

SURGE PROTECTION DEVICES



 **Lovato**
electric

ENERGY AND AUTOMATION

SINGLE PHASE SYSTEMS



PROTECTION DEVICE WIRING RULES

- Favour insertion of the protection device upstream of the residual current breaker to protect it from overvoltage.
- Prefer the adoption of in/out wiring.
- Maintain a connection length to the equipotential bar within 0.5 metres (b).
- Replace the cartridge of the protection device when the status indicator turns red.

Applications



Homes

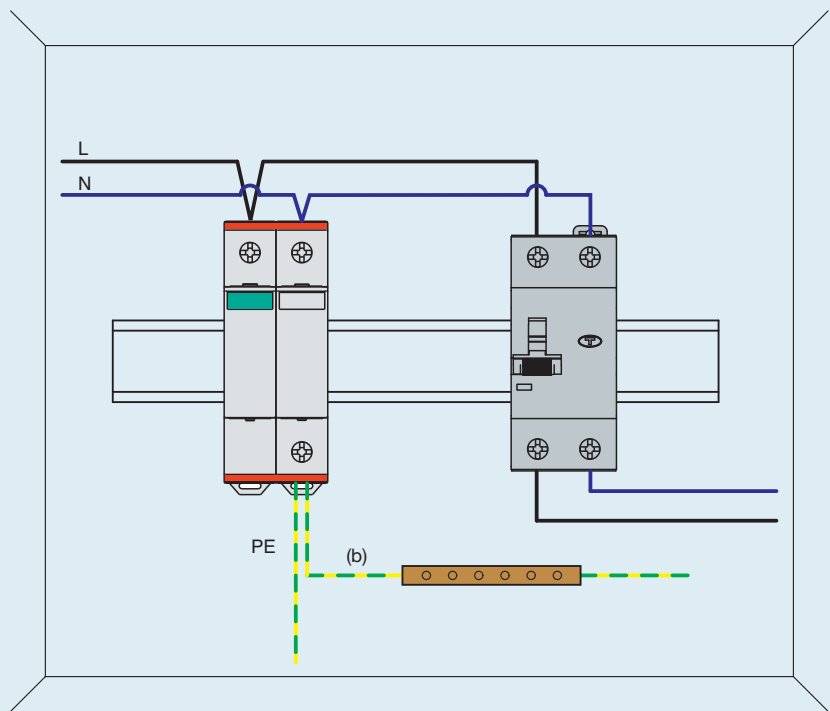


Electronic equipment



AC side of single-phase photovoltaic systems

Installation and wiring



General characteristics

Area	Type	Order codes	DIN modules	Technical characteristics
URBAN	2	SA2 1N A320	2	<ul style="list-style-type: none"> - IEC rated voltage U_n: 230VAC - IEC rated current I_n: 20kA 8/20μs - IEC voltage protection level: $U_p < 1.5kV$ - Surge protection device with plug-in cartridge - Available versions with relay output (code SA2 1N A320R) - Minimum cabling section: 6mm².
NON-URBAN	1-2-3	SA0 1N A320R	2	<ul style="list-style-type: none"> - IEC rated voltage U_n: 230VAC - IEC impulse current I_{imp}: 12.5kA 10/350μs - IEC rated current I_n: 25kA 8/20μs - IEC voltage protection level: $U_p < 1.5kV$ - Surge protection device with plug-in cartridge - Built-in output relay - Minimum cabling section: 16mm².

THREE PHASE SYSTEMS



PROTECTION DEVICE WIRING RULES

- Prefer the adoption of the wiring method illustrated in the figure.
- Maintain a connection length to the equipotential bar within 0.5 metres (b).
- Replace the cartridge of the protection device when the status indicator turns red.

Applications



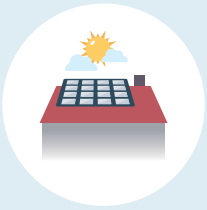
Industrial plants



Residential complexes and public locations

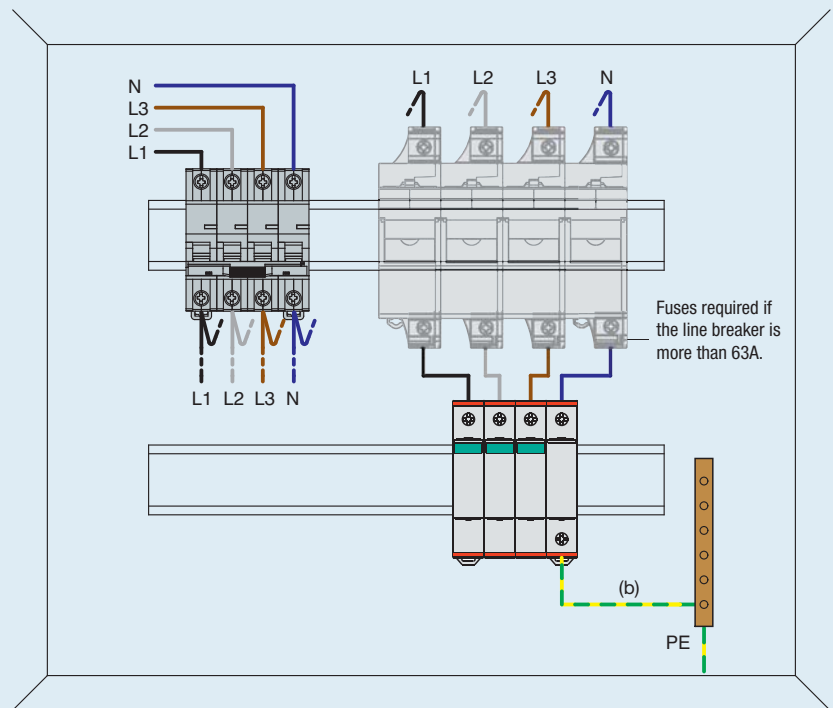


Offices



AC side of three-phase photovoltaic systems

Installation and wiring



General characteristics

Area	Type	Order codes	DIN modules	Technical characteristics
URBAN	2	SA2 3N A320	4	<ul style="list-style-type: none"> - IEC rated voltage U_n: 230/400VAC - IEC rated current I_n: 20kA 8/20μs - IEC voltage protection level: $U_p < 1.5kV$ - Surge protection device with plug-in cartridge - Minimum cabling section: 6mm² - Available versions with relay output (code SA2 3N A320R) - 125A gG/gL fuse for breakers of greater than 63A.
NON-URBAN	1-2-3	SA0 3N A320R	4	<ul style="list-style-type: none"> - IEC rated voltage U_n: 230/400VAC - IEC impulse current I_{imp}: 12.5kA 10/350μs - IEC rated current I_n: 25kA 8/20μs - IEC voltage protection level: $U_p < 1.5kV$ - Surge protection device with plug-in cartridge - Minimum cabling section: 16mm² - Built-in output relay - 160A gG/gL fuse for breakers of greater than 63A.

PHOTOVOLTAIC SYSTEMS

Applications



DC side of photovoltaic systems

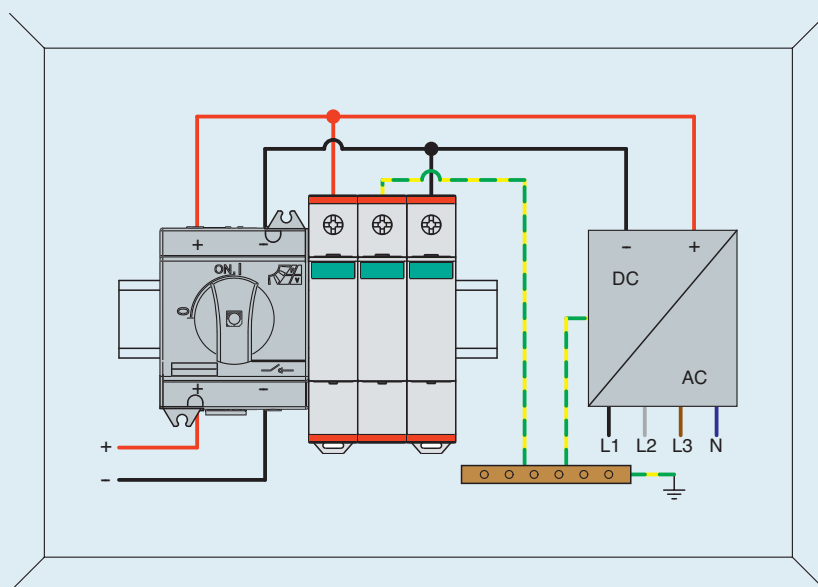


PROTECTION DEVICES WIRING RULES

- Prefer the adoption of the wiring method illustrated in the figure.
- Maintain a connection length to the equipotential bar within 0.5 metres (b), with a minimum section of 6mm².
- Replace the cartridge of the protection device when the status indicator turns red.



Installation and wiring of 3 DIN module protection device



General characteristics

Maximum rated voltage	EN short-circuit current I _{scpv}	Type	Order codes	DIN modules	Technical characteristics
600VDC	100A	2	SA2 DG 600 M2	2	- IEC rated current I _n : 15kA 8/20μs - IEC voltage protection level: U _p < 1.9kV - Surge protection device with plug-in cartridge
	1000A		SA2 DF 600 M3	3	- IEC rated current I _n : 20kA 8/20μs - IEC voltage protection level: U _p < 3.0kV - Surge protection device with plug-in cartridge
1000VDC	100A	2	SA2 DG K00 M3	3	- IEC rated current I _n : 15kA 8/20μs - IEC voltage protection level: U _p < 3.6kV - Surge protection device with plug-in cartridge
	1000A		SA2 DF K00 M3	3	- IEC rated current I _n : 20kA 8/20μs - IEC voltage protection level: U _p < 4.0kV - Surge protection device with plug-in cartridge

ORDER CODES



Order codes	Type	Rated voltage	Max continuous voltage	Voltage protection level	Impulse current	Rated current	Maximum current	Short-circuit current	Backup fuse gL/gg	Immunity to TOV	DIN modules	With relay output	Monoblock	Cartridge
	IEC/EN 61643-11	Un (VAC)	Uc (V)	Up (kV) (L-N/N-PE)	I _{imp} 10/350 (kA) pole	I _n 8/20 (kA) pole	I _{max} 8/20 (kA) pole	I _{sc} 50Hz (kA)	A	V				
SA1B 1N A320R	1 - 2	230	320	< 1.4 / < 1.3	25	25	100	25	250	Yes - 335V	4	Yes	Yes	-
SA1B 2P A320R	1 - 2	230	320	< 1.4	25	25	100	25	250	Yes - 335V	4	Yes	Yes	-
SA1B 3P A320R	1 - 2	230/400	320	< 1.4	25	25	100	25	250	Yes - 335V	6	Yes	Yes	-
SA1B 3N A320R	1 - 2	230/400	320	< 1.4 / < 1.5	25	25	100	25	250	Yes - 335V	8	Yes	Yes	-
SA1B 4P A320R	1 - 2	230/400	320	< 1.4	25	25	100	25	250	Yes - 335V	8	Yes	Yes	-



Order codes	Type	Rated voltage	Max continuous voltage	Voltage protection level	Impulse current	Rated current	Maximum current	Short-circuit current	Backup fuse gL/gg	Immunity to TOV	DIN modules	With relay output	Monoblock	Cartridge
	IEC/EN 61643-11	Un (VAC)	Uc (V)	Up (kV) (L-N/N-PE)	I _{imp} 10/350 (kA) pole	I _n 8/20 (kA) pole	I _{max} 8/20 (kA) pole	I _{sc} 50Hz (kA)	A	V				
SAO 1N A320R	1 - 2 - 3	230	320	< 1.5 / < 1.7	12.5	25	60	25	160	Yes - 335V	2	Yes	-	Yes
SAO 2P A320R	1 - 2 - 3	230	320	< 1.5	12.5	25	60	25	160	Yes - 335V	2	Yes	-	Yes
SAO 3P A320R	1 - 2 - 3	230/400	320	< 1.5	12.5	25	60	25	160	Yes - 335V	3	Yes	-	Yes
SAO 3N A320R	1 - 2 - 3	230/400	320	< 1.5 / < 1.7	12.5	25	60	25	160	Yes - 335V	4	Yes	-	Yes
SAO 4P A320R	1 - 2 - 3	230/400	320	< 1.5	12.5	25	60	25	160	Yes - 335V	4	Yes	-	Yes



Order codes	Type	Rated voltage	Max continuous voltage	Voltage protection level	Impulse current	Rated current	Maximum current	Short-circuit current	Backup fuse gL/gg	Immunity to TOV	DIN modules	With relay output	Monoblock	Cartridge
	IEC/EN 61643-11	Un (VAC)	Uc (V)	Up (kV) (L-N/N-PE)	I _{imp} 10/350 (kA) pole	I _n 8/20 (kA) pole	I _{max} 8/20 (kA) pole	I _{sc} 50Hz (kA)	A	V				
SA2 1N A320	2	230	320	< 1.5 / < 2.0	-	20	40	25	125	Yes - 335V	2	No	-	Yes
SA2 1N A320R	2	230	320	< 1.5 / < 2.0	-	20	40	25	125	Yes - 335V	2	Yes	-	Yes
SA2 2P A320	2	230	320	< 1.5	-	20	40	25	125	Yes - 335V	2	No	-	Yes
SA2 2P A320R	2	230	320	< 1.5	-	20	40	25	125	Yes - 335V	2	Yes	-	Yes
SA2 3P A320	2	230/400	320	< 1.5	-	20	40	25	125	Yes - 335V	3	No	-	Yes
SA2 3P A320R	2	230/400	320	< 1.5	-	20	40	25	125	Yes - 335V	3	Yes	-	Yes
SA2 3N A320	2	230/400	320	< 1.5 / < 2.0	-	20	40	25	125	Yes - 335V	4	No	-	Yes
SA2 3N A320R	2	230/400	320	< 1.5 / < 2.0	-	20	40	25	125	Yes - 335V	4	Yes	-	Yes
SA2 4P A320	2	230/400	320	< 1.5	-	20	40	25	125	Yes - 335V	4	No	-	Yes
SA2 4P A320R	2	230/400	320	< 1.5	-	20	40	25	125	Yes - 335V	4	Yes	-	Yes



Photovoltaic applications														
Order codes	Type	Rated voltage	Max continuous voltage	Voltage protection level	Impulse current	Rated current	Maximum current	Short-circuit current	Backup fuse gPV	DIN modules	With relay output	Monoblock	Cartridge	
	EN 50539-11	Un (VDC)	U _{cpv} (VDC)	Up (kV)	I _{imp} 10/350 (kA) polo	I _n 8/20 (kA) polo	I _{max} 8/20 (kA) polo	I _{scpv} (A)						
SA2 DG 600 M2	2	600	600	< 1.9	-	15	30	100	No, up to 100A	2	No	-	Yes	
SA2 DG 600 M2R	2	600	600	< 1.9	-	15	30	100	No, up to 100A	2	Yes	-	Yes	
SA2 DF 600 M2	2	600	600	< 2.0	-	20	40	1000	No	2	No	-	Yes	
SA2 DF 600 M3	2	600	600	< 3.0	-	20	40	1000	No	3	No	-	Yes	
SA2 DG K00 M3	2	1000	1000	< 3.6	-	15	30	100	No, up to 100A	3	No	-	Yes	
SA2 DG K00 M3R	2	1000	1000	< 3.6	-	15	30	100	No, up to 100A	3	Yes	-	Yes	
SA2 DF K00 M2	2	1000	1000	< 4.0	-	20	30	1000	No	2	No	-	Yes	
SA2 DF K00 M3	2	1000	1000	< 4.0	-	20	40	1000	No	3	No	-	Yes	
SA2 DF K20 M3	2	1200	1200	< 4.0	-	20	40	1000	No	3	No	-	Yes	

All AC protection devices are compliant with the IEC/EN 61643-11 standard.

All DC protection devices are compliant with the EN 50539-11 standard.

■ Codes used the most, presented in brochure.



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