

Modular & Compact Surge Protective Devices (SPDs) for DC Power Systems



DC Power Systems

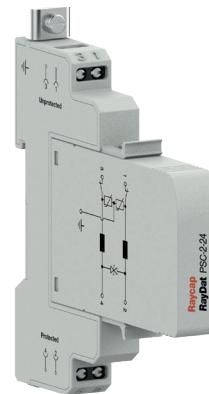
Special features:

- Very high surge ratings
- Protects either floated or grounded lines
- Equipped with screw terminals
- High load current is provided (up to 7A)

RayDat SPLH*
RayDat PSC-2
ProTec DMDR 20**

*UL Listed

**UL Recognized



Symbol Legend:



DIN Rail
Mounting



Screw Connect
Terminals



Modular Design



Compact Design



Shield Directly
Grounded

The RayDat SPLH-2 Series has been developed to protect ungrounded DC power supplies. Coarse protection is provided using two pole gas discharge tubes (GDT), while fine protection is provided using a high-speed silicon (SAD) stage. Care is taken to ensure coordination between these two stages without voltage or surge current blind spots occurring.

The RayDat PSC-2 Series is designed to protect power supplies. Coarse protection is provided by varistors (MOV), while fine protection is provided using a high-speed silicon (SAD) stage.

Internal thermal disconnectors are used to reduce the hazards of thermal runaway during fault conditions or mains incursion onto the low voltage data circuit. If the module is unplugged out of the base, the connection lines remain enabled.

The ProTec DMDR Series is designed to meet the unique requirements of protection for DC power systems found in telecom power and railway applications. The ProTec DMDR Series provides both, common and differential mode protection using high nominal discharge rating for extended operating life under DC conditions.

DATA SHEET

Compact Single-pole SPD

RayDat SPLH-2-7A

D1 • C1 • C2 • C3

UL Listed

IEC/EN Category: D1/C1/C2/C3
 Surge Discharge Ratings: I_n : 10kA, I_{imp} : 2.5kA
 Voltages: 36V DC
 Series Load Current: 7A
 Enclosure: DIN 43880 2TE, DIN Rail Mount
 Terminals: Stranded to 2.5 mm²
 Housing: Compact Design
 Compliance: IEC/EN 61643-21
 UL 497B 4th Edition

**Technical Data****SPLH-2-7A****Electrical**

Nominal Operating Voltage (DC)	U_n	36V
Maximum Continuous Operating Voltage (DC)	U_c	45V
Rated Load Current at 45°C	I_L	7A
Rated Load Current at 80°C	I_L	5A
C2 Nominal Discharge Current (8/20µs) (Line-Ground)	I_n	10kA
C2 Total Nominal Discharge Current (8/20µs)	I_n	20kA
D1 Impulse Current (10/350µs) (Line-Ground)	I_{imp}	2.5kA
D1 Total Impulse Current (10/350µs)	I_{imp}	5kA
Voltage Protection Level at C2 (8/20µs) (Line-Ground)	U_p	<1000V
Voltage Protection Level at C2 (8/20µs) (Line-Line)	U_p	<180V
Response Time Overvoltage Protection	t_A	<1ns
Insulation Resistance of the Protection	R_{iso}	> 45MΩ
Serial Resistance per Path	R	<1Ω
Serial Inductivity	L	22µH
Transverse Capacitance (Line-Ground)	C	<2nF
Transverse Capacitance (Line-Line)	C	<100pF

Mechanical & Environmental

Temperature Range	T_a	-40 °C to +80 °C
Terminal Screw Torque	M_{max}	0.5Nm
Conductor Cross Section		2.5mm ² (Solid, Stranded)
Mounting		35mm DIN Rail, EN 60715
Degree of Protection		IP 20
Housing Material		Thermoplastic: Extinguishing Degree UL 94 V-0

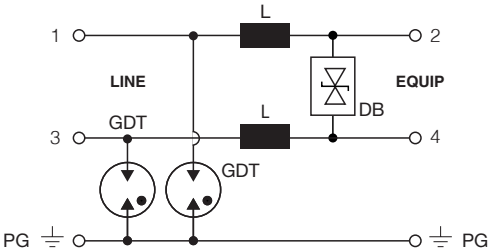
Order Information

Order Code	
SPLH-2-7A	127 626

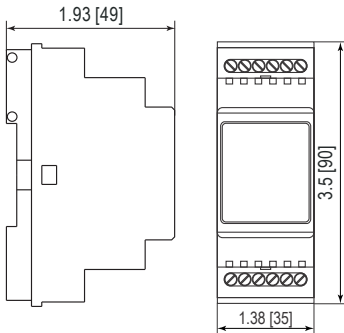
RayDat SPLH-2-7A

Internal Configuration

- Legend
- DB Diode Block
 - GDT Gas Discharge Tube
 - PG Protective Grounding
 - L Inductor



Dimensions & Packaging



Dimensions & Packaging	
SPLH-2-7A	
Dimensions DIN 43880	2 TE
Single Unit Weight	3.17 oz [90 g]
Packaging Dimensions (Single Unit)	4.29 × 3.03 × 1.65" [109 × 77 × 42 mm]
Minimum Order Quantity	7 Units

inches
[mm]

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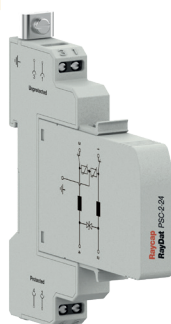


DATA SHEET

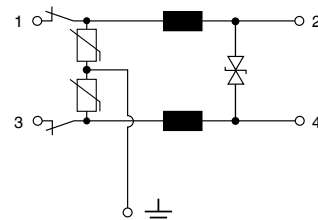
SPD for DC Power Systems with Low Residual Voltage

RayDat PSC-2 Series

C1 • C2 • C3



IEC/EN Category: C1/C2/C3
 Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA
 Voltages: 12, 24, 48 V DC
 Serial Inductivity: 10–14 μ H
 Housing: Modular Design
 Compliance: IEC/EN 61643-21
 Configuration:



Technical Data

PSC-2 Series

12

24

48

Electrical

Lines Protected		1 (2 Conductors)		
Nominal Operating Voltage (DC)	U_n	12V	24V	48V
Maximum Continuous Operating Voltage (DC)	U_c	15V	28V	52V
Rated Operating Current at 25 °C	I_L		4 A	
C2 Nominal Discharge Current (8/20 μ s)	I_n		10 kA	
Maximum Discharge Current (8/20 μ s)	I_{max}		20 kA	
Residual Voltage at 5 kA (8/20 μ s)	U_{res}	< 32V	< 60V	< 135V
Rated Spark Overvoltage	(1, 3-PG)	90-110V	90-110V	90-110V
	(1, 3)	16-20V	30-36V	57-69V
Response Time Overvoltage Protection	t_A		< 1 ns	
Thermal Protection		Thermal Disconnection		
Insulation Resistance of the Protection	R_{iso}	$\geq 15 M\Omega$	$\geq 28 M\Omega$	$\geq 52 M\Omega$
Serial Inductance per Path	L		10–14 μ H	
Transverse Capacitance	C	< 5nF	< 3nF	< 1.5nF

Mechanical

Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]			
Terminal Cross Section Multi-strand (max.)	12 AWG [4 mm ²]			
Terminal Screw Torque	4.5 lbf-in [0.5 Nm]			
Degree of Protection IEC/EN 60529	IP 20 (built-in)			
Housing Material	Thermoplastic; Grey; Extinguishing Degree V-0			
Mounting IEC/EN 60715	35 mm DIN Rail			

Order Information

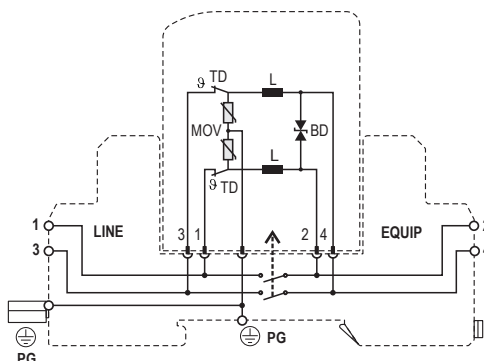
Order Code	12	24	48
PSC-2-xx	7086.83	7086.84	7086.85
PSC-2-xxM (module)	7086.86	7086.87	7086.88

RayDat PSC-2 Series

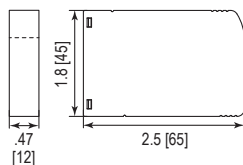
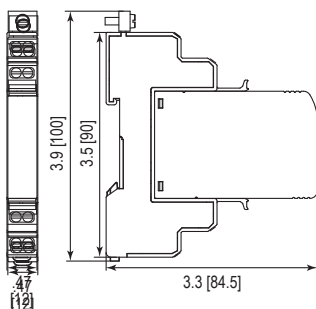
Internal Configuration

Legend

- BD Bi-Directional TVS Diode
- L Inductor
- MOV Metal Oxide Varistor
- PG Protective Ground
- TD Thermal Disconnecter



Dimensions & Packaging



PSC-2 Series

12

24

48

Dimensions

Weight per Unit 2.25 oz [64 g]

Dimensions DIN 43880 2/3 TE

Packaging Dimensions (Single Unit) 3.4 x .59 x 4" [87 x 15 x 102 mm]

Minimum Package Quantity 15 pieces

PSC-2-xxM

12

24

48

Dimensions

Weight per Unit 1.26 oz [36 g]

Packaging Dimensions (Single Unit) 3.4 x .59 x 4" [87 x 15 x 102 mm]

Minimum Package Quantity 15 pieces

inches
[mm]

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RoHS
COMPLIANT  CE

Raycap

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G29-00-040 201120

SPD for DC Power Systems

ProTec DMDR 20 Series

Class III • Type 3 • Type 4CA

UL Recognized



IEC/EN/UL Category: Class III/Type 3/Type 4CA
 Surge Discharge Ratings: U_{oc}/I_{cw} = up to 6kV/3kA
 I_{max} = up to 4kA (8/20 μ s)
 Protection Element: High Energy MOV and GDT
 Voltages: 24, 48, 60, 120V AC
 34, 60, 75, 150 V DC
 Status Indication: Remote Contacts + LED
 Housing: Modular Design
 Compliance: IEC 61643-11:2011
 EN 61643-11:2012+A11:2018
 UL 1449 5th Edition



Technical Data

ProTec DMDR 20 Series

		24*	48	60	120
IEC Electrical					
Nominal AC/DC Voltage	U_o	17V/17V	34V/48V	43V/60V	85V/120V
Maximum Continuous Operating Voltage (AC/DC)	U_c	24V/34V	48V/60V	60V/75V	120V/150V
Open Circuit Voltage of the Combination Wave Generator (1.2/50 μ s)	U_{oc}	2.4kV	2.4kV	6kV	6kV
Short Circuit Current of the Combination Wave Generator (8/20 μ s)	I_{cw}	1.2kA	1.2kA	3kA	3kA
Maximum Discharge Current (8/20 μ s)	I_{max}	2kA	2kA	4kA	4kA
Voltage Protection Level	(L - N) U_p	< 250V	< 500V	< 600V	< 1100V
	(L - PE)/(N - PE)	< 700V	< 800V	< 850V	< 1200V
Response Time of Overvoltage Protection	(L - N) t_A		< 25 ns		
	(L - PE)/(N - PE)		< 100 ns		
Back-Up Fuse (if mains > 32A)			32A gG		
Short-Circuit Current Rating (AC)	I_{sccr}		2kA		
TOV Withstand 5s (AC)	U_T	115V	148V	163V	225V
Number of Ports			1		

UL Electrical

Maximum Continuous Operating Voltage (AC)	MCOV	24V	-	-	-
Maximum Continuous Operating Voltage (DC)	(+)-(-) V_{dcmov}	34V			
	(+/-)-(G)	17V			
Measured Limiting Voltage	(L - N)/(+)-(-) MLV	190V/230V	-	-	-
	(L/N - G)/(+/-)-(G)	580V/540V	-	-	-
Nominal Discharge Current (8/20 μ s)	I_n	1kA	-	-	-

Mechanical

Temperature Range	T_a	-40 °F to +185 °F [-40 °C to +85 °C]			
Permissible Humidity	RH	5%...95%			
Terminal Screw Torque	M_{max}	4.5 lbf-in [0.5 Nm]			
Conductor Cross Section (max.)		10 AWG (Solid, Stranded) / 12 AWG (Flexible)			
		6 mm ² (Solid, Stranded) / 4 mm ² (Flexible)			
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 Status Indication		Green LED			

Order Information

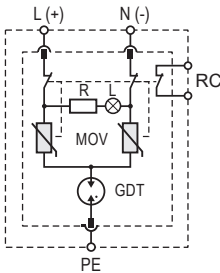
Order Code	24*	48	60	120
ProTec DMDR 20/xxx	510 783	510 833	510 834	510 835
ProTec DMDR 20/xxxM (module)	510 784	510 836	510 837	510 838

*UL Certification.

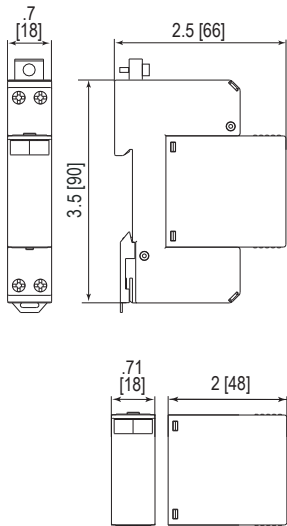
ProTec DMDR 20 Series

Internal Configuration

- Legend
- GDT Gas Discharge Tube
 - MOV Metal Oxide Varistor
 - PE Ground
 - R Resistor
 - L LED
 - RC Remote Control (NC)



Dimensions & Packaging



ProTec DMDR 20 Series	24	48	60	120
Dimensions				
Weight per Unit	3.38 oz [96 g]			
Dimensions DIN 43880	1 TE			
Packaging Dimensions (Single Unit)	4.2 × 3 × .9" [109 × 77 × 24 mm]			
Minimum Package Quantity	12 pieces			

ProTec DMDR 20/xxx M	24	48	60	120
Dimensions				
Weight per Unit	1.12 oz [32 g]			
Packaging Dimensions (Single Unit)	3.8 × 3 × 4.3" [98 × 77 × 110 mm]			
Minimum Package Quantity	12 pieces			

inches
[mm]

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