Surge Protection for Data/Signal Lines



Users of electronic communications equipment such as telephones, instrumentation and control, and data-processing systems must face the problem of keeping these systems operational despite an environment where surges and transient over-voltages are an ever present source of equipment damage and operational downtime.

There are several contributors to this problem:

- The high level of integration of electronic components in today's equipment makes it particularly susceptible to damage from overvoltages.
- Interruptions of service and operational downtime are one of the biggest contributors to loss in revenue.
- Data transmission networks cover large areas and as such are inherently exposed to voltage pickup and disturbances.

The Surge Protection Device (SPD) is a recognized and effective solution to the over-voltage problem. To perform correctly, it must be chosen to meet both the risk exposure and the operating conditions.

The following catalog provides guidance on such selection.

The quality of our products is maintained by means of regular testing. At the same time the acquired ISO 9001 certificate and strict supervision enable us to achieve the highest quality of products and our customers' satisfaction.

As a ISO 9001 certified company we are committed to the work of international standardization both in efforts to make the development, manufacturing and supply of our products more efficient, safer and cleaner, and in their ability to make trade between countries easier and fairer. Attention to quality at Iskra Zaščite is in grained in all employees. We recognize that in the competitive environment we now find ourselves in, quality must be fundamental to our corporate culture if we are to succeed. We realize that the synergies that come from a quality product and a strong partnership with our customers are the core to our continued growth.









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QUICK PRODUCT SELECTION Surge Protective Devices for Data/Signal Systems

Product	Description	Product Name	Page	Product Photo	Connection/Signal
Cloup					
Data/Signal Lines	 Universal Single-pair Data SPD for Shielded Cables Coarse and Fine Protection 	SMH-SH	13	NEW	- 20 mA current loop - Analogue tel. line - RS 232, - RS 422, - V.11, - RS 485 - Thermal probe PT 100, - TTL
	 Universal Single-pair Data SPD for Shielded Cables Coarse and Fine Protection 	SMH-RC	14	NEW	- 20 mA current loop - Analogue tel. line - RS 232, - RS 422, - V.11, - RS 485 - Thermal probe PT 100, - TTL
	 Single-pair SPD; 2-pair SPD Coarse and Fine Protection limp= 5kA/per pair 	SMI, SMI2	15	NEW	- 20 mA current loop - Analogue tel. line - RS 232, - RS 422, - V.11, - RS 485 - Thermal probe PT 100, - TTL
	 Universal Single-pair Data SPD Coarse and Fine Protection Over-current Protection 	SMH-TC	16	and the second s	- 20 mA current loop - Analogue tel. line - RS 232, - RS 422, - V.11, - RS 485 - Thermal probe PT 100, - TTL
	 Universal 2-pair Data SPD Coarse and Fine Protection Over-current Protection 	SMH2-TC	17	(j)	- 20 mA current loop - Analogue tel. line - RS 232, - RS 422, - V.11, - RS 485 - Thermal probe PT 100, - TTL
	 Compact Universal Single-pair Data SPD Coarse and Fine Protection 	NMH-TC	18		- 20 mA current loop - Analogue tel. line - RS 232, - RS 422, - V.11, - RS 485 - Thermal probe PT 100, - TTL
	Compact Universal 2-pair Data SPD Coarse and Fine Protection	NMH2-TC	19		- 20 mA current loop - Analogue tel. line - RS 232, - RS 422, - V.11, - RS 485 - Thermal probe PT 100, - TTL
	 Single-pair SPD, 2-pair SPD Coarse and Fine Protection Over-current Protection 	IM-TD	20		- 20 mA current loop - Analogue tel. line - RS 232, - RS 422, - V.11, - RS 485 - Thermal probe PT 100, - TTL
	 Single-pair SPD Coarse and Fine Protection 	ІМН-ТС	22		- 20 mA current loop - Analogue tel. line - RS 232, - RS 422, - V.11, - RS 485 - Thermal probe PT 100, - TTL
	 Single-pair Data SPD Coarse and Fine Protection Insulation Resistance to Earth Separated signal ground (RS232) 	SMH-SG	24	A LO BERT	- Analogue tel. line - RS 232, - RS 485 - Thermal probe PT 100
	 Single-pair SPD Coarse and Fine Protection Insulation Resistance to Earth 	VMS-TC	25		- Analogue tel. line - RS 485 - Thermal probe PT 100
	 Single-pair SPD Coarse and Fine Protection 	VMO	27		- 20 mA current loop - Analogue tel. line - RS 232, - RS 422, - V.11, - RS 485 - Thermal probe PT 100, - TTL
	 Single-pair SPD Coarse Protection Only Coordination Elements 	SMH-TDR	29	a land	- Analogue tel. line
	 2-pair SPD Coarse Protection only Coordination Elements 	SMH2-TDR	30	A STREET	- Analogue tel. Line
	 Single-pair SPD Coarse Protection only Coordination Elements 	VM-TDR	31		- Analogue tel. Line



TECHNICAL CHARACTERISTICS

Un	Uc	ار at 25°C	In (8/20)	Imax (8/20)	Housing IP 20
(V _{DC})	(V _{DC})	(A)	(kA)	(kA)	DIN 43880
5, 12, 15, 24, 30, 48, 60, 110	6, 15, 18, 28, 33, 52, 64, 170	1	10	20	Modular 12mm
5, 12, 15, 24, 30, 48, 60, 110	6, 15, 18, 28, 33, 52, 64, 170	1	10	20	Modular 12mm
5, 12, 15, 24, 30, 48, 60, 110	6, 15, 18, 28, 33, 52, 64, 170	1	20	30	Modular 12mm
5, 12, 15, 24, 30, 48, 60, 110	6, 15, 18, 28, 33, 52, 64, 170	1	10	20	Modular 12mm
5, 12, 15, 24, 30, 48, 60, 110	6, 15, 18, 28, 33, 52, 64, 170	1	10	20	Modular 12mm
5, 12, 15, 24, 30, 48, 60, 110	6, 15, 18, 28, 33, 52, 64, 170	1	10	20	Compact 12mm
5, 12, 15, 24, 30, 48, 60, 110	6, 15, 18, 28, 33, 52, 64, 170	0.8	10	20	Compact 12mm
5, 12, 15, 24, 30, 48, 60, 110	6, 15, 18, 28, 33, 52, 64, 170	0.145, 1	10	20	Modular 1TE
5, 12, 15, 24, 30, 48, 60, 110	6, 15, 18, 28, 33, 52, 64, 170	1	10	20	Modular 1TE
5, 12, 15, 24, 30, 48, 60, 110	6, 15, 18, 28, 33, 52, 64, 170	1	10	20	Modular 12mm
5, 12, 15, 24, 30, 48, 60, 110	6, 15, 18, 28, 33, 52, 64, 170	1	10	20	Modular 1TE
5, 12, 15, 24, 30, 48, 60, 110	6, 15, 18, 28, 33, 52, 64, 170	1	20	30	Modular 1TE
110	170	0.3	10	20	Modular 12mm
110	170	0.3	10	20	Modular 12mm
110	170	0.3	10	20	Modular 1TE

QUICK PRODUCT SELECTION Surge Protective Devices for Data/Signal Systems

Product Group	Description	Product Name	Page	Product Photo	Connection/Signal
Data/Signal Lines	Single-pair SPDFine Protection only	SMH2-DF	32	NEW	- 20 mA current loop
	 Single-pair SPD Fine Protection only 	IM-VF	33	NEW	- 20 mA current loop
	Single-pair SPDFine Protection only	IM-DF	34	and the second	- 20 mA current loop
	 Single-pair SPD Coarse and Fine Protection Increased Sparkover Voltage Overcurrent Protection 	SMH-20K	35		- Analogue tel. Line - 20 mA current loop - Thermal probe PT 100
	 2-pair SPD Coarse and Fine Protection Increased Sparkover Voltage Overcurrent Protection 	SMH2-20K SMH2-20D	36		- Analogue tel. Line - 20 mA current loop - Thermal probe PT 100
	 SPD for DC power supplies and data lines (CAN bus) Coarse and Fine Protection Over-current Protection 	SMH-TC+PS	37		- DC power supply + 1 data line - CAN bus
	 Single-pair SPD, PCB assembly Coarse and Fine Protection Over-current Protection 	LZ-SMH	38	ALCON OF	- 20 mA current loop - Analogue tel. line - RS 232, - RS 422, - V.11, - RS 485 - Thermal probe PT 100, - TTL
xDSL Technologies	 Single-pair SPD For xDSL Transmission Coarse and Fine Protection 	IM-xDSL	39		- Analogue tel. line - xDSL (VDSL class 1 only)
DC Power Supplies	 Single-pair SPD for xDSL transmission For DC Power Supplies Coarse and Fine Protection 	SMH-PS	41	a set of	- DC power system
	 Single-pair SPD For DC Power Supplies Coarse and Fine Protection 	VM-DC	42		- DC power system
	• SPD for DC Power Supplies • Class I/Type 1/B • limp= 10kA • Mechanical Flag + Remote Contacts (R)	DC PROTEC B(R) 10	43		- DC power system
	SPD for DC Power Supplies Class II/Type 2/C Mechanical Flag + Remote Contacts (R)	DC PROTEC C(R) 40	44		- DC power system
	 DC and AC Power Supplies Class III / Type 3 / D U_{OC}/I_{SC} (1.2/50, 8/20)= 4kV/2kA, 6kV/3kA Remote contacts + LED 	PROTEC DMDR 20	45	NEW	- DC and AC power system
	 Single-pole SPD Class II/Type 2/C Mechanical Flag + Remote Contacts (R) 	PROTEC C(R) 40	46		- DC and AC power system
	 Single-pole SPD Class II/Type 2/C Mechanical Flag + Remote Contacts (R) 	PROTEC CN(R) 40	47		- DC and AC power system



TECHNICAL CHARACTERISTICS

U _n	U _c	IL at 25⁰C	In (8/20)	Imax (8/20)	Housing IP 20 Dimensions
(VDC)	(VDC)	(A)	(KA)	(\\\\)	DIN 43000
5, 12, 24, 60	7, 15, 28, 64	1	0.5	1	Modular 12mm
24	31	10	0.5	1	Compact 6mm
5, 12, 24, 60	7, 15, 28, 64	10	0.5, 0.5, 0.25, 0.1	1	Compact 6mm
230	320	5	10	20	Modular
24, 60	28, 64	0.145	10	20	1211111
230	320	5	10	20	Modular
24, 60	28, 64	0.145	10	20	1211111
24	28	1	10	20	Modular 12mm
12, 24	15, 28	1	10	20	1
120	170	0.2	10	20	Modular 1TE
12, 24, 48	15, 28, 52	4	10	20	Modular 12mm
12, 24	15, 28	10	10	20	Modular 1TE
24, 48	30, 60	Ι	20	60	Compact 4TE
24, 48	30, 60	Ι	20	40	Compact 2TE
24, 48, 60, 120	34/44, 60, 75, 150V _{AC/DC}	Ι	1.2, 2.5, 2.5, 4	3, 6, 6, 10	Modular 1TE
I	75/100V _{AC/DC}	I	20	40	Modular 1TE
I	75/100V _{AC/DC}	I	20	40	Compact 1TE

QUICK PRODUCT SELECTION

Surge Protective Devices for Data/Signal Systems

Product Group	Description	Product Name	Page	Product Photo	Connection/Signal
Data Protocol	 4-wire (2 lines) Data SPD designed for RS-485 Coarse and Fine Protection 	VM-RS	48		- RS 422 - V.11 - RS 485
	D-SUB, 9-pole SPD All Pins Protected	IM-DB 9	50	O	- RS 232
	 D-SUB, 15-pole SPD Coarse and Fine Protection 	IM-DB 15RS	51		- RS 422 - V.11 - X.21
Local Area Networks	 LAN Protector (1 way) All 4 Pairs Protected Freq. < 100MHz, Cat. 5 Capable Termination: RJ45, Cat 5 Connectors 	LZ-NET LZ-NET POE LZ-NET STP	52	C	- LAN (up to Cat. 5)
	 LAN Protector (1 way) All 4 Pairs Protected Freq. < 250MHz, Cat 6 Capable Termination: RJ45, Shielded 	LZ-NET 6	53		- LAN (up to Cat. 6)
	• LAN Protector • 19" Rack Patch Panel up to 24 way • All 4 Pairs Protected • Freq. < 100MHz, Cat. 5 Capable • Termination: RJ45, Cat 5 Connectors	LZ-24NET 19 LZ-24NET 19 PoE	54		- LAN (up to Cat. 5)
	Combined POWER/LAN Protector All 4 Pairs in the UTB Protected Freq. < 100MHz, Cat. 5 Capable Termination: RJ45, Cat 5 Connectors	ZE 200 NET	55		- LAN (up to Cat. 5)
Combined Plug-in Surge Protection	Combined POWER/LAN Protector All 4 Pairs in the UTB Protected Freq. < 100MHz, Cat. 5 Capable Termination: RJ45, Cat. 5 Connectors Compact, Ergonomic Packaging	ZES-76 TEL-TV	56	to an	- TV, telephone line
	Combined POWER/DATA Protector Coax Protected Tel. Protected Termination: RJ11, IEC Connector Compact, Ergonomic Packaging	ZES-7 TEL-TV	57	A see co	- TV, telephone line
	Combined POWER/DATA Protector Coax Protected Tel. Protected Termination: RJ11, IEC Connector Master-slave Function	ZES 1M+5S	58	() () () () () () () () () () () () () (- TV, telephone line
	Combined POWER/DATA Protector Coax Protected Tel. Protected Termination: RJ11, IEC Connector Master-slave Function (USB, Hub)	ZES 1M+4S TEL-NET USB Hub	59	HAR CCCCC	- TV, telephone line - LAN (up to Cat. 5)
	POWER Protector Uoc = 3kV Compact, Ergonomic Packaging	ZES 6	60	0,000,001	



TECHNICAL CHARACTERISTICS

Un	Uc	IL at 25⁰C	l _n (8/20)	lmax (8/20)	Housing IP 20 Dimensions
(V _{DC})	(V _{DC})	(A)	(kA)	(kA)	DIN 43880
5	6	0.5	20	Ι	Compact 2TE
12	15	J	0.1 (line-line)	0.2 (line-line)	Compact
5	6	0,5	20	I	Compact
5 48 5	6 58 6	I	0.3 (line-line; line-PG) 0.06 (line-line; line-PG) 0.3 (line-line; line-PG)	1	Compact
48	48	1	0.15 (line-line) 10 (lines-PG)	I	Compact 19mm
5 48	6 58	I	0.3 (line-line; line-PG) 0.06 (line-line; line-PG)	I	Compact /
5 230V / 50Hz	6 275V / 50Hz	I	0.3 (line-line; line-PG) 3kA (L(N) - PE, L-N) 10kA (L+N-PE)	I	Compact /
110 (Tel.); 50 (Coax.) 230V / 50Hz	170 (Tel.) ; 70 (Coax.) 275V / 50Hz	1	2.5 (Tel.); 5 (Coax)	I	Compact /
110 (Tel.) ; 50 (Coax.) 230V / 50Hz	170 (Tel.) ; 70 (Coax.) 275V / 50Hz	I	2.5 (Tel.); 5 (Coax.)	I	Compact /
110 (Tel.); 50 (Coax.) 230V / 50Hz	170 (Tel.) ; 70 (Coax.) 275V / 50Hz	Ι	2.5 (Tel.); 5 (Coax.)	1	Compact /
110 230V / 50Hz	170 275V / 50Hz	1	2.5	Ι	Compact /
230V / 50Hz	275V / 50Hz	1	1	1	Compact /

QUICK PRODUCT SELECTION Surge Protective Devices for Data/Signal Systems

Product Group	Description	Product Name	Page	Product Photo	Connection/Signal
Coaxial/RF	Coaxial BNC Protector For CCTV and Arcnet Coarse and Fine Protection Indirect Shield Earthing	ZV-BNC	61	N HAR	- Arcnet
	 Coaxial Protector For TV and Cable TV Direct Shield Earthing 	ZV-1 ZV1-F	62	et all and a	- TV - Cable TV
	Coaxial Protector For RF Anntena System Freq.: DC to 2.4GHz GDT	CCP-BNC	63		- Analog video
	Coaxial Protector For Base Station RF Antenna System Freq.: DC to 2.5GHz GDT	CCP-7/16	64		- GSM - GPS - Radio systems
	Coaxial Protector For RF Antenna System Freq.: DC to 2.4GHz GDT	CCP-N	65		- GSM - GPS - Radio systems
	Coaxial Protector For RF Antenna System Freq.: DC to 6.0GHz GDT	CCP-N-6G	66	NEW OF	- GSM - GPS - Radio systems
	Coaxial Protector For RF Antenna System Freq.: DC to 600MHz GDT	CCP-UHF	67		- Radio systems
	Coaxial Protector For RF Antenna System (USA CCTV and CATV System) Freq.: DC to 2.0GHz GDT	CCP-F	68		- Cable TV
	Coaxial Protector For RF Antenna System (EU CCTV and CATV System) Freq.: DC to 2.0GHz GDT	CCP-TV	69	Ð	- TV
	Coaxial Protector For RF Antenna System Freq.: DC to 865-965MHz, 1700-1950MHz	CCP-L/4-7/16	70	and the second s	- GSM
	Coaxial Protector For RF Antenna System Freq.: DC to 865-965MHz, 1700-1950MHz	CCP-L/4-N	71		- GSM



TECHNICAL CHARACTERISTICS

U _n (V _{DC})	U _c (V _{DC})	I∟ at 25ºC (A)	ln (8/20) (kA)	lmax (8/20) (kA)	Termination
5, 12	6, 14	0.1	10	1	BNC - Type M-F and F-F
48 48	66 60	0.1 0.1	5 5	/ /	IEC F
1	70, 180, 280	I	10	20	BNC - Type M-F and F-F
ł	70, 180, 280	I	10	20	7/16 - Type M-F
I	70, 180, 280	I	10	20	N - Type M-F and F-F
I	180	I	10	20	N - Type M-F and F-F
I	70, 180, 280	I	10	20	UHF - Type M-F and F-F
1	70, 180	I	10	20	F - Type M-F and F-F
Ι	70, 180	I	10	20	TV - Type M-F and F-F
I	0	1	15	30	L/4-7/16 - Type M-F and F-F
1	0	1	15	30	L/4-N - Type M-F and F-F

QUICK PRODUCT SELECTION Surge Protective Devices for Data/Signal Systems

Product Group	Description	Product Name	Page	Product Photo	Connection/Signal
Ex	 Single-pair SPD For Hazardous Areas (Ex) Coarse and Fine Protection Insulation Resistance to Earth (x) II 1 G EEx ia IIC T4 Baseefa 04 ATEX 0209X 	IM-15Ex IM-30Ex	72		- Hazardous Areas
Line Fitting	 Single-pair SPD For 3/4" Pipe Installations Coarse and Fine Protection tA < 1ns 	PLP	73		- 20mA current loop
Terminal Connection	OEM PCB module Single-pair SPD Coarse Protection Only PCB Hybrid Flying Leads or Screw Terminals	IM-GD	74	M	- Analogue tel. line - xDSL (VDSL class 1 only) - EIB
PCB Mounting	 OEM PCB module Single-pair SPD Coarse and Fine Protection PCB Hybrid PCB Pins 	IM-NF	75		- RS 232, - RS 422, - V.11, - RS 485 - Thermal probe PT 100 - TTL



TECHNICAL CHARACTERISTICS

Un (V _{DC})	U _c (V _{DC})	ΙΔ at 25°C (A)	ln (8/20) (kA)	lmax (8/20) (kA)	Housing dim. Degree of protection
15 30	18 33	0.5 0.5	10 10	20 20	1TE IP20
24	28	0.145	10 10	20 20	IP 55
110	120	6	5	10	IP20
5, 15, 24	6, 18, 28	0.145	5	10	IP20





SMH-SH Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	3 terminal GDT
Available voltages:	5, 12, 15, 24, 30, 48, 60V _{DC} , 110V _{AC}
Frequency range:	30Mhz
Surge Discharge Ratings:	l _n : 10kA 8/20μs, I _{max} : 20kA 8/20μs
Series load current:	1A
Enclosure:	DIN 43880 2/3TE, DIN rail mount
Terminals:	Multi-strand to 4 mm ²

The SMH-SH series of low voltage protective devices has been developed to protect against the effects of induced voltages onto data, signal and communication circuits.

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 while fine protection is provided using a high speed silicon avalanche diodes or metal oxide varistor stage. Care is taken to ensure coordination between these two stages without voltage or surge current blind spots occurring.

Thermal protection is provided to reduce 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 out of the base, the connection lines remain enabled.

Technical characteristics

Туре					SMF	I-SH			
		5V	12V	15V	24V	30V	48V	60V	110 V
Protection construction				two parts	: base + repla	ceable plug-ii	n module		
Number of protected pairs					1 (2 con	ductors)			
Nominal operating voltage	Un	5V _{DC}	12V _{DC}	15V _{DC}	24V _{DC}	30V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}
Max. continuous operating voltage	Uc	6V _{DC}	15V _{DC}	18V _{DC}	28V _{DC}	33V _{DC}	52V _{DC}	64V _{DC}	170V _{DC}
Rated spark overvoltage	(SH-PG)	184 - 276V	184 - 276V	184 - 276V	184 - 276V	184 - 276V	184 - 276V	184 - 276V	184 - 276V
	(a-b), (a, b-PG)	7 - 10V	16 - 21V	20 - 24V	30 - 36V	35 - 43V	55 - 68V	67 - 85V	184 - 264V
Rated operating current at 25°C	IL.	1A	1A	1A	1A	1A	1A	1A	1A
Nominal discharge current (8/20µs)	In	10kA	10kA	10kA	10kA	10kA	10kA	10kA	10kA
Max. discharge current (8/20µs)	Imax	20kA	20kA	20kA	20kA	20kA	20kA	20kA	20kA
Residual voltage at 5 kA (8/20µs)	(line-line)	< 22V	< 42V	< 48V	< 70V	< 80V	< 140V	< 160V	< 450V
Response time of overvoltage protection	t _A (a, b), (a, b-PC	G) <1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 25ns
Response time of overvoltage protection	t _A (SH-PG)	100ns	100ns	100ns	100ns	100ns	100ns	100ns	100ns
Insulation resistance of the protection	(a-b), (a, b-PG)	≥ 6KΩ	≥ 15MΩ	≥ 18MΩ	≥ 28MΩ	≥ 33MΩ	≥ 52MΩ	≥64MΩ	≥ 170MΩ
	(SH-PG)				>1GΩ	/ 100V			
Serial resistance	R	1.6 - 2.0Ω	1.6 - 2.0Ω	1.6 - 2.0Ω	1.6 - 2.0Ω	1.6 - 2.0Ω	1.6 - 2.0Ω	1.6 - 2.0Ω	1.6 - 2.0Ω
Transverse capacitance	C (a, b), (a, b-PG	i) 50pF	50pF	50pF	50pF	50pF	50pF	50pF	50pF
	(SH-PG)	5pF	5pF	5pF	5pF	5pF	5pF	5pF	5pF
Limit frequency	f _G	30Mhz	30Mhz	30Mhz	30Mhz	30Mhz	30Mhz	30Mhz	30Mhz
Terminal cross section					Multi-stra	nd to 4 mm ²			
Operating temperature					- 40°C	. + 80°C			
Degree of protection					IP	20			
Housing material				Thermopl	astic; gray, ex	tinguishing de	egree V-O		
Dimensions DIN 43880					2/3	TE			
Mounting EN 60715					On a 35m	m DIN rail			
Ordering code Base + Replaceable plu	g-in module	708 201	708 202	708 203	708 204	708 205	708 206	708 207	708 208
Replaceable plug-in mo	dule	708 211	708 212	708 213	708 214	708 215	708 216	708 217	708 218

Dimensional drawing









SMH-RC Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module 12 mm
Available voltages:	5, 12, 15, 24, 30, 48, 60, 110V _{DC}
Freq:	30MHz
Surge Discharge Ratings:	l _n :10kA 8/20μs, l _{max} : 20kA 8/20μs
Load current:	1A
Enclosure:	DIN 43880 2/3TE, DIN rail mount
Terminal:	Multi-strand to 4mm ²

The SMH-RC series provides the same level of protection and technical performance as the SMH-TC series, but also provides the feature of 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.

These barriers provide both coarse and fine protection stages and offer longitudinal and transverse protection.

The initial protection stage comprises a three-pole gas discharge tube and is designed to divert the primary surge energy. The subsequent fine protection stage is implemented using fast bi-directional silicon avalanche diodes. Special design techniques have been employed in the design of the fine protection stage to avoid capacitive line loading and thereby ensure a low insertion loss and wide operating frequency range.

Series line impedance are used to ensure energy co-ordination between the coarse and fine protection stages irrespective of the magnitude of the incident surge. To protect against the hazards of electric shock and fire, which may result when power frequency contact occurs between power and communication lines (often called mains incursion), a thermo-clip is included in 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 through-connection is maintained, allowing continued operations while a replacement module is ordered.

Technical characteristics

Туре					SMI	H-RC					
		5V	12V	15V	24V	30V	48V	60V	110 V		
Protection construction		Two parts: base and extractable insert									
Number of protected pairs					1 (2 cor	nductors)					
Nominal operating voltage	Un	5V _{DC}	12V _{DC}	15V _{DC}	24V _{DC}	30V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}		
Max. continuous operating voltage	Uc	6V _{DC}	15V _{DC}	18V _{DC}	28V _{DC}	33V _{DC}	52V _{DC}	64V _{DC}	170V _{DC}		
Rated spark overvoltage	(a/b-PG)	7 - 10V	16 - 21V	21 - 25V	31 - 37V	36 - 44V	57 - 69V	68 - 84V	184 - 264V		
	(a-b)	7 - 10V	16 - 21V	21 - 25V	31 - 37V	36 - 44V	57 - 69V	68 - 84V	184 - 264V		
Rated operating current at 25°C	IL	1A	1A	1A	1A	1A	1A	1A	1A		
Nominal discharge current (8/20µs)	In	10kA	10kA	10kA	10kA	10kA	10kA	10kA	10kA		
Max. discharge current (8/20µs)	Imax	20kA	20kA	20kA	20kA	20kA	20kA	20kA	20kA		
Residual voltage at 5kA (8/20µs)		< 22V	< 42V	< 48V	< 70V	< 80V	< 140V	< 160V	< 450V		
Response time	t _A	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns		
Thermal protection		Thermo-clip									
Insulation resistance of the protection		≥6KΩ	≥ 15MΩ	≥ 18MΩ	≥ 28MΩ	≥ 33MΩ	≥ 52MΩ	≥ 64MΩ	≥ 170MΩ		
Serial resistance	R	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω		
Transverse capacitance	C	50pF	50pF	50pF	50pF	50pF	50pF	50pF	50pF		
Limit frequency	fg	30MHz	30MHz	30MHz	30MHz	30MHz	30MHz	30MHz	30Mhz		
Terminal cross section					Multi-stra	and to 4 mm ²					
Operating temperature					- 40°C .	+ 80°C					
Degree of protection					IP	20					
Housing material				Thermop	olastic; gray, ex	ktinguishing d	egree V-O				
Dimensions DIN 43880					12	mm					
Mounting EN 60715					On a 35m	m DIN rail					
Ordering code Base + Replaceable	plug-in module	708 221	708 222	708 223	708 224	708 225	708 226	708 227	708 228		
Replaceable plug-in r	nodule	708 231	708 232	708 233	708 234	708 235	708 236	708 237	708 238		

Dimensional drawings



Connection diagram







SMI2 Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module 12 mm
Available voltages:	5, 12, 15, 24, 30, 48, 60, 110V _{DC}
Freq:	30MHz
Surge Discharge Ratings:	I _n :20kA 8/20μs; I _{max} : 30kA 8/20μs; I _{imp} : 10kA 10/350μs
Load current:	1A
Enclosure:	DIN 43880 2/3TE, DIN rail mount
Terminal:	Multi-strand to 4mm ²

The SMI2 series provides the same electrical performance as the SMH2-TC series but with a greater surge withstand level or limp 10kA, (2,5 kA per line). It is intended for operation in electrical environments where higher exposure to the effects of direct or partially direct lightning currents may be experienced. These include wind turbines and PV installations where lightning exposures are more severe, but where protection of sensitive electronics, such as environmental sensors, is just as crucial. These barriers provide both coarse and fine protection stages and offer longitudinal and transverse protection. The initial protection stage comprises a three-pole gas discharge tube and is designed to divert the primary surge energy. The subsequent fine protection stage is implemented using fast bi-directional silicon avalanche diodes. Special design techniques have been employed in the design of the fine protection stage to avoid capacitive line loading and thereby ensure a low insertion loss and wide operating frequency range. Series line impedance are used to ensure energy coordination between the coarse and fine protection stages irrespective of the magnitude of the incident surge. To protect against the hazards of electric shock and fire, which may result when power frequency contact occurs between power and communication lines (often called mains incursion), a thermo-clip is included in 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 through-connection is maintained, allowing continued operations while a replacement module is ordered.

Technical characteristics

Туре					SN	/12				
		5V	12V	15V	24V	30V	48V	60V	110 V	
Protection construction		Two parts: base and extractable insert								
Number of protected pairs					2 (4 con	ductors)				
Nominal operating voltage	U _n	5V _{DC}	12V _{DC}	15V _{DC}	24V _{DC}	30V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}	
Max. continuous operating voltage	Uc	6V _{DC}	15V _{DC}	18V _{DC}	28V _{DC}	33V _{DC}	52V _{DC}	64V _{DC}	170V _{DC}	
Rated spark overvoltage	(a/b-PG)	7 - 10V	16 - 21V	21 - 25V	31 - 37V	36 - 44V	57 - 69V	68 - 84V	184 - 264V	
	(a-b)	7 - 10V	16 - 21V	21 - 25V	31 - 37V	36 - 44V	57 - 69V	68 - 84V	184 - 264V	
Rated operating current at 25°C	IL .	1A	1A	1A	1A	1A	1A	1A	1A	
Nominal discharge current (8/20µs)	In	20kA	20kA	20kA	20kA	20kA	20kA	20kA	20kA	
Max. discharge current (8/20µs)	Imax	30kA	30kA	30kA	30kA	30kA	30kA	30kA	30kA	
Lightning impulse current (10/350µs)	limp	10kA	10kA	10kA	10kA	10kA	10kA	10kA	10kA	
Residual voltage at 5 kA (8/20µs)		< 22V	< 42V	< 48V	< 70V	< 80V	< 140V	< 160V	< 450V	
Response time	t _A	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	
Thermal protection		Thermo-clip								
Insulation resistance of the protection	1	≥6KΩ	≥ 15MΩ	≥ 18MΩ	≥ 28MΩ	≥ 33MΩ	≥ 52MΩ	≥ 64MΩ	≥ 170MΩ	
Serial resistance	R	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	
Transverse capacitance	C	50pF	50pF	50pF	50pF	50pF	50pF	50pF	50pF	
Limit frequency	f _G	30MHz	30MHz	30MHz	30MHz	30MHz	30MHz	30MHz	30Mhz	
Terminal cross section					Multi-stra	nd to 4 mm ²				
Operating temperature					- 40°C	. + 80°C				
Degree of protection					IP	20				
Housing material				Thermop	lastic; gray, ex	tinguishing de	egree V-O			
Dimensions DIN 43880					12r	nm				
Mounting EN 60715					on a 35m	m DIN rail				
Ordering code Base + Replaceable	plug-in module	708 301	708 302	708 303	708 304	708 305	708 306	708 307	708 308	
Replaceable plug-in	module	708 311	708 312	708 313	708 314	708 315	708 316	708 317	708 318	

Dimensional drawings



Leaend GDT

R

DB

PG



DATA/SIGNAL LINES PROTECTION



resistor

diode block

SMH-TC Series



C1/C2/C3 (IEC 60643-21)
Replaceable plug-in module 12 mm
Longitudinal, Transverse
3 terminal GDT
5, 12, 15, 24, 30, 48, 60, 110V _{DC}
30MHz
l _n :10kA 8/20μs, l _{max} : 20kA 8/20μs
1A
DIN 43880 2/3TE, DIN rail mount
Multi-strand to 4mm ²

DATA/SIGNAL LINES PROTECTION

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

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

Series line impedances ensure energy co-ordination between the coarse and a fine protection stages at all levels of the insident surge. To protect against the hazards of electric shock and fire which often results when power frequency contact occurrs 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 out of the base, the connection lines remain enabled.

Technical characteristics

Туре					SMI	H-TC					
		5V	12V	15V	24V	30V	48V	60V	110 V		
Protection construction		Two parts: base and extractable insert									
Number of protected pairs					1 (2 cor	nductors)					
Nominal operating voltage	U _n	5V _{DC}	12V _{DC}	15V _{DC}	24V _{DC}	30V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}		
Max. continuous operating voltage	Uc	6V _{DC}	15V _{DC}	18V _{DC}	28V _{DC}	33V _{DC}	52V _{DC}	64V _{DC}	170V _{DC}		
Rated spark overvoltage	(a/b-PG)	8 - 10V	17 - 21V	21 - 25V	31 - 37V	36 - 44V	57 - 69V	68 - 84V	184 - 264V		
	(a-b)	8 - 10V	17 - 21V	21 - 25V	31 - 37V	36 - 44V	57 - 69V	68 - 84V	184 - 264V		
Rated operating current at 25°C	IL.	1A	1A	1A	1A	1A	1A	1A	1A		
Nominal discharge current (8/20µs)	In	10kA	10kA	10kA	10kA	10kA	10kA	10kA	10kA		
Max. discharge current (8/20µs)	Imax	20kA	20kA	20kA	20kA	20kA	20kA	20kA	20kA		
Residual voltage at 5kA (8/20µs)		< 22V	< 42V	< 48V	< 70V	< 80V	< 140V	< 160V	< 450V		
Response time	t _A	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns		
Thermal protection		Thermo-clip									
Insulation resistance of the protection		≥6KΩ	≥ 15MΩ	≥ 18MΩ	≥28MΩ	≥ 33MΩ	≥ 52MΩ	≥ 64MΩ	≥ 170MΩ		
Serial resistance	R	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω		
Transverse capacitance	C	50pF	50pF	50pF	50pF	50pF	50pF	50pF	50pF		
Limit frequency	fg	30MHz	30MHz	30MHz	30MHz	30MHz	30MHz	30MHz	30Mhz		
Terminal cross section					Multi-stra	and to 4 mm ²					
Operating temperature					- 40°C .	+ 80°C					
Degree of protection					IP	20					
Housing material				Thermor	olastic; gray, ex	ktinguishing d	egree V-O				
Dimensions DIN 43880					12	mm					
Mounting EN 60715					on a 35m	m DIN rail					
Ordering code Base + Replaceable	plug-in module	708 062	708 063	708 064	708 065	708 066	708 067	708 068	708 061		
Replaceable plug-in r	module	708 052	708 053	708 054	708 055	708 056	708 057	708 058	708 051		

Dimensional drawings



Connection diagram







R

DB

PG

SMH2-TC Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module 12 mm
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	3 terminal GDT
Available voltages:	5, 12, 15, 24, 30, 48, 60, 110V _{DC}
Freq:	30MHz
Surge Discharge Ratings:	I _n :10kA 8/20μs, I _{max} : 20kA 8/20μs
Load current:	1A
Enclosure:	DIN 43880 2/3TE, DIN rail mount
Terminal:	Multi-strand to 4mm ²

Like the SMH-TC series, the SMH2-TC provides the same level of protection to two independent circuits (pairs). A number of protection voltages are available to ensure the user is able to select the closest clamping voltage to the normal signal operation of the equipment being protected.

The plug-in module/base design facilitates replacement of a failed module without the need to remove system wiring.

If the module is unplugged out of the base, the connection lines remain enabled.

Technical characteristics

Туре					SMH	2-TC			
		5V	12V	15V	24V	30V	48V	60V	110 V
Protection construction		Two parts: base and extractable insert							
Number of protected pairs		2 (4 conductors)							
Nominal operating voltage	Un	5V _{DC}	12V _{DC}	15V _{DC}	24V _{DC}	30V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}
Max. continuous operating voltage	U _c	6V _{DC}	15V _{DC}	18V _{DC}	28V _{DC}	33V _{DC}	52V _{DC}	64V _{DC}	170V _{DC}
Rated spark overvoltage	(a/b-PG)	8 - 10V	17 - 21V	21 - 25V	31 - 37V	36 - 44V	57 - 69V	68 - 84V	184 - 264V
	(a-b)	8 - 10V	17 - 21V	21 - 25V	31 - 37V	36 - 44V	57 - 69V	68 - 84V	184 - 264V
Rated operating current at 25°C	IL.	1A	1A	1A	1A	1A	1A	1A	1A
Nominal discharge current (8/20µs)	In	10kA	10kA	10kA	10kA	10kA	10kA	10kA	10kA
Max. discharge current (8/20µs)	Imax	20kA	20kA	20kA	20kA	20kA	20kA	20kA	20kA
Residual voltage at 5 kA (8/20µs)		< 22V	< 42V	< 48V	< 70V	< 80V	< 140V	< 160V	< 450V
Response time	t _A	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns
Thermal protection	Thermo-clip								
Insulation resistance of the protection		≥6KΩ	≥ 15MΩ	≥ 18MΩ	≥ 28MΩ	≥ 33MΩ	≥ 52MΩ	≥ 64MΩ	≥ 170MΩ
Serial resistance	R	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω	1.6-2.0Ω
Transverse capacitance	C	50pF	50pF	50pF	50pF	50pF	50pF	50pF	50pF
Limit frequency	fg	30MHz	30MHz	30MHz	30MHz	30MHz	30MHz	30MHz	30Mhz
Terminal cross section					Multi-stra	nd to 4 mm ²			
Operating temperature					- 40°C	. + 80°C			
Degree of protection					IP	20			
Housing material				Thermop	lastic; gray, ex	tinguishing de	egree V-O		
Dimensions DIN 43880					12r	nm			
Mounting EN 60715					on a 35m	m DIN rail			
Ordering code Base + Replaceable	plug-in module	708 012	708 013	708 014	708 015	708 016	708 017	708 018	708 011
Replaceable plug-in	module	708 002	708 003	708 004	708 005	708 006	708 007	708 008	708 001

Dimensional drawings





DATA/SIGNAL LINES PROTECTION



Legend: GDT

R

DB

PG

NMH-TC Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Compact housing 12 mm
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	3 terminal GDT
Available voltages:	5, 12, 15, 24, 30, 48, 60, 110V _{DC}
Freq:	10 - 35 MHz (see specification sheet)
Surge Discharge Ratings:	l _n :10kA 8/20μs, l _{max} : 20kA 8/20μs
Series load current:	1A
Enclosure:	DIN 43880 2/3TE, DIN rail mount
Terminals:	Multi-strand to 4mm ²

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

The initial protection stage comprises a three-pole gas discharge tube and is designed to divert the primary surge energy. The subsequent fine protection stage is carried out using multiple metal-oxide varistors or with fast bidirectional silicon avalanche diodes. Care is taken in the design of this fine protection stage to avoid capacitive line loading and thereby ensuring a low insertion loss and wide operating frequency range.

Care is taken to ensure energy co-ordination between the coarse and a fine protection stages at all levels of the insident surge. To protect against the hazards of electric shock and fire which often results when power frequency contact occurrs 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.

Technical characteristics

Туре		NMH-TC							
		5V	12V	15V	24V	30V	48V	60V	110 V
Protection construction					Protective	e module			
Number of protected pairs					1 (2 con	ductors)			
Nominal operating voltage	U _n	5V _{DC}	12V _{DC}	15V _{DC}	24V _{DC}	30V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}
Max. continuous operating voltage	Uc	6V _{DC}	15V _{DC}	18V _{DC}	28V _{DC}	33V _{DC}	52V _{DC}	64V _{DC}	170V _{DC}
Rated spark overvoltage	(a/b-PG)	7 - 10V	16-21V	20 - 24V	30 - 36V	35 - 43V	55 - 68V	67 - 85V	184 - 264V
	(a-b)	7 - 10V	16 - 21V	20 - 24V	30 - 36V	35 - 43V	55 - 68V	67 - 85V	184 - 264V
Rated operating current at 25°C	IL.	1A	1A	1A	1A	1A	1A	1A	1A
Nominal discharge current (8/20µs)	In	10kA	10kA	10kA	10kA	10kA	10kA	10kA	10kA
Max. discharge current (8/20µs)	Imax	20kA	20kA	20kA	20kA	20kA	20kA	20kA	20kA
Residual voltage at 5 kA (8/20µs)		< 22V	< 42V	< 48V	< 70V	< 80V	< 140V	< 160V	< 450V
Response time of overvoltage protection	t _A	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 25ns
Thermal protection					Therm	o-clip			
Insulation resistance of the protection		≥6KΩ	≥ 15MΩ	≥ 18MΩ	≥28MΩ	≥ 33MΩ	≥ 52MΩ	≥ 64MΩ	≥ 170MΩ
Serial resistance	R	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω
Transverse capacitance	C	30pF	30pF	30pF	30pF	30pF	30pF	30pF	150pF
Limit frequency	f _G	35MHz	35MHz	35MHz	35MHz	35MHz	35MHz	35MHz	10Mhz
Terminal cross section					Multi-stra	nd to 4 mm ²			
Operating temperature					- 40°C	. + 80°C			
Degree of protection					IP:	20			
Housing material				Thermopl	astic; gray, ex	tinguishing de	gree V-O		
Dimensions DIN 43880		12mm							
Mounting EN 60715					on a 35mr	n DIN rail			
Ordering code		707 002	707 003	707 004	707 005	707 006	707 007	707 008	707 001

Dimensional drawings



Connection diagram







NMH2-TC Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Compact housing 12 mm
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	3 terminal GDT
Available voltages:	5, 12, 15, 24, 30, 48, 60, 110V _{DC}
Freq:	3-5 MHz (see specification sheet)
Surge Discharge Ratings:	l _n :10kA 8/20μs, l _{max} : 20kA 8/20μs
Series load current:	0.8A
Enclosure:	DIN 43880 2/3TE, DIN rail mount
Terminals:	Multi-strand to 4mm ²

Like the NMH-TC series, the NMH2-TC provides the same level of protection but in a compact enclosure which can provide protection to two independent circuits (pairs). A number of protection voltages are available to ensure the user is able to select the closest clamping voltage to the normal signal operation of the equipment being protected.

Technical characteristics

Туре					NMH	2-TC			
		5V	12V	15V	24V	30V	48V	60V	110 V
Protection construction					Protectiv	e module			
Number of protected pairs					2 (4 con	ductors)			
Nominal operating voltage	Un	5V _{DC}	12V _{DC}	15V _{DC}	24V _{DC}	30V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}
Max. continuous operating voltage	U _c	6V _{DC}	15V _{DC}	18V _{DC}	28V _{DC}	33V _{DC}	52V _{DC}	64V _{DC}	170V _{DC}
Rated spark overvoltage	(a/b-PG)	7 - 10V	16 - 21V	20 - 24V	30 - 36V	35 - 43V	55 - 68V	67 - 85V	184 - 264V
	(a-b)	7 - 10V	16 - 21V	20 - 24V	30 - 36V	35 - 43V	55 - 68V	67 - 85V	184 - 264V
Rated operating current at 25°C	IL	0.8A	0.8A	0.8A	0.8A	0.8A	0.8A	0.8A	0.8A
Nominal discharge current (8/20µs)	In	10kA	10kA	10kA	10kA	10kA	10kA	10kA	10kA
Max. discharge current (8/20µs)	Imax	20kA	20kA	20kA	20kA	20kA	20kA	20kA	20kA
Residual voltage at 5 kA (8/20µs)	(line-line)	< 22V	< 42V	< 48V	< 70V	< 80V	< 140V	< 160V	< 450V
Response time of overvoltage protection	t _A	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns
Thermal protection					Therm	no-clip			
Insulation resistance of the protection		≥6KΩ	≥ 15MΩ	≥ 18MΩ	≥ 28MΩ	≥ 33MΩ	≥ 52MΩ	≥ 64MΩ	≥ 170MΩ
Serial resistance	R	< 0.5Ω	< 0.5Ω	< 0.5Ω	< 0.5Ω	< 0.5Ω	< 0.5Ω	< 0.5Ω	< 0.5Ω
Transverse capacitance	C	500pF	500pF	500pF	500pF	500pF	500pF	500pF	250pF
Limit frequency	fg	3MHz	3MHz	3MHz	3MHz	3MHz	3MHz	3MHz	5Mhz
Terminal cross section					Multi-stra	nd to 4 mm ²			
Operating temperature					- 40°C	. + 80 ⁰ C			
Degree of protection					IP	20			
Housing material				Thermop	lastic; gray, ex	tinguishing de	egree V-O		
Dimensions DIN 43880					12r	nm			
Mounting EN 60715					On a 35m	m DIN rail			
Ordering code		707 202	707 203	707 204	707 205	707 206	707 207	707 208	707 201

Dimensional drawings



Conne	ection	diagrar	n





🕐 Iskra Zaščite

IM-TD Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	3 terminal GDT
Available voltages:	5, 12, 15, 24, 30, 48, 60, 110V _{DC}
Freq:	0.6 -10 MHz (see specification sheet)
Surge Discharge Ratings:	I _n :10kA 8/20μs, I _{max} : 20kA 8/20μs
Series load current:	145 mA (1A for 110V version)
Safety:	Internal thermal runaway disconnector
Indication:	2 x end-of-life status flag
Enclosure:	DIN 43880 1TE, DIN rail mount
Terminals:	Multi-strand to 6mm ²

The IM-TD series of low voltage protective devices has been developed to protect against the effects of induced voltages onto data, signal and communication circuits.

It 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 while fine protection is provided using a high speed silicon avalanche diodes or metal oxide varistor stage. Care is taken to ensure coordination between these two stages without voltage or surge current blind spots occurring.

Over current protection is provided by a PTC element, which provides a level of protection against short circuit or mains incursion. Internal thermal disconnectors are also employed to reduce the hazards of thermal runaway during fault conditions.

Technical characteristics

Туре					IM-	·TD			
		5V	12V	15V	24V	30V	48V	60V	110V
Protection construction				Two	parts: base an	d extractable	insert		
Number of protected pairs					1 (2 con	ductors)			
Nominal operating voltage	U _n	5V _{DC}	12V _{DC}	15V _{DC}	24V _{DC}	30V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}
Max. continuous operating voltage	Uc	6V _{DC}	15V _{DC}	18V _{DC}	28V _{DC}	33V _{DC}	52V _{DC}	64V _{DC}	170V _{DC}
Rated spark overvoltage	(a/b-PG)	6 .5- 9V	16 - 20V	20 - 24V	30 - 36V	35- 43V	55 - 68V	67 - 85V	184 - 264V
	(a-b)	6.5 - 9V	16 - 20V	20 - 24V	30 - 36V	35 - 43V	55 - 68V	67 - 85V	184 - 264V
Rated operating current at 25°C	IL.	145mA	145mA	145mA	145mA	145mA	145mA	145mA	1A
Nominal discharge current (8/20µs)	In	10kA	10kA	10kA	10kA	10kA	10kA	10kA	10kA
Max. discharge current (8/20µs)	Imax	20kA	20kA	20kA	20kA	20kA	20kA	20kA	20kA
Residual voltage at 5 kA (8/20µs)		< 20V	< 39V	< 45V	< 65V	< 77V	< 135V	< 150V	< 450V
Response time of overvoltage protection	n t _A	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 25ns
Thermal protection	Thermal disconnection in lines a and b								
Overcurrent protection	PTC resistors at I ≥ 0.3 A							/	
Insulation resistance of the protection		≥6KΩ	≥ 15MΩ	≥ 18MΩ	≥ 28MΩ	≥ 33MΩ	≥ 52MΩ	≥ 64MΩ	≥ 170MΩ
Serial resistance	R	9-11Ω	9-11Ω	9-11Ω	9-11Ω	9-11Ω	9-11Ω	9-11Ω	ca 1Ω
Transverse capacitance	C	7nF	4.5nF	3.3nF	2.9nF	2.1nF	1.2nF	1nF	90pF
Limit frequency	f _G	0.6MHz	0.9MHz	1.1MHz	1.4MHz	1.8MHz	2.2MHz	3MHz	10Mhz
Terminal cross section					Multi-strar	nd to 6 mm ²			
Operating temperature				-	25°C + 50°	°C		- 40	⁰ °C + 80 [°] C
Degree of protection					IP	20			
Housing material				Thermopla	astic; yellow, e	xtinguishing	degree V-O		
Dimensions DIN 43880					11	ſE			
Mounting EN 60715					on a 35m	m DIN rail			
Ordering code									
Base + Replaceable plug-in mod	ule	700 010	700 016	700 022	700 028	700 034	700 040	700 046	700 003
Base S-GDT + Replaceable plug	-in module	700 011	700 017	700 023	700 029	700 035	700 041	700 047	700 004
Base RC + Replaceable plug-in r	nodule	700 012	700 018	700 024	700 030	700 036	700 042	700 048	700 005
Base 2GND + Replaceable plug-	in module	700 013	700 019	700 025	700 031	700 037	700 043	700 049	700 006
Replaceable plug-in module		700 009	700 015	700 021	700 027	700 033	700 039	700 045	700 002



IM-TD Series

DATA/SIGNAL LINES PROTECTION

Dimensional drawings



IM base





Connection diagram

Various options for the base unit exist including:

S-GDT base: where a coaxial shield is used and equipotential ground equalization is required.

RC base: Provides remote contacts to signify if an internal thermal disconnect has operated.

 ${\bf 2 \; GND \; base}:$ where a second ground terminal (in addition to the DIN rail ground strip) is provided for installations not utilizing DIN rail.

a b b b b b b b b b b b b b b b b b b b
IM-TD 110 V
GDT S-GDT base
IM-TD 110 V
a b TD B GDT R MOV MOV A a' b b'
RC Base
IM-TD 110 V
a b b c c c c c c c c c c c c c c c c c



IM-TD 5V - 60 V

IM-TD 5V - 60 V

TD.

🕀 PG

Legend:	
TD	thermal decoupler
GDT	gas discharge tube
MOV	varistor
PTC	resistor with a positive
	temperature coeficient
R	resistor
BD	bi-directional TVS diode
SG	signal grounding
PG	protective aroundina

Accessory Part for IM-TD

Testing module IM TEST

IM-TD 110 V



A testing module IM TEST is intended for performing measurements on the IM bases. A module enables performing of the measurements on both input and output sides. It is equipped with five banana sockets with D = 2 mm. Red terminals are connected to the module's output, blue ones are connected to the module's input, whereas yellow one is connected to the grounding contact.

Туре	IMTest
Ordering code	127 145

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2GND base

IMH-TC Series



Enclosure:

Terminals:

IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	3 terminal GDT
Available voltages:	5, 12, 15, 24, 30, 48, 60, 110V _{DC}
Freq:	35 MHz (see specification sheet)
Surge Discharge Ratings:	l _n : 10kA 8/20μs, I _{max} : 20kA 8/20μs
Series load current:	1A

The IMH-TC series of low voltage protective devices has been developed to protect against the effects of induced voltages onto data, signal and communication circuits.

DIN 43880 1TE, DIN rail mount

Multi-strand to 6 mm²

The circuit used is designed to minimize inter-capacitance, and shunt capacitance, thereby maximizing the operating frequency to 35 MHz in most cases.

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 while fine protection is provided using a high speed silicon avalanche diodes or metal oxide varistor stage. Care is taken to ensure coordination between these two stages without voltage or surge current blind spots occurring.

Thermal protection is provided to reduce the hazards of thermal runaway should there be an inadvertent mains incursion fault.

Technical characteristics

Туре					IMH	-TC			
		5V	12V	15V	24V	30V	48V	60V	110 V
Protection construction				Two p	arts: base and	d extractable i	nsert		
Number of protected pairs					1 (2 cond	ductors)			
Nominal operating voltage	Un	5V _{DC}	12V _{DC}	15V _{DC}	24V _{DC}	30V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}
Max. continuous operating voltage	Uc	6V _{DC}	15V _{DC}	18V _{DC}	28V _{DC}	33V _{DC}	52V _{DC}	64V _{DC}	170V _{DC}
Rated spark overvoltage	(a/b-PG)	7 - 10V	15 - 19V	20 - 24V	30 - 36V	35 - 43V	55 - 68V	67 - 85V	184 - 264V
	(a-b)	7 - 10V	15 - 19V	20 - 24V	30 - 36V	35 - 43V	55 - 68V	67 - 85V	184 - 264V
Rated operating current at 25°C	۱L	1A	1A	1A	1A	1A	1A	1A	1A
Nominal discharge current (8/20µs)	In	10kA	10kA	10kA	10kA	10kA	10kA	10kA	10kA
Max. discharge current (8/20µs)	Imax	20kA	20kA	20kA	20kA	20kA	20kA	20kA	20kA
Residual voltage at 5 kA (8/20µs)		< 22V	< 42V	< 48V	<70V	< 80V	< 140V	< 160V	< 450V
Response time of overvoltage protection	t _A	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 25ns
Thermal protection					Thern	no clip			
Insulation resistance of the protection		≥6KΩ	≥ 15MΩ	≥ 18MΩ	≥ 28MΩ	≥ 33MΩ	≥ 52MΩ	≥64MΩ	≥ 170MΩ
Serial resistance	R	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω
Transverse capacitance	C	30pF	30pF	30pF	30pF	30pF	30pF	30pF	150pF
Limit frequency	fG	35MHz	35MHz	35MHz	35MHz	35MHz	35MHz	35MHz	10Mhz
Terminal cross section					Multi-stran	d to 6 mm ²			
Operating temperature					- 40°C	. + 80°C			
Degree of protection					IP	20			
Housing material				Thermopla	stic; yellow, ex	ktinguishing d	egree V-O		
Dimensions DIN 43880					1T	E			
Mounting EN 60715					On a 35m	n DIN rail			
Ordering code									
Base + Replaceable plug-in modu	ule	701 007	701 012	701 017	701 022	701 027	701 032	701 037	701 002
Base S-GDT + Replaceable plug-	-in module	701 008	701 013	701 018	701 023	701 028	701 033	701 038	701 003
Base 2GND + Replaceable plug-i	n module	701 009	701 014	701 019	701 024	701 029	701 034	701 039	701 004
Replaceable plug-in module		701 006	701 011	701 016	701 021	701 026	701 031	701 036	701 001



IMH-TC Series

DATA/SIGNAL LINES PROTECTION

Dimensional drawings



Connection diagram

Various options for the base unit exist including:

S-GDT base: where a coaxial shield is used and equipotential ground equalization is required.

 $\ensuremath{\textbf{2}}$ GND base: where a second ground terminal (in addition to the DIN rail ground strip) is provided for installations not utilizing DIN rail.







20 base PG







GDT

🕀 PG

GDT

IMH-TC 5 V - 60 V

₩ DB

S-GDT base

h

SG



IMH-TC 110 V



Legend:	
TD	thermal decoupler
GDT	gas discharge tube
MOV	varistor
R	resistor
D	diode
DB	diode bloc
SG	signal grounding
PG	protective grounding

Accessory Part for IMH-TC

Testing module IM TEST



A testing module IM TEST is intended for performing measurements on the IM bases. A module enables performing of the measurements on both input and output sides.

It is equipped with five banana sockets with D = 2 mm. Red terminals are connected to the module's output, blue ones are connected to the module's input, whereas yellow one is connected to the grounding contact.

Туре	IMTest	
Ordering code	127 145	



SMH-SG Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	3 terminal GDT
Available voltages:	5, 12, 15, 24, 30, 48, 60 V _{DC} , 110V _{AC}
Freq:	30 Mhz
Surge Discharge Ratings:	l _n : 10kA 8/20μs, l _{max} : 20kA 8/20μs
Series load current:	1A
Enclosure:	DIN 43880 2/3TE, DIN rail mount
Terminals:	Multi-strand to 4 mm ²

The SMH-SG series of low voltage protective devices has been developed to protect against the effects of induced voltages 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 while fine protection is provided using a high speed silicon avalanche diodes or metal oxide varistor stage. Care is taken to ensure coordination between these two stages without voltage or surge current blind spots occurring.

Thermal protection is provided to reduce 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 out of the base, the connection lines remain enabled.

Technical characteristics

Туре		SMH-SG							
		5V	12V	15V	24V	30V	48V	60V	110 V
Protection construction				Two parts	s: base + repla	aceable plug-i	n module		
Number of protected pairs					1 (2 con	ductors)			
Nominal operating voltage	Un	5V _{DC}	12V _{DC}	15V _{DC}	24V _{DC}	30V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}
Max. continuous operating voltage	Uc	6V _{DC}	15V _{DC}	18V _{DC}	28V _{DC}	33V _{DC}	52V _{DC}	64V _{DC}	170V _{DC}
Rated spark overvoltage	(SG-PG)	280 - 420V	280 - 420V	280 - 420V	280 - 420V	280 - 420V	280 - 420V	280 - 420V	280 - 420V
	(a-b), (a, b-SG)	7 - 10V	15 - 19V	20 - 24V	30 - 36V	35 - 43V	55 - 68V	67 - 85V	184 - 264V
Rated operating current at 25°C	l	1A	1A	1A	1A	1A	1A	1A	1A
Nominal discharge current (8/20µs)	In	10kA	10kA	10kA	10kA	10kA	10kA	10kA	10kA
Max. discharge current (8/20µs)	Imax	20kA	20kA	20kA	20kA	20kA	20kA	20kA	20kA
Residual voltage at 5 kA (8/20µs)	(line-line)	< 22V	< 42V	< 48V	< 70V	< 80V	< 140V	< 160V	< 450V
Response time of overvoltage protection t _A (a, b-SG)		< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 25ns
Response time of overvoltage protection t _A (SG-PG)		100ns	100ns	100ns	100ns	100ns	100ns	100ns	100ns
Insulation resistance of the protection	(a-b)	≥6KΩ	≥ 15MΩ	≥ 18MΩ	≥ 28MΩ	≥ 33MΩ	≥ 52MΩ	≥ 64MΩ	≥ 170MΩ
	(SG-PG)	> 1GΩ / 100V							
Serial resistance	R	1.6 - 2.0Ω	1.6 - 2.0Ω	1.6 - 2.0Ω	1.6 - 2.0Ω	1.6 - 2.0Ω	1.6 - 2.0Ω	1.6 - 2.0Ω	1.6 - 2.0Ω
Transverse capacitance	C (a, b-SG)	50pF	50pF	50pF	50pF	50pF	50pF	50pF	50pF
	(SG-PG)	5pF	5pF	5pF	5pF	5pF	5pF	5pF	5pF
Limit frequency	fG	30Mhz	30Mhz	30Mhz	30Mhz	30Mhz	30Mhz	30Mhz	30Mhz
Terminal cross section					Multi-stra	nd to 4 mm ²			
Operating temperature		- 40°C + 80°C							
Degree of protection		IP 20							
Housing material				Thermop	lastic; gray, ex	tinguishing de	egree V-O		
Dimensions DIN 43880					2/3	STE			
Mounting EN 60715					On a 35m	m DIN rail			
Ordering code Base + Replaceable plu	g-in module	708 142	708 143	708 144	708 145	708146	708 147	708 148	708 141
Replaceable plug-in mo	dule	708 132	708 133	708 134	708 135	708 136	708 137	708 138	708 131

Dimensional drawing



Connection diagram

TC

R

BD

SG

PG







VMS-TC Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	3 terminal GDT
Available voltages:	5, 12, 15, 24, 30, 48, 60 V _{DC} , 110V _{AC}
Freq:	0.6 - 3 MHz (see specification sheet)
Surge Discharge Ratings:	I _n : 10kA 8/20 μs, I _{max} : 20kA 8/20μs
Series load current:	1A
Enclosure:	DIN 43880 1TE, DIN rail mount
Terminals:	Multi-strand to 6 mm ²

The VMS-TC series of low voltage protective devices has been developed to protect against the effects of induced voltages 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 while fine protection is provided using a high speed silicon avalanche diodes or metal oxide varistor stage. Care is taken to ensure coordination between these two stages without voltage or surge current blind spots occurring.

Thermal protection is provided to reduce the hazards of thermal runaway should there be an inadvertent mains incursion fault.

Both common (longitudinal) mode and differential (transverse) mode protection is provided.

Technical characteristics

Туре		VMS-TC							
		5V	12V	15V	24V	30V	48V	60V	110 V
Protection construction		Two parts: base + replaceable plug-in module							
Number of protected pairs					1 (2 con	ductors)			
Nominal operating voltage	Un	5V _{DC}	12V _{DC}	15V _{DC}	24V _{DC}	30V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}
Max. continuous operating voltage	Uc	7V _{DC}	15V _{DC}	18V _{DC}	28V _{DC}	33V _{DC}	52V _{DC}	64V _{DC}	170V _{DC}
Rated spark overvoltage	(a/b-PG)	280 - 500V	280 - 500V	280 - 500V	280 - 500V	280 - 500V	280 - 500V	280 - 500V	400 - 680V
	(a-b)	6.5 - 9V	6.5 - 9V	6.5 - 9V	6.5 - 9V	6.5 - 9V	6.5 - 9V	6.5 - 9V	16 - 20V
Rated operating current at 25°C	IL	1A	1A	1A	1A	1A	1A	1A	1A
Nominal discharge current (8/20µs)	In	10kA	10kA	10kA	10kA	10kA	10kA	10kA	10kA
Max. discharge current (8/20µs)	I _{max}	20kA	20kA	20kA	20kA	20kA	20kA	20kA	20kA
Residual voltage at 5 kA (8/20µs)	(line-line)	< 20V	< 39V	< 45V	< 65V	< 77V	< 135V	< 150V	< 450V
Response time of overvoltage protection	t _A (a-b)	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 25ns
Response time of overvoltage protection	t _A (a/b-PG)	100ns	100ns	100ns	100ns	100ns	100ns	100ns	100ns
Insulation resistance of the protection	(a-b)	≥ 6KΩ	≥ 15MΩ	≥ 18MΩ	≥ 28MΩ	≥ 33MΩ	≥ 52MΩ	≥ 64MΩ	≥ 170MΩ
	(a/b-PG)				>1GΩ	/ 100V			
Serial resistance	R	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω	ca 1Ω
Transverse capacitance	C (a-b)	5nF	3nF	2.2nF	1.9nF	1.4nF	0.82nF	0.7nF	90pF
	(a/b-PG)	8pF	8pF	8pF	8pF	8pF	8pF	8pF	8pF
Limit frequency	fg	0.6MHz	0.9MHz	1.1MHz	1.4MHz	1.8MHz	2.2MHz	3.0MHz	10Mhz
Terminal cross section					Multi-stra	nd to 6 mm ²			
Operating temperature		- 40°C + 80°C							
Degree of protection		IP 20							
Housing material		Thermoplastic; yellow, extinguishing degree V-O							
Dimensions DIN 43880					11	E			
Mounting EN 60715					on a 35m	m DIN rail			
Ordering code Base + Replaceable pl	ug-in module	702 005	702 008	702 011	702 014	702 017	702 020	702 023	702 002
Replaceable plug-in me	odule	702 004	702 007	702 010	702 013	702 016	702 019	702 022	702 001



VMS-TC Series

DATA/SIGNAL LINES PROTECTION

Dimensional drawings





Connection diagram

Legend:	
TC	thermo-clip
GDT	gas discharge tube
MOV	varistor
R	resistor
BD	bi-directional TVS diode
PG	protective grounding



Accessory Part for VMS-TC

Testing module VMTEST



A testing module VMTEST is intended for performing measurements on the VM-TD, VMS-TC, VMO bases. A module enables performing of the measurements on both input and output sides. It is equipped with five banana sockets with D = 2 mm. Red terminals are connected to the module's output, blue ones are connected to the module's input, whereas yellow one is connected to the grounding contact.

Туре	VMTest
Ordering code	127 144



VMO Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	2 x 2 terminal GDT,
	1 x 3 terminal GDT
Available voltages:	5, 12, 15, 24, 30, 48, 60 V _{DC} , 110V _{AC}
Freq:	0.6 - 3 MHz (see specification sheet)
Surge Discharge Ratings:	I _n : 20kA 8/20μs, I _{max} : 30kA 8/20μs
Series load current:	1A
Enclosure:	DIN 43880 1TE, DIN rail mount
Terminals:	Multi-strand to 6 mm ²

The VMO series of low voltage protective devices has been developed to protect against the effects of induced voltages onto data, signal and communication circuits.

It is intended for those applications where higher than normal surge discharge levels may be experienced.

Coarse protection is provided by 2, two terminal gas discharge tubes. A second stage of protection is provided using a three terminal gas discharge tube which assists in common mode protection.

Fine protection is provided using a high speed silicon avalanche diodes or metal oxide varistor stage. Care is taken to ensure coordination between these two stages without voltage or surge current blind spots occurring.

Both common (longitudinal) mode and differential (transverse) mode protection is provided.

Technical characteristics

Туре				VN	ЛО				
		5V	12V	15V	24V	30V	48V	60V	110 V
Protection construction				Two parts	s: base + repla	aceable plug-i	n module		
Number of protected pairs					1 (2 con	ductors)			
Nominal operating voltage	U _n	5V _{DC}	12V _{DC}	15V _{DC}	24V _{DC}	30V _{DC}	48V _{DC}	60V _{DC}	110V _{DC}
Max. continuous operating voltage	Uc	7V _{DC}	15V _{DC}	18V _{DC}	28V _{DC}	33V _{DC}	52V _{DC}	64V _{DC}	170V _{DC}
Rated spark overvoltage	(a/b-PG)	6.5 - 9V	16 - 20V	20 - 24V	30 - 36V	35 - 43V	55 - 68V	67 - 85V	184 - 264V
	(a-b)	6.5 - 9V	16 - 20V	20 - 24V	30 - 36V	35 - 43V	55 - 68V	67 - 85V	184 - 264V
Rated operating current at 25°C	IL.	1A	1A	1A	1A	1A	1A	1A	1A
Nominal discharge current (8/20µs)	In	20kA	20kA	20kA	20kA	20kA	20kA	20kA	20kA
Max. discharge current (8/20µs)	Imax	30kA	30kA	30kA	30kA	30kA	30kA	30kA	30kA
Lightning impulse current (10/350µs)	limp	5kA	5kA	5kA	5kA	5kA	5kA	5kA	5kA
Residual voltage at 5 kA (8/20µs)		< 20V	< 39V	< 45V	< 65V	< 77V	< 135V	< 150V	< 450V
Response time of overvoltage protection	on t _A	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 1ns	< 25ns
Insulation resistance of the protection		≥6KΩ	≥ 15MΩ	≥ 18MΩ	≥ 28MΩ	≥ 33MΩ	≥ 52MΩ	≥ 64MΩ	≥ 170MΩ
Serial resistance	R	ca 2Ω	ca 2Ω	ca 2Ω	ca 2Ω	ca 2Ω	ca 2Ω	ca 2Ω	ca 2Ω
Transverse capacitance	С	7nF	4.5nF	3.3nF	2.9nF	2.1nF	1.2nF	1.0nF	150pF
Limit frequency	fG	0.6MHz	0.9MHz	1.1MHz	1.4MHz	1.8MHz	2.2MHz	3.0MHz	10Mhz
Terminal cross section					Multi-stra	nd to 6 mm ²			
Operating temperature					- 40°C	. + 80°C			
Degree of protection					IP	20			
Housing material				Thermopla	astic; yellow, e	xtinguishing c	legree V-O		
Dimensions DIN 43880					11	ſE			
Mounting EN 60715					on a 35m	m DIN rail			
Ordering code Base + Replaceable	plug-in module	702 505	702 508	702 511	702 514	702 517	702 520	702 523	702 502
Replaceable plug-in	module	702 504	702 507	702 510	702 513	702 516	702 519	702 522	702 501





VMO Series

DATA/SIGNAL LINES PROTECTION

Dimensional drawings





Connection diagram

Legend:	
GDT	gas discharge tube
MOV	varistor
R	resistor
BD	bi-directional TVS diode
PG	protective grounding



Accessory Part for VMO

Testing module VM TEST

A testing module VM TEST is intended for performing measurements on the VM-TD, VMS-TC, VMO bases. A module enables performing of the measurements on both input and output sides.

It is equipped with five banana sockets with D = 2 mm. Red terminals are connected to the module's output, blue ones are connected to the module's input, whereas yellow one is connected to the grounding contact.

Туре	VMTest
Ordering code	127 144



SMH-TDR



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Number of protected pairs:	1 (2 lines)
Coarse Protection:	3 terminal GDT
Nom. Operating Voltage Un:	110V _{DC}
Max. Operating Voltage U _C :	170V _{DC}
Series Resistance:	9 - 11Ω
Freq:	< 16MHz
Surge Discharge Ratings:	I _n : 10kA 8/20μs, I _{max} : 20kA 8/20μs
Series load current:	300mA
Enclosure:	DIN 43880 1TE, DIN rail mount
Terminals:	Multi-strand to 4 mm ²

The SMH-TDR has been developed as a generic protector for use on data transmission circuits.

Coarse protection is provided by a three terminal gas discharge tube.

Internal thermal disconnectors are used to reduce the hazards of thermal runaway during fault conditions, or if mains incursion onto the low voltage data circuit, occurs.

To protect against the hazards of electric shock and fire which often results when power frequency contact occurrs 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.

If the module is unplugged out of the base, the connection lines remain enabled.

Technical characteristics

Туре		SMH-TDR		
		110V		
Protection construction		Two parts: base + replaceable plug-in module		
Number of protected pairs		1 (2 conductors)		
Nominal operating voltage	Un	110V _{DC}		
Max. continuous operating voltage	Uc	170V _{DC}		
Rated spark overvoltage	(a/b-PG)	184V - 276V		
	(a-b)	184V - 550V		
Rated operating current at 25°C	IL.	300mA		
Nominal discharge current (8/20µs)	In	10kA		
Max. discharge current (8/20µs)	Imax	20kA		
Residual voltage at 5 kA (8/20µs) < 500V		< 500V		
Response time of overvoltage protection t _A		< 100 ns		
Thermal protection		Thermo-clip		
Insulation resistance of the protection		≥ 1GΩ		
Serial resistance R		9 - 11Ω		
Transverse capacitance C 10 pF		10 pF		
Limit frequency	Limit frequency fg 16 MHz			
Terminal cross section		Multi-strand to 4 mm ²		
Operating temperature		-40°C +80°C		
Degree of protection		IP 20		
Housing material		Thermoplastic; gray, extinguishing degree V-O		
Dimensions DIN 43880		2/3TE		
Mounting EN 60715		on a 35mm DIN rail		
Ordering code Base + Replaceable pl	ug-in module	708 150		
Replaceable plug-in module		708 152		

Dimensional drawings



Connection diagram







SMH2-TDR



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Number of protected pairs:	2 (4 lines)
Coarse Protection:	3 terminal GDT
Nom. Operating Voltage Un:	110V _{DC}
Max. Operating Voltage U _C :	170V _{DC}
Series Resistance:	9 - 11 Ω
Freq:	< 16MHz
Surge Discharge Ratings:	I _n : 10kA 8/20μs, I _{max} : 20kA 8/20μs
Series load current:	300mA
Enclosure:	DIN 43880 1TE, DIN rail mount
Terminals:	Multi-strand to 4 mm ²

The SMH2-TDR has been developed as a generic protector for use on data transmission circuits.

Coarse protection is provided by a three terminal gas discharge tube.

Internal thermal disconnectors are used to reduce the hazards of thermal runaway during fault conditions, or if mains incursion onto the low voltage data circuit, occurs.

To protect against the hazards of electric shock and fire which often results when power frequency contact occurrs 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.

If the module is unplugged out of the base, the connection lines remain enabled.

Technical characteristics

Туре		SMH2-TDR		
		110V		
Protection construction		Two parts: base + replaceable plug-in module		
Number of protected pairs		2 (4 conductors)		
Nominal operating voltage	Un	110V _{DC}		
Max. continuous operating voltage	U _c	170V _{DC}		
Rated spark overvoltage	(a/b-PG)	184V - 276V		
	(a-b)	184V - 550V		
Rated operating current at 25°C	۱L	300mA		
Nominal discharge current (8/20µs)	In	10kA		
Max. discharge current (8/20µs)	Imax	20kA		
Residual voltage at 5 kA (8/20µs)		< 500V		
Response time of overvoltage protectio	n t _A	t _A < 100 ns		
Thermal protection Thermo-clip		Thermo-clip		
Insulation resistance of the protection		≥1GΩ		
Serial resistance R 9 - 11Ω		9 - 11Ω		
Transverse capacitance C 10 pF		10 pF		
Limit frequency	fG	16 MHz		
Terminal cross section Multi-strand to 4 mm ²		Multi-strand to 4 mm ²		
Operating temperature -40°C +80°C		-40°C +80°C		
Degree of protection IP 20		IP 20		
Housing material		Thermoplastic; gray, extinguishing degree V-O		
Dimensions DIN 43880		2/3TE		
Mounting EN 60715		on a 35mm DIN rail		
Ordering code Base + Replaceable	e plug-in module 708 151			
Replaceable plug-in module 708 153		708 153		

Dimensional drawings



Connection diagram

Legend: TC

GDT

R

PG



DATA/SIGNAL LINES PROTECTION



resistor

VM-TDR



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Number of protected pairs:	1 (2 lines)
Coarse Protection:	3 terminal GDT
Nom. Operating Voltage Un:	110V _{DC}
Max. Operating Voltage U _C :	170V _{DC}
Series Resistance:	9 - 11Ω
Freq:	< 16 MHz
Surge Discharge Ratings:	I _n : 10kA 8/20μs, I _{max} : 20kA 8/20μs
Series load current:	300mA
Safety:	Internal thermal runaway disconnector
Indication:	1x end-of-life status flag
Enclosure:	DIN 43880 1TE, DIN rail mount
Terminals:	Multi-strand to 6 mm ²

 ${\sf The VM-TDR}\ series\ has\ been\ developed\ as\ a\ generic\ protector\ for\ use\ on\ data\ transmission\ circuits.$

Coarse protection is provided by a three terminal gas discharge tube.

Internal thermal disconnectors are used to reduce the hazards of thermal runaway during fault conditions, or if mains incursion onto the low voltage data circuit, occurs.

Technical characteristics

Туре		VM-TDR		
		110V		
Protection construction		Two parts: base + replaceable plug-in module		
Number of protected pairs		1 (2 conductors)		
Nominal operating voltage	Un	110V _{DC}		
Max. continuous operating voltage	Uc	170V _{DC}		
Rated spark overvoltage	(a/b-PG)	184V - 276V		
	(a-b)	184V - 550V		
Rated operating current at 25°C	IL .	300mA		
Nominal discharge current (8/20µs)	In	10kA		
Max. discharge current (8/20µs)	Imax	20kA		
Residual voltage at 5 kA (8/20µs)		< 500V		
Response time of overvoltage protection t _A		< 100 ns		
Thermal protection		Thermal disconnection in lines a and b		
Insulation resistance of the protection		≥ 1GΩ		
Serial resistance R		9 - 11Ω		
Transverse capacitance	C	10 pF		
Limit frequency	fg	16 MHz		
Terminal cross section		Multi-strand to 6 mm ²		
Operating temperature		-40°C +80°C		
Degree of protection		IP 20		
Housing material		Thermoplastic; yellow, extinguishing degree V-O		
Dimensions DIN 43880		1TE		
Mounting EN 60715		On a 35mm DIN rail		
Ordering code Base + Replaceable plu	ug-in module	703 052		
Replaceable plug-in module		703 051		

Dimensional drawings



Connection diagram







SMH2-DF



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Number of protected pairs:	2 (4 lines)
Fine Protection:	Bi-directional SAD
Nom. Operating Voltage U _n :	12, 24V _{DC}
Max. Operating Voltage U _C :	15, 28V _{DC} respectively
Freq:	< 30MHz
Surge Discharge Ratings:	I _n : 500A, 250A, 100A respectively
Series load current:	10A
Enclosure:	DIN 43880 6mm DIN rail mount
Terminals:	Multi-strand to 2.5mm ²

DATA/SIGNAL LINES PROTECTION

The SMH2-DF series has been developed to protect data transmission circuits or low voltage alarm circuits such as fire or security.

They only provide fine protection using a high speed, bi-directional, silicon stage.

Where necessary, the SMH2-DF may be used with a higher energy coarse protection unit such as the SMH2-TDR series.

The plug-in module/base design facilities replacement of a failure module without the need to remove system wiring.

If the module is unplugged out of the base, the connection lines remain enabled.

Technical characteristics

Туре		SMH2-DF			
		12V	24V		
Protection construction		Protective module			
Number of protected pairs			2(4 conductors)		
Nominal operating voltage	Un	12V _{DC}	24V _{DC}		
Max. continuous operating voltage	Uc	15V _{DC}	28V _{DC}		
Rated spark overvoltage	(a/b-PG)	18V - 21V	30V - 37V		
	(a-b)	18V - 21V	30V - 37V		
Rated operating current at 25°C	IL .	10A	10A		
Nominal discharge current (8/20µs)	In	500A	250A		
Residual voltage at I _N (8/20µs)		< 48V	< 70V		
Response time of overvoltage protection	t _A	< 1ns	< 1ns		
Insulation resistance of the protection		≥ 15MΩ	≥ 28MΩ		
Serial resistance	R	< 0.1Ω	< 0.1Ω		
Transverse capacitance	С	< 50pF	< 50pF		
Terminal cross section		Multi-strand to 6 mm ²			
Operating temperature		-40°C +80°C			
Degree of protection		IP 20			
Housing material		Thermoplastic; gray, extinguishing degree V-O			
Dimensions DIN 43880		12mm			
Mounting EN 60715		on a 35mm DIN rail			
Ordering code		7082.58	7082.59		

Dimensional drawings







Legend: DB

PG

IM-VF

IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Compact module
Number of protected pairs:	1 line
Fine Protection:	MOV
Nom. Operating Voltage Un:	15, 30V _{DC}
Max. Operating Voltage U _C :	22, 38V _{DC} respectively
Freq:	< 0.5MHz
Surge Discharge Ratings:	I _n : 500A respectively
Series load current:	10A
Enclosure:	DIN 43880 6mm DIN rail mount
Terminals:	Multi-strand to 2.5mm ²

The IM-VF series has been developed to protect data transmission circuits or low voltage alarm circuits such as fire or security.

They only provide fine protection using a MOV.

Where necessary, the IM-VF may be used with a higher energy coarse protection unit such as the VM-TDR series.

Technical characteristics

Туре		IM-VF			
		15V	30V		
Protection construction			Protective module		
Number of protected pairs			(1 conductor)		
Nominal operating voltage	Un	15V _{DC}	30V _{DC}		
Max. continuous operating voltage	Uc	22V _{DC}	38V _{DC}		
Rated spark overvoltage		24V - 30V	42V - 52V		
Rated operating current at 25°C	IL	10A	10A		
Nominal discharge current (8/20µs)	In	500A	500A		
Residual voltage at I _N (8/20µs)		< 53V	< 93V		
Response time of overvoltage protection	t <u>A</u>	< 25ns	< 25ns		
Insulation resistance of the protection		≥ 1.5MΩ	≥ 3MΩ		
Serial resistance	R	< 0.1Ω	< 0.1Ω		
Transverse capacitance	C	< 10nF	< 6nF		
Terminal cross section		Multi-strand to 6 mm ²			
Operating temperature		-40°C +80°C			
Degree of protection			IP 20		
Housing material		Thermoplastic; brown (beige), extinguishing degree V-O			
Dimensions DIN 43880		6mm			
Mounting EN 60715		on a 35mm DIN rail			
Ordering code		704 550	704 551		

Dimensional drawings



Connection diagram







Legend: MOV

PG

IM-DF Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Compact module
Number of protected pairs:	1 (2 lines)
Fine Protection:	Bi-directional SAD
Nom. Operating Voltage U _n :	5, 12, 24, 60V _{DC}
Max. Operating Voltage U _c :	7, 15, 28, 64V _{DC} respectively
Freq:	< 3MHz
Surge Discharge Ratings:	In: 500A, 250A, 100A respectively
Series load current:	10A
Enclosure:	DIN 43880 6mm DIN rail mount
Terminals:	Multi-strand to 2.5mm ²

DATA/SIGNAL LINES PROTECTION

The IM-DF series has been developed to protect data transmission circuits or low voltage alarm circuits such as fire or security.

They only provide fine protection using a high speed, bi-directional, silicon stage.

Where necessary, the IM-DF may be used with a higher energy coarse protection unit such as the VM-TDR series.

Technical characteristics

Туре		IM-DF			
		5V	12V	24V	60V
Protection construction			Protectiv	e module	
Number of protected pairs			1 (2 con	ductors)	
Nominal operating voltage	Un	5V _{DC}	12V _{DC}	24V _{DC}	60V _{DC}
Max. continuous operating voltage	Uc	6V _{DC}	15V _{DC}	28V _{DC}	64V _{DC}
Rated spark overvoltage	(a/b-PG)	8V - 10V	15V - 19V	30V - 36V	67V - 85V
	(a-b)	16V - 20V	30V - 38V	60V - 72V	134V - 170V
Rated operating current at 25°C	IL	10A	10A	10A	10A
Nominal discharge current (8/20µs)	In	500A	500A	250A	100A
Residual voltage at I _N (8/20µs)		< 20V	< 39V	< 65V	< 150V
Response time of overvoltage protection	t _A	< 1ns	< 1ns	< 1ns	< 1ns
Insulation resistance of the protection		≥ 6KΩ	≥ 15MΩ	≥ 28MΩ	≥ 64MΩ
Serial resistance	R	< 0.1Ω	< 0.1Ω	< 0.1Ω	< 0.1Ω
Transverse capacitance	C	< 7nF	< 3nF	< 1nF	< 0.5nF
Terminal cross section			Multi-stran	d to 6 mm ²	
Operating temperature			-40°C	. +80°C	
Degree of protection			IP	20	
Housing material		Thermoplastic; brown (beige), extinguishing degree V-O			
Dimensions DIN 43880			6n	nm	
Mounting EN 60715			on a 35mm DIN rail		
Ordering code		704 508	704 502	704 504	704 506

Dimensional drawings



Connection diagram






SMH-20 Series



DATA/	SIGNAL	LINES	PROTE	CTION
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IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Coarse Protection:	3 terminal GDT
Nom. Operating Voltage U _n :	24, 60, 230V _{DC}
Max. Operating Voltage U _C :	28, 64, 320V _{DC} respectively
Surge Discharge Ratings:	l _n : 10kA 8/20μs, l _{max} : 20kA 8/20μs
Series load current:	145mA, (5A for 230V version)
Safety:	PTC I > 0.3A (24 and 60V versions)
Enclosure:	DIN 43880 2/3TE, DIN rail mount
Terminals:	Multi-strand to 4mm ²

The SMH-20 series of low voltage protective devices has been developed as a generic protector for low voltage application and provides both common (longitudinal) mode and differential (transverse) mode protection.

Coarse protection is provided using a three terminal gas discharge tube while fine protection is provided using a high speed silicon or metal oxide varistor stage.

Over current protection is provided using a PTC element, which provides a level of protection against short circuit fault conditions.

If the module is unplugged out of the base, the connection lines remain enabled.

Technical characteristics

Туре			SMH-20K	SMH-20D	SMH-20D
			230V	24V	48V
Protection construe	ction		Тwo	parts: base + replaceable plug-in mod	dule
Number of protecte	ed pairs			1 (2 conductors)	
Nominal operating	voltage	Un	230V _{DC}	24V _{DC}	60V _{DC}
Max. continuous op	perating voltage	U _C	320V _{DC}	28V _{DC}	64V _{DC}
Rated spark overve	oltage	(a/b-PG)	350V - 504V	350V - 504V	350V - 504V
		(a-b)	351V - 429V	30V - 36V	67V - 85V
Rated operating cu	urrent at 25°C	IL .	5A	145mA	145mA
Nominal discharge	e current (8/20µs)	In	10kA	10kA	10kA
Max. discharge cur	rrent (8/20µs)	Imax	20kA	20kA	20kA
Residual voltage a	t 5 kA (8/20µs)	(line-line)	< 450V	< 65V	< 135V
Response time of o	overvoltage protection	t _A	< 25ns	< 1ns	< 1ns
Overcurrent protect	ction		/ PTC resistors at I > 0.3A PTC resistors at I > 0.3A		
Insulation resistant	ce of the protection		$\geq 320M\Omega$ $\geq 28M\Omega$ $\geq 64M\Omega$		
Serial resistance		R	< 0.1Ω	9-11Ω	9-11Ω
Transverse capacit	tance	C	< 1nF	< 3nF	< 1.2nF
Terminal cross sec	tion		Multi-strand to 4 mm ²	Multi-strand to 4 mm ²	Multi-strand to 4 mm ²
Operating tempera	ature		-40°C +80°C -25°C +50°C -25°C +50°C		
Degree of protection	gree of protection IP 20				
Housing material		Thermoplastic; gray, extinguishing degree V-O			
Dimensions DIN 43	3880		2/3TE		
Mounting EN 6071	15		on a 35mm DIN rail		
Ordering code B	Base + Replaceable plug	-in module	708 154	708 155	708 156
R	Replaceable plug-in mod	ule	708 157	708 158	708 159

Dimensional drawings







SMH2-20 Series



C1/C2/C3 (IEC 60643-21)
Replaceable plug-in module
3 terminal GDT
24, 60, 230V _{DC}
28, 64, 320V _{DC} respectively
l _n : 10kA 8/20μs, I _{max} : 20kA 8/20μs
145mA, (5A for 230V version)
PTC I > 0.3A (24 and 60V versions)
DIN 43880 2/3TE, DIN rail mount
Multi-strand to 4mm ²

The SMH2-20 series of low voltage protective devices has been developed as a generic protector for low voltage application and provides both common (longitudinal) mode and differential (transverse) mode protection.

Coarse protection is provided using a three terminal gas discharge tube while fine protection is provided using a high speed silicon or metal oxide varistor stage.

Over current protection is provided using a PTC element, which provides a level of protection against short circuit fault conditions.

If the module is unplugged out of the base, the connection lines remain enabled.

Technical characteristics

Туре		SMH2-20K	SMH2-20D	SMH2-20D
		230V	24V	48V
Protection construction		Two parts: base + replaceable plug-in module		
Number of protected pairs			2 (4 conductors)	
Nominal operating voltage	Un	230V _{DC}	24V _{DC}	60V _{DC}
Max. continuous operating voltage	Uc	320V _{DC}	28V _{DC}	64V _{DC}
Rated spark overvoltage	(a/b-PG)	350V - 504V	350V - 504V	350V - 504V
	(a-b)	351V - 429V	30V - 36V	67V - 85V
Rated operating current at 25°C	۱լ	5A	145mA	145mA
Nominal discharge current (8/20µs)	In	10kA	10kA	10kA
Max. discharge current (8/20µs)	Imax	20kA	20kA	20kA
Residual voltage at 5 kA (8/20µs)	(line-line)	< 450V	< 65V	< 135V
Response time of overvoltage protection	t _A	< 25ns	< 1ns	< 1ns
Overcurrent protection		/	PTC resistors at I > 0.3A	PTC resistors at I > 0.3A
Insulation resistance of the protection		≥ 320MΩ	≥ 28MΩ	≥ 64MΩ
Serial resistance	R	< 0.1Ω	9-11Ω	9-11Ω
Transverse capacitance	C	< 1nF	< 3nF	< 1.2nF
Terminal cross section		Multi-strand to 4 mm ²	Multi-strand to 4 mm ²	Multi-strand to 4 mm ²
Operating temperature		-40°C +80°C -25°C +50°C -25°C +50°C		
Degree of protection		IP 20		
Housing material		Thermoplastic; gray extinguishing degree V-O		
Dimensions DIN 43880		2/3TE		
Mounting EN 60715		on a 35mm DIN rail		
Ordering code Base + Replaceable plug	g-in module	e 708 160 708 161 708 162		
Replaceable plug-in mod	dule	708 163	708 164	708 165

Dimensional drawings

Connection diagram







DATA/SIGNAL LINES PROTECTION

SMH-TC+PS



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module 12 mm
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	3 terminal GDT (data line), MOVs (PS line)
Available voltages:	24V _{DC}
Freq:	30MHz
Surge Discharge Ratings:	I _n :10kA 8/20μs, I _{max} : 20kA 8/20μs
Load current:	1A (data line), 3A (PS line)
Enclosure:	DIN 43880 2/3TE, DIN rail mount
Terminal:	Multi-strand to 4mm ²

The SMH-TC+PS has been developed for protection of systems with 1 supplying and one signal line (CAN bus, DeviceNet,...)

This efficient overvoltage protective device is intended to protect line from over voltage surges and electrostatic discharges created by switching transients in buildings.

The signal line circuit is designed to minimize intercapacitance, and shunt capacitance, thereby maximizing the operating frequency to 35MHz.

If the module is unplugged out of the base, the connection lines remain enabled.

Technical characteristics

Туре		SMH-TC+PS 24V		
		Data line	Power supply line	
Protection construction		Two parts: base and extractable insert		
Number of protected pairs			2 (1 data line + 1 power supply line	
Nominal operating voltage	Un	24V _{DC}	24V _{AC} / 30V _{DC}	
Max. continuous operating voltage	Uc	28V _{DC}	28V _{AC} / 40V _{DC}	
Rated spark overvoltage	(a/b-PG),	(c/d-PG) 31 - 37V	42 - 52V	
	(a-b), (c-o	d) 31 - 37V	90 - 110V	
Rated operating current at 25°C	۱L	1A	3A	
Nominal discharge current (8/20µs)	In	10kA	10kA	
Max. discharge current (8/20µs)	Imax	20kA	20kA	
Residual voltage at 5 kA (8/20µs)		< 70V	< 100V	
Response time	tA	< 1ns	< 1ns	
Insulation resistance of the protection	(a-b)	≥ 28MΩ	≥ 40MΩ	
Serial resistance	R	1.6-1.8Ω	< 0.2Ω	
Serial inductivity	L	-	15µH	
Transverse capacitance	C	50pF	6nF	
Limit frequency	fG	30MHz	1kHz	
Terminal cross section		Multi-strand to 4 mm ²		
Operating temperature			- 40°C + 80°C	
Degree of protection			IP 20	
Housing material		Therr	moplastic; gray, extinguishing degree V-O	
Dimensions DIN 43880			12mm	
Mounting EN 60715			On a 35mm DIN rail	
Ordering code Base + Replaceable plug-in	module		708 181	
Replaceable plug-in module			708 182	

Dimensional drawings



Connection diagram

Legend:	
GDT	gas discharge tube
R	resistor
DB	diode block
TD	thermal protection
MOV	varistor
BD	bi-directional TVS diode
L	coil
PG	protective grounding





DATA/SIGNAL LINES PROTECTION

LZ-SMH



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	PCB assembly
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	3 terminal GDT
Available voltages:	12, 24V _{DC}
Freq:	30MHz
Surge Discharge Ratings:	l _n :10kA 8/20μs, I _{max} : 20kA 8/20μs
Load current:	1A
Terminal:	Multi-strand to 1.5mm ²

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

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

Series line impedances ensure energy co-ordination between the coarse and a fine protection stages at all levels of the insident surge. To protect against the hazards of electric shock and fire which often results when power frequency contact occurrs 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.

X

DB

OUT

Technical characteristics

LZ-SMH		
12V	24V	
	PCB assembly	
	1 (2 conductors)	
12V _{DC}	24V _{DC}	
15V _{DC}	28V _{DC}	
) 17 - 21V	31 - 37V	
17 - 21V	31 - 37V	
1A	1A	
10kA	10kA	
20kA	20kA	
< 48V	< 70V	
< 1ns	< 1ns	
	Thermo-clip	
≥ 15MΩ	≥ 28MΩ	
1.6-1.8Ω	1.6-1.8Ω	
50pF	50pF	
30MHz	30MHz	
Multi-strand to 1.5 mm ²		
- 40°C + 80°C		
127 555	127 556	
	12V 12V _{DC} 15V _{DC} 15V _{DC} 17 - 21V 17 - 21V 1A 10kA 20kA < 48V < 1ns 20F 30MHz	LZ-SMH 12V 24V PCB assembly 1 (2 conductors) 12V _{DC} 24V _{DC} 15V _{DC} 28V _{DC} 3) 17 · 21V 31 · 37V 17 · 21V 17 · 21V 31 · 37V 16 · 1.8Ω 10kA 20kA 20kA 20kB 50pF 30MHz 30MHz 30MHz 30MHz 40°C + 80°C -40°C + 80°C

Dimensional drawings

Connection diagram





DATA/SIGNAL LINES PROTECTION

IM-xDSL Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Number of protected pairs:	1 (2 lines)
Coarse Protection:	3 terminal GDT
Nom. Operating Voltage Un:	120V _{DC}
Max. Operating Voltage U _C :	170V _{DC}
Series Elements typical:	0.3Ω/50μΗ
Freq:	14 - 22MHz (ref. specification sheet)
Surge Discharge Ratings:	I _n : 10kA 8/20μs I _{max} : 20kA 8/20μs
Series load current:	200mA
Enclosure:	DIN 43880 1TE, DIN rail mount
Terminals:	Multi-strand to 6 mm ²

The IM-xDSL series has been developed to protect class I ADSL transmission. It can also be used to protect ISDN, SDSL and HDSL protocol.

Coarse protection is provided by a three terminal gas discharge tube which provides symmetrical common (longitudinal) mode protection from each line to protective ground.

In more complex versions, a three terminal Sidactor or varistor provides fine differential (transverse) mode protection between lines.

Thermal protection is provided to reduce the hazards of thermal runaway should there be an inadvertent mains incursion fault.

Technical characteristics

Туре			IM-xDSL	IM-xDSL-V	IM-xDSL-T	
Ducto otion constant	ation		T	us parts, hass and sutrastable inco		
Protection constru				t (2 sandusters)		
Number of protecte	ed pairs		1001/	1 (2 conductors)	1001/	
Nominal operating	voltage	Un	120V _{DC}	120V _{DC}	120V _{DC}	
Max. continuous o	perating voltage	Uc	170V _{DC}	170V _{DC}	170V _{DC}	
Rated spark overv	oltage	(a/b-PG)	184 - 276V	184 - 276V	184 - 260V	
		(a-b)	184 - 550V	184 - 264V	184 - 260V	
Rated operating cu	urrent at 25°C	IL	200mA	200mA	200mA	
Nominal discharge	e current (8/20µs)	In	10kA	10kA	10kA	
Max. discharge cu	rrent (8/20µs)	Imax	20kA	20kA	20kA	
Residual voltage a	t 5 kA (8/20µs)		< 700V	< 500V	< 350V	
Response time of	overvoltage protection	tA	< 100ns	< 25ns	< 1ns	
Thermal protection				Thermo-clip		
Insulation resistance of the protection 170MΩ 170MΩ		170ΜΩ				
Serial resistance		R	approx. 0.3Ω	approx. 0.3Ω	approx. 0.3Ω	
Serial inductance		L	approx. 50µH	approx. 50µH	approx. 50µH	
Inductance in the I	оор		< 0.5µH	< 0.5µH	< 0.5µH	
Limit frequency (- 3	3dB, Z _K = 120Ω)	fG	> 22MHz	> 14Mhz	> 17Mhz	
Terminal cross sec	ction			Multi-strand to 6 mm ²		
Operating tempera	ature			- 25°C + 60°C		
Degree of protection			IP 20			
Housing material		Thermoplastic; yellow, extinguishing degree V-O				
Dimensions DIN 43880		1TE				
Mounting EN 60715			on a 35mm DIN rail			
Ordering code	Base + Replaceable plug-	-in module	704 002	704 006	704 010	
	Base 2GND + Replaceab	le plug-in module	e 704 003	704 007	704 011	
	Replaceable plug-in mode	ule	704 001	704 005	704 009	





IM-xDSL Series

Dimensional drawings



Connection diagram

Various options for the base unit exist including:

2 GND base: where a second ground terminal (in addition to the DIN rail ground strip) is provided for installations not utilizing DIN rail.







GD

PG

IM-xDSL-V



IM-xDSL



Legend:	
TC	thermo-clip
GDT	gas discharge tube
MOV	varistor
L	coil
TISP	integrated circuit with thyristor protection
PG	protective grounding





Accessory Part for IM-xDSL

Testing module IM TEST

A testing module IM TEST is intended for performing measurements on the IM bases. A module enables performing of the measurements on both input and output sides.

NON

base

It is equipped with five banana sockets with D = 2 mm. Red terminals are connected to the module's output, blue ones are connected to the module's input, whereas yellow one is connected to the grounding contact.

Туре	IMTest
Ordering code	127 145





SMH-PS Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module
Coarse Protection:	Varistors
Nom. Operating Voltage Un:	12V _{DC} , 24V _{DC} and 48V _{DC}
Max. Operating Voltage U _C :	15V _{DC} , 28V _{DC} and 52V _{DC}
Series Inductivity:	10 - 14μΗ
Surge Discharge Ratings:	Ι _n : 10kA 8/20μs, Ι _{max} : 20kA 8/20μs
Series load current:	4A
Enclosure:	DIN 43880 12mm, DIN rail mount
Terminals:	Multi-strand to 4mm ²

DC POWER SUPPLY PROTECTION

 $The \, {\rm SMH-PS}\, series \, has \, been \, developed \, to \, protect \ power \, supplies.$

Coarse protection is provided by varistors while fine protection is provided using a high speed silicon stage.

Internal thermal disconnectors are used to reduce the hazards of thermal runaway during fault conditions, or if mains incursion onto the low voltage data circuit, occurs.

If the module is unplugged out of the base, the connection lines remain enabled.

Technical characteristics

Туре				SMH-PS		
			12V	24V	48V	
Protection constructio	Protection construction Two parts: base + replaceable plug-in module				g-in module	
Number of protected p	airs			1 (2 conductors)		
Nominal operating vol	tage	Un	12V _{DC}	24V _{DC}	48V _{DC}	
Max. continuous opera	ating voltage	Uc	15V _{DC}	28V _{DC}	52V _{DC}	
Rated spark overvolta	ge	<mark>(1, 2 - PG</mark>)	90V - 110V	90V - 110V	90V - 110V	
		(1, 2)	16V - 20V	30V - 36V	57V - 69V	
Rated operating current	nt at 25°C	IL.	4A	4A	4A	
Nominal discharge cu	rrent (8/20µs)	In	10kA	10kA	10kA	
Max. discharge curren	t (8/20µs)	Imax	20kA 20kA 20kA			
Residual voltage at 5 k	<mark>(Α (8/20μs)</mark>		< 32V < 60V < 135V			
Response time of over	voltage protection	tA	< 1ns < 1ns < 1ns			
Thermal protection			Thermal disconnection			
Insulation resistance of	of the protection		≥ 15MΩ ≥ 28MΩ ≥ 52MΩ			
Serial inductivity		L	10 - 14μH 10 - 14μH 10 - 14μH			
Transverse capaticanc	e	C	< 5nF < 3nF < 1.5nF			
Terminal cross section				Multi-strand to 4 mm ²		
Operating temperature	9			- 40°C + 80°C		
Degree of protection	IP 20					
Housing material		Thermoplastic; gray, extinguishing degree V-O				
Dimensions DIN 4388	0	12 mm				
Mounting EN 60715			on a 35mm DIN rail			
Ordering code	Base + Replaceable plu	ug-in module	708 120	708 121	708 122	
	Replaceable plug-in mo	odule	708 125 708 126 708 127			

Dimensional drawings









VM-DC Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)	
Design:	Replaceable plug-in module	
Coarse Protection:	3 terminal GDT	
Nom. Operating Voltage Un:	$12V_{DC}$ and $24V_{DC}$	
Max. Operating Voltage U _C :	15V _{DC} and 28V _{DC}	
Series Resistance:	0.1Ω	
Freq:	DC	
Surge Discharge Ratings:	l _n : 10kA 8/20μs, I _{max} : 20kA 8/20μs	
Series load current:	10A	
Enclosure:	DIN 43880 1TE, DIN rail mount	
Terminals:	Multi-strand to 6mm ²	

DC POWER SUPPLY PROTECTION

The VM-DC series has been developed to protect DC power supplies.

Coarse protection is provided by a three terminal gas discharge tube while fine protection is provided using a high speed silicon stage.

Internal thermal disconnectors are used to reduce the hazards of thermal runaway during fault conditions, or if mains incursion onto the low voltage data circuit, occurs.

Technical characteristics

Туре			VM-DC			
			12V	24V		
Protection construction			Two parts: base + replaceable plug-in module			
Number of protected pa	irs		1 (2 cor	nductors)		
Nominal operating volta	ige Un	1	12V _{DC}	24V _{DC}		
Max. continuous operat	ing voltage Uc	•	15V _{DC}	28V _{DC}		
Rated spark overvoltag	e (0,	<mark>12/24V</mark> - PG)	184V - 276V	184V - 276V		
	(0	<mark>- 12/24</mark> V)	16V - 20V	30V - 36V		
Rated operating curren	t at 25°C IL		10A	10A		
Nominal discharge curr	ent (8/20µs) In		10kA	10kA		
Max. discharge current	(8/20µs) Im	ax	20kA	20kA		
Residual voltage at 5 k/	<mark>A (8/20µs)</mark>		< 32V (0.12V) < 60V (0.24V			
Response time of overv	oltage protection tA		< 1ns	< 1ns		
Thermal protection			Thermo-clip Thermo-clip			
Insulation resistance of	the protection		≥ 15MΩ ≥ 28M			
Serial resistance	R		< 0.1Ω	< 0.1Ω		
Transverse capaticance	C C		< 1nF	< 3nF		
Terminal cross section			Multi-strand to 6 mm ²			
Operating temperature			-40°C +80°C			
Degree of protection			IP 20			
Housing material			Thermoplastic; yellow, extinguishing degree V-O			
Dimensions DIN 43880			1TE			
Mounting EN 60715			on a 35mm DIN rail			
Ordering code	Base + Replaceable plug-i	n module	703 502	703 504		
	Replaceable plug-in modu	le	703 501	703 503		

Dimensional drawings



Connection diagram

Legend:

TC

GDT

SD

PG



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DC PROTEC B(R) 10 Series

DC POWER SUPPLY PROTECTION



Category IEC / EN / VDE:	Class I / Type 1 / B
Design:	Compact housing
Location of use:	Branch Sub-distribution Boards
Protection modes:	(+) - PE, (-) - PE, (+) - (-)
Protective elements:	MOV
Surge discharge ratings:	l _{imp} = 10kA
Internal protection and safety:	Separate thermal disconnector for each MOV
Status indication:	Mechanical flag + remote contacts (R)
Enclosure:	DIN 43880 4TE, DIN rail mount

The DC PROTEC series has been designed to meet the unique requirements of protection of DC power systems found in telepower and railway applications.

DC-PROTEC 24/48 - provides both common and differential mode protection using high nominal discharge rating for extended operating life under DC conditions.

Technical characteristics

Туре		DC PROTEC B(R) 10		
		24	48	
In accordance with		IEC-61643-1	IEC-61643-1	
Max. continuous operating volt	age (DC) Uc	30V	60V	
Nominal discharge current (8/2	0) In	20kA	20kA	
Max. discharge current (8/20)	Imax	60kA	60kA	
Impulse current (10/350)	limp	10kA	10kA	
Protection level	Up	< 0.6kV	< 0.6kV	
Residual voltage at Iimp	Ures	< 0.3kV	< 0.3kV	
Follow current	lf	NO	NO	
Response time	t _A	< 25ns	< 25ns	
Thermal protection		YES	YES	
Terminal screw torque		max. 4.5Nm	max. 4.5Nm	
Short-circuit withstand current		25kA / 50Hz	25kA / 50Hz	
Temperature range		- 40°C	+ 80°C	
Terminal cross section		35mm ² (solid) / 2	5mm ² (stranded)	
Mounting EN 60715		on a 35mm DIN rail		
Degree of protection		IP 20		
Housing material		Thermoplastic; extinguishing degree UL 94 V-0		
Dimensions DIN 43880		4TE		
Remote contacts		YES		
Contact ratings		AC: 250V/0.5A; 125V/3A		
Terminal cross section		max. 1.5mm ²		
Remote terminal torque		0.25Nm		
Ordering code Without	t remote contact	510 598	510 600	
With re	mote contact	510 599	510 601	

Dimensional drawings







DC PROTEC C(R) 40 Series

DC POWER SUPPLY PROTECTION



Category IEC / EN / VDE:	Class II / Type 2 / C
Design:	Compact housing
Location of use:	DC power systems
Protection modes:	(+)-PE, (-)-PE, (+)-(-)
Protective element:	MOV
Surge discharge ratings:	I _{max} =40kA
Internal protection and safety:	Thermal disconnectors for MOVs
Status indication:	Mechanical flag + remote contacts (R)
Enclosure:	DIN 43880 2TE, DIN rail mount

The DC PROTEC series has been designed to meet the unique requirements of protection of DC power systems found in telepower and railway applications.

DC-PROTEC 24/48 - provides both common and differential mode protection using high nominal discharge rating for extended operating life under DC conditions.

Technical characteristics

Туре			DC PROTEC C(R) 40		
		24	1	48	
In accordance with		IEC-61	643-1 I	EC-61643-1	
Max. continuous operat	ting voltage (DC) Uc	30	V	60V	
Nominal discharge curr	rent (8/20) In	201	(A	20kA	
Max. discharge current	(8/20) I _{max}	40	A	40kA	
Protection level	Ս _p (+	· <mark>)- (-</mark>) < 0.6	ĵkV	< 0.6kV	
	. (+	<mark>·), (-)</mark> - PE < 1.5	škV	< 1.5kV	
Follow current	l _f	N	Э	NO	
Response time	t _A	< 25	ins	< 25ns	
Thermal protection		YE	S	YES	
Terminal screw torque		max. 4	1.5Nm	max. 4.5Nm	
Short-circuit withstand	current	25kA /	50Hz 2	25kA / 50Hz	
Temperature range			- 40°C + 80°C		
Terminal cross section			35mm ² (solid) / 25mm ² (stranded)		
Mounting EN 60715			on a 35mm DIN rail		
Degree of protection			IP 20		
Housing material			Thermoplastic; extinguishing degree UL 94 V-0		
Dimensions DIN 43880			2TE		
Remote contacts			YES		
Contact ratings			AC: 250V/0.5A; 125V/3A		
Terminal cross section			max. 1.5mm ²		
Remote terminal torque			0.25Nm		
Ordering code	Without remote contact	510	564	510 566	
	With remote contact	510	565	510 567	

Dimensional drawings







PROTEC DMDR 20 Series

DC POWER SUPPLY PROTECTION



Category IEC / EN / VDE:	Class III / Type 3 / D
Design:	Replaceable plug-in module
Location of use:	DC and AC power systems
Protection modes:	L/N- PE
Protective element:	MOV+GDT
Surge discharge ratings:	I _{max} =3kA10kA
Status indication:	Remote contacts + LED
Enclosure:	DIN 43880 1TE, DIN rail mount

The PROTEC DMDR series has been designed to meet the unique requirements of protection of DC power systems found in telepower and railway applications.

PROTEC DMDR - provides both common and differential mode protection using high nominal discharge rating for extended operating life under DC conditions.

Technical characteristics

Туре		PROTEC DMDR 20			
		24	48	60	120
In accordance with			IEC-61	643-1	
Protection construction			Two parts: base + repla	ceable plug-in module	
Nominal operating voltage	U _n	24V _{AC}	48V _{AC}	60V _{AC}	120V _{AC}
Max. continuous operating voltage Uc		34V _{AC} /44V _{DC}	60V _{AC/DC}	75V _{AC/DC}	150V _{AC/DC}
Combination wave (1.2/50, 8/20)	U _{oc} /I _{cw}	4kV/2kA	4kV/2kA	6kV/3kA	6kV/3kA
Nominal discharge current (8/20µs)In		1.2kA	2.5kA	2.5kA	4kA
Max. discharge current (8/20µs)	Imax	3kA	6kA	6kA	10kA
Protection level	Up (L-N)	< 180V	< 370V	< 400V	< 600V
	(L-PE/N-PE)	< 550V	< 650V	< 700V	< 850V
Response time of overvoltage protection	t _A (L-N)	< 25ns	< 25ns	< 25ns	< 25ns
	(L-PE/N-PE)	< 100ns	< 100ns	< 100ns	< 100ns
Thermal protection		YES	YES	YES	YES
Terminal cross section			Multi-stran	d to 6 mm ²	
Terminal screw torque			max.	2Nm	
Operating temperature		-40°C +80°C			
Degree of protection			IP	20	
Housing material		Thermoplastic; gray, extinguishing degree UL 94 V-0			
Dimensions DIN 43880		1TE			
Mounting EN 60715		on a 35mm DIN rail			
Ordering code		515 051	515 053	515 054	515 055

Dimensional drawings









PROTEC C(R) 40

Category IEC / EN / VDE:	Class II / Type 2 / C
Design:	Compact housing
Location of use:	Branch sub- distribution boards
Protection modes:	L/N- PE,L-PEN
Protective element:	MOV
Surge discharge ratings:	I _{max} =40kA
Internal protection and safety:	Thermal disconnector for MOV
Status indication:	Mechanical flag + remote contacts (R)
Enclosure:	DIN 43880 1TE, DIN rail mount

PROTEC C 40/75 provide differential-only protection against induced over-voltages. The C model's plug-in module / base design facilitates replacement of a failed module in situ without the need to remove system wiring.

Technical characteristics

Туре		PROTEC C(R) 40		
		75		
In accordance with		IEC-61643-1		
Max. continuous operat	ing voltage (AC/DC) Uc	75/100V		
Nominal discharge curr	ent (8/20) In	20kA		
Max. discharge current	(8/20) I _{max}	40kA		
Protection level	Up	< 0.6kV		
Follow current	I _f	NO		
Response time	t _A	< 25ns		
Thermal protection		YES		
Terminal screw torque		max. 4.5Nm		
Short-circuit withstand current		25kA / 50Hz		
Temperature range		- 40°C + 80°C		
Terminal cross section		35mm ² (solid) / 25mm ² (stranded)		
Mounting EN 60715		on a35mm DIN rail		
Degree of protection		IP 20		
Housing material		Thermoplastic; extinguishing degree UL 94 V-0		
Dimensions DIN 43880		1TE		
Remote contacts		YES		
Contact ratings		AC: 250V/0.5A; 125V/3A		
Terminal cross section		max. 1.5mm ²		
Remote terminal torque		0.25Nm		
Ordering code Without remote contact		500 001		
	With remote contact	500 011		
Replaceable plug-in module		500 216		

Dimensional drawings











DC POWER SUPPLY PROTECTION

PROTEC CN(R) 40



Category IEC / EN / VDE:	Class II / Type 2 / C
Design:	Compact housing
Location of use:	Branch sub-distribution boards
Protection modes:	L/N - PE, L - PEN
Protective element:	MOV
Surge discharge ratings:	I _{max} = 40kA
Internal protection and safety	: Thermal disconnector for MOV
Status indication:	Mechanical flag + remote contacts (R)
Enclosure:	DIN 43880 1TE, DIN rail mount

DC POWER SUPPLY PROTECTION

PROTEC CN 40/75 - provide differential-only protection against induced over-voltages. The CN enclosure provides a compact design.

Technical characteristics

Туре		PROTEC CN(R) 40 75	
In accordance with		IEC-61643-1	
Max. continuous operating voltage (AC/DC)	Uc	75/100V	
Nominal discharge current (8/20)	In	20kA	
Max. discharge current (8/20)	Imax	40kA	
Protection level	Up	< 0.6kV	
Follow current	lf	NO	
Response time	tA	<25ns	
Thermal protection		YES	
Terminal screw torque		max. 3.5Nm	
Short-circuit withstand current		25kA / 50Hz	
Temperature range		- 40°C + 80°C	
Terminal cross section		35mm ² (solid) / 25mm ² (stranded)	
Mounting EN 60715 on a 35mm DIN rail		on a 35mm DIN rail	
Degree of protection IP 20		IP 20	
Housing material Thermoplastic; extinguishing degree UL 94 V-0		Thermoplastic; extinguishing degree UL 94 V-0	
Dimensions DIN 43880		1TE	
Remote contacts		YES	
Contact ratings		AC: 250V/0.5A; 125V/3A	
Terminal cross section		max. 1.5mm ²	
Remote terminal torque		0.25Nm	
Ordering code Without remote conta	ict	507 001	
With remote contact		507 011	

Dimensional drawings





VM-RS



DATA PROTOCOL PROTECTION

IEC category / EN type:	C1/C2/C3 (IEC 60643-21)	
Design:	16 terminal compact module	
Mode of protection:	Longitudinal, Transverse	
Number of protected pairs:	2 (4 lines)	
Coarse Protection:	2 x 3 terminal GDT,	
	2 x 2 terminal GDT	
Nom. Operating Voltage Un:	5 V _{DC}	
Max. Operating Voltage U _C :	6 V _{DC}	
Series Resistance:	1.7 - 1.9Ω per line	
Freq:	< 1.5MHz	
Surge Discharge Ratings:	I _n : 10kA 8/20μs, I _{max} : 20kA 8/20μs	
Series load current:	500mA	
Enclosure:	DIN 43880 2TE, DIN rail mount	
Terminals:	Multi-strand to 2 x 2.5 mm ²	

The VM-RS series has been developed to protect 2 pair data transmission circuits using the RS 485, RS 422 and V11 protocol.

The circuit consists of two balanced pairs with equipotential equalization between them. Equipotential equalization is also provided between signal ground and protective ground to avoid equipment damage from ground potential rises during surge activity.

Coarse protection is provided by a three terminal gas discharge tube while fine protection is provided using a high speed silicon stage which provides both common (longitudinal) mode protection from each line to protective ground, and differential (transverse) mode protection between each pair.

Care is taken to ensure coordination between these two stages without voltage or surge current blind spots occurring.

Thermal protection is provided to reduce the hazards of thermal runaway should there be an inadvertent mains incursion fault.

Technical characteristics

Туре		VM-K5 485
Protection construction		Protective module
Number of protected pairs		2 (4 conductors)
Nominal operating voltage	Un	5V _{DC}
Max. continuous operating voltage	Uc	6V _{DC}
Rated spark overvoltage	(5, 6, 7 and 8 - 4, SG)	6.5V - 8.5V
	(5-6 and 7-8)	6.5V - 8.5V
	(5, 6, 7 and 8 - 2, PG)	78V - 116V
Rated operating current at 25°C	IL .	500mA
Nominal discharge current (8/20µs)	l _n	20kA
Residual voltage at 5 kA (8/20µs)	(line-line)	20V
Response time of overvoltage protection	tA	< 1ns (5, 6, 7, 8 - SG))
Thermal protection		Thermo-clip in lines 5, 6, 7and 8
Insulation resistance of the protection		6kΩ
Serial resistance	R	1.7 - 1.9Ω
Transverse capacitance	C	< 2nF
Limit frequency	fg	> 1MHz
Terminal cross section		Multi-strand to 2 x 2.5mm ²
Operating temperature		-40°C +80°C
Degree of protection		IP 20
Housing material		Thermoplastic; gray, extinguishing degree V-O
Dimensions DIN 43880		2TE
Mounting EN 60715		on a 35mm DIN raill
Ordering code		703 801



VM-RS

DATA PROTOCOL PROTECTION

Dimensional drawings



Connection diagram

l I

Legend:	
TC	thermo-clip
GDT	gas discharge tube
R	resistor
BD	bi-directional TVS diode
PG	protective grounding
SG	signal grounding







IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	In-line module
Number of protected pairs:	8 lines
Nom. Operating Voltage U _n :	12V _{DC}
Max. Operating Voltage U _C :	15V _{DC}
Freq:	< 1MHz
Surge Discharge Ratings:	I _n : 100A 8/20μs/line, I _{max} : 200A 8/20μs/line
Series load current:	500mA
Enclosure:	Plastic
Termination:	DB9 Male - DB9 Female

The IM-DB9 series has been developed to protect transmission circuits using the RS 232 protocol.

Protection is achieved via a DB9, in-line package, comprises a combination of MOV and fast silicon suppressor diodes. All eight lines are protected.

Technical characteristics

Туре		IM-DB 9
Protection construction		Protective module
Nominal operating voltage	Un	12V _{DC}
Max. continuous operating voltage	Uc	15V _{DC}
Nominal discharge current (8/20µs)	In	100A line - line
Max. discharge current (8/20µs)	Imax	200A line - line
Voltage protection level at In	Up	≤ 30V line - line
	·	≤ 200V line - PE
Voltage protection level at 1kV/µs	Up	≤24V line - line
	·	≤ 30V line - PE
Response time of overvoltage protection	tA	≤ 1ns
Insulation resistance of the protection		15ΜΩ
Transverse capacitance	С	600pF line - line
		700pF line - PE
Limit frequency	fG	500kHz
Connector		9 pole M/F
Operating temperature		-40°C +80°C
Degree of protection		IP 20
Housing material		Thermoplastic; gray, extinguishing degree V-O
Ordering code		127 526

Dimensional drawings



Legend: BD bi-directional TVS diode MOV varistor PG protective grounding





IM-DB 15 RS Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	In-line module
Mode of protection:	Longitudinal, Transverse
Number of protected pairs:	2 (4 lines)
Coarse Protection:	2 x 3 terminal GDT,
	1 x 2 terminal GDT
Nom. Operating Voltage U _n :	5V _{DC}
Max. Operating Voltage U _C :	6V _{DC}
Series Resistance:	1.7 - 1.9Ω per line
Freq:	< 35MHz
Surge Discharge Ratings:	l _n : 10kA 8/20μs, l _{max} : 20kA 8/20μs
Series load current:	500mA
Enclosure:	Extruded aluminium
Termination:	Db15 Male - DB15 Female

The IM-DB15 series has been developed to protect 2 pair data transmission circuits using the RS 422, V.11 and X.12 protocols.

The DB15, in-line package, comprises a circuit of two balanced pairs with equipotential equalization between them. Equipotential equalization is also provided between signal ground and protective ground to avoid equipment damage from ground potential rises during surge activity.

Coarse protection is provided by a three terminal gas discharge tube while fine protection is provided using a high speed silicon stage which provides both common (longitudinal) mode protection from each line to protective ground, and differential (transverse) mode protection between each pair. Thermal protection is provided to reduce the hazards of thermal runaway should there be an inadvertent mains incursion fault.

Technical characteristics

Туре		IM-DB 15 RS	IM-DB 15 RS (F-LINE)
Protection construction		Protective module	
Nominal operating voltage	Un	5V _{DC}	
Max. continuous operating voltage	Uc	6V _{DC}	
Rated spark overvoltage	<mark>(2, 9, 4,</mark> 11 - 8, SG)	6.5V - 8.5V	
	(2 - 9 and 4-11)	6.5V - 8.5V	
	<mark>(2, 9, 4,</mark> 11 - 1, PG)	78V - 116V	
Rated operating current at 25°C	IL .	500mA	
Nominal discharge current (8/20µs)	l _n	20kA	
Residual voltage at 5 kA (8/20µs)	(line-line)	< 20V	
Response time of overvoltage protection	tA	< 1ns (2, 9, 4, 11 - 8, SG)	
Thermal protection		Thermo-clip in lines 2, 9, 4 and	d 11
Insulation resistance of the protection		6kΩ	
Serial resistance	R	1.7 - 1.9Ω	
Transverse capacitance	C	< 30nF	
Limit frequency	fg	35Mhz	
Connector		DB 15 (M-LINE)	DB 15 (F-LINE)
Operating temperature		-40°C +80°C	
Degree of protection		IP 20	
Housing material		Al	
Ordering code		127 517	127 516

Dimensional drawings

Connection diagram







DATA PROTOCOL PROTECTION



LZ-NET Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Compact, ergonomic packaging
Protection:	All 4 pairs protected
Nom. Operating Voltage Un:	± 5V _{DC}
Max. Operating Voltage U _C :	± 6V _{DC}
Freq:	< 100MHz, Cat 5 capable
Surge Discharge Ratings I _n :	300А 8/20µs per line
Enclosure:	UTB in-line patch
Termination:	RJ45, Cat. 5 connectors

LOCAL AREA NETWORKS PROTECTION

The LZ-NET series is intended to protect Local Area Networks (LAN) from over voltage surges and electrostatic discharges created by switching transients in buildings. LAN systems are particularly prone to such disturbances because of the often long cable lengths involved which behave like antennas to such atmospheric disturbances. It provides protection to all 8 lines in the UTP, and is Cat 5 capable.

Ground potential equalization between signal and protective (network or PC chassis) ground is provided.

Technical characteristics

Туре		LZ-NET	LZ-NET PoE	LZ-NET STP
Protection construction		Protective module	Protective module	Protective module
Nominal operating voltage	Un	5V _{DC}	48V _{DC}	5V _{DC}
Max. continuous operating voltage	Uc	6V _{DC}	58V _{DC}	6V _{DC}
Nominal discharge current (8/20µs)	In	300A line - line	60A line - line	300A line - line
		300A line - PG	60A line - PG	300A line - PG
Voltage protection level at In	Up	35V line - line	150V line - line	35V line - line
	·	350V line - PG	550V line - PG	350V line - PG
Limit frequency	fG	< 100MHz	< 100MHz	< 100MHz
Response time of overvoltage protection	tA	< 1ns	< 1ns	< 1ns
Connection		Input/Output: RJ45 sockets,	Input/Output: RJ45 sockets,	Input/Output: RJ45S sockets,
		All 4 line pairs protected	all 4 line pairs protected	all 4 line pairs protected
Operating temperature			-40°C +80°C	
Degree of protection			IP 20	
Housing material		Thermoplastic, gray, extinguishing degree V-0		
Ordering code		706 001	706 002	706 011

Dimensional drawings



Connection diagram

 Legend:

 GDT
 gas discharge tube

 DB
 diode block

 PG
 protective grounding



eries



LZ-NET 6



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Compact packaging
Protection:	All 4 pairs protected
Nom. Operating Voltage U _n :	± 48V _{DC}
Max. Operating Voltage U _C :	±48V _{DC}
Freq:	< 250MHz, Cat 6 capable
Surge Discharge Ratings I _n :	250A 8/20μs per line
Enclosure:	UTB in-line patch
Termination:	RJ45, shielded

LOCAL AREA NETWORKS PROTECTION

The LZ-NET 6 series is intended to protect Local Area Networks (LAN) from over voltage surges and electrostatic discharges created by switching transients in buildings. LAN systems are particularly prone to such disturbances because of the often long cable lengths involved which behave like antennas to such atmospheric disturbances. It provides protection to all 8 lines in the UTP, STP and is **Cat 6 capable**.

Ground potential equalization between signal and protective (network or PC chassis) ground is provided.

Technical characteristics

Туре		LZ-NET 6
Protection construction		Protective module
Nominal operating voltage	Un	48V _{DC}
Max. continuous operating voltage	Uc	48V _{DC}
Nominal operating current	١L	1A
Nominal discharge current (8/20µs)	In	150A line - line
Total nominal discharge current (8/20µs)	In	10kA lines - PG
Voltage protection level at In	Up	150V line - line
		550V line - PG
Limit frequency	fG	< 250MHz (Class E)
Response time of overvoltage protection	tA	< 1ns
Connection		Input/Output: RJ45 sockets, all 4 line pairs protected
Operating temperature		-40°C +80°C
Degree of protection		IP 20
Housing material		Metal
Ordering code		706 301

Dimensional drawings





Legend:	
GDT	gas discharge tube
DB	diode block
PG	protective grounding





LZ-xxNET 19 Series

LOCAL AREA NETWORKS PROTECTION



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	19" rack patch panel up to 24 way
Protection:	All 4 pairs protected
Nom. Operating Voltage U _n :	± 5V _{DC}
Max. Operating Voltage U _C :	± 6V _{DC}
Freq:	< 100MHz, Cat 5 capable
Surge Discharge Ratings:	l _n : 300A 8/20μs per line
Enclosure:	19" rack, shielded enclosure, in-line patch
Termination:	RJ45, Cat. 5 connectors
Options:	8, 16, 24 way. Replaceable 8 way module

The LZ-NET 19 series is intended to protect Local Area Networks (LAN) from over voltage surges and electrostatic discharges created by switching transients in buildings. LAN systems are particularly prone to such disturbances because of the often long cable lengths involved which behave like antennas to such atmospheric disturbances. It is designed to fit a 19" rack mount and can provide 8, 16 or 24 way patching to UTP lines.

Technical characteristics

Туре		LZ-xx NET 19	LZ-xx NET 19 PoE	
Protection construction		Protec	tive module	
Number of protected ports		8, -	16 or 24	
Nominal operating voltage	Un	5V _{DC}	48V _{DC}	
Max. continuous operating voltage	Uc	6V _{DC}	58V _{DC}	
Nominal discharge current (8/20µs)	In	300A line - line	60A line - line	
		300A line - PG	60A line - PG	
Voltage protection level at In	U _p	35V line - line	150V line - line	
		550V line - PG	550V line - PG	
Limit frequency	fG	< 100MHz	< 100MHz	
Response time of overvoltage protection	tA	< 1ns	< 1ns	
Connection		Input/Output: RJ 45 soci	Input/Output: RJ 45 sockets, all 4 line pairs protected	
Operating temperature		-40°C +80°C	-40°C +80°C	
Degree of protection		IP 20	IP 20	
Housing material		AI	AI	
Ordering code				
LZ 8 NET 19 (NET Protector for 8 UTP lin	es)	706 110	706 130	
LZ 16 NET 19 (NET Protector for 16 UTP lines)		706 111	706 131	
LZ 24 NET 19 (NET Protector for 24 UTP lines)		706 112	706 132	
LZ 8 NET 19M (Repleceament Surge Module for LZ xx NET 19)) 706 113	706 133	

Dimensional drawings

Connection diagram



Legend: GDT gas discharge tube

DB diode block

PG protective grounding



ZE 200-NET



IEC category / EN type:	III (IEC 60643-1) and C1/C2/C3 (IEC 60643-21)
Design:	Compact, ergonomic packaging
Protection:	Power and Data port
Data port:	Nom. Operating Voltage U _n : ± 5V _{DC}
	Max. Operating Voltage U _C : ± 5V _{DC}
Power port:	Nom. Operating Voltage Un: 230V _{AC}
	Max. Operating Voltage U _c : 275V _{AC}
Freq:	< 100MHz, Cat 5 capable
Surge Discharge Ratings:	Data Port In: 300A 8/20µs per line
	Power Port I _n : 3kA 8/20μs L-N / L-PE
Enclosure:	UTB in-line patch, AC power outlet
Termination:	Data: RJ45, Cat. 5 connectors
	Power: DIN 49 440-CE(7) III, DIN 49 441-CEE(7) IV

The ZE 200-NET series is intended to protect Local Area Networks (LAN) from over voltage surges and electrostatic discharges created by switching transients in buildings. LAN systems are particularly prone to such disturbances because of the often long cable lengths involved which behave like antennas to such atmospheric disturbances.

It provides protection to all 8 lines in the UTP as well as protection to a 230Vac power outlet. Equipotential equalization is provided between the LAN signal port and the AC power port.

Technical characteristics

Туре		ZE 200-NET		
		Power part	Data part	
Protection construction		Protective mod	ule	
Nominal operating voltage	Un	230V / 50Hz	5V _{DC}	
Max. continuous operating voltage	Uc	275V / 50Hz	6V _{DC}	
Nominal discharge current (8/20µs)	In	3kA (L(N) - PE, L - N)	300A line - line	
		10kA (L+N - PE)	300A line - PE	
Pulse discharge voltage (1.2/20µs)	U _{oc}	6kV (L(N) - PE, L - N)	/	
		10kV (L+N - PE)	/	
Voltage protection level at In	Up	< 1000V (L - N)	35V line - line	
	•	< 1500V (L(N) - PE)	350V line - PE	
Forefuse		16A gL - (needed if not present in the network)	1	
Limit frequency	fG	1	100MHz	
Response time of overvoltage protection	t _A	< 25ns (L - N)	< 1ns	
		< 100ns (L(N) - PE)	/	
Connection		DIN 49 440-CE(7)III, DIN 49 441-CEE(7)IV	Input/Output: RJ 45 sockets,	
		Grounding contact	all 4 line pairs protected	
Supervising device: Supply present		Green light	1	
Error		Red light		
Operating temperature		-40°C +80°C		
Degree of protection		IP 20		
Housing material		Thermoplastic, gray, extingui	shing degree V-0	
Ordering code		121 257		

Dimensional drawings



Connection diagram



LOCAL AREA NETWORKS PROTECTION



ZES-76 TEL-TV



IEC catagony / EN typo	III (IEC 60642.1) and C1 (C2 (C2 (IEC 60642.21)))
iec category / Elv type.	III (IEC 00045-1) allu C1/C2/C5 (IEC 00045-21)
Design:	Compact, ergonomic packaging
Protection:	Power, telecommunication and TV
Telecommunication port:	Max. Operating Voltage U _c : 170V _{DC}
TV port:	Max. Operating Voltage U _c : 70V _{DC}
Power port:	Nom. Operating Voltage Un: 230VAC
	Max. Operating Voltage Uc: 250VAC
Surge Discharge Ratings:	Tel. Port I _n : 2.5kA 8/20μs per line
	Coax. Port In: 5kA 8/20µs per line
	Power Port I _n : U _{oc} : 3kV
Enclosure:	UTB in-line patch, AC power outlet
Termination:	Tel.: RJ11 input / RJ11 output
	Coax.: IEC connector
	Power: DIN 49 440-CEE(7) III, DIN 49 441-CEE(7) IV

The adapter ZES-76 TEL-TV is intended for the protection of multimedia devices (e.g. printers, modems, TV sets, Hi-fi's, DVDs etc). The protection is functionally divided into power supply protection (230V), telephone line protection and TV protection. Furthermore, there is also an overload protection fitted. The adapter protects electronic devices against surges caused by lightning strikes, switching operations at larger electrical consumers, induction and other sources of overvoltage.

Technical characteristics

Туре			ZES-76 TEL-TV	
		Power part	Tel. Part	Coax. Part
Protection construction			Protective module	
Nominal operating voltage U	n	230V / 50Hz	110V _{DC}	50V _{DC}
Max. continuous operating voltage	c	250V / 50Hz	170V _{DC}	70V _{DC}
Nominal discharge current (8/20µs)		/	2.5kA	5kA
Pulse discharge voltage (1.2/20µs)	oc	3kV	/	/
Voltage protection level at In U	p	< 1000V (L - N)	700V	700V
Forefuse (needed if not present in the network)		16A gL	/	/
Limit frequency for	ì	/	30MHz	860MHz
Response time of overvoltage protection t,		< 25ns (L - N)	< 100ns	< 100ns
Connection		DIN 49 440-CE(7)III	Input/Output: RJ 11 sockets,	IEC connector
		DIN 49 441-CEE(7)IV		
		Grounding contact		
Supervising device: Protection status		Green light		
Operating temperature		-40°C +80°C		
Degree of protection		IP 20		
Housing material		Thermoplastic, extinguishing degree V-0		
Ordering code			121 368	

Dimensional drawings





COMBINED PLUG-IN SURGE PROTECTION

ZES-7 TEL-TV



IEC category / EN type:	III (IEC 60643-1) and C1/C2/C3 (IEC 60643-21)
Design:	Compact, ergonomic packaging, extension cord, 7 power socket
Protection:	Power, telecommunication and TV
Telecommunication port:	Max. Operating Voltage U _c : 170V _{DC}
TV port:	Max. Operating Voltage U _c : 70V _{DC}
Power port:	Nom. Operating Voltage Un: 230VAC
	Max. Operating Voltage U _c : 250V _{AC}
Surge Discharge Ratings:	Tel. Port I _n : 2.5kA 8/20μs per line
	Coax. Port In: 5kA 8/20µs per line
	Power Port In: Uoc: 3kV
Enclosure:	UTB in-line patch, AC power outlet
Termination:	Tel.: RJ11 input / RJ11 output
	Coax.: IEC connector
	Power: DIN 49 440-CEE(7) III, DIN 49 441-CEE(7) IV

The combined plug-in surge protection ZES-7 TEL-TV is intended for the protection of multimedia devices (e.g. printers, modems, TV sets, Hi-fi's, DVDs etc). The protection is functionally divided into power supply protection (230V), telephone line protection and TV protection. Furthermore, there is also an overload protection fitted. The ZES-7 TEL-TV protects electronic devices against surges caused by lightning strikes, switching operations at larger electrical consumers, induction and other sources of overvoltage.

Technical characteristics

Туре			ZES-7 TEL-TV	
		Power part	Tel. Part	Coax. Part
Protection construction			Protective module	
Nominal operating voltage	Un	230V / 50Hz	110V _{DC}	50V _{DC}
Max. continuous operating voltage	Uc	250V / 50Hz	170V _{DC}	70V _{DC}
Nominal discharge current (8/20µs)	In	/	2.5kA	5kA
Pulse discharge voltage (1.2/20µs)	U _{oc}	3kV	/	/
Voltage protection level at In	Up	< 1000V (L - N)	700V	700V
Limit frequency	fG	/	30MHz	/
Response time of overvoltage protection	tA	< 25ns (L - N)	< 100ns	860MHz
Connection		DIN 49 440-CE(7)III	Input/Output: RJ 11 sockets,	< 100ns
		DIN 49 441-CEE(7)IV		IEC connector
		Grounding contact		
Supervising device: Supply present		Green light		
Protection status		Yellow light		
Operating temperature		-40°C +80°C		
Degree of protection		IP 20		
Housing material		Thermoplastic, extinguishing degree V-0		
Ordering code		121 369		

Dimensional drawings





COMBINED PLUG-IN SURGE PROTECTION

ZES 1M+5S



IEC category / EN type:	III (IEC 60643-1) and C1/C2/C3 (IEC 60643-21)
Design:	Compact, ergonomic packaging, extension cord, 6 power socket
Protection:	Power, telecommunication and TV
Telecommunication port:	Max. Operating Voltage U _C : 170V _{DC}
TV port:	Max. Operating Voltage U _C : 70V _{DC}
Power port:	Nom. Operating Voltage Un: 230VAC
	Max. Operating Voltage U _C : 250V _{AC}
Surge Discharge Ratings:	Tel. Port I _n : 2.5kA 8/20μs per line
	Coax. Port I _n : 5kA 8/20µs per line
	Power Port I _n : U _{oc} : 3kV
Enclosure:	UTB in-line patch, AC power outlet
Termination:	Tel.: RJ11 input / RJ11 output
	Coax.: IEC connector
	Power: DIN 49 440-CEE(7) III, DIN 49 441-CEE(7) IV

The combined plug-in surge protection ZES-1M+5S is intended for the protection of multimedia devices (e.g. printers, modems, TV sets, Hi-fi's, DVDs etc). The protection is functionally divided into power supply protection (230V), telephone line protection and TV protection. Furthermore, there is also an overload protection fitted. The ZES-1M+5S protects electronic devices against surges caused by lightning strikes, switching operations at larger electrical consumers, induction and other sources of overvoltage. Master-slave function is included.

Technical characteristics

Туре			ZES 1M+5S	
		Power part	Tel. Part	Coax. Part
Protection construction			Protective module	
Nominal operating voltage	Un	230V / 50Hz	110V _{DC}	50V _{DC}
Max. continuous operating voltage	Uc	250V / 50Hz	170V _{DC}	70V _{DC}
Nominal discharge current (8/20µs)	In	/	2.5kA	5kA
Pulse discharge voltage (1.2/20µs)	Uoc	3kV	/	/
Voltage protection level at In	Up	< 1000V (L - N)	700V	700V
Limit frequency	fG	/	30MHz	860MHz
Response time of overvoltage protection	tA	< 25ns (L - N)	< 100ns	< 100ns
Connection		DIN 49 440-CE(7)III	Input/Output: RJ 11 sockets,	IEC connector
		DIN 49 441-CEE(7)IV		
		Grounding contact		
Supervising device: Supply present		Green light		
Protection status		Yellow light		
Operating temperature		-40°C +80°C		
Degree of protection		IP 20		
Housing material		Thermoplastic, extinguishing degree V-0		
Ordering code		121 370		

Dimensional drawings





COMBINED PLUG-IN SURGE PROTECTION

ZES 1M+4S TEL-NET USB Hub

COMBINED PLUG-IN SURGE PROTECTION



IEC category / EN type:	III (IEC 60643-1) and C1/C2/C3 (IEC 60643-21)
Design:	Compact, ergonomic packaging, extension cord, 5 power socket
Protection:	Power, telephone/Ethernet Cat5 protection
Data port:	Max. Operating Voltage U _C : 170 V _{DC}
Power port:	Nom. Operating Voltage U _n : 230V _{AC}
	Max. Operating Voltage U _c : 250V _{AC}
Surge Discharge Ratings:	Data Port In: 2.5kA 8/20μs per line
	Power Port In: Uoc: 3kV
Enclosure:	UTB in-line patch, AC power outlet
Termination:	Data: RJ45 input / RJ45 output
	Power: DIN 49 440-CEE(7) III, DIN 49 441-CEE(7) IV

The combined plug-in surge protection ZES-1M+4S is intended for the protection of multimedia devices (e.g. printers, modems, TV sets, Hi-fi's, DVDs etc). The protection is functionally divided into power supply protection (230V) and telephone/Ethernet Cat5 protection. Furthermore, there is also an overload protection fitted. The ZES-1M+4S protects electronic devices against surges caused by lightning strikes, switching operations at larger electrical consumers, induction and other sources of overvoltage. 4 Port passive USB Hub and master-slave function are included.

Technical characteristics

Туре		ZES-1M+4S TEL-TV USB Hub		
		Power part	Data part	
Protection construction		Protective mo	dule	
Nominal operating voltage	Un	230V / 50Hz	110V _{DC}	
Max. continuous operating voltage	Uc	250V / 50Hz	170V _{DC}	
Nominal discharge current (8/20µs)	In	1	2.5kA	
Pulse discharge voltage (1.2/20µs)	U _{oc}	3kV	/	
Voltage protection level at In	Up	< 1000V (L - N)	700V	
Limit frequency	fG	/	100MHz	
Response time of overvoltage protection	tA	< 25ns	< 100ns	
Connection		DIN 49 440-CE(7)III, DIN 49 441-CEE(7)IV	Input/Output: RJ 45 sockets,	
		Grounding contact	all 3 pairs protected	
Supervising device: Supply present		Green light	/	
Protection status		Yellow light		
Operating temperature		-40°C +80°C		
Degree of protection		IP 20		
Housing material		Thermoplastic, extinguishing degree V-0		
Ordering code		121 380		

Dimensional drawings





PLUG-IN SURGE PROTECTION



IEC category / EN type:	III (IEC 60643-1)
Design:	Compact, ergonomic packaging, extension cord, 5 power socket
Protection:	Nom. Operating Voltage Un: 230V _{AC}
	Max. Operating Voltage U _C : 250V _{AC}
Surge Discharge Ratings:	U _{oc} : 3kV
Enclosure:	AC power outlet
Termination:	Power: DIN 49 440-CEE(7) III, DIN 49 441-CEE(7) IV

The plug-in surge protection ZES-6 is intended for the protection of household appliances. There is also an overload protection fitted. The ZES-6 protects electronic devices against surges caused by lightning strikes, switching operations at larger electrical consumers, induction and other sources of overvoltage.

Technical characteristics

Туре		ZES 6	
		Power part	
Protection construction		Protective module	
Nominal operating voltage	Un	230V / 50Hz	
Max. continuous operating voltage	Uc	250V / 50Hz	
Pulse discharge voltage (1.2/20µs)	Uoc	3kV	
Voltage protection level at In	Up	< 1000V (L - N)	
Limit frequency	fG	1	
Response time of overvoltage protection	tA	< 25ns	
Connection		DIN 49 440-CE(7)III, DIN 49 441-CEE(7)IV	
		Grounding contact	
Supervising device: Supply present		Green light	
Protection status		Yellow light	
Operating temperature		-40°C +80°C	
Degree of protection		IP 20	
Housing material		Thermoplastic, extinguishing degree V-0	
Ordering code		121 374	

Dimensional drawings





ZV-BNC Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Impedance matched
Nom. Operating Voltage U _n :	±5, ±12VDC
Max. Operating Voltage U _C :	±6, ±14VDC
Freq:	< 100MHz
Surge Discharge Ratings:	l _n : 10kA 8/20μs, l _{max} : 20kA 8/20μs
Series load current:	100mA
Enclosure:	Shielded enclosure, in-line installation
Termination:	BNC connectors

COAXIAL/RF PROTECTION

The ZV-BNC series is intended to protect Arcnet computer networks and CCTV coaxial video signals.

 $Both \ coarse \ and \ fine \ protection \ is \ provided \ in \ a \ shielded, \ impedance \ matched, \ compact \ in-line \ enclosure.$

Protection is provided core-shield, and shield-protective ground.

The design ensures minimum of capacitance loading thereby ensuring a high operating bandwidth while providing efficient clamping against transient voltages.

Technical characteristics

Туре		ZV-BNC	ZV-BNC
		± 5V	± 12V
Protection construction		I	Protective module
Nominal operating voltage	Un	± 5V _{DC}	± 12V _{DC}
Max. operating voltage	Uc	± 6V _{DC}	± 14V _{DC}
Rated spark overvoltage	(wire-shield) (shield-PG)	13.5V - 16.5V 72V - 108V	30V - 36V 72V - 108V
Rated operating current at 25°C	IL .	100mA	100mA
Nominal discharge current (8/20µs)	In	10kA	10kA
Residual voltage at 5kA (8/20µs)		< 35V (wire-shield)	< 65V (wire-shield)
Response time of overvoltage protection	<mark>(wire-shie</mark> ld)	< 10ns	< 10ns
	(shield-PG)	< 100ns	< 100ns
Insulation resistance of the protection	(wire-shield)	≥ 10MΩ	≥ 28MΩ
	(shield-PG)	≥1GΩ	≥ 1GΩ
Serial resistance	R	9 - 11Ω	9 - 11Ω
Transverse capacitance	(wire-shield)	30pF	30pF
	(shield-PG)	1pF	1pF
Limit frequency	fG	100MHz	100MHz
Transmission rate		16Mbit/s	16Mbit/s
Operating temperature			40°C + 80°C
Degree of protection			IP 20
Casing material			Metal
Connection			BNC connector
Ordering code		705 001	705 002

Dimensional drawings



Legend:	
GDT	gas discharge tube
R	resistor
С	capacitor
D	diode
BD	bi-directional TVS diode
PG	protective grounding





ZV1; ZV1-F Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Impedance matched
Nom. Operating Voltage U _n :	48VDC
Max. Operating Voltage U _C :	60VDC
Freq:	40 - 860MHz
Surge Discharge Ratings:	I _n : 5kA 8/20μs, I _{max} : 10kA 8/20μs
Series load current:	100mA
Enclosure:	Shielded enclosure, in-line installation
Termination:	IEC; F connectors

COAXIAL/RF PROTECTION

The aerial adapters ZV1 (ZV1-F) are intended for the protection of TV sets, aerial amplifiers and cable television CATV.

It should be connected to the aerial input of the TV set, with the coaxial cable from the aerial plugged into the other side. It should be grounded to the protective earth conductor of the housing installation.

In the case of an individual aerial system with an individual aerial amplifier it is recommended to install an additional aerial adapter which should be connected in the same way as for the TV set.

The aerial adapter is not suitable for outdoor installation or installation in very damp places.

Technical characteristics

Туре		ZV-1	ZV1-F
Protection construction		Pro	tective module
Nominal operating voltage	Un	48V _{DC}	48V _{DC}
Max. operating voltage	Uc	60V _{DC}	60V _{DC}
Rated spark overvoltage	(wire-shie	ld) 90V - 110V	90V - 110V
Rated operating current at 25°C	IL.	100mA	100mA
Nominal discharge current (8/20µs)	In	5kA	5kA
Residual voltage at 5kA (8/20µs)		< 500V	< 500V
Response time of overvoltage protection	(wire-shiel	ld) < 25ns	< 25ns
Insulation resistance of the protection	(wire-shiel	ld) ≥ 6MΩ	≥ 6MΩ
Serial resistance	R	< 0.1 Ω	< 0.1 Ω
Limit frequency	fG	40 - 860MHz	40 - 860MHz
Operating temperature		- 40	°C + 80°C
Degree of protection			IP 20
Casing material			Metal
Connection		IEC	F
Ordering code		125 090	125 210
Nominal discharge current (8/20µs) Residual voltage at 5kA (8/20µs) Response time of overvoltage protection Insulation resistance of the protection Serial resistance Limit frequency Operating temperature Degree of protection Casing material Connection Ordering code	In (wire-shiel (wire-shiel R fG	5kA < 500V	5kA < 500V

Dimensional drawings

Connection diagram

ZV1-F

Zv1











CCP-BNC Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	In-line. Impedance matched
Max. Operating Voltage U _C :	70, 180, 280V
Max. Peak Power:	40, 125, 300W respectively
Freq:	DC 2.6GHz
Characteristic Impedance:	50Ω
Insertion loss:	< 0.4dB
Return loss:	> 20dB
Surge Discharge Ratings:	I _N :10kA 8/20μs, I _{MAX} : 20kA 8/20μs
Enclosure:	Shielded enclosure, in-line installation
Termination:	BNC - Type. M-F and F-F available

COAXIAL/RF PROTECTION

The CCP-BNC series of coaxial surge protectors is intended to protect RF antenna systems and is suitable for frequencies from DC to 2.4 GHz.

It is designed as an in-line unit allowing ease of installation. The careful design, low capacitance gas discharge arresters and high quality BNC-type termination connectors, ensures a minimum of insertion loss throughout the frequency band.

Transfer power is 40W to 300W continuous (depending on CCP voltage).

The CCP coaxial cable protector is designed in accordance with the following standards and regulations:

-IEC 61643-21:2000

A grounding stud is provided which should be connected to the system ground, or coaxial feed-through bulkhead, as directly as possible.

Technical characteristics

Туре		CCP70	CCP180	CCP280	CCP70	CCP180	CCP280
		-BNC-FF	-BNC-FF	-BNC-FF	-BNC-MF	-BNC-MF	-BNC-MF
Max. Continuous operating voltage	Uc	70V	180V	280V	70V	180V	280V
Max. peak power		40W	125W	300W	40W	125W	300W
Impedance				5	Ω		
Frequency range				0 - 260	0 MHz		
Insertion losses				< 0	4dB		
Return losses			> 20dB				
Nom. discharge current (8/20µs)	In			10	κA		
Max. discharge current (8/20µs)	Imax			20	κA		
Residual voltage (1kV/µs)		< 600V	< 700V	< 900V	< 600V	< 700V	< 900V
Insulation				> 10	GΩ		
Weight		106g	106g	106g	114g	114g	114g
Operation temperature				- 40 ⁰ C .	+ 80 ⁰ C		
Style of connector		E	BNC female / femal	e		BNC male / female	
Ordering code		800 729	800 730	800 731	800 732	800 733	800 734

Dimensional drawings

Connection diagram

CCP-BNC-MF



CCP-BNC-FF







CCP-7/16 Series



COAXIAL/	RF	PROTECTION

IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design	Bulkhead, impedance matched
Max. Operating Voltage U _C :	70, 180, 280V
Max. Peak Power:	40, 125, 300W respectively
Freq:	DC 2.5GHz
Characteristic Impedance:	50Ω
Insertion loss:	< 0.2dB
Return loss:	> 20dB
Surge Discharge Ratings:	I _N : 10kA 8/20μs, I _{MAX} : 20kA 8/20μs
Enclosure:	Shielded enclosure, bulkhead installation
Termination:	7/16-Type M-F

The CCP-7/16 series of coaxial surge protectors is intended to protect base station RF antenna systems and is suitable for frequencies from DC to $2.5\,$ GHz.

It is designed for bulkhead or in-line installation. The careful design, low capacitance gas discharge arresters and high quality 7/16-type termination connectors ensure a minimum of insertion loss throughout the frequency band. Transfer power is 40W to 300W continuous (depending on CCP voltage).

The CCP coaxial cable protector is designed in accordance with the following standards and regulations:

-IEC 61643-21:2000

GDT is replaceable. The unit should be solidly mounted to the coaxial feed-through bulkhead which should in turn present a low impedance path to ground for direct or partial lightning currents.

Technical characteristics

Туре		CCP70	CCP180	CCP280			
		-7/16-MF	-7/16-MF	-7/16-MF			
Max. Continuous operating voltage	Uc	70V	180V	280V			
Max. peak power		40W	125W	300W			
Impedance			50Ω				
Frequency range			0 - 2500MHz	2			
Insertion losses		< 0.2dB					
Return losses		> 20dB					
Nom. discharge current (8/20µs)	In	10kA					
Max. discharge current (8/20µs)	Imax	20kA					
Residual voltage (1kV/µs)		< 600V	< 700V	< 900V			
Insulation			> 10GΩ				
Weight		214g					
Operation temperature		- 40°C + 80°C					
Style of connector		7/16 male / female					
Ordering code		800 720	800 721	800 722			

Dimensional drawings

Connection diagram



SHIELD PE



CCP-N Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	In-line. Impedance matched
Max. Operating Voltage U _C :	70, 180, 280V
Max. Peak Power:	40, 125, 300W respectively
Freq:	DC 2.6GHz
Characteristic Impedance:	50Ω
Insertion loss:	< 0.4dB
Return loss:	> 20dB
Surge Discharge Ratings:	Ι _Ν : 10kA 8/20μs, Ι _{ΜΑΧ} : 20kA 8/20μs
Enclosure:	Shielded enclosure, in-line installation
Termination:	N - Type. M-F and F-F available

COAXIAL/RF PROTECTION

The CCP-N series of coaxial surge protectors is intended to protect RF antenna systems and is suitable for frequencies from DC to $2.4\,GHz$.

It is designed as an in-line unit allowing ease of installation. The careful design, low capacitance gas discharge arresters and high quality N-type termination connectors, ensures a minimum of insertion loss throughout the frequency band.

Transfer power is 40W to 300W continuous (depending on CCP voltage).

The CCP coaxial cable protector is designed in accordance with the following standards and regulations:

-IEC 61643-21:2000

A grounding stud is provided which should be connected to the system ground, or coaxial feed-through bulkhead, as directly as possible.

Technical characteristics

Туре		CCP70	CCP180	CCP280	CCP70	CCP180	CCP280
		-N-FF	-N-FF	-N-FF	-N-MF	-N-MF	-N-MF
Max. Continuous operating voltage	Uc	70V	180V	280V	70V	180V	280V
Max. peak power		40W	125W	300W	40W	125 W	300 W
Impedance				50	Ω(
Frequency range				0 - 260	00MHz		
Insertion losses			< 0.4dB				
Return losses		> 20dB					
Nom. discharge current (8/20µs)	In			10	κA		
Max. discharge current (8/20µs)	Imax			20	κA		
Residual voltage (1kV/µs)		< 600V	< 700V	< 900V	< 600V	< 700V	< 900V
Insulation				> 10	GΩ		
Weight		138g	138g	138g	142g	142g	142g
Operation temperature				- 40 ⁰ C .	+ 80 ⁰ C		
Style of connector		N female / female N male / female					
Ordering code		800 723	800 724	800 725	800 726	800 727	800 728

Dimensional drawings

Connection diagram

CCP-N-MF



CCP-N-FF







CCP-N-6G Series



COAXIAL/	'RF	PRO	ΤΕCΤΙ	ΟΝ
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IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	In-line. Impedance matched
Max. Operating Voltage U _C :	180V
Max. Peak Power:	125W
Freq:	DC - 6.0GHz
Characteristic Impedance:	50Ω
Insertion loss:	< 0.4dB
Return loss:	> 20dB
Surge Discharge Ratings:	Ι _Ν : 10kA 8/20μs, Ι _{ΜΑΧ} : 20kA 8/20μs
Enclosure:	Shielded enclosure, in-line installation
Termination:	N - Type. M-F and F-F available

The CCP-N-6G series of coaxial surge protectors is intended to protect RF antenna systems and is suitable for frequencies from DC to **6.0GHz**.

It is designed as an in-line unit allowing ease of installation. The careful design, low capacitance gas discharge arresters and high quality N-type termination connectors, ensures a minimum of insertion loss throughout the frequency band.

Transfer power is 125W continuous.

The CCP coaxial cable protector is designed in accordance with the following standards and regulations:

-IEC 61643-21:2000

A grounding stud is provided which should be connected to the system ground, or coaxial feed-through bulkhead, as directly as possible.

Technical characteristics

Туре	CCP180	CCP180
	-N-FF	-N-MF
Max. Continuous operating voltage Uc	180V	180V
Max. peak power	125W	125 W
Impedance	50Ω	
Frequency range	0 - 6.0GH	Z
Insertion losses	< 0.4dB	
Return losses	> 20dB	
Nom. discharge current (8/20µs) In	10kA	
Max. discharge current (8/20µs) Imax	20kA	
Residual voltage (1kV/µs)	< 700V	< 700V
Insulation	> 10GΩ	
Weight	132g	130g
Operation temperature	- 40°C +	80°C
Style of connector	N female / female	N male / female
Ordering code	800 763	800 764

Dimensional drawings

Connection diagram

CCP-N-6G-MF



CCP-N-6G-FF







CCP-UHF Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	In-line. Impedance matched
Max. Operating Voltage U _C :	70, 180, 280V
Max. Peak Power:	40, 125, 300W respectively
Freq:	DC 600MHz
Characteristic Impedance:	50Ω
Insertion loss:	< 0.4dB
Return loss:	> 20dB
Surge Discharge Ratings:	l _N : 10kA 8/20μs, l _{MAX} : 20kA 8/20μs
Enclosure:	Shielded enclosure, in-line installation
Termination:	UHF - Type. M-F and F-F available

COAXIAL/RF PROTECTION

The CCP-UHF series of coaxial surge protectors is intended to protect RF antenna systems and is suitable for frequencies from DC to 600 MHz.

It is designed as an in-line unit allowing ease of installation. The careful design, low capacitance gas discharge arresters and high quality UHF-type termination connectors, ensures a minimum of insertion loss throughout the frequency band.

Transfer power is 40W to 300W continuous (depending on CCP voltage).

The CCP coaxial cable protector is designed in accordance with the following standards and regulations:

-IEC 61643-21:2000

A grounding stud is provided which should be connected to the system ground, or coaxial feed-through bulkhead, as directly as possible.

Technical characteristics

Туре		CCP70 -UHF-FF	CCP180 -UHF-FF	CCP280 -UHF-FF	CCP70 -UHF-MF	CCP180 -UHF-MF	CCP280 -UHF-MF
Max. Continuous operating voltage	Uc	70V	180V	280V	70V	180V	280V
Max. peak power		40W	125W	300W	40W	125W	300W
Impedance				5	ΩΩ		
Frequency range				0 - 60	0MHz		
Insertion losses			< 0.4dB				
Return losses			> 20dB				
Nom. discharge current (8/20µs)	In		10kA				
Max. discharge current (8/20µs)	Imax		20kA				
Residual voltage (1kV/µs)		< 600V	< 700V	< 900V	< 600V	< 700V	< 900V
Insulation				> 1	0GΩ		
Weight		104g	104g	104g	104g	104g	104g
Operation temperature				- 40 ^o C	. + 80 ⁰ C		
Style of connector			UHF female / fema	le		UHF male / female)
Ordering code		800 735	800 736	800 737	800 738	800 739	800 740

Dimensional drawings

Connection diagram

CCP-UHF-MF



CCP-UHF-FF









CCP-F Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	In-line. Impedance matched
Max. Operating Voltage U _C :	70, 180V
Max. Peak Power:	40, 125W respectively
Freq:	DC 2.0GHz
Characteristic Impedance:	75Ω
Insertion loss:	< 0.4dB
Return loss:	> 20dB
Surge Discharge Ratings:	I _N : 10kA 8/20μs, I _{MAX} : 20kA 8/20μs
Enclosure:	Shielded enclosure, in-line installation
Termination:	F - Type. M-F and F-F available

COAXIAL/RF PROTECTION

The CCP-F series of coaxial surge protectors is intended to protect RF antenna systems terminating in F-type connectors and is suitable for frequencies from DC to 1.6 GHz. It is eminently suitable for the protection of USA CCTV and CATV systems.

It is designed as an in-line unit allowing ease of installation. The careful design, low capacitance gas discharge arresters and high quality F-type termination connectors, ensures a minimum of insertion loss throughout the frequency band.

Transfer power is 40 W to 125 W continuous (depending on CCP voltage).

The CCP coaxial cable protector is designed in accordance with the following standards and regulations:

-IEC 61643-21:2000

A grounding stud is provided which should be connected to the system ground, or coaxial feed-through bulkhead, as directly as possible.

Technical characteristics

Туре		CCP70	CCP180	CCP70	CCP180
		-F75-FF	-F75-FF	-F75-MF	-F75-MF
Max. continuous operating voltage	Uc	70V	180V	70V	180V
Max. peak power		40W	125W	40W	125W
Impedance		75Ω			
Frequency range			0 - 200	00MHz	
Insertion losses			< 0.	4dB	
Return losses		> 20dB			
Nom. discharge current (8/20µs)	In	10kA			
Max. discharge current (8/20µs)	Imax	20kA			
Residual voltage (1kV/µs)		< 600V	< 700V	< 600V	< 700V
Insulation		> 10GΩ			
Weight		80g	80g	84g	84g
Operation temperature		- 40°C + 80°C			
Style of connector		F female / female F male / female			female
Ordering code		800 741	800 742	800 743	800 744

Dimensional drawings

Connection diagram

CCP-F-MF



CCP-F-FF







CCP-TV Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	In-line. Impedance matched
Max. Operating Voltage U _C :	70, 180V
Max. Peak Power:	40, 125W respectively
Freq:	DC 2.0GHz
Characteristic Impedance:	75Ω
Insertion loss:	< 0.4dB
Return loss:	> 20dB
Surge Discharge Ratings:	Ι _Ν : 10kA 8/20μs, Ι _{ΜΑΧ} : 20kA 8/20μs
Enclosure:	Shielded enclosure, in-line installation
Termination:	TV - Type. M-F and F-F available

COAXIAL/RF PROTECTION

The CCP-TV series of coaxial surge protectors is intended to protect RF antenna systems terminating in TV-type connectors and is suitable for frequencies from DC to 1.6 GHz. It is eminently suitable for European CCTV and CATV systems.

It is designed as an in-line unit allowing ease of installation. The careful design, low capacitance gas discharge arresters and high quality TV-type termination connectors, ensures a minimum of insertion loss throughout the frequency band.

Transfer power is 40W to 125W continuous (depending on CCP voltage).

The CCP coaxial cable protector is designed in accordance with the following standards and regulations:

-IEC 61643-21:2000

A grounding stud is provided which should be connected to the system ground, or coaxial feed-through bulkhead, as directly as possible.

Technical characteristics

Туре		CCP70	CCP180	CCP70	CCP180
		-TV75-FF	-TV75-FF	-TV75-MF	-TV75-MF
Max. continuous operating voltage	Uc	70V	180V	70V	180V
Max. peak power		40W	125W	40W	125W
Impedance		75Ω			
Frequency range		0 - 2000MHz			
Insertion losses		< 0.4dB			
Return losses		> 20dB			
Nom. discharge current (8/20µs)	In	10kA			
Max. discharge current (8/20µs)	Imax	20kA			
Residual voltage (1kV/µs)		< 600V	< 700V	< 600V	< 700V
Insulation		> 10GΩ			
Weight		80g 82g			
Operation temperature		- 40°C + 80°C			
Style of connector		TV female / female TV male / female			female
Ordering code		800 745	800 746	800 747	800 748

Dimensional drawings

Connection diagram

CCP-TV-MF



CCP-TV-FF







CCP-L/4-7/16 Series

COAXIAL/RF PROTECTION



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design	Bulkhead, impedance matched
Max. Peak Power:	500W
Freq:	865 - 965MHz, 1700 - 1950MHz
Characteristic Impedance:	50Ω
Insertion loss:	< 0.2dB
Return loss:	> 20dB
Surge Discharge Ratings:	I _N : 15kA 8/20μs, I _{MAX} : 30kA 8/20μs
Enclosure:	Shielded enclosure, bulkhead installation
Termination:	L/4-7/16-Type M-F and F-F available

The CCP-L/4-7/16 series of coaxial surge protectors is intended to protect base station RF antenna systems and is suitable for frequencies from DC to 865 - 965 Mhz, 1700 - 1950MHz.

It is designed for bulkhead or in-line installation. The careful design, low intermodulation and high quality 7/16-type termination connectors ensure a minimum of insertion loss throughout the frequency band.

Transfer power is 500W.

The CCP coaxial cable protector is designed in accordance with the following standards and regulations:

-IEC 61643-21:2000

Technical characteristics

Туре		CCP-L/4	CCP-L/4	
		-7/16-MF	-7/16-FF	
Max. Continuous operating voltage	Uc	0V	0V	
Max. peak power		500W	500W	
Impedance		50Ω		
Frequency range		865 - 965, 1700 - 1950MHz		
Insertion losses		< 0.2dB		
Return losses		> 20dB		
Nom. discharge current (8/20µs)	In	15kA		
Max. discharge current (8/20µs)	Imax	30kA		
Voltage protection level	Up	< 100V		
Insulation		> 10GΩ		
Weight		320g 312g		
Operation temperature		- 40°C + 80°C		
Style of connector		L/4-7/16 male / female	L/N-7/16 female / female	
Ordering code		800 755	800 756	

Dimensional drawings






CCP-L/4-N Series

IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design	Bulkhead, impedance matched
Max. Peak Power:	500W
Freq:	865 - 965MHz, 1700 - 1950MHz
Characteristic Impedance:	50Ω
Insertion loss:	< 0.2dB
Return loss:	> 20dB
Surge Discharge Ratings:	l _N : 15kA 8/20μs, I _{MAX} : 30kA 8/20μs
Enclosure:	Shielded enclosure, bulkhead installation
Termination:	L/4-N-Type M-F and F-F available

COAXIAL/RF PROTECTION

The CCP-L/4-N series of coaxial surge protectors is intended to protect base station RF antenna systems and is suitable for frequencies from DC to 865 - 965 Mhz, 1700 - 1950MHz.

It is designed for bulkhead or in-line installation. The careful design, low intermodulation and high quality 7/16-type termination connectors ensure a minimum of insertion loss throughout the frequency band.

Transfer power is 500W.

The CCP coaxial cable protector is designed in accordance with the following standards and regulations:

-IEC 61643-21:2000

Technical characteristics

Туре		CCP-L/4	CCP-L/4	
		-N-MF	-N-FF	
Max. Continuous operating voltage	Uc	0V	0V	
Max. peak power		500W	500W	
Impedance		50	Ω	
Frequency range		865 - 965, 1700 - 1950MHz		
Insertion losses		< 0.2dB		
Return losses		> 20dB		
Nom. discharge current (8/20µs)	In	15kA		
Max. discharge current (8/20µs)	Imax	30kA		
Voltage protection level	Up	< 100V		
Insulation		> 10	GΩ	
Weight		282g 266g		
Operation temperature		- 40°C + 80°C		
Style of connector		L/4-N male / female L/4-N female / female		
Ordering code		800 757 800 758		

Dimensional drawings



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Connection diagram





IM-Ex Series



SURGE PROTECTION OF	
EXPLOSIVE ENVIRONMENTS	(Ex)

IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	Replaceable plug-in module, inherently safe design
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	3 terminal GDT
Nom. Operating Voltage Un:	15, 30V _{DC}
Max. Operating Voltage U _C :	18, 33V _{DC} respectively
Series Resistance:	0.1 - 0.4Ω per line
Freq:	< 3 Mhz
Surge Discharge Ratings:	l _n : 10kA 8/20μs, l _{max} : 20kA 8/20μs
Series load current:	500mA
Enclosure:	DIN 43880 1TE, DIN rail mount
Terminals:	Multi-strand to 6mm ²

The IM-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 ATEX directive. The protection module should be located as close to the end-user equipment being protected, as possible.

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 while fine protection is provided using a high speed bi-directional silicon stage. Care is taken to ensure coordination between these two stages without voltage or surge current blind spots occurring.

Technical characteristics

		IW-JUEX		
Explosion protected	II 1G EEx ia II CT4			
IEC Type Examination Certificate No.	Baseefa 04 A	FEX0209X		
Number of protected pairs	1(2) cond	uctors		
Nominal operating voltage Un	15V _{DC}	30V _{DC}		
Max. operating voltage Uc	18V _{DC}	33V _{DC}		
Rated spark overvoltage (a/b-PG)	458 - 662V	458 - 662V		
(a-b)	20 - 25V	36 - 44V		
Rated operating current at 25°C IL	500mA	500mA		
Nominal discharge current (8/20µs) In	10kA	10kA		
Max. discharge current (8/20µs) Imax	20kA 20kA			
Residual voltage at 5kA (8/20µs) (a-b)	34V	59V		
Response time of the protection tA	< 1ns	< 1ns		
Insulation resistance of the protection	≥ 18MΩ	≥ 3 3 MΩ		
Serial resistance R	0.1 -0.4Ω	0.1 -0.4Ω		
Transverse capacitance C	< 10pF	< 10pF		
Cross section of connecting wire	max. 6 mm ²			
Ambient temperature Ta	$P_{i} \le 1\Omega (-30^{\circ}C \le Ta \le 80^{\circ}C)$			
	$P_i \le 1.2\Omega$ (- 30°C \le Ta \le 60°C)			
	$P_i \le 1.3\Omega$ (- 30°C \le Ta \le 40°C)			
Degree of protection	IP 20			
Housing material	Thermoplastic; gray, extinguishing degree UL 94 V-O			
Mounting	on a 35mm DIN rail			
Ordering code	704 102 704 104			

Dimensional drawings



Connection diagram







PLP 24V



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	in-line, ¾" conduit fitting
Mode of protection:	Longitudinal, Transverse
Coarse Protection:	3 terminal GDT
Nom. Operating Voltage U _n :	24 V _{DC}
Max. Operating Voltage U _C :	28 V _{DC}
Series Resistance:	< 3 Ω per line
Freq:	< 3 MHz (see specification sheet)
Surge Discharge Ratings:	l _n :10kA 8/20μs, I _{max} : 20kA 8/20μs
Series load current:	145 mA
Enclosure:	%" stainless steel fitting conduit
Terminals:	Multi-strand to 2.5 mm ²

The PLP-24V series of low voltage protective devices is intended for the protection of data circuits such as 4-20mA current loops, in industrial environments.

The $\frac{3}{10}$ -inch pipe fitting makes this device ideal for applications such as the protection of field mount sensors, transducers and RTUs. The unit can be configured in-line with the cable with the cable conduit and sensor terminals, or in a "T" configuration.

The circuit 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 while fine protection is provided using a high speed silicon avalanche diode or metal oxide varistor stage. Care is taken to ensure coordination between these two stages without voltage or surge current blind spots occurring.

Thermal protection is provided to reduce the hazards of thermal runaway should there be an inadvertent mains incursion fault.

Technical characteristics

Туре		PLP 24V
Protection construction		Protective module
Number of protected pairs		1 (2 conductors)
Nominal operating voltage	Un	24V _{DC}
Max. continuous operating voltage	U _C	28V _{DC}
Rated spark overvoltage	(a/b-PG)	90V - 110V
	(a-b)	36V - 44V
Rated operating current at 25°C	۱	145 mA
Nominal discharge current (8/20µs)	In	10 kA
Max. discharge current (8/20µs)	Imax	20 kA
Residual voltage at 5 kA (8/20µs)	Ures (line	-line) < 59V
Response time of overvoltage protection	tA	< 1 ns
Insulation resistance of the protection		≥ 28MΩ
Serial resistance	R	< 5Ω
Transverse capacitance	С	< 3 nF
Terminal cross section		2.5 mm ²
Operating temperature		-40°C +80°C
Degree of protection		IP 55
Housing material		Stainless stell
Mounting		on pipe 3/4 inch
Ordering code		127 515

Dimensional drawings

Connection diagram



Legend:	
GDT	gas discharge tube
DB	diode block
MOV	varistor
R	resistor
L	coil
PG	protective grounding



LINE FITTING SURGE PROTECTION



IM-GD Series



TERMINAL CONNECTION SURGE PROTECTION

IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	OEM PCB module
Mode of protection:	Transverse, Differential
Number of protected lines:	1 pair (2 lines)
Nom. Operating Voltage U _n :	110V _{DC}
Max. Operating Voltage U _C :	120V _{DC}
Surge Discharge Ratings:	I _n : 5kA 8/20μs, I _{max} : 10kA 8/20μs
Series load current:	6A
Enclosure:	PCB hybrid
Terminals:	Flying leads or screw terminals

 $\label{eq:constraint} The \, \text{IM-GD} \, \text{series} \, \text{is intended} \, \text{as a generic protector} \, \text{for data circuits}.$

It provides coarse protection via a three terminal gas discharge tube.

An internal thermal disconnector provides protection during mains incursion.

Technical characteristics

Туре		IM-GD	IM-GDC	
Protection construction		Protective module		
Number of protected pairs		1 (2 cc	onductors)	
Nominal operating voltage	Un	110V _{DC}	110V _{DC}	
Max. continuous operating voltage	Uc	120V _{DC}	120V _{DC}	
Rated spark overvoltage	(a/b-PG)	184V - 312V	184V - 312V	
	(a-b)	184V - 624V	184V - 624V	
Rated operating current at 25°C	۱ _L	6A	6A	
Nominal discharge current (8/20µs)	In	5kA	5kA	
Residual voltage at 5kA (8/20µs)		< 700V	< 700V	
Response time of overvoltage protection	tA	< 100ns	< 100ns	
Thermal protection		Thermo-clip	Thermo-clip	
Insulation resistance of the protection		≥ 1GΩ	≥ 1GΩ	
Transverse capacitance	C	< 1pF	< 1pF	
Terminal cross section		0.5mm ²	1.5mm ²	
Ground conductor terminal cross section		0.75mm ²	1.5mm ²	
Length of connecting conductors		150mm	150mm	
Operating temperature		-40°C +80°C	-40°C +80°C	
Degree of protection		IP 20		
Housing material		Thermoplastic; gray, extinguishing degree V-O		
Ordering code		123 495	123 496	

Dimensional drawings



Connection diagram

Legend: TC thermo-clip GDT gas discharge tube PG protective grounding





IM-NF Series



IEC category / EN type:	C1/C2/C3 (IEC 60643-21)
Design:	OEM PCB module
Mode of protection:	Transverse
Number of protected lines:	1
Nom. Operating Voltage Un:	5, 15, 24V _{DC}
Max. Operating Voltage U _C :	6, 18, 28V _{DC}
Series Elements typical:	18Ω / 47μΗ
Freq:	< 0.6 - 1.4MHz (ref. Specification sheet)
Surge Discharge Ratings:	I _n : 5kA 8/20μs, I _{max} : 10kA 8/20μs
Series load current:	145mA
Enclosure:	PCB hybrid
Terminals:	PCB pins

The IM-NF series is designed as a hybrid, PCB mount, protector against the effects of induced voltages onto data, signal and communication circuits. It is used by OEM as a component in their final product assembly.

It consists of a multi-stage protector with coarse protection being provided by a two terminal gas discharge tube while fine protection is provided using a high speed silicon stage. Care is taken to ensure coordination between these two stages without voltage or surge current blind spots occurring.

Over current protection is provided by a PTC element, which provides a level of protection against short circuit or mains incursion. Internal thermal disconnectors are also employed to reduce the hazards of thermal runaway during fault conditions.

An inline inductor is incorporated and can be used to achieve better coordination with other on-board protection components.

Technical characteristics

Туре		IM-NF		
		5V	15V	24V
Protection construction			Protective module	
Number of protected pairs			1 (2 conductors)	
Nominal operating voltage	Un	5 V _{DC}	15 V _{DC}	24 V _{DC}
Max. continuous operating voltage	Uc	6 V _{DC}	18 V _{DC}	28 V _{DC}
Rated spark overvoltage		6.5 - 8V	20 - 24V	30 - 36V
Rated operating current at 25°C	۱L	145mA	145mA	145mA
Nominal discharge current (8/20µs)	In	5kA	5kA	5kA
Residual voltage at 5kA (8/20µs)		< 20V	< 45V	< 65V
Response time of overvoltage protection	tA	< 1ns	< 1ns	< 1ns
Thermal protection		Thermal disconnection		
Insulation resistance of the protection		≤ 6 kΩ	≤ 18 MΩ	≤ 28 MΩ
Serial capacitance	R	15 - 18Ω	15 - 18Ω	15 - 18Ω
Serial inductance	L	47mH	47mH	47mH
Transverse capacitance	С	< 10nF	< 4nF	< 3nF
Operating temperature		-40°C +80°C		
Degree of protection		IP 20		
Housing material		Thermoplastic; gray, extinguishing degree V-O		
Mounting		on a printed circuit		
Ordering code		127 138	127 139	127 141

Dimensional drawings

Connection diagram



Legend:	
TD	thermal decoupler
GDT	gas discharge tube
L	coil
PTC	varistor with a positive
	temperature
coeficient	
BD	bi-directional TVS diode
SG	signal grounding





PCB MOUNTING SURGE PROTECTION

SELECTION GUIDE

Signal / Data transmission

Signal / Data transmission

Signal	Recommended SPD	Page	Signal	Recommended SPD	Page
0-20mA, 4-20mA Current loops	SMH-SG 24V	24	Genius Bus	SMH2-TC 12V	17
	NMH-TC 24V	18		SMH-TC 12V	16
	VMO 24V	27		SMH-SH 12V	13
	PLP 24V	73	Industrial Ethernet	LZ-NET 6	53
Arcnet	ZV-BNC -+5V	63	Interbuss inline (remote bus)	SMH-TC 5V	16
Binary signals	SMH-TC 5V - 60V	16		SMH2-TC 5V	17
	SMH2-TC 5V - 60V	17		NMH-TC 5V	18
	SMH-SG 5V - 60V	24		NMH2-TC 5V	19
	SMH-SH 5V - 60V	13		SMH-SH 5V	13
	SMI2 5V - 60V	15	Interbus inline (I/O)	SMH2-TC 24V	17
	NMH-TC 5V - 60V	18		NMH2-TC 24V	19
	NMH2-TC 5V - 60V	19		SMI2 24V	15
	IM-TD 5V - 60V	20		VMO 24V	27
Bitbus (IEEE-1118)	SMH-TC 5V	16	Interbus field multiplexer	SMH-SG 5V	24
х <i>У</i>	SMH2-TC 5V	17	KNX Bus	IM-GD	74
	SMH-SG 5V	24		IM-GDC	74
	SMH-SH 5V	13	Local Operating Network (LON)	SMH-TC 5V	16
CAN Bus (data line only)	SMH-TC 12V	16		SMH2-TC 5V	17
	SMH2-TC 12V	17		SMH-SG 5V	24
	SMH-SG 12V	24	MODBUS	SMH-TC 5V	16
	SMH-SH 12V	13		SMH2-TC 5V	17
	SMH-PS 24V	41		SMH-SG 5V	24
	PROTEC DMDR 20/24V	45		SMH-SH 5V	13
CAN Bus (data + power line)	SMH-TC+PS	37	Opto interface	SMH2-TC 24V	17
CCTV	ZV-BNC -+12V	61		NMH2-TC 24V	19
Control-Net	ZV-BNC -+12V	61		SMH-SH 24V	13
Data Highway Plus	SMH2-TC 12V	17		IM-TD 24V	20
	SMH-TC 12V	16		VMO 24V	27
Device Net (data line only)	SMH-TC 12V	16		SMI2 24V	15
	SMH2-TC 12V	17		SMH-SH 24V	13
	SMH-SG 12V	24	Power Over Ethernet (PoE)	LZ-NET 6	53
Device Net (power line only)	SMH-PS 24V	41		LZ-NET PoE	52
Device Net (data + power line)	SMH-TC+PS	37		LZ-24NET 19 PoE	54
	PROTEC DMDR 20/24V	45	Power Supply (DC or AC)	SMH-PS 12V - 48V	41
EIB	IM-GD	74		VM-DC 12V - 24V	42
	IM-GDC	74		PROTEC DMDR 20/24V - 120V)	45
Ex(i) circuits	IM-15Ex	72		DC PROTEC B(R) 24V - 48V	43
	IM-30Ex	72		DC PROTEC C(R) 24V - 48V	44
Ethernet Cat5	LZ-NET 6	53		PROTEC C(R) 40/75V	46
	LZ-NET	52		PROTEC CN(R) 40/75V	47
	ZE 200 NET	55	Profibus DP	SMH-TC 5V	16
	LZ-24NET 19	54		SMH2-TC 5V	17
Ethernet Cat6	LZ-NET 6	53		SMH-SG 5V	24
FDDI, CDDI	LZ-NET 6	53		SMH-SH 5V	13
	LZ-NET	52	Profibus PA	SMH-SG 24V	24
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Fieldbus (Ex)	IM-15Ex	72		SMH2-TC 24V	17
	IM-30Ex	72		SMH-SH 24V	13



SELECTION GUIDE

Signal / Data transmission

Telecommunication

Profibus PA(Ex) M.30E+ 72 ADSL SMH-TC 10V 16 R5 232 SMH-50 12V TA MADS 9 MADS 1-7 38 R5 422, V11, X21 SMH-2T 12V TA MADS 1-7 39 MADS 1595 SMH-2T 12V TA MADS 1-7 39 MADS 1595 SMH-7C 12V TA MADS 1-7 39 MADS 1595 SMH-7C 12V TA MADS 1-7 39 MAD2 TO 12V TA SMH-2TC 2V TA SMH-2TC 2V TA MADS 1595 SMH-7C 12V TA SMH-7C 2V TA SMH-7C 2V TA MADE 10 12V TB CATAGO CATA SMH-7C 2V TA	Signal	Recommended SPD	Page	Signal	Recommended SPD	Page
Profebus PA/EA)MAS0EX72ADSLSMH-TC 10V16RS 222MM-S0 1/V24MA-S0LMA-S0L39RS 422, V11, X21MM-27C 12/V117MA-20LMA-30L39MM-27C 12/V116MA-30LMA-30L39MM-27C 12/V117MA-20LMA-30L39MM-27C 12/V117MA-20L116MA-30L39MM-27C 12/V118MA-20L3030MM-27C 12/V118MA-20L3030MM-27C 12/V118MA-20L3030MM-27C 12/V118MA-20L3030MM-27C 12/V118MA-20L3030MM-27C 12/V118MA-20L30MM-27C 12/V118MA-20L30MM-27C 12/V118MA-20L30MM-27C 12/V118MA-20L30MM-27C 12/V118MA-20L30MM-27C 12/V118MA-20L30MM-27C 12/V118MA-20L30MM-27C 12/V118MA-20L30MM-27C 12/V1173030SilveC L1SMH-27C 17/V118MM-27C 12/V11730MM-27C 12/V117MM-27C 12/V117MM-27C 12/V117MM-27C 12/V117MM-27C 12/V117MM-27C 12/V117MM-27C 12/V117MM-27C 12/V118MM-27C 12/V117 <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th></td<>						
Name (Neb) Note	Profibus PA (Fx)	IM-30Ex	72		SMH-TC 110V	16
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SMH-SH 5V 13 Suconet SMH-SH 5V 13 Suconet SMH-SC 5V 16 SMH-SG 5V 24 SML-SC 5V 17 SMH-SG 5V 24 SMI-2-TC 12V 19 SMH-SG 5V 24 SMI2110V 15 SMH-SH 5V 13 SMI2110V 15 Voice over IP (VoIP) LZ-NET 6 53 SHDSL SMH-SG 5V 24 Voice over IP (VoIP) LZ-NET 6 53 SHDSL SMH-SG 5V 24 MM-TC 24V 13 SHDSL SMH-SC 5V 16 MM-TC 24V 18 MM-TC 10V 16 MM-TC 24V 18 MM-SDL-T 39 SMI-SG 24V 24 TDSL SMH-SDL-T 39 SMI24V 18 MM-TC 12V 18 MM-SDL-T 39 SMI-SG 12V 73 SMH-SG 12V 73 MM-SDL-T 39 SMH-SG 12V 24 SMH-SG 12V 24 SMH-SG 12V 30 <th< td=""><td></td><td>SMH-SG 5V</td><td>24</td><td></td><td>SMH-TC 110V</td><td>16</td></th<>		SMH-SG 5V	24		SMH-TC 110V	16
Suconet SMH-TC SV 16 IM-xDSL-T 39 SMH2-TC 5V 17 SDSL NMH2-TC 12V 19 SMH-SG 5V 24 SMI2 110V 15 SMH-SG 5V 13 LZ-NET 6 53 Voice over IP (VoIP) LZ-NET 6 53 SMDSL SMH-SG 5V 24 LZ-NET PoE 52 SMH-TC 5V 16 SMH-TC 5V 16 LZ-NET PoE 54 SMH-TC 5V 17 SMH2 10V 16 MM-TC 24V 18 SMH-TC 110V 16 IM-xDSL-T 39 VMO 24V 27 SM12 24V 18 IM-xDSL-T 39 SMI2 24V 15 SMH-TC 110V 16 IM-xDSL-T 39 SMI2 24V 15 SMH-SC 110V 16 IM-xDSL-T 39 SMH-SK 24V 73 SMH-SC 110V 16 IM-xDSL-T 39 SMH-SK 124V 13 IM-xDSL 39 IM-xDSL-T 39 SMH-SK 12V 54 SMH-SC 12V1		SMH-SH 5V	13		IM-xDSL	39
SMH2-TC 5V 17 SDSL NMH2-TC 12V 19 SMH-SG 5V 24 SMI2 110V 15 SMH-SH 5V 13 LZ-NET 6 53 Voice over IP (VoIP) LZ-NET 6 53 SHDSL SMH-SG 5V 24 LZ-NET 0PE 52 SHDSL SMH-SG 5V 24 LZ-VET 19 POE 54 SMH-TC 5V 16 NMH-TC 24V 14 T-DSL SMH-TC 110V 16 NMH-TC 24V 18 VMO 24V 39 MM-TC 110V 16 NMH-TC 24V 18 VMO 24V 77 MM-TC 110V 16 SMI2 24V 17 YDSL SMH-TC 110V 16 MM-TC 12V 18 MM-TC 110V 16 M-D 24V 73 SMH-TC 110V 16 SMH-SH 24V 13 MM-TC 110V 16 M-D 24V 73 MM-TC 110V 16 M-D 24V 73 SMH-TC 110V 16 M-TC 12V 13 M-TC 110V <t< td=""><td>Suconet</td><td>SMH-TC 5V</td><td>16</td><td></td><td>IM-xDSL-T</td><td>39</td></t<>	Suconet	SMH-TC 5V	16		IM-xDSL-T	39
SMH-SG 5V 24 SMI2 110V 15 SMH-SH 5V 13 LZ-NET 6 53 Voice over IP (VoIP) LZ-NET 6 53 SMDSL SMH-SG 5V 24 LZ-NET PoE 52 SMH-SG 5V 16 SMH-SG 5V 16 LZ-24NET 19 PoE 54 SMH-SG 24V 17 SMH2-TC 5V 17 Temperature measurement SMH-SG 24V 24 SMH-TC 10V 16 NMH-TC 24V 18 MM-xDSL 39 39 VMO 24V 27 MM-xDSL 39 39 39 SM12 24V 15 PLP 24V 13 MM-xDSL 39 SMH-SH 24V 13 MM-xDSL 39 MM-xDSL 39 Token ring LZ-NET 53 22-NET 54 SMH-SG 12V 13 TL SMH-SG 12V 24 SMH-SG 12V 14 SMH-SG 12V 14 MM-RD 12V 16 SMH-SG 12V 13 MM-KD 14 SMH-SG 14 SMH-SG 14 SMH-SG		SMH2-TC 5V	17	SDSL	NMH2-TC 12V	19
SMH-SH 5V 13 L2-NET 6 53 Voice over IP (VoIP) L2-NET 6 53 SMD-SL SMH-SG 5V 24 L2-VET POE 52 SMH-SC 5V 16 SMH-C 5V 16 L2-24NET 19 POE 54 SMH-SC 5V 17 SMH-SC 5V 17 Temperature measurement SMH-SC 24V 24 SMH-TC 10V 16 NMH-TC 24V 18 IM-xDSL 39 39 VMO 24V 27 SML-SDL-T 39 39 39 SMI-SH 24V 13 IM-xDSL 18 10-xDSL 39 SMH-SH 24V 13 IM-xDSL 39		SMH-SG 5V	24		SMI2 110V	15
Voice over IP (VoIP) L2-NET 6 53 SHDSL SMH-SG 5V 24 L2-NET PoE 52 SMH-TC 5V 16 L2-24NET 19 PoE 54 SMH-TC 5V 17 Temperature measurement SMH-SG 24V 24 T-DSL SMH-TC 110V 16 NMH-TC 24V 18 M-XDSL-T 39<		SMH-SH 5V	13		LZ-NET 6	53
LZ-NET PoE 52 SMH-TC 5V 16 LZ-24NET 19 PoE 54 SMH2-TC 5V 17 Temperature measurement SMH-SG 24V 24 T-DSL SMH-TC 110V 16 NMH-TC 24V 18 M-XDSL 39 <	Voice over IP (VoIP)	LZ-NET 6	53	SHDSL	SMH-SG 5V	24
LZ-24NET 19 PoE 54 SMH2-TC 5V 17 Temperature measurement SMH-SG 24V 24 T-DSL SMH-TC 110V 16 NMH-TC 24V 18 M-XDSL-T 39 39 VM0 24V 27 M-XDSL-T 39 SMI-SG 24V 15 SMH-TC 110V 16 PLP 24V 73 M-XDSL-T 39 SMH-SH 24V 13 M-XDSL-T 39 Token ring LZ-NET 6 53 M-XDSL-T 39 LZ-NET 19 54 M-XDSL-T 39 TTL SMH-SG 12V 24 SMH-TC 12V 16 SMH-SH 12V 13 M-XDSL-T 39 MH-TC 12V 16 SMH-XDSL-T 39 MM-TC 12V 16 SMH-XDSL-T 14 MH-TC 12V 16 SMH-XDSL-T 14 MH-TC 12V 18 M-XDSL-T 14 MH-TC 12V 18 M-XDSL -T 14 MH-TC 12V 18 M-XDSL -T	· · /	LZ-NET PoE	52		SMH-TC 5V	16
Temperature measurement SMH-SG 24V 24 T-DSL SMH-TC 110V 16 NMH-TC 24V 18 MO 24V 27 MM-xDSL-T 39 SMI2 24V 15 VDSL SMH-TC 110V 16 PLP 24V 73 MM-TC 110V 16 SMH-SH 24V 13 MM-TC 110V 16 Token ring LZ-NET 6 53 MM-XDSL-T 39 LZ-NET 19 54 MM-xDSL-T 39 TTL SMH-SG 12V 24 SMH-TC 12V 16 SMH-SH 12V 13 MM-TC 12V 16 MH-DB 9 50 MM-TC 12V 16		LZ-24NET 19 PoE	54		SMH2-TC 5V	17
NMH-TC 24V 18 IM-xDSL 39 VMO 24V 27 IM-xDSL-T 39 SMI2 24V 15 VDSL SMH-TC 110V 16 PLP 24V 73 SMH-SH 24V 13 IM-xDSL-T 39 Token ring LZ-NET 6 53 IM-xDSL-T 39 LZ-NET 19 54 IM-xDSL-T 39 TTL SMH-SG 12V 24 SMH-TC 12V 16 SMH-SH 12V 13 NMH-TC 12V 18 IM-DB 9 50 50 IM-XDS	Temperature measurement	SMH-SG 24V	24	T-DSL	SMH-TC 110V	16
VMO 24V 27 IM-xDSL-T 39 SMI2 24V 15 SMH-TC 110V 16 PLP 24V 73 IM-xDSL 39 SMH-SH 24V 13 IM-xDSL-T 39 Token ring LZ-NET 6 53 IM-xDSL-T 39 LZ-NET 52 LZ-24NET 19 54 IM-xDSL-T 39 TTL SMH-SG 12V 24 IM-XDSL 10 IM-XDSL-T 10 MH-TC 12V 16 IM-XDSL 10 IM-XDSL 10 IM-XDSL 10 IM-XDSL 10 MH-TC 12V 16 IM-XDSL 10 IM-XDSL 10 IM-XDSL 10 IM-XDSL 10 IM-DB 9 50 IM-XDSL 10 IM-XDSL 10 IM-XDSL 10 IM-XDSL 10		NMH-TC 24V	18		IM-xDSL	39
SMI2 24V 15 VDSL SMH-TC 110V 16 PLP 24V 73 IM-xDSL 39 SMH-SH 24V 13 IM-xDSL-T 39 Token ring LZ-NET 6 53 IM-xDSL-T 39 LZ-NET 52 LZ-24NET 19 54 F TTL SMH-SG 12V 24 SMH-TC 12V 16 SMH-SH 12V 13 NMH-TC 12V 18 IM-DB 9 50 50 F		VMO 24V	27		IM-xDSL-T	39
PLP 24V 73 IM-xDSL 39 SMH-SH 24V 13 IM-xDSL-T 39 Token ring LZ-NET 6 53 IM-xDSL 39 LZ-NET 52 LZ-24NET 19 54 TTL SMH-SG 12V 24 SMH-TC 12V 16 SMH-SH 12V 13 NMH-TC 12V 18 IM-DB 9 50 50 50		SMI2 24V	15	VDSL	SMH-TC 110V	16
SMH-SH 24V 13 Token ring LZ-NET 6 53 LZ-NET 52 LZ-24NET 19 54 TTL SMH-SG 12V SMH-SH 12V 16 SMH-SH 12V 13 NMH-TC 12V 18 IM-DB 9 50		PLP 24V	73		IM-xDSL	39
Token ring LZ-NET 6 53 LZ-NET 52 LZ-24NET 19 54 TTL SMH-SG 12V 24 SMH-TC 12V 16 SMH-SH 12V 13 NMH-TC 12V 18 IM-DB 9 50		SMH-SH 24V	13		IM-xDSL-T	39
LZ-NET 52 LZ-24NET 19 54 TTL SMH-SG 12V 24 SMH-TC 12V 16 SMH-SH 12V 13 NMH-TC 12V 18 IM-DB 9 50	Token ring	LZ-NET 6	53			
LZ-24NET 19 54 TTL SMH-SG 12V 24 SMH-TC 12V 16 SMH-SH 12V 13 NMH-TC 12V 18 IM-DB 9 50		LZ-NET	52			
SMH-SG 12V 24 SMH-TC 12V 16 SMH-SH 12V 13 NMH-TC 12V 18 IM-DB 9 50		LZ-24NET 19	54			
SMH-TC 12V 16 SMH-SH 12V 13 NMH-TC 12V 18 IM-DB 9 50	TTL	SMH-SG 12V	24			
SMH-SH 12V 13 NMH-TC 12V 18 IM-DB 9 50		SMH-TC 12V	16			
NMH-TC 12V 18 IM-DB 9 50		SMH-SH 12V	13			
IM-DB 9 50		NMH-TC 12V	18			
		IM-DB 9	50			



Typical applications

Wastewater management Ivel measurement equipment / PROFIBUS PA SMH-TC 24V SMH-SG 24V 24 SMH-TC 24V 16 SMH2-TC 24V 17 PI measurement equipment / PROFIBUS PA SMH2-TC 5V SMH-TC 24V 16 SMH2-TC 5V File measurement equipment / PROFIBUS PA SMH-SG 5V SMH-TC 24V 16 SMH2-TC 5V 17 PI measurement equipment / PROFIBUS PA SMH-SG 5V SMH-TC 24V 16 SMH2-TC 5V SMH-SG 5V 24 SMH-SG 5V 24 SMH-SG 5V 24 SMH-SG 24V 24 PI measurement equipment / 4-20mA SMH2-TC 5V 17 SMH-TC 24V 17 PI P24V 73 SMH-SG 24V 24 PI measurement / PI 000 SMH-TC 24V 14 PI measurement / PI 000 SMH-TC 24V 16 PI 24V 15 PI	Industry	Applications	Products	Page
Industrial automation Amalog video ZV-BNC 12V 61 PoE video ZV-BNC 12V 16 SMH-TC 24V 16 SMH-TC 24V 17 SMH-TC 24V 17 SMH-TC 24V 17 SMH-TC 5V 17 SMH-TC 5V 17 SMH-TC 5V 17 SMH-TC 5V 17 SMH-SC 5V 24 SMH-TC 5V 17 SMH-SC 5V 24 SMH-TC 5V 17 SMH-SC 5V 24 SMH-TC 5V 18 Flow measurement equipment /PROFIBUS PS SMH-TC 5V 18 Flow measurement equipment /Proto SMH-TC 5V 18 VMO 24V 27 PLP 24V 13 Security agencies Amalog video ZV-BNC 12V 61 PoE video IZ-NET 6 53 IZ-NET 6 53 Vide over IP (VoIP) IZ-NET 6 53 IZ-NET 6 53 Industrial automation Industrial buses SMH-TC 5V - SMH-TC 80V 18 SME-SG 20V IS SME-SG 20V 17<	Wastewater management			
SMH-TC 24V 16 SMH-TC 5V 17 SMH-TC 5V 16 SMH-TC 5V 16 SMH-TC 5V 16 SMH-TC 5V 17 SMH-TC 5V 18 SMH-TC 5V 17 SMH-SG 5V 24 SMH-SG 24V 24 NMH-TC 24V 18 VMO 24V 27 PLP 24V 73 SMI 224V 16 SMI 224V 17 Similar 224V 18 VMO 24V 27 SMH-SG 24V 24 NH-TC 24V 18 VMO 24V 27 Similar 24V 13 Security agencies Z-BIC 12V Incustrial automation Z-NET 6 Incustrial automation Z-NET 76 Sim 250 V SMI-SG 6V 24 <	5	level measurement equipment / PROFIBUS PA	SMH-SG 24V	24
Security agencies Analog video ZV-BNC 12V 61 Voice over IP (VoIP) ZV-BNC 12V 61 53 Voice over IP (VoIP) ZV-BNC 12V 61 53 Industrial automation Justral bulles 52 52 Industrial automation Justral bulles 53 53 53 Industrial automation Justral bulles 54 54 54 Industrial automation Justral bulles 54 54 54 Industrial automation Justral bulles 54 54 54 54 Industrial automation Justral bulles SMH-TC 64V 54 54 54 54 54 54 54 54 54 54 55		a in the set	SMH-TC 24V	16
PH measurement equipment / PROF IBUS DP SMH-TC 5V 16 SMH-2T C 5V 17 SMH-SG 5V 24 SMH-SG 2V 24 SMH-SG 2V 24 WMO 24V 27 PLP 24V 73 SME 262 4V 24 WMO 24V 27 Security agencies Temperature measurement / P11000 SMH-SG 24V 24 WMO 24V 27 SMI2 24V 15 PLP 24V 73 SMH-SG 24V 24 VMO 24V 27 Smi2 24V 15 PLP 24V 73 SMH-SG 24V 24 Security agencies ZNET 6 Vice over IP (VoIP) ZNET 6 Z-NET PoE 12 Z-NET PoE 12 Z-NET PoE 12 <t< td=""><td></td><td></td><td>SMH2-TC 24V</td><td>17</td></t<>			SMH2-TC 24V	17
Security agencies Analog video ZV-BNC 12V 61 Pice video L2 NET 6 53 Vide over IP (VoIP) L2-NET 6 53 L2-VINET 19 PoE 54	A Standard State	pH measurement equipment / PROFIBUS DP	SMH-TC 5V	16
SMH-SG 5V 24 SMH-SH 5V 13 Flow measurement equipment /4:20mA SMH-SG 24V 24 NMH-TC 24V 18 VMO 24V 27 PLP 24V 73 Temperature measurement /P1000 SMH-SG 24V 24 NMH-TC 24V 18 VMO 24V 27 Security agencies			SMH2-TC 5V	17
SMH-SH 5V 13 Flow measurement equipment / 4-20mA SMH-SG 24V 24 NMH-TC 24V 18 W00 24V 27 PLP 24V 73 Security agencies MM-HTC 24V 18 Analog video ZV-BNC 12V 61 PDE video LZ NET 6 53 LZ-NET 6 53 12 Vice over IP (VoIP) LZ-NET 6 53 LZ-NET 6 53 12 LZ-NET 6 53 12 LI-NET 6 53 12 LZ-NET 70 14 14 MM-TC 5V - SMH-TC 60V 16 SMH-SB 5V - SMH-SF 60V 17 SMH-SB 5V - SMH-SF 60V 17 SMH-SB 5V - SMH-SF 60V 18 MM-TC 5V - SMH-TC 60V 18 SMH-SE 6V 18 18 19 <			SMH-SG 5V	- 24
Flow measurement equipment / 4-20mA SMH-SG 24V 24 NMH-TC 24V 18 VMO 24V 27 PLP 24V 73 PLP 24V 73 Temperature measurement / P11000 SMH-SG 24V 24 NMH-TC 24V 18 VMO 24V 27 PLP 24V 73 SMH-SG 24V 24 SMH-SG 24V 18 VMO 24V 27 SMH-SG 24V 18 VMO 24V 27 SMH-SG 24V 18 VMO 24V 27 SMH-SG 24V 15 PLP 24V 73 SMH-SG 24V 15 SMH-SG 24V 15 PLP 24V 73 SMH-SG 24V 16 Socurity agencies Analog video ZV-BNC 12V 61 L2 NET 6 53 Socurity agencies L2 NET 6 L2 NET 6 53 L2 NET 6 53 Industrial automation L2 NET 6 L2 NET 6 52 L2 ANET 19 PoE 54 Industrial automation Midutrial busis SMH-TC 5V - SMH-TC 60V 16 SMH-SG 5V - SMH-SH 60V 18			SMH-SH 5V	13
Industrial automation Industrial buses SMH-TC SV - SMH-TC 60V 16 Shires S Industrial buses SMH-TC SV - SMH-TC 60V 16 Shires S Industrial buses SMH-TC SV - SMH-TC 60V 16 Shires S Industrial buses SMH-TC SV - SMH-TC 60V 16 Shires S Industrial buses SMH-TC SV - SMH-TC 60V 16 Shires S Industrial buses SMH-TC SV - SMH-TC 60V 16 Shires S Industrial buses SMH-TC SV - SMH-TC 60V 16 Shires S Industrial buses SMH-TC SV - SMH-TC 60V 16 Shires S SMH-TC SV - SMH-TC 60V 17 SMH-TC SV - SMH-TC 60V 17 SMH-TC SV - SMH-TC 60V 17 SMH-TC SV - SMH-TC 60V 17 SMH-TC SV - SMH-TC 60V 17		Flow measurement equipment /4-20mA	SMH-SG 24V	24
VMO 24V 27 PLP 24V 73 Temperature measurement / Pt1000 SMH-SG 24V 24 NMH-TC 24V 18 VMO 24V 27 SMI2 24V 15 PLP 24V 73 Security agencies Analog video ZV-BNC 12V 61 POE vide0 LZ NET 6 53 LZ-NET 6 53 LZ-NET 6 53 LZ-VET 6 53 LZ-NET 6 53 LZ-VET 19 PoE 54 12 14 Industrial automation Industrial buses SMH-TC 5V - SMH-TC 60V 16 SML25V - SMH-3G 60V 24 SMH-SH 5V - SMH-3G 60V 24 SMH-SH 5V - SMH-3G 60V 24 SMH-3H 5V - SMH-3G 60V 24 SML25V - SML260V 13 SMI25V - SML260V 15 SML25V - SML260V 15 SML-3G 5V - SML-3G 60V 16 SML25V - SML260V 15 SML27G 5V - SML-3G 60V 13			NMH-TC 24V	18
PLP 24V 73 Temperature measurement / Pt1000 SMH-SG 24V 24 NMH-TC 24V 18 VMO 24V 27 SMI2 24V 15 PLP 24V 73 Security agencies Z-BNC 12V 61 PoE video LZ NET 6 53 L2-NET 6 53 LZ-NET 6 52 L2-24NET 19 PoE 54 LZ-NET 19 PoE 54 Industrial automation Industrial buses SMH-TC 5V - SMH-TC 60V 16 SMH-SG 5V - SMH-SG 60V 17 SMH-SG 5V - SMH-SG 60V 17 SMH-SG 5V - SMH-SG 60V 13 SMI2 5V - SMH-SG 60V 13 SMI2 5V - SMH-SG 60V 13 SMI2 5V - SMH-SG 60V <td></td> <td>1</td> <td>VMO 24V</td> <td>27</td>		1	VMO 24V	27
Industrial automation Industrial buses SMH-SG 24V 24 NMH-TC 24V 18 VMO 24V 27 SMI2 24V 15 PLP 24V 73 SMH-SH 24V 13 Security agencies ZV-BNC 12V 61 PoE video L2 NET 6 53 L2-NET 6 53 L2-NET 6 53 L2-NET 70E 52 L2-NET 6 53 L2-NET 90E 52 L2-VET 6 53 L2-VET 70E 52 L2-VET 70E 52 L2-VET 70E 52 L2-VET 70E 54 SMH-SG 5V - SMH-TC 60V 16 SMH-SG 5V - SMH-SG 60V 14 SMH-SG 5V - SMH-SG 60V 14 SMH-SG 5V - SMH-SG 60V 14 SMH-SG 5V - SMH-SG 60V 13 SMI2 5V - SMH-SG 60V 14 SMI2 5V - SMH-SG 60V 15 NMH-TC 6V - NMH-TC 60V 16 SMI2 5V - SMI-SG 60V 15 SMI-SG 5V - SMH-SG 60V 18 SMI2 5V - SMI-SG 60V 18 NH-2TC 5V - NMH-ZTC 60V 19			PLP 24V	73
Industrial automation Industrial buses SMH-TC 5V - SMH-TC 60V 16 SMH-SH 24V 13 SMH-SH 24V 13 Security agencies X X SMH-SH 24V 14 Vice over IP (VoIP) L2-NET 6 53 L2-NET 90E 52 L2-24NET 19 PoE 54 X X X X SMH-TC 5V - SMH-TC 60V 16 SMH-TC 5V - SMH-TC 60V 16 SMH-SG 5V - SMH-SG 60V 24 SMH-SH 5V - SMH-SG 60V 24 SMH 25V - SMH-SG 60V 13 SM		Temperature measurement / Pt1000	SMH-SG 24V	24
VMO 24V 27 SMI2 24V 15 PLP 24V 73 SMH-SH 24V 13 Security agencies Analog video ZV-BNC 12V 61 POE video LZ NET 6 53 LZ-NET 6 53 LZ-NET POE 52 LZ-NET 70E 52 LZ-NET POE 52 LZ-NET 800V 16 Industrial automation Industrial buses SMH-TC 5V - SMH-TC 60V 16 SMH-SG 5V - SMH-SG 60V 24 SMH-SH 5V - SMH-SH 60V 13 SMI2 SV - SMI2 60V 13 SMI2 SV - SMI2 60V 13 SMI2 SV - SMI4 - SG 60V 14 SMI2 SV - SMI4 - SG 60V 14 SMI2 SV - SMI2 60V 15 MH-TC 5V - NMH-TC 60V 18 MM42-TC SV - NMH-TC 60V 18 MH2-TC 6V - NMH-TC 60V 18 </td <td></td> <td></td> <td>NMH-TC 24V</td> <td>18</td>			NMH-TC 24V	18
SMI2 24V 15 PLP 24V 73 SMH-SH 24V 13 Security agencies XVBNC 12V 61 PoE video LZ NET 6 53 Voice over IP (VoIP) LZ-NET 6 53 LZ-NET PoE 52 52 LZ-NET 19 PoE 54 Industrial automation SMI-TC 5V - SMH-TC 60V 16 SMI2-TC 5V - SMH-SG 60V 24 SMI2-SU - SMI2-SU - SMI2 30 SMI2-SU - SMI2-SU - SMI-SU - SU 31 SMI2-SU - SMI2-SU - SMI2-SU - SMI2 31 SMI			VMO 24V	27
PLP 24V 73 SMH-SH 24V 13 Security agencies XV-BNC 12V 61 PoE video LZ NET 6 53 Voice over IP (VoIP) LZ-NET 6 53 LZ-NET PoE 52 LZ-NET 19 PoE 54 Industrial automation Industrial buses SMH-TC 5V - SMH-TC 60V 16 SMH-TC 5V - SMH-SG 60V 24 SMH-SH 5V - SMH-SH 60V 13 SMI2 5V - SMI2 60V 13 SMI2 5V - SMI2 60V 15 NMH-TC 5V - NMH-TC 60V 18 NMH-TC 5V - NMH-TC 60V 18			SMI2 24V	15
Security agencies Analog video ZV-BNC 12V 61 PoE video LZ NET 6 53 Voice over IP (VoIP) LZ-NET 6 53 LZ-NET PoE 52 LZ-24NET 19 PoE 54			PLP 24V	73
Security agencies Analog video ZV-BNC 12V 61 PoE video LZ NET 6 53 LZ-NET 6 53 LZ-NET 6 52 LZ-NET PoE 52 LZ-NET 19 PoE 54 Industrial automation Industrial buses Industrial buses SMH-TC 5V - SMH-TC 60V 16 SMH-TC 5V - SMH-SG 60V 24 SMH-SG 5V - SMH-SG 60V 13 SMI2 5V - SMH-SG 60V 13 SMI2 5V - SMH-SG 60V 15 NMH-TC 5V - NMH-TC 60V 16 SMI2 5V - SMI2 TC 60V 17 SMI2 5V - SMH-SG 60V 24 SMH-TC 5V - SMH-SG 60V 24 SMI-SG 5V - SMH-SG 60V 13 SMI2 5V - SMI2 TC 60V 15 NMH-TC 5V - NMH-TC 60V 18 NMH-TC 5V - NMH-TC 60V 18 NMH2-TC 5V - NMH2-TC 60V 19			SMH-SH 24V	13
Analog video ZV-BNC 12V 61 PoE video LZ NET 6 53 Voice over IP (VoIP) LZ-NET 6 53 LZ-NET PoE 52 LZ-24NET 19 PoE 54	Security agencies			
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Voice over IP (VoIP) LZ-NET 6 53 LZ-NET PoE 52 LZ-24NET 19 PoE 54 Industrial automation Industrial automation SMH-TC 5V - SMH-TC 60V 16 SMH2-TC 5V - SMH-SG 60V 24 SMH-SG 5V - SMH-SG 60V 24 SMH-SG 5V - SMH-SG 60V 24 SMH2 6V - SMI-SG 60V 13 SMI2 5V - SMI-SG 60V 13 SMI2 5V - SMI-SG 60V 15 NMH-TC 5V - NMH-TC 60V 18 NMH-TC 5V - NMH-TC 60V 18		PoE video	LZ NET 6	53
LZ-NET PoE 52 LZ-24NET 19 PoE 54 Industrial automation Industrial buses SMH-TC 5V - SMH-TC 60V 16 SMH-SG 5V - SMH-2-TC 60V 17 SMH-SG 5V - SMH-SG 60V 24 SMH-SU 5V - SMH-SH 60V 13 SMI2 5V - SMH-SU 60V 13 SMI2 5V - SMH-TC 60V 15 NMH-TC 5V - NMH-TC 60V 18 NMH2-TC 5V - NMH2-TC 60V 19		Voice over IP (VoIP)	LZ-NET 6	53
LZ-24NET 19 PoE 54 Industrial automation Industrial buses SMH-TC 5V - SMH-TC 60V 16 SMH-SG 5V - SMH-SG 60V 24 SMH-SG 5V - SMH-SG 60V 24 SMH-SH 5V - SMH-SH 60V 13 SMI2 5V - SMI2 60V 15 NMH-TC 5V - NMH-TC 60V 18 NMH2-TC 5V - NMH2-TC 60V 19			LZ-NET PoE	52
Industrial automation Multiple automation Multiple automation Mul			LZ-24NET 19 PoE	54
Industrial automation SMH-TC 5V - SMH-TC 60V 16 SMH2-TC 5V - SMH2-TC 60V 17 SMH-SG 5V - SMH-SG 60V 24 SMH-SH 5V - SMH-SH 60V 13 SMI2 5V - SMI2 60V 15 NMH-TC 5V - NMH-TC 60V 18 NMH2-TC 5V - NMH2-TC 60V 19				
Industrial buses SMH-TC 5V - SMH-TC 60V 16 SMH2-TC 5V - SMH2-TC 60V 17 SMH-SG 5V - SMH-SG 60V 24 SMH-SU 5V - SMH-SH 60V 13 SMI2 5V - SMI2 60V 15 NMH-TC 5V - NMH-TC 60V 18 NMH2-TC 5V - NMH2-TC 60V 19	Industrial automation			10
SMH2-TC 5V - SMH2-TC 60V 17 SMH-SG 5V - SMH-SG 60V 24 SMH-SH 5V - SMH-SH 60V 13 SMI2 5V - SMI2 60V 15 NMH-TC 5V - NMH-TC 60V 18 NMH2-TC 5V - NMH2-TC 60V 19	NOTO A DU TRAT	Industrial buses		10
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