

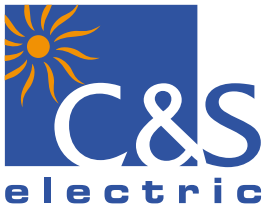
We touch your **electricity** everyday!

## CSPDT SERIES

Surge Protection Device



Precise Defence Against Every Spike



C&S Electric Ltd. is a leading manufacturer of electrical and electronic equipment in India. It is one of India's largest exporters of industrial switchgear & power busbar products. C&S Electric products are used in applications ranging from power generation, transmission and distribution, protection and final consumption.

C&S Electric has the following product verticals:

- LV Switchgear
- LV Switchboards
- LV & MV Bus-Ducts
- LV Busways
- Protection and Measurement Devices

## MANUFACTURING FACILITIES



C&S Controlgear Plant at Noida



C&S Switchgear Plant at Noida



World-Class Manufacturing Plants at SIDCUL, Haridwar

### MARKET LEADER

C&S is one of the leading supplier in the LV Switchgear business segment and a market leader in the busbar business with more than 50% share in Indian market.

### 11 MANUFACTURING PLANTS

C&S Electric have 11 state-of-the-art manufacturing facilities in Noida, Haridwar & Guwahati, which are equipped with latest tools and systems to ensure highest level of quality and services.

### 600+ STOCKISTS

A dedicated network of channel partners, ensuring access to the farthest corners of India, with an obsession for customer services. In addition C&S products are available in 8000+ retail counters nationally.

### EXPORTS TO OVER 85 COUNTRIES

C&S exports the entire range of products across all 7 continents, thus reaffirming its position as one of India's largest exporters of industrial electrical products.

### 5000+ WORKFORCE

5000+ Workforce including over 371 engineers, dedicated sales team of 424 people & millions of satisfied customers.

### R&D

4 Govt. approved labs/centres, over 20,000 sqft. space dedicated to R&D, 70 R&D engineers, state of the art testing & design facilities ... & most of the all a passion for innovation & excellence.

We touch your electricity everyday!

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## Glossary

Item	Description
$U_p$	<b>Voltage Protection Level</b> Maximum voltage to be expected at the SPD terminals due to an impulse stress with defined voltage steepness and an impulse stress with a discharge current with given amplitude and wave shape. — (IEC 61643-11)
8/ 20 $\mu$ s	<b>8/ 20 Current Impulse</b> Current impulse with a nominal virtual front time of 8 $\mu$ s and a nominal time to half-value of 20 $\mu$ s. — (IEC 61643-11)
1.2/ 50 $\mu$ s	<b>1.2/50 Voltage Impulse</b> Voltage impulse with a nominal virtual front time of 1.2 $\mu$ s and a nominal time to half-value of 50 $\mu$ s. — (IEC 61643-11)
$U_c$	<b>Maximum Continuous Operating Voltage</b> Maximum r.m.s. voltage, which may be continuously applied to the SPD's mode of protection. — (IEC 61643-11)
$I_n$	<b>Nominal Discharge Current</b> Crest value of the current through the SPD having a current waveshape of 8/20 $\mu$ s. — (IEC 61643-11)
$I_{imp}$	<b>Impulse Discharge Current for Class I Test</b> Crest value of a discharge current through the SPD with specified charge transfer Q and specified energy W/R in the specified time. — (IEC 61643-11)
$I_{max}$	<b>Maximum Discharge Current</b> Crest value of a current through the SPD having an 8/20 $\mu$ s waveshape and magnitude according to the manufacturers specification. $I_{max}$ is equal to or greater than $I_n$ . — (IEC 61643-11)
<b>Modes of Protection</b>	<b>Modes of Protection</b> An intended current path, between terminals that contains protective components, e.g. line-to-line, line-to-earth, line-to-neutral, neutral-to-earth. — (IEC 61643-11)
IP	<b>Degrees of Protection of enclosure</b> Classification preceded by the symbol IP indicating the extent of protection provided by an enclosure against access to hazardous parts, against ingress of solid foreign objects and possibly harmful ingress of water. — (IEC 60529 )
TCO	<b>Thermal-Link</b> A non-resettable device incorporating a THERMAL ELEMENT which will open a circuit once only when exposed for a sufficient length of time to a temperature in excess of that for which it has been designed.
ATCO	<b>Alloy Thermal-Link</b> Alloy Type Thermal-Link, Alloy is the thermal element.

## Cause of Surge

### What is a Surge and Why You Need Protection

Electricity powers everything around us - from our homes to offices, factories, and sensitive machines. But sometimes, a sudden spike in voltage called a surge can sneak into the system and cause serious trouble.

### So, what exactly is a surge?

A surge is a sharp, quick rise in electrical voltage. It lasts just a fraction of a second, but that's enough to damage or even destroy electronic devices and appliances.

### Where do surges come from?

**Lightning strikes** - A lightning bolt hitting near a power line can send a massive surge through the entire electrical network.

**Switching of heavy equipment** - Machines like motors, elevators, and even large air conditioners can cause internal surges when they're turned on or off.

**Power grid problems** - Sudden power cuts or when electricity comes back after a blackout can lead to unexpected voltage spikes.

**Static electricity** - Even small electrostatic discharges can harm delicate electronics.

### What damage can surges do?

**Ruin your equipment** - TVs, computers, control systems and even LED lights can get burnt or stop working.

**Shorten lifespan of devices** - Even if the surge doesn't break them instantly, it weakens the internal parts over time.

**Cause breakdowns and downtime** - In offices, industries or hospitals, this means work stops and losses pile up.

**Start fires** - In extreme cases, surges can lead to overheating or sparks that cause fires.

That's why Surge Protective Devices (SPDs) are essential. They act like bodyguards for your electrical system - catching the surge and safely sending it to the ground before it can do any harm.

### What is SPD?

A Surge Protective Device (SPD) is designed to safeguard electrical systems by limiting transient overvoltages caused by lightning or switching operations. It redirects sudden voltage spikes safely to the ground, ensuring that the surge level remains within a safe range - protecting both the electrical installation and connected equipment.

### Type 2

Type 2 SPD serves as the primary line of defence in low-voltage electrical systems. Typically installed in every distribution board, it prevents surges from spreading through the system, thereby protecting downstream devices and sensitive loads from potential damage.

### Type 1+2

Type 1+2 SPD serves as the primary line of defence in low-voltage electrical systems where there is a high risk of direct lightning strikes or strong surges. Typically installed at the main distribution board, it provides combined protection by discharging high-energy lightning currents (Type 1) and limiting residual over voltages (Type 2), thereby safeguarding both upstream and downstream devices and ensuring system-wide protection.



## Overvoltage

In today's world, power plays a crucial role in both industrial activities and daily routines. However, power systems face the risk of experiencing both internally generated and externally induced overvoltage. The primary types of overvoltage in a power system are as follows:

### Transient overvoltage caused by atmospheric events

The immense energy of lightning strikes leads to instantaneous high-energy production, resulting in surge currents that can reach hundreds of kA. Additionally, lightning waves have the capability of entering through power lines, leading to impairments in electrical equipment and power infrastructure.

### Transient overvoltage arising from switching actions

Overvoltage may be triggered by the power grid's switching procedures.

### Temporary overvoltage

This category includes persistent (lasting seconds) temporary overvoltage (such as unbalanced ground faults) or harmonic-related overvoltage.

### Surge Voltage Caused by Lightning

Devices that use electricity can get damage because of strong energy from lightning. Because of this, surge protectors should be used to keep the device safe. A LEMP can happen if lightning hits something right on, close to, or far away. Studies show that lightning hitting the ground within a specific range can create high voltage in cables, which can damage the tools plugged into those cables.

### Switching operations

Electromagnetic pulses are produced by switching operations (known as switching electromagnetic pulses or SEMP), which subsequently may result in induced surge voltages capable of extending into electrical cables. The electrical currents during a short circuit or when turning on devices that consume a lot of power are very high for a short amount of time.

### Electrostatic Discharges

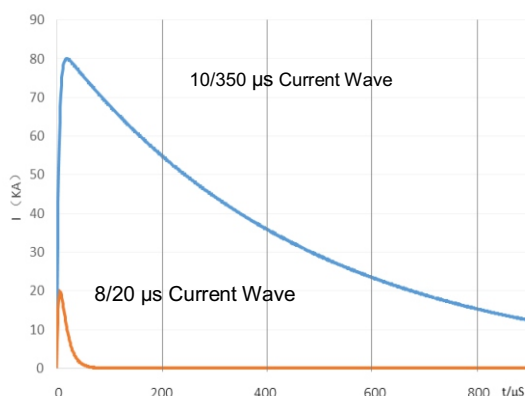
Electrostatic discharges, referred to as ESD, happen when conductive elements that are visible and possess varying levels of electrostatic charge get near one another, causing an exchange of electrical charges. This phenomenon might lead to the production of electrostatic charge within a conductive component that is exposed inside electrical and electronic setups. In the end, the electrostatic charge builds up to an intensity that is sufficient for it to leap to a conductive component that is exposed and has a potential that differs.

### Damage Due to Lighting The lighting can cause three basic type of damage:

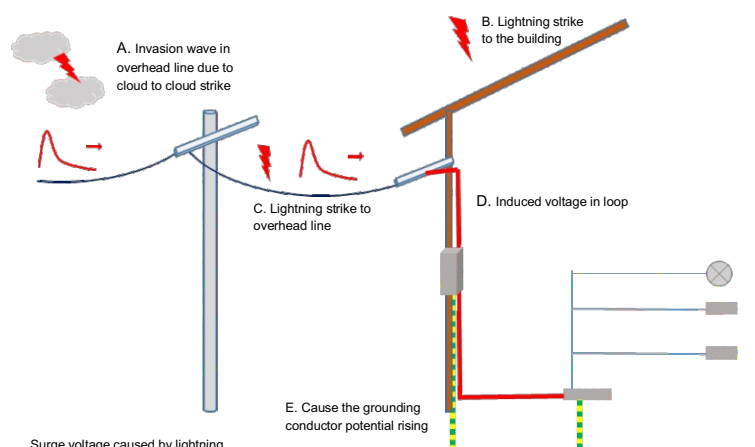
**D1:** injury to living beings by electric shock

**D2:** physical damage (fire, explosion, mechanical destruction, chemical release) due to lighting current effects, including sparking

**D3:** failure of internal systems due to LEMP



Standard lightning test wave





## Features

- Available in both AC & DC
- Pole : 1P+N, 2P, 3P, 3P+N
- Degree of Protection : IP-20
- DIN Rail Method
- Pluggable module for Easy Replacement

## Application

### Residential Buildings

They are frequently found in residences, particularly those with a lot of delicate electronic equipment or those in locations with a considerable danger of lightning. All circuits and appliances, including computers, TVs, refrigerators, and other gadgets, can be protected against internal and external surges by a Type 2 SPD placed in the main breaker panel.

### Commercial Buildings

Type 2 SPDs are crucial for safeguarding vital systems including servers, point-of-sale (POS) terminals, HVAC controllers, and lighting systems in office buildings, retail establishments, and other commercial properties.

### Industrial Facilities

Industrial environments often have significant internal surge risks from the operation of heavy machinery, motors, and switching equipment. Type 2 SPDs are installed in sub-distribution boards and machine control cabinets to protect programmable logic controllers (PLCs), automation interfaces, and production line sensors.

### Data and Communication Networks

Type 2 SPDs help ensure the continuous operation of sensitive IT infrastructure, including routers, switches, and network storage, by protecting them from surges that can cause data loss or equipment failure

Renewable Energy Systems: In solar farms and various renewable energy facilities, Type 2 SPDs safeguard inverters and other essential components against surges, thereby ensuring the safety and stability of the system.

### Telecom infrastructure

Telecom infrastructure, which is highly exposed to lightning, often consists of elevated structures such as cell towers, microwave links, and radio masts, rendering them prime targets for both direct and indirect lightning strikes. Type 2 SPDs play a crucial role in a comprehensive protection strategy. Their main function is to safeguard the power supply to the equipment, and they are frequently combined with other types of SPDs that are specifically designed for data and signal lines.

## Specifications

Parameters	Details
Degrees of Protection of enclosure	IP-20
Wiring Ability	(1.5 ~ 25) mm <sup>2</sup> (Flexible) / 35 mm <sup>2</sup> Rigid
Installation	35 mm DIN rail
Operating State / Fault Indication	Green (OK) / Red (Fault)
Remote Indication Contacts	AC: 250 V / 0.5 A, DC: 250 V / 0.1 A
Short Current Rating I <sub>SCCR</sub>	25 kA
Max. Main side Overcurrent protection	80 AgL/gG
According to Standard	IEC/EN 61643-11 Class II
Altitude	-500 ~ 5000 m
Operational Temperature Range	(-40 ~ 85) °C

## Technical Specifications : Type 2 AC

Reference	Un (VAC)	Uc (V~)	In (kA)	I <sub>max</sub> (kA)	Up (kV)	Protection Mode
CSPDT2385AC1PN	230	L-N : 385 N-PE : 255	20	40	L-N : 1.8 N-PE : 1.0	1+1 (L-N,N-PE)
CSPDT2385AC3PN	230/400	L-N : 385 N-PE : 255	20	40	L-N : 1.8 N-PE : 1.0	3+1 (L-N,N-PE)

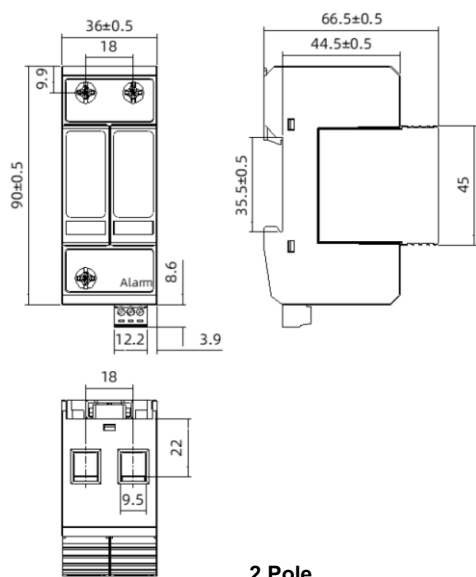
## Technical Specifications : Type 2 DC

Reference	U <sub>CPV</sub> (VDC)	In (kA)	I <sub>max</sub> (kA)	Up (kV)	Protection Mode
CSPDT2600DC2P	600	20	40	2.0	DC+/- -PE
CSPDT21000DC3P	1000	20	40	4.0	DC+ -DC-, DC+ /DC- -PE
CSPDT21500DC3P	1500	20	40	5.0	DC+ -DC-, DC+ /DC- -PE

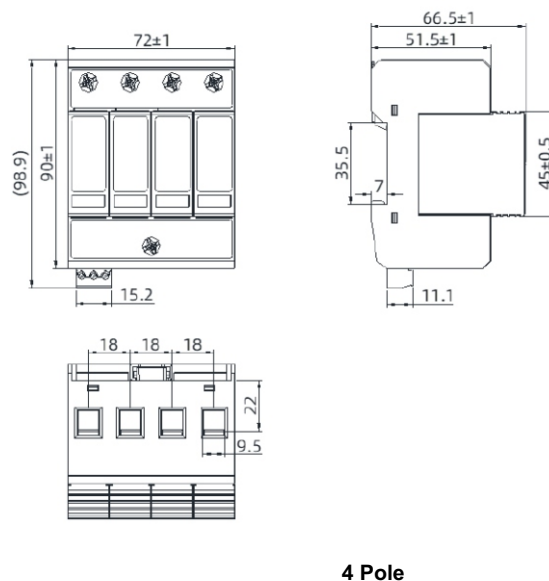


## Dimension Details

CSPDT2385AC1PN

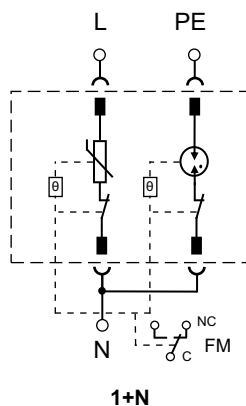


CSPDT2385AC3PN

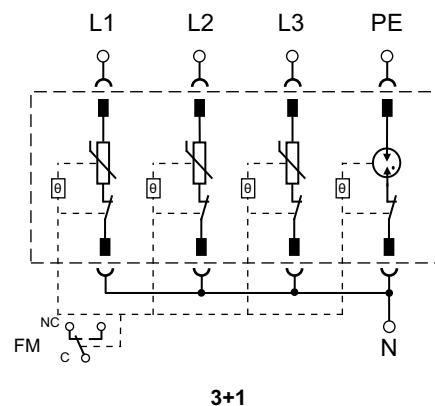


## Schematics

CSPDT2385AC1PN

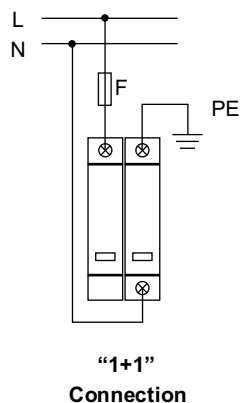


CSPDT2385AC3PN

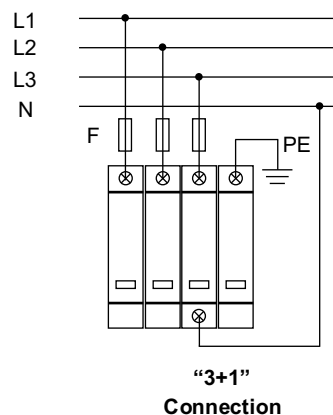


## Wiring Diagram

CSPDT2385AC1PN

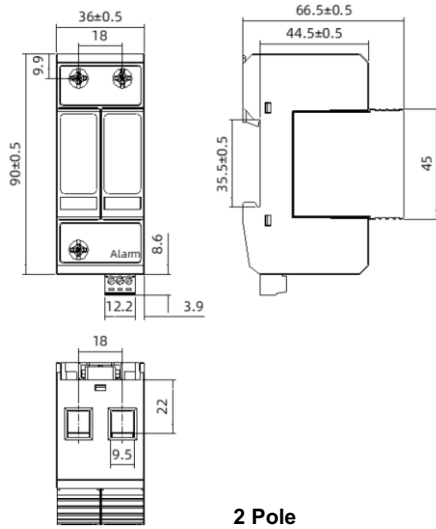


CSPDT2385AC3PN

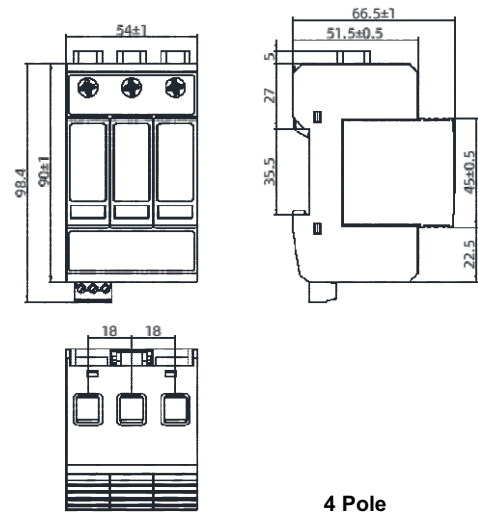


## Dimension Details

CSPDT2600CC2P

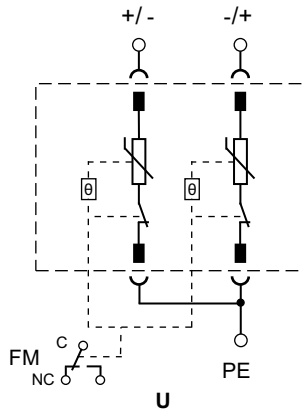


CSPDT21000DC3P / CSPDT21500DC3P

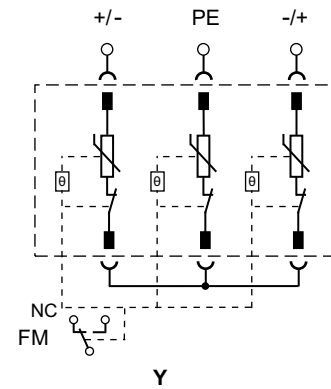


## Schematics

CSPDT2600CC2P

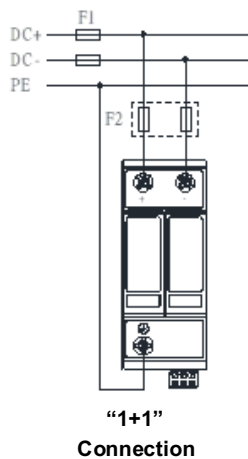


CSPDT21000DC3P / CSPDT21500DC3P

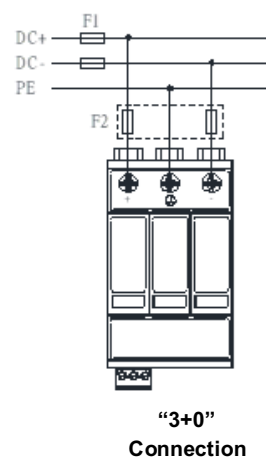


## Wiring Diagram

CSPDT2600CC2P



CSPDT21000DC3P / CSPDT21500DC3P





## Features

- Available in both AC & DC
- Pole : 1P+N, 2P, 3P, 3P+N
- Degree of Protection : IP-20
- DIN Rail Method
- With Remote signal contact
- Pluggable module for Easy Replacement

## Application

### Main Distribution Board (MDB) / Service Entrance

Located at the point where utility power enters the building, this board serves as the starting point of the electrical installation. It safeguards the entire electrical system against high-energy lightning surges and switching overvoltage's.

### Buildings with External Lightning Protection Systems (LPS)

This is crucial if the building is equipped with a lightning rod or down conductor system, as a direct lightning strike can introduce significant currents into the earthing system.

### Industrial & Commercial Facilities

This includes manufacturing plants, data centers, telecommunications, oil and gas operations, railways, airports, and more. It provides protection for sensitive electronics and control systems.

### Residential & Office Buildings

This is important for protecting devices such as computers, air conditioners, elevators, solar inverters, etc. Modern electrical codes often mandate this protection when an LPS is in place.

### Renewable Energy Systems (Solar, Wind, EV Charging Stations)

This applies to the AC side of solar inverters or wind turbine connections, where there is a high risk of surges.

## Specifications

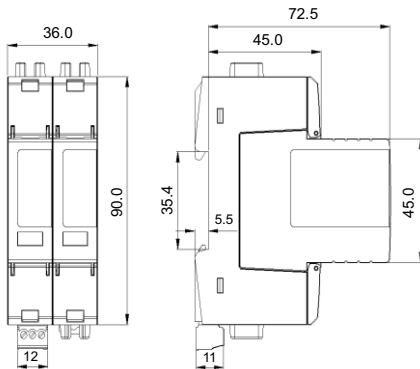
Parameters	Details
Degrees of Protection of enclosure	IP-20
Wiring Ability	(1.5 ~ 25) mm <sup>2</sup> (Flexible) /35 mm <sup>2</sup> Rigid
Installation	35 mm DIN rail
Alarm	Remote + Indicator
Operating State / Fault Indication	Green (OK) / Red (Fault)
Remote Indication Contacts	AC: 250V / 0.5 A, 125V /1A
	DC: 250V / 0.1 A, 125V / 0.2A, 75A / 0.5A
Cross section of Remote indication conductors	1.5mm
Short Current Rating I <sub>SCCR</sub>	25 kA
Max. Main side Over current protection	200 AgL/gG
According to Standard	EN 61643-11 Class II
Altitude	-500 ~ 5000 m
Operational Temperature Range	(-40 ~ 85) °C

## Technical Specifications : Type 1+2 AC

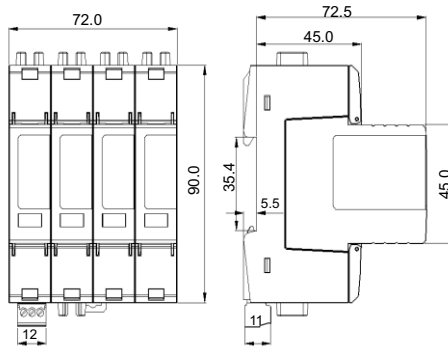
Reference	Un (VAC)	Uc (V~)	I <sub>imp</sub> (kA)	I <sub>n</sub> (kA)	I <sub>max</sub> (kA)	Up (kV)	Protection Mode
CSPDT120385AC1PN	230	L-N : 385 N-PE : 255	11.0 12.5	25	50	L-N : 2.0 N-PE : 1.5	1+1 (L-N, N-PE)
CSPDT120385AC3PN	230/400	L-N : 385 N-PE : 255	11.0 12.5	25	50	L-N : 2.0 N-PE : 1.5	3+1 (L-N, N-PE)
CSPDT120880AC3P	400/690	880	10.0	25	50	5.0	3W+PE
CSPDT121300AC3P	800/1000	1300	5.0	25	50	6.4	3W+PE

## Dimension Details

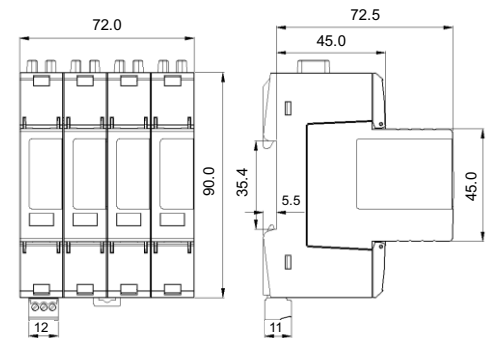
CSPDT120385AC1PN



CSPDT120385AC3PN

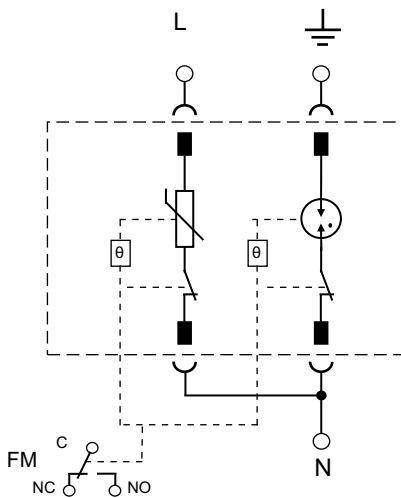


CSPDT120880AC3P / CSPDT121300AC3P

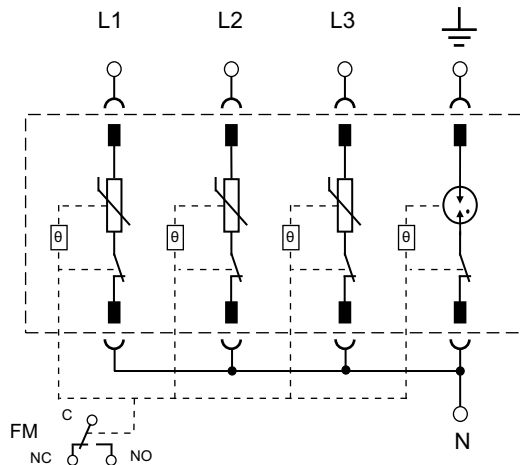


## Schematics

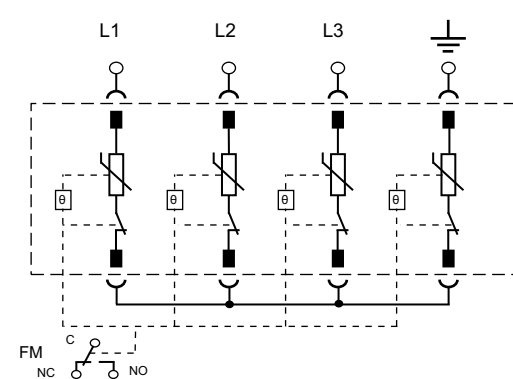
CSPDT120385AC1PN



CSPDT120385AC3PN

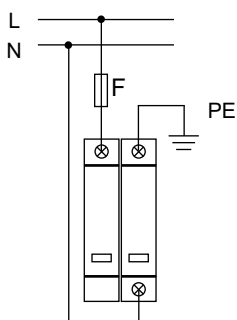


CSPDT120880AC3P / CSPDT121300AC3P



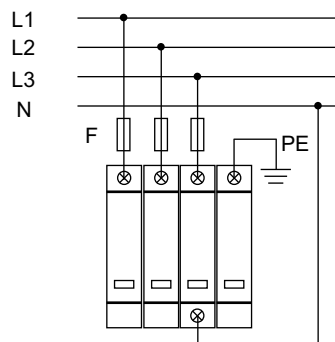
## Wiring Diagram

CSPDT120385AC1PN



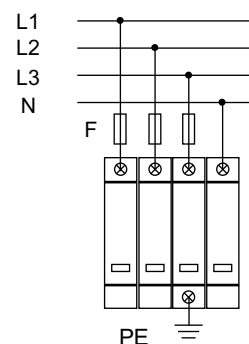
"1+1"  
Connection

CSPDT120385AC3PN



"3+1"  
Connection

CSPDT120880AC3P / CSPDT121300AC3P



"4+0"



## Specifications

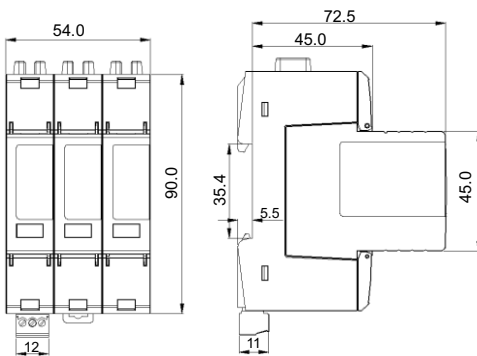
Parameters	Details
Degrees of Protection of enclosure	IP-20
Wiring Ability	(1.5 ~ 25) mm <sup>2</sup> (Flexible) /35 mm <sup>2</sup> Rigid
Installation	35 mm DIN rail
Alarm	Remote + Indicator
Operating State / Fault Indication	Green (OK) / Red (Fault)
Remote Indication Contacts	AC: 250V / 0.5 A, 125V /1A
	DC: 250V / 0.1 A, 125V / 0.2A, 75A / 0.5A
Cross section of Remote indication conductors	1.5mm
Short Current Rating I <sub>SCCR</sub>	1000A
Max. Main side Over current protection	200 AgL/gG
According to Standard	EN 61643-11 Class II
Altitude	-500 ~ 5000 m
Operational Temperature Range	(-40 ~ 85) °C

## Technical Specifications : Type 1+2 DC

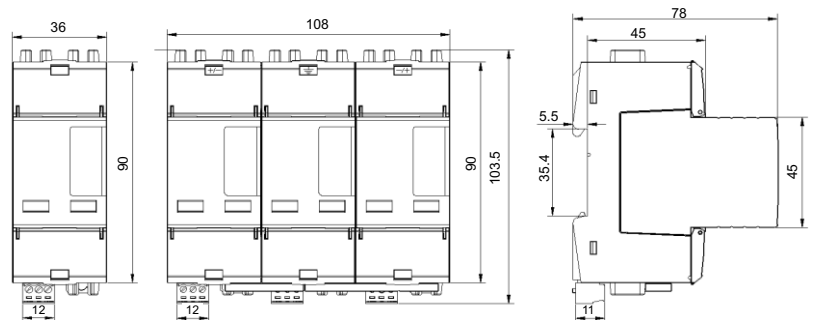
Reference	U <sub>CPV</sub> (VDC)	I <sub>imp</sub> (kA)	I <sub>n</sub> (kA)	I <sub>max</sub> (kA)	U <sub>p</sub> (kV)	Protection Mode
CSPDT1290011DC3P	900	11.0	25	50	4.0	DC+/DC- -PE, DC+ — DC-
CSPDT1215005DC3P	1500	5.0	25	50	6.0	
CSPDT121500125DC3P	1500	12.5	25	50	6.4	

## Dimension Details

CSPDT1215005DC3P / CSPDT1290011DC3P

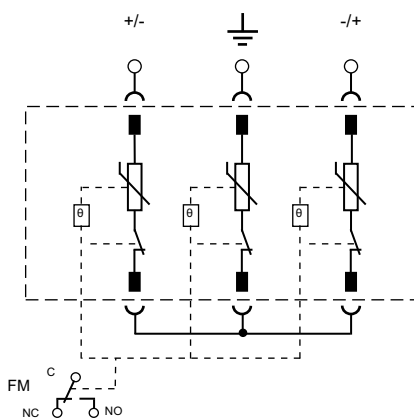


CSPDT121500125DC3P

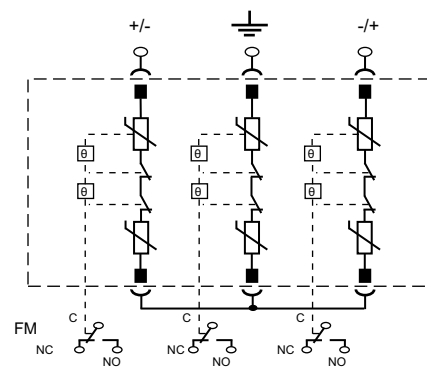


## Schematics

CSPDT1215005DC3P / CSPDT1290011DC3P

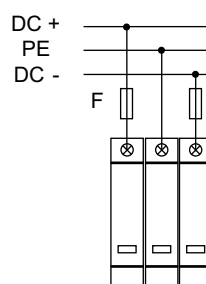


CSPDT121500125DC3P



## Wiring Diagram

CSPDT1290011DC3P / CSPDT1215005DC3P / CSPDT121500125DC3P



“Y”

Connection

## Ordering Information Type 2 SPD

<b>CSPDT</b>	<b>T2</b>	<b>V</b>	<b>P</b>
<b>Type</b> T2 : Type 2			
<b>Voltage</b> 385 AC 600 DC 1000 DC 1500 DC			
<b>No.of Poles</b> 1PN * 2P 3P 3PN *			

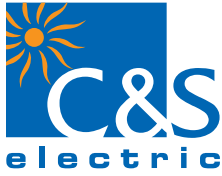
Note : “ \* ” is only for Type 2AC SPD.

## Ordering Information Type 1+2 SPD

<b>CSPDT</b>	<b>T12</b>	<b>V</b>	<b>X</b>	<b>P</b>
<b>Type</b> T12 : Type 1+2				
<b>Voltage : VAC</b> 385AC 880AC 1300AC 900DC 1500DC				
<b>AC (limp)</b> Not Applicable for AC <b>DC (limp)</b> 5 11** 125				
<b>No.of Poles</b> 1PN * 3P 3PN *				

Note : “ \* ” is only applicable for Type 1+2 385AC SPD.

“ \*\* ” is only applicable for 900 DC.



## Marketing offices spread all over India

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### CUSTOMER CARE

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#### NORTHERN REGION

**DELHI**  
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**LUDHIANA**  
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**LUCKNOW**  
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**KANPUR**  
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**JAIPUR**  
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#### CENTRAL REGION

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**RAIPUR**  
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**NAGPUR**  
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#### EASTERN REGION

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**GUWAHATI**  
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**RANCHI**  
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**WESTERN REGION**  
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**VIJAYAWADA**  
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### RESIDENT ENGINEERS

**AHMEDABAD:** Visnagar **BANGALORE:** Bellary, Hassan, Hubli, Mangalore **BARODA:** Anand, Vapi **BHUBANESWAR:** Behrampur, Cuttack, Rourkela, Sambalpur **CHENNAI:** Vellore, Trichy **KOCHI:** Kollam **COIMBATORE:** Erode **DELHI & HARYANA:** Gurugram, Hissar, Panipat, **UP (W) & UK:** Agra, Bareilly, Dehradun, Ghaziabad, Meerut, Moradabad, Noida **GUWAHATI:** Silchar, Tezpur **HYDERABAD:** Karimnagar, Warangal **INDORE:** Bhopal, Gwalior, Jabalpur, Rewa, Ujjain **J&K:** Kashmir, Srinagar **JAIPUR:** Bhilwara, Bikaner, Jodhpur, Kota, Sikar, Udaipur **KOLKATA:** Bankura, Bardhaman, Siliguri **LUCKNOW:** Gorakhpur, Prayagraj, Shahjhanpur, Varanasi **LUDHIANA:** Amritsar, Barnala, Jammu, Mansa **MADURAI:** Nagercoil, Rajapalayam **MUMBAI:** Aurangabad, Nasik **NAGPUR:** Akola, Amravati, Chandrapur **PUNE:** Goa, Nasik, Kolhapur, Sangali, Solapur **RAIPUR:** Ambikapur **RAJKOT:** Bhavnagar, Jamnagar **RANCHI:** Dhanbad, Muzaffarpur, Patna, Purnia, Siwan **SURAT:** Aurangabad, Nasik **VIJAYAWADA:** Chittoor, Rajahmundry, Tirupathi, Vishakhapatnam

### WAREHOUSES

#### National Warehouse

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