

Pluggable Multi-pole Surge Protective Devices (SPD) for DC systems



Lightning and Surge Protection for DC Systems

ProTec T2 DCU & ProTec T2 DCB

Special features:

- For use in various DC systems and EV fast chargers
- Available in Bipolar and Unipolar SPD versions
- Available in operating voltages from 250V to 1500 V
- Optional remote contact (RC) signaling
- IEC Type 2 and DC Type 1 (UL 1449) SPD
- Vibration and shock withstand capability



IEC CD 61643-41 Edition 1



UL 1449 5th Edition



Raycap has developed a new DC DIN rail SPD portfolio that meets the requirements of the upcoming IEC 61643-41 DC SPD sub-standard under IEC 61643 and is at the same time certified to UL 1449 5th edition under requirements of SUPPLEMENT SB – DIRECT CURRENT (DC) SPDs.

This new DC surge protection standard is necessary because existing Power SPDs, compliant with the IEC 61643-31 DC PV SPD supplement or IEC 61643-11 AC SPDs, do not cover requirements present in DC applications.

Our new DC products can be used in DC industry applications, where DC bus is used to provide power to equipment (such as robotic arms, motor drives, controllers, ...) and AC/DC power conversion can be omitted to increase efficiency, electric vehicle (EV) fast chargers, battery energy storage systems (BESS), control cabinet supply lines, safety lightning and other DC applications.



More Product Information



Pluggable Multi-Pole SPD for DC Systems

ProTec T2 DCU 3Y (Unipolar)

Type 2 • DC SPD Type 1



Location of Use: DC Systems, EV Chargers
 Network Systems: Unipolar grounded / ungrounded, TN, TT*, IT*
 Mode of Protection: (+) - PE / G, (-) - PE / G, (+) - (-)
 IEC/UL Category: Type 2, DC SPD Type 1
 Housing: Pluggable Design
 Compliance: IEC CD 61643-41 Edition 1
 UL 1449 5th Edition

Technical Data

ProTec T2-xxxxDCU-3Y(-R)		500	1000	1500
IEC Electrical				
Nominal DC Voltage	U_n	500 V	1000 V	1500 V
Maximum Continuous Operating Voltage (DC)	(+) - (-) U_{CDC}	500 V	1000 V	1500 V
	(+) / (-) - PE U_{CDC}	500 V	1000 V	1500 V
Nominal Discharge Current (8/20 μ s)	I_n	20 kA	20 kA	20 kA
Maximum Discharge Current	I_{max}	40 kA	40 kA	40 kA
Total Discharge Current (8/20 μ s)	I_{Total}	70 kA	70 kA	55 kA
Impulse Discharge Current (10/350 μ s)	I_{imp}	5 kA	5 kA	2.8 kA
Total Discharge Current (10/350 μ s)	I_{Total}	10 kA	10 kA	3 kA
Voltage Protection Level	(+) - (-) U_p	2400 V	3150 V	3700 V
	(+) / (-) - PE U_p	2400 V	3150 V	3700 V
Overcurrent Protection (max)		200 AgBat**	200 AgBat***	200 AgBat***
Short-Circuit Current Rating (DC)	I_{SCCR}		30 kA (L/R < 3 ms)	
Response Time			< 25 ns	
Overvoltage Category			III	
Number of Ports			1	
UL Electrical				
Maximum Permitted DC Voltage	(+) - (-) V_{dcmcov}	500 V	1000 V	1500 V
	(+) / (-) - G V_{dcmcov}	500 V	1000 V	1500 V
Voltage Protection Rating	VPR	1800 V	2500 V	3000 V
Nominal Discharge Current (8/20 μ s)	I_n		20 kA	
Short-Circuit Current Rating (DC)	SCCR		100 kA	
Mechanical & Environmental				
Operating Temperature Range	T_a	-40 °F to +185 °F [-40 °C to +85 °C]		
Permissible Operating Humidity	RH	5%...95%		
Altitude (max)		6562 ft [2000 m]		
Terminal Screw Torque	M_{max}	35 lbf-in per UL 1449 [4.5 Nm]		
Conductor Cross Section (max)		6 AWG (Solid, Stranded) per UL 1449		
		35 mm ² (Solid, Stranded) / 25 mm ² (Flexible)		
		Cu Only per UL 1449		
Mounting		35 mm DIN Rail, EN 60715		
Degree of Protection		IP 20 (built-in)		
Housing Material		Thermoplastic: Extinguishing Degree UL 94 V-0		
Thermal Protection		Yes		
Operating State / Fault Indication		Green Flag / Not Green Flag		
Remote Contacts (RC)		Optional		
RC Switching Capacity		125 V / 1 A; DC: 48 V / 0.5 A, 24 V / 0.5 A, 12 V / 0.5 A		
RC Conductor Cross Section (max)		16 AWG (Solid) / 1.5 mm ² (Solid)		

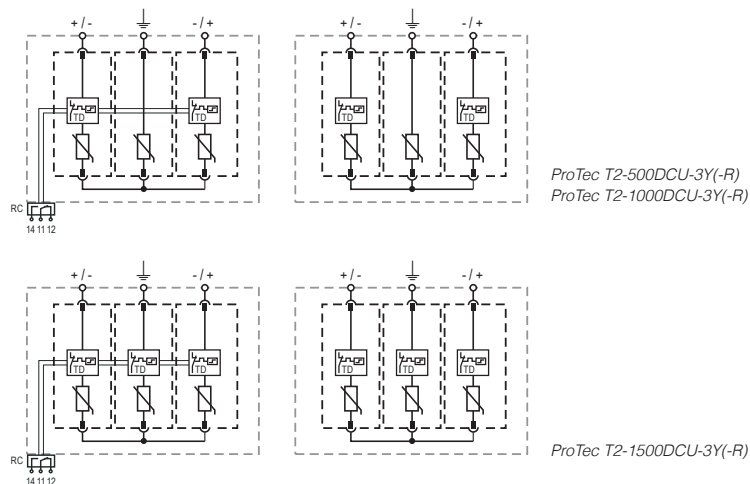
*Only for DC power systems which are electrically separated from AC power systems.

ETI NH1 BAT 200A/500V DC (004723266), *ETI NH1 BAT 200A/1500V DC (004110656)

Internal Configuration

Legend

	PE / G Conductor Terminal
	Remote Contacts Terminal (Optional)
	Thermal Disconnect

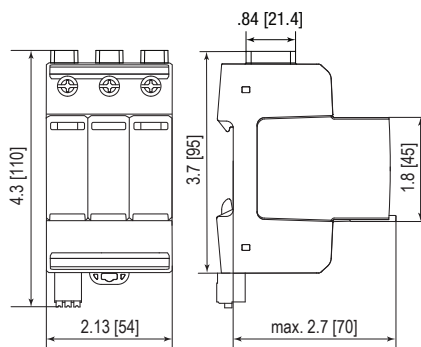


Order Information

Order Code	500	1000	1500
ProTec T2-xxxxDCU-3Y	59.A983	59.A985	59.A987
ProTec T2-xxxxDCU-3Y-R (with remote contacts)	59.A984	59.A986	59.A988
ProTec T2-250DCU-M-P (side plug)	59.A989	-	-
ProTec T2-250DCU-P (middle plug)	59.A990	-	-
ProTec T2-500DCU-M-P (side plug)	-	59.A991	-
ProTec T2-500DCU-P (middle plug)	-	59.A992	-
ProTec T2-750DCU-M-P (plug)	-	-	59.A993

Dimensions & Packaging

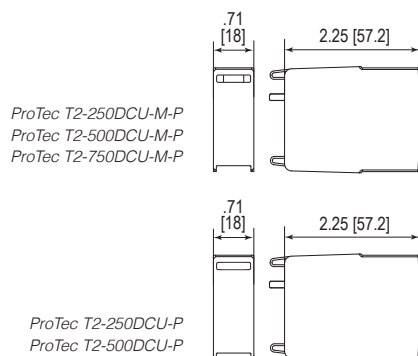
inches [mm]



Complete Unit Dimensions & Packaging

ProTec T2-xxxxDCU-3Y	500	1000	1500
Weight	pounds .772	.831	.791
	grams 350	377	359
ProTec T2-xxxxDCU-3Y-R			
Weight	pounds .789	.849	.809
	grams 358	385	367
DIN 43880 Dimension	3 TE / 2.13" [54mm]		
Packaging Dimensions (HxWxL)	4.3 x 4.5 x 13.8" [109 x 115 x 352 mm]		
Standard Order Quantity	5 Units		

Spare Plug



Single Unit Dimensions & Packaging

ProTec T2-xxxDCU-M-P	250	500	750
Weight	pounds .141	.161	.146
	grams 64	73	66
ProTec T2-xxxDCU-P	250	500	750
Weight	pounds .134	.157	-
	grams 61	71	-
DIN 43880 Dimension	1 TE / .70" [18 mm]		
Packaging Dimensions (HxWxL)	3.2 x 4.5 x 12" [83 x 116 x 305 mm]		
Standard Order Quantity	24 Units		



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Pluggable Multi-Pole SPD for DC Systems

ProTec T2 DCB 3Y (Bipolar)

Type 2 • DC SPD Type 1



Location of Use: DC Systems, EV Chargers
 Network Systems: Bipolar grounded, TN-C, TN-C-S, TN-S
 Mode of Protection: (+) - PE/M/G, (-) - PE/M/G, (+) - (-)
 IEC/UL Category: Type 2, DC SPD Type 1
 Housing: Pluggable Design
 Compliance: IEC CD 61643-41 Edition 1
 UL 1449 5th Edition

Technical Data

ProTec T2-xxxxDCB-3Y(-R)

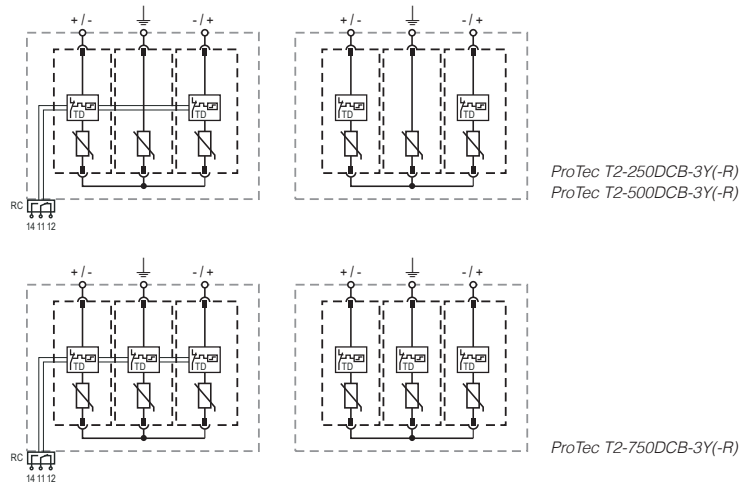
		250	500	750
IEC Electrical				
Nominal DC Voltage	U_n	250 V	500 V	750 V
Maximum Continuous Operating Voltage (DC)	(+) - (-) U_{CDC}	500 V	1000 V	1500 V
	(+) / (-) - PE/M U_{CDC}	250 V	500 V	750 V
Nominal Discharge Current (8/20 μ s)	I_n	20 kA	20 kA	20 kA
Maximum Discharge Current	I_{max}	40 kA	40 kA	40 kA
Total Discharge Current (8/20 μ s)	I_{Total}	70 kA	70 kA	55 kA
Impulse Discharge Current (10/350 μ s)	I_{imp}	5 kA	5 kA	2.8 kA
Total Discharge Current (10/350 μ s)	I_{Total}	10 kA	10 kA	3 kA
Voltage Protection Level	(+) - (-) U_p	2400 V	3150 V	3700 V
	(+) / (-) - PE/M U_p	2400 V	3150 V	3700 V
Overcurrent Protection (max)		200 AgBat*	200 AgBat**	200 AgBat**
Short-Circuit Current Rating (DC)	I_{SCCR}		30 kA (L/R < 3 ms)	
Response Time			< 25 ns	
Overvoltage Category			III	
Number of Ports			1	
TN-System Bipolar				
TOV Withstand 5s (DC)	(+) / (-) - PE/M U_T	412 V	825 V	1238 V
TOV Withstand 120min (DC)	(+) / (-) - PE/M U_T	550 V	1100 V	1650 V
TT-System Bipolar				
TOV Withstand 5s (DC)	(+) / (-) - PE U_T	550 V	1100 V	1650 V
TOV Withstand 120min (DC)	(+) / (-) - PE U_T	412 V	825 V	1238 V
TOV Withstand 5s (DC)	(+) / (-) - M U_T	412 V	825 V	1238 V
TOV Withstand 120min (DC)	(+) / (-) - M U_T	550 V	1100 V	1650 V
UL Electrical				
Maximum Permitted DC Voltage	(+) - (-) V_{dmcov}	500 V	1000 V	1500 V
	(+) / (-) - G V_{dmcov}	500 V	1000 V	1500 V
Voltage Protection Rating	VPR	1800 V	2500 V	3000 V
Nominal Discharge Current (8/20 μ s)	I_n		20 kA	
Short-Circuit Current Rating (DC)	SCCR		100 kA	
Mechanical & Environmental				
Operating Temperature Range	T_a	-40 °F to +185 °F [-40 °C to +85 °C]		
Permissible Operating Humidity	RH	5%...95%		
Altitude (max)		6562 ft [2000 m]		
Terminal Screw Torque	M_{max}	35 lbf-in per UL 1449 [4.5 Nm]		
Conductor Cross Section (max)		6 AWG (Solid, Stranded) per UL 1449		
		35 mm ² (Solid, Stranded) / 25 mm ² (Flexible)		
		Cu Only per UL 1449		
Mounting		35 mm DIN Rail, EN 60715		
Degree of Protection		IP 20 (built-in)		
Housing Material		Thermoplastic: Extinguishing Degree UL 94 V-0		
Thermal Protection		Yes		
Operating State / Fault Indication		Green Flag / Not Green Flag		
Remote Contacts (RC)		Optional		
RC Switching Capacity		125 V / 1 A; DC: 48 V / 0.5 A, 24 V / 0.5 A, 12 V / 0.5 A		
RC Conductor Cross Section (max)		16 AWG (Solid) / 1.5 mm ² (Solid)		

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Internal Configuration

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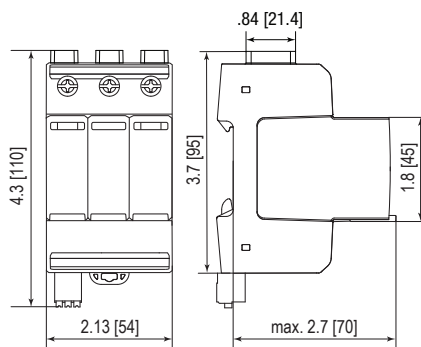
	PE/M/G Conductor Terminal
	Remote Contacts Terminal (Optional)
	Thermal Disconnect



Order Information

Order Code	250	500	750
ProTec T2-xxxDCB-3Y	59.A955	59.A957	59.A959
ProTec T2-xxxDCB-3Y-R (with remote contacts)	59.A956	59.A958	59.A960
ProTec T2-250DCB-M-P (side plug)	59.A961	-	-
ProTec T2-250DCB-P (middle plug)	59.A962	-	-
ProTec T2-500DCB-M-P (side plug)	-	59.A963	-
ProTec T2-500DCB-P (middle plug)	-	59.A964	-
ProTec T2-750DCB-M-P (plug)	-	-	59.A965

Dimensions & Packaging

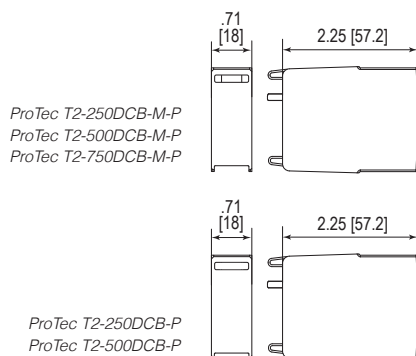


inches [mm]

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