SELECTION GUIDE
BACKUP FUSE FOR SPD

How to choose the correct
backup fuse for SPD

Lovato electric
ENERGY AND AUTOMATION

FAQ: How to choose the correct backup fuse for SPD

● Why is it required to install a backup fuse?

The need to install a backup fuse upstream of SPD is linked to the end of life of the SPD itself.
A SPD composed by varistor elements for phase protection can reach the end of its life in 2 ways: overload or short circuit.

a. End of life due to overload: this is the most common case and does not involve any additional risk of short circuit for the system. The SPD at the end of its life behaves as an open circuit.

b. End of life due to short circuit: it is a very remote case that occurs in the event of a violent electrodynamic stress inside the device that causes the active wires (phases and neutral) to be constantly in conduction with the earth connection. This causes the prospective short circuit current Ik to be at the point of installation of the SPD.

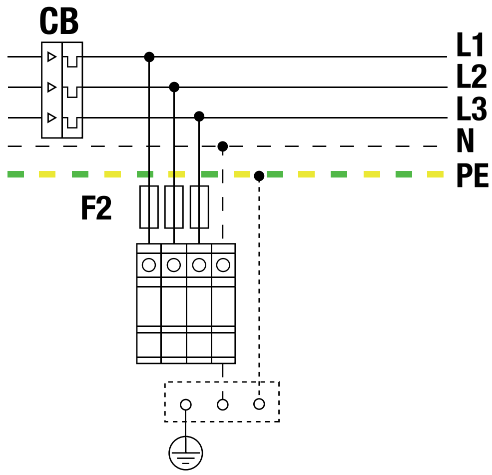
The backup fuse is mandatory to protect the system in the event of the end of life of the SPD due to short circuit.

● Choice of backup fuse

If a backup fuse is required, the choice of fuse depends on:

- Prospective short circuit current Ik
- Type and size of line protection used in the system.

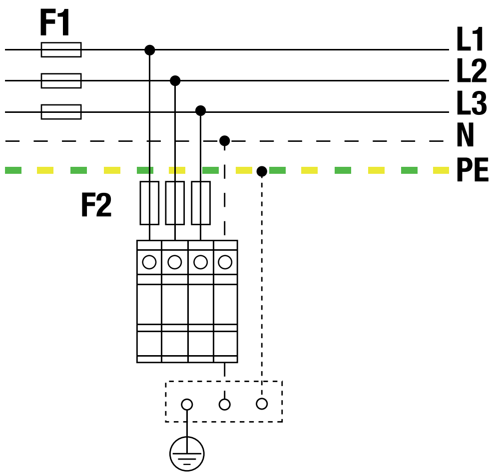
a. Line protected by circuit breaker



CB=Circuit breaker
F2=Backup fuse

<table>
<tr><td rowspan="2">SPD</td><td>Series</td><td colspan="2">Type 1 (Iimp=25kA)
SA1B</td><td colspan="2">Type 1 (Iimp=12,5kA)
SA0G | SA0</td><td>Type 2 (In=20kA)
SG2</td><td>Type 2 (In=5kA)
SG2C</td></tr>
<tr><td>Ik</td><td>Ik<=50kA</td><td>50kA<Ik<=100kA</td><td>Ik<=25kA</td><td>Ik<=25kA</td><td>Ik<=100kA</td><td>Ik<=6kA</td></tr>
<tr><td rowspan="5">In
CB</td><td><=32A</td><td colspan="2" rowspan="3">Backup fuse
not needed</td><td rowspan="3">Backup fuse
not needed</td><td rowspan="2">Backup fuse
not needed</td><td rowspan="3">Backup fuse
not needed</td><td>Backup fuse
not needed</td></tr>
<tr><td>32A<In<=63A</td><td rowspan="4">63A gG without derating</td></tr>
<tr><td>63A<In<=125A</td><td rowspan="3">125A gG with derating, limp=10kA 160A gG without derating</td></tr>
<tr><td>>125A</td><td rowspan="2">125A gG with derating, limp=10kA 250A gG without derating</td><td rowspan="2">125A gG with derating, limp=10kA</td><td rowspan="2">125A gG with derating, limp=10kA 250A gG without derating</td><td rowspan="2">125A gG without derating</td></tr>
<tr><td>N.a.</td></tr>
</table>

b. Line protected by fuse



F1=Line fuse
F2=Backup fuse

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not needed</td><td rowspan="4">Backup fuse
not needed</td><td>Backup fuse
not needed</td></tr>
<tr><td>63A<In<=100A</td><td rowspan="5">63A gG without derating</td></tr>
<tr><td>100A<In<=125A</td></tr>
<tr><td>125A<In<=250A</td><td rowspan="3">125A gG with derating, limp=10kA 160A gG without derating</td></tr>
<tr><td>>250A</td><td rowspan="2">125A gG with derating, limp=10kA 250A gG without derating</td><td rowspan="2">125A gG with derating limp=10kA</td><td rowspan="2">125A gG with derating, limp=10kA 250A gG without derating</td><td rowspan="2">125A gG without derating</td></tr>
<tr><td>N.a.</td></tr>
</table>

● Examples

a. Line protected by circuit breaker

SG23NA300R installed in a system with a prospective short circuit current Ik=50kA and protected upstream by a 160A circuit breaker.

Series		Type 2 (Iimp=20kA) SG2
Ik		Ik<=100kA
In CB	<=32A	Backup fuse not needed
	32A<In<=63A	
	63A<In<125A	
	>125A	125A gG without derating

Backup fuse needed: **125A class gG.**

SA1B3NA320R installed in a system with prospective short circuit current Ik=60kA and protected upstream by a 100A circuit breaker.

Series		Type 1 (Iimp=25kA) SA1B (Isccr=50kA)	
Ik		Ik<=50kA	50kA<Ik<=100kA
In CB	<=32A	Backup fuse not needed	
	32A<In<=63A		
	63A<In<=125A		
	>125A	125A gG with derating, Iimp=10kA 250A gG without derating	125A gG with derating, Iimp=10kA

Backup fuse **NOT** needed.

b. Line protected by fuses

SG23NA300R installed in a system with a prospectiveshort circuit current Ik=50kA and protected upstream by a 160A fuse.

Series		**Type 2 (In=20kA)** **SG2 (Isccr=50kA)**
Ik		Ik<=100kA
In F1	<=63A	Backup fuse not needed
	63A<In<=100A	
	100A<In<=125A	
	125A<In<=250A	
	>250A	125A gG without derating

Backup fuse **NOT** needed.

SA1B3NA320R installed in a system with a prospective short circuit current Ik=25kA and protected upstream by a 315A fuse.

Series		**Type 1 (Iimp=25kA)** **SA1B (Isccr=50kA)**	
Ik		Ik<=50kA	50kA<Ik<=100kA
In F1	<=63A	Backup fuse not needed	
	63A<In<=100A		
	100A<In<=125A		
	125A<In<=250A		
	>250A	125A gG with derating, Iimp=10kA 250A gG without derating	125A gG with derating, Iimp=10kA

Backup fuse needed:
- 125A class gG with derating Iimp=10kA
- 250A class gG without derating

PD 195 GB 05 26

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