

SPD

Surge Protection Device for DC Low-Voltage Power System

SD20R Series

Description

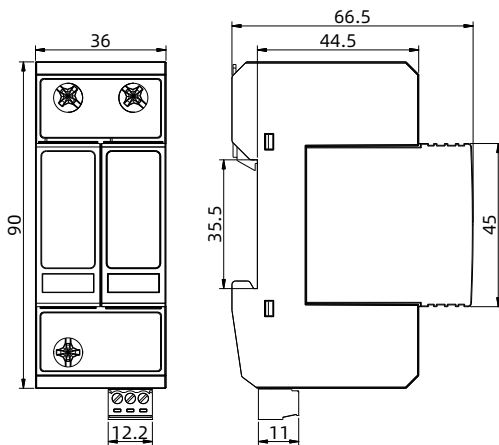


Surge Protection Device for DC Low-Voltage Power System (SPD)(rated up to 1500 VDC) protects against lightning-induced and transient surges by rapidly diverting excess energy, safeguarding critical equipment in electrical and communication circuits.

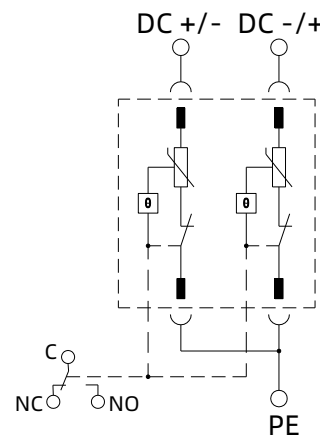
Surge Protective Devices (SPDs) for DC low-voltage power systems, widely applied in protecting power and signal lines from overvoltages, are highly effective in limiting abnormal overvoltages and dissipating lightning surge energy.

SETsafe | SETfuse's Surge Protective Device SD20R series are mainly composed of a Metal Oxide Varistor (MOV), a plug-in type cartridge, a base, and internal/external metal components. Nominal discharge current (In): 20 kA; Maximum continuous operating voltage (Uc): (24~1500) VDC; Safety Approval: TUV; Complies with RoHS and REACH.

Dimensions (mm)



Schematics



Features

- For DC low-voltage power systems.
- Built-in over-temperature protection for safe failure mode.
- Visual status indicator and remote alarm contact.
- The plug-in cartridge features polarized design and prevention against cross-mating.

Applications

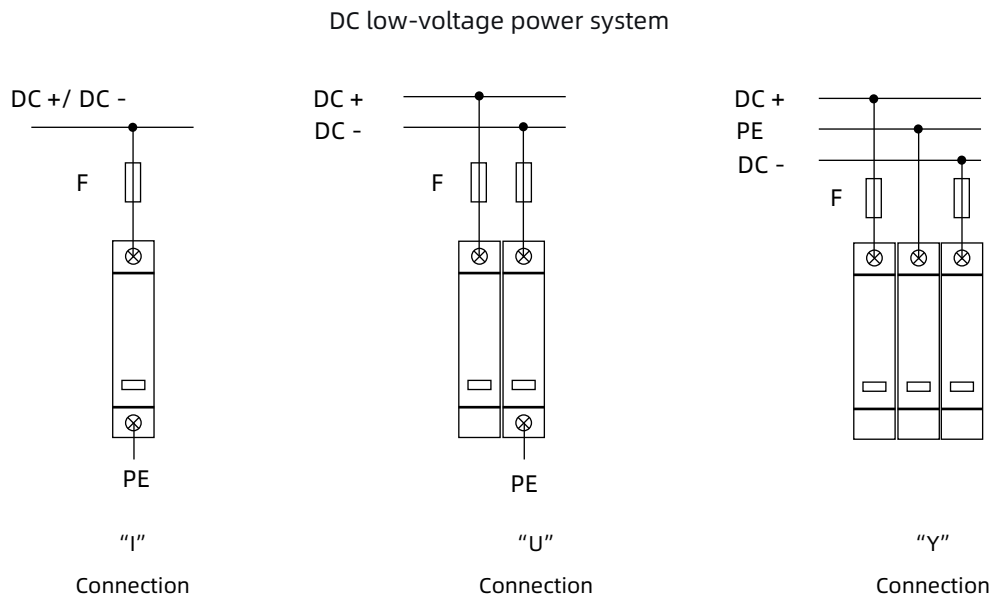
- DC Charging Pile
- Internet Data Center (IDC)
- DC Lightning Protection Enclosure (DC SPD Box)
- Energy Storage Converter (PCS)
- DC Combiner Box

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Wiring Diagram



Technical Characteristics

Characteristics	Specifications
Degrees of Protection of enclosure	IP20
Wiring Ability	1.5 ~ 25 mm ² (Flexible) / 35 mm ² (Rigid)
Installation	35 mm DIN rail
Alarm	Remote + Indicator
Operating State / Fault Indication	Green (OK) / Red (Fault)
Remote Indication Contacts	AC: 250 V / 0.5 A, 125 V / 1 A DC: 250 V / 0.1 A, 125 V / 0.2 A, 75 A / 0.5 A
Remote alarm contact conductor cross-section	1.5 mm ²
Maximum rating for the upstream overcurrent protective device	40 A aR
Rated short-circuit current I_{SCDC}	50 kA
According to Standard	IEC 61643-41
Altitude	-500 ~ +5000 m
Operational Temperature Range	(-40 ~ 85) °C

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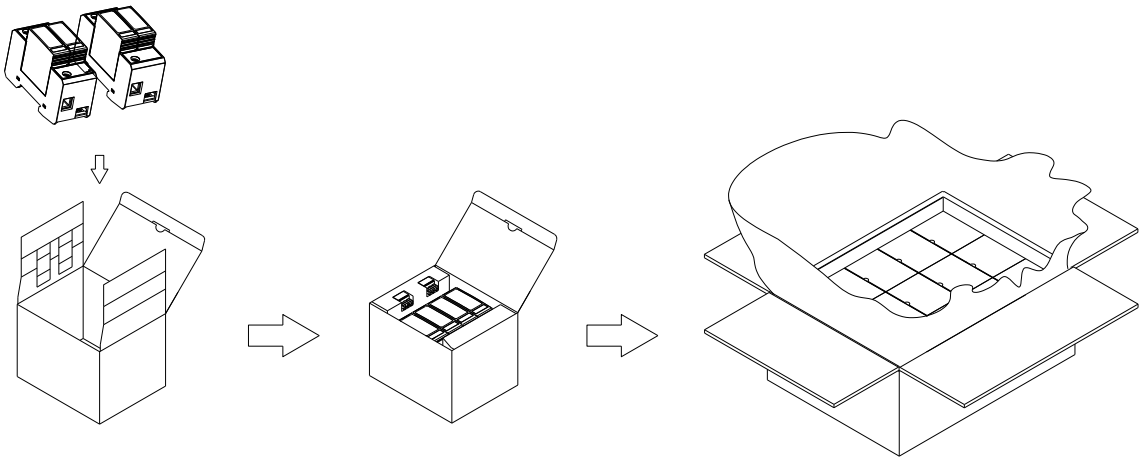
SD20R Series

Technical Specifications

Model	Maximum continuous operating voltage	Nominal Dis-charge Current (8/20 μ s)	Maximum Dis-charge Cur- rent (8/20 μ s)	Voltage Protec- tion Rating	Modes of Protection	Safety Approval
	(U_c)	(I_n)	(I_{max})	(U_p)		TUV
SD20R24L211DC	24 VDC	20 kA	40 kA	+~-: 0.8 kV +/-~PE: 0.4 kV	DC+/DC- — PE DC+ — DC-	●
SD20R240L211DC	240 VDC	20 kA	40 kA	+~-: 2.0 kV +/-~PE: 1.0 kV		●
SD20R600L211DC	600 VDC	20 kA	40 kA	+~-: 4.0 kV +/-~PE: 2.0 kV		●

Note: For certification details of different models, please refer to the technical data sheet.

Packaging Information



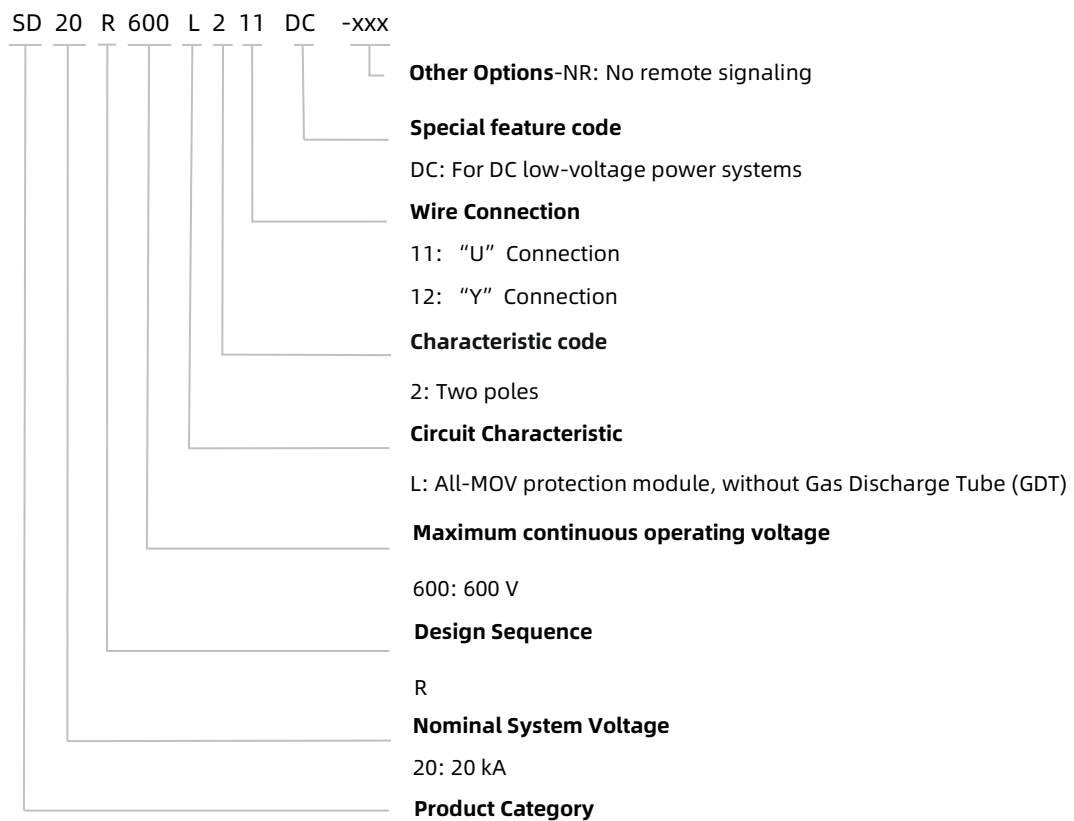
Item	Inner	carton
Package Size (mm)	98 x 80 x 76	425 x 320 x 195
Quantity (PCS)	2	60

Agency Information

Certification Body Logo	Standards	NO.	Category
	IEC 61643-41	R 50698283	Class II

Note: For certification details of different models, please refer to the technical data sheet.

Part Numbering System



Reminder:

Part numbering system in the datasheet is only for selecting correct parameter and product features. Before plaining order, please contact us for specifications and use the part number and product code in the specifications to place order to ensure the part is correct. Product code is the unique indentification.

Overvoltage

Electricity is an essential part of modern human production and life. But power facilities are threatened by internal and external overvoltages. Power system overvoltage mainly includes:

Transient overvoltage of atmospheric origin: Lightning strikes instantly generate high energy, generating surge currents up to hundreds of kA, and lightning wave can invade along power lines, causing damage to power facilities and electrical equipment.

Transient overvoltage due to switching: Switching operations of a power utility may cause overvoltage.

Temporary overvoltage: A long duration (second level) temporary overvoltage (asymmetric ground fault) or harmonious overvoltage.

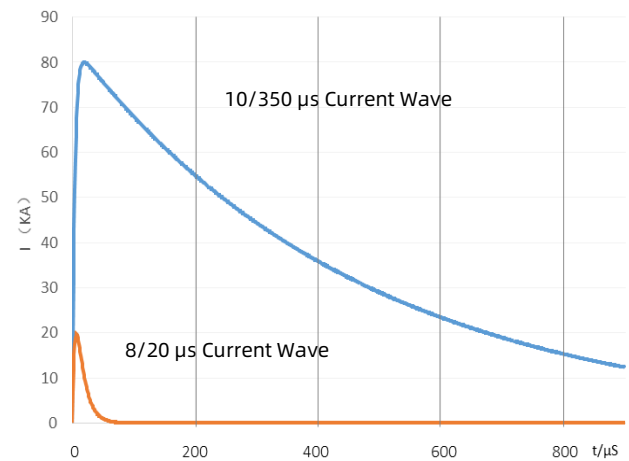
Surge Voltage Caused by Lightning

Electrical and electronic system are subject to damage from a lightning electromagnetic impulse (LEMP). Therefore SPM need to be provided avoid failure of internal system. LEMP may caused by direct, near and far lightning strikes. According to the relevant research, lightning strikes within a certain distance may cause dangerous overvoltage on the cable, endangering the equipment connected to it.

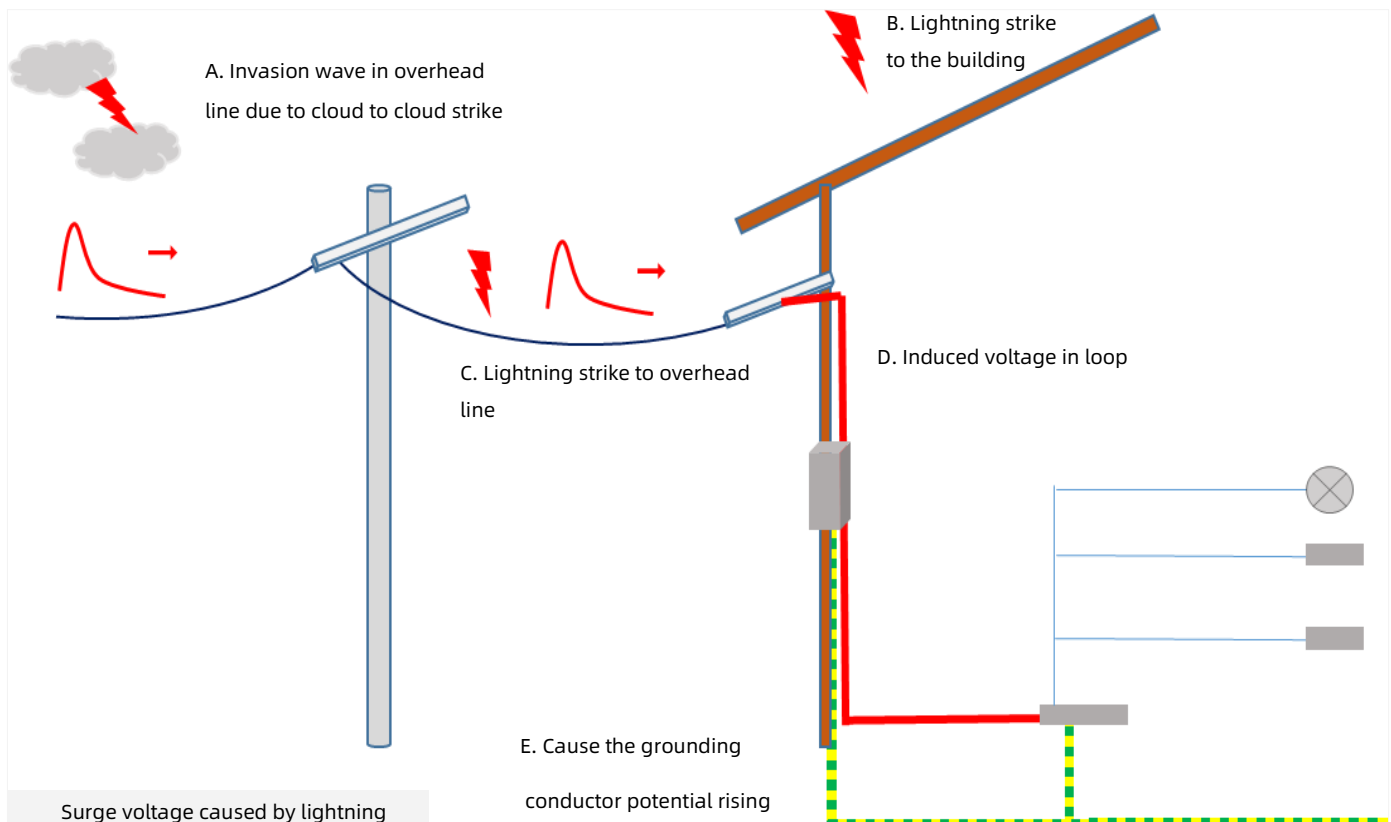
Damage Due to Lightning

The lighting can cause three basic type of damage:

- D1: injury to living beings by electric shock;
- D2: physical damage (fire, explosion, mechanical destruction, chemical release) due to lightning current effects, including sparking;
- D3: failure of internal systems due to LEMP.



Standard lightning test wave



Glossary

Item	Definitions
U_p	Voltage protection level Maximum voltage peak value expected to appear between the terminals of the SPD under specified test conditions with defined voltage steepness, current amplitude and waveform. — (IEC 61643-41)
8/20 μ s	8/20 μs impulse current An impulse current with a virtual front time (T1) of 8 microseconds and a time to half-value (T2) of 20 microseconds. — (IEC 61643-41)
1.2/50 μ s	1.2/50 μs impulse voltage An impulse voltage with a virtual front time (T1) of 1.2 microseconds and a time to half-value (T2) of 50 microseconds. — (IEC 61643-41)
U_c	Maximum continuous operating voltage The maximum voltage that can be continuously applied to the SPD. — (IEC 61643-41)
I_n	Nominal discharge current The peak value of an 8/20 current wave flowing through the SPD. — (IEC 61643-41)
I_{imp}	Impulse current for Class I test The impulse current Iimp is defined by three parameters: the peak current (Ipeak), the charge (Q) and the specific energy (W/R). — (IEC 61643-41)
I_{max}	Maximum discharge current The peak value of a current with an 8/20 μ s wave shape and manufacturer-declared magnitude flowing through the SPD. Imax is equal to or greater than In. — (IEC 61643-41)
Modes of protection	Protection mode A predetermined circuit between two connection points, comprising one or more protective components. — (IEC 61643-41)
IP	Degree of protection provided by enclosure The extent to which an enclosure provides protection against access to hazardous parts, ingress of solid foreign objects, and/or ingress of water. — (IEC 60529)



ATTENTION

Usage

1. The voltage applied continuously to the SPD must not exceed its maximum continuous operating voltage U_c .
2. When atmosphere press is from 54 kPa to 106 kPa, the related altitude shall be from 5000 m to - 500 m.
3. Do not touch the product body or wires directly when power is on, to avoid electric shock.

Replacement

As SPD is a non-repairable product, for safety sake, please use the same type of SPD for replacement.

Storage

Do not store SPD at high temperature, high humidity or corrosive gas environment. Use them up within 2 years after receiving the goods.

Installation

1. Installation and startup may only be carried out by qualified personnel. The relevant country-specific regulations must be observed.
2. Check the device for external damage before installation. If the device is defective, it must not be used.
3. Pay attention to risk of electric shock. Please cutoff all electrical power before installation or service.
4. Lay the output cables to the surge protective devices (SPDs) as short as possible, without loops.
5. Please install proper backup protection devices in front of SPD.
6. Do not apply mechanical stress to the SPD body during or after the installation.

Maintenance

1. Check SPD status according to instructions before and after the thunderstorm season each year.
2. If the indicator of "failure state" appears, the SPD is damaged. Replace the SPD with same type.
3. Ensure electrical connections and mountings are correct before energizing the circuit.
4. SPD's quality is well controlled and strictly inspected before delivery. If non-functional ones are found during operation, please contact us early enough.