

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



DC Power Systems

RayDat SPLH*
RayDat PSC-2
ProTec DMDR 20

*UL Listed

Special features:

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



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 (8/20 μ s) (Line-Ground)	I_n	10kA
C2 Total Nominal Discharge Current (8/20 μ s)	I_n	20kA
D1 Impulse Current (10/350 μ s) (Line-Ground)	I_{imp}	2.5kA
D1 Total Impulse Current (10/350 μ s)	I_{imp}	5kA
Voltage Protection Level at C2 (8/20 μ s) (Line-Ground)	U_p	< 1000V
Voltage Protection Level at C2 (8/20 μ s) (Line-Line)	U_p	< 180V
Response Time Overvoltage Protection	t_A	< 1ns
Insulation Resistance of the Protection	R_{iso}	> 45M Ω
Serial Resistance per Path	R	< 1 Ω
Serial Inductivity	L	22 μ H
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

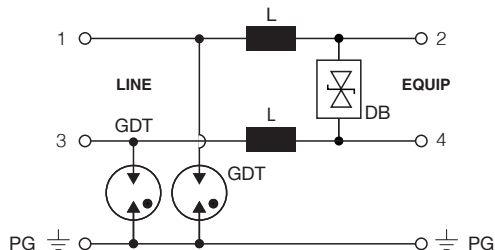
Order Code		
SPLH-2-7A		127 626

RayDat SPLH-2-7A

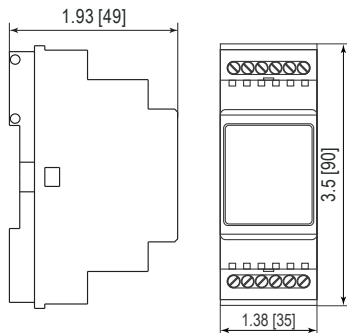
Internal Configuration

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 [90g]
Packaging Dimensions (Single Unit)	4.29 x 3.03 x 1.65" [109 x 77 x 42mm]
Minimum Order Quantity	7 Units

inches
[mm]

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DATA SHEET

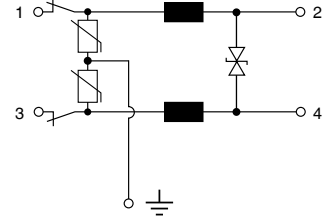
SPD for DC Power Systems with Low Residual Voltage

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

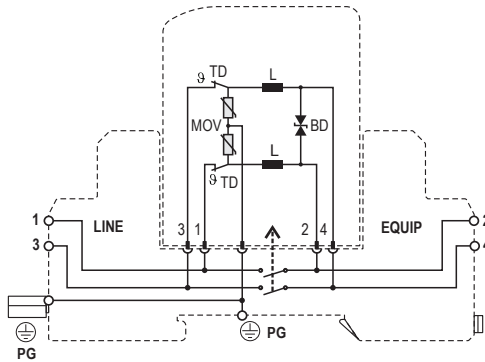
PSC-2 Series	12	24	48	
Electrical				
Lines Protected	1 (2 Conductors)			
Nominal Operating Voltage (DC)	U_n 12V	24V	48V	
Maximum Continuous Operating Voltage (DC)	U_c 15V	28V	52V	
Rated Operating Current at 25 °C	I_L	4 A		
C2 Nominal Discharge Current (8/20 μ s)	I_n	10 kA		
Maximum Discharge Current (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	35mm 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

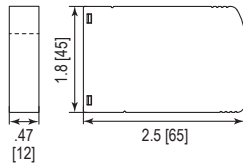
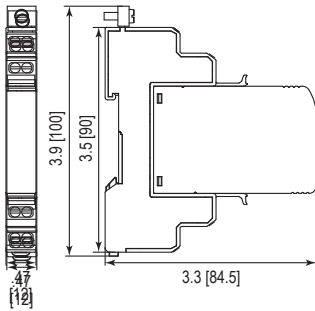
Internal Configuration

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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DATA SHEET

SPD for DC Power Systems ProTec DMDR 20 Series Class III



IEC/EN Category: Class III/Type 3
 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
 Status Indication: Remote Contacts + LED
 Housing: Modular Design
 Compliance: IEC 61643-11:2011
 EN 61643-11:2012



Technical Data

ProTec DMDR 20 Series

		24	48	60	120
Electrical					
Nominal AC/DC Voltage	U_o	17V/24V	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	

Mechanical

Temperature Range	T_a	-40 °F to +158 °F [-40 °C to +70 °C]			
Permissible Humidity	RH	5%...95%			
Terminal Screw Torque	M_{max}	4.5 lbf-in [0.5Nm]			
Conductor Cross Section (max.)		10 AWG (Solid, Stranded) / 12 AWG (Flexible)			
		6 mm ² (Solid, Stranded) / 4 mm ² (Flexible)			
Mounting		35mm 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

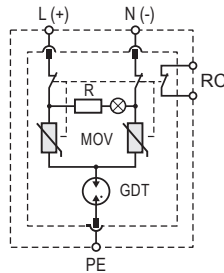
Order Code	24	48	60	120
ProTec DMDR 20/xxx	510 783	510 833	510 834	510 835
ProTec DMDR 20/xxxM (module)	510 784	510 836	510 837	510 838

ProTec DMDR 20 Series

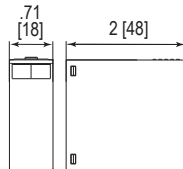
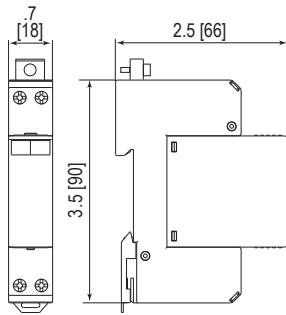
Internal Configuration

Legend

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



Dimensions & Packaging



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

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

inches
[mm]

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