

TRABTECH PRODUCTS  
**APPLICATION NOTE**

# MCR-PLUGTRAB PT Pluggable Surge Protection for DeviceNet Networks

Combines protection for both the 24 VDC power supply circuit and for the CAN-high and CAN-low data signals.

No. 2106A

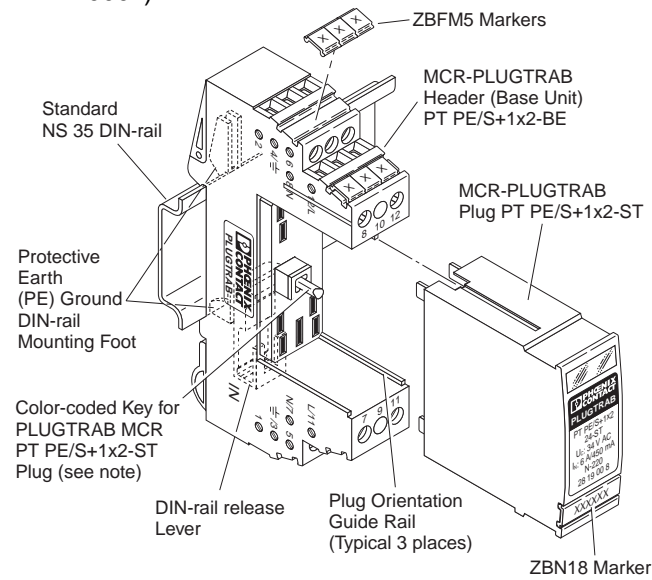
July 2005

## 1. Introduction

The MCR-PLUGTRAB PT consist of a header (PT PE/S+1x2-BE) and a plug (PT PE/S+1x2-24-ST). The header (base unit) attaches to standard DIN-rail and the replaceable plug fits into the header. Figure 1 shows the various features of the PLUGTRAB module. The MCR-PLUGTRAB PT provides ideal protection for DeviceNet networks

### Note

This surge protection device is suitable for any protocol based on the physical layer of CAN (e.g. DeviceNet, CANopen, NMEA 2000®).



### Note

The PT PE/S+1x2-BE header can be used with different types of plugs having different functionality. To prevent accidentally inserting the wrong plug into the header, each plug comes with a color-coded key that automatically attaches itself to the header when first installed. Once installed, only plugs of the same type can be used.

Figure 1. Features of the MCR-PLUGTRAB PT

1. DeviceNet™ is a trademark of Open DeviceNet Vendors Association
2. NMEA 2000 is a registered trademark of the National Marine Electronics Association
3. CANopen is a tradename of CAN in Automation (CiA) international users' and manufacturers' group

## 2. Dimensions (see Figure 2)

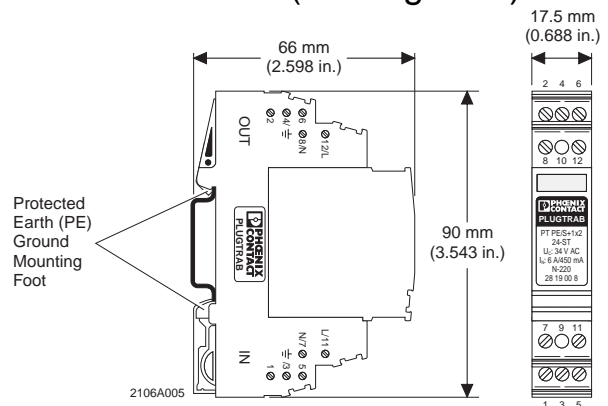
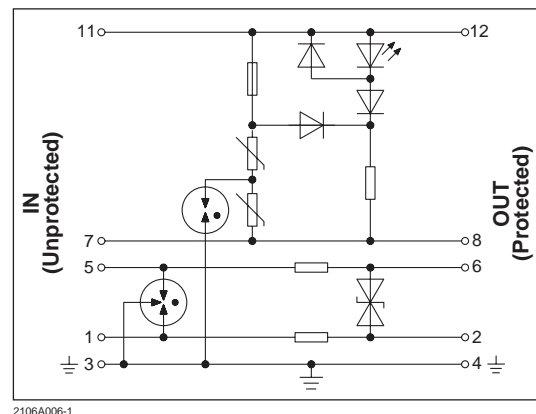


Figure 2. MCR-PLUGTRAB PT Dimensions

## 3. Circuit Diagram

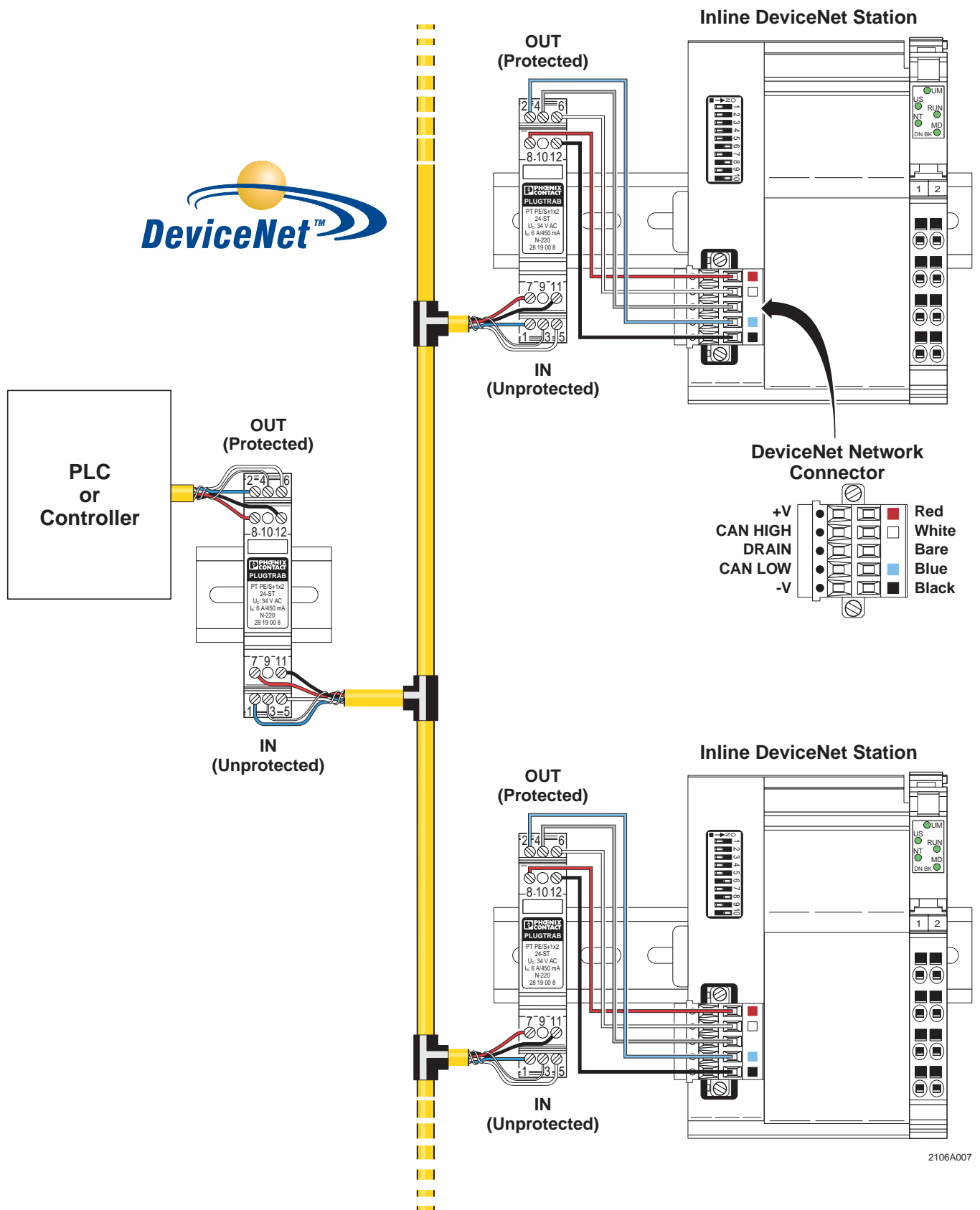
The module is designed to protect both the 24 VDC power supply and the data signals (CAN-high and CAN-low). See Figure 3.



Pin No.	Description
1 & 2	CAN-low (White)
3 & 4	GND/Drain
5&6	CAN-high (Blue)
7 & 8	Neutral (Black)
9 & 10	Not Used
11 & 12	± 24 V dc (Red)

Figure 3. MCR-PLUGTRAB PT Circuit Diagram

#### 4. Application Example (see Figure 4)



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Figure 4. MCR-PLUGTRAB PT Surge Protection in a DeviceNet Network

## 5. Technical Data (see Table 1)

Table 1. MCR-PLUGTRAB PT Technical Information

Specification	Power	Data
IEC category/VDE requirement class	III/D	C1, C2, C3, D1
Maximum Continuous Operating Voltage (MCOV)	DC AC	40 V dc 28 V ac
Maximum continuous operating current $I_N$ at 30 °C (per path)	6 A	450 mA
Maximum single impulse discharge (8/20 $\mu$ s)	core to core core to GND	10 kA 10 kA
Total surge current (8/20 $\mu$ s)	core to GND	700 A
Limiting (clamping) voltage at 1 kV/ $\mu$ s	core to core core to GND	$\leq 180$ V $\leq 55$ V
Response time $t_a$	core to core core to GND	$\leq 25$ ns $\leq 100$ ns
Resistance per path	CAN-low (pins 1 & 2) CAN-high (pins 5 & 6) neutral (pins 7 & 8) 24 V dc (pins 11 & 12)	NA 2.2 $\Omega$ 2.2 $\Omega$ NA NA
Operating temperature range	-40 °C to +85 °C	-40 °C to +85 °C
Inflammability class in accordance with UL 94	V0	V0
Degree of protection in accordance with IEC 529/EN 60 529	IP 20	IP 20
Test standards	IEEE C62.36	IEEE C62.36

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## 6. Installing and Removing the MCR-PLUGTRAB Module

### 6.1 Installing the Header (base unit) onto the DIN-rail

1. Refer to Figure 5. Position the header so that the grounding foot of header is over the upper leg of the DIN-rail.
2. With the grounding foot of the header resting on the upper leg of the DIN-rail, slide the header to the desired position along the DIN-rail, then push the header inward until it latches with the lower leg of the DIN-rail.

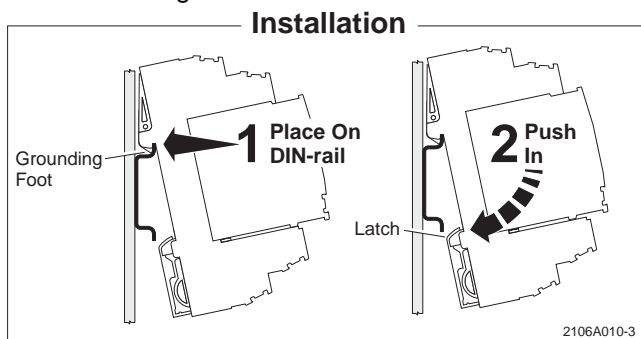


Figure 5. Installing the MCR-PLUGTRAB Module to the DIN-rail

### 6.2 Removing the Header from the DIN-rail

1. Refer to Figure 6. Insert a blade-type screwdriver (approx. 3.5 mm wide) into the header latch and carefully push upward to release the latch from the lower leg of the DIN-rail. Once released, swing the header away from the DIN-rail, then lift the header straight up and off the DIN-rail.

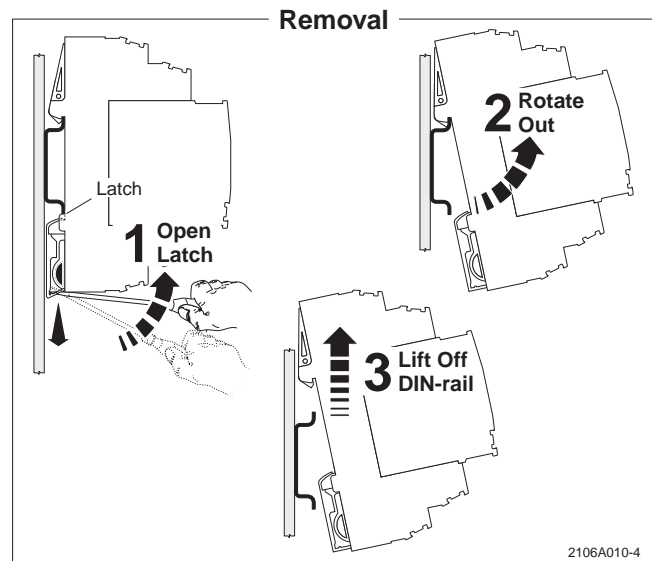


Figure 6. Removing the MCR-PLUGTRAB Module from the DIN-rail

## 7. Wire and Strip-length Requirements (see Figure 7)

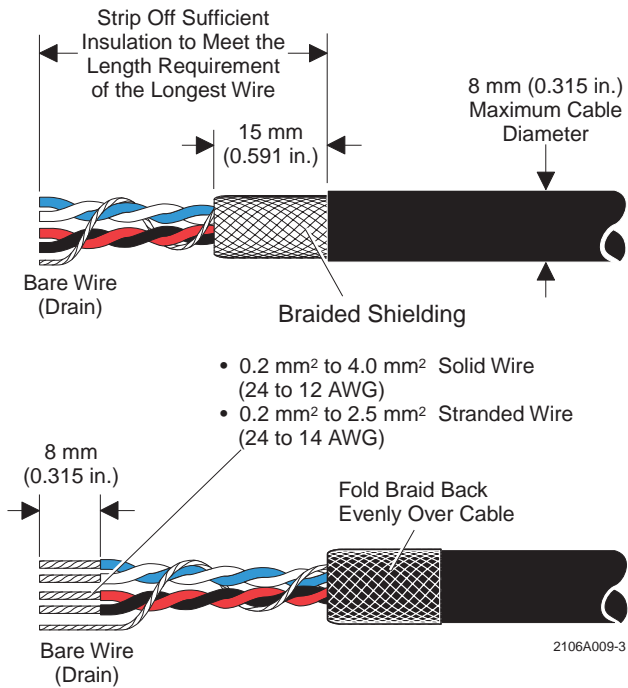


Figure 7. DeviceNet Cable with Two, Twisted-pair Wires and Drain

## 8. Connecting the Wires (see Figure 8)

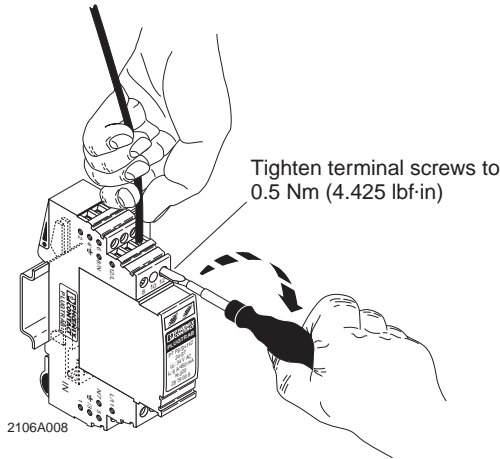


Figure 8. Connecting Individual Wires to the MCR-PLUGTRAB Header

## 9. Ordering Data (see Table 2)

Table 2. Ordering Information

Description	Type	Order No.
MCR-PLUGTRAB Plug	PT PE/S+1x2-24-ST	28 19 00 8
MCR-PLUGTRAB Header (Base Unit)	PT PE/S+1x2-BE	28 56 25 6
DIN-rail, perforated, 2 meter length*	NS 35/7.5 GELOCHT	08 01 73 3
DIN-rail, unperforated, 2 meter length*	NS 35/7.5 UNGELOCHT	08 01 68 1
Zack marking strip, (header), 10-strips of 12 labels, white, unprinted**.3	ZBFM 5/WH: UNPRINTED	08 03 59 5
Zack marking strip (plug), 5-sections, white, for individual labeling with marker**.	ZBN 18 SO/CMS	08 00 76 3

\* DIN-rail is available cut to length and with a variety of other custom options. See "Mounting Material/Tools" section of our CLIPLINE catalog.

\*\* ZB markers can be custom printed or ordered or with consecutive numbering. See "Marking Materials" section of our CLIPLINE catalog for additional information.

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## D-UFB-IB-S-RBO

Order No.: 2748360



Attachment plug with surge protection for 2-conductor remote bus output. Connection: D-SUB 9 female connector - male connector with ca. 20 cm conductor, snap-on foot for mounting on NS 32 or NS 35/7.5

### Commercial data

EAN	4017918062514
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.2176 KG
Catalog page information	Page 131 (TT-2007)

### Technical data

#### General

Housing material	Aluminum
Color	black

Standards for air and creepage distances	VDE 0110-1
	IEC 60664-1: 1992-10
Total surge current (8/20) $\mu$ s	1.5 kA
Ambient temperature (operation)	-40 °C ... 80 °C
Mounting type	DIN rail 35 mm
Design	Attachment plug for DIN rail mounting
Degree of protection	IP10
Direction of action	Line-Line & Line-Earth Ground
Width	16.50 mm
Height	70.00 mm
Length	112.80 mm

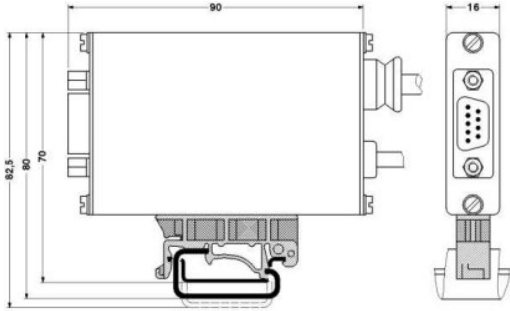
**Protective circuit**

IEC category	C1
	C3
VDE requirement class	C1
	C3
Nominal voltage $U_N$	5 V DC
Arrester rated voltage $U_C$	5.8 V DC
Arrester rated voltage $U_C$ (Core-Core)	5.8 V DC
Arrester rated voltage $U_C$ (Core-Earth)	5.8 V DC
Nominal current $I_N$	300 mA (25°C)
Operating effective current $I_C$ at $U_C$	$\leq 300 \mu$ A
Discharge current to PE at $U_C$	$\leq 300 \mu$ A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Core)	350 A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Earth)	350 A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-GND)	350 A
Total surge current (8/20) $\mu$ s	1.5 kA
Max. discharge surge current $I_{max}$ (8/20) $\mu$ s maximum (Core-Earth)	350 A
Output voltage limitation at 1 kV/ $\mu$ s (Core-Core) spike	$\leq 35$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) spike	$\leq 35$ V

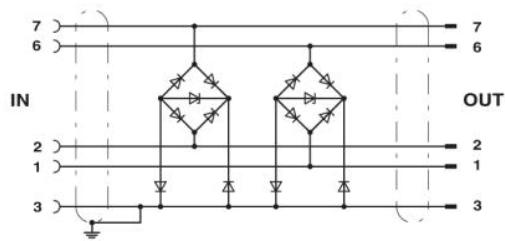
Output voltage limitation at 1 kV/ $\mu$ s (Core-Core) static	$\leq 12$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) static	$\leq 12$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-GND) static	$\leq 12$ V
Residual voltage at $I_n$ , (conductor-conductor)	$\leq 30$ V
Residual voltage at $I_n$ , (conductor-ground)	$\leq 30$ V
Residual voltage at $I_n$ , (conductor-GND)	$\leq 30$ V
Protection level $U_p$ (Core-Core)	$\leq 35$ V
Protection level $U_p$ (Core-Earth)	$\leq 35$ V
Response time $t_A$ (Core-Core)	$\leq 500$ ns
Response time $t_A$ (Core-Earth)	$\leq 500$ ns
	$\leq 500$ ns
Input attenuation aE, sym.	0.1 dB ( $\leq 7$ MHz)
	0.1 dB ( $\leq 8.5$ MHz)
	0.1 dB (up to 2.5 MHz 600 Ohm $\Omega$ )
Cut-off frequency $f_g$ (3 dB), sym. in 50 Ohm system	Typ. 100 MHz
Cut-off frequency $f_g$ (3 dB), sym. in 150 Ohm system	$> 100$ MHz
Cut-off frequency $f_g$ (3 dB), sym. in 600 Ohm system	Typ. 30 MHz
Capacity (Core-Core)	50 pF
Capacity (Core-GND)	50 pF
Capacity (Core-Earth)	50 pF
Surge carrying capacity in acc. with IEC 61643-21 (Core-Core)	C1 (500 V / 250 A)
Surge carrying capacity in acc. with IEC 61643-21 (Core-Earth)	C1 (500 A/250 A)
<b>Connection data</b>	
Type of connection	D-SUB-9
Connection type IN	D-SUB-9 socket
Connection type OUT	D-SUB-9 connector
Connection method	Remote bus output
<b>Connection, protective circuit</b>	
Standards/regulations	IEC 61643-21

## Drawings

### Dimensioned drawing



### Circuit diagram





## D-UFB-V11/S-SB-S

This product has been replaced by a newer version.

Order No.: 2782180

The illustration shows version D-UFB-V11/S-SB-B



Attachment plug with surge voltage fine protection for V.11 interface.  
Connection: D-SUB-15 male/female connector, for direct assembly on  
the device interface

### Commercial data

EAN	4017918069414
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.1068 KG
Catalog page information	Page 99 (TT-2002)

### Technical data

#### General

Housing material	Aluminum
Color	black
Standards for air and creepage distances	VDE 0110-1 IEC 60664-1: 1992-10
Total surge current (8/20) $\mu$ s	5 kA
Ambient temperature (operation)	-40 °C ... 60 °C
Mounting type	Direct assembly on the device interface
Design	Attachment plug
Degree of protection	IP20
Direction of action	Line-Line & Line-Signal Ground/Shield & Signal Ground/Shield-Earth Ground

Width	24.50 mm
Height	54.50 mm
Length	84.60 mm
<b>Protective circuit</b>	
IEC category	C1
	C3
VDE requirement class	C1
	C3
Arrester rated voltage $U_c$ (Core-GND)	15 V DC
Nominal current $I_N$	1 A (60°C)
Operating effective current $I_c$ at $U_c$	$\leq 5 \mu\text{A}$
Discharge current to PE at $U_c$	$\leq 1 \mu\text{A}$
Nominal discharge surge current $I_n$ (8/20) $\mu\text{s}$ (Core-Core)	300 A
Nominal discharge surge current $I_n$ (8/20) $\mu\text{s}$ (Core-Earth)	300 A
Nominal discharge surge current $I_n$ (8/20) $\mu\text{s}$ (Core-GND)	300 A
Total surge current (8/20) $\mu\text{s}$	5 kA
Max. discharge surge current $I_{max}$ (8/20) $\mu\text{s}$ maximum (Core-Earth)	300 A
Nominal pulse current $I_{an}$ (10/1000) $\mu\text{s}$ (Core-Earth)	59 A
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Earth) spike	$\leq 650 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-GND) spike	$\leq 22 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Shield) spike	$\leq 22 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Earth) static	$\leq 650 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-GND) static	$\leq 22 \text{ V}$
Residual voltage at $I_n$ , (conductor-GND)	$\leq 28 \text{ V}$
Residual voltage with $I_{an}$ (10/1000) $\mu\text{s}$ (conductor-GND)	$\leq 25 \text{ V}$
Protection level $U_p$ (Core-Earth)	$\leq 650 \text{ V}$
Protection level $U_p$ (Core-GND)	$\leq 28 \text{ V}$
Response time $t_A$ (Core-Core)	$\leq 1 \text{ ns}$

Response time $t_A$ (Core-Earth)	$\leq 1$ ns
	$\leq 100$ ns
Input attenuation $a_E$ , asym.	0.1 dB ( $\leq 300$ kHz)
	0.1 dB ( $\leq 30$ kHz)
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 50 Ohm system	Typ. 2.5 MHz
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 600 Ohm system	Typ. 200 kHz
Surge carrying capacity in acc. with IEC 61643-21 (Core-Core)	C1 (500 V / 250 A)
Surge carrying capacity in acc. with IEC 61643-21 (Core-Earth)	C1 (500 A/250 A)
	C3 (25 A)

**Connection data**

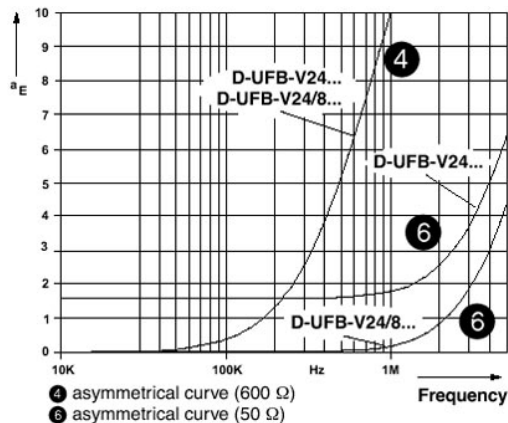
Type of connection	D-SUB-9
Connection type IN	D-SUB-9 male connector
Connection type OUT	D-SUB-9 female connector
Connection method	V.24

**Connection, protective circuit**

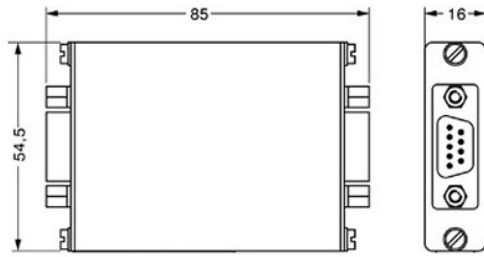
Standards/regulations	IEC 61643-21
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**Drawings**

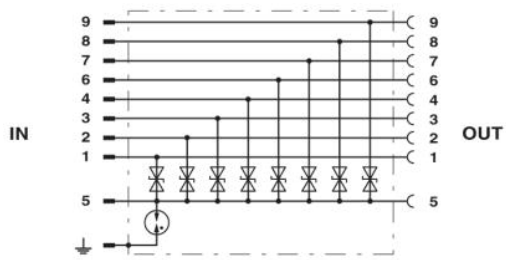
Diagram



Dimensioned drawing



Circuit diagram

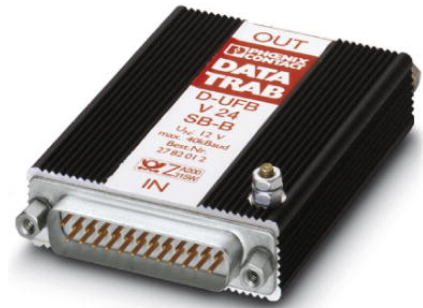


## D-UFB-V24/BS-B

This item is no longer available. Should you have any questions, please contact our Sales Team.

Order No.: 2782025

The illustration shows version D-UFB-V24/SB-B



Attachment plug with surge protection for V.24 interface. Connection: D-SUB-25 female/male connector, installation in lines

### Commercial data

EAN	4017918069261
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.1045 KG
Catalog page information	Page 102 (TT-2005)

### Technical data

#### General

Housing material	Aluminum
Color	black
Ambient temperature (operation)	-40 °C ... 60 °C
Mounting type	Connection-specific intermediate plugging

Design	Attachment plug
Degree of protection	IP20
Direction of action	Line-Line & Line-Signal Ground/Shield & Signal Ground/Shield-Earth Ground
Width	24.50 mm
Height	54.50 mm
Length	84.60 mm
<b>Protective circuit</b>	
IEC category	C2
	C3
VDE requirement class	C2
	C3
Arrester rated voltage $U_c$ (Core-Earth)	15 V DC
Nominal current $I_N$	260 mA (25°C)
Operating effective current $I_c$ at $U_c$	$\leq 6 \mu\text{A}$
Nominal discharge surge current $I_n$ (8/20) $\mu\text{s}$ (Core-Earth)	5 kA
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Earth) spike	$\leq 600 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Shield) spike	$\leq 24 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Earth) static	$\leq 600 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-GND) static	$\leq 24 \text{ V}$
Residual voltage at $I_n$ , (conductor-GND)	$\leq 21 \text{ V}$
Protection level $U_p$ (Core-Earth)	$\leq 600 \text{ V}$
Protection level $U_p$ (Core-GND)	$\leq 24 \text{ V}$
Response time $t_A$ (Core-Earth)	$\leq 1 \text{ ns}$
	$\leq 100 \text{ ns}$
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 50 Ohm system	3.5 MHz (typical)
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 600 Ohm system	300 kHz (typical)
Resistance in series	20 $\Omega$ (Path 2-2)
	20 $\Omega$ (Path 3-3)

**Connection data**

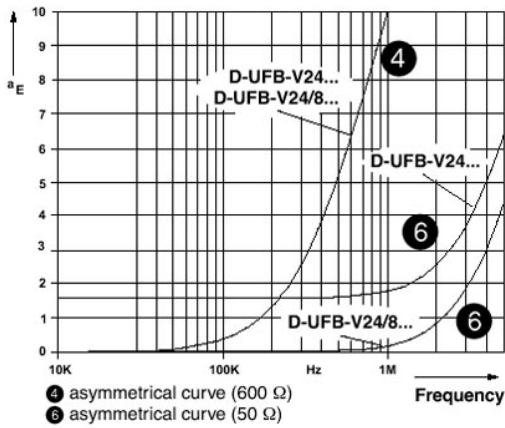
Type of connection	D-SUB-25
Connection type IN	D-SUB-25 socket
Connection type OUT	D-SUB-25 male connector
Connection method	V.24

**Connection, protective circuit**

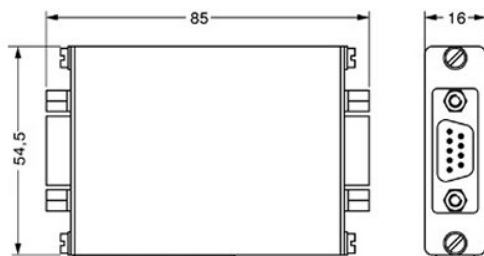
Standards/regulations	IEC 61643-21
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**Drawings**

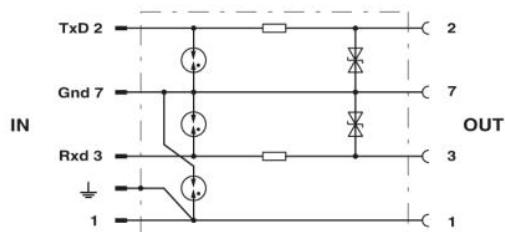
Diagram



Dimensioned drawing



Circuit diagram

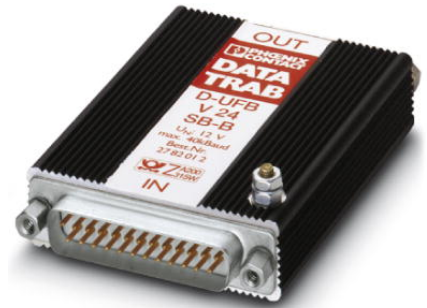


## D-UFB-V24/SB-S

This product has been replaced by a newer version.

Order No.: 2782038

The illustration shows version D-UFB-V24/SB-B



Attachment plug with surge protection for V.24 interface. Connection: D-SUB-25 male/female connector, for direct assembly on the device interface

### Commercial data

EAN	4017918069278
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.1051 KG
Catalog page information	Page 102 (TT-2005)

### Technical data

#### General

Housing material	Aluminum
Color	black
Ambient temperature (operation)	-40 °C ... 60 °C



Mounting type	Direct assembly on the device interface
Design	Attachment plug
Degree of protection	IP20
Direction of action	Line-Line & Line-Signal Ground/Shield & Signal Ground/Shield-Earth Ground
Width	24.50 mm
Height	54.50 mm
Length	84.60 mm
<b>Protective circuit</b>	
IEC category	C2
	C3
VDE requirement class	C2
	C3
Arrester rated voltage $U_c$ (Core-Earth)	15 V DC
Nominal current $I_n$	260 mA (25°C)
Operating effective current $I_c$ at $U_c$	$\leq 6 \mu\text{A}$
Nominal discharge surge current $I_n$ (8/20) $\mu\text{s}$ (Core-Earth)	5 kA
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Earth) spike	$\leq 600 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Shield) spike	$\leq 24 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Earth) static	$\leq 600 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-GND) static	$\leq 24 \text{ V}$
Residual voltage at $I_n$ , (conductor-GND)	$\leq 21 \text{ V}$
Protection level $U_p$ (Core-Earth)	$\leq 600 \text{ V}$
Protection level $U_p$ (Core-GND)	$\leq 24 \text{ V}$
Response time $t_A$ (Core-Earth)	$\leq 1 \text{ ns}$
	$\leq 100 \text{ ns}$
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 50 Ohm system	3.5 MHz (typical)
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 600 Ohm system	300 kHz (typical)
Resistance in series	20 $\Omega$ (Path 2-2)
	20 $\Omega$ (Path 3-3)

**Connection data**

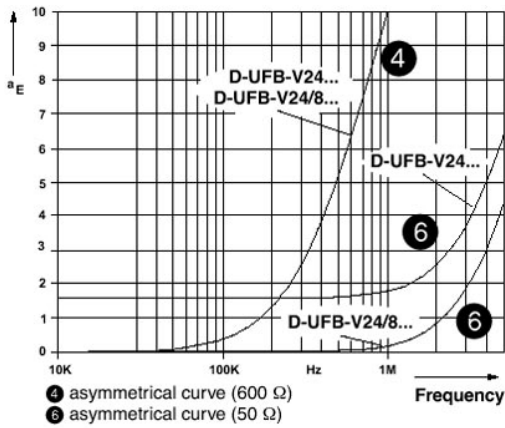
Type of connection	D-SUB-25
Connection type IN	D-SUB-25 male connector
Connection type OUT	D-SUB-25 female connector
Connection method	V.24

**Connection, protective circuit**

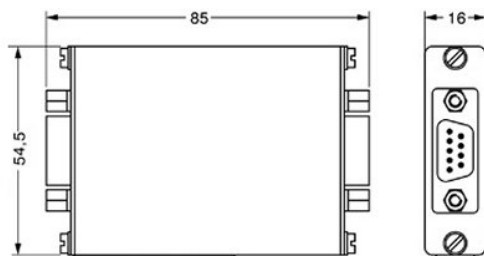
Standards/regulations	IEC 61643-21
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**Drawings**

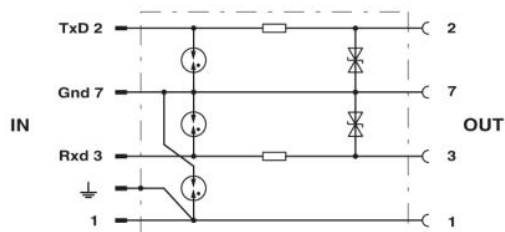
Diagram



Dimensioned drawing



Circuit diagram

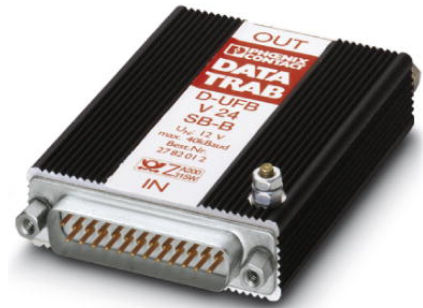


## D-UFB-V24/BS-S

This product has been replaced by a newer version.

Order No.: 2782041

The illustration shows version D-UFB-V24/SB-B



Attachment plug with surge protection for V.24 interface. Connection: D-SUB-25 female/male connector, for direct assembly on the device interface

### Commercial data

EAN	4017918069285
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.1106 KG
Catalog page information	Page 102 (TT-2005)

### Technical data

#### General

Housing material	Aluminum
Color	black
Ambient temperature (operation)	-40 °C ... 60 °C

Mounting type	Direct assembly on the device interface
Design	Attachment plug
Degree of protection	IP20
Direction of action	Line-Line & Line-Signal Ground/Shield & Signal Ground/Shield-Earth Ground
Width	24.50 mm
Height	54.50 mm
Length	84.60 mm
<b>Protective circuit</b>	
IEC category	C2
	C3
VDE requirement class	C2
	C3
Arrester rated voltage $U_c$ (Core-Earth)	15 V DC
Nominal current $I_n$	260 mA (25°C)
Operating effective current $I_c$ at $U_c$	$\leq 6 \mu\text{A}$
Nominal discharge surge current $I_n$ (8/20) $\mu\text{s}$ (Core-Earth)	5 kA
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Earth) spike	$\leq 600 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Shield) spike	$\leq 24 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Earth) static	$\leq 600 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-GND) static	$\leq 24 \text{ V}$
Residual voltage at $I_n$ , (conductor-GND)	$\leq 21 \text{ V}$
Protection level $U_p$ (Core-Earth)	$\leq 600 \text{ V}$
Protection level $U_p$ (Core-GND)	$\leq 24 \text{ V}$
Response time $t_A$ (Core-Earth)	$\leq 1 \text{ ns}$
	$\leq 100 \text{ ns}$
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 50 Ohm system	3.5 MHz (typical)
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 600 Ohm system	300 kHz (typical)
Resistance in series	20 $\Omega$ (Path 2-2)
	20 $\Omega$ (Path 3-3)

**Connection data**

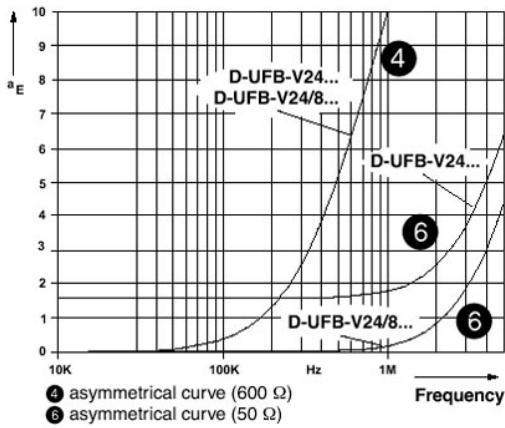
Type of connection	D-SUB-25
Connection type IN	D-SUB-25 socket
Connection type OUT	D-SUB-25 male connector
Connection method	V.24

**Connection, protective circuit**

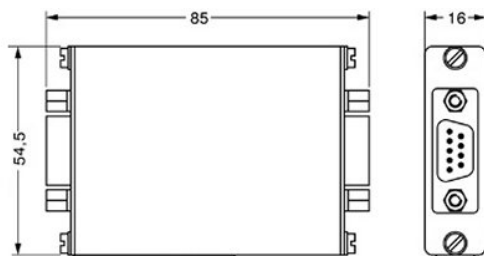
Standards/regulations	IEC 61643-21
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**Drawings**

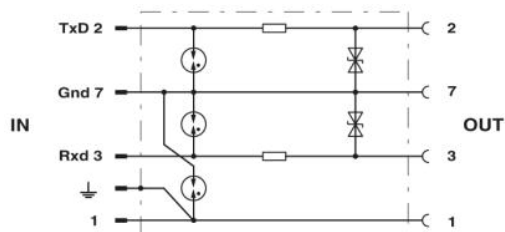
Diagram



Dimensioned drawing



Circuit diagram

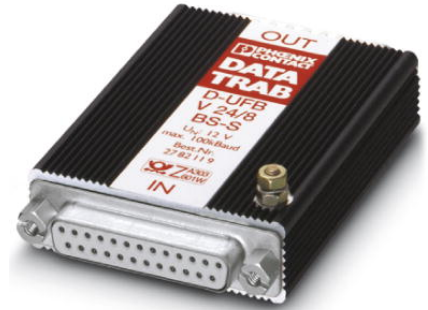


## D-UFB-V24/8-SB-B

### Discontinued item

Order No.: 2782096

The illustration shows version D-UFB-V24/SB-S



Attachment plug with surge voltage fine protection for V.24 interface with handshake. Connection: D-SUB-25 male/female connector, for installation in lines

#### Commercial data

EAN	4017918069339
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.101 KG
Catalog page information	Page 125 (TT-2007)

#### Technical data

##### General

Housing material	Aluminum
Color	black

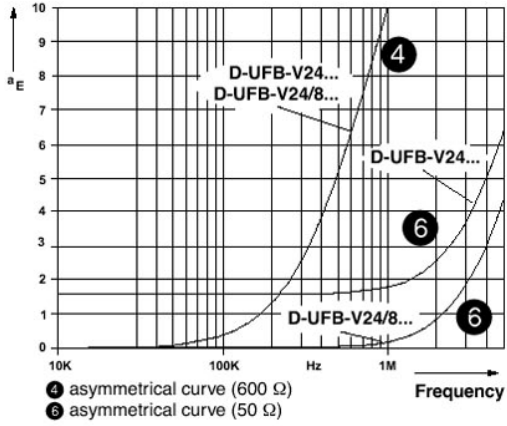
Standards for air and creepage distances	VDE 0110-1
	IEC 60664-1: 1992-10
Total surge current (8/20) $\mu$ s	5 kA
Ambient temperature (operation)	-40 °C ... 60 °C
Mounting type	Connection-specific intermediate plugging
Design	Attachment plug
Degree of protection	IP20
Direction of action	Line-Line & Line-Signal Ground/Shield & Signal Ground/Shield-Earth Ground
Width	24.50 mm
Height	54.50 mm
Length	84.60 mm
<b>Protective circuit</b>	
IEC category	C1
	C3
VDE requirement class	C1
	C3
Arrester rated voltage $U_c$	15 V DC
Arrester rated voltage $U_c$ (Core-GND)	15 V DC
Nominal current $I_N$	1 A (60°C)
Operating effective current $I_c$ at $U_c$	$\leq 5 \mu$ A
Discharge current to PE at $U_c$	$\leq 1 \mu$ A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Core)	300 A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Earth)	300 A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-GND)	300 A
Total surge current (8/20) $\mu$ s	5 kA
Max. discharge surge current $I_{max}$ (8/20) $\mu$ s maximum (Core-Earth)	300 A
Nominal pulse current $I_{an}$ (10/1000) $\mu$ s (Core-Earth)	59 A
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) spike	$\leq 600$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-GND) spike	$\leq 22$ V

Output voltage limitation at 1 kV/ $\mu$ s (Core-Shield) spike	$\leq 22$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) static	$\leq 600$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-GND) static	$\leq 22$ V
Residual voltage at In, (conductor-GND)	$\leq 28$ V
Residual voltage with I <sub>an</sub> (10/1000) $\mu$ s (conductor-GND)	$\leq 25$ V
Protection level U <sub>p</sub> (Core-Earth)	$\leq 600$ V
Protection level U <sub>p</sub> (Core-GND)	$\leq 28$ V
Response time t <sub>A</sub> (Core-Core)	$\leq 1$ ns
Response time t <sub>A</sub> (Core-Earth)	$\leq 1$ ns
	$\leq 100$ ns
Input attenuation a <sub>E</sub> , asym.	0.1 dB ( $\leq 700$ kHz)
	0.1 dB ( $\leq 50$ kHz)
Cut-off frequency f <sub>g</sub> (3 dB), asym. (GND) in 50 Ohm system	Typ. 4 MHz
Cut-off frequency f <sub>g</sub> (3 dB), asym. (GND) in 600 Ohm system	Typ. 300 kHz
Surge carrying capacity in acc. with IEC 61643-21 (Core-Core)	C1 (500 V / 250 A)
Surge carrying capacity in acc. with IEC 61643-21 (Core-Earth)	C1 (500 A/250 A)
	C3 (25 A)
<b>Connection data</b>	
Type of connection	D-SUB-25
Connection type IN	D-SUB-25 socket
Connection type OUT	D-SUB-25 male connector
Connection method	V.24
<b>Connection, protective circuit</b>	
Standards/regulations	IEC 61643-21

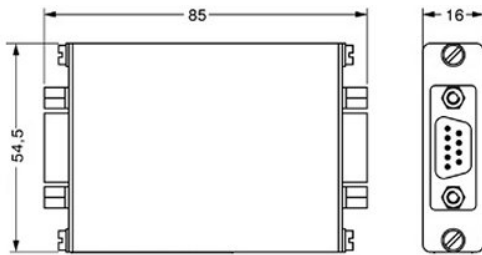


Drawings

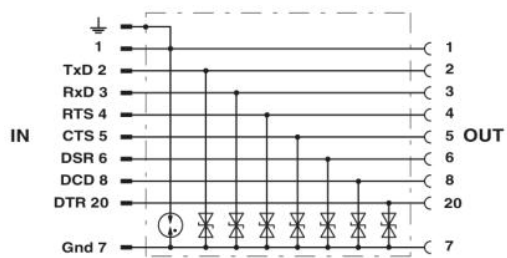
Diagram



Dimensioned drawing



Circuit diagram

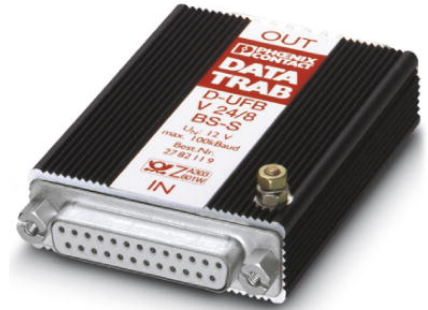


## D-UFB-V24/8-BS-B

This product has been replaced by a newer version.

Order No.: 2782106

The illustration shows version D-UFB-V24/SB-S



Attachment plug with surge voltage fine protection for V.24 interface with handshake. Connection: D-SUB-25 female/male connector, for installation in lines

### Commercial data

EAN	4017918069346
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.1019 KG
Catalog page information	Page 103 (TT-2005)

### Technical data

#### General

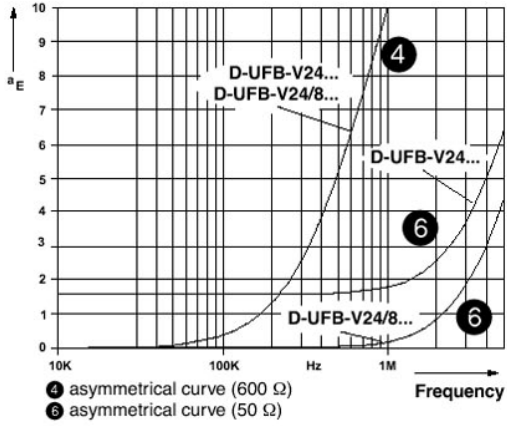
Housing material	Aluminum
Color	black

Standards for air and creepage distances	VDE 0110-1
	IEC 60664-1: 1992-10
Total surge current (8/20) $\mu$ s	5 kA
Ambient temperature (operation)	-40 °C ... 60 °C
Mounting type	Connection-specific intermediate plugging
Design	Attachment plug
Degree of protection	IP20
Direction of action	Line-Line & Line-Signal Ground/Shield & Signal Ground/Shield-Earth Ground
Width	24.50 mm
Height	54.50 mm
Length	84.60 mm
<b>Protective circuit</b>	
IEC category	C1
	C3
VDE requirement class	C1
	C3
Arrester rated voltage $U_c$ (Core-GND)	15 V DC
Nominal current $I_N$	1 A (60°C)
Operating effective current $I_c$ at $U_c$	$\leq 5 \mu$ A
Discharge current to PE at $U_c$	$\leq 1 \mu$ A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Core)	300 A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Earth)	300 A
Total surge current (8/20) $\mu$ s	5 kA
Max. discharge surge current $I_{max}$ (8/20) $\mu$ s maximum (Core-Earth)	300 A
Nominal pulse current $I_{an}$ (10/1000) $\mu$ s (Core-Earth)	59 A
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) spike	$\leq 600$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-GND) spike	$\leq 22$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Shield) spike	$\leq 22$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) static	$\leq 600$ V

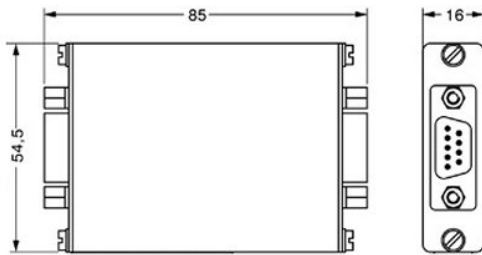
Output voltage limitation at 1 kV/ $\mu$ s (Core-GND) static	$\leq 22$ V
Residual voltage at In, (conductor-GND)	$\leq 28$ V
Residual voltage with $I_{an}$ (10/1000) $\mu$ s (conductor-GND)	$\leq 25$ V
Protection level $U_p$ (Core-Earth)	$\leq 600$ V
Protection level $U_p$ (Core-GND)	$\leq 28$ V
Response time $t_A$ (Core-Core)	$\leq 1$ ns
Response time $t_A$ (Core-Earth)	$\leq 1$ ns
	$\leq 100$ ns
Input attenuation aE, asym.	0.1 dB ( $\leq 700$ kHz)
	0.1 dB ( $\leq 50$ kHz)
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 50 Ohm system	Typ. 4 MHz
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 600 Ohm system	Typ. 300 kHz
Surge carrying capacity in acc. with IEC 61643-21 (Core-Core)	C1 (500 V / 250 A)
Surge carrying capacity in acc. with IEC 61643-21 (Core-Earth)	C1 (500 A/250 A)
	C3 (25 A)
<b>Connection data</b>	
Type of connection	D-SUB-25
Connection type IN	D-SUB-25 socket
Connection type OUT	D-SUB-25 male connector
Connection method	V.24
<b>Connection, protective circuit</b>	
Standards/regulations	IEC 61643-21

Drawings

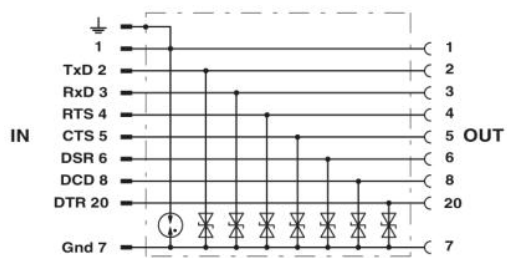
Diagram



Dimensioned drawing



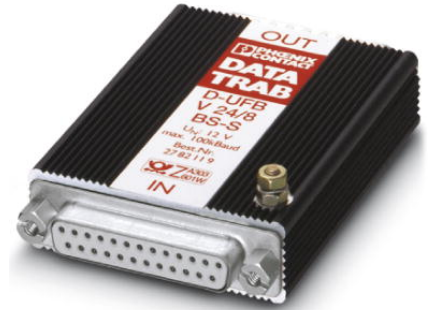
Circuit diagram



## D-UFB-V24/8-BS-S

### Discontinued item

Order No.: 2782119



Attachment plug with surge voltage fine protection for V.24 interface with handshake. Connection: D-SUB-25 female/male connector, for direct assembly on the device interface

#### Commercial data

EAN	4017918069353
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.1076 KG
Catalog page information	Page 125 (TT-2007)

#### Technical data

##### General

Housing material	Aluminum
Color	black

Standards for air and creepage distances	VDE 0110-1
	IEC 60664-1: 1992-10
Total surge current (8/20) $\mu$ s	5 kA
Ambient temperature (operation)	-40 °C ... 60 °C
Mounting type	Direct assembly on the device interface
Design	Attachment plug
Degree of protection	IP20
Direction of action	Line-Line & Line-Signal Ground/Shield & Signal Ground/Shield-Earth Ground
Width	24.50 mm
Height	54.50 mm
Length	84.60 mm

**Protective circuit**

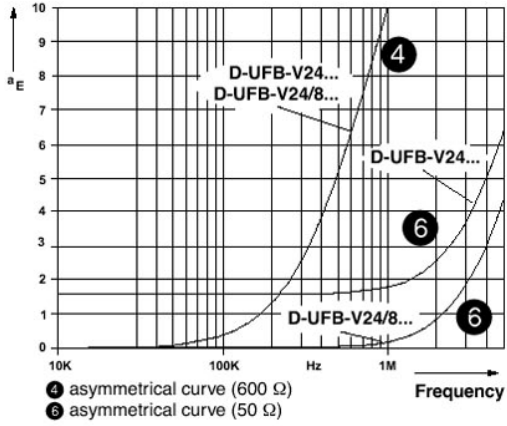
IEC category	C1
	C3
VDE requirement class	C1
	C3
Arrester rated voltage $U_c$ (Core-GND)	15 V DC
Nominal current $I_N$	1 A (60°C)
Operating effective current $I_c$ at $U_c$	$\leq 5 \mu$ A
Discharge current to PE at $U_c$	$\leq 1 \mu$ A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Core)	300 A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Earth)	300 A
Total surge current (8/20) $\mu$ s	5 kA
Max. discharge surge current $I_{max}$ (8/20) $\mu$ s maximum (Core-Earth)	300 A
Nominal pulse current $I_{an}$ (10/1000) $\mu$ s (Core-Earth)	59 A
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) spike	$\leq 600$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-GND) spike	$\leq 22$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Shield) spike	$\leq 22$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) static	$\leq 600$ V

Output voltage limitation at 1 kV/ $\mu$ s (Core-GND) static	$\leq 22$ V
Residual voltage at In, (conductor-GND)	$\leq 28$ V
Residual voltage with $I_{an}$ (10/1000) $\mu$ s (conductor-GND)	$\leq 25$ V
Protection level $U_p$ (Core-Earth)	$\leq 600$ V
Protection level $U_p$ (Core-GND)	$\leq 28$ V
Response time $t_A$ (Core-Core)	$\leq 1$ ns
Response time $t_A$ (Core-Earth)	$\leq 1$ ns
	$\leq 100$ ns
Input attenuation aE, asym.	0.1 dB ( $\leq 700$ kHz)
	0.1 dB ( $\leq 50$ kHz)
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 50 Ohm system	Typ. 4 MHz
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 600 Ohm system	Typ. 300 kHz
Surge carrying capacity in acc. with IEC 61643-21 (Core-Core)	C1 (500 V / 250 A)
Surge carrying capacity in acc. with IEC 61643-21 (Core-Earth)	C1 (500 A/250 A)
	C3 (25 A)
<b>Connection data</b>	
Type of connection	D-SUB-25
Connection type IN	D-SUB-25 socket
Connection type OUT	D-SUB-25 male connector
Connection method	V.24
<b>Connection, protective circuit</b>	
Standards/regulations	IEC 61643-21

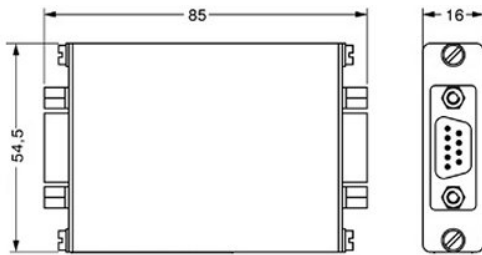


Drawings

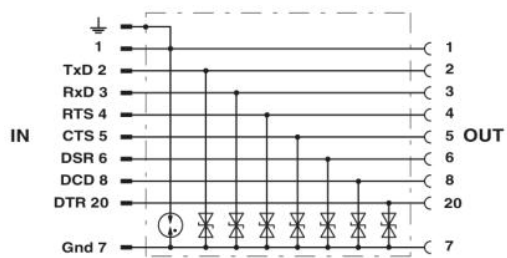
Diagram



Dimensioned drawing



Circuit diagram

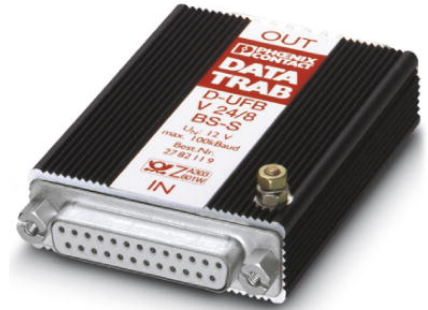


## D-UFB-V24/8-SB-S

### Discontinued item

Order No.: 2782122

The illustration shows version D-UFB-V24/SB-S



Attachment plug with surge voltage fine protection for V.24 interface with handshake. Connection: D-SUB-25 male/female connector, for direct assembly on the device interface

#### Commercial data

EAN	4017918069360
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.1065 KG
Catalog page information	Page 125 (TT-2007)

#### Technical data

##### General

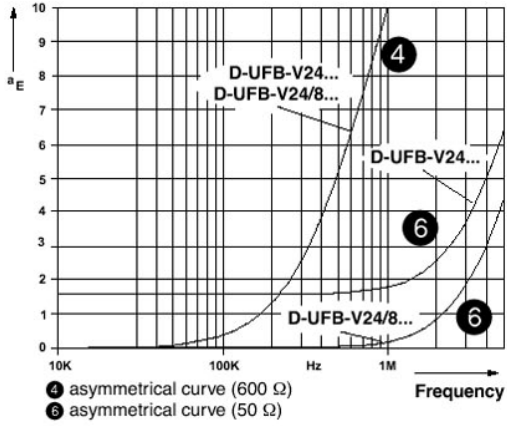
Housing material	Aluminum
Color	nickel

Standards for air and creepage distances	VDE 0110-1
	IEC 60664-1: 1992-10
Total surge current (8/20) $\mu$ s	5 kA
Ambient temperature (operation)	-40 °C ... 60 °C
Mounting type	Direct assembly on the device interface
Design	Attachment plug
Degree of protection	IP20
Direction of action	Line-Line & Line-Signal Ground/Shield & Signal Ground/Shield-Earth Ground
Width	24.50 mm
Height	54.50 mm
Length	84.60 mm
<b>Protective circuit</b>	
IEC category	C1
	C3
VDE requirement class	C1
	C3
Arrester rated voltage $U_c$ (Core-GND)	15 V DC
Nominal current $I_N$	1 A (60°C)
Operating effective current $I_c$ at $U_c$	$\leq 5 \mu$ A
Discharge current to PE at $U_c$	$\leq 1 \mu$ A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Core)	300 A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Earth)	300 A
Total surge current (8/20) $\mu$ s	5 kA
Max. discharge surge current $I_{max}$ (8/20) $\mu$ s maximum (Core-Earth)	300 A
Nominal pulse current $I_{an}$ (10/1000) $\mu$ s (Core-Earth)	59 A
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) spike	$\leq 600$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-GND) spike	$\leq 22$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Shield) spike	$\leq 22$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) static	$\leq 600$ V

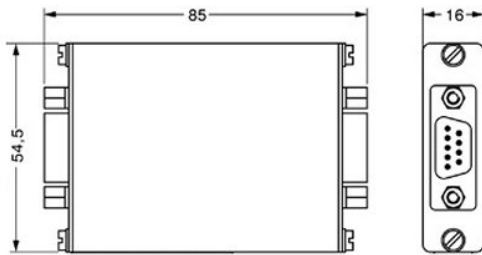
Output voltage limitation at 1 kV/ $\mu$ s (Core-GND) static	$\leq 22$ V
Residual voltage at In, (conductor-GND)	$\leq 28$ V
Residual voltage with $I_{an}$ (10/1000) $\mu$ s (conductor-GND)	$\leq 25$ V
Protection level $U_p$ (Core-Earth)	$\leq 600$ V
Protection level $U_p$ (Core-GND)	$\leq 28$ V
Response time $t_A$ (Core-Core)	$\leq 1$ ns
Response time $t_A$ (Core-Earth)	$\leq 1$ ns
	$\leq 100$ ns
Input attenuation aE, asym.	0.1 dB ( $\leq 700$ kHz)
	0.1 dB ( $\leq 50$ kHz)
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 50 Ohm system	Typ. 4 MHz
Cut-off frequency $f_g$ (3 dB), asym. (GND) in 600 Ohm system	Typ. 300 kHz
Surge carrying capacity in acc. with IEC 61643-21 (Core-Core)	C1 (500 V / 250 A)
Surge carrying capacity in acc. with IEC 61643-21 (Core-Earth)	C1 (500 A/250 A)
	C3 (25 A)
<b>Connection data</b>	
Type of connection	D-SUB-25
Connection type IN	D-SUB-25 male connector
Connection type OUT	D-SUB-25 female connector
Connection method	V.24
<b>Connection, protective circuit</b>	
Standards/regulations	IEC 61643-21

Drawings

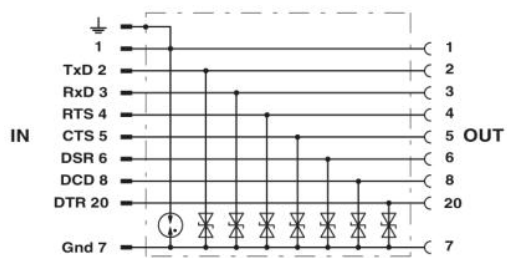
Diagram



Dimensioned drawing



Circuit diagram



## D-UFB-V11/S-SB-S

This product has been replaced by a newer version.

Order No.: 2782180

The illustration shows version D-UFB-V11/S-SB-B



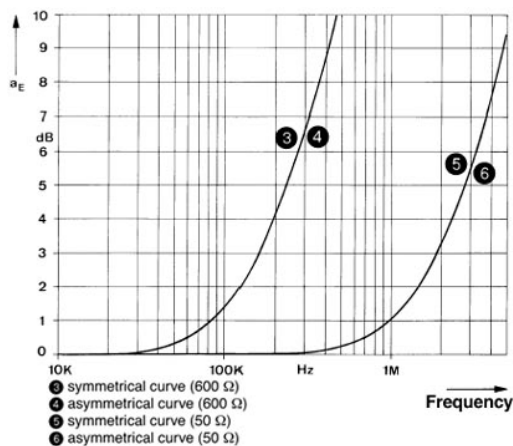
Attachment plug with surge voltage fine protection for V.11 interface.  
Connection: D-SUB-15 male/female connector, for direct assembly on the device interface

### Commercial data

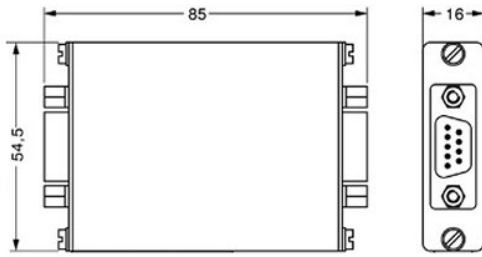
EAN	4017918069414
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.1068 KG
Catalog page information	Page 99 (TT-2002)

### Drawings

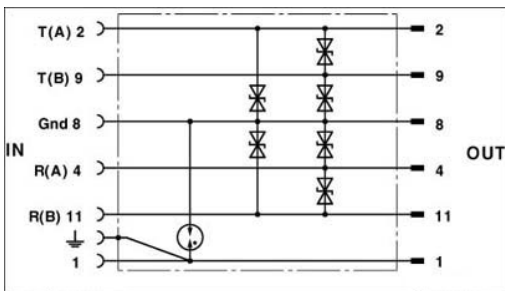
#### Diagram



Dimensioned drawing



Circuit diagram



## D-UFB-V11/SB-B

This item is no longer available. Should you have any questions, please contact our Sales Team.

Order No.: 2796118

The illustration shows version D-UFB-V11/BS-S



Attachment plug with surge protection for V.11 interface. Connection: D-SUB-15 male connector/female connector, installation in lines.

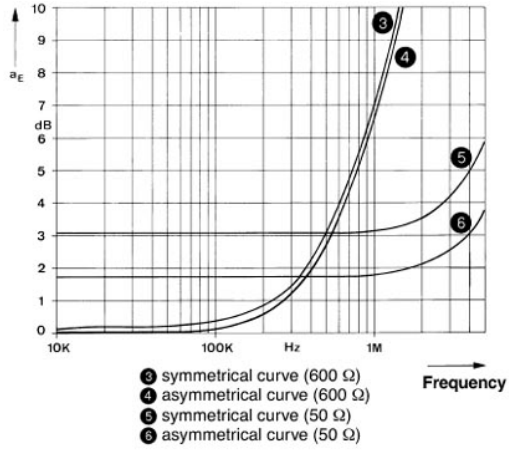
### Commercial data

EAN	4017918073305
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.1091 KG
Catalog page information	Page 104 (TT-2005)

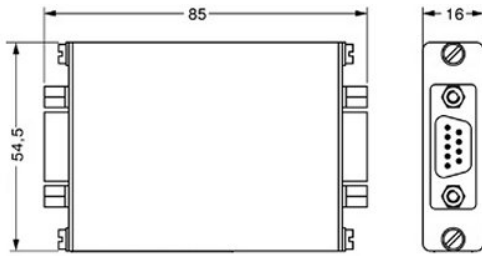


Drawings

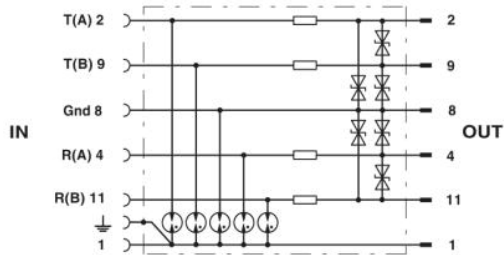
Diagram



Dimensioned drawing



Circuit diagram



## D-UFB-V11/BS-B

Order No.: 2796121

The illustration shows version D-UFB-V11/BS-S



Attachment plug with surge protection for V.11 interface. Connection:  
D-SUB-15 female/male connector, installation in lines

### Commercial data

EAN	4017918073312
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.1088 KG
Catalog page information	Page 126 (TT-2007)

### Technical data

#### General

Housing material	Aluminum
Color	black
Standards for air and creepage distances	VDE 0110-1
	IEC 60664-1: 1992-10

Total surge current (8/20) $\mu$ s	10 kA
Ambient temperature (operation)	-40 °C ... 60 °C
Mounting type	Connection-specific intermediate plugging
Design	Attachment plug
Degree of protection	IP20
Direction of action	Line-Line & Line-Signal Ground/Shield & Signal Ground/Shield-Earth Ground
Width	24.50 mm
Height	54.50 mm
Length	84.60 mm

**Protective circuit**

IEC category	C1
	C2
	C3
	D1
VDE requirement class	C1
	C2
	C3
	D1
Arrester rated voltage $U_c$	12 V DC
Arrester rated voltage $U_c$ (Core-Core)	12 V DC
Arrester rated voltage $U_c$ (Core-GND)	12 V DC
Nominal current $I_N$	175 mA (25°C)
Operating effective current $I_c$ at $U_c$	$\leq 10 \mu$ A
Discharge current to PE at $U_c$	$\leq 4 \mu$ A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Core)	5 kA
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Earth)	5 kA
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-GND)	5 kA
Total surge current (8/20) $\mu$ s	10 kA
Output voltage limitation at 1 kV/ $\mu$ s (Core-Core) spike	$\leq 22$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) spike	$\leq 600$ V

Output voltage limitation at 1 kV/ $\mu$ s (Core-Core) static	$\leq 22$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) static	$\leq 600$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-GND) static	$\leq 22$ V
Residual voltage at $I_n$ , (conductor-conductor)	$\leq 17$ V
Residual voltage at $I_n$ , (conductor-GND)	$\leq 33$ V
Protection level $U_p$ (Core-Core)	$\leq 25$ V (C2 (4 kV/2 kA))
	$\leq 30$ V (C2 (10 kV/5 kA))
Protection level $U_p$ (Core-Earth)	$\leq 700$ V (C2 (10 kV/5 kA))
Protection level $U_p$ (Core-GND)	$\leq 30$ V (C2 (4 kV/2 kA))
Response time $t_A$ (Core-Core)	$\leq 1$ ns
Response time $t_A$ (Core-Earth)	$\leq 1$ ns
	$\leq 100$ ns
Input attenuation aE, sym.	3.2 dB ( $\leq 1$ MHz)
	0.4 dB ( $\leq 600$ kHz)
Input attenuation aE, asym.	1.7 dB ( $\leq 1$ MHz)
	0.1 dB ( $\leq 600$ kHz)
Cut-off frequency $f_g$ (3 dB), sym. in 50 Ohm system	Typ. 5 MHz
Cut-off frequency $f_g$ (3 dB), sym. in 600 Ohm system	Typ. 500 kHz
Cut-off frequency $f_g$ (3 dB), asym. (PE) in 50 Ohm system	Typ. 5 MHz
Cut-off frequency $f_g$ (3 dB), asym. (PE) in 600 Ohm system	Typ. 500 kHz
Resistance in series	22 $\Omega$
Surge carrying capacity in acc. with IEC 61643-21 (Core-Core)	C2 (10 kV/5 kA)
Surge carrying capacity in acc. with IEC 61643-21 (Core-Earth)	C2 (10 kV/5 kA)
	D1 (2.5 kA)
<b>Connection data</b>	
Type of connection	D-SUB-15
Connection type IN	D-SUB-15 socket
Connection type OUT	D-SUB-15 connector
Connection method	V.11

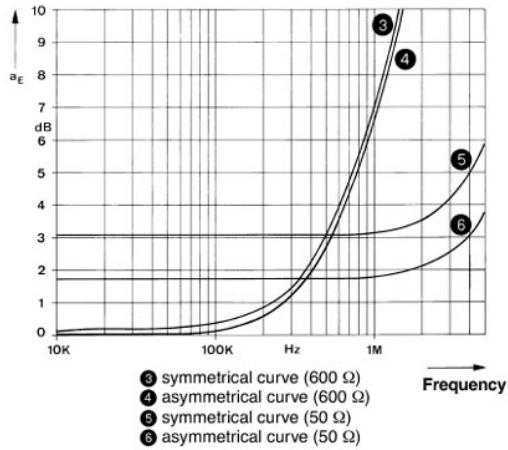
**Connection, protective circuit**

Standards/regulations

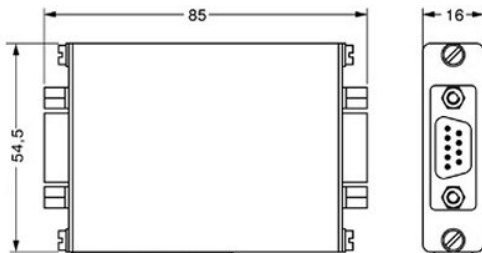
IEC 61643-21

**Drawings**

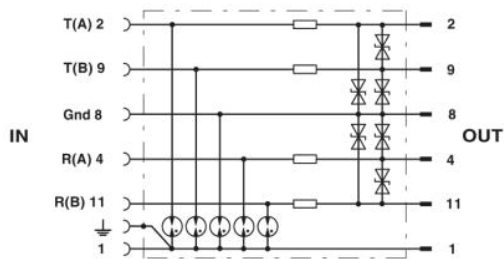
Diagram



Dimensioned drawing



Circuit diagram



## CN-UFB- 5DC/E-LAN

This item is no longer available. Should you have any questions, please contact our Sales Team.

Order No.: 2809490



Attachment connector with surge protection for LAN interfaces.  
Connection: N connector female/male connector

### Commercial data

EAN	4017918076443
Pack	10 pcs.
Customs tariff	85363010
Weight/Piece	0.15138 KG
Catalog page information	Page 98 (TT-2005)

### Technical data

#### General

Color	black
Standards for air and creepage distances	DIN VDE 0110-1 IEC 60664-1: 1992-10
Surge voltage category	II
Pollution degree	2
Ambient temperature (operation)	-40 °C ... 80 °C
Mounting type	Connection-specific intermediate plugging
Design	Attachment plug
Degree of protection	IP20
Direction of action	Line-Signal Ground/Shield & Signal Ground/Shield-Earth Ground

Width	25.40 mm
Height	96.00 mm
Length	25.40 mm
<b>Protective circuit</b>	
IEC category	C2
	C3
	D1
VDE requirement class	C2
	C3
	D1
Arrester rated voltage $U_c$ (Core-Earth)	0.5 V DC
	-7.5 V DC
Nominal current $I_N$	500 mA (25°C)
Operating effective current $I_c$ at $U_c$	$\leq 100 \mu\text{A}$
Discharge current to PE at $U_c$	$\leq 1 \mu\text{A}$
Nominal discharge surge current $I_n$ (8/20) $\mu\text{s}$ (Core-Earth)	10 kA
Nominal discharge surge current $I_n$ (8/20) $\mu\text{s}$ (Core-Shield)	10 kA
Nominal pulse current $I_{an}$ (10/1000) $\mu\text{s}$ (Core-Earth)	100 A
Nominal pulse current $I_{an}$ (10/1000) $\mu\text{s}$ (Core-Shield)	100 A
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Core) spike	$\leq 12 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Earth) spike	$\leq 600 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Shield) spike	$\leq 25 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Earth) static	$\leq 12 \text{ V}$
Residual voltage at $I_n$ , (conductor-ground)	$\leq 70 \text{ V}$ (at PE conductor length: 2 cm)
	$\leq 160 \text{ V}$ (at PE conductor length: 30 cm)
	$\leq 400 \text{ V}$ (at PE conductor length: 150 cm)
Residual voltage at $I_n$ , (conductor-shield)	$\leq 12 \text{ V}$
	$\leq -25 \text{ V}$

Residual voltage with $I_{an}$ (10/1000) $\mu$ s (conductor-ground)	$\leq 12$ V (at PE conductor length: 2 cm)
	$\leq 15$ V (at PE conductor length: 30 cm)
	$\leq 20$ V (at PE conductor length: 150 cm)
	$\leq 1.5$ V
	$\leq -12$ V
Response time $t_A$ (Core-Earth)	$\leq 100$ ns
Response time $t_A$ (Core-GND)	$\leq 1$ ns
Input attenuation $a_E$ , asym.	0.3 dB (up to 40 MHz, 50 $\Omega$ system)
Cut-off frequency $f_g$ (3 dB), asym. (shield) in 50 Ohm system	200 MHz
Capacity (Core-Earth)	2 pF
Capacity asymmetrical (shield)	25 pF (1 MHz)
Resistance in series	2.35 $\Omega \pm 10$ %

**Connection data**

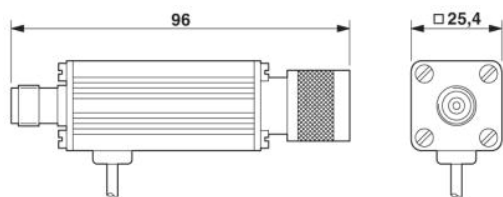
Type of connection	N connector 50 $\Omega$
Connection type IN	N connector
Connection type OUT	N connector

**Connection, protective circuit**

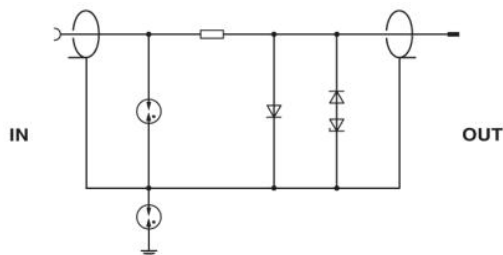
Standards/regulations	IEC 68-1
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**Drawings**

Dimensioned drawing



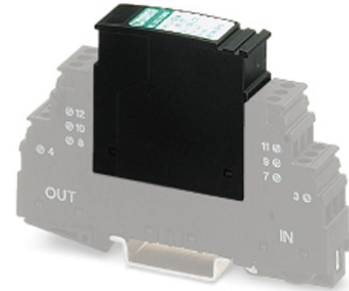
Circuit diagram





## PT 2-ISDN-NT-ST

Order No.: 2858098



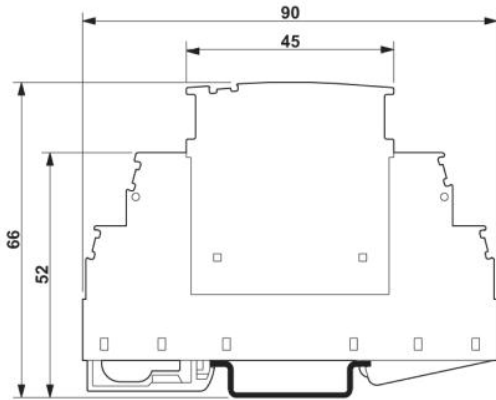
Surge protection plug for base element, for the protection of a double wire of the Uko interface (ISDN).

### Commercial data

EAN	4017918890803
Pack	10 pcs.
Customs tariff	85363090
Weight/Piece	0.02019 KG
Catalog page information	Page 117 (TT-2005)

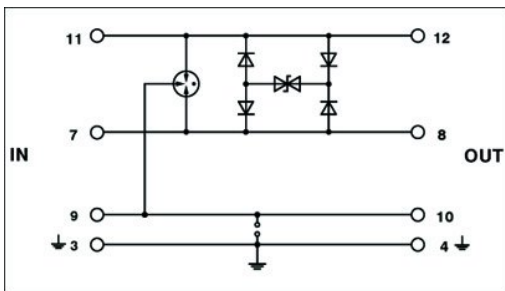
## Drawings

### Dimensioned drawing



The figure shows the complete module consisting of a base element and connector

### Circuit diagram



## DT-LAN-CAT.6+

Order No.: 2881007



RJ45 attachment plug with surge protection for LAN interfaces Can be alternatively snapped onto DIN rails.

### Commercial data

EAN	4046356151900
Pack	1 pcs.
Customs tariff	85363010
Weight/Piece	0.3145 KG
Catalog page information	Page 139 (TT-2009)

### Technical data

#### General

Housing material	Zinc die-cast
Color	Silver/black

Standards for air and creepage distances	VDE 0110-1
	IEC 60664-1: 1992-10
Total surge current (8/20) $\mu$ s	10 kA
Ambient temperature (operation)	-40 °C ... 85 °C
Mounting type	Connection-specific attachment plug and DIN rail, 35 mm
Design	Attachment plug for DIN rail mounting
Number of positions	8
Degree of protection	IP20
Direction of action	Line-Line & Line-Ground/Shield
Width	25.00 mm
Height	63.00 mm
Length	103.00 mm

**Protective circuit**

IEC category	B2
	C1
	C2
	C3
	D1
VDE requirement class	B2
	C1
	C2
	C3
	D1
Arrester rated voltage $U_c$	$\leq 3.3$ V DC
Arrester rated voltage $U_c$ (Core-Core)	$\leq 3.3$ V DC ( $\pm 60$ V DC / PoE)
Arrester rated voltage $U_c$ (Core-Earth)	$\leq 180$ V DC
Nominal current $I_N$	$\leq 1.5$ A ( $\leq 25^\circ\text{C}$ )
Operating effective current $I_c$ at $U_c$	$\leq 1$ $\mu$ A
Discharge current to PE at $U_c$	$\leq 8$ $\mu$ A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Core)	100 A
Nominal discharge surge current $I_n$ (8/20) $\mu$ s (Core-Earth)	2 kA (per signal pair)
Total surge current (8/20) $\mu$ s	10 kA
Nominal pulse current $I_{an}$ (10/700) $\mu$ s (Core-Core)	$\leq 40$ A

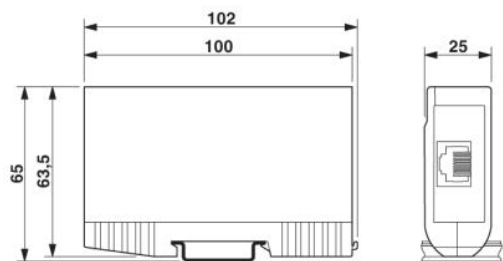
Nominal pulse current $I_{an}$ (10/700) $\mu$ s (Core-Earth)	$\leq 160$ A
Output voltage limitation at 1 kV/ $\mu$ s (Core-Core) spike	$\leq 85$ V (PoE)
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) spike	$\leq 700$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Core) static	$\leq 9$ V
Output voltage limitation at 1 kV/ $\mu$ s (Core-Earth) static	$\leq 700$ V
Residual voltage at $I_{n,}$ (conductor-conductor)	$\leq 15$ V
	$\leq 100$ V (PoE)
Protection level $U_p$ (Core-Core)	$\leq 9$ V (B2 (1 kV/25 A) )
	$\leq 100$ V (B2 (1 kV/25 A) - PoE)
	$\leq 15$ V (500 V/100 A)
Protection level $U_p$ (Core-Earth)	$\leq 600$ V (B2 ( )
	$\leq 700$ V (C2 (4 kV/2 kA))
Response time $t_A$ (Core-Core)	$\leq 1$ ns
Response time $t_A$ (Core-Earth)	$\leq 100$ ns
Input attenuation $a_E$ , sym.	1 dB ( $\leq 250$ MHz)
Near-end crosstalk attenuation	$\leq 35$ dB (At 250 MHz / 100 $\Omega$ )
Cut-off frequency $f_g$ (3 dB), sym. in 100 Ohm system	$> 500$ MHz
Capacity (Core-Core)	Typ. 12 pF ( $f= 1$ MHz / $V_R= 0$ V)
Capacity (Core-Earth)	Typ. 2 pF ( $f= 1$ MHz / $V_R= 0$ V)
Surge carrying capacity in acc. with IEC 61643-21 (Core-Core)	B2 (1 kV/25 A)
Surge carrying capacity in acc. with IEC 61643-21 (Core-Earth)	B2 (4 kV / 100 A)
	C2 (4 kV / 2 kA)
	D1 (1 kA)
<b>Connection data</b>	
Type of connection	RJ45
Connection type IN	RJ45 female connector
Connection type OUT	RJ45 female connector
<b>Connection, equipotential bonding</b>	
Type of connection	Cable connection

**Connection, protective circuit**

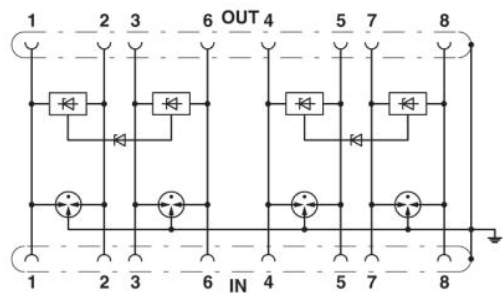
Standards/regulations	IEC 61643-21
	EN 50173-1
	ISO/IEC 11801-Am.1

**Drawings**

Dimensioned drawing



Circuit diagram



## PT 2-TELE

Order No.: 2882828



Surge protection plug, consisting of plug and base element, for protecting a double conductor of analog telecommunication interfaces.

### Commercial data

EAN	4046356115148
Pack	10 pcs.
Customs tariff	85363010
Weight/Piece	0.06555 KG
Catalog page information	Page 153 (TT-2009)

### Product description

Surge protection plug for DIN rail mounting, 2-section pluggable, normal mode voltage coarse and fine protection for 2-conductor analog telecommunication interface as well as common mode voltage coarse protection to ground.

## Technical data

### General

Housing material	PA
Inflammability class acc. to UL 94	V0
Color	black
Standards for air and creepage distances	VDE 0110-1
	IEC 60644-1
Total surge current (8/20) $\mu$ s	20 kA
Ambient temperature (operation)	-40 °C ... 85 °C
Mounting type	DIN rail 35 mm
Design	DIN rail module, two-section, divisible
Number of positions	2
Degree of protection	IP20
Direction of action	Line-Line & Line-Earth Ground
Width	17.70 mm
Height	65.50 mm
Length	90.00 mm
Pitch unit	1 Div.

### Protective circuit

IEC category	C1
	C2
	C3
	D1
	B2
	VDE requirement class
C2	
C3	
D1	
B2	
Arrester rated voltage $U_c$	
	130 V AC
Arrester rated voltage $U_c$ (Core-Core)	185 V DC
	130 V AC



Arrester rated voltage $U_c$ (Core-Earth)	185 V DC
	130 V AC
Nominal current $I_n$	450 mA (Up to 45°C)
Operating effective current $I_c$ at $U_c$	$\leq 10 \mu\text{A}$
Discharge current to PE at $U_c$	$\leq 10 \mu\text{A}$
Nominal discharge surge current $I_n$ (8/20) $\mu\text{s}$ (Core-Core)	10 kA
Nominal discharge surge current $I_n$ (8/20) $\mu\text{s}$ (Core-Earth)	10 kA
Total surge current (8/20) $\mu\text{s}$	20 kA
Max. discharge surge current $I_{\text{max}}$ (8/20) $\mu\text{s}$ maximum (Core-Earth)	18 kA
Nominal pulse current $I_{\text{an}}$ (10/700) $\mu\text{s}$ (Core-Core)	100 A
Nominal pulse current $I_{\text{an}}$ (10/700) $\mu\text{s}$ (Core-Earth)	100 A
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Core) static	$\leq 300 \text{ V}$
Output voltage limitation at 1 kV/ $\mu\text{s}$ (Core-Earth) static	$\leq 300 \text{ V}$
Residual voltage at $I_n$ , (conductor-conductor)	$\leq 160 \text{ V}$ (C2 (5kA))
Residual voltage at $I_n$ , (conductor-ground)	$\leq 200 \text{ V}$ (C2 (5kA))
Response time $t_A$ (Core-Core)	$\leq 500 \text{ ns}$
Response time $t_A$ (Core-Earth)	$\leq 500 \text{ ns}$
Input attenuation aE, sym.	Typ. 0.2 dB (Up to 5 MHz)
Cut-off frequency $f_g$ (3 dB), sym. in 100 Ohm system	Typ. 70 MHz
Capacity (Core-Core)	Typ. 30 pF
Capacity (Core-Earth)	Typ. 30 pF
Resistance in series	2.2 $\Omega$ $\pm 10 \%$
Surge carrying capacity in acc. with IEC 61643-21 (Core-Core)	B2 (4 kV / 100 A)
	C1 (1 kV / 500 A)
	C2 (10 kV/5 kA)
	C3 (2 kV / 25 A)
	D1 (1 kA)

Surge carrying capacity in acc. with IEC 61643-21 (Core-Earth)	B2 (4 kV / 100 A)
	C1 (1 kV / 500 A)
	C2 (10 kV/5 kA)
	C3 (2 kV/25 A)
	D1 (1 kA)

**Connection data**

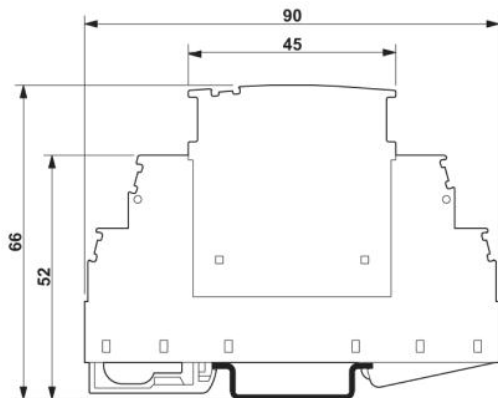
Type of connection	Screw connection
Connection type IN	Screw terminal blocks
Connection type OUT	Screw terminal blocks
Screw thread	M3
Tightening torque, min	0.8 Nm
Stripping length	8 mm
Conductor cross section stranded min.	0.2 mm <sup>2</sup>
Conductor cross section stranded max.	2.5 mm <sup>2</sup>
Conductor cross section solid min.	0.2 mm <sup>2</sup>
Conductor cross section solid max.	4 mm <sup>2</sup>
Conductor cross section AWG/kcmil min.	24
Conductor cross section AWG/kcmil max	12

**Connection, protective circuit**

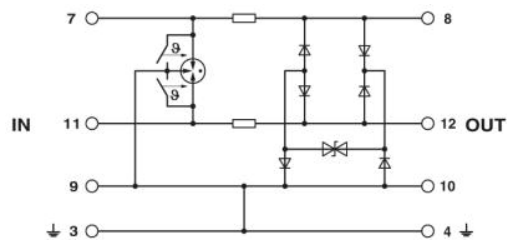
Standards/regulations	IEC 61643-21
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**Drawings**

Dimensioned drawing



Circuit diagram



## DATATRAB D-LAN-CAT.5E

# Features

- Permanently connected equipotential bonding cable (ground connection)
- Multifunctional protection circuit – all 8 signal conductors are protected
- EMC-suitable housing
- Connection conforming to the system for ETHERNET, Token Ring, FDDI/CDDI...
- Connecting jumper included



DATATRAB **D-LAN-CAT.5E** is a surge protection device for the most popular high-speed data transmission systems. The circuit of this multi-functional surge arrester protects all 8 signal paths that are connected via the RJ 45 connector therefore providing protection for Ethernet, Token Ring and CDDI (FDDI) network interfaces. The protection adapter fulfills the increased performance requirements for transmission quality in accordance with Cat. 5e (enhanced Cat. 5). This means that even in the case of transmission rates up to 100 mbps, data is transmitted reliably without signal attenuation.

The protection adapter has an RJ 45 socket for network connection, and a short connecting line with RJ 45 plug for the data line connection on the terminal. A cable marked with "ground" is guided out of the adapter housing for the ground connection.

For installation on a DIN rail, a version with snap-on foot is available. The protective device can therefore be used with industrial Ethernet terminals to meet control cabinet requirements.

The ground connection must be made along the shortest possible route with the conductor marked with (⊥) that leads out of the adapter housing. The conductor must be trimmed to the length required.

## DATATRAB D-LAN-19"

- Multifunctional protection circuit – all 8 signal conductors are protected
- EMC-suitable housing
- Connection conforming to the system for ETHERNET, Token Ring, FDDI/CDDI...
- Fast and simple connection by complete front wiring
- Protection modules for 4-24 ports



DATATRAB **D-LAN-19"** is a surge protection device that protects up to 24 ports of a LAN distribution. Protection for up to 24 LAN ports with RJ 45 connection is accommodated in just one height unit (1U). The protection device should preferably be installed in the switch cabinet. D-LAN-19" protects all 8 signal conductors of a data cable and is suitable for the network interfaces in Ethernet, Token Ring and CDDI (FDDI). The surge protection device fulfills the increased performance requirements for transmission quality in accordance with Class D (Cat. 5e; enhanced Cat 5). This means that even in the case of transmission rates up to 100 mbps, data is transmitted reliably and in accordance with current standards.

The building cabling is connected to the lower RJ 45 sockets (IN) and the data cables leading to the Switch/HUB are connected to the upper RJ 45 sockets (OUT). The housing can be grounded

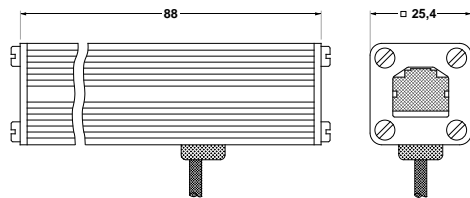
- Directly via a connection on the housing, or
- Indirectly via a gas-filled surge arrester in the housing.

# D-LAN-CAT.5E

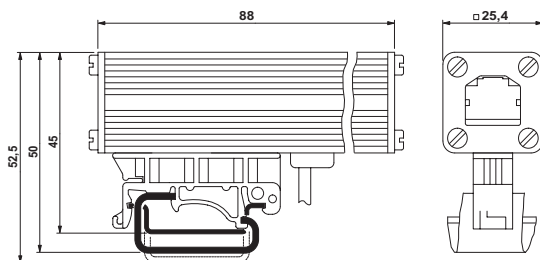
Universal protection adapter with RJ 45 connector, Class D/Cat.5e



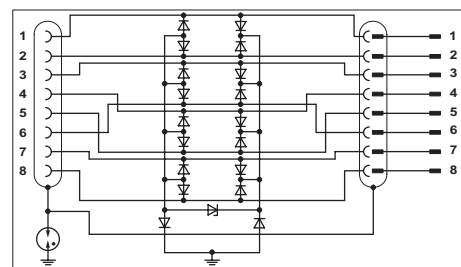
Description	Type	Order No.	Pcs. Pkt.
<b>DATATRAB adapter,</b> protection adapter to be inserted into the data line for the protection of the LAN interface incl. RJ 45 cable	<b>D-LAN-CAT.5E</b>	<b>28 58 99 1</b>	<b>1</b>
<b>DATATRAB adapter,</b> as above, however with universal foot, without RJ 45 cable, for mounting on	<b>D-LAN-CAT.5E-U</b>	<b>28 59 08 4</b>	<b>1</b>
<b>RJ 45 cable for D-LAN-CAT.5E-U,</b> Cat.5, FTP, 2 x 2 x 0.14 mm <sup>2</sup> with RJ 45 connector on both sides	<b>D-C/RJ45-8/0,5</b> <b>D-C/RJ45-8/1,5</b>	<b>28 38 69 4</b> <b>28 18 19 3</b>	<b>1</b> <b>1</b>
<b>Technical data</b>			
IEC category/VDE requirement class:	B3, C1, C2, C3, D1		
Max cont. operating voltage: MCOV: U <sub>C</sub>	7 V DC		
Max. cont. operating current I <sub>N</sub>	1.5 A/ 25 °C		
Nom. discharge surge curr. I <sub>n</sub> (8/20)μs:	Core-Core/Core-↓	350 A/2.5 kA	
Total surge current (8/20)μs:	Core-↓	2.5 kA	
Limiting (clamping) voltage at 1 kV/ μs:	Core-Core/	≤ 22 V/≤ 700 V	
Residual voltage at I <sub>n</sub> :	Core-Core/Core-↓	≤ 45 V/≤ 45 V	
Response time t <sub>a</sub> :	Core-Core/Core-↓	≤ 500 ns/≤ 100 ns	
Input attenuation a <sub>i</sub> in a 100/150 Ω system (typ.):	1 dB to 100 MHz		
<b>General technical data</b>			
Temperature range:	- 40 °C to + 80 °C		
Connection data:	IN / OUT	RJ45 socket/ RJ45 socket	
Degree of protection in acc. with IEC 60529/EN 60529:	IP 20		
Based on test standards:	IEC 61643-21:2000-09, UL 497B, IEEE C 62.36		



Dimensional drawing D-LAN-CAT5.E



Dimensional drawing D-LAN-CAT5.E-U



# D-LAN-19''

19" rack with RJ 45 connector,  
Class D/Cat.5e



Description	Type	Order No.	Pcs. Pkt.	
<b>DATATRAB 19" rack,</b> LAN protective device in a 19" rack to be inserted into the data line	24 ports	<b>D-LAN-19"-24</b>	28 38 79 1	1
	20 ports	<b>D-LAN-19"-20</b>	28 80 13 4	1
	16 ports	<b>D-LAN-19"-16</b>	28 80 14 7	1
	12 ports	<b>D-LAN-19"-12</b>	28 80 15 0	1
	8 ports	<b>D-LAN-19"-8</b>	28 80 16 3	1
	4 ports	<b>D-LAN-19"-4</b>	28 80 17 6	1

Technical data	
IEC category/VDE requirement class:	B3, C1, C2, C3, D1
Max. cont. operating voltage: MCOV: $U_C$	6 V DC
Max. cont. operating current: $I_N$ :	1.5 A/ 25 °C
Nom. discharge surge curr. $I_n$ (8/20) $\mu$ s: Core-Core/Core- $\downarrow$	350 A/2.5 kA
Total surge current (8/20) $\mu$ s: Core- $\downarrow$	5 kA
Limiting (clamping) voltage at 1 kV/ $\mu$ s: Core-Core/	$\leq 20$ V/ $\leq 700$ V
Residual voltage at $I_n$ : Core-Core/Core- $\downarrow$	$\leq 65$ V/ $\leq 50$ V or 220 V with Varistor
Response time $t_d$ : Core-Core/Core- $\downarrow$	$\leq 500$ ns/ $\leq 100$ ns
Input attenuation $a_1$ in a 100/150 $\Omega$ system (typ.):	1 dB to 100 MHz

General technical data	
Temperature range:	- 40 °C to + 80 °C
Connection data: IN / OUT	RJ45 Socket / RJ45 Socket
Degree of protection in acc. with IEC 60529/EN 60529:	IP 20
Based on test standards:	IEC 61643-21:2000-09, UL 497B, IEEE C62.36

