

Modular Surge Protective Devices (SPDs) for Data & Signal Lines



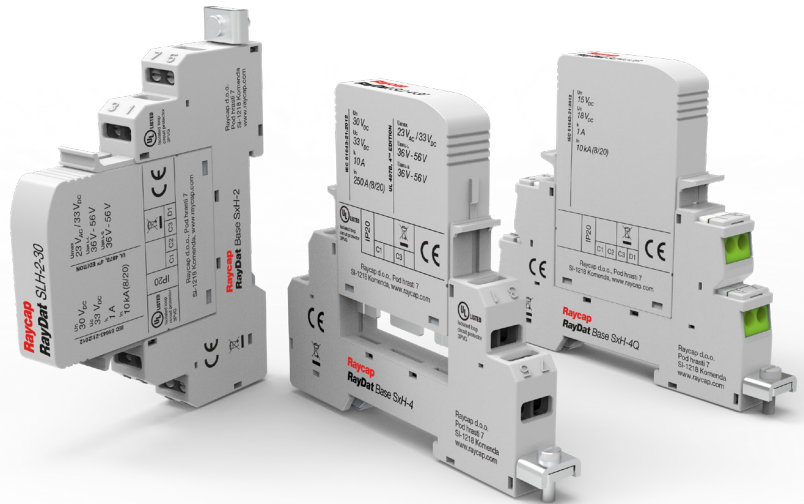
RayDat SL Series

Special features:

- Very high surge ratings
- The connection lines remain enabled during module replacement
- High density – up to 4 protected lines at only 12mm width
- Equipped with Screw or Quick connect (spring loaded) terminals

RayDat SLH-2*
RayDat SLH-4*
RayDat SSH-3*
RayDat SLL-4*
RayDat SUI-4*

*UL Listed



Symbol Legend:



DIN Rail Mounting



Screw Connect Terminals



Quick Connect Terminals



Modular design



Shield Directly Grounded



Shield Indirectly Grounded

These efficient overvoltage barriers (except RayDat SLL) contain both, coarse and fine protection stages, and provide longitudinal and a transverse surge protection, while RayDat SLL contains fine protection stage only.

The initial protection stage comprises a three-pole gas discharge tube (GDT) that is designed to divert the primary surge energy. The subsequent fine protection stage is carried out using fast bi-directional silicon avalanche diodes (SAD). Care is taken in the design of the fine protection stage to avoid capacitive line loading, thereby ensuring a low insertion loss and wide operating frequency range.

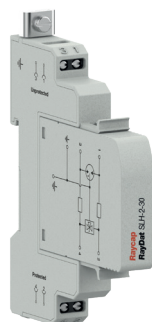
Series line impedances ensure energy coordination between the coarse and a fine protection stages at all levels of a surge incident. To protect against the hazards of electric shock and fire, which often results when power frequency (or lines frequency) contact occurs between power and communication lines (often called mains incursion), a thermo-clip is included on the primary protection stage to divert the power frequency current to ground.

The plug-in module/base design facilitates replacement of a failed module without the need to remove system wiring. If the module is unplugged from the base, the connection lines remain enabled.

DATA SHEET

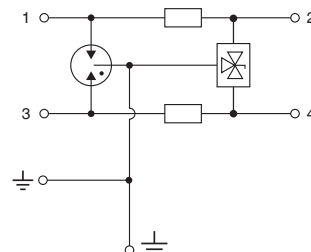
Modular SPD for Single Pair RayDat SLH-2 Series D1 • C1 • C2 • C3

*UL Listed



IEC/EN Category: D1/C1/C2/C3
Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA, I_{imp} : 2.5 kA
Voltages: 5, 12, 15, 24, 30*, 48, 60 V DC
Frequency Range: 30 MHz
Housing: Modular Design
Compliance: IEC/EN 61643-21
UL 497B 4th Edition

Configuration:



Technical Data

SLH-2 Series

5 12 15 24 30* 48 60

Electrical

Lines Protected		1 (2 Conductors)						
Nominal Operating Voltage (DC)	U_n	5V	12V	15V	24V	30V	48V	60V
Maximum Continuous Operating Voltage (DC)	U_c	6V	15V	18V	28V	33V	52V	64V
Rated Load Current at 25°C	I_L	1 A						
C2 Nominal Discharge Current (8/20µs)	I_n	10 kA						
Maximum Discharge Current (8/20µs)	I_{max}	20 kA						
D1 Impulse Current (10/350µs)	I_{imp}	2.5 kA						
Residual Voltage at 5kA (8/20µs)	U_{res}	<22V	<42V	<48V	<70V	<80V	<140V	<160V
Rated Spark Overvoltage	(Line-Ground)	7-10V	16-21V	21-25V	31-37V	36-44V	57-69V	68-84V
	(Line-Line)	7-10V	16-21V	21-25V	31-37V	36-44V	57-69V	68-84V
Response Time Overvoltage Protection	t_A	< 1 ns						
Thermal Protection		Yes						
Insulation Resistance of the Protection	R_{iso}	≥ 6 KΩ	≥ 15 MΩ	≥ 18 MΩ	≥ 28 MΩ	≥ 33 MΩ	≥ 52 MΩ	≥ 64 MΩ
Serial Resistance per Path	R	1.6-2.0 Ω						
Transverse Capacitance	C	50 pF						
Cut-off Frequency	f_G	30 MHz						

Mechanical

Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]							
Terminal Cross Section Multi-strand (max.)	12 AWG [4 mm ² , 2.5 mm ² Q Version]							
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	5	12	15	24	30*	48	60
SLH-2-xxx	7086.33	7086.34	7086.35	7086.36	7082.80	7086.37	7086.38
SLH-2-xxxQ (Quick Connect Terminals)	7085.05	7085.06	7085.07	7085.08	7085.09	7085.10	7085.11
SLH-2-xxxM (module)	7086.40	7086.41	7086.42	7086.43	7082.81	7086.44	7086.45

DATA SHEET

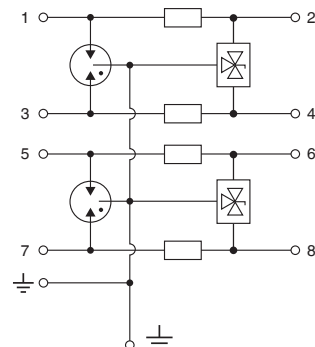
Modular SPD for Two Pair RayDat SLH-4 Series D1 • C1 • C2 • C3

*UL Listed



IEC/EN Category: D1/C1/C2/C3
Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA, I_{imp} : 5 kA
Voltages: 5, 12*, 15, 24*, 30*, 48, 60 V DC
Frequency Range: 30 MHz
Housing: Modular Design
Compliance: IEC/EN 61643-21
UL 497B 4th Edition

Configuration:



Technical Data

SLH-4 Series

5 12* 15 24* 30* 48 60

Electrical

Lines Protected		2 (4 Conductors)						
Nominal Operating Voltage (DC)	U_n	5V	12V	15V	24V	30V	48V	60V
Maximum Continuous Operating Voltage (DC)	U_c	6V	15V	18V	28V	33V	52V	64V
Rated Load Current at 25°C	I_L	1 A						
C2 Nominal Discharge Current (8/20µs)	I_n	10 kA						
Maximum Discharge Current (8/20µs)	I_{max}	20 kA						
D1 Impulse Current (10/350µs)	I_{imp}	5 kA						
Residual Voltage at 5 kA (8/20µs)	U_{res}	<22V	<42V	<48V	<70V	<80V	<140V	<160V
Rated Spark Overvoltage	(Line-Ground)	7-10V	17-21V	21-25V	31-37V	36-44V	57-69V	68-84V
	(Line-Line)	7-10V	17-21V	21-25V	31-37V	36-44V	57-69V	68-84V
Response Time Overvoltage Protection	t_A	< 1 ns						
Thermal Protection		Yes						
Insulation Resistance of the Protection	R_{iso}	≥ 6 KΩ	≥ 15 MΩ	≥ 18 MΩ	≥ 28 MΩ	≥ 33 MΩ	≥ 52 MΩ	≥ 64 MΩ
Serial Resistance per Path	R	1.6-2.0 Ω						
Transverse Capacitance	C	50 pF						
Cut-off Frequency	f_G	30 MHz						

Mechanical

Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]							
Terminal Cross Section Multi-strand (max.)	12 AWG [4 mm², 2.5 mm² Q Version]							
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							

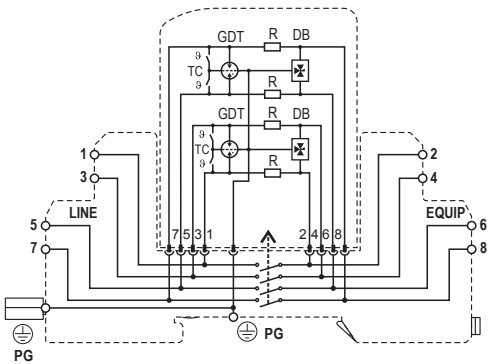
Order Information

Order Code	5	12*	15	24*	30*	48	60
SLH-4-xxx	7086.47	7086.48	7086.49	7086.50	7082.78	7086.51	7086.52
SLH-4-xxxQ (Quick Connect Terminals)	7085.13	7085.14	7085.15	7085.16	7085.17	7085.18	7085.19
SLH-4-xxxM (module)	7086.54	7086.55	7086.56	7086.57	7082.79	7086.58	7086.59

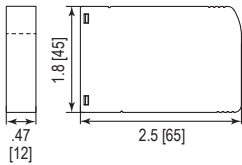
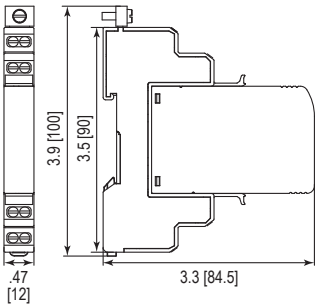
RayDat SLH-4 Series

Internal Configuration

- Legend
- DB Diode Block
 - GDT Gas Discharge Tube
 - PG Protective Grounding
 - R Resistor
 - TC Thermo-clip



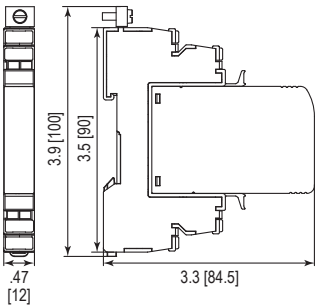
Dimensions & Packaging



SLH-4 Series	5	12	15	24	30	48	60
Dimensions							
Weight per Unit	2.32 oz [66 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						

SLH-4-xxxM Series	5	12	15	24	30	48	60
Dimensions							
Weight per Unit	1.05 oz [30 g]						
Packaging Dimensions (Single Unit)	3.4 x .59 x 4" [87 x 15 x 102 mm]						
Minimum Package Quantity	15 pieces						

Quick Connect Terminals



SLH-4-xxxQ Series	5	12	15	24	30	48	60
Dimensions							
Weight per Unit	2.32 oz [66 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						

inches
[mm]

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DATA SHEET

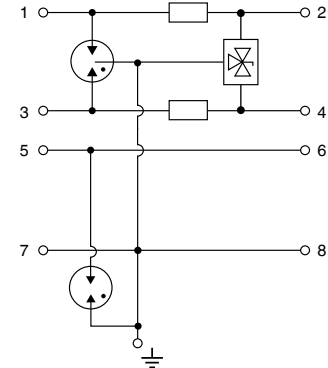
SPD for Shielded Cable RayDat SSH-3 Series D1 • C1 • C2 • C3

*UL Listed



IEC/EN Category: D1/C1/C2/C3
Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA, I_{imp} : 2.5 kA
Voltages: 5*, 12*, 15, 24, 30*, 48, 60 V DC
Frequency Range: 30 MHz
Housing: Modular Design
Compliance: IEC/EN 61643-21
UL 497B 4th Edition

Configuration:



Technical Data

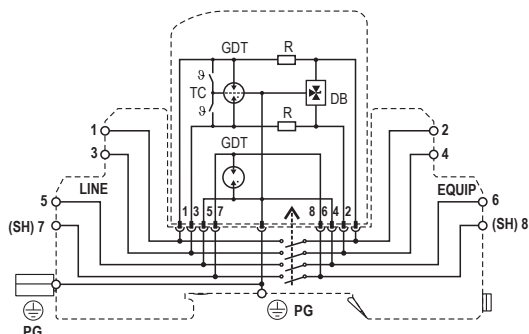
SSH-3 Series		5*	12*	15	24	30*	48	60
Electrical								
Lines Protected		1 (2 Conductors)						
Nominal Operating Voltage (DC)	U _n	5V	12V	15V	24V	30V	48V	60V
Maximum Continuous Operating Voltage (DC)	U _c	6V	15V	18V	28V	33V	52V	64V
Rated Load Current at 25°C	I _L	1 A						
C2 Nominal Discharge Current (8/20 μs)	I _n	10 kA						
Maximum Discharge Current (8/20 μs)	I _{max}	20 kA						
D1 Impulse Current (10/350 μs)	I _{imp}	2.5 kA						
Residual Voltage at 5 kA (8/20 μs)	(Line-Line) U _{res}	<22V	<42V	<48V	<70V	<80V	<140V	<160V
Rated Spark Overvoltage	(Shield-Ground)	184-276V						
	(Line-Line), (Line-Ground)	7-10V	16-21V	20-24V	30-36V	35-43V	55-68V	67-85V
Response Time Overvoltage Protection (Shield-Ground)	t _A	<100 ns						
	(Line-Line), (Line-Ground)	<1 ns						
Insulation Resistance of the Protection (Shield-Ground)	R _{iso}	> 1 GΩ/100V						
	(Line-Line), (Line-Ground)	≥ 6 KΩ	≥ 15 MΩ	≥ 18 MΩ	≥ 28 MΩ	≥ 33 MΩ	≥ 52 MΩ	≥ 64 MΩ
Serial Resistance per Path	R	1.6-2.0 Ω						
Transverse Capacitance (Shield-Ground)	C	5 pF						
	(Line-Line), (Line-Ground)	50 pF						
Cut-off Frequency	f _G	30 MHz						
Mechanical								
Temperature Range				-40 °F to +176 °F [-40 °C to +80 °C]				
Terminal Cross Section Multi-strand (max.)				12 AWG [4 mm², 2.5 mm² Q Version]				
Terminal Screw Torque				4.5 lbf-in [0.5 Nm]				
Degree of Protection IEC/EN 60529				IP20 (built-in)				
Housing Material				Thermoplastic; Grey; Extinguishing Degree V-0				
Mounting IEC/EN 60715				35 mm DIN Rail				
Order Information								
Order Code		5*	12*	15	24	30*	48	60
SSH-3-xxx		7086.01	7086.02	7086.03	7086.04	7086.05	7086.06	7086.07
SSH-3-xxxQ (Quick Connect Terminals)		7086.90	7086.91	7086.92	7086.93	7086.94	7086.95	7086.96
SSH-3-xxxM (module)		7086.09	7086.10	7086.11	7086.12	7086.13	7086.14	7086.15

RayDat SSH-3 Series

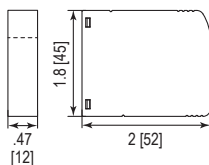
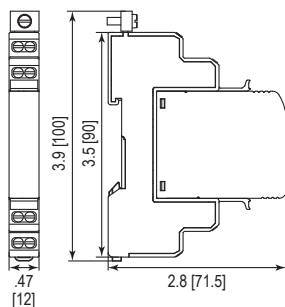
Internal Configuration

Legend

- DB Diode Block
- GDT Gas Discharge Tube
- PG Protective Grounding
- R Resistor
- SH Shielded
- TC Thermo-clip



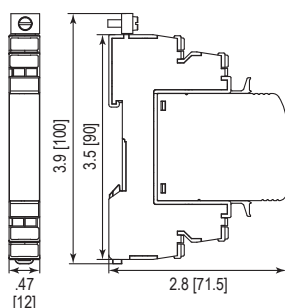
Dimensions & Packaging



SSH-3 Series	5	12	15	24	30	48	60
Dimensions							
Weight per Unit	2.11 oz [60 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						

SSH-3-xxxM Series	5	12	15	24	30	48	60
Dimensions							
Weight per Unit	.91 oz [26 g]						
Packaging Dimensions (Single Unit)	3.4 x .59 x 4" [87 x 15 x 102 mm]						
Minimum Package Quantity	15 pieces						

Quick Connect Terminals



SSH-3-xxxQ Series	5	12	15	24	30	48	60
Dimensions							
Weight per Unit	2.18 oz [62 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						

inches
[mm]

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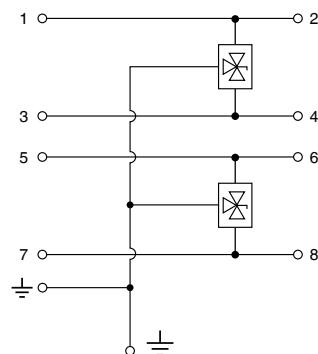
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G29-00-691 201120



IEC/EN Category: C1/C3
 Surge Discharge Ratings: I_n : 250 A
 Voltages: 30 V DC
 Frequency Range: 30 MHz
 Housing: Modular Design
 Compliance: IEC/EN 61643-21
 UL 497B 4th Edition

Configuration:



Technical Data

SLL-4 Series

30

Electrical

Lines Protected		2 (4 Conductors)
Nominal Operating Voltage (DC)	U_n	30 V
Maximum Continuous Operating Voltage (DC)	U_c	33 V
Rated Load Current at 25°C	I_L	10 A
C1 Nominal Discharge Current (8/20 μs)	I_n	250 A
Residual Voltage at 5 kA (8/20 μs)	(Line-Line) U_{res}	< 80 V
Rated Spark Overvoltage	(Line-Line)	36-44 V
	(Line-Ground)	36-44 V
Response Time Overvoltage Protection	(Line-Line) t_A	< 1 ns
	(Line-Ground)	< 1 ns
Insulation Resistance of the Protection	(Line-Line) R_{iso}	≥ 33 MΩ
	(Line-Ground)	≥ 33 MΩ
Serial Resistance per Path	R	0.1 Ω
Transverse Capacitance	(Line-Line) C	50 pF
	(Line-Line)	50 pF
Cut-off Frequency	f_G	30 MHz

Mechanical

Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]
Terminal Cross Section Multi-strand (max.)	12 AWG [4 mm², 2.5 mm² Q Version]
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

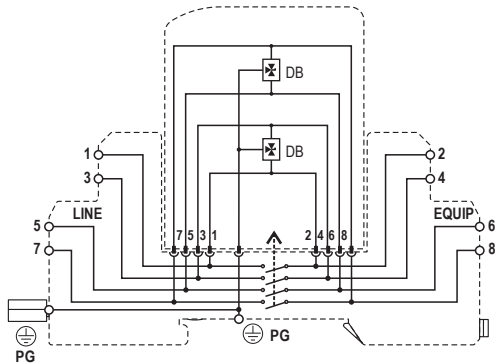
Order Information

Order Code	30
SLL-4-xx	7082.92
SLL-4-xxQ (Quick Connect Terminals)	7085.27
SLL-4-xxM (module)	7082.93

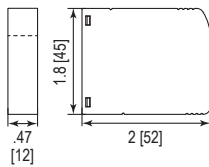
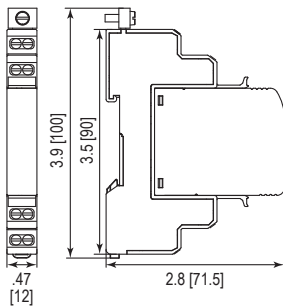
RayDat SLL-4 Series

Internal Configuration

Legend
DB Diode Block
PG Protective Grounding



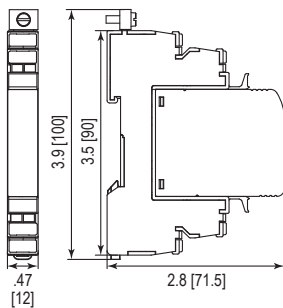
Dimensions & Packaging



SLL-4 Series	30
Dimensions	
Weight per Unit	1.97 oz [56 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

SLL-4-xxM Series	30
Dimensions	
Weight per Unit	.77 oz [22 g]
Packaging Dimensions (Single Unit)	3.4 x .59 x 4" [87 x 15 x 102 mm]
Minimum Package Quantity	15 pieces

Quick Connect Terminals



SLL-4-xxQ Series	30
Dimensions	
Weight per Unit	2.04 oz [58 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

inches
[mm]

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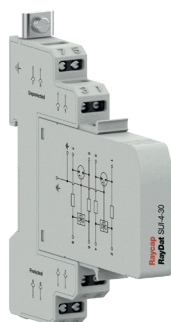
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G29-00-697 201120

DATA SHEET

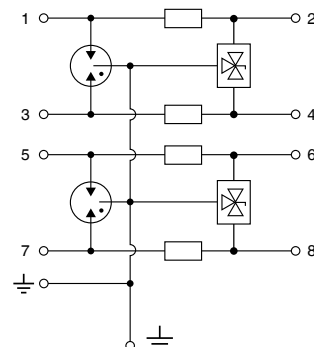
SPD for Two Pair Exposed Lines RayDat SUI-4 Series D1 • C1 • C2 • C3

*UL Listed



IEC/EN Category: D1/C1/C2/C3
Surge Discharge Ratings: I_n : 20 kA, I_{max} : 30 kA, I_{imp} : 5 kA
Voltages: 5, 12, 15, 24, 30*, 48, 60 V DC
Frequency Range: 30 MHz
Housing: Modular Design
Compliance: IEC/EN 61643-21
UL 497B 4th Edition

Configuration:



Technical Data

SUI-4 Series

5 12 15 24 30* 48 60

Electrical

Lines Protected		2 (4 Conductors)						
Nominal Operating Voltage (DC)	U_n	5V	12V	15V	24V	30V	48V	60V
Maximum Continuous Operating Voltage (DC)	U_c	6V	15V	18V	28V	33V	52V	64V
Rated Load Current at 25°C	I_L	1 A						
C2 Nominal Discharge Current (8/20µs)	I_n	20 kA						
Maximum Discharge Current (8/20µs)	I_{max}	30 kA						
D1 Impulse Current (10/350µs)	I_{imp}	5 kA						
Residual Voltage at 5 kA (8/20µs)	U_{res}	<22V	<42V	<48V	<70V	<80V	<140V	<160V
Rated Spark Overvoltage	(Line-Ground)	7-10V	16-21V	21-25V	31-37V	36-44V	57-69V	68-84V
	(Line-Line)	7-10V	16-21V	21-25V	31-37V	36-44V	57-69V	68-84V
Response Time Overvoltage Protection	t_A	< 1 ns						
Thermal Protection		Yes						
Insulation Resistance of the Protection	R_{iso}	≥ 6 KΩ	≥ 15 MΩ	≥ 18 MΩ	≥ 28 MΩ	≥ 33 MΩ	≥ 52 MΩ	≥ 64 MΩ
Serial Resistance per Path	R	1.6-2.0 Ω						
Transverse Capacitance	C	50 pF						
Cut-off Frequency	f_G	30 MHz						

Mechanical

Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]							
Terminal Cross Section Multi-strand (max.)	12 AWG [4 mm²]							
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

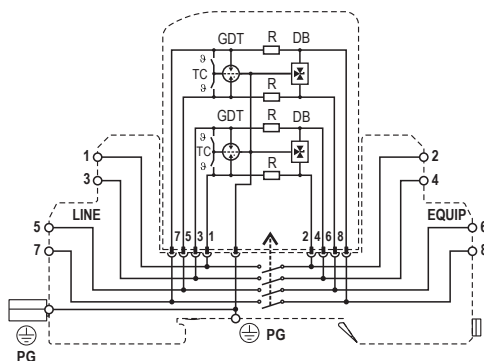
Order Code	5	12	15	24	30*	48	60
SUI-4-xxx	7083.21	7083.22	7083.23	7083.24	7083.25	7083.26	7083.27
SUI-4-xxxM (module)	7083.29	7083.30	7083.31	7083.32	7083.33	7083.34	7083.35

RayDat SUI-4 Series

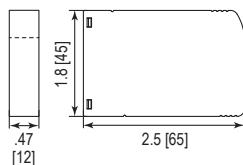
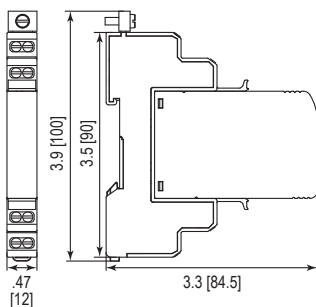
Internal Configuration

Legend

- DB Diode Block
- GDT Gas Discharge Tube
- PG Protective Grounding
- R Resistor
- TC Thermo-clip



Dimensions & Packaging



SUI-4 Series

5 12 15 24 30 48 60

Dimensions

Weight per Unit	2.46 oz [70 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

SUI-4-xxxM Series

5 12 15 24 30 48 60

Dimensions

Weight per Unit	1.05 oz [30 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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G29-00-694 201120

Surge Protective Devices (SPDs) for Explosive Environments



Ex Protection

Special features:

- Very high surge ratings
- High density – up to 4 protected lines
- Version for DIN rail mounting available
- Version in metal (Stainless steel) housing available

RayDat Ex-2
RayDAT PLP Ex
RayDAT PLP2 Ex
RayDAT PLP-24/5 Ex
RayDAT PLP3L Ex



Symbol Legend:



*DIN Rail
Mounting*



*Screw Connect
Terminals*



Compact Design



Modular Design



Wire Connection



*Shield Directly
Grounded*



Ex Certificate

The RayDat Ex Series is intended to provide protection to low voltage signal and data circuits, located in potentially explosive environments.

It is intended for use on inherently safe circuits in accordance with the ATEX directive. The protection module should be located as close as possible to the end-user equipment being protected. The circuit consists of a multi-stage protector providing both, common (longitudinal) mode and differential (transverse) mode protection.

Coarse protection is provided using a three terminal gas discharge tube (GDT), while fine protection is provided using a high-speed bi-directional silicon stage. Care is taken between these two stages to ensure coordination without voltage or surge current blind spots occurring.

RoHS
COMPLIANT



DATA SHEET

SPD for Explosive Environments

RayDat Ex-2 Series

D1 • C1 • C2 • C3



IEC/EN Category: D1/C1/C2/C3
Surge Discharge Ratings: I_n : 5 kA, I_{max} : 10 kA, I_{imp} : 1 kA
Voltages: 12, 24 V DC

Max. Operating Voltage: U_c : 15, 28 VDC

Terminals: Stranded to 4 mm²

Housing: Modular Design

Compliance: IIEC/EN 61643-21

IEC 60079-0:2011

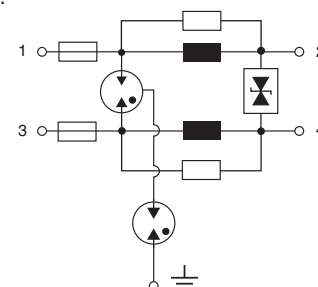
IEC 60079-11:2011

EN 60079-0:2012+A11:2013

EN 60079-11:2012



Configuration:



	Input Power P_i	Temperature Class	Maximum Ambient
$U_o = U_i$	$P_i = 1W$	T6	50 °C
$I_o = I_i$	$P_i = 1.3W$	T5	55 °C
$P_o = P_i$	$P_i = 2W$	T4	60 °C

Technical Data

Ex-2 Series

12

24

Type

Intrinsic Safety Parameters

Explosion Protected

II 1G Ex ia IIC T* Ga (-40 °C ≤ Ta ≤ +°C)

Maximum Input Voltage	U_i	16V	29V
Maximum Input Current	I_i	500mA	
Maximum Input Power	P_i	2W	
Maximum Internal Capacitance	C_i	10nF	
Maximum Internal Inductance	L_i	0.11 mH	
Number of Protected Pairs		1 (2 Conductors)	

Electrical

Nominal Operating Voltage (DC)	U_n	12V	24V
Maximum Continuous Operating Voltage (DC)	U_c	15V	28V
Rated Load Current at 25°C	I_L	500mA	
Nominal Discharge Current (8/20 μs)	I_n	5kA	
Maximum Discharge Current (8/20 μs)	I_{max}	10kA	
D1 Impulse Current (10/350 μs)	I_{imp}	1kA	
Residual Voltage at 5kA (8/20 μs)	U_{res}	< 145V	
Rated Spark Overvoltage (Line-Line)		16-21V	31-37V
(Line-Ground)		584-876V	
Response Time Overvoltage Protection	t_A	< 1 ns	
Insulation Resistance at U_c	R_{iso}	≥ 15 MΩ	≥ 28 MΩ
Insulation Resistance at 500VDC (Line-Ground)		> 1 GΩ	
Serial Resistance per Path	R	< 1 Ω	
Transverse Capacitance	C	< 10 pF	
Cut-off Frequency	f_G	3 MHz	

Mechanical

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
Ex-2-xx	704 120	704 121

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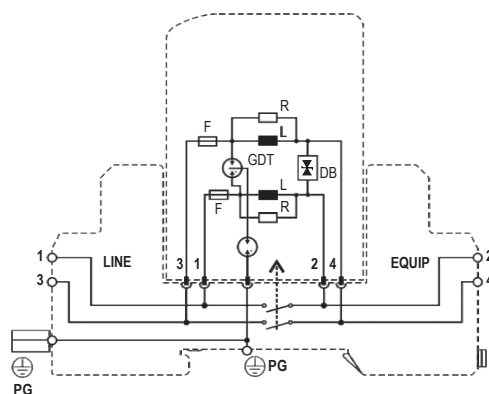
Information contained in this document is subject to change at any time without notice.

RayDat Ex-2 Series

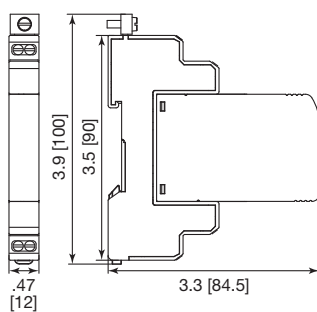
Internal Configuration

Legend

- DB Diode Block
- F Fuse
- GDT Gas Discharge Tube
- L Inductor
- PG Protective Grounding
- R Resistor



Dimensions & Packaging



Ex-2 Series

12

24

Dimensions

Weight per Unit	3.10 oz [88 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

inches
[mm]

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G29-00-037 201120

SPD for Explosive Environments

RayDat PLP Ex Series

D1 • C1 • C2 • C3



IEC/EN Category: D1/C1/C2/C3
 Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA, I_{imp} : 2.0 kA
 Voltages: 24, 48, 24/5V DC
 Max. Operating Voltage: U_c : 33, 54, 33/7.5V DC
 Frequency Range: 30 MHz

Enclosure: Stainless Steel IP54
 Terminals: Connecting Cables 1 mm², 250 mm length
 Housing: Conduit Fitting
 Compliance: IEC/EN 61643-21



IEC 60079-0:2011
 IEC 60079-11:2011
 EN 60079-0:2012+A11:2013
 EN 60079-11:2012



UL 60079-0, 6th Edition
 UL 60079-11, 6th Edition
 CAN/CSA C22.2 No. 60079-0:2015
 CAN/CSA C22.2 No. 60079-11:2014

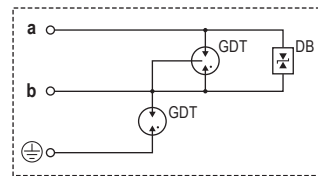
Technical Data

PLPEx		PLP-24Ex	PLP2-24Ex	PLP2-48Ex	PLP-24/5Ex	PLP3L-24Ex
Type						
Intrinsic Safety Parameters						
IECEx BAS 14.0167X		Ex ia IIC T6 Ga (-30°C ≤ 50°C), Ex ia IIIC T85°C Da (-30°C ≤ 50°C)				
Basefa14ATEX0364X		II 1G Ex ia IIC T6 Ga (-30°C ≤ 50°C), II 1D Ex ia IIIC T85°C Da (-30°C ≤ 50°C)				
SGSNA/18/BAS/00003		Class I, Zone 0 AEx ia IIC T6 Ga (-30°C ≤ 50°C), Ex ia IIC T6 Ga (-30°C ≤ 50°C), Zone 20 AEx ia IIIC T85°C Da (-30°C ≤ 50°C), Ex ia IIIC T85°C Da (-30°C ≤ 50°C)				
Maximum Input Voltage	U _i	50V				
Maximum Input Current	I _i	800mA				
Maximum Input Power	P _i	2W				
Maximum Internal Inductance	L _i	60μH				
Electrical						
Nominal Operating Voltage (DC)	U _n	24V	24V	48V	24V/5V	24V
Maximum Continuous Operating Voltage (DC)	U _c	33V	33V	54V	33V/7.5V	33V
Rated Spark Overvoltage	(Line-Ground)	584-864V	584-864V	584-864V	584-864V	584-864V
	(Line-Line)	36-44V	36-44V	58-68V	36-44V, 9-13V	36-44V
Total Nominal Discharge Current (8/20μs)	I _n	5kA	10kA	10kA	10kA	7.5kA
Total Discharge Current (8/20μs)	I _{max}	10kA	20kA	20kA	20kA	15kA
Total Impulse Current (10/350μs)	I _{imp}	1.0kA	2.0kA	2.0kA	2.0kA	1.5kA
Residual Voltage at I _{max} (8/20μs)	(Line-Ground) U _{res}	<1.3kV	<1.3kV	<1.3kV	<1.3kV	<1.3kV
Response Time Overvoltage Protection	t _A	<1ns				
Insulation Resistance of the Protection	(Line-Line) R _{iso}	>32MΩ	>32MΩ	>32MΩ	>32MΩ/75kΩ	>32MΩ
Insulation Resistance at U(Line-Ground)=500VDC	R	>1GΩ				
Transverse Capacitance	C	<30pF				
Cut-off Frequency	f _G	30MHz				
Mechanical						
Ambient Temperature Range			-22 °F < Ta < +140 °F [-30 °C < Ta < +60 °C]			
Connection Cables		D × L	17 AWG × 9.8" [1 mm² × 250 mm]			
Degree of Protection IEC/EN 60529				IP54		
Housing Material				Stainless Steel		
Dimension	Length	3.07" [78 mm]	4.72" [120 mm]	4.72" [120 mm]	4.72" [120 mm]	4.72" [120 mm]
Order Information						
Order Code		PLP-24Ex	PLP2-24Ex	PLP2-48Ex	PLP-24/5Ex	PLP3L-24Ex
1/2" NPT		127 594	127 600	127 597	127 603	127 606
M20 × 1.5		127 595	127 601	127 598	127 604	127 607
G 1/2" (BSP 1/2 inch)		127 596	127 602	127 599	127 605	127 608

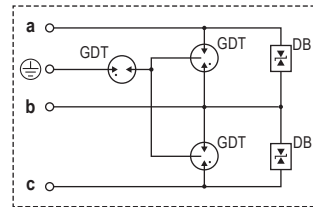
RayDat PLP Ex Series

Internal Configuration

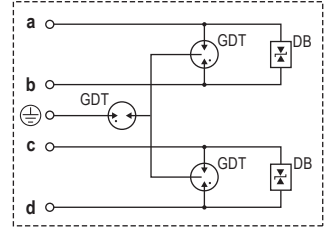
Legend
 DB Diode Block
 GDT Gas Discharge Tube



PLP-24Ex

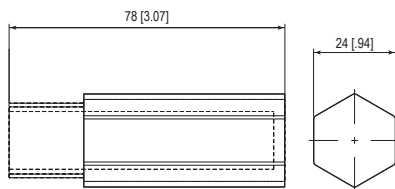


PLP3L-24Ex



PLP2-24Ex
 PLP2-48Ex
 PLP-24/5Ex

Dimensions & Packaging



PLP-24Ex

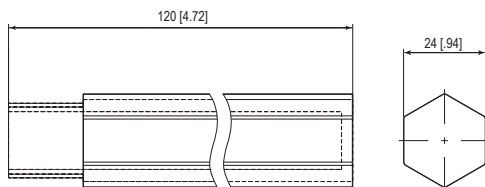
PLP-24 Ex
 1/2" NPT

PLP-24 Ex
 M 20 x 1/2"

PLP-24 Ex
 G 1/2"

Dimensions

Weight per Unit	5.99 oz [170 g]
Packaging Dimensions (Single Unit)	1.34 x 1.34 x 4.25" [34 x 34 x 108 mm]
Minimum Package Quantity	6 pieces



PLP2-xxEx

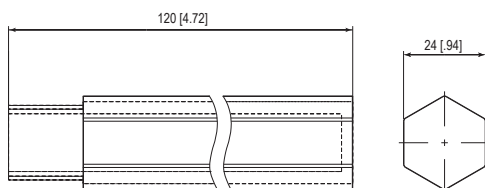
PLP2-xx Ex
 1/2" NPT

PLP2-xx Ex
 M 20 x 1/2"

PLP2-xx Ex
 G 1/2"

Dimensions

Weight per Unit	10.22 oz [290 g]
Packaging Dimensions (Single Unit)	1.34 x 1.34 x 5.43" [34 x 34 x 138 mm]
Minimum Package Quantity	6 pieces



PLP3L-24Ex

PLP3L-24 Ex
 1/2" NPT

PLP3L-24 Ex
 M 20 x 1/2"

PLP3L-24 Ex
 G 1/2"

Dimensions

Weight per Unit	10.22 oz [290 g]
Packaging Dimensions (Single Unit)	1.34 x 1.34 x 5.43" [34 x 34 x 138 mm]
Minimum Package Quantity	6 pieces

inches
 [mm]

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 G29-00-038 201120

Modular Surge Protective Devices (SPDs) for Data & Signal Lines



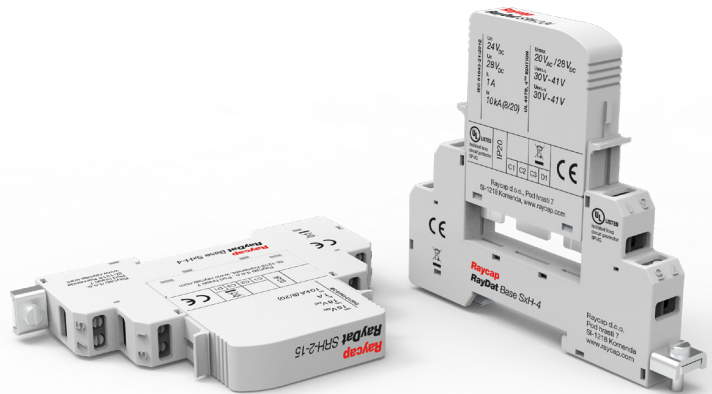
RayDat SRH Series

RayDat SRH-2*
RayDat SRH-2L*

*UL Listed

Special features:

- Very high surge ratings
- The connection lines remain enabled during module replacement
- Version available with potential free contact for fault detection
- Version available with LED visual indication for fault detection



Symbol Legend:



DIN Rail Mounting



Screw Connect Terminals



Quick Connect Terminals



Modular design



Shield Directly Grounded

These efficient overvoltage barriers contain both, coarse and fine protection stages and provide longitudinal and a transverse surge protection.

These products also feature an additional set of voltage free contacts which can be used for remote signalization and monitoring of the device's status. If the unit fails, the contacts change state.

The initial protection stage comprises a three-pole gas discharge tube (GDT) and is designed to divert the primary surge energy. The subsequent fine protection stage is carried out using fast bi-directional silicon avalanche diodes (SAD).

The design of the fine protection stage enables the product to avoid capacitive line loading and ensures a low insertion loss and wide operating frequency range.

Series line impedances ensure energy coordination between the coarse and a fine protection stages at all levels of a surge incident. To protect against the hazards of electric shock and fire, which often results when power frequency contact occurs between power and communication lines, often called mains incursion, a thermo-clip is included on the primary protection stage to divert the power frequency current to ground.

DATA SHEET

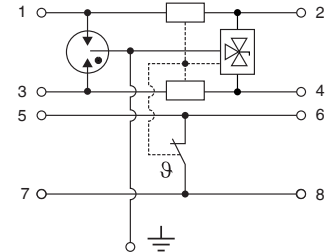
SPD with Remote Contacts RayDat SRH-2 Series D1 • C1 • C2 • C3

*UL Listed



IEC/EN Category: D1/C1/C2/C3
Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA, I_{imp} : 2.5 kA
Voltages: 5*, 12*, 15, 24*, 30*, 48, 60 V DC
Frequency Range: 30 MHz
Housing: Modular Design
Compliance: IEC/EN 61643-21
UL 497B 4th Edition

Configuration:



Technical Data

SRH-2 Series		5*	12*	15	24*	30*	48	60
Electrical								
Lines Protected		1 (2 Conductors)						
Nominal Operating Voltage (DC)	U_n	5V	12V	15V	24V	30V	48V	60V
Maximum Continuous Operating Voltage (DC)	U_c	6V	15V	18V	28V	33V	52V	64V
Rated Load Current at 25°C	I_L	1 A						
C2 Nominal Discharge Current (8/20µs)	I_n	10 kA						
Maximum Discharge Current (8/20µs)	I_{max}	20 kA						
D1 Impulse Current (10/350µs)	I_{imp}	2.5 kA						
Residual Voltage at 5 kA (8/20µs)	U_{res}	<22V	<42V	<48V	<70V	<80V	<140V	<160V
Rated Spark Overvoltage	(Line-Ground)	7-10V	16-21V	21-25V	31-37V	36-44V	57-69V	68-84V
	(Line-Line)	7-10V	16-21V	21-25V	31-37V	36-44V	57-69V	68-84V
Response Time Overvoltage Protection	t_A	< 1 ns						
Thermal Protection		Yes						
Insulation Resistance of the Protection	R_{iso}	≥ 6 KΩ	≥ 15 MΩ	≥ 18 MΩ	≥ 28 MΩ	≥ 33 MΩ	≥ 52 MΩ	≥ 64 MΩ
Serial Resistance per Path	R	1.6-2.0 Ω						
Transverse Capacitance	C	50 pF						
Cut-off Frequency	f_G	30 MHz						

Mechanical

Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]							
Terminal Cross Section Multi-strand (max.)	12 AWG [4 mm ² , 2.5 mm ² Q Version]							
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							
Remote Contacts Ratings	AC 250V/0.5 A, DC 50V/1 A							

Order Information

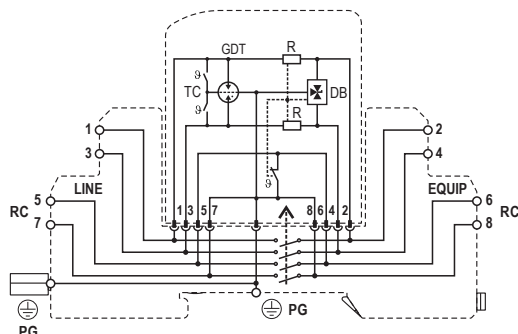
Order Code	5*	12*	15	24*	30*	48	60
SRH-2-xxx	7086.17	7086.18	7086.19	7086.20	7086.21	7086.22	7086.23
SRH-2-xxxQ (Quick Connect Terminals)	7085.33	7085.34	7085.35	7085.36	7085.37	7085.38	7085.39
SRH-2-xxxM (module)	7086.25	7086.26	7086.27	7086.28	7086.29	7086.30	7086.31

RayDat SRH-2 Series

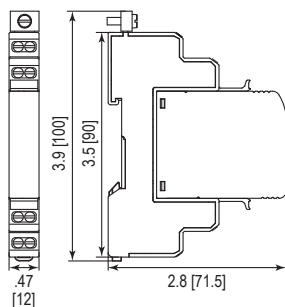
Internal Configuration

Legend

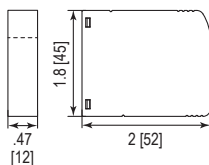
- DB Diode Block
- GDT Gas Discharge Tube
- PG Protective Grounding
- R Resistor
- RC Remote Control (NC)
- TC Thermo-clip



Dimensions & Packaging

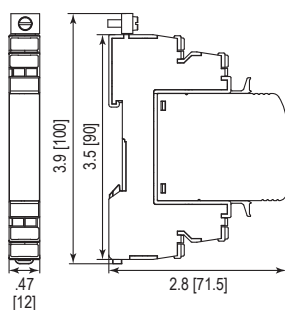


SRH-2 Series	5	12	15	24	30	48	60
Dimensions							
Weight per Unit	2.04 oz [58 g]						
Dimensions DIN 43880	2/3 TE						
Packaging Dimensions (Single Unit)	3.4 x .59 x 4" [87 x 15 x 102 mm]						
Minimum Package Quantity	15 pieces						



SRH-2-xxxM Series	5	12	15	24	30	48	60
Dimensions							
Weight per Unit	.84 oz [24 g]						
Packaging Dimensions (Single Unit)	3.4 x .59 x 4" [87 x 15 x 102 mm]						
Minimum Package Quantity	15 pieces						

Quick Connect Terminals



SRH-2-xxxQ Series	5	12	15	24	30	48	60
Dimensions							
Weight per Unit	2.11 oz [60 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						

inches
[mm]

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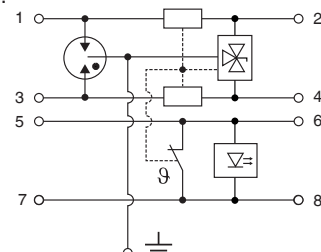
Raycap

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G29-00-692 201120



IEC/EN Category: D1/C1/C2/C3
 Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA, I_{imp} : 2.5 kA
 Voltages: 5, 12, 24, 30 V DC
 Frequency Range: 30 MHz
 Housing: Modular Design
 Compliance: IEC/EN 61643-21
 UL 497B 4th Edition

Configuration:

Technical Data
SRH-2L Series
Electrical

		5	12	24	30
Lines Protected		1 (2 Conductors)			
Nominal Operating Voltage (DC)	U_n	5V	12V	24V	30V
Maximum Continuous Operating Voltage (DC)	U_c	6V	15V	28V	33V
Rated Load Current at 25°C	I_L	1 A			
C2 Nominal Discharge Current (8/20µs)	I_n	10 kA			
Maximum Discharge Current (8/20µs)	I_{max}	20 kA			
D1 Impulse Current (10/350µs)	I_{imp}	2.5 kA			
Residual Voltage at 5kA (8/20µs)	U_{res}	< 22V	< 42V	< 70V	< 80V
Rated Spark Overvoltage	(Line-Ground)	7-10V	16-21V	31-37V	36-44V
	(Line-Line)	7-10V	16-21V	31-37V	36-44V
Response Time Overvoltage Protection	t_A	< 1 ns			
Thermal Protection		Yes			
Insulation Resistance of the Protection	R_{iso}	≥ 6 KΩ	≥ 15 MΩ	≥ 28 MΩ	≥ 33 MΩ
Serial Resistance per Path	R	1.6-2.0 Ω			
Transverse Capacitance	C	50 pF			
Cut-off Frequency	f_G	30 MHz			

Mechanical

Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]				
Terminal Cross Section Multi-strand (max.)	12 AWG [4 mm²]				
Terminal Screw Torque	4.42 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				
Remote Contacts Ratings	AC 250V/0.5 A, DC 50V/1 A				

Order Information

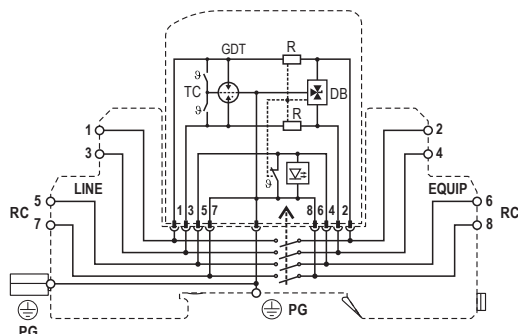
Order Code	5	12	24	30
SRH-2-xxxL	7085.44	7085.46	7085.48	7085.42
SRH-2-xxxLM (module)	7085.45	7085.47	7085.49	7085.43
SRH-2-xxxLQ	7085.56	7085.58	7085.60	7085.62

RayDat SRH-2L Series

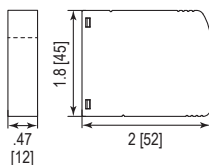
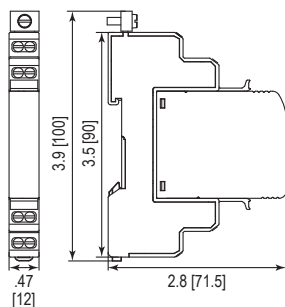
Internal Configuration

Legend

- DB Diode Block
- GDT Gas Discharge Tube
- PG Protective Grounding
- R Resistor
- RC Remote Control (NC)
- TC Thermo-clip



Dimensions & Packaging



SRH-2L Series 5 12 24 30

Dimensions

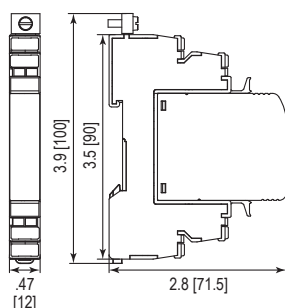
Weight per Unit	2.04 oz [58 g]
Dimensions DIN 43880	2/3 TE
Packaging Dimensions (Single Unit)	3.4 x .59 x 4" [87 x 15 x 102 mm]
Minimum Package Quantity	15 pieces

SRH-2-xxxLM Series 5 12 24 30

Dimensions

Weight per Unit	.85 oz [24 g]
Packaging Dimensions (Single Unit)	3.4 x .59 x 4" [87 x 15 x 102 mm]
Minimum Package Quantity	15 pieces

Quick Connect Terminals



SRH-2LQ Series 5 12 24 30

Dimensions

Weight per Unit	2.11 oz [60 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

inches
[mm]

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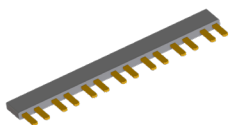
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G29-00-693 201120

DATA SHEET

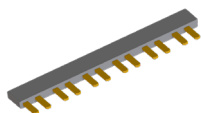
SPD with Visual Indication

RayDat SRH-2L Accessories**D1 • C1 • C2 • C3****RayDat PSU-14****RayDat PSU-14****127 621****Electrical**

Input Voltage	U_{out}	21.5V DC ... 28V DC
Output Voltage		max. 28V DC
Output Current	I_{out}	2x2mA
Input Terminals		3 (+), 1 (-)

RayDat PSU-PB-7P**RayDat PSU-PB-7P****127 622****Electrical**

Number of Poles	7
-----------------	---

RayDat PSU-PB-6P**RayDat PSU-PB-6P****127 623****Electrical**

Number of Poles	6
-----------------	---

Modular Surge Protective Devices (SPDs) for Data & Signal Lines



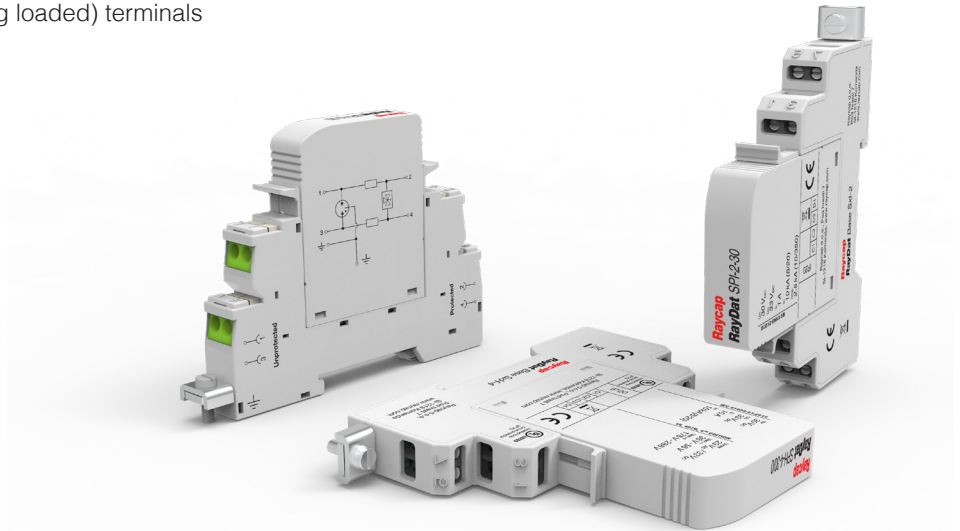
RayDat SP Series

Special features:

- Very high surge ratings
- The connection lines remain enabled during module replacement
- High density – up to 2 protected pairs at only 12mm width
- Equipped with Screw or Quick connect (spring loaded) terminals

RayDat SPH-2*
RayDat SPH-4*
RayDat SPI-2
RayDat SPI-4

*UL Listed



Symbol Legend:



DIN Rail Mounting



Screw Connect Terminals



Quick Connect Terminals



Modular design



Shield Directly Grounded

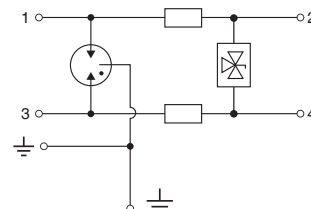
The RayDat SP Series of surge protective devices has been developed to protect a pair loop, which could be ungrounded onto data, signal and communication circuits. It is intended for those applications where high ground potential rises may frequently occur, such as in locations close to electric railways. The circuit topology consists of a multi-stage protector providing both, common (longitudinal) mode and differential (transverse) mode protection. Coarse protection is provided by a three terminal gas discharge tube (GDT), while fine protection is provided using a high-speed silicon avalanche diode (SAD) or metal oxide varistor (MOV) stage.

Care is taken between these two stages to ensure coordination without voltage or surge current blind spots occurring. Thermal protection reduces the hazards of thermal runaway, should there be an inadvertent mains incursion fault. Both common (longitudinal) mode and differential (transverse) mode protection is provided. If the module is unplugged from the base, the connection lines remain enabled.



IEC/EN Category: D1/C1/C2/C3
 Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA, I_{imp} : 2.5 kA
 Voltages: 30 V DC
 Frequency Range: 30 MHz, 10 MHz
 Housing: Modular Design
 Compliance: IEC/EN 61643-21
 UL 497B 4th Edition

Configuration:

**Technical Data****SPH-2 Series****30****Electrical**

Lines Protected		1 (2 Conductors)
Nominal Operating Voltage (DC)	U_n	30 V
Maximum Continuous Operating Voltage (DC)	U_c	33 V
Rated Load Current at 25°C	I_L	1 A
C2 Nominal Discharge Current (8/20 μs)	I_n	10 kA
Maximum Discharge Current (8/20 μs)	I_{max}	20 kA
D1 Impulse Current (10/350 μs)	I_{imp}	2.5 kA
Residual Voltage at 5 kA (8/20 μs)	(Line-Line) U_{res}	< 80 V
Rated Spark Overvoltage	(Line-Ground)	184-276 V
	(Line-Line)	36-44 V
Response Time Overvoltage Protection	(Line-Line) t_A	< 1 ns
	(Line-Ground)	< 100 ns
Insulation Resistance of the Protection	(Line-Ground) R_{iso}	> 1 GΩ/100 V
	(Line-Line)	≥ 33 MΩ
Serial Resistance per Path	R	1.6-2.0 Ω
Transverse Capacitance	(Line-Line) C	50 pF
	(Line-Ground)	5 pF
Cut-off Frequency	f_G	30 MHz

Mechanical

Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]
Terminal Cross Section Multi-strand (max.)	12 AWG
	4 mm ² , 2.5 mm ² Q Version
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

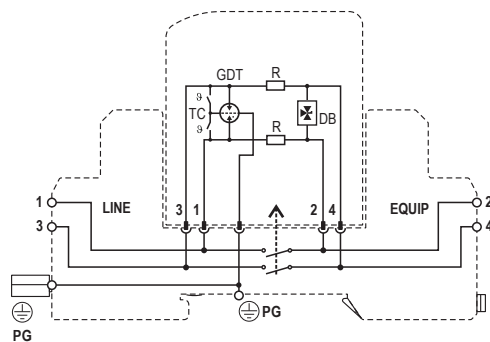
Order Code	30
SPH-2-xxx	7082.84
SPH-2-xxxQ (Quick Connect Terminals)	7085.25
SPH-2-xxxM (module)	7082.85

RayDat SPH-2 Series

Internal Configuration

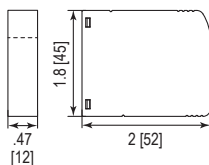
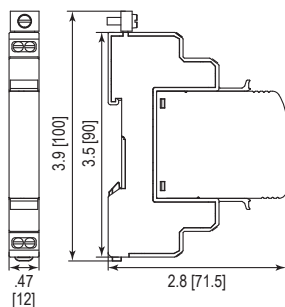
Legend

- DB Diode Block
- GDT Gas Discharge Tube
- PG Protective Grounding
- R Resistor
- TC Thermo-clip



SPH-2-30

Dimensions & Packaging



SPH-2 Series

30

Dimensions

Weight per Unit	1.83 oz [52 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

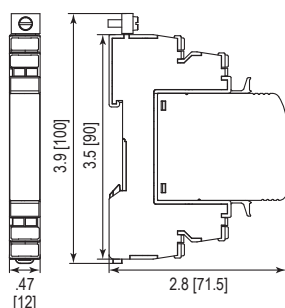
SPH-2-xxxM Series

30

Dimensions

Weight per Unit	.84 oz [24 g]
Packaging Dimensions (Single Unit)	3.4 x .59 x 4" [87 x 15 x 102 mm]
Minimum Package Quantity	15 pieces

Quick Connect Terminals



SPH-2-xxxQ Series

30

Dimensions

Weight per Unit	1.9 oz [54 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

inches
[mm]

Information contained in this document is subject to change at any time without notice.



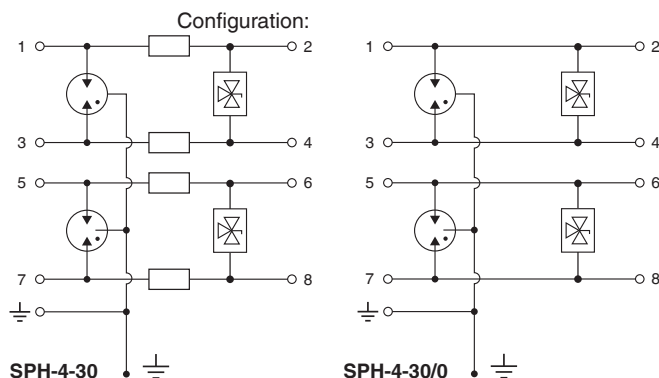
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IEC/EN Category: D1/C1/C2/C3
 Surge Discharge Ratings: I_n : 10 kA, I_{max} : 20 kA, I_{imp} : 5 kA
 Voltages: 30 V DC
 Frequency Range: 30 MHz
 Housing: Modular Design
 Compliance: IEC/EN 61643-21
 UL 497B 4th Edition



Technical Data

SPH-4 Series

Electrical

Lines Protected	2 (4 Conductors)		
Nominal Operating Voltage (DC)	U_n	30 V	
Maximum Continuous Operating Voltage (DC)	U_c	33 V	
Rated Load Current at 25°C	I_L	1 A	10 A
C2 Nominal Discharge Current (8/20 μ s)	I_n	10 kA	
Maximum Discharge Current (8/20 μ s)	I_{max}	20 kA	
D1 Impulse Current (10/350 μ s)	I_{imp}	5 kA	
Residual Voltage at 5 kA (8/20 μ s)	(Line-Line) U_{res}	< 80 V	
Rated Spark Overvoltage	(Line-Ground)	184-276 V	
	(Line-Line)	36-44 V	
Response Time Overvoltage Protection	(Line-Line) t_A	< 1 ns	
	(Line-Ground)	< 100 ns	
Insulation Resistance of the Protection	(Line-Ground) R_{iso}	> 1 G Ω /100 V	
	(Line-Line)	≥ 33 M Ω	
Serial Resistance per Path	R	1.6-2.0 Ω	0.1 Ω
Transverse Capacitance	(Line-Line) C	50 pF	
	(Line-Ground)	5 pF	
Cut-off Frequency	f_G	30 MHz	

Mechanical

Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]		
Terminal Cross Section Multi-strand (max.)	12 AWG		
	4 mm ² , 2.5 mm ² Q Version		
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

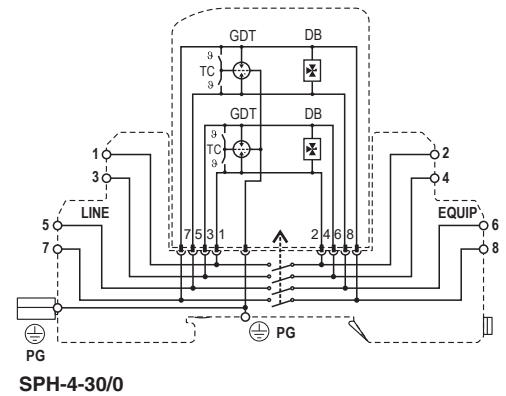
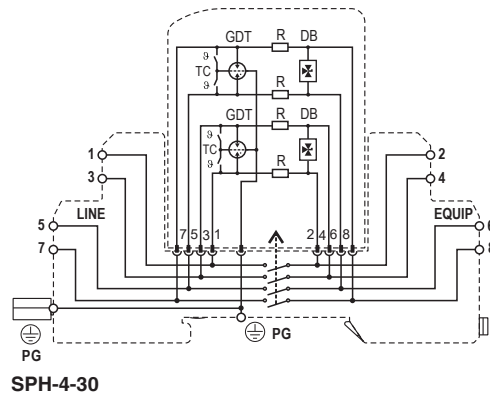
Order Code	30	30/0
SPH-4-xx	7082.82	7086.89
SPH-4-xxQ (Quick Connect Terminals)	7085.24	7085.28
SPH-4-xxM (module)	7082.83	7085.29

RayDat SPH-4 Series

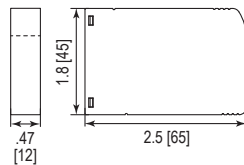
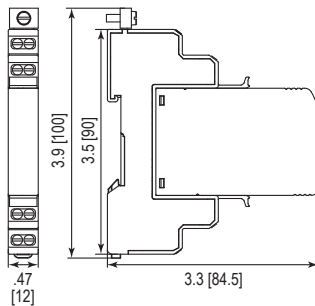
Internal Configuration

Legend

- DB Diode Block
- GDT Gas Discharge Tube
- PG Protective Grounding
- R Resistor
- TC Thermo-clip



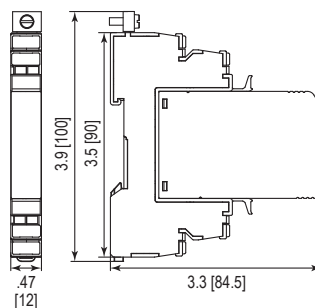
Dimensions & Packaging



SPH-4 Series	30	30/0
Dimensions		
Weight per Unit	2.32 oz [66 g]	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	

SPH-4-xxM Series	30	30/0
Dimensions		
Weight per Unit	1.05 oz [30 g]	.99 oz [28 g]
Packaging Dimensions (Single Unit)	3.4 x .59 x 4" [87 x 15 x 102 mm]	
Minimum Package Quantity	15 pieces	

Quick Connect Terminals



SPH-4-xxQ Series	30	30/0
Dimensions		
Weight per Unit	2.40 oz [68 g]	2.32 oz [66 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	

inches
[mm]

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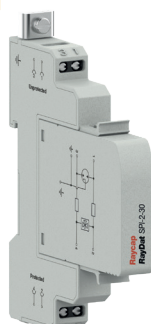
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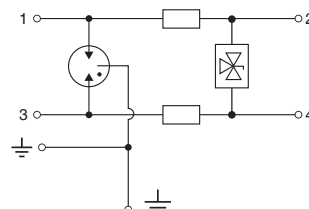
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DATA SHEET

Modular SPD for Two Pair RayDat SPI-2 Series D1 • C1 • C2 • C3



IEC/EN Category: D1/C1/C2/C3
Surge Discharge Ratings: I_n : 10kA, I_{max} : 20kA, I_{imp} : 2.5kA
Voltages: 30 V DC
Frequency Range: 30MHz, 10MHz
Housing: Modular Design
Compliance: IEC/EN 61643-21
Configuration:



Technical Data

SPI-2 Series

30

Electrical

Lines Protected		1 (2 Conductors)
Nominal Operating Voltage (DC)	U_n	30V
Maximum Continuous Operating Voltage (DC)	U_c	33V
Rated Load Current at 25°C	I_L	1 A
C2 Nominal Discharge Current (8/20µs)	I_n	10kA
Maximum Discharge Current (8/20µs)	I_{max}	20kA
D1 Impulse Current (10/350µs)	I_{imp}	2.5kA
Total Impulse Current (10/350µs)	I_{imp}	5kA
Residual Voltage at 5kA (8/20µs)	(Line-Line) U_{res}	<80V
Rated Spark Overvoltage	(Line-Ground)	184-276V
	(Line-Line)	36-44V
Response Time Overvoltage Protection	(Line-Line) t_A	<1 ns
	(Line-Ground)	<100ns
Insulation Resistance of the Protection	(Line-Ground) R_{iso}	> 1 GΩ/100V
	(Line-Line)	≥ 33 MΩ
Serial Resistance per Path	R	1.6-2.0Ω
Transverse Capacitance	(Line-Line) C	50pF
	(Line-Ground)	5pF
Cut-off Frequency	f_G	30MHz

Mechanical

Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]
Terminal Cross Section Multi-strand (max.)	12 AWG
	4 mm ² , 2.5 mm ² Q Version
Terminal Screw Torque	4.5 lbf-in [0.5Nm]
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

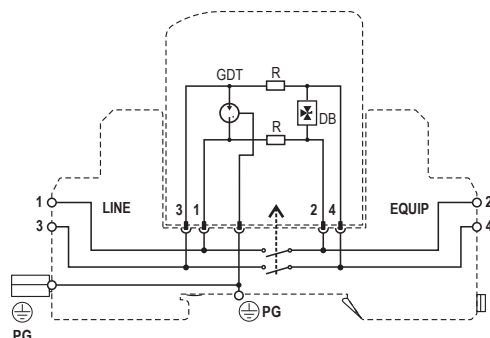
Order Information

Order Code	30
SPI-2-xxx	7085.67
SPI-2-xxxM (module)	7085.68

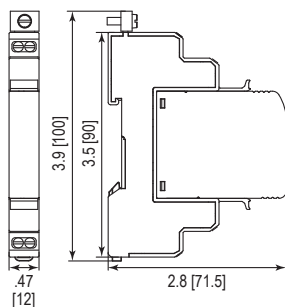
RayDat SPI-2 Series

Legend

DB Diode Block
GDT Gas Discharge Tube
PG Protective Grounding
R Resistor



Dimensions & Packaging

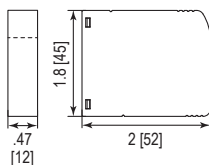


SPI-2 Series

30

Dimensions

Weight per Unit	1.90 oz [54 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



SPI-2-xxxM Series

30

Dimensions

Weight per Unit	.84 oz [24 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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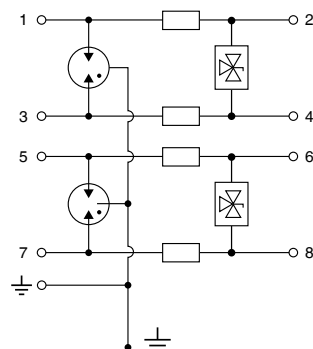
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DATA SHEET

Modular SPD for Two Pair RayDat SPI-4 Series D1 • C1 • C2 • C3



IEC/EN Category: D1/C1/C2/C3
Surge Discharge Ratings: I_n : 10kA, I_{max} : 20kA, I_{imp} : 2.5kA
Voltages: 30 V DC
Frequency Range: 30 MHz, 10 MHz
Housing: Modular Design
Compliance: IEC/EN 61643-21
Configuration:



Technical Data

SPI-4 Series

30

Electrical

Lines Protected		2 (4 Conductors)
Nominal Operating Voltage (DC)	U_n	30V
Maximum Continuous Operating Voltage (DC)	U_c	33V
Rated Load Current at 25°C	I_L	1 A
C2 Nominal Discharge Current (8/20µs)	I_n	10 kA
Maximum Discharge Current (8/20µs)	I_{max}	20 kA
D1 Impulse Current (10/350µs)	I_{imp}	2.5 kA
Total Impulse Current (10/350µs)	I_{imp}	10 kA
Residual Voltage at 5kA (8/20µs)	(Line-Line) U_{res}	< 80V
Rated Spark Overvoltage	(Line-Ground)	184-276V
	(Line-Line)	36-44V
Response Time Overvoltage Protection	(Line-Line) t_A	< 1 ns
	(Line-Ground)	< 100ns
Insulation Resistance of the Protection	(Line-Ground) R_{iso}	> 1 GΩ/100V
	(Line-Line)	≥ 33 MΩ
Serial Resistance per Path	R	1.6-2.0Ω
Transverse Capacitance	(Line-Line) C	50pF
	(Line-Ground)	5pF
Cut-off Frequency	f_G	30 MHz

Mechanical

Temperature Range	-40 °F to +176 °F [-40 °C to +80 °C]
Terminal Cross Section Multi-strand (max.)	12 AWG
	4 mm², 2.5 mm² Q Version
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

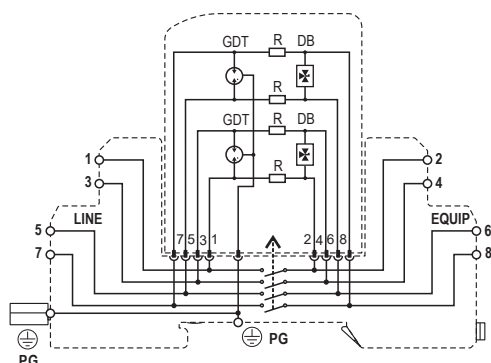
Order Information

Order Code	30
SPI-4-xxx	7085.69
SPI-4-xxxM (module)	7085.70

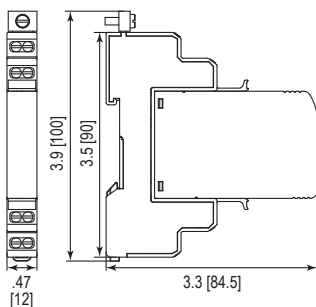
RayDat SPI-4 Series

Legend

DB Diode Block
GDT Gas Discharge Tube
PG Protective Grounding
R Resistor



Dimensions & Packaging

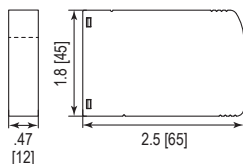


SPI-4 Series

30

Dimensions

Weight per Unit	2.40 oz [68 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



SPI-4-xxM Series

30

Dimensions

Weight per Unit	1.05 oz [30 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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