# COOPER Bussmann

# Surge Protection Made Simple<sup>™</sup> for Twisted Pair Data Cables UL Listed 497B DIN-Rail Mount Universal Surge Protective Device for Measuring and Control Circuits, and Bus Systems

#### Description

The Cooper Bussmann universal four-pole, DIN-Rail mounted surge arresters provide effective protection with minimum space requirements and are designed for stringent requirements on the availability of measuring and control circuits, and bus systems.

To ensure safe operation, the arresters provide protection against vibration and shock up to a 30-fold acceleration of gravity. The function-optimized design of the devices allows quick and easy removal of protection modules via "make-before-break" terminals that assure continuity of data signals in the protected and unprotected state.

For IEC Applications - Instruction for Surge Protective Device Use In Zone 2 Explosive Atmospheres per ATEX.

- 1. When installed in potentially explosive atmospheres, the Data Signal DIN Series shall be installed into an enclosure which meets the requirements of a recognized type of protection, in accordance with EN 60079-0.
- 2. The Data Signal DIN Series as transient suppressor. This approval applies to the following equipment types:
  - BSPD5DING BSPD12DING
- BSPD24DING
- BSPD48DING BSPD5DINLHF
- BSPD24DINLHF
- Ambient and Temperature Class
  - -40°C to +80°C. T4:
  - DEKRA 12ATEX0254 X: II 3 G Ex nA IIC T4 Gc · Standards used for:
  - ATEX: EN60079-0: 2009, EN 60079-15: 2005
- UL 497B Listed
- Function-optimized design for safe use and easy installation
- · Four-pole and base mounts on grounded 35mm DIN-Rail
- Module removal without signal interruption via "make-beforebreak" circuitry
- 0-180V BSPD0180DINL automatically adjusts to system operating voltage and can protect data circuits of different voltages up to 100mA load current.

#### **Dimensions-mm**



#### www.cooperbussmann.com/Surge



BSPD5DING **BSPD12DING** BSPD24DING **BSPD48DING BSPD5DINLHF BSPD24DINLHF** BSPD0180DINL



# Four-Pole DIN-Rail Mount Universal **SPD for Data Signal Applications**

#### **Circuit Diagrams**





#### **BSPD5DING BSPD12DING BSPD24DING BSPD48DING**



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### **BSPD0180DINL**





TECHNICAL DATA											
Catalog number — Prefix: BSPD	5DING	12DING	24DING	48DING	5DINLHF	24DINLHF	0180DINL				
Nominal voltage (U <sub>N</sub> )	5V	12V	24V	48V	5V	24V	0-180V				
Nominal current at 45°C (IL)	1.0A	0.75A	0.75A	0.75A	1.0A	1.0A	≤0.1A@80°C				
VPL line-line for l <sub>imp</sub> D1 (Up)	≤29V	≤50V	≤102V	≤160V	≤25V	≤65V	$\leq U_N + 53V$				
VPL line-PG for l <sub>imp</sub> D1 (Up)	≤27V	≤37V	≤66V	≤95V	≤550V	≤550V	-				
VPL line-line at 1kV/µs C3 (Up)	≤18V	≤38V	≤90V	≤140V	≤11V	≤47V	see Note 1				
VPL line-PG at 1kV/µs C3 (Up)	≤9V	≤19V	≤45V	≤70V	≤550V	≤550V	-				
VPL line-line for I <sub>N</sub> C2 (U <sub>p</sub> )	-	-	-	-	-	-	see Note 2				
VPL line-PG for C2 / C3 / D1	-	-	-	-	-	-	$\leq$ 550V				
D1 Total lightning impulse current (10/350µs) (limp)	10kA	10kA	10kA	10kA	10kA	10kA	10kA				
D1 Lightning impulse current (10/350µs) per line (limp)	2.5kA	2.5kA	2.5kA	2.5kA	2.5kA	2.5kA	2.5kA				
C2 Total nominal discharge current (8/20µs) (In)	20kA	20kA	20kA	20kA	20kA	20kA	20kA				
C2 Nominal discharge current (8/20µs) per line (In)	10kA	10kA	10kA	10kA	10kA	10kA	10kA				
Series impedance per line	1.0Ω	1.8Ω	1.8Ω	1.8Ω	1.0Ω	1.0Ω	10Ω/7.5Ω typ				
Frequency of the operating voltage (fU <sub>N</sub> )	-	-	-	-	-	-	0-400Hz				
Max. continuous operating DC voltage (U <sub>C</sub> )	6V	15V	33V	54V	6V	33V	180V				
Max. continuous operating AC voltage (U <sub>C</sub> )	4.2V	10.6V	23.3V	38.1V	4.2V	23.3V	127V				
Permissible superimposed signal voltage (U <sub>signal</sub> )							± 5V				
"Nominal current at 80°C (IL)	_	_	_	_	_	_	100mA				
(corresponds to max. short-circuit current)"											
Cut-off frequency line-PG (f <sub>G</sub> )	1.0MHz	2.7MHz	6.8MHz	8.7MHz	100MHz	100MHz	-				
Cut-off frequency line-line (U <sub>Signal</sub> , balanced 100 $\Omega$ ) (f <sub>G</sub> )	-	-	-	-	-	-	50MHz				
Capacitance line-line (C)	<u>≤</u> 2.7nF		_≤0.5nF	_≤0.35nF							
Capacitance line-PG (C)			≤1.0nF		≤16pF	5	516pF				
ATEX Approvals	†	†	†	+	+	+	—				
Agency information		++	++	++	++	++	‡				
IEC 61643-21 Test category	D1, C2, C3										
Operating temperature range	-40°C to +80°C										
Degree of protection	IP20										
For mounting on	35mm DIN-Rails per EN 60715										
Grounding	Via base part										
Color / enclosure material	Grey / Polyamide PA 6.6										
Test standards	IEC 61643-21 / EN 61643-21, UL 497B										
Connection (input / output)	Screw terminal										
Conductors Solid	12-28AWG (4-0.08mm²)										
Flexible	14-28AWG (2.5-0.08mm²)										
Terminal torque	3.5 Lb-In (0.4 N•m)										
Warranty	5 Years*										

\* See Cooper Bussmann SPD Limited Warranty Statement (3A1502) for details at www.cooperbussmann.com/surge.

#### 0-180V SPD Application and Mode of Operation

# The BSPD0180DINL surge protective device automatically adjusts to the operating voltage (from 0 to 180 volts) of the protected device.

When an overvoltage event occurs, the SPD voltage protection level adjusts itself based upon the output terminal operating voltage of the base.

Note 1 - See Diagram 1 - VPL line-line graph line C3. Note 2 - See Diagram 1 - VPL line-line graph line C2.

#### † DEKRA 12ATEX0254 X: II 3 G Ex nA IIC T4 Gc

†† ATEX, UL, CSA

‡ UL 497B

#### Diagram 1: Voltage Protection Level Up (V) (Line - Line)







#### **DIN-Rail Universal 4 Wire Data Signal SPDs and Applications**

Universal 4 wire data signal SPD products are specified by communication technology. The table below contains the specific SPD product, by part number, and the applications to which they are suited to be used.



Bus Systems and Measuring, and Control Technology     X <th< th=""><th>Part Numbers</th><th>BSPD5DING</th><th>BSPD12DING</th><th>BSPD24DING</th><th>BSPD48DING</th><th>BSPD5DINLHF</th><th>BSPD24DINLHF</th><th>BSPD0180DINL</th></th<>	Part Numbers	BSPD5DING	BSPD12DING	BSPD24DING	BSPD48DING	BSPD5DINLHF	BSPD24DINLHF	BSPD0180DINL
0-20 mA, 4-20 mA Signals     X <td></td> <td>[</td> <td>BUS SYSTEMS AND</td> <td>MEASURING, AND</td> <td>CONTROL TECHNOL</td> <td>OGY</td> <td></td> <td></td>		[	BUS SYSTEMS AND	MEASURING, AND	CONTROL TECHNOL	OGY		
Binary Signals     X	0-20 mA, 4-20 mA Signals			X			X (4-20mA only)	Х
CAN-Bus (data line only)     N     N     N     N     X     X     X       C-Bus (Honeywell)      X     X     X     X     X       Data Highway Plus      X     X     X     X       Device Net (data line only)      X     X     X     X       Dupline      X     X     X     X       Fieldbus Foundation      X     X     X       Fieldbus Foundation      X     X     X       FSK      X     X     X       FBIC/D / FIPWAY      X     X     X       FSK      X     X     X     X       Iterbus INLINE, (/O)      X     X     X     X       LON - TP/XF 78      X     X     X     X       LUXMATE Bus      X     X     X     X       Procontic CS31 (RS232)     X     X     X     X       PROFIBU	Binary Signals	Х	Х	X	Х			
C-Bus (Honeywell)     X     X     X       Data Highway Plus      X     X       Device Net (data line only)      X     X       Dupline      X     X       E-Bus (Honeywell)      X     X       Fieldbus Foundation      X     X       Fieldbus Foundation      X     X       Fieldbus Foundation      X     X       Fisk      X     X       FSK      X     X       Interbus INLINE (I/O)      X     X       Interbus INLINE, Long-distance bus     X     X     X       K Bus      X     X     X       LON - TP/XF 78      X     X     X       LUXMATE Bus      X     X     X       MDDBUS      X     X     X       Procontic C301 (RS422)     X     X     X       PROFIBUS DP/FMS      X     X     X <	CAN-Bus (data line only)					Х		Х
Data Highway Plus     X     X       Device Net (data line only)     X     X       Dupline     X     X       E-Bus (Honeywell)     X     X       Fieldbus Foundation     X     X       Iter-Bus (RS485)     X     X       Interbus INLINE (I/O)     X     X       Interbus INLINE, LINE, Long-distance bus     X     X       LON - TP/XF 78     X     X       LUXMATE Bus     X     X       MobBUS     X     X       MPI Bus     X     X       Procontic CS31 (RS232)     X     X	C-Bus (Honeywell)					Х		Х
Device Net (data line only)     X     X     X       Dupline      X     X       E-Bus (Honeywell)      X     X       Fieldbus Foundation     X     X     X       Fieldbus Foundation     X     X     X       Fisk     X     X     X       FIPIO / FIPWAY     X     X     X       FSK     X     X     X       FSK     X     X     X       Interbus INLINE (I/O)     X     X     X       Interbus INLINE,     X     X     X       Long-distance bus     X     X     X       K Bus     X     X     X       LON - TP/XF 78     X     X     X       LUXMATE Bus     X     X     X       MODBUS     X     X     X       MPI Bus     X     X     X       Procontic CS31 (RS232)     X     X     X       PROFIBUS DP/FMS     X     X     X	Data Highway Plus							X
Dupline     N     N     N       Fieldbus Foundation     X     X     X       FSK     X     X     X       FSK     X     X     X       Interbus INLINE (I/O)     X     X     X       Interbus INLINE, Long-distance bus     X     X     X       K Bus     X     X     X     X       LON - TP/XF 78     X     X     X     X       LUXMATE Bus     X     X     X     X       MODBUS     X     X     X     X       MPI Bus     X     X     X     X       Procontic CS31 (RS232)     X     X     X     X       PROFIBUS DP/FMS     X     X     X     X       PROFIBUS SIMATIC NET     X	Device Net (data line only)					Х		X
B-Bus     A     X       Fieldbus Foundation     X     X       FIPIO / FIPWAY     X     X       FSK     X     X       FISK     X     X       Iterbus (RS485)     X     X       Interbus (RS485)     X     X       K Bus     X     X       LON - TP/XF 78     X     X       LUXMATE Bus     X     X       MBus     X     X       MODBUS     X     X       Procontic CS31 (RS232)     X     X       Procontic T200 (RS422)     X     X       PROFIBUS DP/FMS     X     X       PROFIBUS SIMATIC NET     X     X       PSM EG RS422 & RS485     X     X       SM Ed RS425     X     X	Dupline							X
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IPIO / FIPWAYImage: State of the	Fieldbus Foundation						Х	X
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InclusionXXLong-distance busXXK BusXXLON - TP/XF 78XXLUXMATE BusXXM BusXXMODBUSXXMPI BusXXProcontic CS31 (RS232)XProcontic T200 (RS422)XPROFIBUS DP/FMSXPROFIBUS SIMATIC NETXPROFIBUS SIMATIC NETXPROFIBUS (RS485)XRackbus (RS485)XR BusXRS 485XRS 485XXX	Interbus INLINE							Λ
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Im Dus     A       MODBUS     X     X       MPI Bus     X     X       Procontic CS31 (RS232)     X     X       Procontic T200 (RS422)     X     X       PROFIBUS DP/FMS     X     X       PROFIBUS PA     X     X       PROFIBUS SIMATIC NET     X     X       PSM EG RS422 & RS485     X     X       Rackbus (RS485)     X     X       R Bus     X     X       RS 485     X     X	M Rue						Л	×
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PROFIBUS DP/FMS     X     X     X       PROFIBUS SIMATIC NET     X     X     X       PSM EG RS422 & RS485     X     X     X       Rackbus (RS485)     X     X     X       R Bus     X     X     X       RS 485     X     X     X	Procentic CS31 (RS232)		<u>^</u>			V		V
PROFIBUS DP/FMS X X   PROFIBUS PA X X   PROFIBUS SIMATIC NET X X   PSM EG RS422 & RS485 X X   Rackbus (RS485) X X   R Bus X X   RS 485 X X	Procontic 1200 (RS422)					X		X X
PROFIBUS SIMATIC NET X X   PSM EG RS422 & RS485 X X   Rackbus (RS485) X X   R Bus X X   RS 485 X X	PROFIBUS DP/FMS					X	X	X
PROFIBUS SIMATIC NET     X     X     X       PSM EG RS422 & RS485     X     X     X       Rackbus (RS485)     X     X     X       R Bus     X     X     X       RS 485     X     X     X	PROFIBUS PA						X	<u> </u>
PSM EG RS422 & RS485     X     X     X       Rackbus (RS485)     X     X     X       R Bus     X     X     X       RS 485     X     X     X	PROFIBUS SIMATIC NET					X		<u>X</u>
Rackbus (RS485)     X     X     X       R Bus     X     X     X       RS 485     X     X     X	PSM EG RS422 & RS485					X		<u> </u>
R Bus     X     X       RS 485     X     X     X	Rackbus (RS485)					X		X
IRS 485 I I I X I I X	R Bus					X		X
	RS 485					X		Х
RS422, V11 X X	RS422, V11					X		Х
SafetyBUS p X X	SafetyBUS p					Х		Х
Securilan LON Bus X	Securilan LON Bus					X		
SIGMASYS X	SIGMASYS				Х			
SS97 SIN/X (RS 232) X .	SS97 SIN/X (RS 232)		Х					
SUCONET X X	SUCONET					Х		Х
Resistance Temp. Measuring	Resistance Temp. Measuring							
Ni1000, PT100, PT1000 Wire X	Ni1000, PT100, PT1000 Wire		X					
NTC & PTC Thermistors	NTC & PTC Thermistors							
TTL X	TTL		Х					
TTY 4–20mA X	TTY 4–20mA			Х				
TELECOMMUNICATION, TELEPHONY			TELEC	COMMUNICATION, T	ELEPHONY			
a/b Wires X	a/b Wires							Х
ADSL, ADSL 2+ X	ADSL, ADSL 2+							Х
ISDN S <sub>0</sub> , S2 <sub>m</sub> /U2 <sub>m</sub> UKO/UPO X	ISDN S0, S2m/U2m UKO/UPO							Х
Modem M1 X	Modem M1		Х					
SDSL, SHDSL X X	SDSL, SHDSL						Х	Х
Telephony Systems	Telephony Systems							
(e.g., Siemens, HICOM, Alcatel) X	(e.g., Siemens, HICOM, Alcatel)							Х
T-DSL X	T-DSL							Х
Telecommunication Systems	Telecommunication Systems							~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
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VDSI VDSI V	VDSI							X
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		hard to the state						

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