Page 14-4

SURGE PROTECTION DEVICES TYPE 1 AND 2 MONOBLOCK VERSIONS

- 1P, 1P+N, 2P, 3P, 3P+N, 4P
- IEC impulse current Iimp (10/350µs): 25kA
- IEC maximum discharge current Imax (8/20µs): 100kA
- SPD status indicator
- Version with output for remote status indication.

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SURGE PROTECTION DEVICES TYPE 1 AND 2 VERSIONS WITH PLUG-IN CARTRIDGE

- 1P, 1P+N, 2P, 3P, 3P+N, 4P
- IEC impulse current Iimp (10/350µs): 12.5kA
- IEC maximum discharge current Imax (8/20µs): 60kA
- IEC combined surge Uoc/Isc (1.2/50, 8/20µs): 10kV/5kA
- Single module status indicator
- Version with output for remote status indication.

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SURGE PROTECTION DEVICES TYPE 2 VERSIONS WITH PLUG-IN CARTRIDGE

- 1P, 1P+N, 2P, 3P, 3P+N, 4P
- IEC maximum discharge current Imax (8/20µs): 40kA
- IEC rated discharge current In (8/20µs): 20kA
- Single module status indicator
- Versions with and without output for remote status indication.

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SURGE PROTECTION DEVICES TYPE 2 FOR PHOTOVOLTAIC APPLICATIONS

- Versions with plug-in cartridge: +, -, PE
- IEC maximum operational voltage: 1200VDC
- IEC maximum discharge current Imax (8/20µs): 40kA
- IEC rated discharge current In (8/20µs): 20kA
- Single module status indicator
- Versions with or without output for remote status indication
- Tested according to EN 50539-11
- UL Recognized versions.

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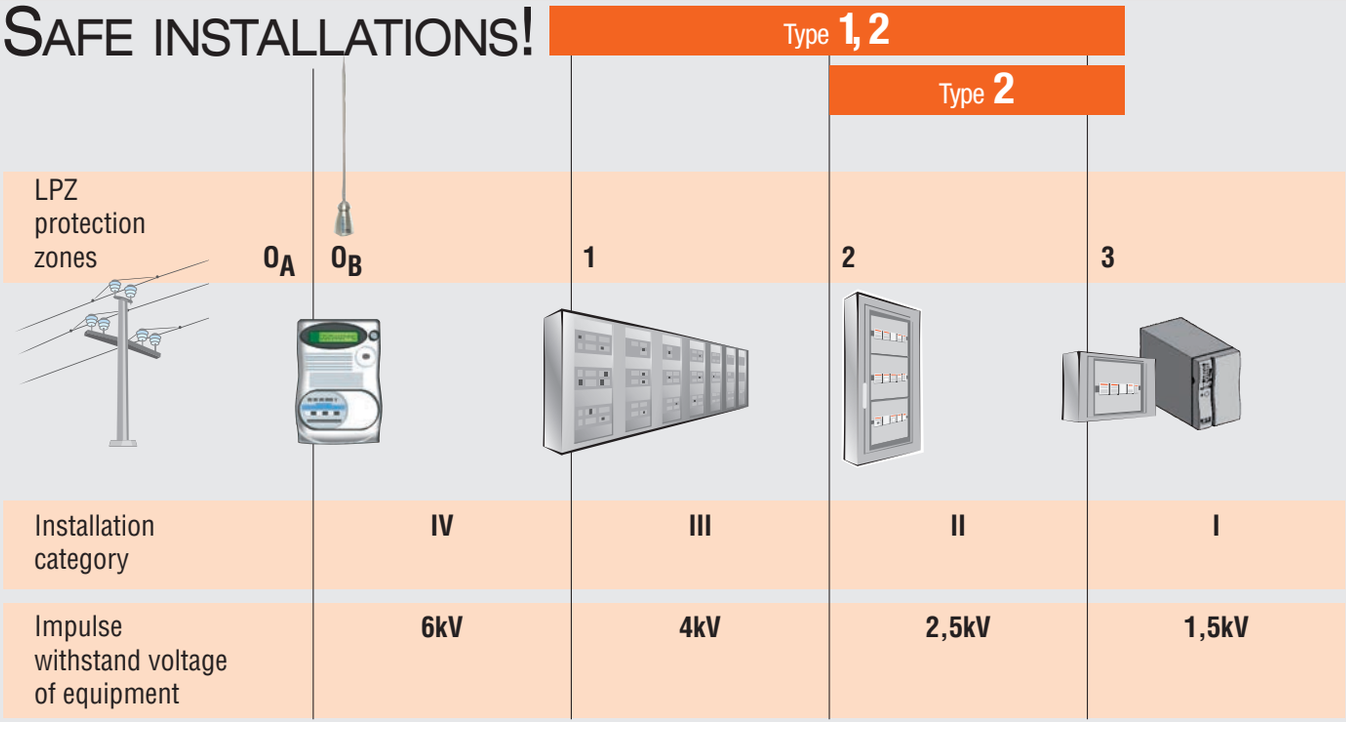
SPARE PLUG-IN CARTRIDGES

- Versions suitable for SPDs:
  - Type 1 and 2
  - Type 2
  - Type 2 for photovoltaic applications
- Status indicator for single modules.

Surge protection devices

- Protection against overvoltage and high surge conditions caused by direct or indirect lightning strikes
- Types with plug-in cartridge provide fast servicing capability
- Mechanical indicator for visual failure status signalling of single modules
- Versions with or without output for remote SPD status indication
- Versions for photovoltaic applications.

SAFE INSTALLATIONS!



SURGE PROTECTION DEVICES

The surge arresters commonly defined as SPDs (Surge Protection Devices), are devices designed to protect electric systems and equipment against transient and impulse overvoltages such as those caused by lightning and by electric switching.
Their function is to divert the discharge or impulse current generated by an overvoltage to earth/ground, thereby protecting the equipment downstream.
SPDs are installed in parallel with the electric line to be protected. At the mains rated voltage, they are comparable to an open circuit and have a high impedance at their ends.
In the presence of an overvoltage, this impedance falls to very low values, closing the circuit to earth/ground.
Once the overvoltage has ended, their impedance rises again rapidly to the initial value (very high), returning to open loop conditions.
The SA1B (monoblock) type protects against direct and indirect lightning strikes as well as induced overvoltage conditions. It can be installed in areas with a high risk of direct lightning strikes, inside main distribution boards or nearby sub-distribution boards. With the SA0 plug-in cartridge type, the same features are available with the advantage of only having to replace the protection cartridge once the SPD blows.

PROTECTION ZONES

Standards define the LPZs (Lightning Protection Zones), which indicate the different zones at risk. These are distinguished among:

LPZ 0A: Area outside a building not protected by LPS (e.g. lightning rods) where a direct lightning strike is possible. In this zone, there is total exposure to induced electromagnetic fields.

LPZ 0B: Area outside a building protected by LPS; therefore, a direct lighting strike is not possible. In this zone, there is total exposure to induced electromagnetic fields.

LPZ 1: Area inside a building so protected against direct lightning strikes.
In this zone, there is the possibility of very high overvoltages and of induced electromagnetic fields which may be attenuated depending on the degree of screening. This zone must be protected by an SPD type 1 at the boundary with zone LPZ 0A or 0B.

LPZ 2: Area inside a building (e.g. in a room), in which there is the possibility of low overvoltages since they are limited by SPDs installed upstream. This zone must be protected by an SPD type 2 at the boundary with zone LPZ 1.

LPZ 3: Area inside a building (e.g. the system connected to a socket in a room) characterised by very sensitive equipment, in which there is the possibility of very low overvoltages as they are limited by SPDs installed upstream.
This zone must be protected by an SPD type 3 at the boundary with zone LPZ 2.

INSTALLATION CATEGORY

For the correct choice of the SPD, the dielectric strength of the equipment to protect needs to be considered. This level is established by IEC 60664-1 standard.
For a 230/400V installation, it specifies:

Installation category IV: 6kV for devices installed upstream of the distribution board (for example, delivery point with the distribution system).

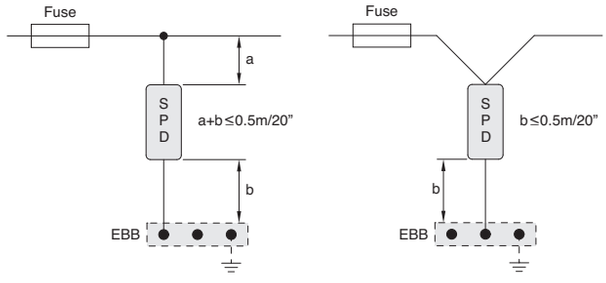
Installation category III: 4kV for devices being part of the fixed system (for example, distribution boards, switching devices, isolators, ducting and their accessories)

Installation category II: 2.5kV for non electronic devices (for example, household appliances or electric tools)

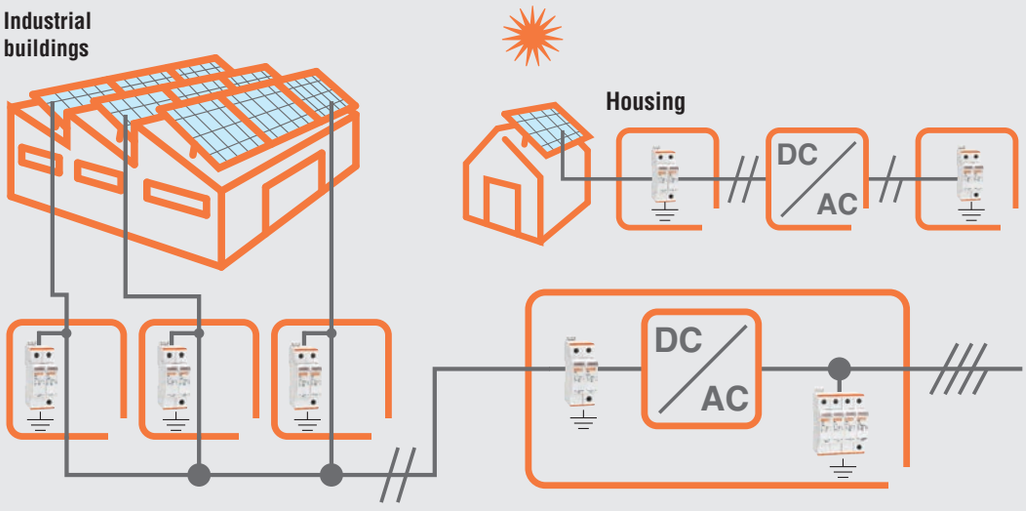
Installation category I: 1.5kV for equipment containing “particularly sensitive” electronic circuits (for example, electronic devices like PCs or TVs)

RECOMMENDATIONS FOR INSTALLATION

For correct installation, it is advisable to make connections between the line and the SPD input (phase or neutral terminals) as well as between the SPD output (earth/ground terminal) and the equipotential bonding connection with a maximum 0.5m/20” length of the leads. To reduce the distance, use of the so-called “V connection” is admissible.



For more details, IEC/EN 62305 standards can be consulted.



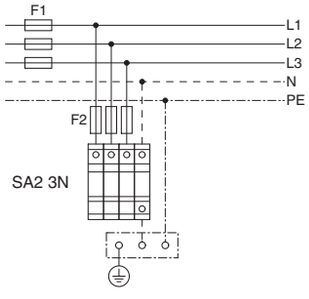
Type 2 DC

SURGE PROTECTION DEVICES FOR PHOTOVOLTAIC APPLICATIONS

In photovoltaic applications of a domestic environment or industrial facility or other similar circumstances, equipped with lightning rod systems having a safety distance (S), SPD type 2, suitable for DC duty, can be used to protect the installation. It is advisable to install these devices as close as possible to the photovoltaic panels, consequently in the so-called string boards. If the AC/DC inverter is far away from the string boards (indicatively more than 10m/33' apart), another SPD type 2 DC needs to be installed next to the inverter on the DC side. Installation of SPD type 2 suitable of AC duty is also required downstream of the inverter on the AC side. For more details, consult specific national standards and/or application guides issued by local authorities for solar systems concerning protection against lightning. The SA2DG… and SA2DF… types with plug-in cartridges are suitable for connection in the DC side of a solar installation and offer protection against induced overvoltage conditions. The SA2... type is suitable for installation downstream of the inverter on the AC side and in intermediate panels.

BACKUP PROTECTION

Protection against short circuits of SPDs is provided by overcurrent devices (gL/gG fuses), which should be chosen according to the SPD manufacturer's recommendations.



F1>125A gL/gG → F2 =125A gL/gG
F1≤125A gL/gG → F2 = not required.

SPD COORDINATION

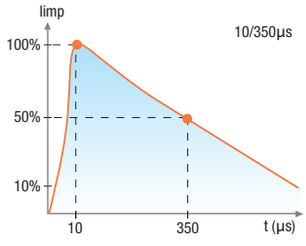
In order to obtain an effective protection against overvoltage, it is advisable to install several SPDs coordinated with one another in cascade connection.
For instance, it is advisable to have a Type 1 SPD in the main distribution board, a Type 2 SPD in the sub-distribution board and a Type 3 SPD near the terminal equipment to be protected.
In this way, the energy originating from an overvoltage gradually decreases as it reaches the equipment to protect.

DEFINITIONS AND RATINGS ACCORDING TO IEC/EN

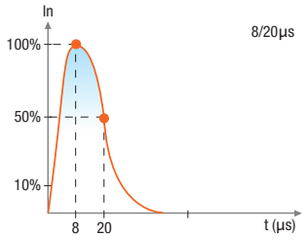
Maximum continuous voltage Uc:
Maximum value of AC or DC voltage that the SPD is capable of permanently withstanding without activating or getting damaged; this is its rated voltage.

Protection level voltage Up:
Maximum value of the voltage between the terminals of the SPD in presence of an impulsive overvoltage. It is a fundamental parameter to correctly choose the SPD; it must be taken into account with regards to the impulse voltage of the equipment to protect.

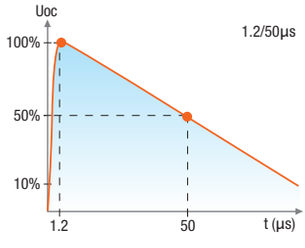
Impulse current Imp:
Crest value of the current that circulates in the SPD with a 10/350μs waveform (activation must be guaranteed for 20 times without damage). It is used to classify SPDs in test class I.



Rated discharge current In:
Crest value of the current that circulates in the SPD with an (8/20μs waveform (activation must be guaranteed for 20 times without damage). It is used to classify SPDs in test class II.



Open circuit discharge voltage Uoc:
Crest value of the no-load discharge voltage delivered by the test generation with a 1.2/50μs waveform simultaneously with a short-circuit current of an 8/20μs waveform, applied at the SPD terminals. It is used to classify SPDs in test class III.



Surge protection devices Type 1 and 2 monoblock

SA1B 1P A320R

new

SA1B 3N A320R

new

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
		(SPDT)		n°	[kg]
MONOBLOCK VERSION. IEC impulse current limp (10/350µs) 25kA per pole.					
SA1B 1P A320R	1P	YES	2	1	0.275
SA1B 1N A320R	1P+N	YES	4	1	0.390
SA1B 2P A320R	2P	YES	4	1	0.395
SA1B 3P A320R	3P	YES	6	1	0.595
SA1B 3N A320R	3P+N	YES	8	1	0.760
SA1B 4P A320R	4P	YES	8	1	0.780

Characteristics

Type	IEC rated voltage Un	IEC voltage protection level Up	Power installation system
	[V]	[kV] L-N	
SA1B 1P A320R	230	<1.4	TN-C, TN-S, TT❶
SA1B 1N A320R	230	<1.4/1.3	TT, TN-S
SA1B 2P A320R	230	<1.4	TN-S
SA1B 3P A320R	230/400	<1.4	TN-C
SA1B 3N A320R	230/400	<1.4/1.5	TT, TN-S
SA1B 4P A320R	230/400	<1.4	TN-S

❶ For L-PE only.

Main characteristics
The surge protection device type SA1B combines the performance of SPD type 1 and 2 into a single product. It protects against direct and indirect lightning strikes as well as induced overvoltage conditions.
It can be installed in areas with a high risk of direct lightning strikes, inside main distribution boards or nearby sub-distribution boards.

Operational characterstics
- IEC maximum continuous operating voltage Uc: 320VAC
- IEC maximum discharge current Imax (8/20µs): 100kA per pole
- IEC rated discharge current In (8/20µs): 25kA per pole
- Version with relay output having changeover contact for remote status indication
- IEC degree of protection: IP20.

Reference standards
Comply with standards: IEC/EN 61643-11.

Surge protection devices Type 1 and 2 with plug-in cartridge

SA0 1P A320R

SA0 2P A320R

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
		(SPDT)		n°	[kg]
VERSION WITH PLUG-IN CARTRIDGE. IEC impulse current limp (10/350µs) 12.5kA per pole.					
SA0 1P A320R	1P	YES	1	1	0.195
SA0 1N A320R	1P+N	YES	2	1	0.365
SA0 2P A320R	2P	YES	2	1	0.370
SA0 3P A320R	3P	YES	3	1	0.540
SA0 3N A320R	3P+N	YES	4	1	0.670
SA0 4P A320R	4P	YES	4	1	0.670

Main characteristics
SURGE PROTECTION DEVICES TYPE SA0
It has a plug-in cartridge and combines the performance of SPD type 1 and 2 into a single product. It is ideal in all those systems of reduced extent to protect the load side downstream of main circuit breaker to terminal equipment.
It protects against direct and indirect lightning strikes as well as induced overvoltage conditions. It can be installed inside main distribution boards and nearby terminal equipment.
The protection cartridges are plug-in and can be easily replaced for quick servicing.

SURGE PROTECTION DEVICE SA2
It is suitable for installation in sub-distribution boards and nearby terminal equipment.
It protects against indirect overvoltages.
The protection cartridges are plug-in and can be easily replaced for quick servicing.

Surge protection devices Type 2 with plug-in cartridge

SA2 2P A320R

SA2 3N A320R

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
		(SPDT)		n°	[kg]
VERSION WITH PLUG-IN CARTRIDGE. IEC maximum discharge current Imax (8/20µs) 40kA per pole.					
SA2 1P A320	1P	NO	1	1	0.140
SA2 1P A320R	1P	YES	1	1	0.145
SA2 1N A320	1P+N	NO	2	1	0.240
SA2 1N A320R	1P+N	YES	2	1	0.245
SA2 2P A320	2P	NO	2	1	0.260
SA2 2P A320R	2P	YES	2	1	0.265
SA2 3P A320	3P	NO	3	1	0.370
SA2 3P A320R	3P	YES	3	1	0.375
SA2 3N A320	3P+N	NO	4	1	0.465
SA2 3N A320R	3P+N	YES	4	1	0.470
SA2 4P A320	4P	NO	4	1	0.480
SA2 4P A320R	4P	YES	4	1	0.485

Opwerational characteristics
- IEC maximum continuous operating voltage Uc: 320VAC/420VDC
- IEC maximum discharge current Imax (8/20µs) per pole: 60kA (SA0...); 40kA (SA2...)
- IEC rated discharge current In (8/20µs) per pole: 25kA (SA0...); 20kA (SA2...)
- Versions with or without relay output having changeover contact for remote status indication
- IEC degree of protection: IP20.

Reference standards
Comply with standards: IEC/EN 61643-11.

Characteristics

Type	IEC rated voltage Un	IEC voltage protection level Up	Power installation
	Un	Up	
	[V]	[kV] L-N	
SA0/SA2 1P A...	230	<1.5	TN-C, TN-S, TT❶
SA0/SA2 1N A...	230	<1.5	TT, TN-S
SA0/SA2 2P A...	230	<1.5	TN-S
SA0/SA2 3P A...	230/400	<1.5	TN-C
SA0/SA2 3N A...	230/400	<1.5	TT, TN-S
SA0/SA2 4P A...	230/400	<1.5	TN-S

❶ For L-PE only.

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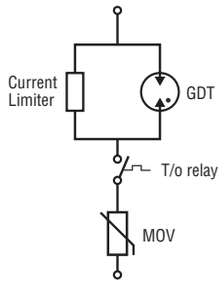
Surge protection devices Type 2 for photovoltaic applications with plug-in cartridge

SA2 DG...

SA2 DF...

Order code	Pole arrange-ment	Relay output	Number of DIN modules	Qty per pkg	Wt
		(SPDT)		n°	[kg]
VERSION WITH PLUG-IN CARTRIDGE. EN short-circuit current rating Iscpv 100A.					
SA2 DG 600M2	+, -, PE	NO	2	1	0.320
SA2 DG 600M2R	+, -, PE	YES	2	1	0.325
SA2 DG K00M3	+, -, PE	NO	3	1	0.420
SA2 DG K00M3R	+, -, PE	YES	3	1	0.425
EN short-circuit current rating Iscpv 1000A.					
SA2 DF 600M2	+, -, PE	NO	2	1	0.285
SA2 DF 600M3	+, -, PE	NO	3	1	0.305
SA2 DF K00M2	+, -, PE	NO	2	1	0.410
SA2 DF K00M3	+, -, PE	NO	3	1	0.500
SA2 DF K20M3	+, -, PE	NO	3	1	0.550

Protection circuit for each module type SA2 DF...
Self-protected surge protection devices



In case of short but intense overvoltage conditions, both the spark gap element (GDT- Gas Discharge Tube) and the varistor (MOV – Metal Oxide Varistor) simultaneously trigger.
In case of weak but prolonged overvoltage conditions, the current limiter considerably reduces the current flowing through the varistor. This technological solution guarantees a longer varistor life.
Ultimately, another particular mechanism of the surge arrester quickly extinguishes the electric arc during the thermal overload tripping phase.

Main characteristics
The surge protection device type SA2 D with plug-in cartridge for photovoltaic applications is suitable for installation on the direct-current end of a photovoltaic installation and protects against induced overvoltage conditions.
The protection cartridges are plug-in and can be easily replaced for quick servicing.

Operational characteristics
- EN maximum continuous voltage Ucpv: 600VDC, 1000VDC, 1200VDC
- Versions with or without relay output having changeover contact for remote status indication
- EN degree of protection: IP20.

Certifications and compliance
Certifications obtained: UL Recognized for USA and Canada (cURus – File E352471), as Surge-protective Devices – Component, Type 4 for use in SPD Type 2 photovoltaic applications only; for SA2DF600M2, SA2DFK00M2 and SA2DFK20M3 types. Also UL 1449 and CSA C22.2 n°8 for cURus certified types mentioned above.
Products having this type of marking are intended for use as components of complete workshop-assembled equipment.
Compliant with standards: EN 50539-11 for all.

Characteristics

Type	EN rated voltage Un	EN continuous voltage Ucpv	EN voltage protection level Up
	[VDC]	[VDC]	[kV]
SA2 DG 600M2	600	600	<1.9
SA2 DG K00M3	1000	1000	<3.6
SA2 DF 600M2	600	600	<2.0
SA2 DF 600M3	600	600	<3
SA2 DF K00M2	1000	1000	<4.0
SA2 DF K00M3	1000	1000	<4.0
SA2 DF K20M3	1200	1200	<4.0

Accessories and spare parts Plug-in cartridges

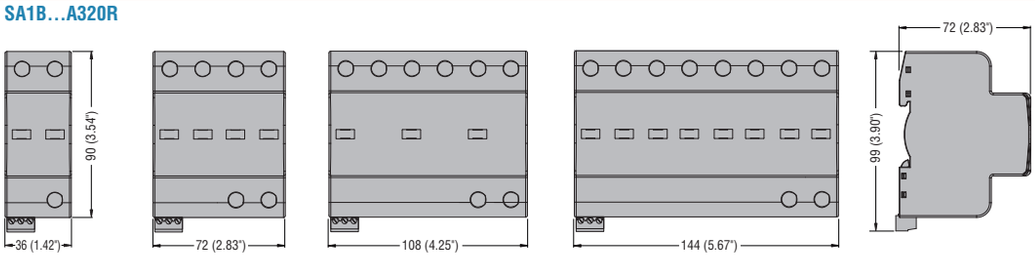
SAX00 P A320

SAX02 P A320

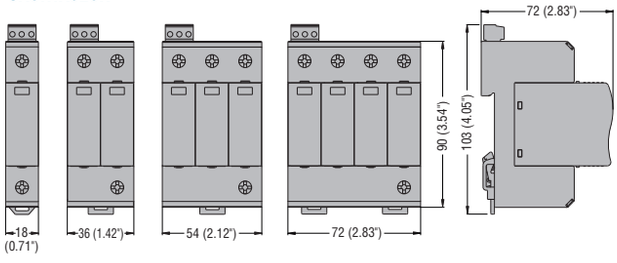
Order code	Description	Qty per pkg	Wt
		n°	[kg]
SAX00 P A320	For SA0... types	1	0.100
SAX02 P A320	For SA2... types	1	0.100
SAX02 DF 600M2	For SA2 DF 600M2 type	1	0.100
SAX02 DF 600M3	For SA2 DF 600M3 type	1	0.100
SAX02 DF K00M2	For SA2 DF K00M2 type	1	0.100
SAX02 DF K00M3	For SA2 DF K00M3 type	1	0.100
SAX02 DF K20M3	For SA2 DF K20M3 type	1	0.100
SAX02 DG 600M2	For SA2 DG 600... types	1	0.100
SAX02 DG K00M3	For SA2 DG K00... types	1	0.100

Reference standards
Compliant with standards: IEC/EN 61643-11 for all;
EN 50539-11 for types SAX02 DF... and SAX02 DG...;
UL 1449, CSA C22.2 n° 8 for SAX02 DF 600M2, SAX02 DF K00M2, SAX02 DF K20M3.

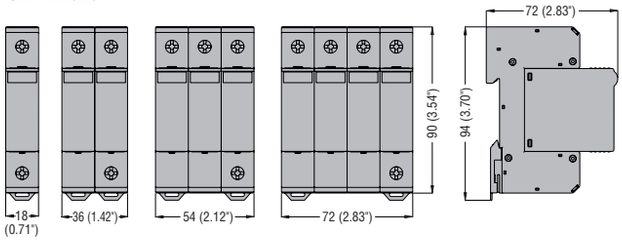
SA1B…A320R



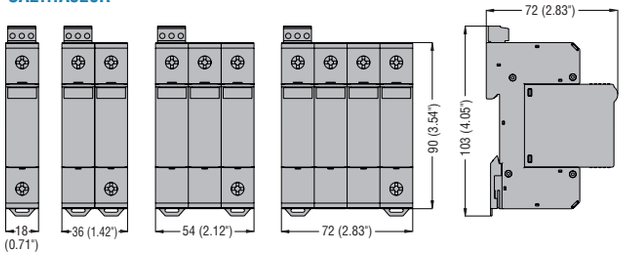
SA0…A320R



SA2…A320



SA2…A320R



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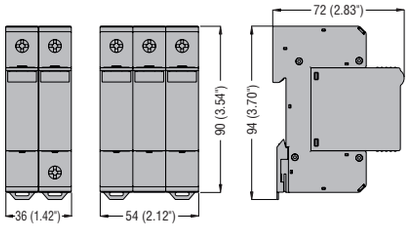
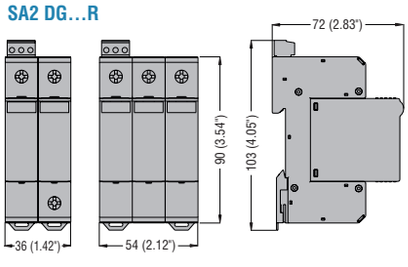
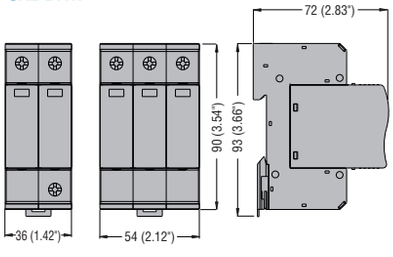


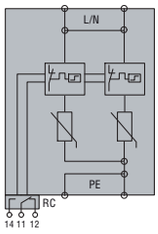
SA2 DG…R



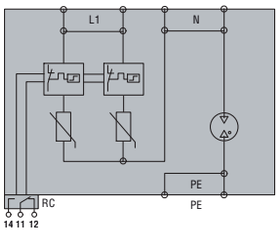
SA2 DF…



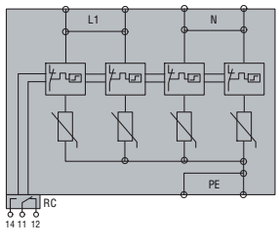
SA1B 1P A320R



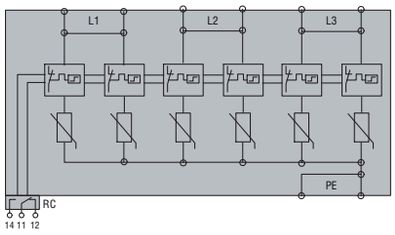
SA1B 1N A320R



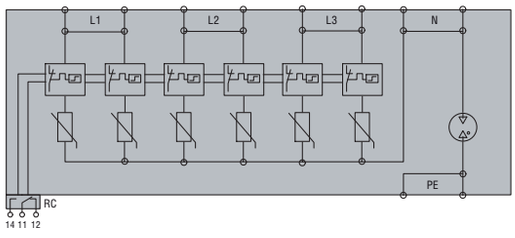
SA1B 2P A320R



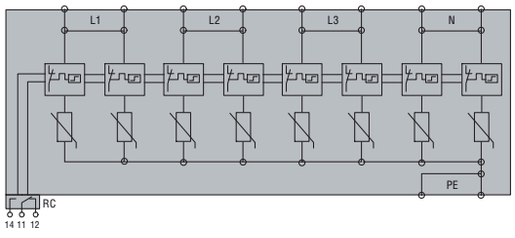
SA1B 3P A320R



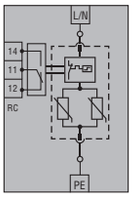
SA1B 3N A320R



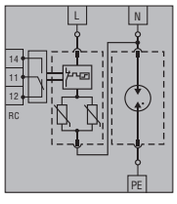
SA1B 4P A320R



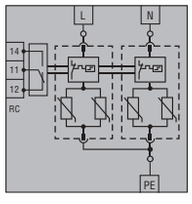
SA0 1P A320R



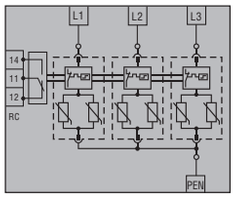
SA0 1N A320R



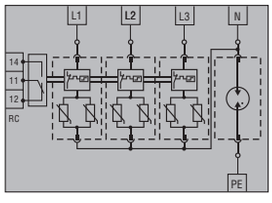
SA0 2P A320R



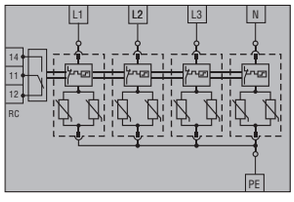
SA0 3P A320R



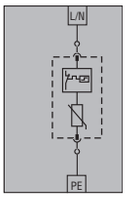
SA0 3N A320R



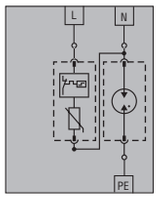
SA0 4P A320R



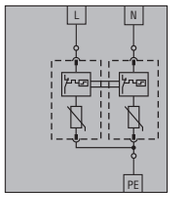
SA2 1P A320



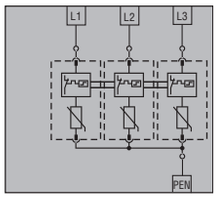
SA2 1N A320



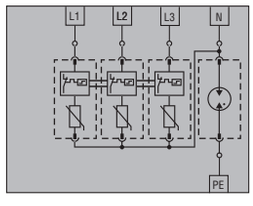
SA2 2P A320



SA2 3P A320



SA2 3N A320



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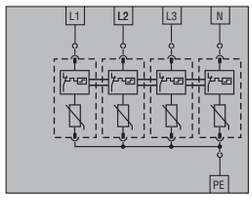

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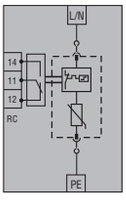
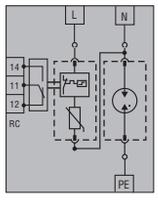
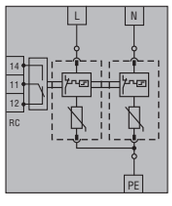


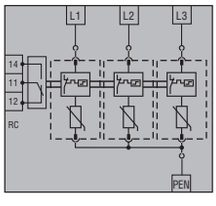
SA2 1N A320R



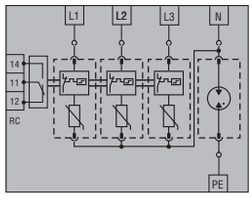
SA2 2P A320R



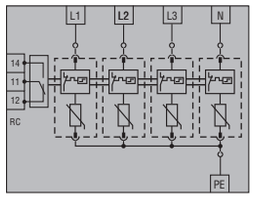
SA2 3P A320R



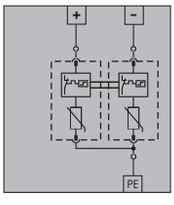
SA2 3N A320R



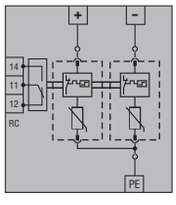
SA2 4P A320R



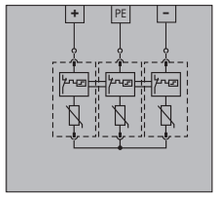
SA2 DG 600M2



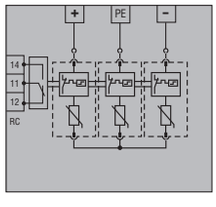
SA2 DG 600M2R



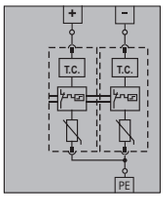
SA2 DG K00M3



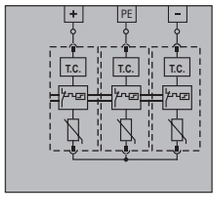
SA2 DG K00M3R



SA2 DF 600M2
SA2 DF K00M2



SA2 DF 600M3
SA2 DF K00M3
SA2 DF K20M3



TYPE with relay output		SA1B 1P A320R	SA1B 1N A320R	SA1B 2P A320R	SA1B 3P A320R	SA1B 3N A320R	SA1B 4P A320R
ELECTRICAL PROPERTIES							
SPD per IEC/EN 61643-11		Type 1 and 2 (Test class I and II)					
IEC rated voltage Un	VAC	230	230	230	230 / 400	230 / 400	230 / 400
IEC maximum continuous voltageUc	VAC / VDC	320					
IEC impulse current Iimp (10/350) (L-N/N-PE)	kA	25	25 / 50	25 per pole	25 per pole	25 / 100	25 per pole
IEC max impulse current Imax (8/20) (L-N/N-PE)	kA	100	100 / 100	100 per pole	100 per pole	100 / 100	100 per pole
IEC rated discharge current In (8/20) (L-N/N-PE)	kA	25	25 / 50	25 per pole	25 per pole	25 / 100	25 per pole
IEC voltage protection level Up (L-N/N-PE)	kV	<1.4	<1.4 / <1.3	<1.4	<1.4	<1.4 / <1.5	<1.4
Temporary overvoltage (TOV) Ut (L-N for 5s)	VAC	335					
IEC residual voltage Ures (L-N/N-PE) at 3kA (8/20)	kV	1	1	1	1.1	1.1	1.1
IEC follow current If (N-PE)	Arms	—	>100	—	—	>100	—
Tripping time ta (L-N/N-PE)	ns	<25	<25 / 100	<25	<25	<25 / 100	<25
Thermal isolation protection		Yes					
IEC backup protection fuse (supply>250A) (L-N/N-PE)	A	250 (gL/gG class)					
IEC maximum short-circuit current 50Hz	kA	25					
Status indicator - operating / failure	Colour	Green / Red					
CONNECTIONS							
IEC degree of protection		IP20					
Terminal tightening torque	Nm	3					
Maximum conductor section	mm^2	25 (flexible) / 35 (rigid)					
RELAY OUTPUT FOR REMOTE STATUS INDICATION							
Type of contact		Changeover (NO/NC - SPDT)					
Contact capacity	A	0.5A at 250VAC; 3A at 125VAC; 0.1A at 250VDC; 0.2A at 125VDC					
Contact terminal tightening torque	Nm	0.25					
Maximum contact conductor section	mm^2	1.5					
AMBIENT CONDITIONS							
Operating temperature	°C	-40….+80					
Fixing		On 35mm DIN rail (IEC/EN 60715)					
Housing material		Termoplastic, RAL 7035, UL 94 V-0					

TYPE with relay output		SA0 1P A320R	SA0 1N A320R	SA0 2P A320R	SA0 3P A320R	SA0 3N A320R	SA0 4P A320R
ELECTRICAL PROPERTIES							
SPD per IEC/EN 61643-11		Type 1, 2 and 3 (Test class I, II and II)					
IEC Rated voltage Un	VAC	230	230	230	230 / 400	230 / 400	230 / 400
IEC maximum continuous voltage Uc	VAC / VDC	320 / 420					
IEC impulse current Iimp (10/350) (L-N/N-PE)	kA	12.5	12.5 / 50	12.5 per pole	12.5 per pole	12.5 / 50	12.5 per pole
IEC max discharge current Imax (8/20) (L-N/N-PE)	kA	60	60 / 50	60 per pole	60 per pole	60 / 50	60 per pole
IEC rated discharge current In (8/20) (L-N/N-PE)	kA	25	25 / 30	25 per pole	25 per pole	25 / 30	25 per pole
IEC combined surge Uoc/Isc (1.2/50, 8/20)	kV/kA	10 / 5					
IEC voltage level protection Up (L-N/N-PE)	kV	<1.5	<1.5 / <1.7	<1.5	<1.5	<1.5 / <1.7	<1.5
IEC temporary overvoltage (TOV) Ut (L-N for 5s)	VAC	335					
IEC residual voltage Ures (L-N/N-PE) at 5kA (8/20)	kV	0.8	0.8 / 0.2	0.8	0.8	0.8 / 0.2	0.8
IEC follow current If (N-PE)	Arms	—	>100	—	—	>100	—
Tripping time ta (L-N/N-PE)	ns	<25	<25 / 100	<25	<25	<25 / 100	<25
Thermal isolation protection		Yes					
IEC backup fuse (supply>160A) (L-N/N-PE)	A	160 (gL/gG class)					
IEC maximum short-circuit current 50Hz	kA	25					
Status indicator - operating / failure	Colour	— / Red					
CONNECTIONS							
IEC degree of protection		IP20					
Terminal tightening torque	Nm	3					
Maximum conductor section	mm^2	25 (flexible) / 35 (rigid)					
RELAY OUTPUT FOR REMOTE STATUS INDICATION							
Type of contact		Changeover (NO/NC - SPDT)					
Contact capacity	A	0.5A at 250VAC; 3A at 125VAC; 0.1A at 250VDC; 0.2A at 125VDC					
Contact terminal tightening torque	Nm	0.25					
Maximum contact conductor section	mm^2	1.5					
AMBIENT CONDITIONS							
Operating temperature	°C	-40….+80					
Fixing		On 35mm DIN rail (IEC/EN 60715)					
Housing material		Thermoplastic, RAL 7035, UL 94 V-0					

TYPE without relay output		SA2 1P A320	SA2 1N A320	SA2 2P A320	SA2 3P A320	SA2 3N A320	SA2 4P A320
with relay output		SA2 1P A320R	SA2 1N A320R	SA2 2P A320R	SA2 3P A320R	SA2 3N A320R	SA2 4P A320R
ELECTRICAL PROPERTIES							
SPD per IEC/EN 61643-11		Type 2 (Test Class II)					
IEC rated voltage Un	VAC	230	230	230	230 / 400	230 / 400	230 / 400
IEC maximum continuous voltage Uc	VAC / VDC	320 / 420					
IEC max discharge current Imax (8/20) (L-N/N-PE)	kA	40	40 / 40	40 per pole	40 per pole	40 / 40	40 per pole
IEC rated impulse current In (8/20) (L-N/N-PE)	kA	20	20 / 20	20 per pole	20 per pole	20 / 20	20 per pole
IEC voltage protection level Up (L-N/N-PE)	kV	<1.5	<1.5 / <2	<1.5	<1.5	<1.5 / <2	<1.5
IEC temporary overvoltage (TOV) Ut (L-N for 5s)	VAC	335					
IEC residual voltage Ures (L-N/N-PE) at 3kA (8/20)	kV	0.95	0.95 / 0.1	0.95	0.95	0.95 / 0.1	0.95
IEC follow current If (N-PE)	Arms	—	>100	—	—	>100	—
Tripping time ta (L-N/N-PE)	ns	<25	<25 / 100	<25	<25	<25 / 100	<25
Thermal isolation protection		Yes					
IEC backup protection fuse (supply>125A) (L-N/N-PE)	A	125 (gL/gG class)					
IEC maximum short-circuit current 50Hz	kA	25					
Status indicator - operating / failure		Green / Red					
CONNECTIONS							
IEC degree of protection		IP20					
Terminal tightening torque	Nm	3					
Maximum conductor section	mm²	25 (flexible) / 35 (rigid)					
RELAY OUTPUT FOR REMOTE STATUS INDICATION							
Type of contact		Changeover (NO/NC - SPDT)					
Contact capacity	A	0.5A at 250VAC; 3A at 125VAC; 0.1A at 250VDC; 0.2A at 125VDC					
Contact terminal tightening torque	Nm	0.25					
Maximum contact conductor section	mm²	1.5					
AMBIENT CONDITIONS							
Operating temperature	°C	-40….+80					
Fixing		On 35mm DIN rail (IEC/EN 60715)					
Housing material		Thermoplastic, RAL 7035, UL 94 V-0					

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TYPE without relay output			SA2 DF 600M2	SA2 DF 600M3	SA2 DF K00M2	SA2 DF K00M3	SA2 DF K20M3	SA2 DG 600M2	SA2 DG K00M3
with relay output			—	—	—	—	—	SA2 DG 600M2R	SA2 DG K00M3R
ELECTRICAL PROPERTIES									
SPD per EN 50539-11			Type 2 (Test class II)						
UL Recognized for USA and Canada			Yes	—	Yes	—	Yes	—	—
Rated voltage Un (EN) / MCOV (UL)	VDC		600	600	1000	1000	1200	600	1000
Maximum continuous voltage Ucpv (EN/UL)	VDC		600	600	1000	1000	1200	600	1000
Maximum discharge current Imax (8/20)	EN	kA/pole	40	30	30	40	40	30	30
	UL		50	—	20	—	50	—	—
Rated discharge current In (8/20)	EN	kA/pole	20	20	20	20	20	15	15
	UL		20	—	10	—	20	—	—
Voltage protection level Up (EN) / VPR (UL)	kV		<2.0	<3.0	<4.0	<4.0	<4.0	<1.9	<3.6
EN residual voltage Ures at 5kA (8/20)	kV		1						
Tripping time ta	ns		<25						
Thermal isolation protection			Yes						
EN maximum short-circuit current Iscpv	A		1000					100	
EN backup protection fuse (Isc>100A)	A		—					100A gPV	
Status indication – operating / failure	Colour		– / Red					Green / Red	
CONNECTIONS									
EN degree of protection			IP20						
Terminal tightening torque	Nm		3 (26lbin)					3	
Maximum conductor section	mm²		1.5...25 (flexible / stranded) / AWG 16...3 - 1.5...35 (rigid / solid) AWG 16...2						
RELAY OUTPUT FOR REMOTE STATUS INDICATION									
Type of contact, if any			Changeover (1NO/1NC – SPDT)						
Contact capacity	A		0.5A at 250VAC; 3A at 125VAC; 0.1A at 250VDC; 0.2A at 125VDC						
Contact terminal tightening torque	Nm / lbin		0.25 / 2.2						
Maximum contact conductor section	mm² / AWG		1.5 / 16						
AMBIENT CONDITIONS									
Operating temperature			-40….+80°C						
Fixing			On 35mm DIN rail (IEC/EN 60715)						
Housing material			Thermoplastic, RAL 7035, UL 94 V-0						