



E 90 range of fuse holders
for the North American market
Uncompromising performance

Simplicity of Design

ABB Excellence Meets Customer Demands



Your customer demands devices for disconnecting and switching and effective heat dissipation, in addition to meeting mandatory requirements and international standards.

The dedicated designers at ABB have directed their passion, expertise and creativity in the development of the E 90 Series of fuse holders designed for the North American market.

This range of fuse holders includes PV use in combination with class CC and class J fuses, all certified according to North American standards.

The new ABB standard Certified according to these important North American marks



A passport to the world.
International quality marks and UL certification make
E 90 the ideal choice for designers and manufacturers
of switchboards and installations.



E 90 range for the NAM

ABB Design Meets Customer Demands



Industrial automation

E 90 fuse holders

- One module per pole
- Versions 1, 1N, 2, 3, 3N, 4
- AC-22B according to IEC 60947-3
- Rated current 32 A
- Rated voltage 400 V AC-22B and 690 V AC-20B
- Can be equipped with 10.3 x 38 mm aM and gG fuses
- Designed for isolation and switching under load and for protection of secondary circuits of industrial plants
- All versions are available with optical blown fuse indicator
- Compatible with ABB busbars of S 200 series and Unifix plug-in system
- cURus certification





Photovoltaic installations E 90 PV fuse holders

- One module per pole
- 1 and 2-pole versions
- DC-20B according to IEC 60947-3
- Rated current 32 A
- Rated voltage 1000 V DC
- Can be equipped with 10.3 x 38 mm gPV fuses
- Designed for isolation and protection of circuits in photovoltaic installations up to 1000 V DC
- All versions are available with optical blown fuse indicator
- Certified according to UL 4248-18



E 90 range for the NAM

ABB Design Meets Customer Demands

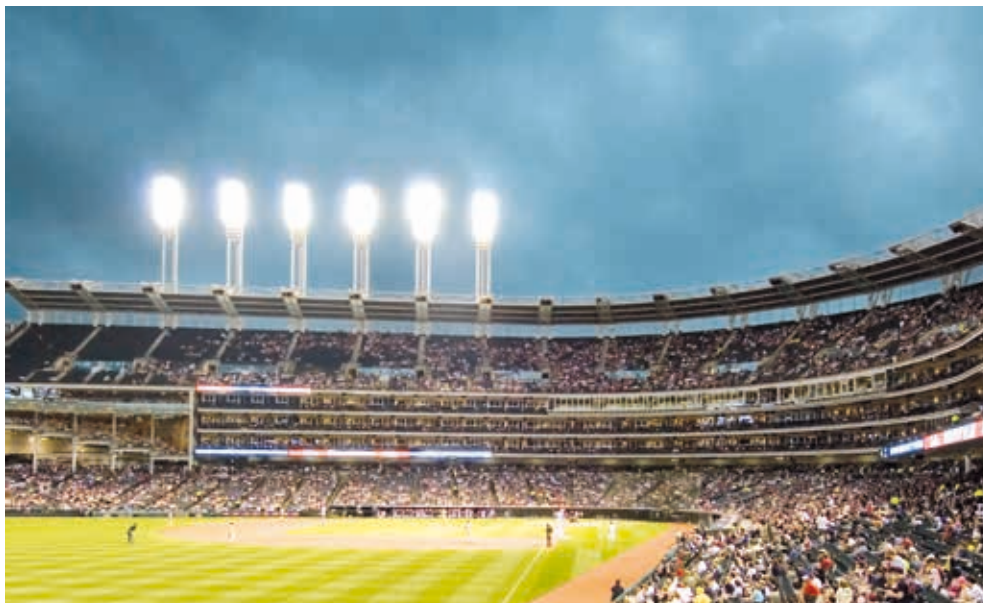


Industrial circuit protection

E 90 50/125 fuse holders

- Versions 1, 1N, 2, 3, 3N
- AC-20B according to IEC 60947-3
- Rated current 50 and 125 A
- Rated voltage 690 V AC
- Can be equipped with any type of cylindrical fuses 14x51 (E 90/50) and 22x58 mm (E 90/125)
- Specifically designed for industrial circuit protection
- All versions are available with optical blown fuse indicator
- Certified according to UL 4248-1





Branch circuit protection E 90 CC fuse holders

- One module per pole
- 1, 1N, 2, 3, 3N, 4-pole versions
- Rated current 30 A
- Rated voltage 600 V AC/DC
- Can be equipped only with Class CC fuses
- All versions are available with optical blown fuse indicator
- Certified according to UL 4248-4
- Rejection member feature according to UL 4248-4



E 90 range for the NAM

ABB Design Meets Customer Demands



Industrial installations

E 90 30/60 J fuse holders

- 1, 2 and 3-pole versions
- Rated current 30 and 60 A
- Rated voltage 600V AC
- Can be equipped with Class J fuses
- All versions are available with optical blown fuse indicator
- UL listed according to UL 4248-8



Choosing the best ABB sets performance standard

Tip-top performance

E 90 fuse holders can be used in any application where you need to ensure electrical protection and isolation.

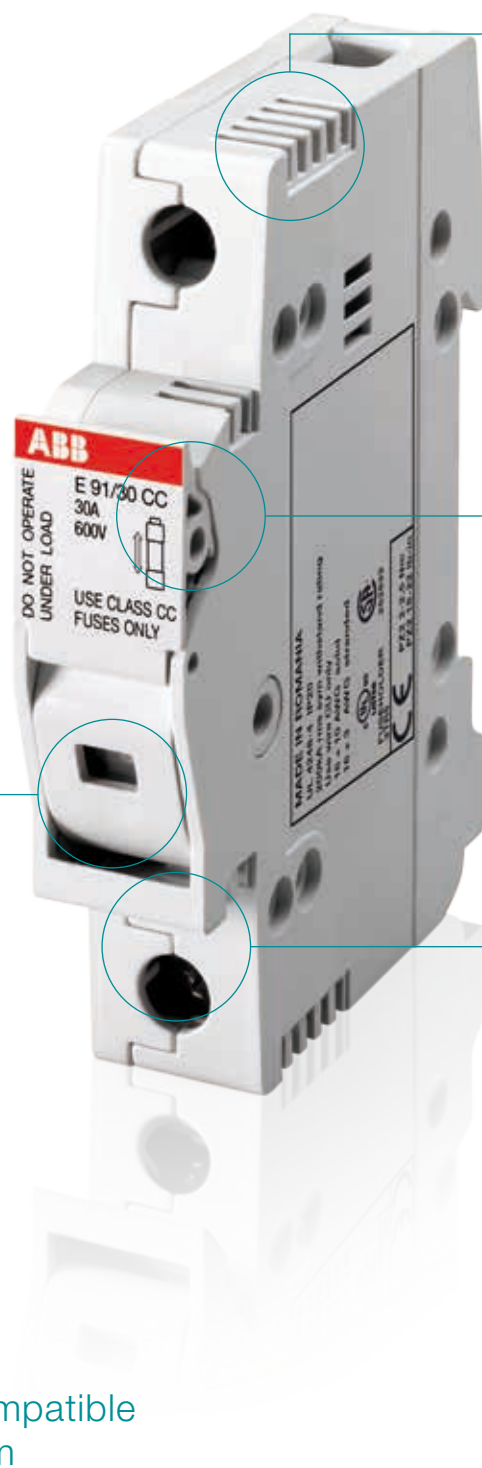
The technology solutions applied to reduce power dissipation help minimize module heating.

Completeness

Fuse tripping can be easily displayed, thanks to the special blown fuse indicator light.

Ease of installation.

E 90 fuse holders are fully compatible with the Unifix-L wiring system



Reliability

Venting grooves and cooling chambers improve heat dissipation even in multiple-pole configurations. The reduced operating temperature inside fuse holders ensures durability and reliability of the devices over time.

Compactness

The compact dimensions enable the switchboard door to be closed, even when the fuse holder is open, thus ensuring total safety during maintenance.

Universal use

Screw holes with increased diameter accommodate insulated screwdrivers and electric screwdrivers. With the Pozidrive PZ2 screws, tightening can be performed by exerting less torque than conventional screws, and the same electric screwdriver can be used for all terminals.

Moreover, the PS connection busbars facilitate the connecting operations, making the wiring both simple and safe, providing complete integration with S 200 and SN 201 System pro M compact[®] circuit breakers.

The E 90 safe and smart range is designed for quick and flawless installations. Because of its unique features, the E 90 series sets a new safety standard.

Reliable connections

Wide terminals allow the use of cables with sections up to 50 mm² and the antivibration knurling on the terminal cages ensures safe and reliable connections.

Rejection Member function

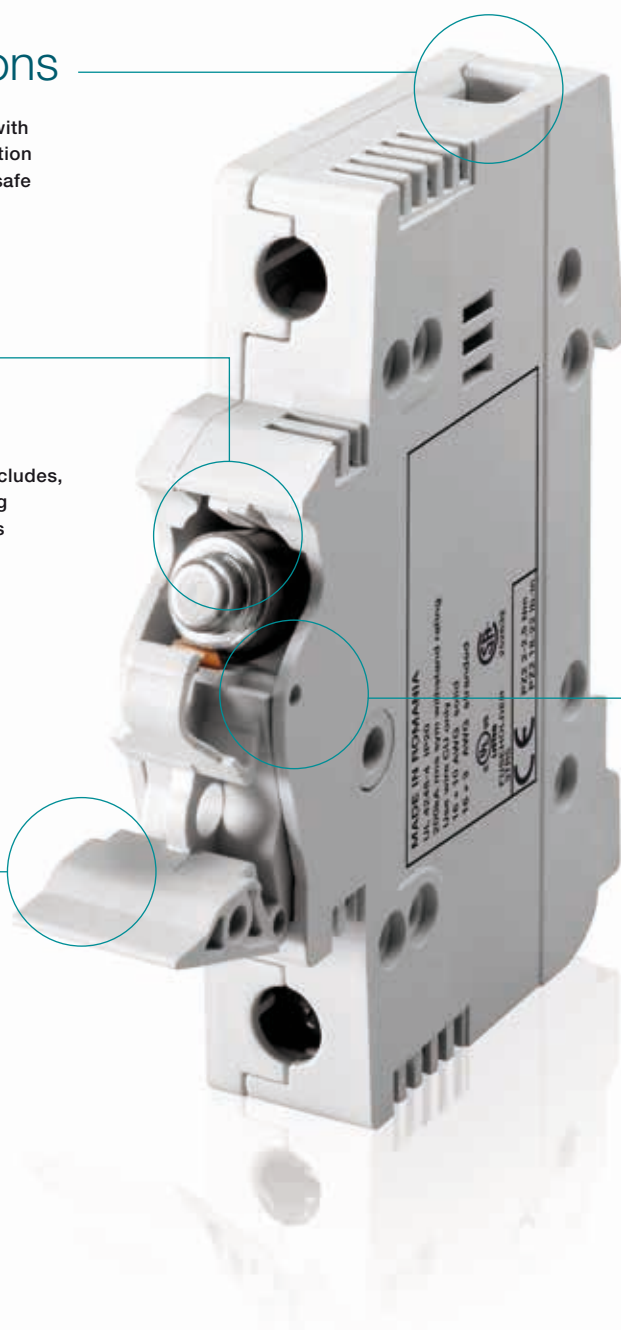
The E 90/30 CC range of fuse holders includes rejection member functionality according to UL 4248-4 in order to insert only class CC fuses.

Ease of use

Fuse holder profile has been designed for maximum ease of use. The 90° flip hinge with ergonomic knob makes the replacement of fuses easier, even in small spaces or when wearing protective gloves.

Environmental protection.

The fuse holders are compliant with RoHS (Restriction of Hazardous Substances) European directive, which prohibits the use of hazardous substances in the manufacture of electrical and electronic equipment.



Safety

To ensure protection and safety during maintenance operations and to avoid any accidental switching, fuse holders can be sealed in closed position, and padlocked in open position. The protection degree is IP20 when the unit is installed behind the switchboard slotting. For the series E 90 50/125 and the E 90 30/60 J series, the protection degree IP20 is also available as a unit standalone with respect to wire size $\geq 10\text{mm}^2$.

Smart protection for installations with E 90s

The entire E 90 series is available with an optical blown fuse indicator light. E 90s PV is the first fuse holder for photovoltaic installations with an optical blown fuse indicator, which efficiently monitors DC installations up to 1000 V.

Flexible

- E 90 CC: 24 to 600 V operation in AC networks. Can be powered from both the load side and the supply side
- E 90 PV: 24 to 1000 V operation in DC networks with upstream supply

(See wiring diagrams on page 27)

Simple

No need for auxiliary supply or specific wiring

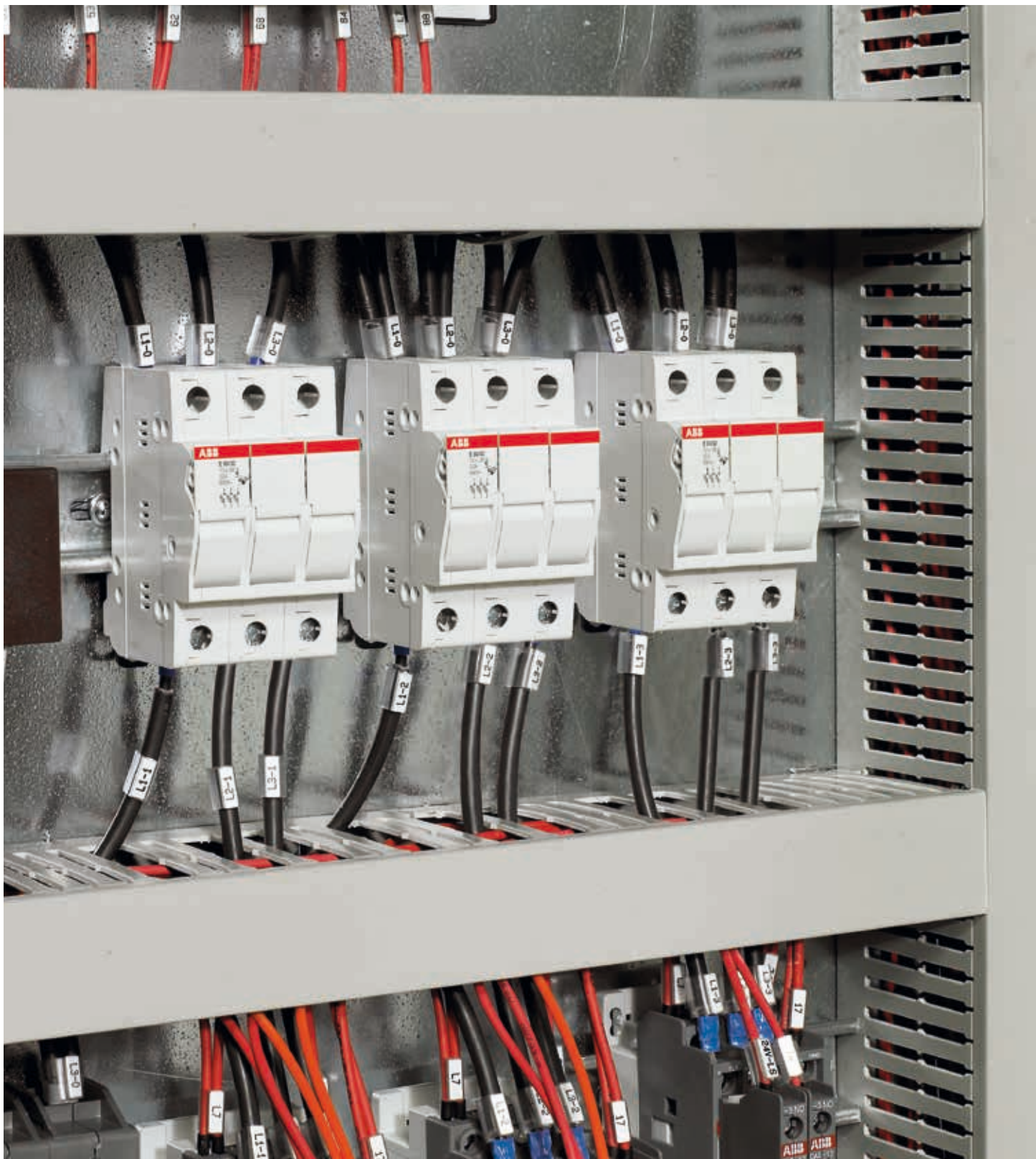
Effective

Local fuse tripping signal
Allows the faulty phase to be detected immediately



Results you can trust

High performance E 90 fuse holders



E 90 protection and control

Developed for automation and industry

Applications:

- Automation switchboards
- On-board switchboards
- Original equipment manufacturer (OEMs)

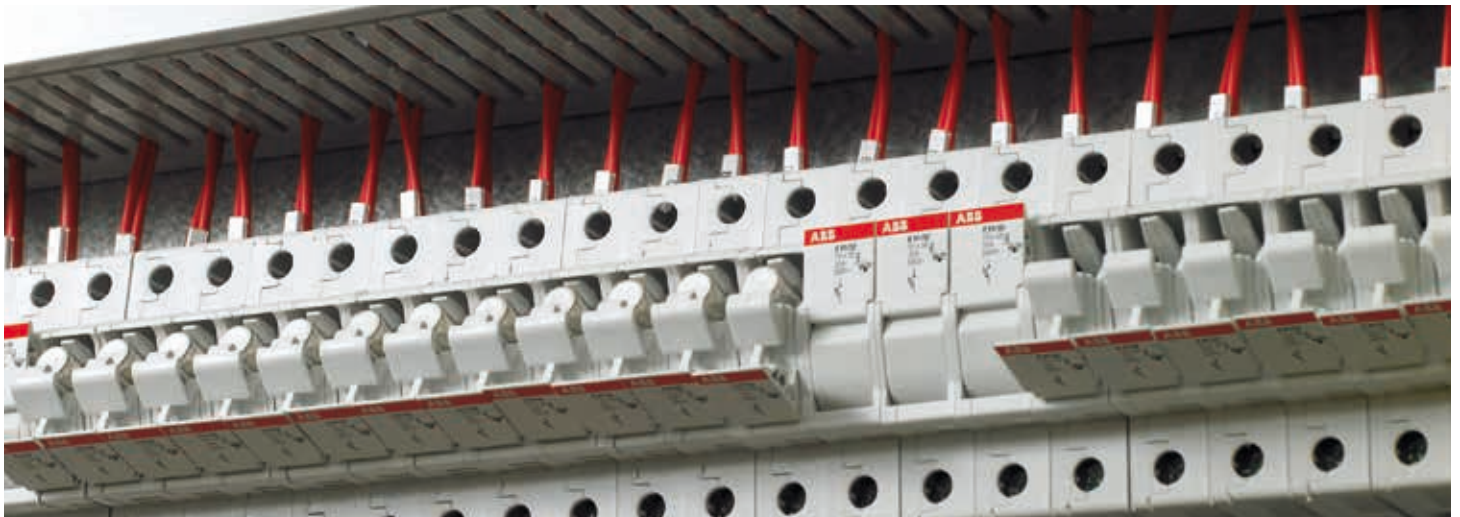
Main functions:

- Protection of terminal circuits
- Switching of loads, including inductive
- Selectivity



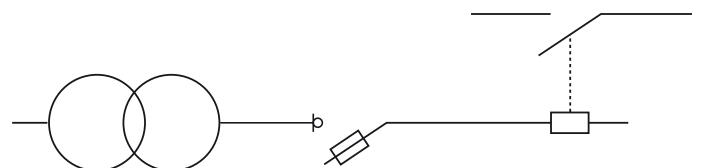
E 90 fuse holders are designed for switching under load, ensuring isolation and protection against short circuit and overload, in compliance with the IEC 60947-3 Standard.

E 90 range is designed to comply with the strictest requirements of OEMs and panel builders. They are ideally installed in industrial automation switchboards to protect secondary circuits, primary and secondary transformers, motors, and other resistive or inductive loads. Due to the AC-22B utilization category, according to the IEC 60947-3 Standard, E 90 fuse holders are convenient, simple, and reliable devices for load switching and protection. Fuse holders ensure selectivity, if equipped with appropriate fuses. Since they are uURus type-approved, they can be installed in UL-certified machines designed for the North American market.



Application example

Shown at right is a typical industrial control application. According to IEC 60364-1 Standard, the secondary winding of a control transformer must be protected against short circuits and overload. The transformer provides dedicated 230 V AC power supply to a battery of industrial contactors.



E 90 PV fuse holders for photovoltaic applications Designed for industry professionals

Features:

- For 10.3 x 38 mm fuses
- Rated voltage 1000 V DC
- Rated current 32 A
- DC-20B utilization category
- Reference standards:
IEC 60947-3, UL 4248-18



E 90 PV fuse holders have been specifically designed for photovoltaic applications. Because of their rated voltage up to 1000 V DC, they are the ideal solution for protecting cells, inverters, or surge arresters. During maintenance operations they ensure isolation of circuits and strings up to 1000 V in direct current, all in total safety.

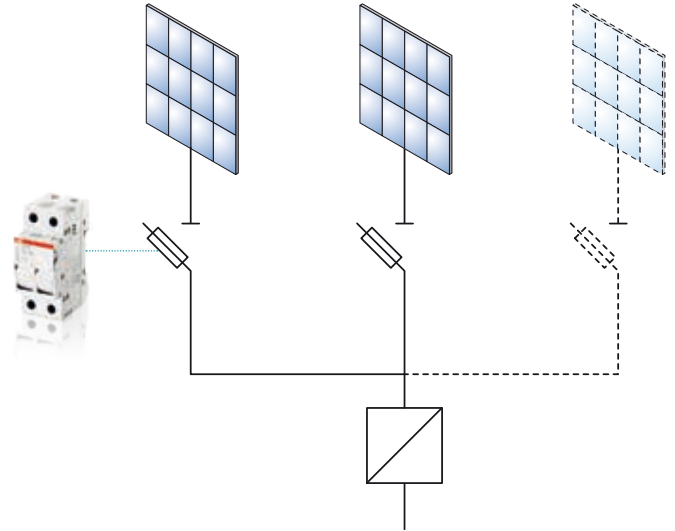


Isolation and protection of strings up to 1000 V

Application examples

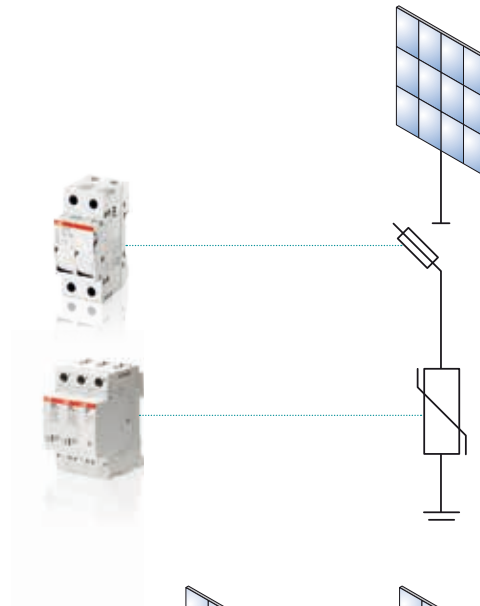
String protection

To prevent damage to the equipment in the direct current lines of photovoltaic installations and ensure that it remains **isolated** when maintenance work is performed, E 90 PV fuse holders can be installed downstream of the inverter so that each string is protected. The fuses must be selected to match the rated current of the line.



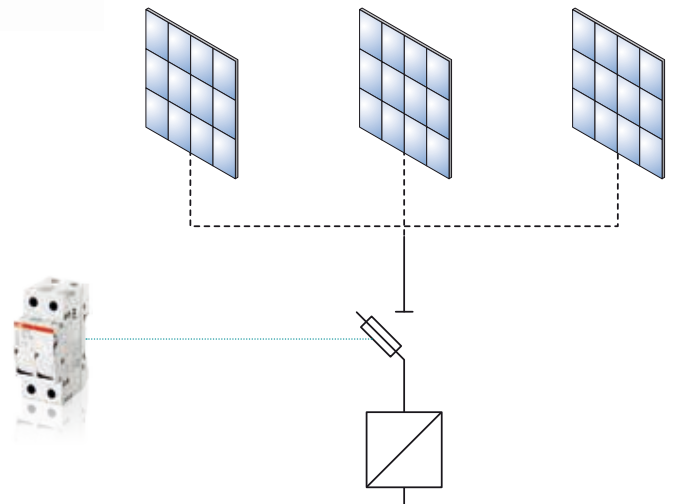
Surge arrester back-up

When the short-circuit current at the installation point exceeds 100 A DC, **OVR PV** surge arresters require back-up protection with a specific gR-type fuse.



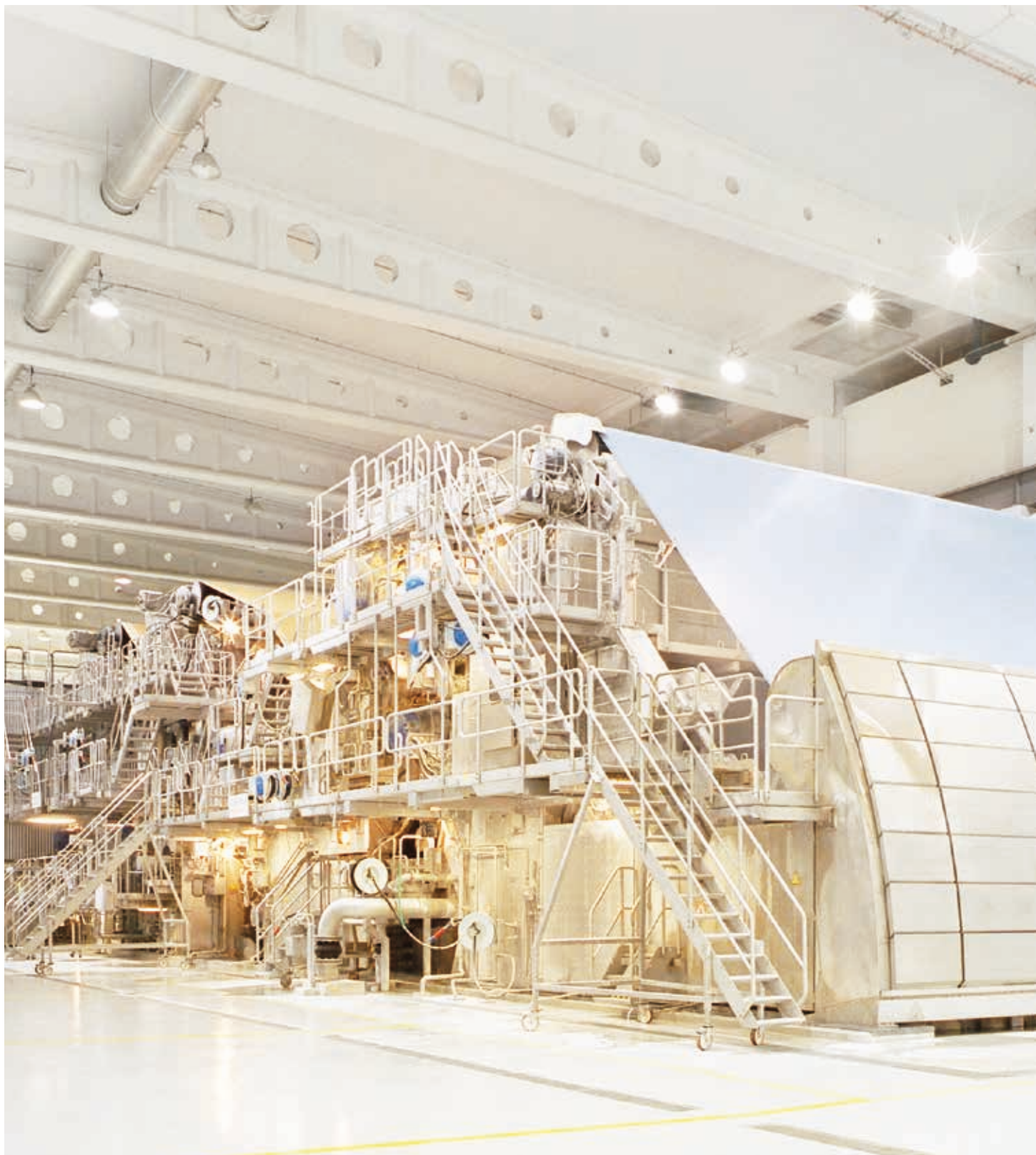
DC side of the inverter

In small photovoltaic installations, E 90 PV fuse holders can be used to protect the direct current side of the inverter. Fuse holder should be selected according to the inverter rated current.



E 90 50/125 fuse holders

Protection for industrial circuits



Perfect integration, guaranteed innovation

Features:

- For 14x51 and 22x58 mm fuses
- Rated voltage
690V AC according to IEC and
600V AC/DC according to UL
- UR type-approved



E 90 50/125 fuse holders are specifically designed to protect industrial circuits because of aM and gG cylindrical fuses with 50 A and 125 A ratings that ensure disconnection properties according to IEC 60947-3. (The usage of 125 A fuses within E 90/125 fuse holder is allowed only in case the fuse power dissipation is lower than the maximum acceptable power dissipation value of the fuse holder. For more details see the "Questions and Answers" section.

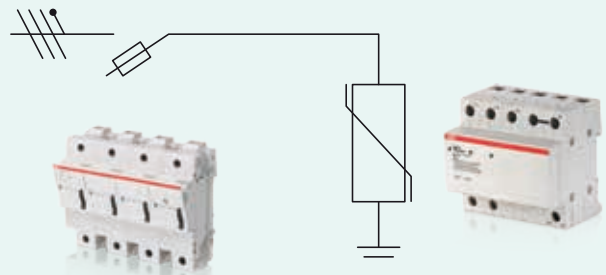
The E 90/50 and E 90/125 fuse holders have been specifically designed to be used in all applications that require protection and isolation of high-current loads. Because of their compatibility with gG and aM cylindrical fuses, they offer maximum flexibility in terms of protection of installation with rated currents up to 125 A. Since it can be padlocked in an open position, this ensures the safety of personnel who carry out maintenance operations. In addition, the availability of optical blown fuse indicators in all versions of the new E 90 50/125 enables easy and efficient monitoring of distribution networks with high current ratings.



Application examples

OVR PV back-up protection, shown at right, is a typical application for fuse holder in the E 90 50/125 series.

E 90 50/125 can also be used for motors and transformers protection, or for protection against overloads and short circuits in low voltage applications where currents are up to 125 A.



E 90 CC fuse holders

Designed for the North American market



E 90 CC fuse holders

Specifically developed for branch circuit protection

Features

- UL Listed according to UL 4248-1 and UL 4248-4
- Can be equipped only with Class CC fuses
- Rated voltage 600 V AC/DC
- Rated current 30 A
- 1, 1N, 2, 3, 3N, 4-pole versions
- Rejection member only allows insertion of a class CC fuse



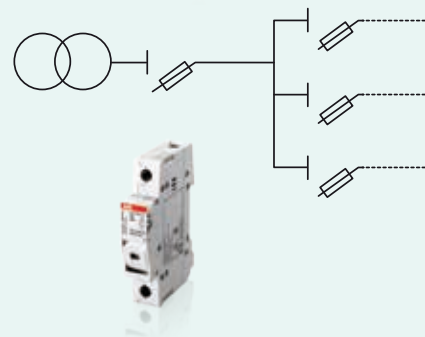
E 90 CC range has been designed to comply with North American market regulations. This enables worldwide manufacturers to sell their equipment in conformity with safety requirements in these countries.

Class CC fuses have specific characteristics dedicated to terminal protection of components and apparatuses against short-term overloads and protection against the short circuiting of motors. Maximum rated current of a Class CC fuse is 30 A, whereas the maximum rated voltage is 600 V. The breaking capacity reaches 200 kA. The specific properties of the Class CC fuses are valued in the North American market because they provide protection against short-circuits, even with equipment with limited resistance. The use of Class CC fuses is continuously increasing in the American market, since the safety and reliability prescriptions of end users have become stricter and do not tolerate any permanent damage to motor starts.



Application example

E 90 CC fuse holders have been developed to host Class CC fuses and are used in the NAM markets mainly as branch circuit protection. See example shown at right.



Developed for the North American market
universally reliable
E 90 30/60 J fuse holders



E 90 J fuse holders

Specifically designed to be equipped with class J fuses

Features:

- UL listed according to 4248-8
- Can only be equipped with Class J fuses
- Rated voltage 600 V AC
- Rated current up to 60 A
- With 1, 2 and 3-pole versions



E 90 J range has been designed to comply with North American market regulations. The E 90 J fuse carriers are the ideal solution for industrial installations, motors and transformer protection, heating systems and control circuits.

In accordance with the reference standard UL 4248-8, they come in voltage and current ratings up to 600 V and 30/60 A. The breaking capacity reaches 200 kA. They are available in 1P, 2P and 3P versions. The versions with blown fuse indicator light provide a visual signal of the fuse break condition. They can be padlocked open and sealed closed to ensure operator safety during maintenance operations.



Application example

Shown at right is shown a typical example of motor protection. E 90 J fuse holders are mainly used in the North American market for motors, alternators, and transformer protection, or as heating and light circuit protection.



Technical data

E 90 series for North American market

Data according to UL

Type		E 90/32	E 90/32 PV	
Rated current	[A]	32	32	
Rated Voltage	[V]	600	1000	
Type of current		AC/DC	DC	
Fuse		10.3 x 38	10.3 x 38	
Rated frequency	[Hz]	50-60	-	
Tightening torque	[Nm]	PZ2 2-2.5	PZ2 2-2.5	
Protection degree		IP20	IP20	
Terminals section	[mm ²]	25	25	
Cross section rigid copper conductors	[AWG]	16÷10	-	
Cross section stranded copper conductors	[AWG]	16÷3	8÷3	
Padlockable (when open)		•	•	
Sealable (when closed)		•	•	

Marks and Approvals

cULus			
UL		• ⁽²⁾	
cURus	• ⁽¹⁾		
CSA			

(1) = certified at 600 V in compliance with UL 4248-1

(2) = certified at 1000 V in compliance with UL 4248-18

(3) = certified at 600 V in compliance with UL 4248-8

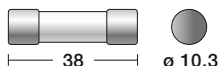
(4) = certified at 600 V in compliance with UL 4248-4

***** IP20 also as standalone device installed on DIN rail, with respect to cables with a cross-section area $\geq 10 \text{ mm}^2$

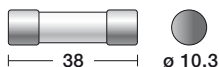
	E 90/50	E 90/125	E 90/30 CC	E 90 30 J	E 90 60 J
	50	125	30	30	60
	600	600	600	600	600
	AC/DC	AC/DC	AC/DC	AC/DC	AC/DC
	14 x 51	22 x 58	Class CC 10.4 x 38	Class J 21 x 57	Class J 27 x 60
	50-60	50-60	60	60	60
	PZ2 3-3.5	PZ2 3.5-4	PZ2 2-2.5	PZ2 3.5-4	PZ2 3.5-4
	IP20 *****	IP20 *****	IP20	n.a.	n.a.
	35	50	25	50	50
	14÷10	14÷10	16÷10	12÷10	12÷10
	14÷2	14÷1	16÷3	12÷1	12÷1
	•	•	•	•	•
	•	•	•	•	•
			•(4)	•(3)	•(3)
	•(1)	•(1)			
			•	•	•

Order codes

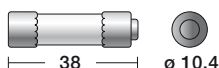
E 90 series for North American market



Poles	Rated current In [A]	Modules	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 92/32 fuse holder for 10.3 x 38 mm fuses							
1	32	1	009238	E 91/32	2CSM200923R1801	0.061	6
1	32	1	024835	E 91/32s*	2CSM202483R1801	0.062	6
1+N	32	2	008934	E 91N/32	2CSM200893R1801	0.130	3
1+N	32	2	515036	E 91N/32s*	2CSM251503R1801	0.131	3
2	32	2	008835	E 92/32	2CSM200883R1801	0.122	3
2	32	2	514930	E 92/32s*	2CSM251493R1801	0.123	3
3	32	3	047537	E 93/32	2CSM204753R1801	0.183	2
3	32	3	020639	E 93/32s*	2CSM202063R1801	0.184	2
3+N	32	4	047339	E 93N/32	2CSM204733R1801	0.252	1
3+N	32	4	514831	E 93N/32s*	2CSM251483R1801	0.254	1
4	32	4	047230	E 94/32	2CSM204723R1801	0.244	1
4	32	4	020530	E 94/32s*	2CSM202053R1801	0.245	1

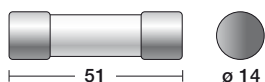


Poles	Rated current In [A]	Modules	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 90 PV fuse holder for 10.3 x 38 mm fuses for DC							
1	32	1	047131	E 91/32 PV	2CSM204713R1801	0.061	6
1	32	1	046936	E 91/32 PVs*	2CSM204693R1801	0.062	6
2	32	2	047032	E 92/32 PV	2CSM204703R1801	0.122	3
2	32	2	569138	E 92/32 PVs*	2CSM256913R1801	0.122	3

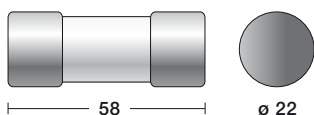


Poles	Rated current In [A]	Modules	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 90/30 CC fuse holder for Class CC 10.4 x 38 mm fuses							
1	30	1	998723	E 91/30 CC	2CSM299872R1801	0.061	6
1	30	1	998822	E 91/30 CCs*	2CSM299882R1801	0.062	6
1+N	30	2	998921	E 91N/30 CC	2CSM299892R1801	0.130	3
1+N	30	2	999027	E 91N/30 CCs*	2CSM299902R1801	0.131	3
2	30	2	999126	E 92/30 CC	2CSM299912R1801	0.122	3
2	30	2	999225	E 92/30 CCs*	2CSM299922R1801	0.123	3
3	30	3	999324	E 93/30 CC	2CSM299932R1801	0.183	2
3	30	3	999423	E 93/30 CCs*	2CSM299942R1801	0.184	2
3+N	30	4	999522	E 93N/30 CC	2CSM299952R1801	0.252	1
3+N	30	4	999621	E 93N/30 CCs*	2CSM299962R1801	0.253	1
4	30	4	999720	E 94/30 CC	2CSM299972R1801	0.244	1
4	30	4	999829	E 94/30 CCs*	2CSM299982R1801	0.245	1

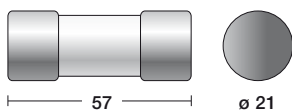
*s: version with blown fuse indicator



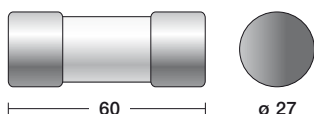
Poles	Rated current In [A]	Modules	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 90/50 fuse holder for 14 x 51 mm fuses (AC-20B)							
1	50	1.5	790228	E 91/50	2CSM279022R1801	0.095	4
1	50	1.5	372028	E 91/50s*	2CSM237202R1801	0.095	4
1+N	50	3	779827	E 91N/50	2CSM277982R1801	0.19	2
1+N	50	3	023920	E 91N/50s*	2CSM202392R1801	0.19	2
2	50	3	779728	E 92/50	2CSM277972R1801	0.19	2
2	50	3	070320	E 92/50s*	2CSM207032R1801	0.19	2
3	50	4.5	779629	E 93/50	2CSM277962R1801	0.285	1
3	50	4.5	574828	E 93/50s*	2CSM264362R1801	0.285	1
3+N	50	6	779520	E 93N/50	2CSM277952R1801	0.38	1
3+N	50	6	563020	E 93N/50s*	2CSM264342R1801	0.38	1
3+N	50	6	048824	E 93N/50 sx	2CSM204882R1801	0.38	1
3+N	50	6	048725	E 93N/50s sx	2CSM204872R1801	0.38	1



Poles	Rated current In [A]	Modules	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 90/125 fuse holder for 22 x 58 mm fuses							
1	100	2	775720	E 91/125	2CSM264352R1801	0.135	4
1	100	2	896326	E 91/125s*	2CSM289632R1801	0.135	4
1+N	100	4	773528	E 91N/125	2CSM264382R1801	0.27	2
1+N	100	4	049425	E 91N/125s*	2CSM204942R1801	0.27	2
2	100	4	771326	E 92/125	2CSM264372R1801	0.27	2
2	100	4	049326	E 92/125s*	2CSM204932R1801	0.27	2
3	100	6	775027	E 93/125	2CSM264332R1801	0.405	1
3	100	6	049227	E 93/125s*	2CSM204922R1801	0.405	1
3+N	100	8	965329	E 93N/125	2CSM296532R1801	0.54	1
3+N	100	8	049128	E 93N/125s*	2CSM204912R1801	0.54	1



Poles	Rated current In [A]	Modules	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 90 J fuse holder for Class J 21 x 57 mm fuses							
1	30	2	048220	E 91/30 J	2CSM204822R1801	0.135	4
2	30	4	048121	E 92/30 J	2CSM204812R1801	0.27	2
3	30	6	048022	E 93/30 J	2CSM204802R1801	0.405	1
1	30	2	047926	E 91/30s J *	2CSM204792R1801	0.135	4
2	30	4	047827	E 92/30s J *	2CSM204782R1801	0.27	2
3	30	6	047728	E 93/30s J *	2CSM204772R1801	0.405	1



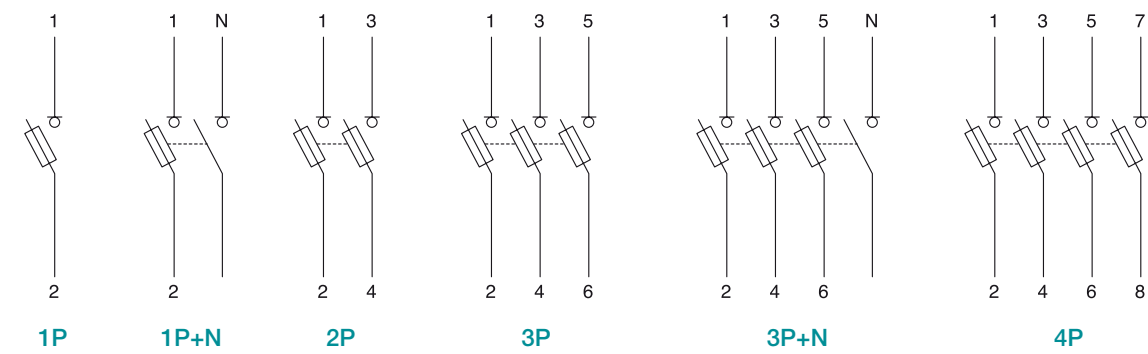
E 90 J fuse holder for Class J 27 x 60 mm fuses							
1	60	2.5	047629	E 91/60 J	2CSM204762R1801	0.175	3
2	60	5	049821	E 92/60 J	2CSM204982R1801	0.35	1
3	60	7.5	049722	E 93/60 J	2CSM204972R1801	0.525	1
1	60	2.5	049623	E 91/60s J *	2CSM204962R1801	0.175	3
2	60	5	049524	E 92/60s J *	2CSM204952R1801	0.35	1
3	60	7.5	738824	E 93/60s J *	2CSM273882R1801	0.525	1

*s: versione with blown fuse indicator

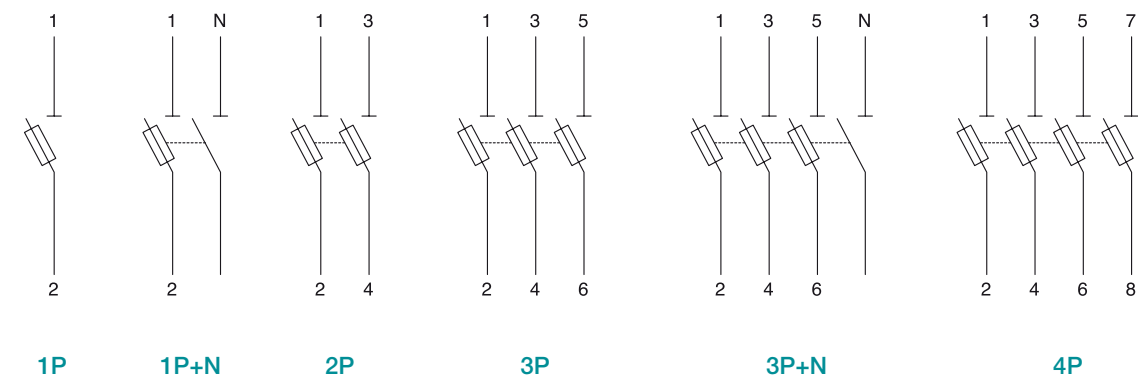
Wiring diagrams and overall dimensions

E 90 series for North American market

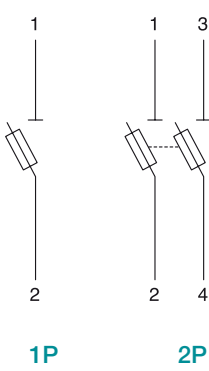
E 90/32 wiring diagrams



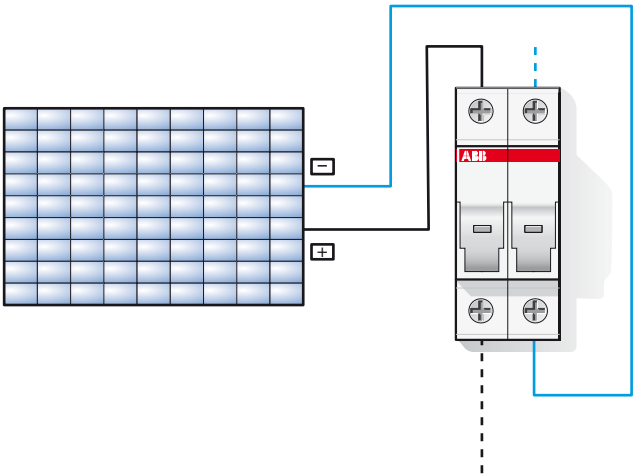
E 90/30 CC wiring diagrams



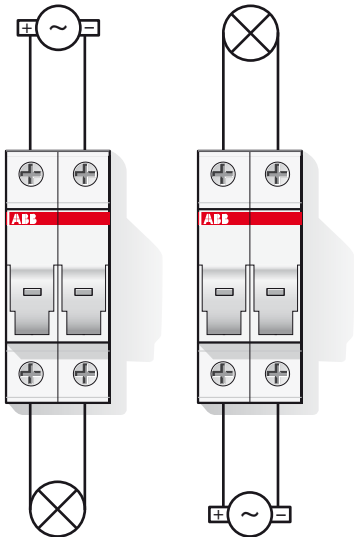
E 90/32 PV wiring diagrams



Wiring diagrams

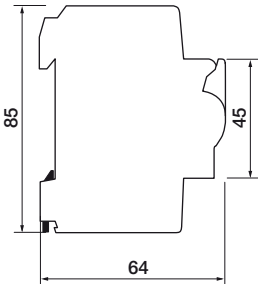
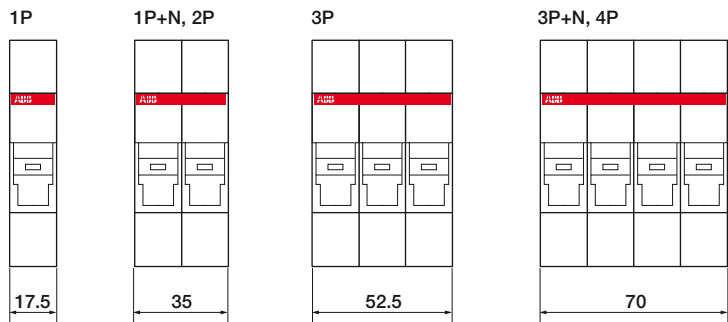


Wiring diagram for DC networks



Wiring diagram for AC networks

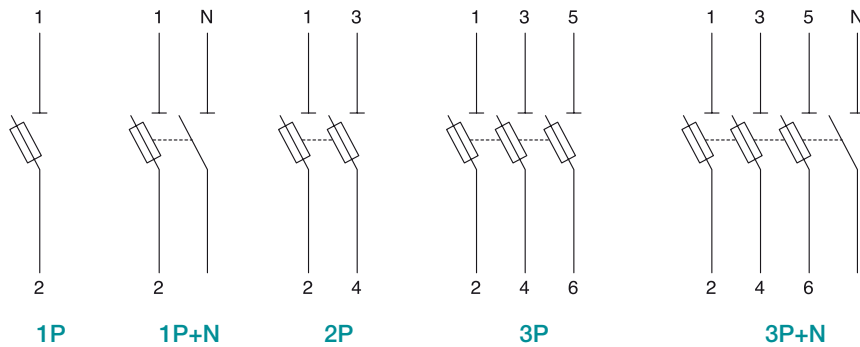
Overall dimensions



Wiring diagrams and overall dimensions

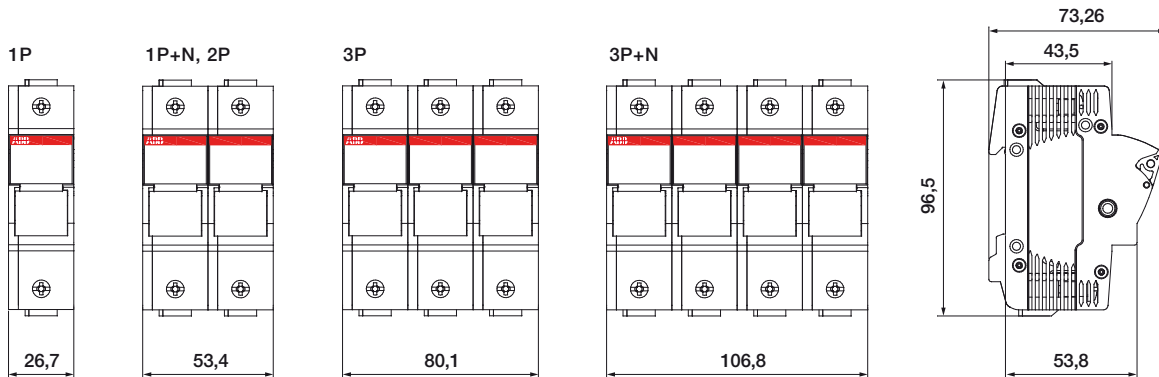
E 90 50/125 series

Wiring diagrams

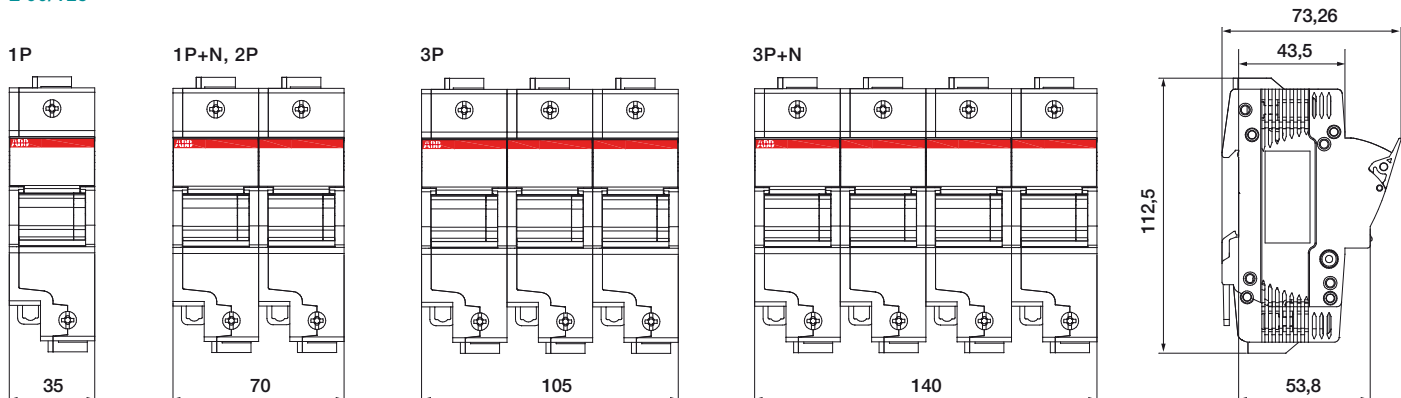


Overall dimensions

E 90/50



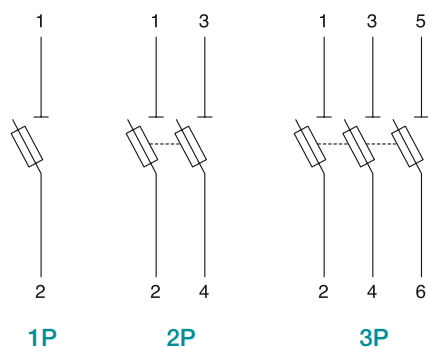
E 90/125



Wiring diagrams and overall dimensions

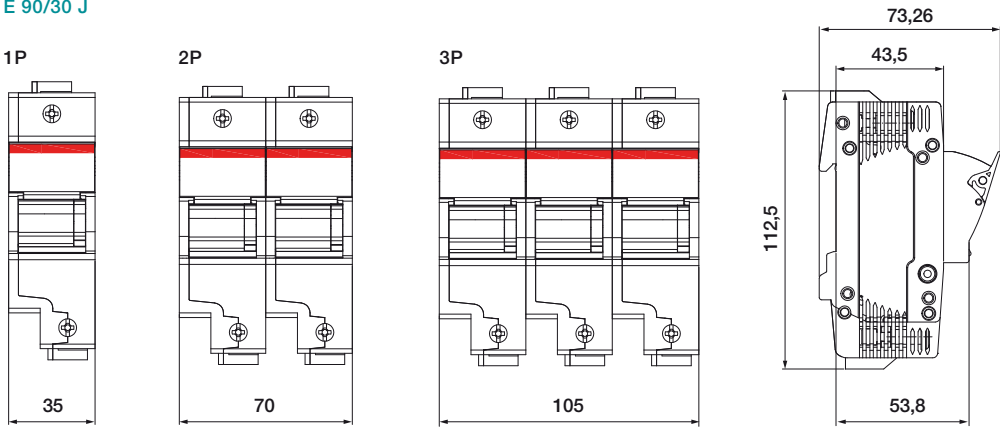
E 90 30/60 J

Wiring diagrams

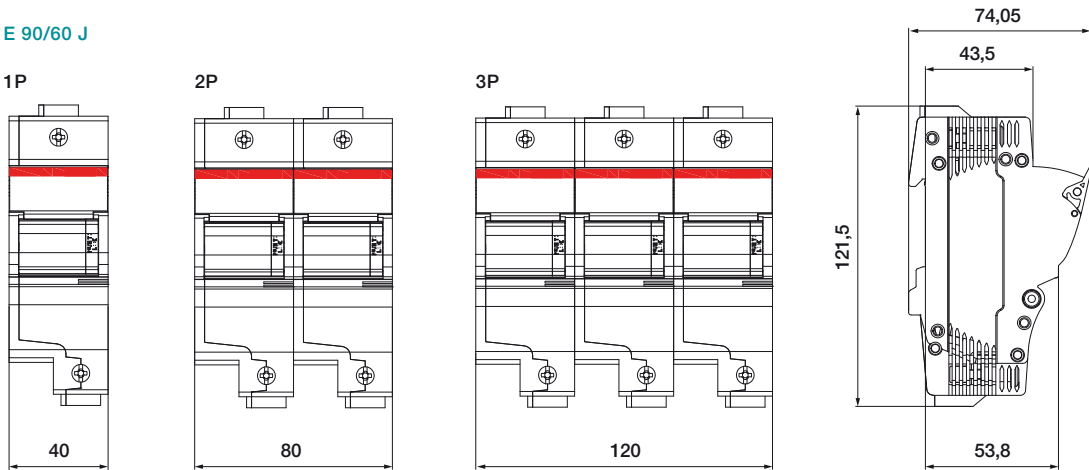


Overall dimensions

E 90/30 J



E 90/60 J



How to choose a protection system

When choosing a protection system, an important feature to consider is the power dissipation of the system “fuse + fuse holder.” It is important to make sure that the power dissipated by the fuse does not exceed the limit imposed by the fuse holder in which it is installed.



30 | E 90 range of fuse holders for the North American Market

- Other external factors should be taken into consideration:
- the current derating depends on the number of poles in the installation
 - the current derating depends on the climatic conditions

Derating values for E 90 fuse holders

The derating parameters in the table must be considered if several poles are installed side by side or if the equipment is installed in unusual climatic conditions.

Installation of single poles side by side			
E 90/32		E 90 50/125	
Poles	Maximum current	Poles	Maximum current
1...4	In	1...3	In
5...7	0.80 x In	4...6	0.95 x In
more than 7	0.70 x In	more than 7	0.90 x In

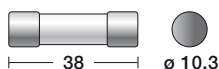
Climatic conditions			
E 90/32		E 90 50/125	
Maximum temperature	Maximum current	Maximum temperature	Maximum current
20° C	In	20° C	In
20° C	0.95 x In	30° C	0.95 x In
20° C	0.90 x In	40° C	0.90 x In
20° C	0.80 x In	50° C	0.85 x In

E 9F gG cylindrical fuses

The fastest protection for industrial automation switchboards

E 9F gG series fuses are the best way to protect against overloads and short-circuits together with E 90 fuse holders series. They feature a fast tripping curve that is ideal for protecting electronic devices, transformers and electric cables. The E 9F gG series is available for all the main sizes (10.3 x 38 mm, 14 x 51 mm e 22 x 58 mm) and with a wide range of rated current values (from 1 A to 125 A and up to 690 V AC).

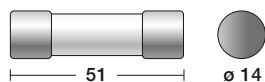
All the E 9F series fuses conform to the RoHS directive and are type-approved in accordance with the most important international naval marks.



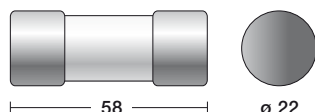
Rated current In [A]	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 9F 10 gG 10.3 x 38 mm cylindrical fuses					
0.5	773337	E 9F10 GG05	2CSM277333R1801	0.007	10
1	771135	E 9F10 GG1	2CSM277113R1801	0.007	10
2	587231	E 9F10 GG2	2CSM258723R1801	0.007	10
4	575436	E 9F10 GG4	2CSM257543R1801	0.007	10
6	563631	E 9F10 GG6	2CSM256363R1801	0.007	10
8	586333	E 9F10 GG8	2CSM258633R1801	0.007	10
10	574538	E 9F10 GG10	2CSM257453R1801	0.007	10
12	562733	E 9F10 GG12	2CSM256273R1801	0.007	10
16	775430	E 9F10 GG16	2CSM277543R1801	0.007	10
20	773238	E 9F10 GG20	2CSM277323R1801	0.007	10
25	771036	E 9F10 GG25	2CSM277103R1801	0.007	10
32	587132	E 9F10 GG32	2CSM258713R1801	0.007	10

E 9F gG cylindrical fuses

The fastest protection for industrial automation switchboards



Rated current In [A]	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 9F 14 gG 14 x 51 mm cylindrical fuses					
2	775232	E 9F14 GG2	2CSM277523R1801	0.018	10
4	773030	E 9F14 GG4	2CSM277303R1801	0.018	10
6	770831	E 9F14 GG6	2CSM277083R1801	0.018	10
8	910039	E 9F14 GG8	2CSM291003R1801	0.018	10
10	909835	E 9F14 GG10	2CSM290983R1801	0.018	10
12	909637	E 9F14 GG12	2CSM290963R1801	0.018	10
16	587835	E 9F14 GG16	2CSM258783R1801	0.018	10
20	576037	E 9F14 GG20	2CSM257603R1801	0.018	10
25	564232	E 9F14 GG25	2CSM256423R1801	0.018	10
32	586937	E 9F14 GG32	2CSM258693R1801	0.018	10
40	575139	E 9F14 GG40	2CSM257513R1801	0.018	10
50	563334	E 9F14 GG50	2CSM256333R1801	0.018	10



Rated current In [A]	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 9F 22 gG 22 x 58 mm cylindrical fuses					
4	571834	E 9F22 GG4	2CSM257183R1801	0.048	10
6	592839	E 9F22 GG6	2CSM259283R1801	0.048	10
8	581031	E 9F22 GG8	2CSM258103R1801	0.048	10
10	569237	E 9F22 GG10	2CSM256923R1801	0.048	10
12	594031	E 9F22 GG12	2CSM259403R1801	0.048	10
16	582236	E 9F22 GG16	2CSM258223R1801	0.048	10
20	570431	E 9F22 GG20	2CSM257043R1801	0.048	10
25	595335	E 9F22 GG25	2CSM259533R1801	0.048	10
32	583530	E 9F22 GG32	2CSM258353R1801	0.048	10
40	571735	E 9F22 GG40	2CSM257173R1801	0.048	10
50	593935	E 9F22 GG50	2CSM259393R1801	0.048	10
63	582137	E 9F22 GG63	2CSM258213R1801	0.048	10
80	570332	E 9F22 GG80	2CSM257033R1801	0.048	10
100	595236	E 9F22 GG100	2CSM259523R1801	0.048	10
125	583431	E 9F22 GG125	2CSM258343R1801	0.048	10

Technical specifications

Rated voltage	[V]	400, 500, 690 AC
Rated current	[A]	0,5...125
Breaking capacity	[kA]	20, 120
Overall dimensions	[mm]	10.3 x 38, 14 x 51, 22 x 58
Weight	[g]	7, 18, 48
Marks		LLOYD, BV
Standards		IEC 60269-2; ROHS 2002/98/CE

E 9F 10 gG 10.3 x 38 mm cylindrical fuses

Type	Rated current [A]	Rated voltage [V AC]	Breaking capacity [kA]
E 9F10 GG05	0.5	500	120
E 9F10 GG1	1	500	120
E 9F10 GG2	2	500	120
E 9F10 GG4	4	500	120
E 9F10 GG6	6	500	120
E 9F10 GG8	8	500	120
E 9F10 GG10	10	500	120
E 9F10 GG12	12	500	120
E 9F10 GG16	16	500	120
E 9F10 GG20	20	500	120
E 9F10 GG25	25	500	120
E 9F10 GG32	32	400	120

E 9F 14 gG 14 x 51 mm cylindrical fuses

Type	Rated current [A]	Rated voltage [V AC]	Breaking capacity [kA]
E 9F14 GG2	2	690	120
E 9F14 GG4	4	690	120
E 9F14 GG6	6	690	120
E 9F14 GG8	8	690	120
E 9F14 GG10	10	690	120
E 9F14 GG12	12	690	120
E 9F14 GG16	16	690	120
E 9F14 GG20	20	690	120
E 9F14 GG25	25	690	120
E 9F14 GG32	32	500	120
E 9F14 GG40	40	500	120
E 9F14 GG50	50	500	120

E 9F 22 gG 22 x 58 mm cylindrical fuses

Type	Rated current [A]	Rated voltage [V AC]	Breaking capacity [kA]
E 9F22 GG4	4	690	120
E 9F22 GG6	6	690	120
E 9F22 GG8	8	690	120
E 9F22 GG10	10	690	120
E 9F22 GG12	12	690	120
E 9F22 GG16	16	690	120
E 9F22 GG20	20	690	120
E 9F22 GG25	25	690	120
E 9F22 GG32	32	690	120
E 9F22 GG40	40	690	120
E 9F22 GG50	50	690	120
E 9F22 GG63	63	690	120
E 9F22 GG80	80	690	120
E 9F22 GG100	100	500	120
E 9F22 GG125	125	500	120

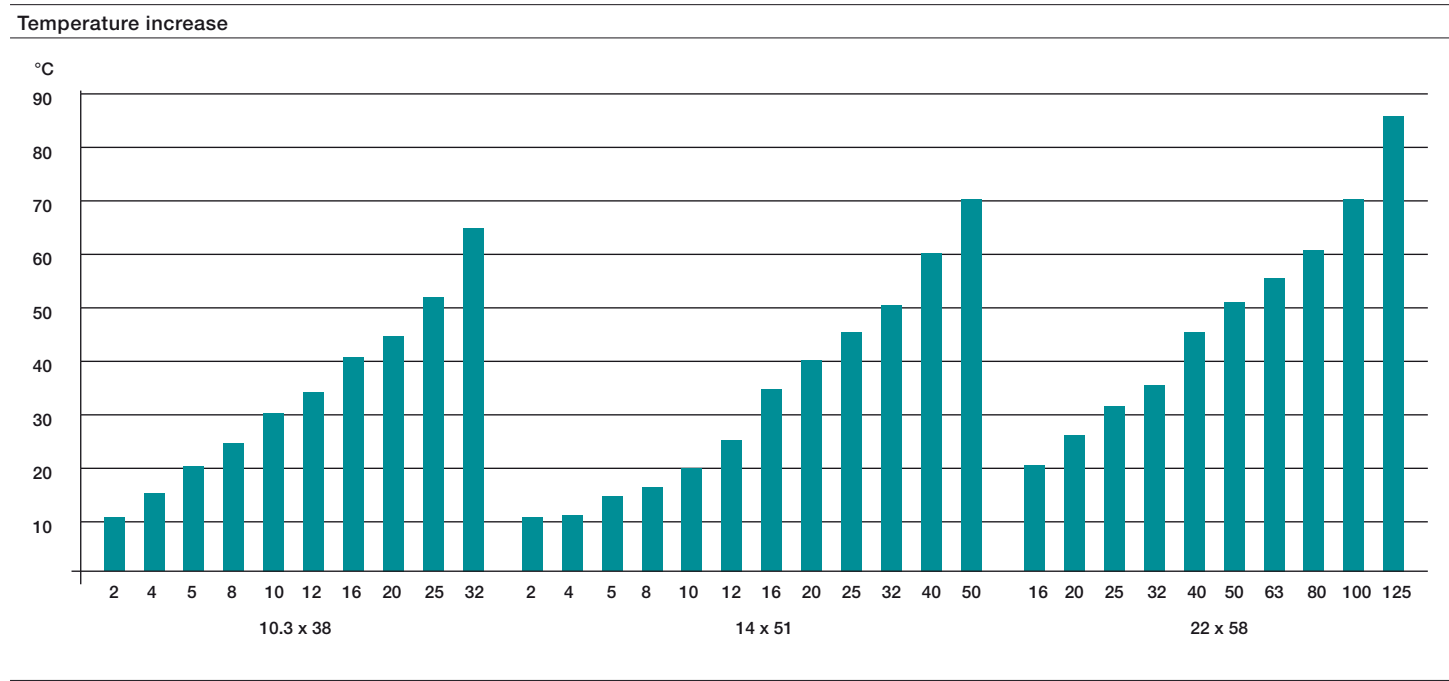
E 9F gG cylindrical fuses

The fastest protection for industrial automation switchboards

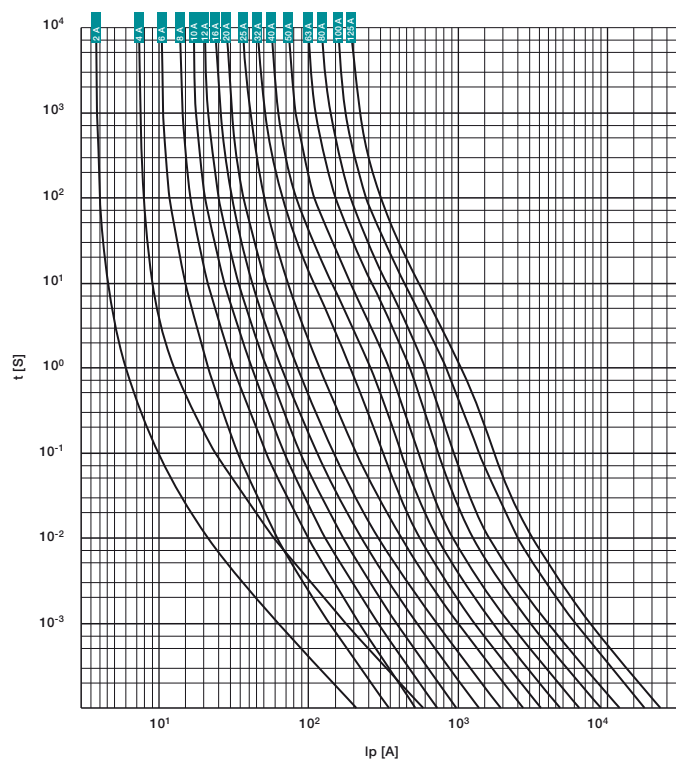
Power dissipation [W]			
In [A]	Size [mm]		
	10.3 x 38	14 x 51	22 x 58
1	0.07	0.60	
2	0.45	0.75	
4	0.50	1.10	1.25
6	0.85	1.25	1.40
8	0.95	1.45	1.60
10	1.30	1.65	1.90
12	1.40	1.80	2
16	1.90	2.35	2.50
20	2.40	2.75	3.40
25	2.70	3.10	3.50
32	2.80	3.60	3.70
40		4	4.30
50		4.80	5.30
63			6.30
80			7.40
100			8.3
125			11.3

It is important to make sure that the power dissipated by the fuse does not exceed the limit imposed by the fuse holder in which it is installed.

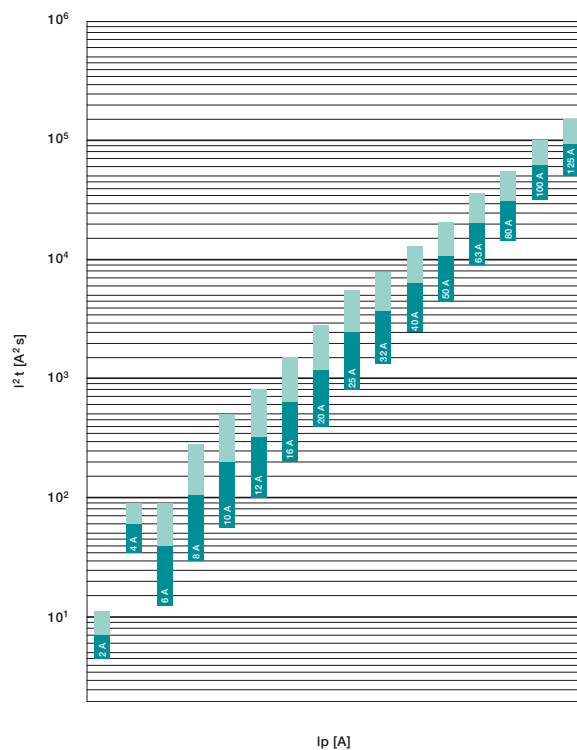
The maximum power dissipation values, in accordance with the specifications of the E 90 fuse holders series are highlighted in green.



Characteristic tI



Characteristic I²t



Maximum length [m] of the copper conductors

Copper
conductor section
[mm²]

Rated current I_n [A] of gG fuses

	16	20	25	32	40	50	63	80	100	125
1.5	99/113	86/87	40/59	21/29	13/16	7/9				
2.5		134	110/122	67/84	41/51	25/33	13/20	8/11		
4			183	139	108/119	67/84	46/58	24/32	14/17	7.3/10
6				214	165	139	94/113	55/70	33/41	20/27
10					275	226	172	130	90/108	57/70
16							283	217	168	128
25								336	257	197
35									367	283
50										379

Use this table to find the cable length, in meters, that is protected by a fuse.

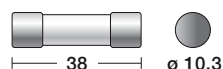
Cross the rated current of the fuse (in the columns) with the section of the conductor (on the lines).

The resulting number corresponds to the protected length of the conductor: for example, a 32 A fuse can protect up to 214 meters of 6 mm² section cable. When there are two values, it means that the maximum length of the cable is between the two numbers given in the table.

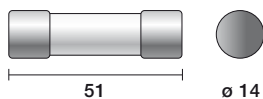
E 9F aM cylindrical fuses

Delayed protection for motor starts

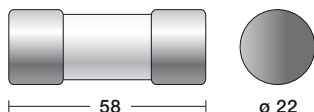
E 9F aM series fuses are the best way to protect against overloads and short-circuits together with E 90 fuse holders series. They feature a delayed tripping curve and are therefore ideal for protecting industrial motors that require high inrush current during the starting phase. The E 9F aM series is available for all the main sizes (10.3 x 38 mm, 14 x 51 mm e 22 x 58 mm) and with a wide range of rated current values (from 1 A to 125 A and up to 690 V AC). All the E 9F series fuses conform to the RoHS directive and are type-approved in accordance with the most important international naval marks.



Rated current In [A]	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 9F 10 aM 10.3 x 38 mm cylindrical fuses					
0.5	574736	E 9F10 AM05	2CSM257473R1801	0.007	10
1	562931	E 9F10 AM1	2CSM256293R1801	0.007	10
2	775638	E 9F10 AM2	2CSM277563R1801	0.007	10
4	773436	E 9F10 AM4	2CSM277343R1801	0.007	10
6	771234	E 9F10 AM6	2CSM277123R1801	0.007	10
8	587330	E 9F10 AM8	2CSM258733R1801	0.007	10
10	575535	E 9F10 AM10	2CSM257553R1801	0.007	10
12	563730	E 9F10 AM12	2CSM256373R1801	0.007	10
16	586432	E 9F10 AM16	2CSM258643R1801	0.007	10
20	574637	E 9F10 AM20	2CSM257463R1801	0.007	10
25	562832	E 9F10 AM25	2CSM256283R1801	0.007	10
32	775539	E 9F10 AM32	2CSM277553R1801	0.007	10



Rated current In [A]	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 9F 14 aM 14 x 51 mm cylindrical fuses					
1	575337	E 9F14 AM1	2CSM257533R1801	0.018	10
2	563532	E 9F14 AM2	2CSM256353R1801	0.018	10
4	586234	E 9F14 AM4	2CSM258623R1801	0.018	10
6	574439	E 9F14 AM6	2CSM257443R1801	0.018	10
8	562634	E 9F14 AM8	2CSM256263R1801	0.018	10
10	775331	E 9F14 AM10	2CSM277533R1801	0.018	10
12	773139	E 9F14 AM12	2CSM277313R1801	0.018	10
16	770930	E 9F14 AM16	2CSM277093R1801	0.018	10
20	587033	E 9F14 AM20	2CSM258703R1801	0.018	10
25	575238	E 9F14 AM25	2CSM257523R1801	0.018	10
32	563433	E 9F14 AM32	2CSM256343R1801	0.018	10
40	586135	E 9F14 AM40	2CSM258613R1801	0.018	10
45	574330	E 9F14 AM45	2CSM257433R1801	0.018	10
50	562535	E 9F14 AM50	2CSM256253R1801	0.018	10



Rated current In [A]	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 9F 22 aM 22 x 58 mm cylindrical fuses					
6	586036	E 9F22 AM6	2CSM258603R1801	0.048	10
8	574231	E 9F22 AM8	2CSM257423R1801	0.048	10
10	562436	E 9F22 AM10	2CSM256243R1801	0.048	10
12	775133	E 9F22 AM12	2CSM277513R1801	0.048	10
16	772934	E 9F22 AM16	2CSM277293R1801	0.048	10
20	770732	E 9F22 AM20	2CSM277073R1801	0.048	10
25	774938	E 9F22 AM25	2CSM277493R1801	0.048	10
32	772736	E 9F22 AM32	2CSM277273R1801	0.048	10
40	770534	E 9F22 AM40	2CSM277053R1801	0.048	10
50	594130	E 9F22 AM50	2CSM259413R1801	0.048	10
63	582335	E 9F22 AM63	2CSM258233R1801	0.048	10
80	570530	E 9F22 AM80	2CSM257053R1801	0.048	10
100	595434	E 9F22 AM100	2CSM259543R1801	0.048	10
125	583639	E 9F22 AM125	2CSM258363R1801	0.048	10

Technical specifications

Rated voltage	[V]	400, 500, 690 AC
Rated current	[A]	0,5...125
Breaking capacity	[kA]	20, 120
Overall dimensions	[mm]	10.3 x 38, 14 x 51, 22 x 58
Weight	[g]	7, 18, 48
Marks		LLOYD, BV
Standards		IEC 60269-2; ROHS 2002/98/CE

E 9F aM cylindrical fuses

Delayed protection for motor starts

E 9F 10 aM 10.3 x 38 mm cylindrical fuses

Type	Rated current [A]	Rated voltage [V AC]	Breaking capacity [kA]
E 9F10 AM05	0,5	500	120
E 9F10 AM1	1	500	120
E 9F10 AM2	2	500	120
E 9F10 AM4	4	500	120
E 9F10 AM6	6	500	120
E 9F10 AM8	8	500	120
E 9F10 AM10	10	500	120
E 9F10 AM12	12	500	120
E 9F10 AM16	16	500	120
E 9F10 AM20	20	500	120
E 9F10 AM25	25	400	120
E 9F10 AM32	32	400	120

E 9F 22 aM 22 x 58 mm cylindrical fuses

Type	Rated current [A]	Rated voltage [V AC]	Breaking capacity [kA]
E 9F22 AM6	6	690	120
E 9F22 AM8	8	690	120
E 9F22 AM10	10	690	120
E 9F22 AM12	12	690	120
E 9F22 AM16	16	690	120
E 9F22 AM20	20	690	120
E 9F22 AM25	25	690	120
E 9F22 AM32	32	690	120
E 9F22 AM40	40	690	120
E 9F22 AM50	50	690	120
E 9F22 AM63	63	690	120
E 9F22 AM80	80	690	120
E 9F22 AM100	100	500	120
E 9F22 AM125	125	500	120

E 9F 14 aM 14 x 51 mm cylindrical fuses

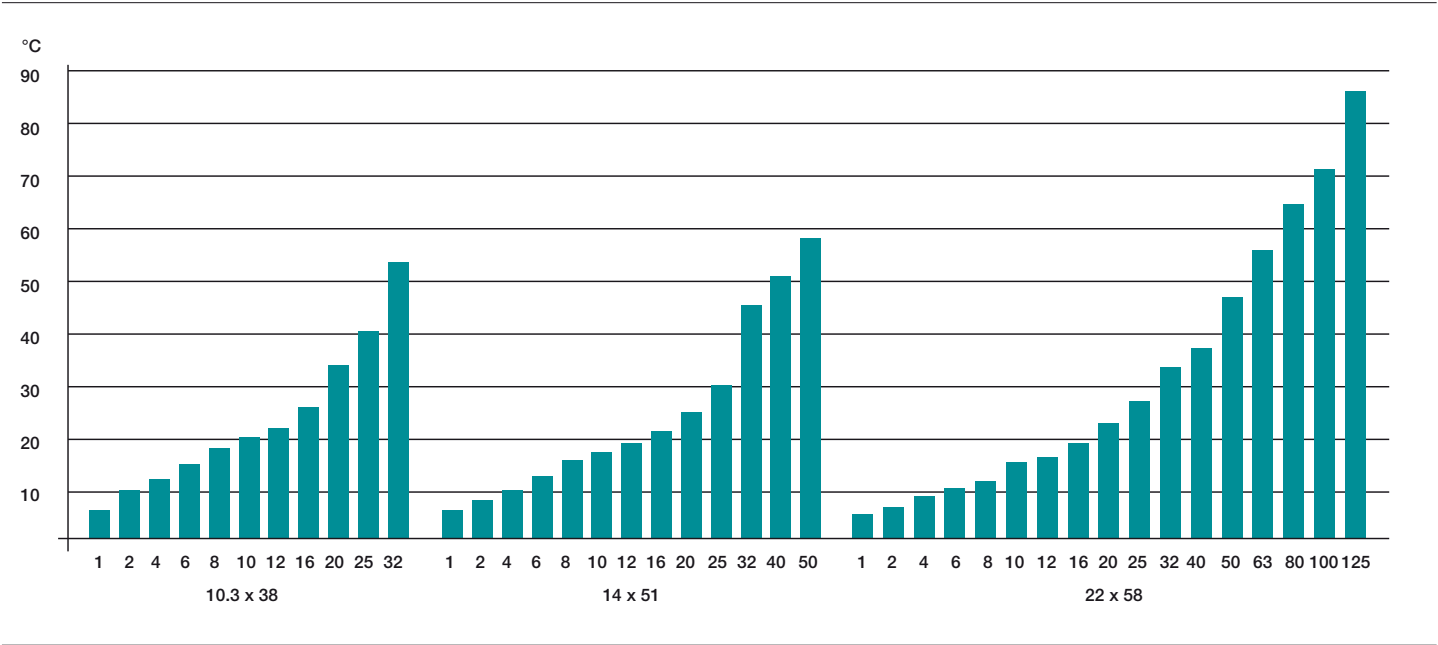
Type	Rated current [A]	Rated voltage [V AC]	Breaking capacity [kA]
E 9F14 AM1	1	690	120
E 9F14 AM2	2	690	120
E 9F14 AM4	4	690	120
E 9F14 AM6	6	690	120
E 9F14 AM8	8	690	120
E 9F14 AM10	10	690	120
E 9F14 AM12	12	690	120
E 9F14 AM16	16	690	120
E 9F14 AM20	20	690	120
E 9F14 AM25	25	690	120
E 9F14 AM32	32	500	120
E 9F14 AM40	40	500	120
E 9F14 AM50	50	500	120

It is important to make sure that the power dissipated by the fuse does not exceed the limit imposed by the fuse holder in which it is installed.

The maximum power dissipation values, in accordance with the specifications of the E 90 fuse holders series are highlighted in green.

Power dissipation [W]			
In [A]	Size [mm]		
	10.3 x 38	14 x 51	22 x 58
0.5	0.70		
1	0.10	0.13	
2	0.14	0.18	
4	0.28	0.28	
6	0.38	0.42	0.45
8	0.55	0.55	0.60
10	0.62	0.65	0.75
12	0.82	0.75	0.85
16	0.87	1.05	1.15
20	1.05	1.30	1.35
25	1.20	1.55	1.70
32	1.80	2.05	2.20
40		2.65	2.70
45		2.85	-
50		2.95	3.60
63			4.80
80			6.20
100			6.65
125			9.90

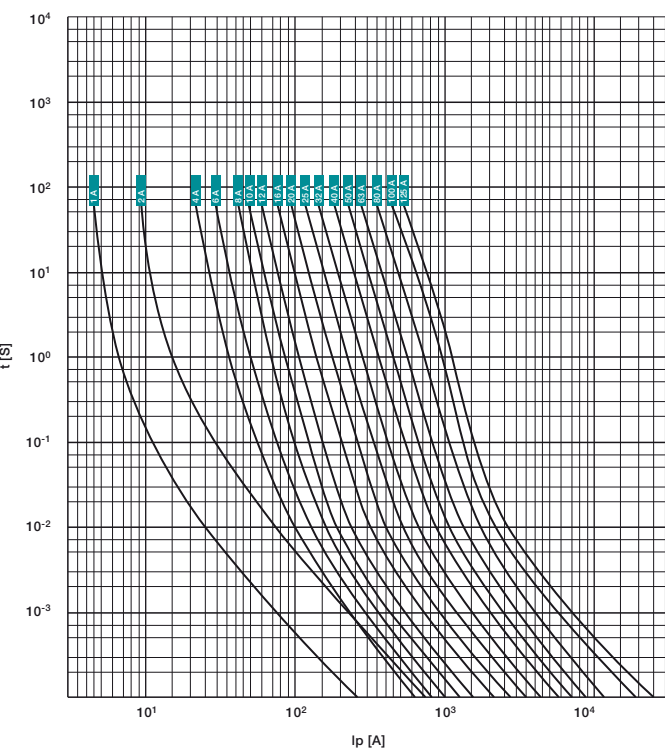
Temperature increase



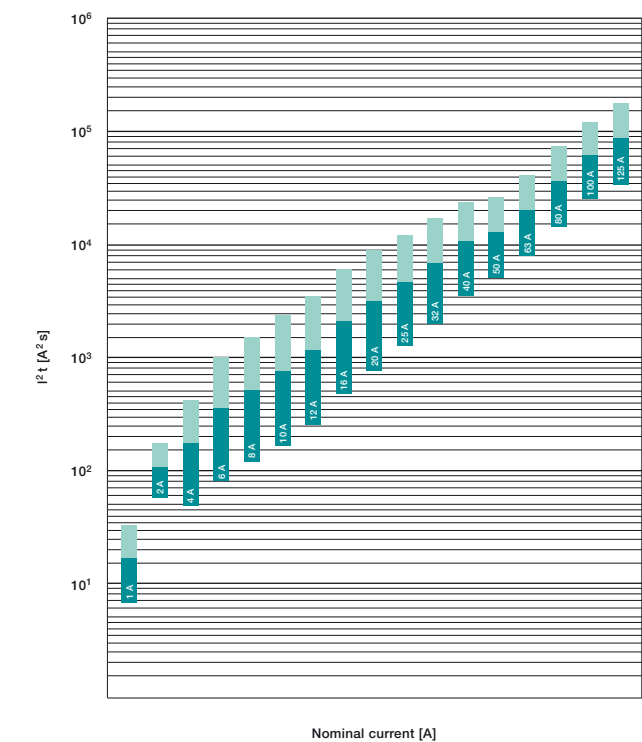
E 9F aM cylindrical fuses

Delayed protection for motor starts

Characteristic tI



Characteristic I²t



Maximum cable length according to the rated current and section of the conductor

Copper conductor section [mm²]	Rated current I _n [A] of aM fuses									
	16	20	25	32	40	50	63	80	100	125
1.5	55/64	37-45	25/30	15/20						
2.5	116	84/94	58/68	40/49	26/32	17/20				
4	181	147	118	84/95	58/68	42/48	28/33	18/23		
6	273	223	178	139	105/117	79/89	55/64	37/42	26/31	14/20
10				227	181	147	113/125	80/94	57/69	40/47
16						236	189	151	120	83/97
25								231	185	147
35									262	210

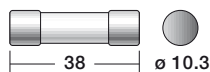
Use this table to find the cable length, in meters, that is protected by a fuse.

Cross the rated current of the fuse (in the columns) with the section of the conductor (on the lines). The resulting number corresponds to the protected length of the conductor: for example, a 32 A fuse can protect up to 139 meters of 6 mm² section cable. When there are two values, it means that the maximum length of the cable is between the two numbers given in the table.

E 9F gPV cylindrical fuses

The best protection for direct current photovoltaic installations

The E 9F gPV series of cylindrical fuses has been specifically designed for protecting direct current circuits up to 1000 V. Available in the 10.3 x 38 mm size for up to 30 A rated current values, they are the best way to protect the strings, inverters and surge arresters in photovoltaic installations according to UL 4248-18.



Rated current In [A]	Bbn 8012542 EAN	Type code	Order code	Piece weight [kg]	Pack unit pcs
E 9F gPV 10.3 x 38 mm cylindrical fuses					
1	134565	E 9F1PV	2CSM213456R1801	0.007	10
2	134664	E 9F2PV	2CSM213466R1801	0.007	10
3	134763	E 9F3PV	2CSM213476R1801	0.007	10
4	134862	E 9F4PV	2CSM213486R1801	0.007	10
5	134961	E 9F5PV	2CSM213496R1801	0.007	10
6	135067	E 9F6PV	2CSM213506R1801	0.007	10
7	135166	E 9F7PV	2CSM213516R1801	0.007	10
8	135265	E 9F8PV	2CSM213526R1801	0.007	10
10	135364	E 9F10PV	2CSM213536R1801	0.007	10
12	135463	E 9F12PV	2CSM213546R1801	0.007	10
15	135562	E 9F15PV	2CSM213556R1801	0.007	10
20	135661	E 9F20PV	2CSM213566R1801	0.007	10
25	135760	E 9F25PV	2CSM213576R1801	0.007	10
30	135869	E 9F30PV	2CSM213586R1801	0.007	10

Technical specifications

Rated voltage	[V]	1000 DC
Rated current	[A]	1...30
Breaking capacity	[kA]	10
Minimum breaking capability		from 1A to 7A = 1.3 x In from 8A to 30A = 2.0 x In
Dimensions	[mm]	10.3 x 38
Weight	[g]	7
Standards		IEC 60269-6; ROHS 2002/98/CE

E 9F gPV cylindrical fuses

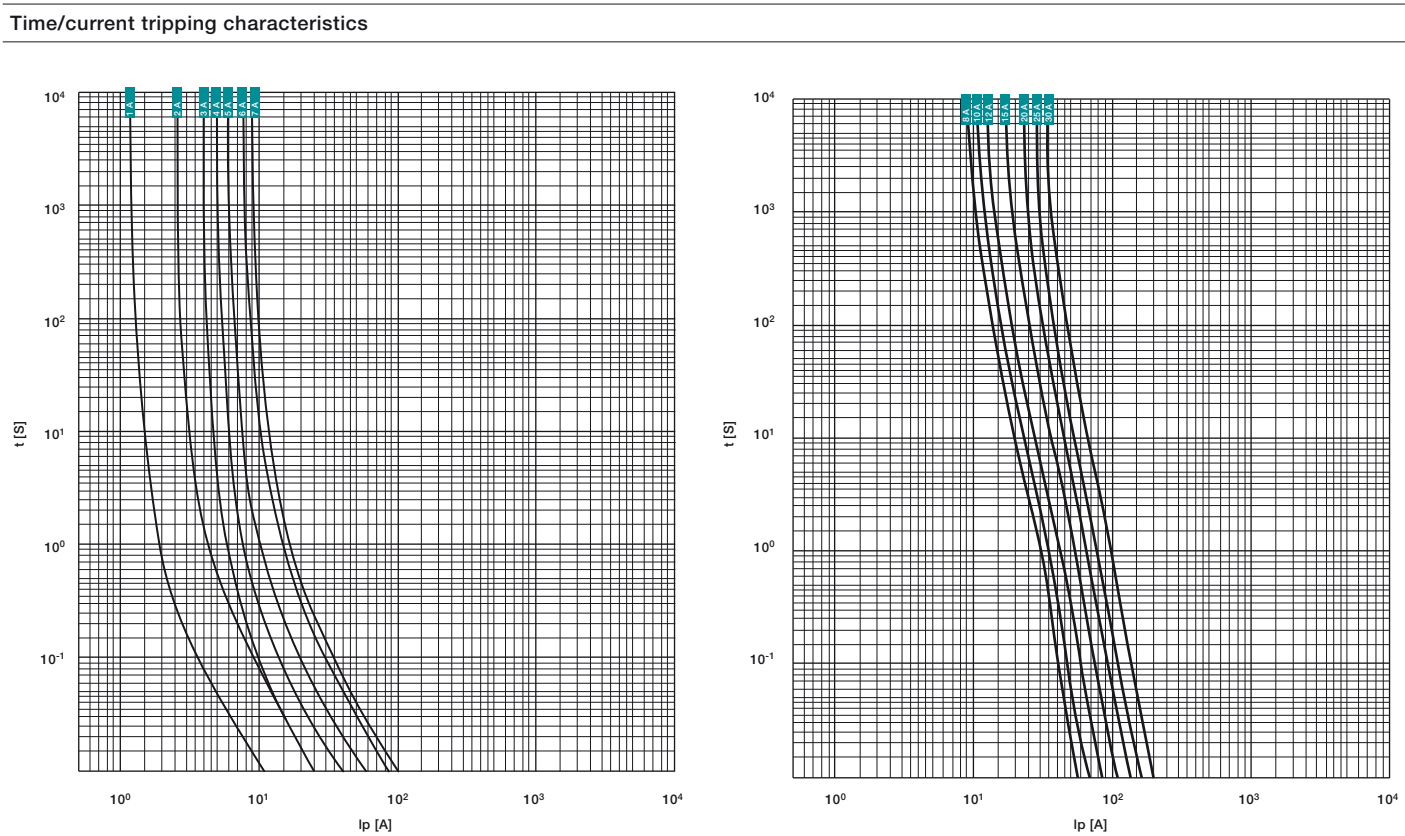
The best protection for direct current photovoltaic installations

E 9F gPV 10.3 x 38 mm cylindrical fuses				
Type	Rated current [A]	Dissipated power 0.7 In [W]	Dissipated power 0.8 In [W]	Dissipated power In [W]
E 9F1 PV	1	0.125	0.175	0.25
E 9F2 PV	2	0.160	0.250	0.32
E 9F3 PV	3	0.66	0.87	1.36
E 9F4 PV	4	0.69	0.8	1.25
E 9F5 PV	5	0.59	0.73	1.12
E 9F6 PV	6	0.42	0.67	1.05
E 9F7 PV	7	0.40	0.64	1
E 9F8 PV	8	0.77	0.88	1.48
E 9F10 PV	10	0.67	0.9	1.5
E 9F12 PV	12	0.72	1	1.8
E 9F15 PV	15	0.9	1.3	2.2
E 9F20 PV	20	1.1	1.5	2.8
E 9F25 PV	25	1.3	1.8	3
E 9F30 PV	30	1.5	1.9	3.7

The power dissipation of the fuse cannot exceed the maximum power dissipation accepted by the fuse holder.

Derating in combination with Ambient Temperature

Ambient temperature [°C]	Derating Coefficient
-30	1.2
-10	1.1
10	1.0
30	0.9
50	0.8
70	0.8



Questions & answers

Technical details and insights for E 90 fuse holders and fuses

Why should I use a fuse for circuit protection?

There are 4 main reasons:

- Safety: Fuses don't cause dangerous situations (arcs, flames, gas production) since they protect the circuit by blowing. Moreover, the intervention speed on high short circuit currents limits significantly the flash hazard at the fault location.
- Reliability: When a fault is detected, the fuse operates, providing protection. A new fuse is then installed, restoring the protection to its original state. There is no risk of being contaminated by oil, corrosion or dust and no unexpected tripping.
- Universal use: The fuse's characteristics are standardized in order to ensure effective coordination with other devices.
- Economic: The fuse is still the most economical solution to prevent damages caused by short-circuits and overloads.

What are the main characteristics of a class CC fuse?

A class CC fuse meets the following three conditions:

- Interrupts all available overcurrents within its interrupt rating.
- Within its current limiting range, limits the clearing time at rated voltage to an interval equal to, or less than, the first major or symmetrical current loop duration.
- Limits peak let-through current to a value less than the available peak current.

What distinguishes a fuse holder for class CC fuses (E 90/30 CC) from a fuse holder for IEC fuses?

Class CC fuse holders are provided with a rejection member to prevent the installation of fuses of other classes according to UL 4248-4.

E 90/30 CC assure the rejection member functionality that has been certified by UL laboratories.

What is the difference between Midget and Class CC fuses?

Class CC fuses are current limiting fuses with rejection tips on the bottom to prevent them from being used in holders not rated similarly.

Midget fuses are defined as supplemental fuses and are not rated for current limiting. They do not have rejection tips because they can be used in most fuse holders regardless of class ratings.

E 90 Wizard

E 90 Wizard is an APP to easily select fuse and fuse holder codes in few simple steps wherever you are.

E 90 Wizard helps you to select ABB codes for E 90 and E 9F series for all the applications: industrial, residential, photovoltaic and North American markets.

E 90 Wizard can provide you the right code, listing technical characteristics and documentation links.

Available for iPhone and Android.



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