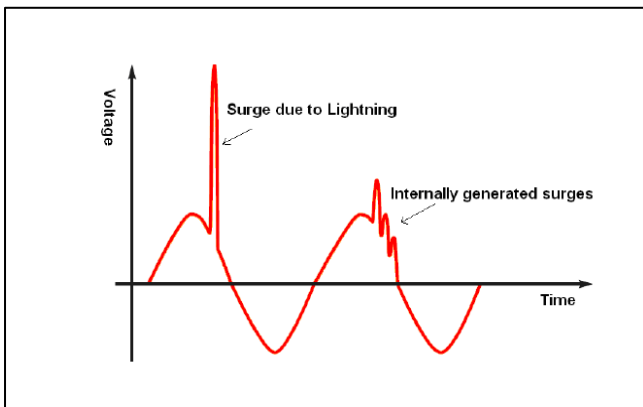


Surge is an unavoidable phenomenon in the electrical system. Surge can arise due to internal or external factors and depending upon its severity, can be detrimental for the system.

**What is surge?**

A voltage of at least two times the system’s RMS voltage with a duration measured from 1micro second to several hundred micro seconds is called Surge.

External factors causing surge include direct and/or indirect lightning strike whereas grid switching, load switching, CB interruption are some of the internal factors.



**Need for an SPD**

Every equipment has rated impulse withstand voltage which indicates that equipment is capable of withstanding that much impulse voltage without failure

Overvoltage Category	I	II	III	IV
Type of Equipment	Electronic Devices	Electrical Appliances (Refrigerators, Ovens etc.)	Distribution and final circuits (Motor, Sockets etc.)	Incomer, Meter
Impulse Withstand voltage (kV)	1.5	2.5	4	6

Ref: IEC 60947-1

As given in above table, IEC Standard specifies various overvoltage categories which are classified based on equipment’s impulse withstand voltage limit.

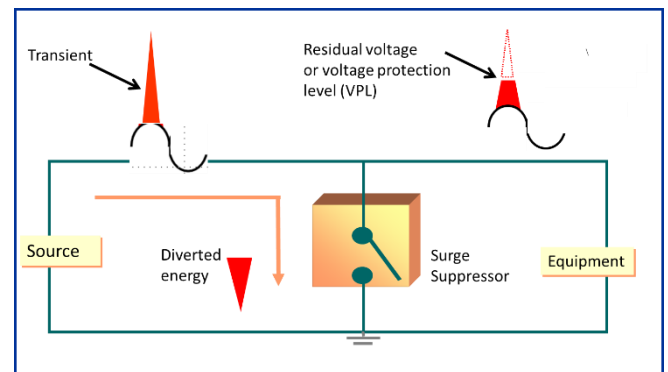
When surge brings high impulse voltage in the system, SPD operates and brings the voltage to an acceptable level across the equipment.

**What does an SPD do?**

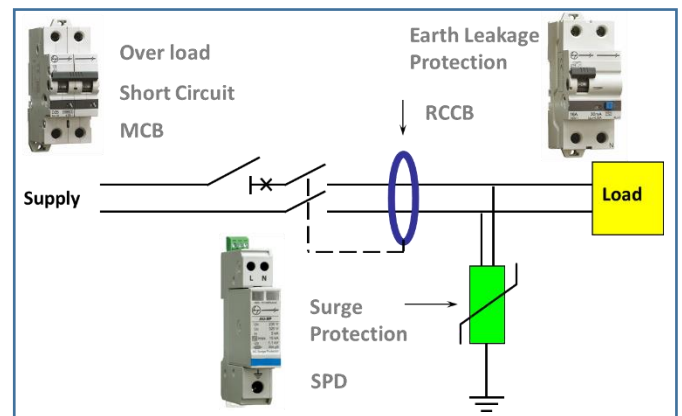
A device which diverts or limits surge current is called Surge protection Device (SPD).

SPD momentarily ‘switches’ from open circuit/high resistance mode into a low impedance mode as it sees high voltages beyond a threshold.

As shown in picture, SPDs should be connected between source and equipment, in parallel connection to the equipment to divert high voltage through it.



SPD is an integral part of complete protection for final distribution system. MCBs provide protection against overload and short-circuit, RCDs protect against electric shock and earth leakage whereas SPDs provide protection against direct and indirect surges, as shown below.



In case of any query, please write to us at [SPD@Intebg.com](mailto:SPD@Intebg.com)