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AN INTRODUCTION TO SURGE PROTECTION

An Introduction to Surge Protection:

Lightning / Surge protection for electrical and electronic systems to the new British and European standard BS EN 62305-4.
Kingsmill Industries (UK) Ltd can offer a complete solution to protect vital electrical and electronic systems from damage. Recently introduced standards put equal importance to protecting the electrical installation and electrical equipment as to the building itself.
Modern micro electronic components are very sensitive to overvoltage's and because many systems are networked, they rely on each other for the system to operate. If one part of the system gets damaged due to lightning or surges the whole system will not operate. The consequential losses suffered during such events i.e. downtime and lost production can be very high.
Kingsmill Industries (UK) Ltd can offer a wealth of experience in helping you decide which product best suits your needs together with our manufacturer who has many years experience in the industry. You can speak to a product specialist who will quickly answer any questions you may have and recommend the correct product for your application. Our catalogue contains the most commonly used products. We have however, over 4000 devices and components, a product for every application.

New Standard BSEN62305-4 1st Sept 2008 & 17th Edition Wiring Regs Amendments 1st Jan 2012.

This new standard replaced BS6651 on the above date, it is now mandatory to fit a lightning current arrester on main incoming panels which are situated in buildings with external lightning conductors or fed by an overhead line. This type of arrester are designated as a Type1, we recommend a combined T1+T2+T3 arrester as this gives additional surge protection for no added cost. The minimum discharge capability for a T1 arrester has to be 50Ka 10/350µs level 3 or 4.
For a Level 1 installation the minimum requirement is 100Ka 10/350µs.
Panels feeding external circuits such as car park lighting, cctv etc should also have a combined T1+T2+T3 arrester fitted as standard.
An example of a T1+T2+T3 combined arrester is SPC25 DS/4+0/LED 10651LED Level 1, 100Ka 10/350µs.
For panels in buildings without external lightning conductors and fed by underground cables a T2 surge arrester is sufficient. Sub-distribution boards or local control panels more than 10 metres from the main incomer and not feeding external circuits then a Type2 surge arrester can be used.
An example of a T2 surge arrester is Part no SY2-C40X.
Final sub-circuits and sensitive electronic equipment for example fire/burglar panels, PLC's which are fitted more than 10 metres from the last surge arrester should have a T3 surge arrester fitted at the panel or equipment to be protected.
An example of a T3 surge arrester is SY2-D/LED.

For further information including surge protection design and recommendations please contact our sales office.

Three SPD Classes:

Main Incoming Position	**Sub Dist. Board Position**	**Socket Outlet or Final Sub Circuit**
CLASS I	**CLASS II**	**CLASS III**
PROTECTION AGAINST DIRECT LIGHTNING CURRENTS (LIGHTNING CURRENT ARRESTER) (10/350 µs)	PROTECTION AGAINST INDIRECT LIGHTNING EFFECTS (SURGE ARRESTER) (10/350 µs)	PROTECTION AGAINST SWITCHING OVERVOLTAGES (SURGE ARRESTER) (10/350 µs)

PROTECTION FOR INDUSTRIAL / COMMERCIAL / ELECTRICAL

Product sensitive electronic equipment with high quality European manufactured Surge Arresters. Todays highly sensitive electronics require protection, you can achieve this by using the following lightning / surge arresters. They are quick and easy to install, and are competitively priced against other brands.

SPD240

Type 2 single phase and neutral Surge arrester for 230v applications. This unit is ideal for controlling voltage surges and remote lightning strikes. Maximum discharge current 80ka 8/20µs. IP56 weatherproof polycarbonate enclosure also available as displayed.

Dimensions:

150 (H) x 115 (D) x 80 (W) (mm)

Backup size of MCB 32A to 63A

Cable Size - 4mm² to 10mm²

SPD415

Type 2 three phase and neutral Surge arrester for 415v applications. This unit is ideal for controlling voltage surges and remote lightning strikes. Maximum discharge current 160ka 8/20µs. IP56 weatherproof polycarbonate enclosure also available as displayed.

Dimensions:

150 (H) x 115 (D) x 80 (W) (mm)

Backup size of MCB 32A to 63A

Cable Size - 4mm² to 10mm²

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PROTECTION FOR INDUSTRIAL / COMMERCIAL / ELECTRICAL

Product sensitive electronic equipment with high quality European manufactured Surge Arresters. Todays highly sensitive electronics require protection, you can achieve this by using the following lightning / surge arresters. They are quick and easy to install, and are competitively priced against other brands.

LSPD240

Combined type 1 & 2 single phase and neutral, direct lightning and surge arrester for 230v applications. This unit is ideal for controlling voltage surges and even direct lightning strikes which directly hit the building. It is mandatory to fit such a device if the building has an external lightning conductor or Faraday Cage.

IP56 weatherproof polycarbonate enclosure also available as displayed.

Dimensions:

225 (H) x 115 (D) x 160 (W) (mm)

Backup size of MCB or fuse 60A min.

Cable Size - 16mm² to 25mm²

LSPD415

Combined type 1 & 2 three phase and neutral, direct lightning and surge arrester for 230v applications. This unit is ideal for controlling voltage surges and even direct lightning strikes which directly hit the building. It is mandatory to fit such a device if the building has an external lightning conductor or Faraday Cage.

IP56 weatherproof polycarbonate enclosure also available as displayed.

Dimensions:

225 (H) x 115 (D) x 160 (W) (mm)

Backup size of MCB or fuse 60A min.

Cable Size - 16mm² to 25mm²

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PROTECTION FOR INDUSTRIAL / COMMERCIAL / ELECTRICAL

TYPE 2 UNIVERSAL PLUGGABLE SURGE ARRESTERS

SY1-C-40X

SY2-C-40X

SPD According to	IEC61643-1 EN61643-11 Type 2
Maximum continuous operating voltage UcV	(350V DC) 275 VAC
Voltage protection level in Up Voltage protection level at 5kA Up Voltage protection level at 3kA Up	≤1.5kV ≤0.9kV ≤0.6kV
Nominal discharge current In (8/20μs)kA	20kA
Maximum discharge current Imax (8/20μs)kA	40kA
Withstand Short Circuit	50kA RMS
Response time ns	<25ns
Dimensions	72(W) 90(H) 66(D)mm, Din-Rail Mountable
Enclosure Material	Yellow/Grey, UL94 V-O
Degree of Protection	IP20
Recommended backup MCB/fuse	32A to 63A
Terminal Capacity: Phase Line Neutral Earth Line Signal Line	2.5-35mm² 4.0-35mm² 1.0mm²
Visual indication of Status	Green - OK, Red - Replace module
Remote Alarm Contact	Contact close if any part of the device fails

ENCLOSURES AVAILABLE UPON REQUEST

TYPE 2/3 UNIVERSAL PLUGGABLE SURGE ARRESTER - 2 POLE (SP + N)

SY2-D

SY2-D-LED

SPD According to	IEC61643-1 EN61643-11 Type 3
Maximum continuous operating voltage UcV	(275 V)
Voltage protection level at 3kA (8/20μs)	≤0.6kV
Nominal discharge current In (8/20μs)kA	5kA
Maximum discharge current Imax (8/20μs)kA	10kA
Response time ns	<25ns
Dimensions	18(W) 90(H) 66(D)mm
Enclosure Material	Grey, UL94 V-O
Degree of Protection	IP20
Recommended backup MCB/fuse	32A or less
Terminal Capacity	1.5mm² - 4mm²
Visual indication of Status	Black - OK, Red - Replace module
Remote Alarm Contact	Contact close if any part of the device fails
Din Rail Mountable	Yes

ENCLOSURES AVAILABLE UPON REQUEST

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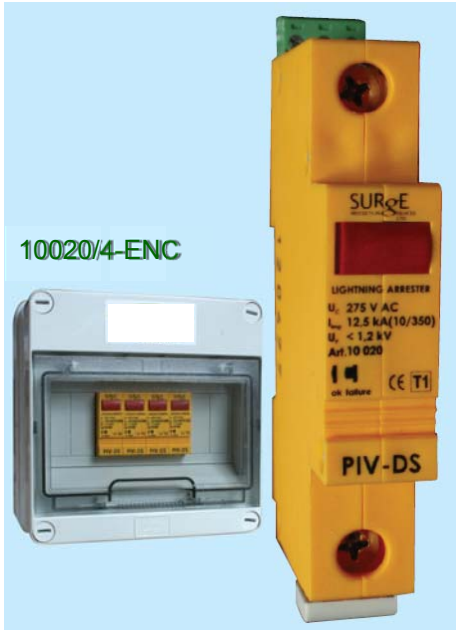
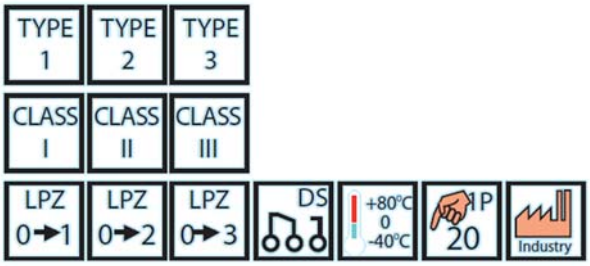
COMPACT T1+T2+T3 COMBINED LIGHTNING CURRENT & SURGE ARRESTER

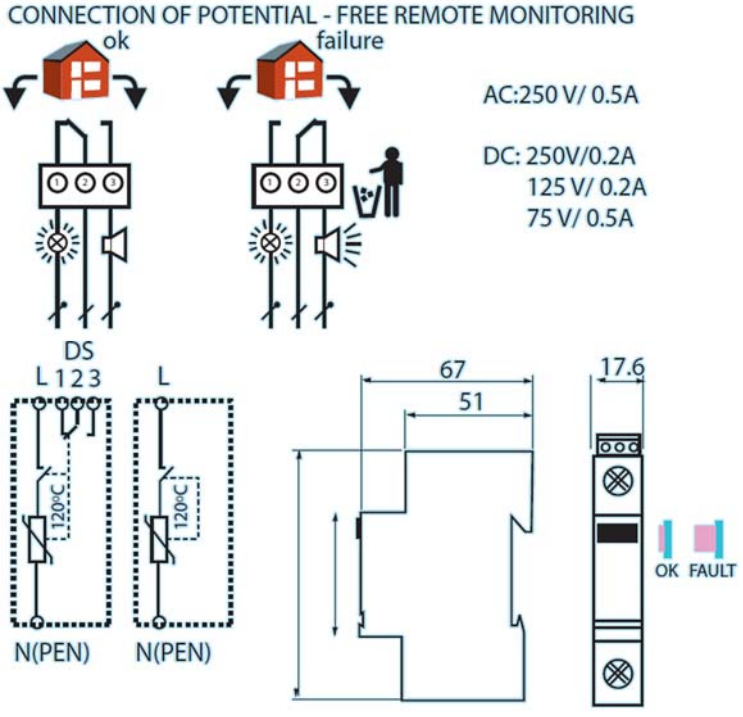
10020

Maximum continuous operating voltage	Uc	275 AC
Lightning impulse current (10/350) Charge Specific Energy	1_{mp} Q W/R	12.5kA 6.25 As 39 kJ/
Maximum discharge current (8/20)	1_{max}	100kA
Nominal discharge current (8/20)	1_n	20 kA
Temporary overvoltage (TOV)	U_T	335 V/5 sec
Voltage protection level at 1_{mp}	U_P	<1.2 kV
Response Time	t_A	< 25 ns
Rec. back-up fuse or MCB		63 AMPS
Lifetime		Min. 100,000 h
Short-circuit withstand capability At max. back-up fuse	I_P	60 kA rms
Weight	m	140g
Let through voltage at 3ka 8/20 µs Short circuit to BS6651:1999		A_{pp} C = 600 V
Part Number 1 Pole		10020
Part Number 4 Pole		10020/4





10020/4



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TYPE 1+2+3 COMBINED LIGHTNING & SURGE ARRESTERS

4 POLE ARRESTER

10651/LED

ENCLOSURES AVAILABLE UPON REQUEST

Type SPC25 DS/4+0/LED		
Max continuous operating voltage	Uc	275 V AC
Lightning impulse current (10/350) Charge Specific Energy	Limp Q W/R	25kA 12.5 As 156 kj/
Total Lightning current (10/350) L1+L2+L3+N-PE	Itotal	100kA
Max.discharge current (8/20) per mode	Imax	120kA
Nominal discharge current (8/20 per mode.	In	50kA
Voltage protection level at Iimp	up	<1.2kV
Response Time	tA	<25ns
Temporary overvoltage (TOV)	UT	335 V/5 sec.
Rec.Back-Up fuse/MCCB		63A/100A
Max. Back-Up fuse ("V" connection)		63AgL/gG
Short circuit withstand capability at max back-up fuse	Ip	80kArms
Weight	m	1125g
Lifetime		Min 100,000 h
Let through voltage (I) 3ka 8/20µs, short circuit current to BS 6651+1999 AppC		600V

2 POLE ARRESTER

10650/LED

ENCLOSURES AVAILABLE UPON REQUEST

Type SPC25 DS/4+0/LED		
Max continuous operating voltage	Uc	275 V AC
Lightning impulse current (10/350) Charge Specific Energy	Limp Q W/R	25kA 12.5 As 156 kj/
Total Lightning current (10/350) L1+L2+L3+N-PE	Itotal	50kA
Max.discharge current (8/20) per mode	Imax	120kA
Nominal discharge current (8/20 per mode.	In	50kA
Voltage protection level at Iimp	up	<1.2kV
Response Time	tA	<25ns
Temporary overvoltage (TOV)	UT	335 V/5 sec.
Rec.Back-Up fuse/MCCB		63A/100A
Max. Back-Up fuse ("V" connection)		63AgL/gG
Short circuit withstand capability at max back-up fuse	Ip	80kArms
Weight	m	565g
Lifetime		Min 100,000 h
Let through voltage (I) 3ka 8/20µs, short circuit current to BS 6651+1999 AppC		600V

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TELEPHONE / FAX / MODEM SURGE ARRESTER

FOR BT TYPE SOCKETS : TEST CATEGORY D+C+B TO BS EN 61643-21

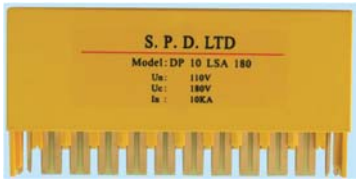
Number of Protect Pairs	2	DTB2/ART
Nominal Voltage	UN	170v
Max. continuous operating voltage	UC	204v
Nominal current	IN	100mA
C2 Max. discharge current (8/20)	1MAX	2kA
Nominal discharge current (8/20)	IN	1kA
Voltage proection level at 1kV/µs	UP	520v
Response time	TA	<30ns
Data rate		10MBit/s
Series impedance per line		1,5 - 10 Ω
Parasitic capacitance	C	1, 5nF
Operating temperature range	U	-40ºC ÷ + 80ºC
Category tested acc. To IEC 61643:21-		A2, B2, C2, C3, D1

DTB2/ART

10 PAIR TELEPHONE SURGE ARRESTER : D+C+B TO BS EN 61643-21

Nominal direct voltage (UN)	110v=
Max. continuous operating direct voltage (Uc)	180v=
Max. continuous operating alternating voltage (Uc)	180~
Residual voltage at 1kV/µs (Ures)	<250V
Nominal operating current at 25ºC (IL)	145mA
C2 nominal discharge current (8/20µs) (IN)	5kA
Max. impulse discharge current (8/20µs) (Imax)	10kA
Protection level at In (Up)	220V
Response time (tA)	<1ns
Thermal response time at 230V/23 A ac and ambient temp. 25ºC (TA)	<2s
Capacitance wire-earth (C)	<0.1nF
Series inductance at 25ºC (L)	47µH
Series resistance per line at 25ºC ®	3-6 Ω
Max. transmission frequency (fg)	≤1.2MHz
Operating temperature range (TU)	-40 to + 80ºC
Enclosure material / colour	Thermoplastic, grey or yellow
Dimensions (L x W x H)	110 x 2.25 x 40mm
Net weight / pc	90g

DP10-LSA180



EARTH-BAR

DP1-LSA180

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DATA SIGNAL LINE ARRESTERS

SP - 30 : SP - 48

Model Number		DATA SIGNAL ARRESTER 2 POLE							
		SP5	SP12	SP15	SP24	SP30	SP48	SP60	SP110
Nominal Voltage: Un		5V-	12V-	15V-	24V-	30V-	48V-	60V-	110V-
Max. Continious Voltage :DC.Uc		6V-	14.5V-	17.8V-	26.8V-	34.8V-	55.1V-	65V-	170V-
Max. Continious voltage: Ac.Uc		4.2V	10.2V	12.5V	18.9V	24.5V	38.9V	50V	130V
Nominal Current: In		1A							
C2 Total Nominal Discharge Current In (8/20µs) 20kA									
D1 Total Lightning Impulse Current (10/350µs) imp 10kA									
Voltage protective	Core/Core	≤50V	≤70V	≤85v	≤100V	≤130V	≤200V	≤240V	≤730V
Level Upin	Core/PE	≤45V	≤60V	≤70v	≤80V	≤80V	≤120V	≤150V	≤400V
Voltage protective	CoreCore	≤16V	≤38V	≤50v	≤70V	≤95V	≤150V	≤180V	≤520V
Level: Up 1kv/µs	Core/PE	≤8V	≤19V	≤25v	≤35V	≤50V	≤75V	≤95V	≤260V
Response Time: tA		≤1ns							≤25ns
Resistance		1Ω	1.5Ω	1.6Ω	1.8Ω	1.8Ω	1.8Ω	1.8Ω	
Insertion Loss		≤0.3dB							
Working Frequency		≤10MHz							
Degree of Protection		IP20							
Dimensions		*150 (H) x 115 (D) x 80 (W) (mm)*							
Enclosure Material		Polyamide PA6.6							
Connector		Screw Terminals							
Signal SPD - REP-SP series									

CO-AXIAL BNC C.C.T.V. ARRESTER

Model Number.		D-24/BNC
Nominal Voltage (V) Un		24
Maximum Continious Voltage (V) Uc		24/28
C2 Nominal Dischareg Current (8/20µs) per line In		5kA
C2 Nominal Dischareg Current (8/20µs) shield-PG In		10kA
Voltage Protection level	Line-Shield	≤300
Voltage Protection level	Line-Shield	≤50
Transmission Speed (bps) Vs		10Mbps
Series impedence per line (Ohm)		3 Ohm
Isertion loss (dB)		0.5 @ 10MHz
Response time Ta		1ns
Type of Connection IN/OUT		BNC Female / Male
Dimensions (mm)		*70 (H) x 25 (D) x 70*
Environment Temperature (ºC)		-25 ~ + 70

Surge arresters for coaxial Ethernet network systems protect against surges at the boundaries from lightning protection zone 0 3. Data network protector in accordance with IEC614321. Limit the transients with gas discharge tubes and transzorb diodes.

Two-stage protection circuit in aluminium housing. BNC connector for Ethernet systems. Simple installation. This can also be applied for the protection of video signals, cameras and / or TV systems.

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PROTECTION OF PHOTOVOLTAIC / SOLAR SYSTEMS

SPD-PV1000

Maximum continuous operating voltage UcV	1060v DC
Voltage protection level In Up	4kv
Nominal discharge current In (8/20µs) kA	20kA
Maximum discharge current Imax (8/20µs) kA	40kA
Withstand	50kA RMS
Response time ns	< 25ns
Dimensions	W 4mm H 90mm D 66mm Din-rail mountable
Enclosure material	Grey UL94 V-O
Degree of protection	IP20
Recommend backup MCB/fuse	32A to 63A
Terminal Capacity Phase line neutral line Earth line Signal line	2.5~35mm² 4.0~35mm²
Visual indication of status	Green OK, Red, replace module
Din rail mountable	Yes

ENCLOSURES AVAILABLE UPON REQUEST

Type 2 to EN61643-11, fault indication, remote signal contact optional, pluggable and replacement modules.

SPD-PV600

Maximum continuous operating voltage UcV	640v DC
Voltage protection level In Up	2.2kv
Nominal discharge current In (8/20µs) kA	20kA
Maximum discharge current Imax (8/20µs) kA	40kA
Response time ns	< 25ns
Dimensions	W 4mm H 90mm D 66mm Din-rail mountable
Enclosure material	Grey UL94 V-O
Degree of protection	IP20
Recommend backup MCB/fuse	32A to 63A
Terminal Capacity Phase line neutral line Earth line Signal line	2.5~35mm² 4.0~35mm² 1.0mm²
Visual indication of status	Green OK, Red, replace module
Din rail mountable	Yes

ENCLOSURES AVAILABLE UPON REQUEST

Type 2 to EN61643-11, fault indication, remote signal contact optional, pluggable and replacement modules.

1st AMENDMENT, 17th EDITION WIRING REGS COMPLIANT