

TOYO

Surge Protection Device



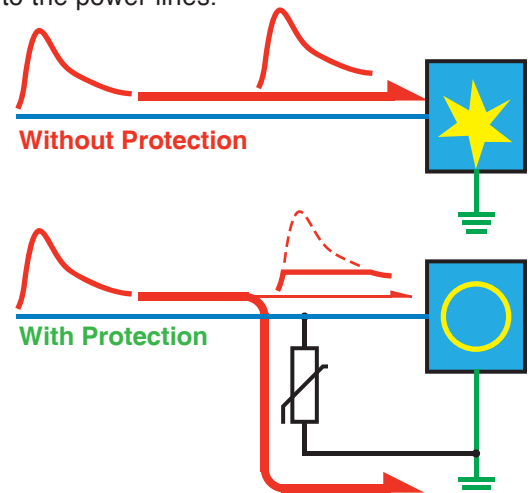
Comply with IEC61643-1, IEC61643-21 and UL1449 ed.2 Standards

Lightning induced surges and electrostatic discharges can create very strong electromagnetic radiation over long distances, which can destroy all equipments connected to any nearby power lines. Whether routed inside or outside the buildings, all lines are at risk from such discharges and therefore the use of Surge Protection Device (SPD) is highly recommended for protecting the equipments that are connected to the power lines.

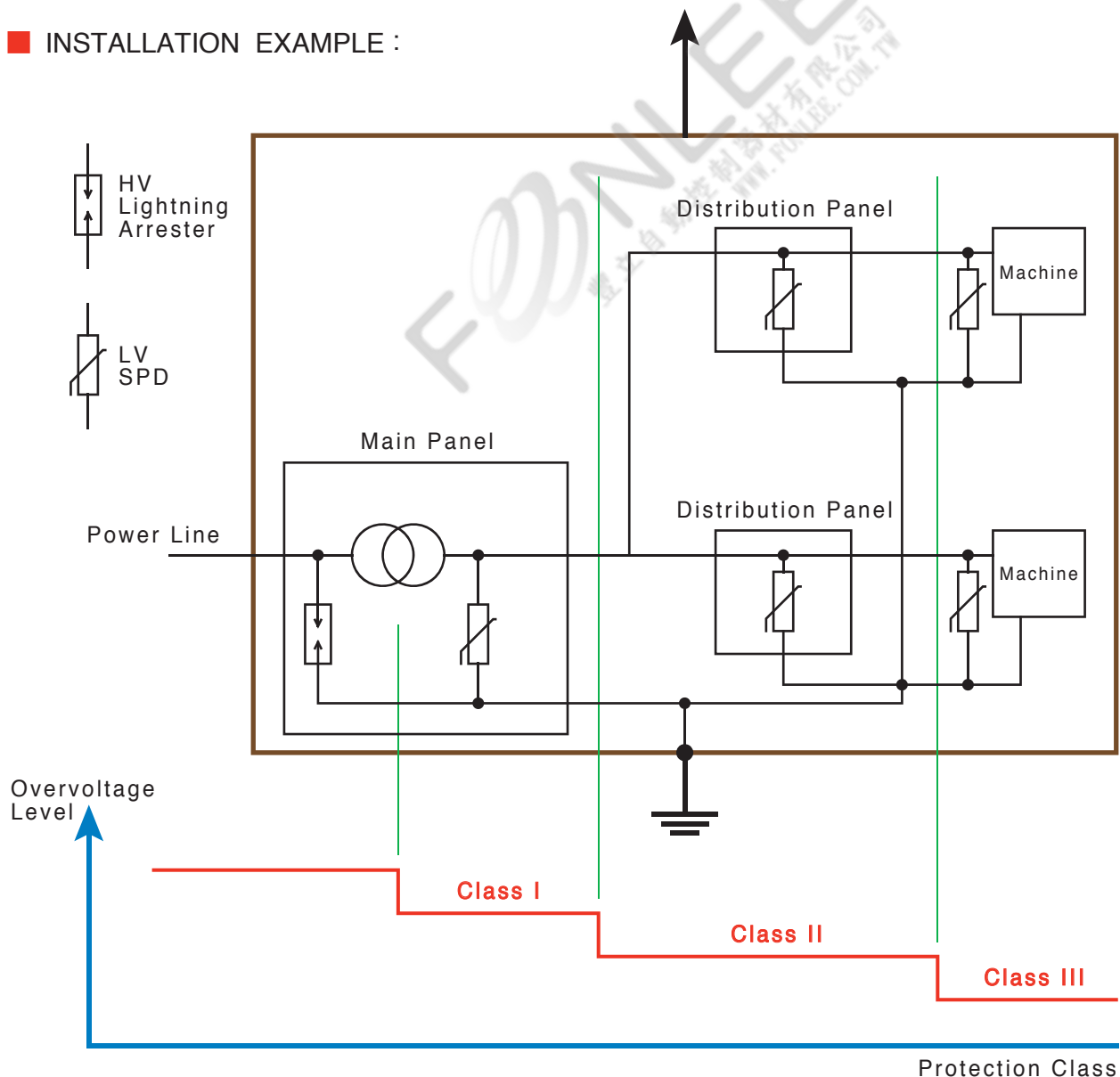
Also, surge can be induced by impulse current generated from internal supplying system and the ON and OFF (start and stop) of the power equipments such as arc furnace, motor, electrical and mechanical switching, capacitive and inductive load...etc. These surge currents would destroy any precise electronic device, cause error message or failure of power equipments, shorten their life expectancy and eventually break down the entire power plant. This is why Surge Protection Device is developed.

The induced surge currents are diverted to the earth before they can reach the equipments connected to the downstream power network while the overvoltages are kept to a harmless level and the equipments are kept running safely and normally.

TOYO Surge Protection Devices are plug-in type easy to install, and are made with metal oxide varistor (MOV) and gas discharge tube (GDT) technologies, recommended for protecting any equipment connected to main power supplies. The selection of the product type is done by taking into account the exposition degree to lightning of the area, installation in isolated or metropolitan area, cost, sensitivity level of the equipment, neutral earthing system and installation method.



■ INSTALLATION EXAMPLE :



■ ORDERING FORM :

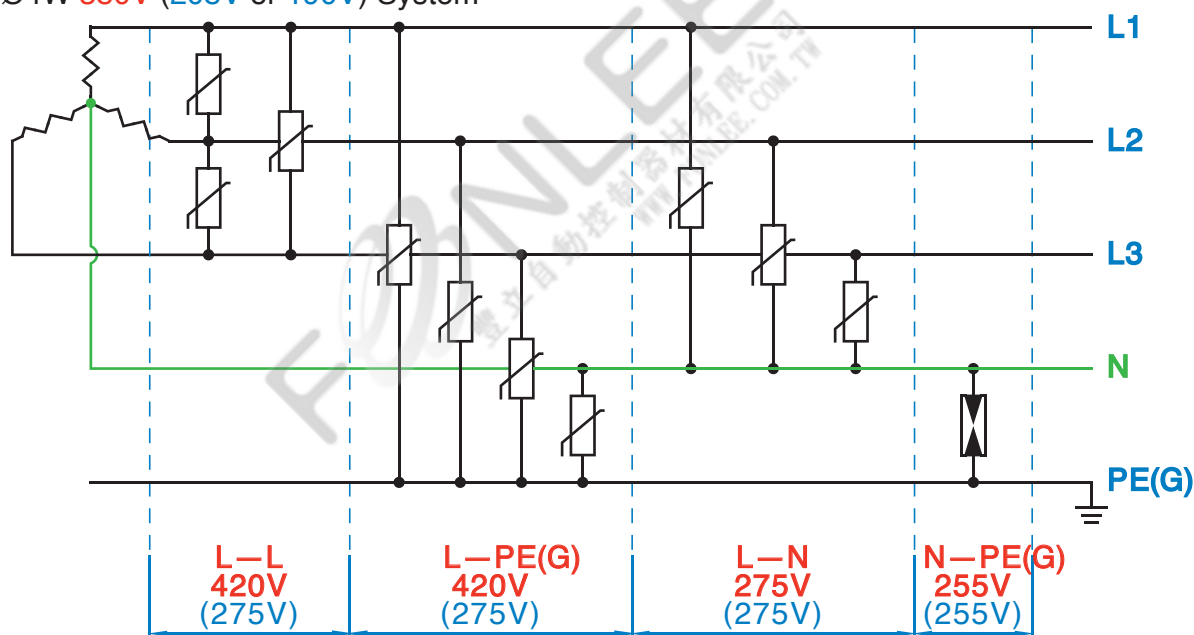
TSPD — **BX** — **4** — **42** — **040**

1
2
3
4

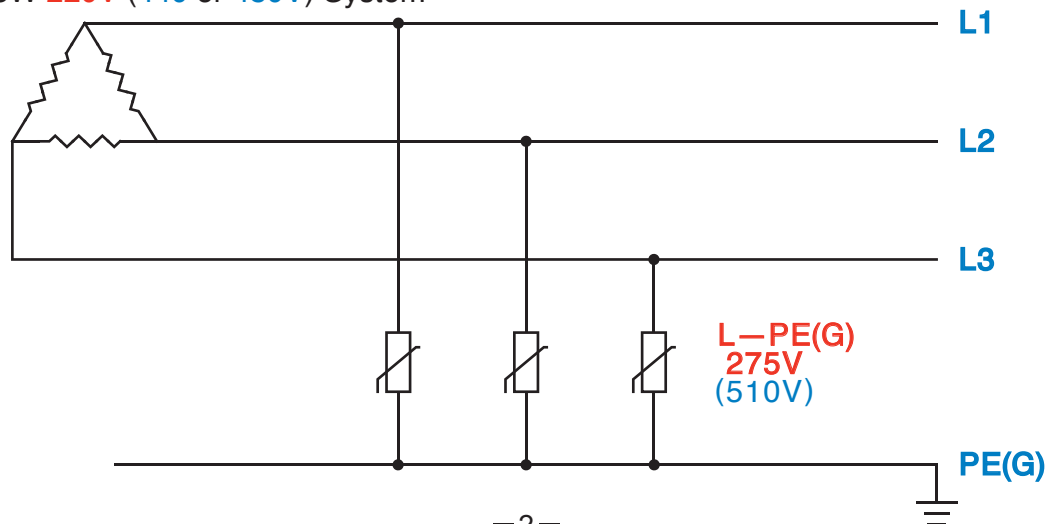
- 1** — SPD Type :
D, C, B, M, BX, DNPE, CNPE, BNPE, NPE.
- 2** — Poles
 1=1P 2=2P, 1P+N, 1P+NPE 3=3P, 2P+N, 2P+NPE
 4=4P, 3P+N, 3P+NPE N=Arrester Only (without base).
- 3** — Max. Continuous Working Voltage ($U_c V_{AC}$)
 27=275V 42=420V 51=510V 25=255V (for NPE only)
 S=Others (made upon request).
- 4** — Max. Discharging Current (I_{max} , kA)
 015=15kA 020=20kA 040=40kA
 060=60kA 080=80kA 100=100kA 150=150kA

■ VOLTAGE SELECTION EXAMPLE

- 3Ø4W 380V (208V or 190V) System



- 3Ø3W 220V (440 or 480V) System



SPECIFICATION :

Type		TSPD—D		TSPD—C		TSPD—B			
Class		III		II		I—II			
Impulse Current (I_{imp}) (10/350μs) (1P)		—		—		8kA		10kA	
Nonminal Discharge Current (I_n) (8/20μs) (1P)		10kA		20kA		40kA		60kA	
Maximum Discharge Current (I_{max}) (8/20μs) (1P)		20kA		40kA		80kA		100kA	
Max. Continuous Operating Voltage (U_{cVAc})		275	420	275	420	275	420	275	420
Activating Over Voltage (V_{Ac})		430	680	430	680	430	680	430	680
Voltage Protection Level (≤U_pkV)		1.2	1.5	1.5	2.0	2.2	2.5	2.5	3.0
Fault Indicator		Normal :  / Fault : 							
Fault Output		—							
Response Time		<25ns							
Electric Leakage (I_{le}) (75% U_c1mA)		<20μA (I _{pe} residual current <5μA)							
IP Classification		IP20							
Operating Temperature		−40°C ~ +80°C							
Wiring	L — N	≥ 2.5 mm ²		≥ 5.5 mm ²		≥ 14 mm ²			
	PE	≥ 2.5 mm ²		≥ 5.5 mm ²		≥ 22 mm ²			
Installation		35mm DIN rail							
Recommended Fuses or Breaker		16A		32A		63A			
Weight		113g		116g		180g		200g	
Testing Standards		IEC61643-1 IEC61643-21 UL1449 ed.2							

DIMENSION (mm) :



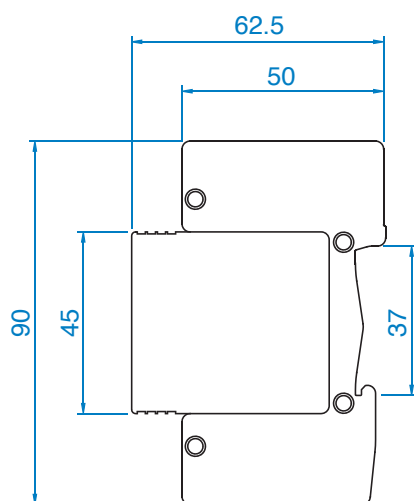
TSPD—D



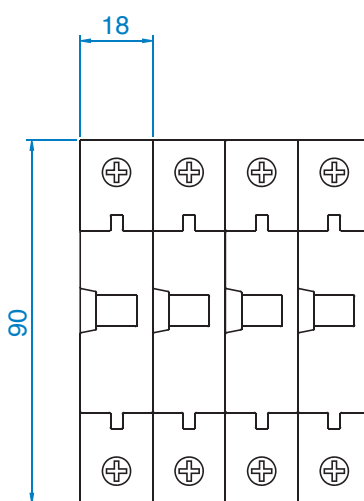
TSPD—C



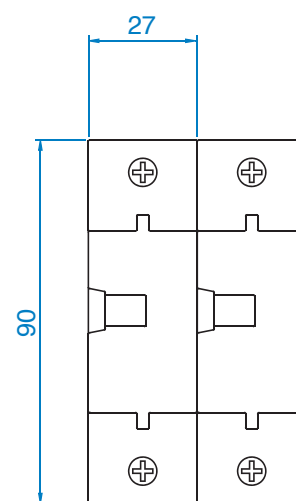
TSPD—B



TSPD—D, C, B



TSPD—D, C



TSPD—B

SPECIFICATION :

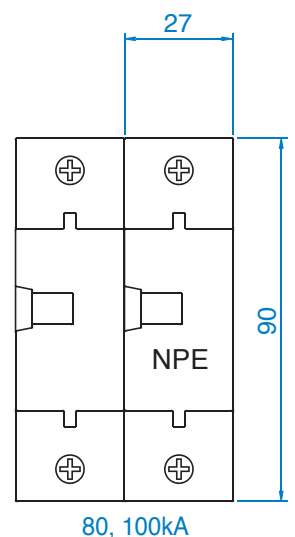
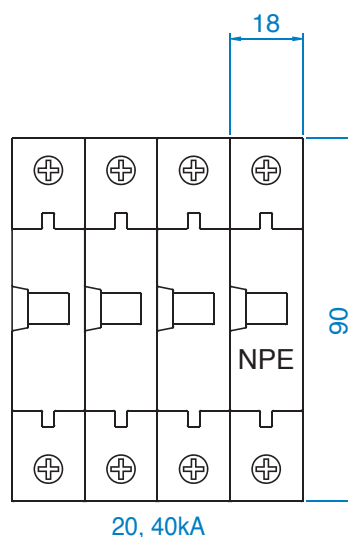
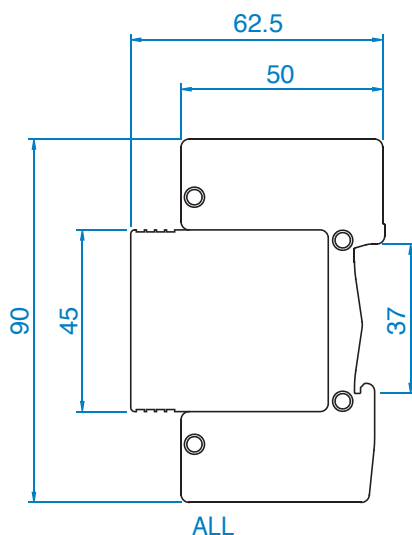
Type	TSPD—NPE 			
Class	III	II	I—II	
Impulse Current (I_{imp}) (10/350 μ s) (1P)	—		8kA	10kA
Nonminal Discharge Current (I_n) (8/20 μ s) (1P)	10kA	20kA	40kA	50kA
Maximum Discharge Current (I_{max}) (8/20 μ s) (1P)	20kA	40kA	80kA	100kA
Max. Continuous Operating Voltage (U_{cVAc})	255			
Activating Over Voltage (V_{Ac})	—			
Voltage Protection Level ($\leq U_{pkV}$)	1.5 ~ 2.0			
Fault Indicator	—			
Fault Output	—			
Response Time	<25ns			
Electric Leakage (I_{le}) (75% U_{c1mA})	<20 μ A (Ipe residual current <5 μ A)			
IP Classification	IP20			
Operating Temperature	-40°C ~ +85°C			
Wiring	L — N	$\geq 2.5 \text{ mm}^2$	$\geq 5.5 \text{ mm}^2$	$\geq 14 \text{ mm}^2$
	PE	$\geq 2.5 \text{ mm}^2$	$\geq 5.5 \text{ mm}^2$	$\geq 22 \text{ mm}^2$
Installation	35mm DIN rail			
Recommended Fuses or Breaker	16A	32A	63A	
Weight	113g	116g	180g	200g
Testing Standards	IEC61643-1		IEC61643-21	UL1449 ed.2

 Spark Gap

DIMENSION (mm) :



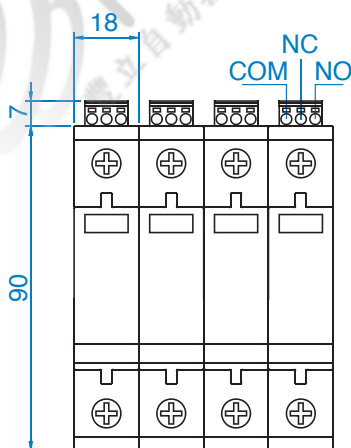
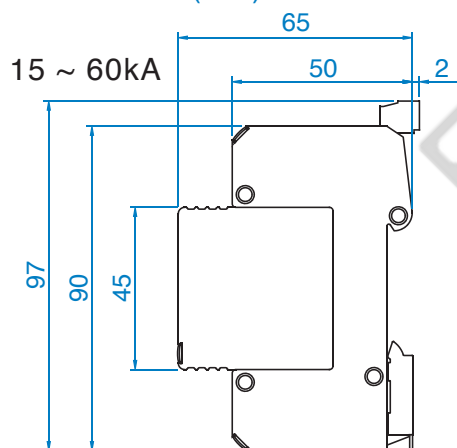
TSPD—NPE



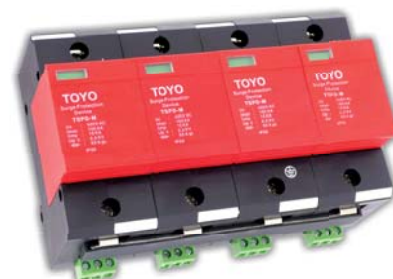
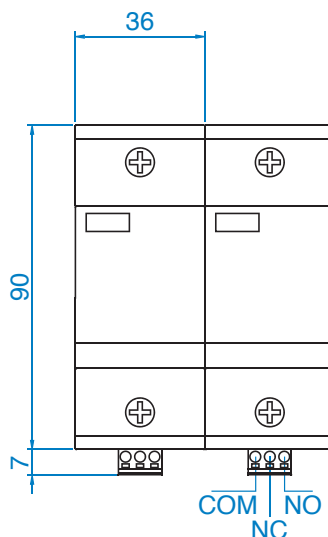
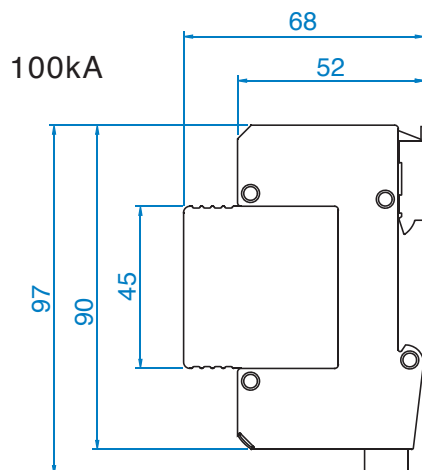
SPECIFICATION :

Type		TSPD—M											
Class		III			II			I—II					
Impulse Current (I_{imp}) (10/350μs) (1P)		—						6kA			10kA		
Nonminal Discharge Current (I_n) (8/20μs) (1P)		5kA			15kA			25kA			40kA		
Maximum Discharge Current (I_{max}) (8/20μs) (1P)		15kA			40kA			60kA			100kA		
Max. Continuous Operating Voltage (U_{cVAc})		275	420	510	275	420	510	275	420	510	275	420	510
Activating Over Voltage (V_{Ac})		430	680	820	430	680	820	430	680	820	430	680	820
Voltage Protection Level (≤U_pkV)		1.0	1.6	2.0	1.2	1.8	2.2	1.5	2.0	2.5	1.6	2.2	2.7
Fault Indicator		Normal :  / Fault : 											
Fault Output		with fault output contact											
Response Time		<25ns											
Electric Leakage (I_{le}) (75% U_c1mA)		<20μA (I _p e residual current <5μA)											
IP Classification		IP20											
Operating Temperature		-40°C ~ +80°C											
Wiring	L — N	≥ 2.5 mm ²			≥ 5.5 mm ²						≥ 14 mm ²		
	PE	≥ 2.5 mm ²			≥ 5.5 mm ²						≥ 22 mm ²		
Installation		35mm DIN rail											
Recommended Fuses or Breaker		16A			32A			50A			63A		
Weight		113g			116g			126g			200g		
Testing Standards		IEC61643-1 IEC61643-21 UL1449 ed.2											

DIMENSION (mm) :



TSPD—M
15, 40, 60kA



TSPD—M
100kA

SPECIFICATION :

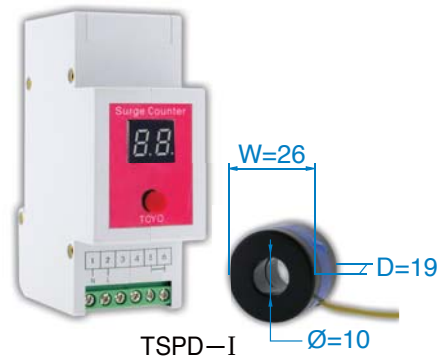
Type	TSPD—BX		
Class	I—II		
Impulse Current (I_{imp}) (10/350μs) (1P)	15kA		
Nonminal Discharge Current (I_n) (8/20μs) (1P)	100kA		
Maximum Discharge Current (I_{max}) (8/20μs) (1P)	150kA(*200kA)		
Max. Continuous Operating Voltage (U_{cVAC})	275	420	510
Activating Over Voltage (V_{AC})	430	680	820
Voltage Protection Level (≤U_{pKV})	3.2	3.5	4.0
Fault Indicator	Normal : ☐ / Fault : ☒		
Fault Output	with fault output contact		
Response Time	<25ns		
Electric Leakage (I_{le}) (75% U_c1mA)	<20μA (I _p e residual current <5μA)		
IP Classification	IP20		
Operating Temperature	−40℃ ~ +80℃		
Wiring	L — N	≥ 14 mm ²	
	PE	≥ 22 mm ²	
Installation	35mm DIN rail		
Recommended Fuses or Breaker	100A		
Weight	450g		
Testing Standards	IEC61643-1 IEC61643-21 UL1449 ed.2		

*option

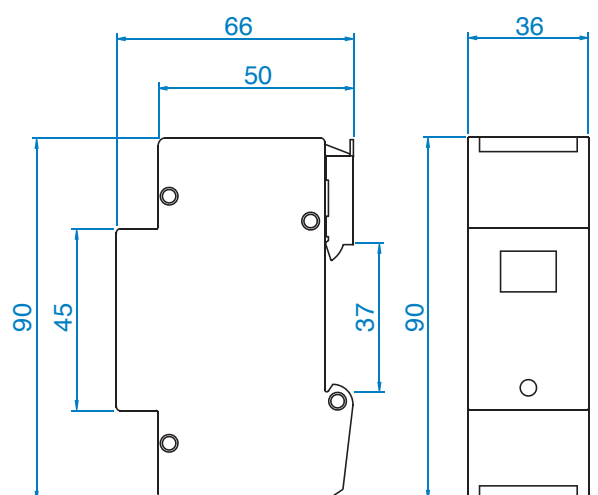
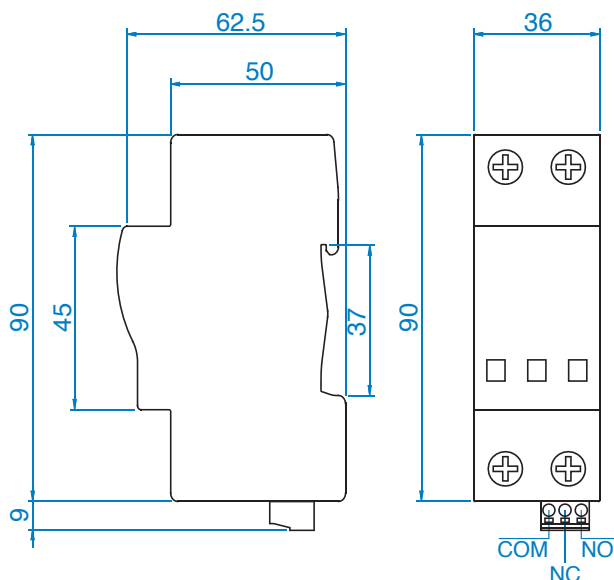
DIMENSION (mm) :



TSPD—BX

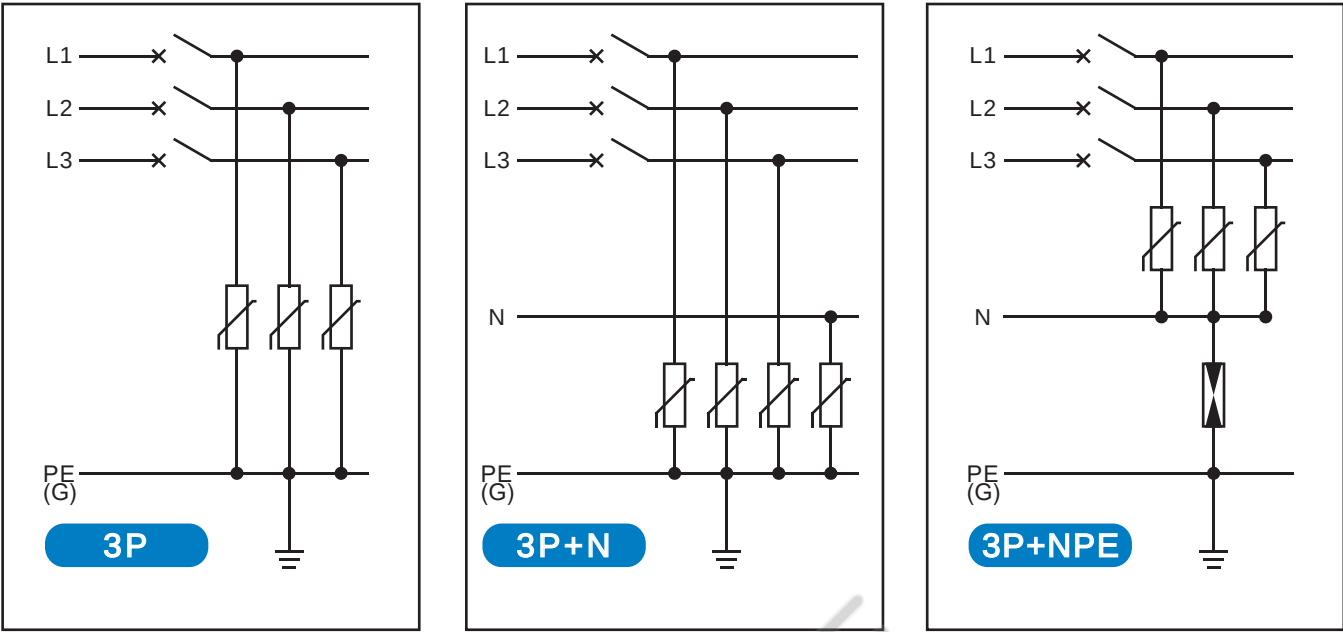


TSPD—I



CONNECTION EXAMPLE :

★SPD



★SURGE COUNTER

