitoring**	**Replacement Cartridge**[3]
OVRT22N15150PU	15	240/120V Split Phase, 208/120V Wye	No	OVRT215150CU, OVRT270NCU
OVRT22N15320PU	15	240/120V HLD, 480/240V Split Phase, 480/277V Wye	No	OVRT215320CU, OVRT270NCU
OVRT22N40150PTSU	40	240/120V Split Phase, 208/120V Wye	Yes	OVRT240150CU, OVRT270NCU
OVRT22N40320PTSU	40	240/120V HLD, 480/240V Split Phase, 480/277V Wye	Yes	OVRT240320CU, OVRT270NCU
OVRT22N40440PTSU	40	600/347V Wye	Yes	OVRT240440CU, OVRT270NCU
OVRT22N40550PTSU	40	600/347V Wye	Yes	OVRT240550CU, OVRT270NCU
OVRT22N40660PTSU	40	600/347V Wye	Yes	OVRT240660CU, OVRT270NCU

(1) May require multiple SPDs
(2) May require up to two replacement cartridges
(3) May require up to two phase and one neutral replacement cartridges

c UL US LISTED CE RoHS Compliant

For more information go to **abb.com/low-voltage**

FEATURES AND BENEFITS

- Certified to UL 1449 4th Edition as a recognized component
- Type 4 SPD suitable for use in Type 2 locations
- Capable of protecting AC networks up to 600V
- Replaceable cartidges for ease of maintenance
- End of Life Indicator

PRODUCT SPECIFICATIONS

Electrical

Nominal Discharge Current Rating (I-n)	Model Dependent
Operating Frequency	50–60 Hz
Connection Methods	Screw Terminal #4 – #14 AWG
Response Time	Less than 25 nanosecond
Monitoring	Standard–Visual • Remote–Optional

Mechanical

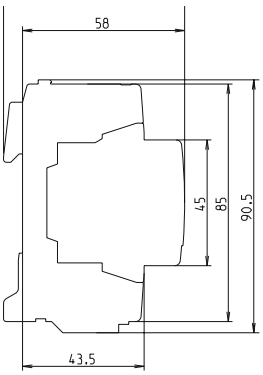
Weight	0.5 – 0.75 lb. (0.25 – 0.34 Kg)
Enclosure Type	IP20
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 6562 ft. (2000 m)
Product Design	Integrated Thermal Disconnect

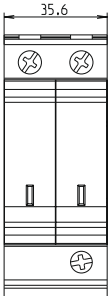
Regulatory

UL 1449 4th Edition Type	Type 4 for Type 2 locations
UL 1283	No
IEEE C62.41.1, .2, C62.45	No
Listed by	UL
CE	Yes

DIMENSIONAL SPECIFICATIONS

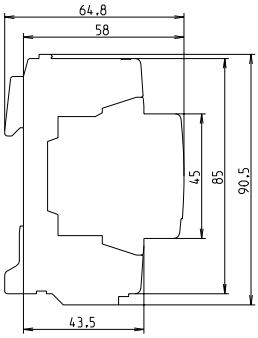
Two Pole

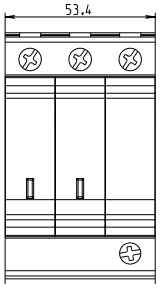




OVRT22L15150PU
OVRT22L15320PU

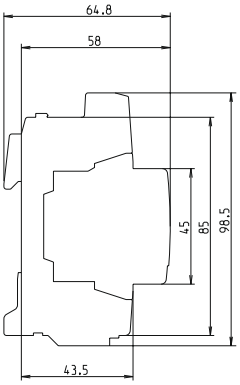
Two Pole plus Neutral

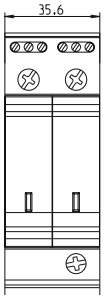




OVRT22N15150PU
OVRT22N15320PU

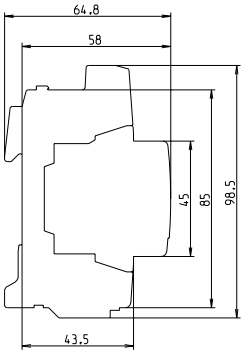
Two Pole with Contact

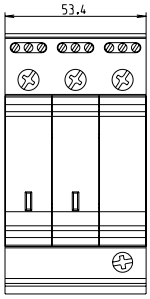




OVRT22L40150PTSU
OVRT22L40320PTSU

Two Pole plus Neutral with Contact





OVRT22N40150PTSU
OVRT22N40320PTSU
OVRT22N40440PTSU
OVRT22N40550PTSU
OVRT22N40660PTSU

DIN-Rail Three Pole

MEDIUM DUTY FOR CONTROL PANEL APPLICATIONS

Three pole

Three pole with contact

Three pole plus neutral

Three pole plus neutral with contact

AVAILABLE CONFIGURATIONS

Three Pole				
Model Number	**kA Per Phase**	**Service Voltage[1]**	**Remote Monitoring**	**Replacement Cartridge[2]**
OVRT23L15150PU	15	240/120V Split Phase, 208/120V Wye	No	OVRT215150CU
OVRT23L15320PU	15	240/120V HLD, 240V Delta, 480/240V Split Phase, 480/277V Wye	No	OVRT215320CU
OVRT23L40150PTSU	40	240/120V Split Phase, 208/120V Wye	Yes	OVRT240150CU
OVRT23L40320PTSU	40	240/120V HLD, 240V Delta, 480/240V Split Phase, 480/277V Wye	Yes	OVRT240320CU
OVRT23L40440PTSU	40	240V Delta, 480/240V Split Phase, 600/347V Wye	Yes	OVRT240440CU
OVRT23L40550PTSU	40	480V Delta	Yes	OVRT240550CU
Three Pole plus Neutral				
Model Number	**kA Per Phase**	**Service Voltage[1]**	**Remote Monitoring**	**Replacement Cartridge[3]**
OVRT23N15150PU	15	208/120V Wye	No	OVRT215150CU OVRT270NCU
OVRT23N15320PU	15	480/277V Wye, 240/120V HLD	No	OVRT215320CU OVRT270NCU
OVRT23N40150PTSU	40	208/120V Wye	Yes	OVRT240150CU OVRT270NCU
OVRT23N40320PTSU	40	480/277V Wye, 240/120V HLD	Yes	OVRT240320CU OVRT270NCU
OVRT23N40440PTSU	40	600/347V Wye	Yes	OVRT240440CU OVRT270NCU
OVRT23N40550PTSU	40	600/347V Wye	Yes	OVRT240550CU OVRT270NCU
OVRT23N40660PTSU	40	600/347V Wye	Yes	OVRT240660CU OVRT270NCU

(1) May require multiple SPDs
(2) May require up to three replacement cartridges
(3) May require up to three phase and one neutral replacement cartridges

c UL US LISTED CE RoHS Compliant

FEATURES AND BENEFITS

- Certified to UL 1449 4th Edition as a recognized component
- Type 4 SPD suitable for use in Type 2 locations
- Capable of protecting AC networks up to 600V
- Replaceable cartidges for ease of maintenance
- End of Life Indicator

PRODUCT SPECIFICATIONS

Electrical

Nominal Discharge Current Rating (I-n)	Model Dependent
Operating Frequency	50–60 Hz
Connection Methods	Screw Terminal #4 – #14 AWG
Response Time	Less than 25 nanosecond
Monitoring	Standard–Visual • Remote–Optional

Mechanical

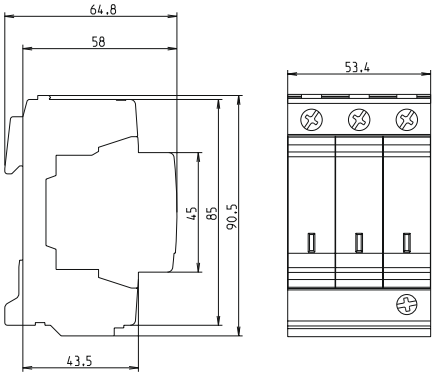
Weight	0.75 – 1.00 lb. (0.34 – 0.5 Kg)
Enclosure Type	IP20
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 6562 ft. (2000 m)
Product Design	Integrated Thermal Disconnect

Regulatory

UL 1449 4th Edition Type	Type 4 for Type 2 locations
UL 1283	No
IEEE C62.41.1, .2, C62.45	No
Listed by	UL
CE	Yes

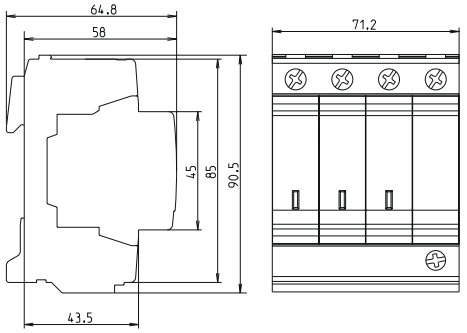
DIMENSIONAL SPECIFICATIONS

Three Pole



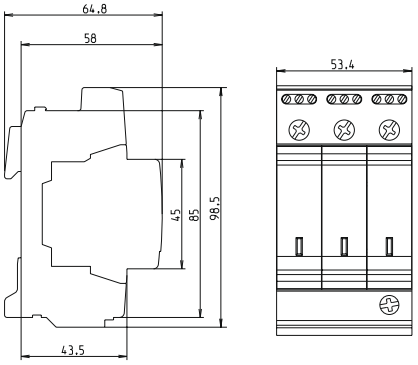
OVRT23L15150PU
OVRT23L15320PU

Three Pole plus Neutral



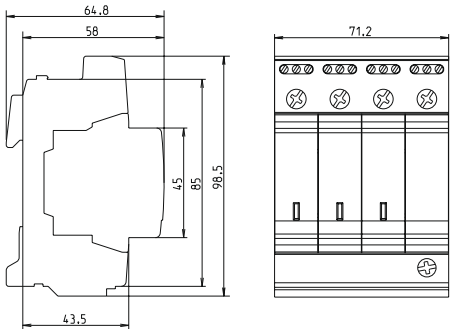
OVRT23N15150PU
OVRT23N15320PU

Three Pole with Contact



OVRT23L40150PTSU
OVRT23L40320PTSU
OVRT23L40440PTSU
OVRT23L40550PTSU

Three Pole plus Neutral with Contact



OVRT23N40150PTSU
OVRT23N40320PTSU
OVRT23N40440PTSU
OVRT23N40550PTSU
OVRT23N40660PTSU

DIN-Rail Photovoltaic

SOLAR COMBINER BOXES AND INVERTERS

Three pole

Three pole with contact

AVAILABLE CONFIGURATIONS

Photovoltaic					
Model Number	**Maximum Continuous Operating Voltage**	**kA Per Phase**	**Remote Monitoring**	**Number of Poles**	**Replacement Cartridge**
OVRPV15600PU	750	15	No	3	OVRPV15600CU
OVRPV15600PTSU	750	15	Yes	3	OVRPV15600CU
OVRPV40600PU	750	40	No	3	OVRPV40600CU
OVRPV40600PTSU	750	40	Yes	3	OVRPV40600CU
OVRPV15800PU	1000	15	No	3	OVRPV15800CU
OVRPV15800PTSU	1000	15	Yes	3	OVRPV15800CU
OVRPV40800PU	1000	40	No	3	OVRPV40800CU
OVRPV40800PTSU	1000	40	Yes	3	OVRPV40800CU
OVRPV151000PU	1250	15	No	3	OVRPV151000CU
OVRPV151000PTSU	1250	15	Yes	3	OVRPV151000CU
OVRPV401000PU	1250	40	No	3	OVRPV401000CU
OVRPV401000PTSU	1250	40	Yes	3	OVRPV401000CU

Note: Replacement cartridges are only usable for OVR PV DIN-Rail product range show above.

c UL us LISTED CE RoHS Compliant

FEATURES AND BENEFITS

- Certified to UL 1449 3rd Edition as a recognized component; Type 4 SPD suitable for use in Type 1 locations
- Built-in thermal protection with 25A DC breaking capacity
- Removable cartridges for easy maintenance with no need to isolate the line
- Remote signaling contact for monitoring the operating status (TS versions)
- No subsequent short-circuit current
- No risk if the polarity is reversed

PRODUCT SPECIFICATIONS

Electrical

Nominal Discharge Current Rating (I-n)	Model Dependent
Connection Methods	Screw Terminal #4 – #14 AWG
Response Time	Less than 25 nanosecond
Monitoring	Standard – Visual • Remote – Optional

Mechanical

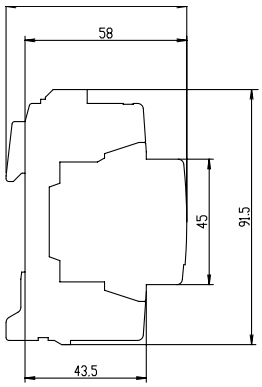
Weight	0.75 lb. (.34 Kg)
Enclosure Type	IP20
Installation Location	Indoor
Operating Environment	-40° to +176°F (-40° to +80°C)
Altitude	Up to 6562 ft. (2000 m)
Product Design	Integrated Thermal Disconnect

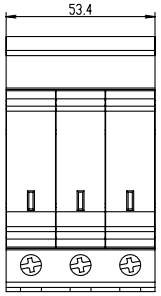
Regulatory

UL 1449 3rd Edition Type	Type 4 for Type 1 locations
UL 1283	No
IEEE C62.41.1, .2, C62.45	No
Listed by	UL
CE	Yes

DIMENSIONAL SPECIFICATIONS

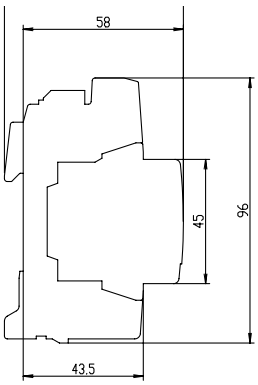
Three Pole

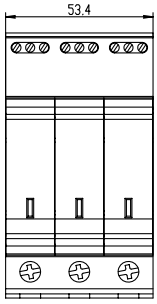




OVRPV401000PU
OVRPV151000PU
OVRPV40800PU
OVRPV15800PU
OVRPV40600PU
OVRPV15600PU

Three Pole with Contact





OVRPV401000PTSU
OVRPV151000PTSU
OVRPV40800PTSU
OVRPV15800PTSU
OVRPV40600PTSU
OVRPV15600PTSU

Glossary

Attenuation
The reduction of a signal or electrical surge from one point to another. Wire resistance, surge protective devices (SPDs), high voltage arresters, and power conditioners attenuate surges to varying degrees. Attenuation is used to describe the EMI/RFI filtering characteristics on Surge Protection Devices at a specific frequency and is usually expressed in decibels.

Canadian Standards Association (CSA)
CSA is an independent, non-profit, product-safety testing and standards agency. Accredited by OSHA and is classified as an NRTL, CSA serves industry, government private business and consumers in Canada and in the global marketplace.

Cascading
The practice of installing surge protective devices at two or more points on the electrical power system. The upstream device is designed to divert the majority of transient surges that comes from external sources (such as lightning, and power companies' induced transients), while secondary devices serve to clamp the residual surge energy as well as any surge activity that originates within the facility. The use of cascading SPD systems also protect against surge impulses entering a facility downstream of service entrance. Please see IEEE 1100 for additional information about cascading.

Clamping Voltage
The peak voltage that SPDs allow into an electric circuit based on a specific test waveform.

Electromagnetic Interference (EMI)
EMI is a frequency voltage disturbance. They affect sensitive electrical circuitry because of electromagnetic conduction or radiation that is emitted from an external source. EMI is often referred to as "RFI."

Filter
The electronic device that limits certain frequency bands while allowing others to pass through. Filter designs that are integral to One-Port Surge Protection Devices are of the band pass variety that attenuates a thin range of frequencies between line and ground mode. Filters that are integral to a Two-Port Surge Protection Device are mainly of the low-pass variety that allows the 60Hz rms signal to continue to the loads while reducing the higher interference frequencies.

Follow Current
Current supplied by the electrical power system and flowing through the SPD during and following the passage of discharge current.

IEEE 1100 (Emerald Book)
IEEE Recommends the "Best Practice" for the Powering and Grounding of Electrical Equipment.

IEEE C62.41.1
This is the IEEE Guide on the Surge Environment in Low-Voltage AC Power Circuit Applications.

IEEE C62.41.2
The IEEE Recommended Practice on the Characterization of Surge Protections in Low-Voltage AC Power Circuits.

IEEE C62.45
The IEEE guide on Surge Testing of Equipment Connected to Low-Voltage AC Power Circuits.

IEEE C62.62
The IEEE Standard Test Specifications for Surge-Protective Devices for Low-Voltage AC Power Circuits.

IEEE C62.72
The IEEE Application Guide for Surge-Protective Devices for Low-Voltage AC Power Circuits.

Institute of Electrical and Electronics Engineers (IEEE)
This organization is an international engineering society of electrical and electronic engineers. The IEEE Standards Association has more than 8000 active members that develop the standards we use today.

kA Rating
See "Maximum Single Impulse Surge Rating"

Maximum Continuous Operating Voltage (MCOV)
The maximum steady state voltage at which the SPD can operate and meet its specification within its rated temperature. Per NEC 285, no SPD shall be installed on an electrical system where the MCOV rating of the SPD is less than the maximum continuous Phase-to-ground power frequency voltage at the point of application. MCOV ratings for an SPD should be in compliance with test and evaluation procedures outlined in the nominal discharge surge current test of UL1449 3rd Edition, Section 37.7.3.

Maximum Single Impulse Surge Rating
The maximum 8/20µs surge current pulse an SPD device is capable of surviving on a single-impulse basis without suffering either performance degradation or more than 10% deviation of clamping voltage at a specified surge current. The Maximum Single Impulse Surge Rating (or kA rating) should be specified by mode since the number and type of components in any SPD may vary by mode.

National Electrical Code (NEC)
NFPA Standard #70. More commonly referred to as the National Electrical Code (NEC). The code is a set of rules, regulations and recommended electrical practices published by the National Fire Protection Association.

National Electrical Equipment Manufacturers Association (NEMA)
NEMA is a standards body comprised of industry members with the objective to develop technical standards in the best interest of the electrical equipment industry and users, establish and advocate industry policies on legislative and regulatory matters and to collect, analyze and disseminate industry data.

Nominal Discharge Current (In)
The peak value of the current, selected by the manufacturer, impressed through the SPD having a current wave shape of 8/20m where the SPD remains functional after 15 applied surges. Testing and assignment of (In) is carried out by an OSHA approved NRTL per the guidelines of UL 1449 Standard.

Nominal Voltage
The normal operating voltage of the electrical system. For three Phase systems in the Wye voltage configuration that include ground the voltages are typically 120/208 or 277/480. The first number in this voltage configuration is the Phase to neutral and Phase to ground voltage level. The second number is the Phase to Phase voltage level.

Overvoltage
An overvoltage is any increase in the nominal Phase voltage. The event is typically categorized as an increase of 110% above the nominal voltage for durations lasting longer than 1 minute. The overvoltage is typically below the turn on voltage of the surge protective device.

Short Circuit Current (SCC)
The maximum available current that an electrical system can produce under fault conditions.

Short Circuit Current Rating (SCCR) of an SPD
The level at which a SPD is suitable for use on an AC power circuit that is capable of delivering not more than the root-mean square symmetrical current at a declared voltage during a short circuit condition. The SCCR rating of an SPD is assigned by UL, based on abnormal overvoltage testing performed under guidelines outlined under UL 1449 3rd Edition and is required to be marked on the SPD per article 285 of the National Electrical Code.

Sine Wave
The fundamental oscillatory RMS voltage and current waveform which is standard to 50/60Hz electrical power systems.

Suppressed Voltage Rating (SVR)
No longer a valid rating for SPDs with the adoption of UL 1449 3rd Edition release, this was a per mode clamping voltage rating assigned by UL that was based on testing to a 6kV/500A combination surge waveform. SVR ratings have now been superseded by UL 1449 VPR ratings. See "Voltage Protection Rating." Comparisons between VPR and SVR ratings are not possible.

Surge
A transient voltage or current with a duration of a few microseconds.

Surge Life Rating
The number of tested surge impulses that a SPD can be exposed to with less than 10% deviation from pre-test benchmark clamping levels.

Surge Life Test
This is a test used to determine the per-mode Surge Life Rating of an SPD based on the repetitive application of a specific surge current waveform across the terminals of the SPD. A commonly used and widely accepted surge life test waveform is IEEE C62.41 Category C3 applied to the SPD in 1-minute intervals.

Surge Rated Fusing
Fusing components that have been tested and certified for use up to the maximum specified surge current level without failure.

Temporary Overvoltage (TOV) Withstand Level
This is the maximum rms voltage limit and duration of a temporary over-voltage event that the SPD can withstand without any changes in operational parameters or functionality.

Transient
A short duration, fast rising voltage event. Causes include lightning strikes, equipment switching and electrical motors.

Transient Voltage Surge Suppressor (TVSS)
Term no longer used, replaced with Surge Protective Devices (SPD).

Underwriters Laboratories (UL)
Underwriters Laboratories Inc. (UL) is an independent, not-for-profit product safety certification organization that has been testing products and writing Standards since 1894. UL partners with manufacturers to provide safe products through UL testing, certification and follow-up audits.

UL 1283
UL Standard for Electromagnetic Interference Filters. UL 1283 sets product safety testing requirements for EMI/RFI type filters.

UL 1449
UL Standard for Surge Protective Devices. UL 1449 sets minimum product safety testing requirements for SPDs.

UL 96A
UL Standard for Lightning Protection System installations.

Voltage Protection Rating (VPR)
VPR was adopted as part of UL 1449 3rd Edition and is the clamping performance data for SPDs. Each SPD mode is subjected to a 6kV/3kA combination surge wave and its measured clamping value is rounded up to the nearest value based on table 63.1 from UL 1449 3rd Edition.

FAQs

What is a Surge Protective Device (SPD)?

A device designed to limit surge energy to electrical equipment. It does this by diverting or limiting surge current. A SPD is wired in parallel to the equipment it is intended to protect. Once the surge voltage exceeds its designed rating it "begins to clamp" and starts to conduct energy directly to the electrical grounding system. An SPD has a very low resistance during this time and "shorts" the energy to ground. Once the surge is over it "opens" up, so it does not trip upstream circuit breakers.

What is the difference between TVSS and SPD?

In an effort to consolidate terms, Underwriters Laboratories decided in September 2009 to no longer use "TVSS" and "Secondary Surge Arrester." Surge Protective Device (SPD) is now used on AC power systems rated less than 1000 VAC. UL also classified SPD into four types, Type 1, Type 2, Type 3, and Type 4. This classification is based on the application and the location where they are to be used.

How does a Type 1 SPD compare to a Type 2 SPD?

A Type 1 SPD does not require a means of disconnect and can be connected to either side of the service entrance. A Type 2 requires a means of disconnect such as a circuit breaker.

What SPDs should I choose for my facility?

For the most comprehensive answer to this question please contact your local Joslyn representative.

For general purpose applications:

For service entrance a Type 1 SPD with a surge current rating greater than 200kA/mode.

For secondary distribution a Type 1 or Type 2 SPD with a surge current rating greater than 80kA/mode.

For Branch and Point of Use a Type 2 SPD with a surge current rating greater than 60kA/mode.

The location and descriptions come from the IEEE C62.41 standards which identify surge risk within a facility in relation to the service entrance.

What is cascade surge protection?

Cascade protection applies surge protection at each location within an electrical distribution system. A SPD can be placed at the Service Entrance, Secondary Distribution, and on Branch panels. At each point the surge is reduced to a lower level, minimizing the surge to the sensitive equipment.

What is the UL Nominal Discharge Surge Current (In) Test?

This is a new test designed to thermally stress the MOVs (Metal Oxide Varistor) and the design of the SPD. The manufacturer must claim the surge ratingkA level per mode of the protection device and the MCOV (Maximum Continuous Operating Voltage) value per mode. Type 1 devices can be 10 or 20kA. Type 2 devices can be 3, 5, 10, or 20kA. During this test the unit is surged at the claimedkA level, 1 second after the surge the manufacturer's claimed MCOV voltage must be applied to the unit under test for 1 minute. This is repeated for a total of 5 surges, then the unit can rest for 30 minutes. After 30 minutes 5 more surges are applied, followed by another 30 minute rest, followed by a final set of 5 surges. Pre and post VPR shot clamping voltages can not deviate by more than +/– 10% for the test to be successful. The key to this test is that MCOV values are no longer determined based upon the value of the MOV used in the system. MCOV values are now tested values that are determined and/or verified during this test.

What is the UL Short Circuit Current Rating (SCCR)?

UL 1449 and the National Electric Code (NEC) require the SCCR (Short Circuit Current Rating) to be marked on all SPD units. It is not a surge rating, but the maximum allowable current a SPD can interrupt in the event of a failure. NEC Article 285.6 requires the SPD to be installed where the available fault current is less than the SCCR rating of the SPD unit.

What is Suppressed Voltage Rating (SVR)?

SVR was part of an earlier version of UL 1449 Edition and is no longer used in the UL 1449 standard. The SVR was replaced by VPR.

What is Voltage Protection Rating (VPR)?

VPR was adopted as part of UL 1449 3rd Edition and is the clamping performance data for SPDs. Each SPD mode is subjected to a 6kV/3kA combination surge wave and its measured clamping value is rounded up to the nearest value based on table 63.1 from UL 1449 3rd Edition.

How are SPDs related to UL 96A?

UL 96A is the standard for Lightning Protection systems. For a building to meet UL 96A is must have a Type 1 SPD with a Nominal Discharge Current rating of 20kA installed at the service entrance.

How are SPDs related to UL 1283?

Some SPD models include noise filtration. This noise filtration is tested to UL 1283 safety standard.

What is the most important factor in SPD installation?

The lead length of wires connecting the SPD can significantly improve or degrade the performance. The shorter the lead length the better the performance.

Do SPDs protect against direct lightning strikes?

A direct lighting strike is the most powerful and difficult surge to protect against. Proper grounding and bonding of the electrical system and employing proper surge protection can protect sensitive equipment. A SPD with a higher single surge current rating will perform best against this type of event, if the unit is properly installed and the grounding system is adequate. The maximum single withstand surge current rating is defined in IEEE SPD Standard C62.62.

Is "Response Time" a valid specification?

Response time specifications are not supported by any standards organizations overseeing Surge Protective Devices. IEEE C62.62 Standard Test Specification for SPDs specifically mentions it should not be used as a specification.

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Industry codes and specifications

Thomas and Betts surge protection devices meet or exceed applicable industry specifications or codes which are detailed in the appropriate T&B product literature.

c UL us LISTED Intertek CE FC RoHS Compliant

United States

Thomas & Betts Corporation
Electrical Division Headquarters
8155 T&B Boulevard
Memphis, TN 38125
Phone: 901.252.8000
Fax: 901.252.1354
Technical Services:
888.862.3289
Customer Service:
1.800.816.7809
Email: elec_custserv@tnb.com

Thomas & Betts Power Solutions
5900 Eastport Blvd., Bldg. V
Richmond, VA 23231
Phone: 800.238.5000
Fax: 804.236.4040

Canada

Thomas & Betts Ltd
700 Avenue Thomas
St.-Jean-sur-Richelieu
Quebec J2X 2M9
Phone: 450.347.5318
Fax: 450.347.1976

Latin America

Mexico: 01-800-TNB-HELP
Central America & Caribbean:
+52.81.8329.7707
South America:
+52.81.8329.7643
Email: servicioalcliente@tnb.com

Europe/Africa

T&B European Centre
200 Chaussée de Waterloo
B-1640 Rhode-St-Genèse
Belgium
Phone: +32.235.98200
Email: europe_inquiry@tnb.com

Middle East

Thomas & Betts Ltd
PO Box 54567
Office 107 5EA East Wing
Dubai Airport Free Zone
Dubai
United Arab Emirates
Phone: +9714.609.1635
Fax: +9714.609.1636
Email: me_ex_enquiry@tnb.com

Asia Pacific

Thomas & Betts Asia Pte Ltd
10 Ang Mo Kio Street 65
#06-07 Techpoint
Singapore 569059
Phone: +65.6720.8828
Fax: +65.6720.8780
Email: asia_inquiry@tnb.com

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Thomas & Betts Corporation
5900 Eastport Blvd., Bldg. V
Richmond, VA 23231
Phone: 800.238.5000
www.tnbpowersolutions.com

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