

HelioProtection[®] Program

Solutions for photovoltaic
(ISSUE 9)

SOLUTIONS GUIDE



MERSEN
Ferraz Shawmut is Mersen

THE COMMITMENT OF MERSEN IN SAFER AND MORE RELIABLE SOLAR PHOTOVOLTAIC INSTALLATIONS

In the solar market more especially, Mersen is a driving force in the development of safer and more reliable solar photovoltaic installations.

To participate in implementing such installations, Mersen has developed a special program of solutions branded HelioProtection®.

HelioProtection® program is a mix of:

- **Dedication** – all the solutions have been designed for the specific solar photovoltaic applications.
- **Innovation** – the solutions in this program are all on the technological edge.
- **Expertise** – this program is supported in the marketplace by a team of Mersen's experts for helping the customer to select and apply the proper solution.

HelioProtection® is a brand of Mersen.



The logo for HelioProtection, featuring a stylized grid of blue and green squares to the left of the brand name 'HelioProtection' in a green, sans-serif font.



GOING EVEN FURTHER TOGETHER

To support all those we work with - developers, designers, engineering consultants, purchasers, quality managers, qualification inspectors, insurance companies, rating and listing agencies - in their efforts to specify, design, build, test and run solar power systems, Mersen has invested in the necessary resources:

- a qualified design department to help with the most complex and arduous projects and get involved in co-design or co-development initiatives;
- a technical support department with attentive engineering staff listening to other professionals and helping them match protection components or solutions to their equipment;
- a hotline at **+33 4 26 29 29 29**.

Two labs dedicated to quality

The proof of that quest for continual improvement: a total of more than a million tests in 25 years! Mersen has two test labs: one in Newburyport, Massachusetts, and one in Saint Bonnet de Mure in France. The two are complementary, in terms of the available resources, to be able to offer the widest possible range of a.c. and d.c. tests to UL-CSA and IEC standards.



Mersen welcomes customers at both locations to run test campaigns focused on critical points in their own bills of requirements.

An innovative PV installation for product test and validation with a total power of 35KW and an exclusive modular architecture to configure the installation: 6 strings of 24 PV modules or 12 strings of 12 PV modules.

Newburyport:

- a specialized d.c. lab - obviously an asset in designing fuses for photovoltaic applications;
- a low power test lab;
- fusion tests at 0 to 6000A constant current;
- simulations of equipment starting up and stopping from 0 to 3000A;
- a low voltage test bench for surge protective devices;
- temperature tests, etc.

Saint-Bonnet-de-Mure:

Types of Tests

Measurement of short-circuit characteristics of electrical protection gear, certification tests, tests on monitoring systems and inverters, tests of **faults (to ground, between panels, between strings of panels)** and their impact on equipment.

All other usual tests on actual systems.

Testing Equipment

- 144 panels of polycrystalline silicon at 240Wp (30 to 37V, 8A, 18 kg) for a total of approx. 35 kW with two possible configurations:
- 400VDC wiring, 12 parallel strings of 12 panels in series;
- 800VDC wiring, 6 parallel strings of 24 panels in series.

STANDARDIZATION COMPONENTS, SYSTEMS AND INSTALLATIONS

Photovoltaic equipment and systems are governed by international general standards. IEC and UL standards provide the rules to apply to implement state-of-the-art PV installations.

Besides that international or more local standards relay and complete the general standards. They concern more precise fields such as: complete systems and installations, components incorporated in the systems and connection to the grid.



General Standards

IEC 62548 Edition 1
Installation and safety requirements for photovoltaic (PV) generators



Standards, Guidelines, Recommendations

PV Installations PV Systems

IEC 60364-7-712
Low Voltage Installations – PV Installations.

DIN V VDE V0126-5
Junction boxes for photovoltaic modules.

IEC 61439-1
Low voltage switchgear and controlgear assemblies

Surge Protective Devices (SPDs)

EN 50539-11

Low voltage surge protective devices – Surge protective devices for specific application including D.C. – Part 11: Requirements and tests for SPDs in photovoltaic applications

Fuses for Photovoltaic Systems

UL 2579
IEC 60269-6
Low voltage fuses – Part 6: Supplementary requirements for fuse-links for the protection of solar PV energy systems.

Photovoltaic Fuseholders

UL 4248-18

Enclosed and Dead-Front Switches for use in Photovoltaic Systems

UL 98B

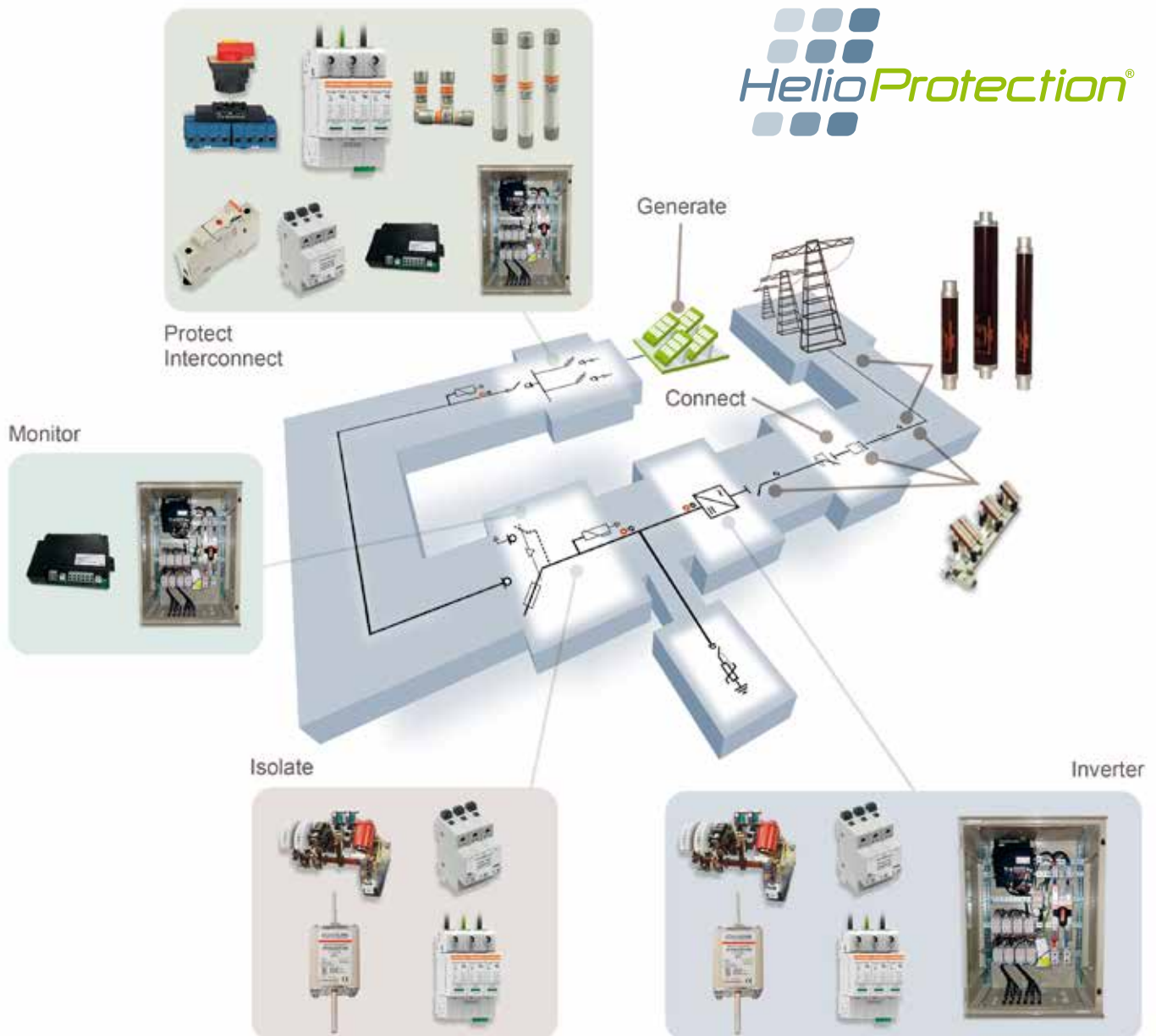
PV Power Converters And Grid Connection

IEC 61727
Photovoltaic (PV) systems – Characteristics of the utility interface.

GUARANTEED PROTECTION, FROM THE CELL TO THE GRID

The fact that a solar device is both a DC environment and a non interruptible source of current whenever the sun is shining makes things pretty complicated compared to our customary AC world. Ensuring the safety of solar power generating facilities is a tricky business, because there are very specific risks inherent to this kind of electrical equipment.

So compliance with standards and recommendations is critical to guaranteeing the safety of people and property.



PRODUCT OFFERING

Residential DC & AC Combiner Boxes

A dedicated product offer for private home and small apartment building PV system from 3 to 5kW.

DC combiner box

DC combiner boxes are located between the solar modules and the inverter. This provides an optimal connection system for 2 strings of 25A under 600VDC or 20A under 1000VDC.

The DC combiner boxes include load isolation and surge protection in 2 different configurations, depending on inputs connection type.



Catalog Number	Number of inputs	DC ratings	DC surge protection	Input connection type	Output connection type	Protection class
HSB2IT20SP10Z	2	25A, 600VDC	Type II, 1000VDC	M16, Ø: 4.5-10mm	M16, Ø: 4.5-10mm	IP65, IK07
HSB2IT20SP10X	2	or 20A, 1000VDC		MC4 connection	M16, Ø: 4.5-10mm	

AC combiner box

AC combiner boxes are located between the inverter and the meter. This provides an optimal connection and protection for the AC network. The AC combiner boxes include a differential load breaker and an AC surge protection.



Catalog Number	AC ratings	AC surge protection	Input connection type	Output connection type	Protection class
HSAC16A230V	16A, 230VAC	Type II, 230VAC	M20, Ø: 7-13mm	M20, Ø: 7-13mm	IP65, IK07
HSAC25A230V	25A, 230VAC		M20, Ø: 7-13mm	M20, Ø: 7-13mm	

PRODUCT OFFERING

HelioProtection®

Fuse gPV

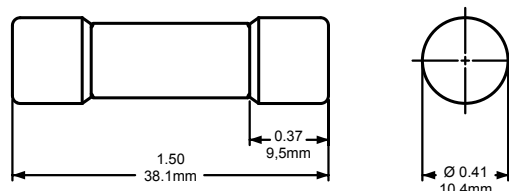
HP6M – 600VDC



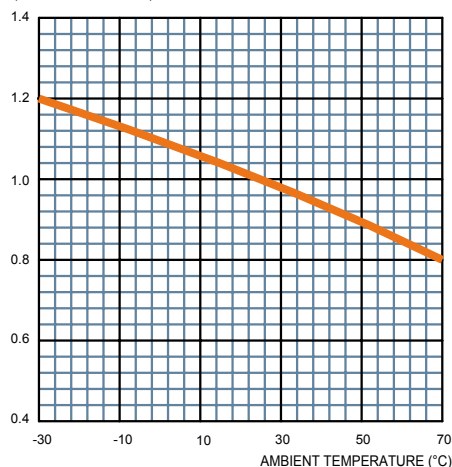
Mersen's HP6M photovoltaic (PV) fuse series is designed specifically to protect the PV modules against the reverse currents. These HP6M fuses, designed for low minimum breaking capacity capabilities of 1.35 times the fuse rated current value, allows for safe circuit interruption under typical low fault current conditions produced by PV arrays.

Minimum Breaking Capacity = 1.35In Maximum Breaking Capacity = 10kA				
Max. Operating Voltage = Rated Voltage	Rated Current	Catalog Number	Reference Number	Packaging
600VDC UL Listed CSA Certified IEC 60269-6 Approved (gPV)	1	HP6M1	L1018565	10
	2	HP6M2	M1018566	
	3	HP6M3	N1018567	
	4	HP6M4	Q1018569	
	5	HP6M5	R1018570	
	6	HP6M6	S1018571	
	7	HP6M7	T1018572	
	8	HP6M8	V1018573	
	10	HP6M10	X1018575	
	12	HP6M12	Y1018576	
	15	HP6M15	Z1018577	
	20	HP6M20	A1018578	
	25	HP6M25	K1018610	
	30	HP6M30	L1018611	

Drawing



DERATING COEFFICIENT (% OF FUSE RATING)



Fuse holders

Nb of poles	Catalog Number	Reference Number	Nb of modules (17.5mm)	Packaging	Indicator
1	US101HEL	D1009979	1	12	No
1	US101IHEL	Q1009461	1	12	Yes
1	USGM1HEL	P1022294	1	12	No
1	USGM1IHEL	N1022293	1	12	Yes

Electrical Characteristics

Rated Voltage (V)	Nominal Current (A)	Catalog Number	70% AMP RATING (W)	80% AMP RATING (W)	100% AMP RATING (W)
600	1	HP6M1	0.14	0.19	0.31
600	2	HP6M2	0.19	0.26	0.43
600	3	HP6M3	0.64	0.85	1.4
600	4	HP6M4	0.58	0.77	1.3
600	5	HP6M5	0.65	0.87	1.4
600	6	HP6M6	0.69	0.92	1.5
600	7	HP6M7	-	-	-
600	8	HP6M8	0.92	1.23	2.0
600	10	HP6M10	0.96	1.28	2.1
600	12	HP6M12	1.12	1.49	2.5
600	15	HP6M15	0.99	1.32	2.2
600	20	HP6M20	1.25	1.67	2.8
600	25	HP6M25	1.38	1.84	3.1
600	30	HP6M30	1.5	2.0	3.3



PRODUCT OFFERING

HelioProtection®

Fuse gPV

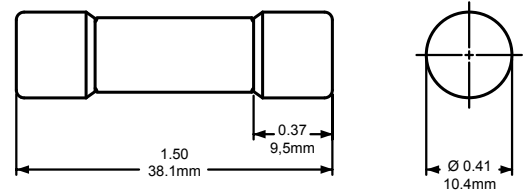
HP10M – 1000VDC



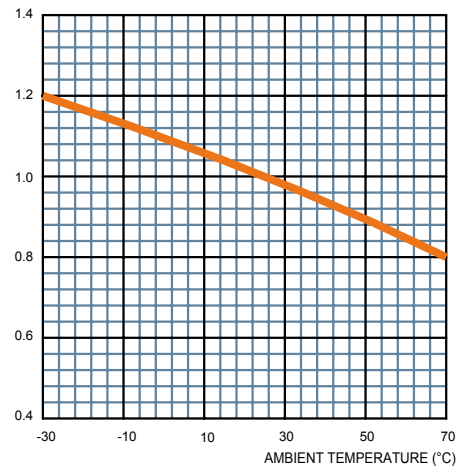
Mersen's HP10M photovoltaic (PV) fuse series is designed specifically to protect the PV modules against the reverse currents. These HP10M fuses, designed for low minimum breaking capacity capabilities of 1.35 times the fuse rated current value, allows for safe circuit interruption under typical low fault current conditions produced by PV arrays.

Minimum Breaking Capacity = 1.35In Maximum Breaking Capacity = 10kA				
Max. Operating Voltage = Rated Voltage	Rated Current	Catalog Number	Reference Number	Packaging
1000VDC UL Listed CSA Certified IEC 60269-6 Approved (gPV)	1	HP10M1	B1018579	10
	2	HP10M2	C1018580	
	3	HP10M3	D1018581	
	4	HP10M4	E1018582	
	5	HP10M5	F1018583	
	6	HP10M6	G1018584	
	7	HP10M7	H1018585	
	8	HP10M8	J1018586	
	10	HP10M10	L1018588	
	12	HP10M12	M1018589	
	15	HP10M15	N1018590	
	20	HP10M20	P1018591	
	25	HP10M25	D1023825	
	30	HP10M30	E1023826	

Drawing



DERATING COEFFICIENT (% OF FUSE RATING)



Fuse holders

Nb of poles	Catalog Number	Reference Number	Nb of modules (17.5mm)	Packaging	Indicator
1	US101HEL	D1009979	1	12	No
1	US101HEL	Q1009461	1	12	Yes
1	USGM1HEL	P1022294	1	12	No
1	USGM1HEL	N1022293	1	12	Yes

Electrical Characteristics

Rated Voltage (V)	Nominal Current (A)	Catalog Number	70% AMP RATING (W)	80% AMP RATING (W)	100% AMP RATING (W)
1000	1	HP10M1	0.125	0.175	0.250
1000	2	HP10M2	0.160	0.250	0.320
1000	3	HP10M3	0.66	0.87	1.36
1000	4	HP10M4	0.69	0.8	1.25
1000	5	HP10M5	0.59	0.73	1.12
1000	6	HP10M6	0.42	0.67	1.05
1000	7	HP10M7	0.40	0.64	1.0
1000	8	HP10M8	0.77	0.88	1.48
1000	10	HP10M10	0.67	0.90	1.5
1000	12	HP10M12	0.72	1.0	1.8
1000	15	HP10M15	0.9	1.3	2.2
1000	20	HP10M20	1.1	1.5	2.8
1000	25	HP10M25	1.3	1.8	3.0
1000	30	HP10M30	1.5	1.9	3.7



PRODUCT OFFERING

HelioProtection®

Fuse gPV

10x85 - 1200/1500 VDC



Mersen's 10x85 photovoltaic (PV) fuse series is designed specifically to protect the PV modules against the reverse currents. These 10x85 fuses, designed for low minimum breaking capacity capabilities of 1.35 times the fuse rated current value, allows for safe circuit interruption under typical low fault current conditions produced by PV arrays.

They are rated 1200V and 1500V and meet the trend for increasing the maximum open circuit voltage across the PV modules.

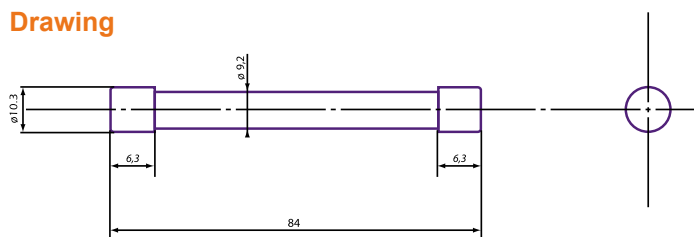
DC HelioProtection® Fuse complies with new IEC 60269-1 and with the new 60269-6 introducing the gPV type of fuse.

Basics characteristics									
Size	Maximum operating voltage for L/R ≤ 0,5ms	Rated Current	Operation	Breaking Capacity @ Un	Power losses End contacts		Catalog number	Ref. number	Packaging
					0.7In	0.8In			
mm	V	A		kA	W	W			
D10xL85	1500	12	gPV type	10	1.5	3.7	HP15MGPV12	Y1044106	10
		16			2.3	5.7	HP15MGPV16	Z1044107	10
		8			1,3	1,7	DC10HEL12C8	D1014188	45
	1 200	10			1,3	1,7	DC10HEL12C10	T1012017	45
		12,5			1,3	1,9	DC10HEL12C12,5	X1008754	45
		16			1,5	2,1	DC10HEL12C16	Y1008755	45
		20			1,8	2,5	DC10HEL12C20	Z1008756	45
		25			2,2	3	DC10HEL9C25	A1008757	45
	900	25							

Other ratings available on request.



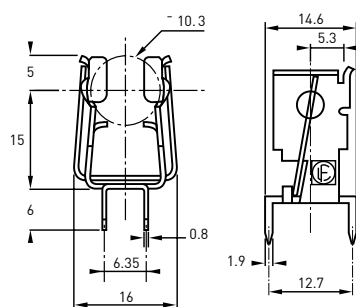
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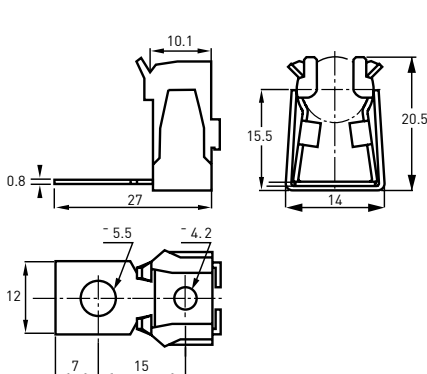
Fuse clips

Catalog Number	Reference number	Designation	Weight (g)	Pack
MR10RESSORTCI	Y098507	MR10 CI	4.5	200
MR10RESSORTCI	Y098507	MR10CI	4.5	1000

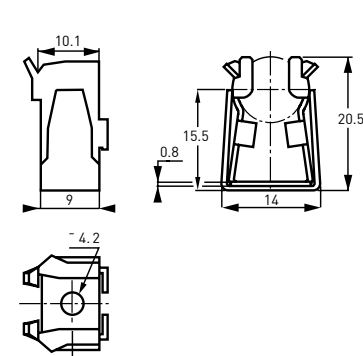
MR10 CI



MR10



MR10 without compressor



PRODUCT OFFERING

Modulostar

HelioProtection®



The Modulostar HelioProtection® fuse holders from Mersen are very well known in the power low voltage distribution application market. HelioProtection® Fuse gPV were specially designed for PV, and DC more generally speaking, applications.

They comply with both UL512 and IEC 60269-1 standards and RoHS as well.

The plastic parts of our Modulostar HelioProtection® are UL94 V0 to V2 (Yellow Card). Two models are available: one with and one without blown fuse indication via an indicator light which is on when the fuse is blown (open circuit). The blown fuse indication operates from 350VDC up to 1000VDC.

Characteristics

- **Wiring:** rigid wire = 1 - 16mm² (18-6AWG), flexible wire = 0.75 - 10mm² (18-8AWG) use 75°C wire CO only.
- **Screw driver heads: Mersen** recommends use of PZ 2 or flat 5.5x1mm heads (maximum diameter 6mm).
- **Maximum tightening torque: 2.2Nm**
- DC20B-IP2X.

Recommendations

- Do not operate under load.
- **Non insulated conductive parts:** preferably the equipment should be laid out keeping the + and - polarities separate.
- **Mounting with SPD:** check that the SPD' Up is compatible with the US10's IU imp=6kV (see UTE C15-712).

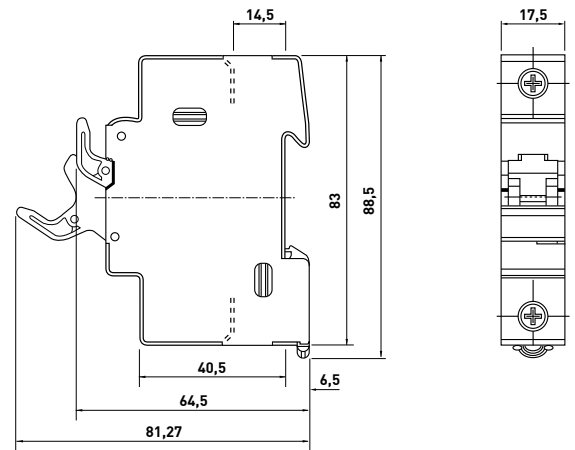


Nb of pole	Cat. Number	Ref. Number	Nb of Mode (17.5mm)	Pack	Indicator
1	US101HEL	D1009979	1	12	Without Ind.
1	US101HEL	Q1009461	1	12	With Ind.

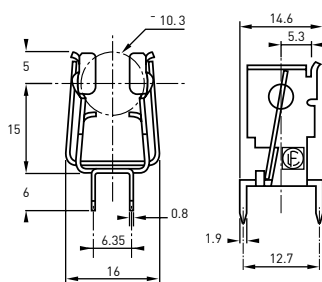
Nominal Voltage Ui DC	Voltage Isolation Uimp	Nominal Current	Max. power losses in the fuse links	Fuse links rating	Cable wire section (mm ²) recommended
1000VDC	6kV	32A	3W	≤12	2.5
	6kV	32A	3W	16	2.5
Pollution Degree 2	6kV	32A	3W	20	2.5
	6kV	32A	3W	25	4
	6kV	32A	3W	30	6

Fuse clips

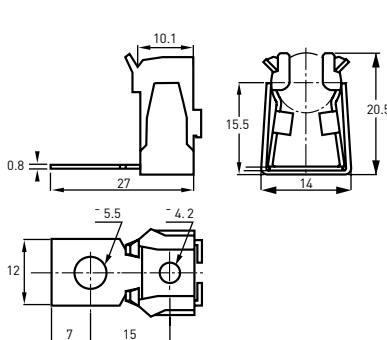
Cat. Number	Designation	Weight (g)	Pack
MR10RESSORTCI	MR10 CI	4.5	200
MR10RESSORT	MR10	7.0	20
MR10RESSORTSP	MR10 without compressor	5.7	20



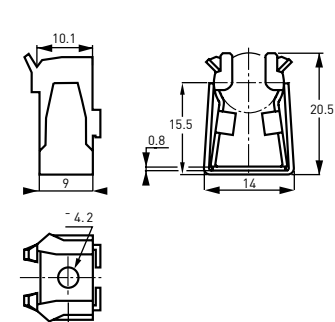
MR10 CI



MR10



MR10 without compressor



PRODUCT OFFERING

USGM1HEL



UltraSafe™ Fuseholders

Innovative UltraSafe midget fuseholders with screw-less, spring pressure, wire termination technology

Mersen's new USGM series fuseholders deliver the ultimate ease-of-use, time (labor) saving and reliable solution available in the marketplace. Mersen is the first manufacturer to offer screw-less, spring pressure, wire termination technology into a power fuseholder, delivering the best of both technologies to its customers.

They comply with UL4248-18 standard and IEC 60947-3. Now you can experience the combined benefits of safety, ease-of-use, labor savings and reliability of UltraSafe fuseholders and spring pressure technology.

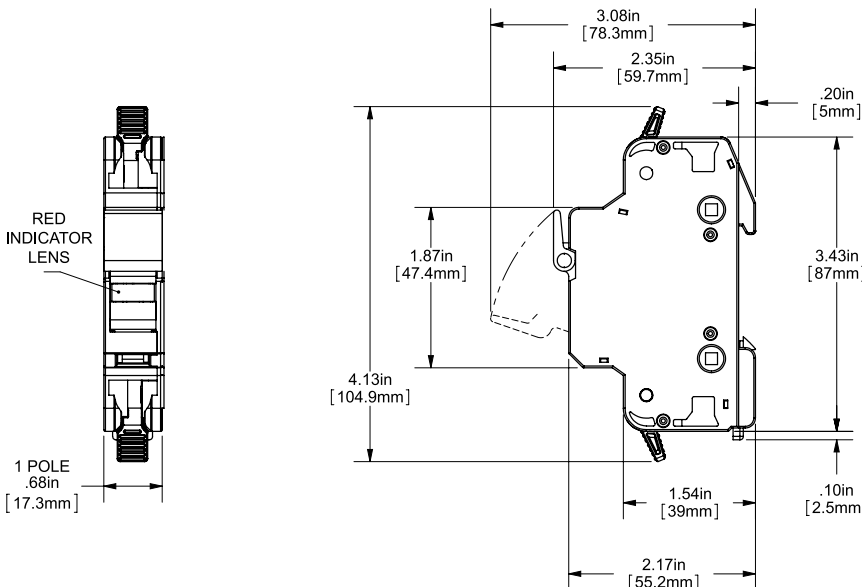
Fuse Type	No. of Poles	Voltage Rating	Ampere Rating	Visual Indication	Catalog Number	Ref. Number	Packaging
Photovoltaic	1	1000VDC	30	No	USGM1HEL	P1022294	12
				Yes	USGM1IHEL	N1022293	12

Recommended Fuse Usage:

- USGM1HEL use with Photovoltaic Fuses: HP6M, HP10M.

Additional Specifications:

- **Screw-less, spring pressure terminals:** WAGO CAGE CLAMP®.
- **Wire Range:** #14 to 6 AWG (2.5 to 16mm²) Single Conductor; #14 to 10 AWG (2.5 to 5.0mm²) Dual Conductor.
- **Wire Type:** 60/75/90°C Solid/ Stranded Copper.



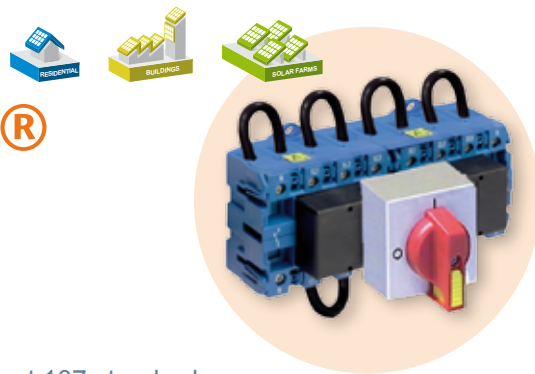
Ratings:

- Volts: 1000VDC maximum
- Amps : 30A maximum
- SCCR : 200kAAC, 100kA DC



PRODUCT OFFERING

HelioProtection® Switch



These disconnect switches comply with IEC 60947-3 and VDE 0660 part 107 standards.

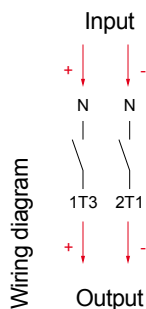
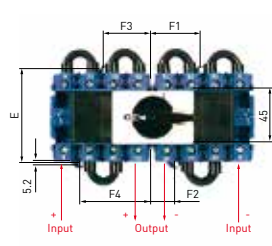
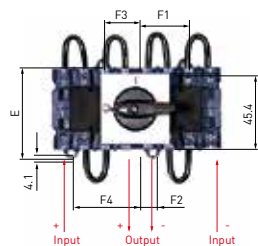
- These are real d.c. switches, specially designed for PV applications.
- HelioProtection® switches are complete compact products, and are delivered already assembled with their shunts (so there's only one catalog number for the whole unit!).
- Connections are IP20 rated finger safe. HelioProtection® switches are fitted to be mounted directly on a DIN rail.
- They must be installed and tested by qualified personnel with thorough knowledge of the rules governing installation in PV applications.

Category of use	Uoc - Max. Offload Voltage Ue - Operational Voltage		780 VDC 650 VDC	1000 VDC 800 VDC	Insulation Voltage	Number of Poles
	Catalog Number	Ref. Number	Rated Current (A)			
DC21B	IT20HEL6CCF	P1015026	25	21	1000VDC	6
	IT32HEL6CCF	Q1015027	32	28		6
	IT40HEL6CCF	W1015032	40	28		6
	IT70HEL6CCF	X1015033	60	-		6
	IT20HEL10CCF	M1016427	-	25		8
	IT25HEL10CCF	Z1011930	-	32		8
	IT32HEL10CCF	A1011931	-	32		8
	IT40HEL10CCF	B1011932	-	40		8
	IT70HEL10CCF	E1011935	-	60	8	

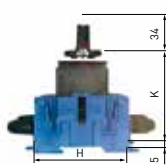
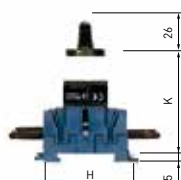
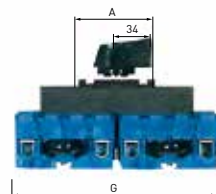
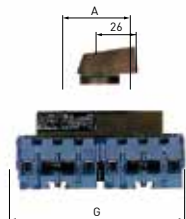
All our models of HelioProtection® switch can be equipped with a handle for door mounting.
*These HelioProtection® switches are complete compact products, and are delivered already assembled with their shunts (so there's only one catalog number for the whole unit!)

IT20HEL10CCF
IT32HEL10CCF
IT40HEL10CCF

IT70HEL10CCF

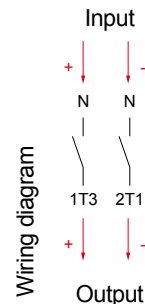


Dimensions	IT20HEL10CCF IT32HEL10CCF	IT40HEL10CCF	IT70HEL10CCF
	A	43,7	105,4
E	60	70	90
F1	32	37,5	47,5
F2	10	12,5	22,5
F3	23,5	28,5	44,5
F4	45,5	53,5	69,5
G	111	132	184
H	54	64	80
K	64	62,5	76,2
L	9	10	14



Recommended tightening torque

IT32HEL10CCF	1,25 Nm
IT32HEL10CCF	1,80 Nm

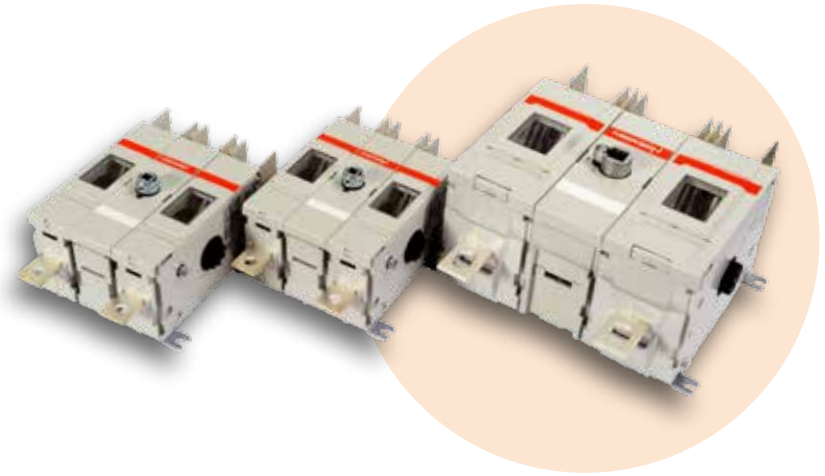


PRODUCT OFFERING

PV-Rated Disconnect Switches

NEW
LINE

Mersen launches a global line of premium compact low voltage switchgear



PV-rated Switches
100A to 500A Up to 1000VDC

Function

Standard switch-disconnect provides the load break switching function: making, carrying, breaking current plus isolation

Applications

2-pole PV-rated switches disconnect individual strings, individual arrays and PV inverter from the DC side

Features

- **Safety:**
Robust design, visible contacts, user-independent operation
- **Performance:**
Specifically designed for DC applications: dual magnetic breaking
- **Size:**
40% to 57% smaller footprint = greatly reduced installation area
- **Flexibility in installation:**
Symmetrical power-pole design independent of polarity
- **Flexibility in logistics:**
Ordering process and stock control is more fluent due to reduced part numbers
- **Environmental impact:**
No harmful material

Versions and accessories

- Extended shaft
- Pistol type handle
- Direct mounting type handle
- Auxiliary contact
- Module for auxiliary contact
- Mechanical and electrical interlock
- Terminal clamp
- Short-circuit link
- Terminal shroud

PRODUCT OFFERING

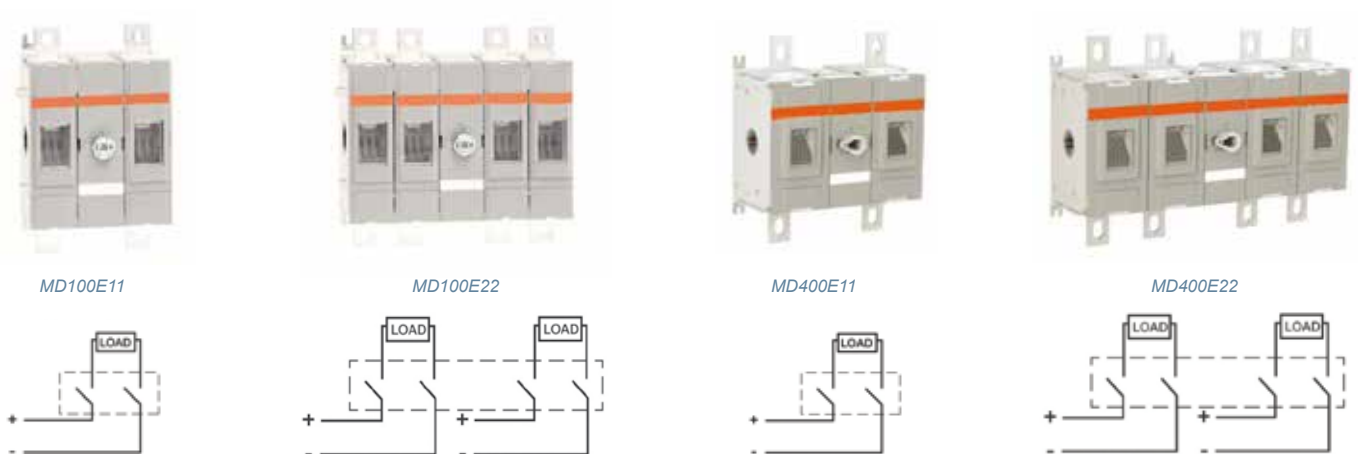
PV-Rated Disconnect Switches



UL 98 and IEC-Rated DC Switches

Mersen offers a range of DC disconnect switches especially designed for PV applications, in 2 poles and 2x2 poles configurations for double circuit applications. The technology inside the switch and the visible contacts allow a quick, safe, and reliable DC breaking power at all current levels up to 1000VDC. With a symmetric 2-pole design, the product is ready and simple to install independently of the polarity, with very limited power losses, and with a smaller footprint than competition.

IEC DC Switches



Switch Body

Ampere Rating	100	160	200	250	315	400	500
2-pole Configuration	MD100E11	MD160E11	MD200E11	MD250E11	MD315E11	MD400E11	MD500E11
Handle and shaft configuration 2x2-pole	MD100E22	MD160E22	MD200E22	MD250E22	MD315E22	MD400E22	MD500E22

Handles and Shafts



HD250



HB65

Direct Front Operation Locking Handle							
	HD250	HD250	HD250	HD250	HD400	HD400	HD400

Pistol Style							
	HB65	HB65	HB65	HB65	HB95/ HB125	HB95/ HB125	HB95/ HB125

B=Black. Substitute 'R' for 'B' if a red handle is desired. Ex. HR65

Shafts							
Shaft	SPA__	SPA__	SPA__	SPA__	SFB__	SFB__	SFB__

SPA Lengths: 130, 210, 290, 360, 430 Ex. SPA130. SFB Lengths: 280, 325, 395 Ex. SFB280

PRODUCT OFFERING

PV-Rated Disconnect Switches



Technical Data

Technical data according to IEC 60947 for switch-disconnectors									
Switch size		A	MD100E	MD160E	MD200E	MD250E	MD315E	MD400E	MD500E
Rated Insulation voltage U_i	Pollution degree 2	V	1500	1500	1500	1500	1500	1500	1500
	Pollution degree 3	V	1500	1500	1500	1500	1500	1500	1500
Rated impulse withstand	50 Hz 1 min kV	kV							
		kV	12	12	12	12	12	12	12
Rated thermal current I_{th} ...with minimum cable or bar cross section	In open air, normal conditions ¹	A	100	160	200	250	315	400	630
	In enclosure 40°C	A	100	160	200	250	315	400	550
	In enclosure 60°C	A	100	160	200	250	315	400	440
	Cu	mm ²	35	70	95	120	185	240	240
Rated operational current / poles in series DC-21B	1000	V	100 / 2	160 / 2	200 / 2	250 / 2	315 / 2	400 / 2	500 / 2
			100 / 2x2	160 / 2x2	200 / 2x2	250 / 2x2	315 / 2x2	400 / 2x2	500 / 2x2
Rated short-time withstand current, 1000 V, 1 s	R.M.S. -value I_{sw}	kA	5	5	5	5	10	10	10
Rated short circuit making capacity, 1000 V	Peak value I_{cm}	kA	5	5	5	5	10	10	10
Power loss / pole	At rated current	W	2	4	6	9,5	6	9,7	15,1
Cable size	Cu	mm ²							
Terminal bolt size	Metric thread diameter x length	mm	M8x25	M8x25	M8x25	M8x25	M10x30	M10x30	M12x40
Terminal tightening torque	Counter torque required	Nm	15-22	15-22	15-22	15-22	30-44	30-44	50-75

1) Normal conditions defined in IEC 60947-1-6.1

IEC DC-rated Non-Fused switches

Part #	Description	Ref
MD100E11	DC Switch 100A IEC 1000V 2p	G1043217
MD160E11	DC Switch 160A IEC 1000V 2p	H1043218
MD200E11	DC Switch 200A IEC 1000V 2p	J1043219
MD250E11	DC Switch 250A IEC 1000V 2p	K1043220
MD100E22	DC Switch 100A IEC 2x1000V 4p	L1043221
MD160E22	DC Switch 160A IEC 2x1000V 4p	M1043222
MD200E22	DC Switch 200A IEC 2x1000V 4p	N1043223
MD250E22	DC Switch 250A IEC 2x1000V 4p	P1043224
MD315E11	DC Switch 315A IEC 1000V 2p	Q1043225
MD400E11	DC Switch 400A IEC 1000V 2p	R1043226
MD500E11	DC Switch 500A IEC 1000V 2p	S1043227
MD315E22	DC Switch 315A IEC 2x1000V 4p	T1043228
MD400E22	DC Switch 400A IEC 2x1000V 4p	V1043229
MD500E22	DC Switch 500A IEC 2x1000V 4p	W1043230

Handles

Part #	Description	Ref
HB65	Handle black 65mm IP65 NEMA 3R	W1043368
HB95	Handle black 95mm IP65 NEMA 3R	N1043913
HB125	Handle black 125mm IP65 NEMA 3R	A1043372
HD250	Handle black 250mm IP65 NEMA 3R	W1043391
HD400	Handle black 400mm IP65 NEMA 3R	X1043392

Shafts

Part #	Description	Ref
SFB280	Shaft SwitchFuse 12x12x280mm	F1043423
SFB325	Shaft SwitchFuse 12x12x325mm	G1043424
SFB395	Shaft SwitchFuse 12x12x395mm	H1043425
SPA130	Shaft pistol handle 6x6x130mm	V1043919
SPA210	Shaft pistol handle 6x6x210mm	P1043431
SPA290	Shaft pistol handle 6x6x290mm	Q1043432
SPA360	Shaft pistol handle 6x6x360mm	W1043920
SPA430	Shaft pistol handle 6x6x430mm	X1043921

PRODUCT OFFERING

WebCom

Energy data logger



Network connectivity, operation and configuration

WebCom is an easy to configure data logger operating via Ethernet. WebCom is configured through the web interface on the embedded HTTP server. WebCom collects data from connected devices and stores them in the CSV format. At a configurable time, it sends the data to a central server where it can be treated and analysed to optimise maintenance and operation management. WebCom can be fully configured and updated remotely to reduce maintenance costs.

Inverters supported

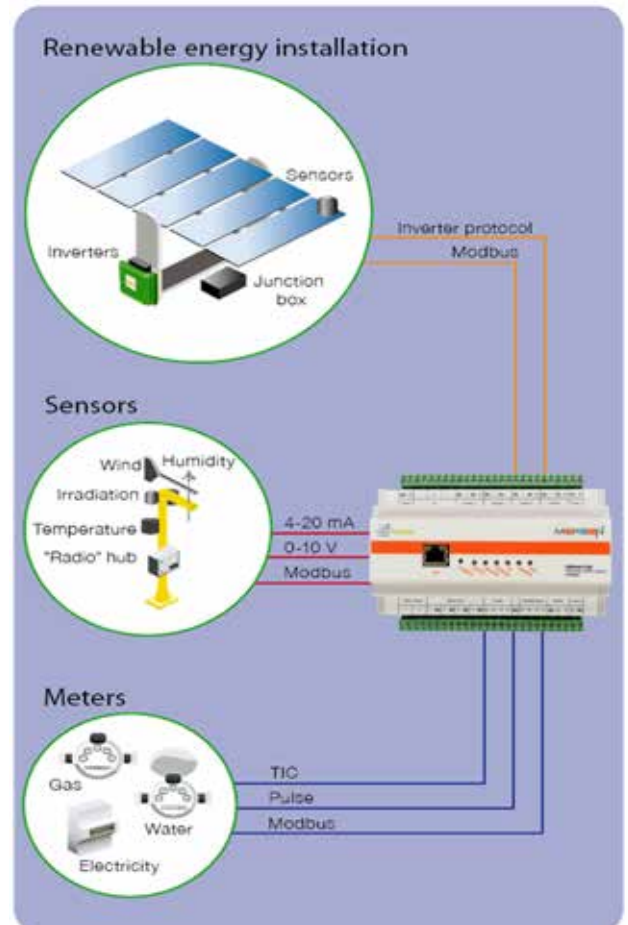
The WebCom gateway integrates an auto-detect function to identify the number of inverters and their address. The majority of inverters available on the market are supported: Danfoss (ComLynx), Diehl Ako (Platinum), Fronius, Ingeteam (IngeconSun & Modbus TCP), Kaco, LTI, PowerOne, Refu (USS), Schneider-Electric (SunEzy & Xantrex), Siemens (USS), SMA, SMA Central, Socomec (Sunsys-Home & Sunsys-Pro) and Mastervolt.

Technical data

Connection Type	Intpus	Characteristics
Serial Interfaces	Port1	RS485 - Inverter protocols
	Port2	RS485/RS232 - Modbus equipments
Meter Interfaces	TIC1, TIC2 & TIC 3	1 multiplex meter* (TIC)
GPIO	Pulse input	2 inputs, pulse length: 40 ms to 1,000 ms
	Analog inputs	4 inputs 0-10
	Digital inputs	2 dry contact inputs
	Digital outputs	2 relay outputs
Network Interfaces	Ethernet RJ45	10/100 Mb/s IP services
Environmental		
	Service temperature	-5°C to +50°C
	Box format	DIN rail
	Dimensions	70 x 157 x 59 mm
Approvals		
	CE	EN 50082EN & 55022 class B
	UL	UL 60950-1

Ordering Information

Product Type	Cat. number	Reference	Comment
WebCom	HM2RS485COMA	D1039304	24Vdc power supply included



PRODUCT OFFERING

Greenstring

PV String Monitoring



The Mersen solution provides a modular electronic cards approach offering a high degree of customization. It allows to monitor from 1 to 30 PV strings by adding up to **4 AUX Card(s)** to the **MAIN Card** and up to 8 external sensors by adding the **PROBE Card**.

Technical data

	MAIN card	AUX Card	PROBE card
Electrical Features			
Number of inputs	6	6	8
Maximum rated voltage	1000 VDC	1000 VDC	-
Maximum current per Input	25 A	25 A	-
Maximum current Output	150 A	150 A	-
String Voltage measurement			
Measurement range	± 1000 VDC	± 1000 VDC	-
Accuracy	± 0.5% (± 5 V)	± 0.5% (± 5 V)	-
String Current measurement			
Measurement range	±20 A	±20 A	-
Accuracy	± 0.5% (± 100 mA)	± 0.5% (± 100 mA)	-
Measurement inputs			
Digital inputs	-	-	1 potential-free or pulse input, 0 - 100 Hz
Analog inputs	-	-	7 inputs, individually configurable: - 4-20 mA: precision ± 1%, impedance 100 Ω - 0-10 V: precision ± 1%
Temperature measurement			
Measurement range	-40 °C to +100 °C	-40 °C to +100 °C	-
Precision	± 2 °C	± 2 °C	-
Communication			
Protocol	Modbus RTU on RS-485	-	-
Monitoring and Signaling inputs			
SPD end-of-life status	1, potential-free input	-	-
DC breaker status	1, potential-free input	-	-
Power Supply from PV strings			
Voltage range	250 VDC to 1000 VDC	-	-
Power consumption	2.5W @ 1000 VDC	0.5W	-
Mechanics			
Input connection type	Cage Clamp (max. 6mm ²)	Cage Clamp (max. 6mm ²)	Cage Clamp (max. 2.5mm ²)
Dimensions (L x W x H) in mm	190 x 160 x 35	190 x 160 x 35	190 x 160 x 35
Environmental Conditions			
Operating & Storage temperature	-30°C to +70°C	-30°C to +70°C	-30°C to +70°C
Relative humidity	10% to 95% non-condensing	10% to 95% non-condensing	10% to 95% non-condensing

Ordering Information

Product Type	Cat. number	Reference	Comment
MAIN card	HMMC6B	V1042309	-
AUX card	HMAC6A	A1034632	-
PROBE card	HMPC8A	B1034633	24Vdc power supply mandatory
Connection Kit	HMKCNA	C1034634	1 RS485 shielded cable and 1 connection card
Configuration kit	HMKCGA	D1034635	The configuration software and the RS485 to USB cable

PRODUCT OFFERING

Surge-Trap[®]-DC

No back-up fuse required



Surge protective devices for PV applications:

large-scale, rooftop and self-consumption DC installations.

The Surge-Trap[®] PV pluggable SPDs provide advanced overvoltage protection to photovoltaic systems by utilizing Mersen's new optimized dynamic thermal disconnection system, which does not require additional overcurrent protection (back-up fuse) due to its high short-circuit withstand rating. These devices are designed to be mounted on 35mm DIN-rail while complying with EN-50539-11 and UL 1449 3rd Ed.



Large-scale and rooftop PV

Cat. number	Ref. number	Number of poles/phases	U _{cpv}	I _{scpv}	I _{max} (8/20)	I _n (8/20)	U _p at I _n	Remote	Cartridge No L-N
Y PV									
STPT2-40K600V-YPV	83020138	3	660 VDC	10000 A	40 kA	20 kA	≤ 2.6 kV	No	SP2-40K600V-PV
STPT2-40K600V-YPVM	83020139	3	660 VDC	10000 A	40 kA	20 kA	≤ 2.6 kV	Yes	SP2-40K600V-PV
STPT2-40K1000V-YPV	83020140	3	1060 VDC	10000 A	40 kA	20 kA	≤ 4 kV	No	SP2-40K1000V-PV
STPT2-40K1000V-YPVM	83020141	3	1060 VDC	10000 A	40 kA	20 kA	≤ 4 kV	Yes	SP2-40K1000V-PV
STPT2-40K1500V-YPV	83020158	3	1500 VDC	10000 A	40 kA	10 kA	≤ 5 kV	No	SP2-40K1500V-PV
STPT2-40K1500V-YPVM	83020159	3	1500 VDC	10000 A	40 kA	10 kA	≤ 5 kV	Yes	SP2-40K1500V-PV

Self-consumption PV

Cat. number	Ref. number	Number of poles/phases	U _{cpv}	I _{scpv}	I _{max} (8/20)	I _n (8/20)	U _p at I _n	Remote	Cartridge No L-N
U PV									
STPT2-40K60V-2P	83020128	2	65 VDC	1000 A	40 kA	20 kA	≤ 0.7 kV	No	SP2-40K60V
STPT2-40K60V-2PM	83020129	2	65 VDC	1000 A	40 kA	20 kA	≤ 0.7 kV	Yes	SP2-40K60V
STPT2-40K75V-2P	83020130	2	80 VDC	1000 A	40 kA	20 kA	≤ 0.8 kV	No	SP2-40K75V
STPT2-40K75V-2PM	83020131	2	80 VDC	1000 A	40 kA	20 kA	≤ 0.8 kV	Yes	SP2-40K75V

Electrical diagrams

Cat. number	Ref. number	U _{cpv}	I _{scpv}	I _{max} (8/20)	I _n (8/20)	U _p at I _n
PV						
SP2-40K60V	83020008	65 VDC	1000 A	40 kA	20 kA	≤ 0.35 kV
SP2-40K75V	83020009	80 VDC	1000 A	40 kA	20 kA	≤ 0.4 kV
SP2-40K600V-PV	83020005	330 VDC	10000 A	40 kA	20 kA	≤ 1.3 kV
SP2-40K1000V-PV	83020006	530 VDC	10000 A	40 kA	20 kA	≤ 2 kV
SP2-40K1500V-PV	83020010	750 VDC	10000 A	40 kA	10 kA	≤ 2.5 kV

Environmental & Physical characteristics

- Operating and storage temperature (C°): -40 to +80
- Response time (t_a) (ns): <25
- Enclosure material: PA66 CT1, V-0
- Cross section flexible (mm²): 6 to 25
- Cross section solid (mm²): 6 to 35
- Terminal torque (N.m): 4 max

U_{cpv} – Maximum continuous operating voltage (PV)

I_{scpv} – Short-circuit current rating (PV)

I_{max} – Maximum discharge current (8/20μs)

I_n – Nominal discharge current (8/20μs)

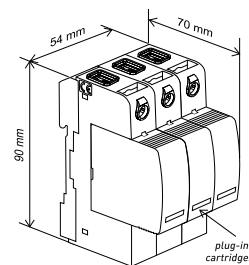
U_p – Voltage protection level

Approvals / Standards

- EN-50539-11
- UTE C 61740-51
- UL 1449 3rd Ed recognized, File No E468946
- CE

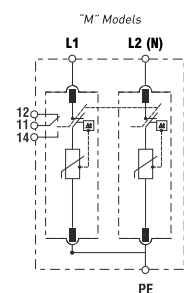
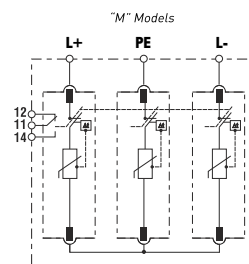
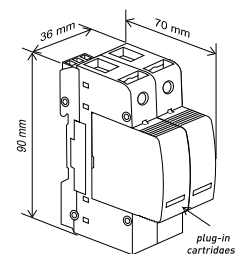
Large-scale and rooftop PV

STPT2-40K600V-YPV(M)
STPT2-40K1000V-YPV(M)



Self-consumption PV

STPT2-40K60V-2P(M)
STPT2-40K75V-2P(M)



PRODUCT OFFERING

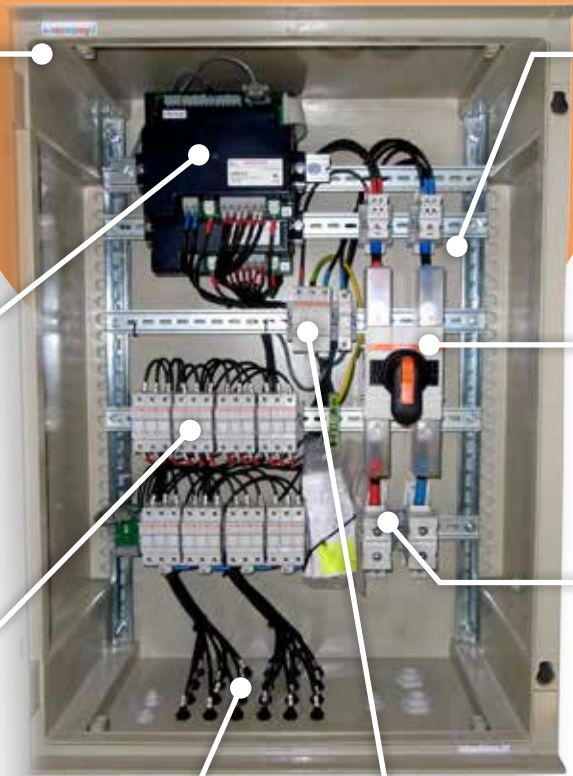
DC Combiner Boxes



Mersen offers a complete range of modular solutions for the most varied requirements. Designed and assembled on customer demand, DC combiner boxes can contain terminal blocks, surge protection, fuses and load circuit breakers and systems that permanently monitor the performance of the strings.

Thanks to its long standing expertise in safety solutions, Mersen is performing the electrical validation and qualification of the systems, to ensure product quality and reliability in extreme conditions.

A Perfect Solution for every customer's requirements



Reliable Protection

Polyester reinforced with glass fiber enclosure protecting up to IP66 to ensure a safe use outside.

Individual Solutions

DC combiner box are assembled on customer demand to answer the most varied requirements.

String performance monitoring

Mersen monitoring system continuously detects the string current and the voltage. Any abnormality is detected immediately.

Load-Break switch

To isolate the DC side of a PV system load-break switch are used.

Fuse and fuse-holder

A complete range of fuse and fuse-holder to protect PV module against overload from 1 to 30A and 600 to 1200V.

Power Distribution blocks

Specially for use in the PV area, Mersen offers blocks to distribute power over wiring from 2.5 to 300mm².

100% Tested

All DC combiner boxes are certified in Mersen laboratory and 100% tested after assembly.

Surge protection

The surge protection is using Mersen's patented TPMOV technology in a pluggable design up to 1000V to meet higher demands of PV systems.

PRODUCT OFFERING

DC Combiner Boxes



Technical data

Enclosure			
Dimensions (HxWxD)	270 x 360 x 230 mm	308 x 255 x 150 mm	847 x 636 x 300 mm
Casing	polyester reinforced with glass fiber	polyester reinforced with glass fiber	polyester reinforced with glass fiber
IP protection class (IEC60529)	IP 65	IP 65	IP 65
IK resistance classe (IEC 62262)	IK 09	IK 10	IK 10
Colour	RAL 7032	RAL 7032	RAL 7032
Electrical Properties			
Max. rated voltage DC	1000 VDC	1000 VDC	1000 VDC
Max. current per input DC	10.5 A	3 A	14 A
DC switching capacity (IEC 60947-3)	40 A (DC21B 1000V)	20 A (DC21B 1000V)	315 A (DC21B 1000V)
Surge Protection DC	Type II / Up < 3,2kV @ 5kA	-	Type II / Up < 3,2kV @ 5kA
Over-voltage category	Cat. III	-	Cat. III
Internal IP class	IP 20	IP 20	IP 20
Inputs			
Number of DC inputs	3	5	18
Connection DC input cable to	-	US101HEL (1-16mm ²)	-
Connection type DC input	MC4 Connectors	M16 connection, IP68, Ø: 4.5-10mm	MC4 Connectors
Fuses	yes	yes	yes
Outputs			
Number of DC outputs	1	1	1
Connection DC output cable to	spring terminal (max. 10mm ²)	spring terminal (max. 10mm ²)	FSPDB4A (16-185mm ²)
Connection type DC output	M20 connection, IP68, Ø: 7-13mm	M20 connection, IP68, Ø: 7-13mm	M40 connection, IP68, Ø: 19-28mm
Connection DC earth protection	M16 connection, IP68, Ø: 4.5-10mm	-	M20 connection, IP68, Ø: 7-13mm
String Monitoring			
Monitoring board	-	-	-
Circuit breaker status	-	-	-
Surge Protection EOL	-	-	-
External Sensors	-	-	-
Power Supply	-	-	-
Environmental			
Condensation Management	2 climatic valves IP68	-	2 climatic valves IP68
Water evacuation	1 water drain plug IP55	1 water drain plug IP55	1 water drain plug IP55
Ambiant temperature range	-20°C to +45°C	-20°C to +45°C	-20°C to +40°C
	IEC 61439-2, Class II		IEC 61439-2, Class II

Ordering Information

Catalog Number	HS5IT20V10Z	HS3IT40SP10X	HS18IT315SP10X
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PRODUCT OFFERING



DC Combiner Boxes with String Monitoring



Enclosure			
647 x 436 x 250 mm	747 x 536 x 300 mm	1056 x 852 x 350 mm	1056 x 852 x 350 mm
polyester reinforced with glass fiber	polyester reinforced with glass fiber	polyester reinforced with glass fiber	polyester reinforced with glass fiber
IP 65	IP 65	IP 65	IP 65
IK 10	IK 10	IK 10	IK 10
RAL 7032	RAL 7032	RAL 7032	RAL 7032
Electrical Properties			
1000 VDC	1000 VDC	1000 VDC	1000 VDC
10.5 A	13 A	14 A	11 A
80 A (DC21B 1000V)	100 A + 100A (DC21B 1000V)	315 A (DC21B 1000V)	400 A (DC21B 1000V)
Type II / Up < 3,2kV @ 5kA	Type II / Up < 3,2kV @ 5kA	Type II / Up < 3,2kV @ 5kA	Type II / Up < 3,2kV @ 5kA
Cat. III	Cat. III	Cat. III	Cat. III
IP 20	IP 20	IP 20	IP 20
Inputs			
6	12	18	28
-	-	-	-
MC4 Connectors	MC4 Connectors	MC4 Connectors	MC4 Connectors
yes	yes	yes	yes
Outputs			
1	2	1	1
FSPDB2A (2.5-70mm ²)	FSPDB2A (2.5-70mm ²)	FSPDB4A (16-185mm ²)	FSPDB4A (16-185mm ²)
M32 connection, IP68, Ø: 11-21mm	M32 connection, IP68, Ø: 11-21mm	M40 connection, IP68, Ø: 19-28mm	M40 connection, IP68, Ø: 19-28mm
M16 connection, IP68, Ø: 4.5-10mm	M16 connection, IP68, Ø: 4.5-10mm	M20 connection, IP68, Ø: 7-13mm	M20 connection, IP68, Ø: 7-13mm
String Monitoring			
1 HMMC6A	1 HMMC6A + 1 HMAC6A	1 HMMC6A + 2 HMAC6A + 1 HMPC8A	1 HMMC6A + 4 HMAC6A
optional	yes	yes	yes
optional	yes	yes	yes
-	-	yes	-
self-supplied	self-supplied	24 VDC ±10%	self-supplied
Environmental			
2 climatic valves IP68	2 climatic valves IP68	2 climatic valves IP68	2 climatic valves IP68
1 water drain plug IP55	1 water drain plug IP55	1 water drain plug IP55	1 water drain plug IP55
-20°C to +40°C	-20°C to +45°C	-20°C to +45°C	-20°C to +40°C
IEC 61439-2, Class II	IEC 61439-2, Class II	IEC 61439-2, Class II	IEC 61439-2, Class II
HM6IT80SP10X	HM122IT100SP10X	HM18IT315SP10X	HM18IT315SP10X

PRODUCT OFFERING

Greeneye Greenbrain

PV Safety Solution

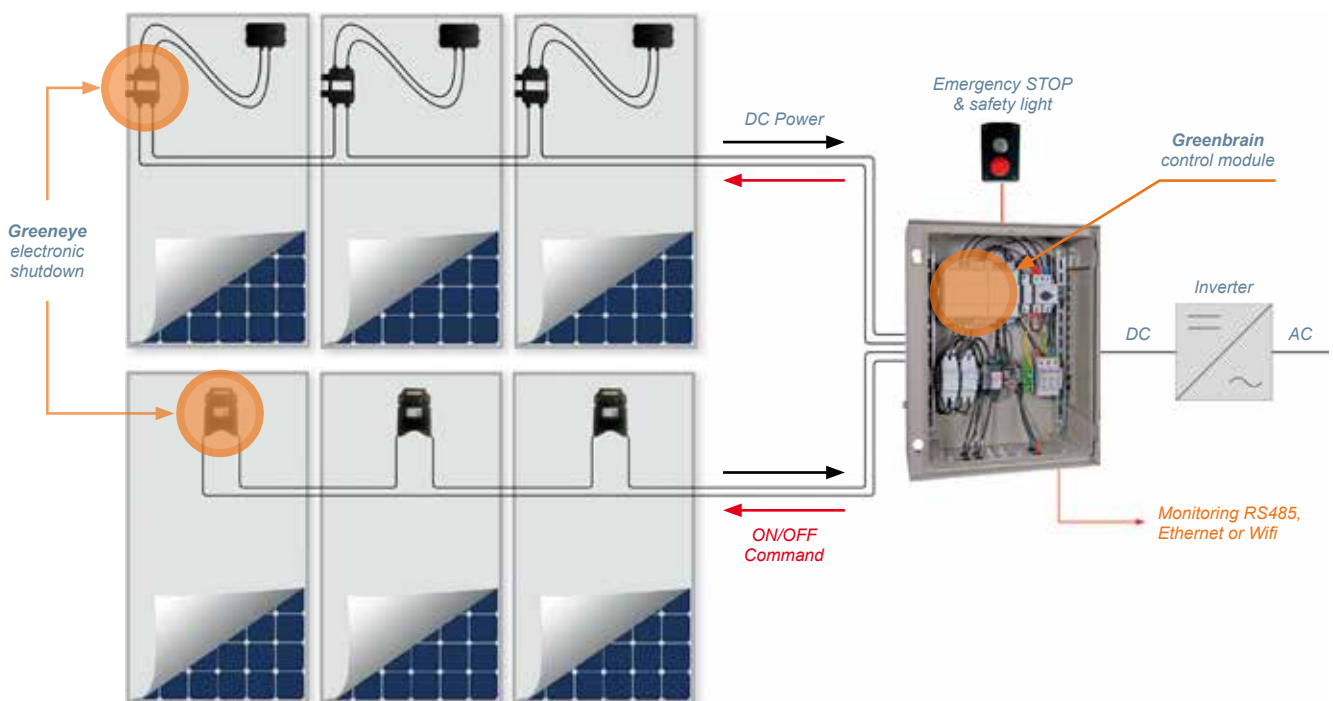
Protection system for workers, electricians and firefighters against electrocution hazards, providing an individual shutdown feature per PV module to reduce PV module output current and voltage down to zero.

Total Safety Solution

- Individual shutdown of each PV module: **0VDC & 0A**
- **Failsafe** safety system with **25 year warranty**
- Emergency stop and safety light control
- Control input from DC arc fault detector
- Control over DC wires through PLC
- Monitoring at PV module level
- Modular solution

Certified Safety

- SIL2 according to IEC 51508-1 and IEC 51508-2
- Fire Safety Compliance
 - UTE C15 712-1:2013-07
 - VDE-AR-E 2100-712:2013-05
 - ÖVE R11-1:2013-03
 - NEC 2014 revision
- Easy installation: plug & play



PRODUCT OFFERING

Greeneye Greenbrain

PV Safety Solution



Greeneye Add-On module

When connected to a PV module, the Greeneye smart PV switch provides an individual shutdown feature of that module through a control over the DC string wires. It is a failsafe safety system designed according to **SIL2** safety standard. The Greeneye Add-On module is available with several PV connector options for an easy and fast installation.

Cat. Number	Reference	Ordering Information	Package
HGEME80V12AX	X1038631	Add-On module with Multi-Contact MC4 connectors	12
HGEME80V12AZ	Z1038633	Add-On module with HUBER+SUHNER RADOX® connectors	12
HGEME80V12AY	Y1038632	Add-On module with Amphenol Helios H4 connectors	12



Greeneye Embedded module

When connected to a PV module, the Greeneye smart PV switch provides an individual shutdown feature of that module through a control over the DC string wires. It is a failsafe safety system designed according to **SIL2** safety standard. The Greeneye embedded in the modular PV junction box RADOX® Blue-Safety from HUBER+SUHNER AG is using three cool bypass diodes to reduce power dissipation.

Cat. Number	Reference	Ordering Information	Package
HGEHS80V12AX	A1038634	Embedded module with Multi-Contact MC4 connectors	20
HGEHS80V12AZ	C1038636	Embedded module with HUBER+SUHNER RADOX® connectors	20
HGEHS80V12AY	B1038635	Embedded module with Amphenol Helios H4 connectors	20



Greenbrain

The **Greenbrain-C** manages the emergency stop button, the safety light and the remote control DC switch if used. The Greenbrain-C is mandatory to control and power supply to the other Greenbrain modules.

The **Greenbrain-S** manages the operating mode (ON / OFF) of the Greeneye modules through PLC system over DC wires. Each Greenbrain-S can manage 2 strings of 24 modules, limited to 1 000 VDC, 4 Greenbrain-S can be connected together to support up to 8 strings.

Cat. Number	Reference	Ordering Information	Package
HGB-C1000V	K1041495	1 Greenbrain-C to control 4 Greenbrain-S	1
HGB-S1000V12A	J1041494	1 Greenbrain-S for 2 strings of Greeneye	1

Accessories

Cat. Number	Reference	Ordering Information	Package
HGE-TEST	A1042843	GreenTester to test Greeneye installed on PV modules	1
HEL-STOP+LED	W1042310	Emergency STOP button and safety light	1
HEL-ALIM24VDC	H1042988	24Vdc power supply	1

PRODUCT OFFERING



HelioProtection® Fuse

HP10NH 1000VDC

Mersen HP10NH photovoltaic (PV) fuse series was engineered and designed specifically for the protection of photovoltaic systems. HelioProtection® HP10NH fuse links are designed for the protection of cables in a PV group of chains when a short circuit occurs in a panel (main fuse category). This HelioProtection® main fuse range enlarges our PV fuse links offering on a size having a worldwide acceptance. They are of the gPV type and comply with both IEC 60269-6 and UL 2579 PV standards.



Features Benefits

- Global acceptance
- Low fault current interrupting capability
- Temperature cycle withstand capability
- Durable construction for enhanced system longevity
- High efficiency with low power losses
- Small footprint

Applications

- All photovoltaic applications
- Inverter DC input protection
- Re-combiner applications (sub combiner, array combiner, master combiner)

Ratings

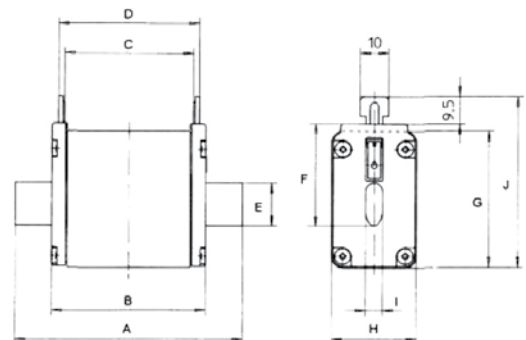
- 1000VDC
- IR = 50kA (L/R = 1ms)

Approvals

- IEC 60269-6
- UL 2579
- RoHS compliance



Size	Rated Voltage (V)	Nominal Current (A)	Class	Catalog Number	Reference Number	Watt losses @ 100% In (W)	Watt losses @ 70% In (W)	Package
NH1	1000VDC	50	gPV	HP10NH1GPV50	Z1028283	11	4.6	3
		63		HP10NH1GPV63	A1028284	13	5.4	3
		80		HP10NH1GPV80	B1028285	15	6.1	3
		100		HP10NH1GPV100	C1028286	17	7.2	3
		125		HP10NH1GPV125	D1028287	18	7.4	3
		160		HP10NH1GPV160	E1028288	23	9.6	3
NH2	1000VDC	200	HP10NH2GPV200	X1037619	27	11.3	3	
		250	HP10NH2GPV250	Y1037620	31	12.9	3	



	A	B	C	D	E	F	G	H	I	J
NH1	135	70.8	63	68	20	40	52.5	39.5	6	64.5
NH2	150	68	63	68	26	48,5	60	51	6	72

PRODUCT OFFERING

HelioProtection[®] Fuse

HP12NH – 1250VDC



Mersen HP12NH photovoltaic (PV) fuse series was engineered and designed specifically for the protection of photovoltaic systems. HelioProtection[®] HP12NH fuse-links are designed for the protection of cables in a PV group of chains when a short circuit occurs in a panel (main fuse category). This HelioProtection[®] main fuse range enlarges our PV fuse-links offering on a size having a worldwide acceptance. They are of the gPV type and comply with both IEC 60269-6 and UL 2579 PV standards.

Features Benefits

- Global acceptance
- Low fault current interrupting capability
- Temperature cycle withstand capability
- Durable construction for enhanced system longevity
- High efficiency with low power losses

Applications

- All photovoltaic applications
- Inverter DC input protection
- Re-combiner applications (sub combiner, array combiner, master combiner)

Ratings

- 1250VDC
- IR = 50kA (L/R = 1ms)

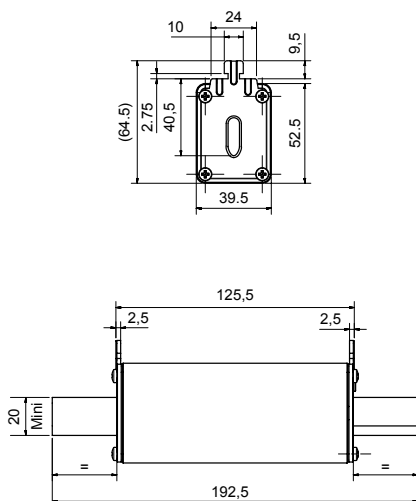
Approvals

- IEC 60269-6
- UL 2579
- RoHS compliance

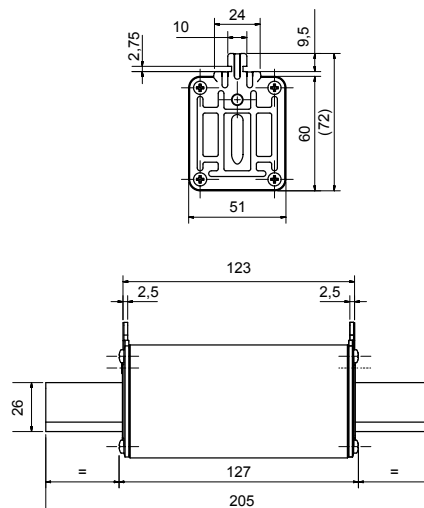


Size	Rated Voltage (V)	Nominal Current (A)	Class	Catalog Number	Reference Number	Power dissipation at 0.7xI _n	Power dissipation at I _n	Package
NH1XL	1250VDC	125	gPV	HP12NH1XLGPV125	G1039744	11.5	29	1
		160		HP12NH1XLGPV160	H1039745	14	36	1
NH2XL		200		HP12NH2XLGPV200	J1039746	16	40	1
		250		HP12NH2XLGPV250	K1039747	18	44	1
NH3L		250		HP12NH3LGPV250	Z1033389	18	46	1
		315		HP12NH3LGPV315	A1033390	22	46	1
		350		HP12NH3LGPV350	B1033391	23	55	1
		400		HP12NH3LGPV400	C1033392	29	73	1

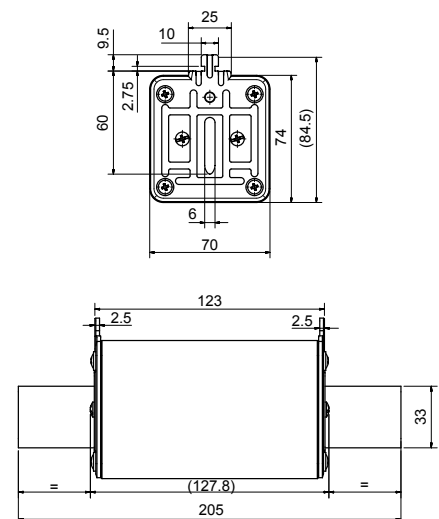
Dimensions NH1XL



Dimensions NH2XL



Dimensions NH3L



PRODUCT OFFERING



HelioProtection[®] Fuse

HP15NH – 1500VDC

Mersen HP15NH photovoltaic (PV) fuse series was engineered and designed specifically for the protection of photovoltaic systems. HelioProtection[®] HP15NH fuse links are designed for the protection of cables in a PV group of chains when a short circuit occurs in a panel (main fuse category). This HelioProtection[®] main fuse range enlarges our PV fuse links offering on a size having a worldwide acceptance. They are of the gPV type and comply with both IEC 60269-6 and UL 2579 PV



Features Benefits

- Global acceptance
- Low fault current interrupting capability
- Temperature cycle withstand capability
- Durable construction for enhanced system longevity
- High efficiency with low power losses

Applications

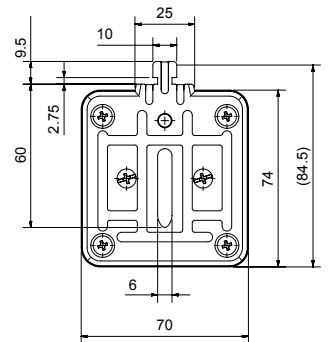
- All photovoltaic applications
- Inverter DC input protection
- Re-combiner applications (sub combiner, array combiner, master combiner)

Standards

- IEC 60269-6
- UL 2579 (pending)
- RoHS compliance

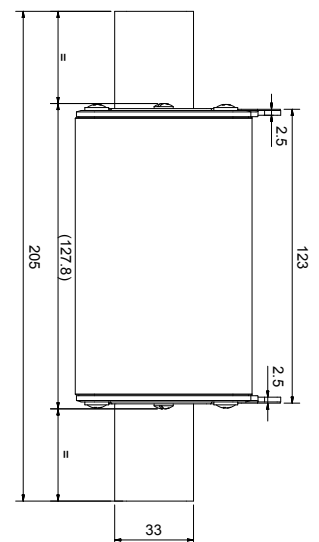


Size	Rated Voltage (V)	Nominal Current (A)	Class	Catalog Number	Reference Number	Power dissipation at 0.7xI _n	Power dissipation at I _n	Package
NH3L	1500VDC	160	gPV	HP15NH3LGPV160	H1037859	15	36	1
		200		HP15NH3LGPV200	J1037860	18	44	1
		250		HP15NH3LGPV250	K1037861	20	50	1
		315		HP15NH3LGPV315	L1037862	23	57	1
		350		HP15NH3LGPV350	M1037863	25	63	1
		400		HP15NH3LGPV400	N1037864	28	71	1



NH-fuse-links gPV 1500VDC Direct Mounting size 3L

Catalog number	Reference number	Rated current I _n	Power dissipation at 0.7xI _n	Power dissipation at I _n	Weight	Package
HP15NH3LGPV160B	T1048679	160 A	15 W	36 W	1.66 kg	1
HP15NH3LGPV200B	V1048680	200 A	18 W	44 W	1.66 kg	1
HP15NH3LGPV250B	W1048681	250 A	20 W	50 W	1.66 kg	1
HP15NH3LGPV315B	X1048682	315 A	23 W	57 W	1.66 kg	1
HP15NH3LGPV350B	Y1048683	350 A	25 W	63 W	1.66 kg	1
HP15NH3LGPV400B	Z1048684	400 A	28 W	71 W	1.66 kg	1



PRODUCT OFFERING

HelioProtection® Fuse

DC120-123 – 1000 – 1200VDC

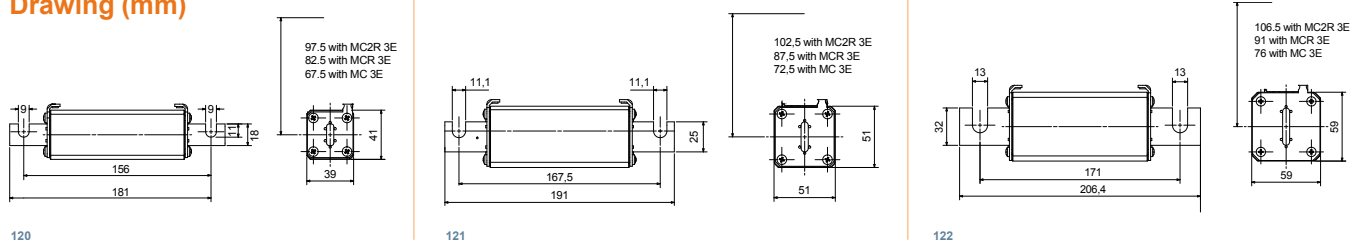


The HelioProtection® Fuse DC120-123 series are designed for the protection of cables in a PV groups of chains when a short circuit occurs in a panel.

These HelioProtection® fuse comply with the IEC 60269-1 standard and the IEC 60269-6 standard with specific mechanical dimensions. They are of the gPV type.

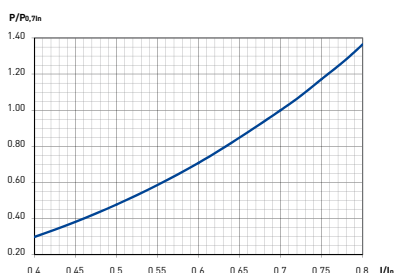
Minimum Breaking Capacity = 1.35In Maximum Breaking Capacity = 100kA										
Size	Rated Voltage	Nominal Current (A)	Class	Catalog Number EF	Reference Number EF	Catalog Number EF	Reference Number EF	Watt Losses @ In	Watt Losses @ 0.7In	Packaging
120	1200	50	gPV	DC120GPV12C050E	X1003993	DC120GPV12C050P	A1025386	20.1	8.2	1
120	1200	63	gPV	DC120GPV12C063E	Y1003994	DC120GPV12C063P	D1025389	21.1	8.6	
120	1200	80	gPV	DC120GPV12C080E	Z1003995	DC120GPV12C080P	E1025390	26.8	10.9	
121	1200	100	gPV	DC121GPV12C100E	A1003996	DC121GPV12C100P	F1025391	30.9	12.6	
121	1200	125	gPV	DC121GPV12C125E	B1003997	DC121GPV12C125P	G1025392	36.1	14.7	
121	1200	160	gPV	DC121GPV12C160E	C1003998	DC121GPV12C160P	H1025393	41.2	16.8	
121	1200	200	gPV	DC121GPV12C200E	D1003999	DC121GPV12C200P	K1025395	48.4	19.8	
121	1200	250	gPV	DC121GPV12C250E	E1004000	DC121GPV12C250P	L1025396	56.7	23.1	
122	1100	315	gPV	DC122GPV11C315E	F1004001	DC122GPV11C315P	M1025397	63.9	26.1	
123	1100	400	gPV	DC123GPV10C400E	G1004002	DC123GPV10C400P	N1025398	79.3	32.4	

Drawing (mm)

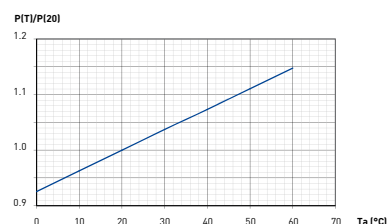


Fuse bases

Cat. Number	Nb of poles	Packaging	Insulation Voltage
SP43-120	1	1	2 500VDC
SE43-121	1	1	
SE43-122	1	1	
SF50-123	1	1	



Corrective factor for power losses vs. ambient temperature



PRODUCT OFFERING

Photovoltaic Fuse-holders

1000VDC



HPBB11PPR

NH fuse-bases for NH fuse-links gPV 1000VDC, size 1, 250A, single pole



Catalog Number	Reference Number	Power acceptance	Rated impulse withstand voltage U_{imp}	Design	Package
HPBB11PPR	A1030607	32 W	8 kV	open design, for DIN-rail or screw mounting, for NH fuse links size 1	3
HPBB11PPRFS	K1032916	32 W	8 kV	with touch protection, for DIN-rail or screw mounting, for NH fuse links size 1	3



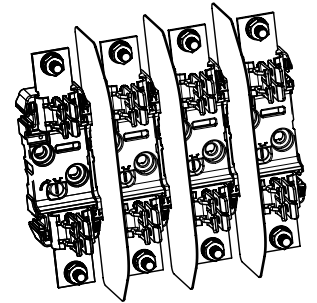
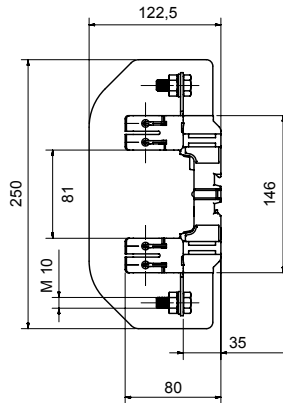
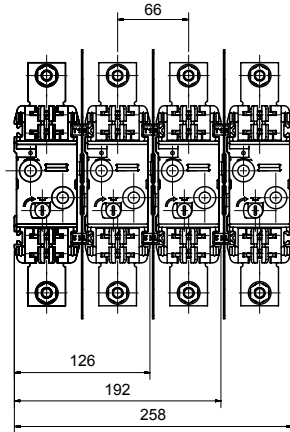
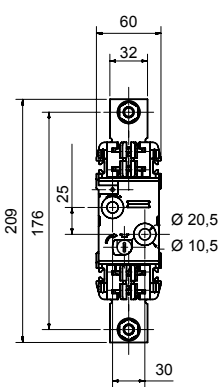
HPBB21PPR

NH fuse-bases for NH fuse-links gPV 1000VDC, size 2, 315A, single pole



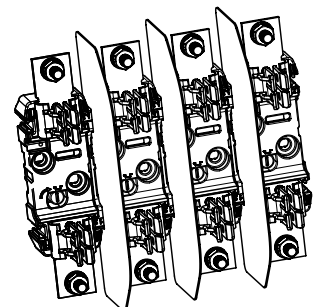
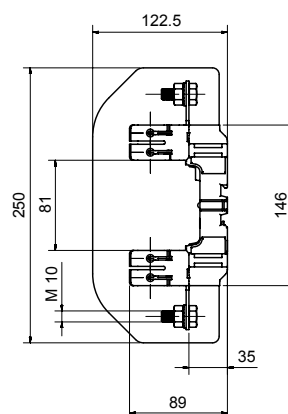
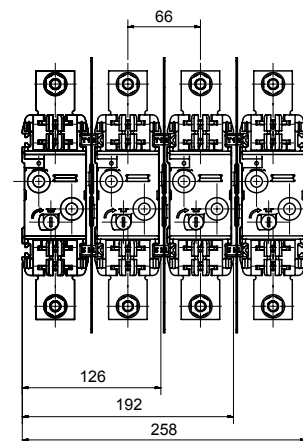
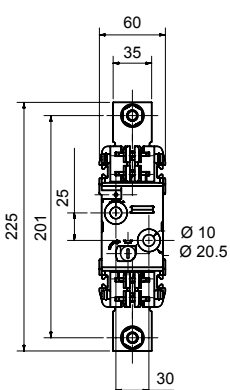
Catalog Number	Reference Number	Power acceptance	Rated impulse withstand voltage U_{imp}	Design	Package
HPBB21PPR	C1037509	45 W	8 kV	open design, for DIN-rail or screw mounting, for NH fuse links size 1 and 2	3
HPBB21PPRFS	D1037510	45 W	8 kV	with touch protection, for DIN-rail or screw mounting, for NH fuse links size 1 and 2	3

NH fuse-base for short NH fuse-links gPV, sizes 1, type PP, open design (dimensions in mm)



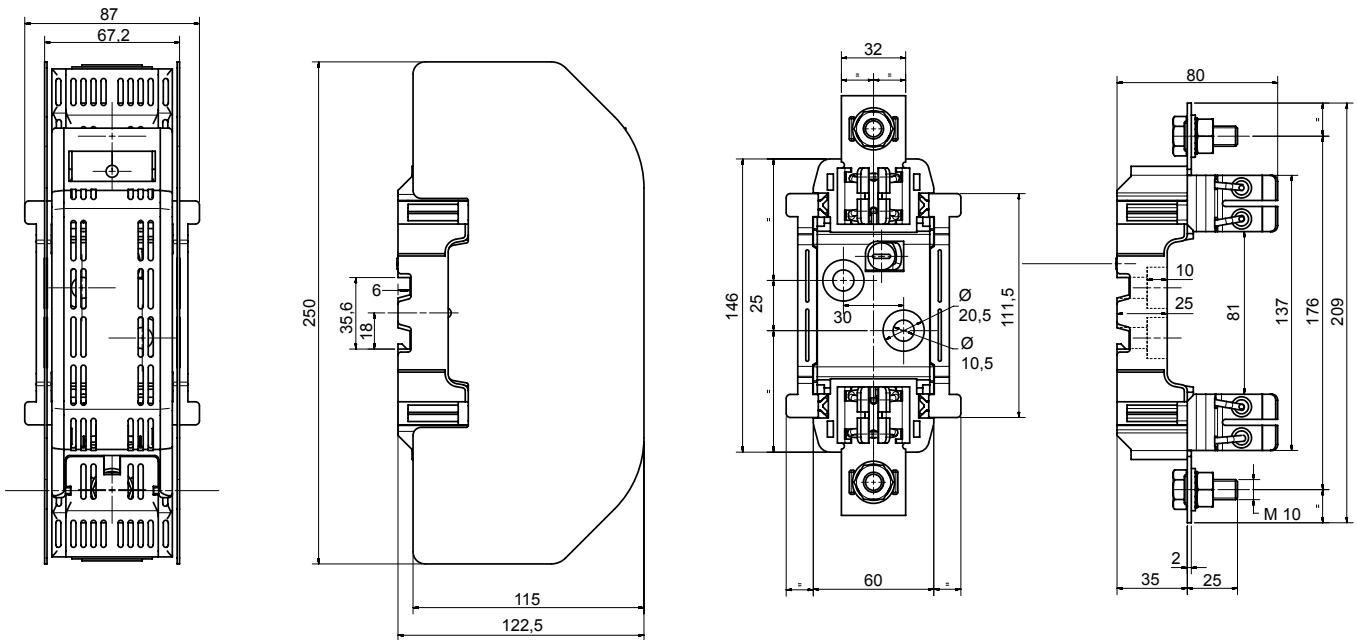
In case of multipole units in parallel without barriers a distance of 8mm must be considered between the live parts of the fuses.

NH fuse-base for short NH fuse-links gPV, sizes 2, type PP, open design (dimensions in mm)

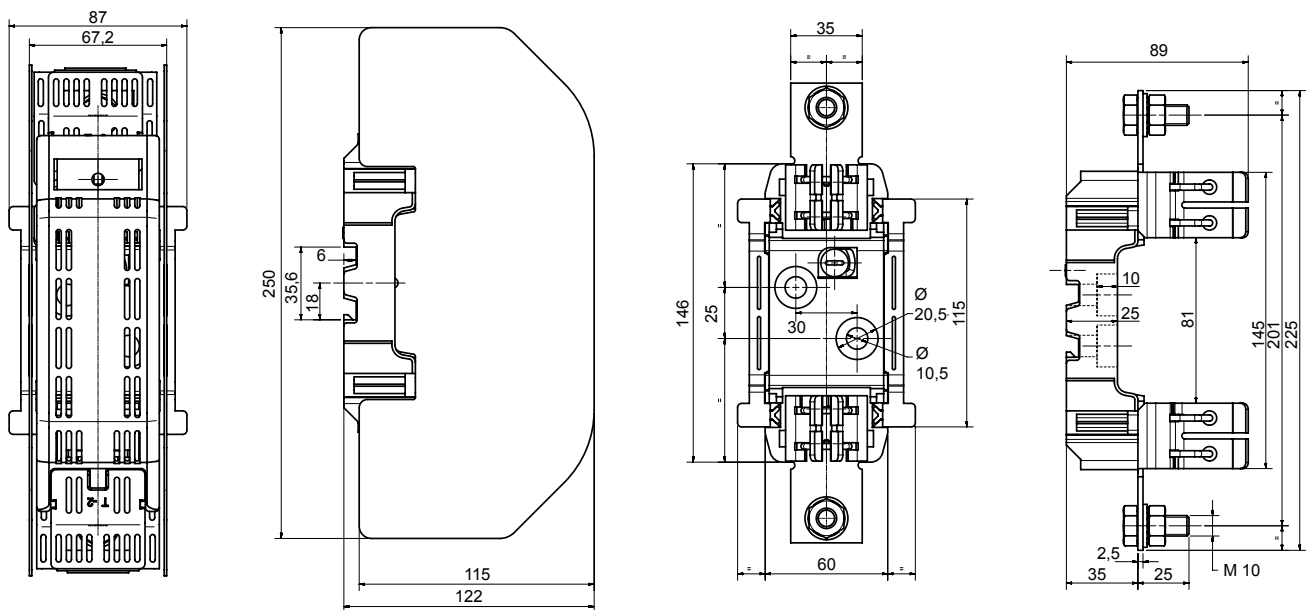


In case of multipole units in parallel without barriers a distance of 8mm must be considered between the live parts of the fuses.

NH fuse-base for short NH fuse-links gPV, sizes 1, type PP with touch protection (dimensions in mm)



NH fuse-base for short NH fuse-links gPV, sizes 2, type PP with touch protection (dimensions in mm)



NH Fuse handle for NH fuse links size 00-4



NHHANDLE

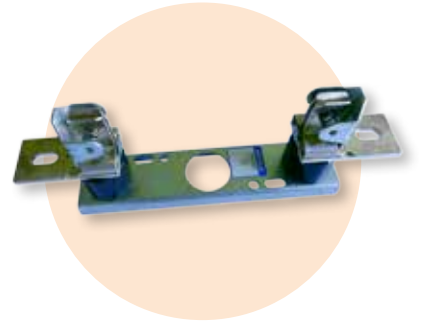


08024.000000

Catalog Number	Reference Number	Size	Design	Weight	Package
NHHANDLE	P215592	00 to 4	without arm protection to DIN VDE 0636-2, DIN VDE 608-4	279 g	5
08024.000000	X216105	00 to 4	with fire proof arm protection to DIN VDE 0636-2, DIN VDE 608-4	627 g	1

PRODUCT OFFERING

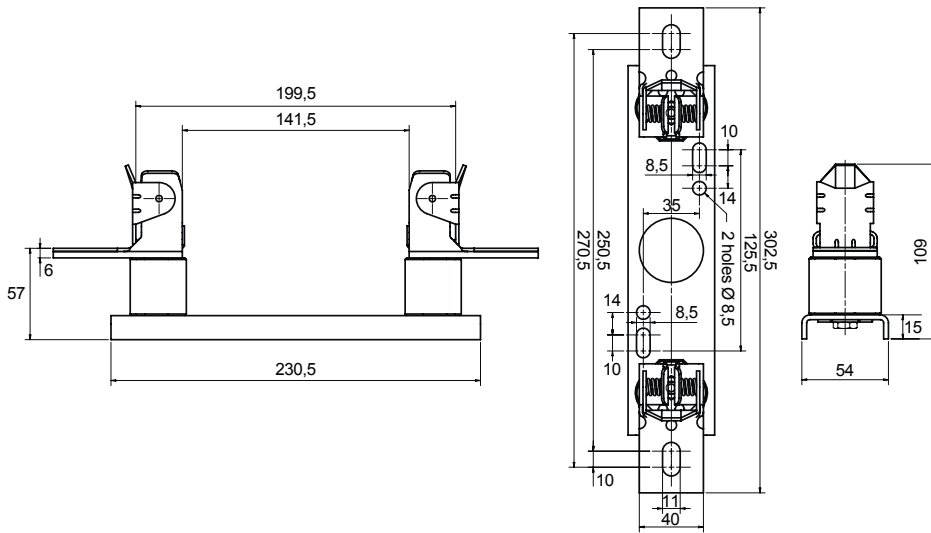
Photovoltaic Fuse-holders 1500VDC - open version



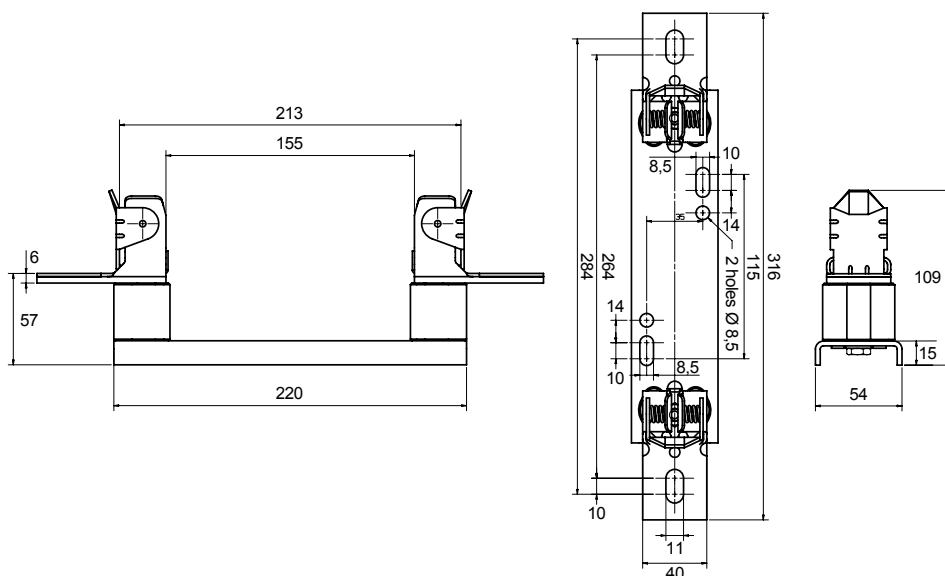
Open Fuse bases for NH long fuse-links gPV up to 1500VDC, 1 pole, SCCR 50kA

Catalog Number	Reference Number	Power acceptance	Rated impulse withstand voltage U_{imp}	Rating	Design	Package
SP36121	B1026353	59	8kV	250	open design, screw mounting, for NH1XI fuse link	1
SP36122-123	P1025054	95	8kV	630	open design screw mounting, for NH2XI and NH3L fuse links	1

Dimensions SP36121

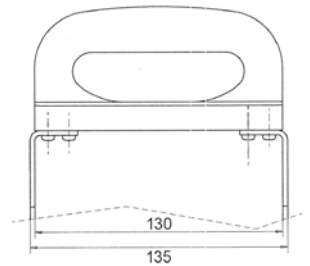
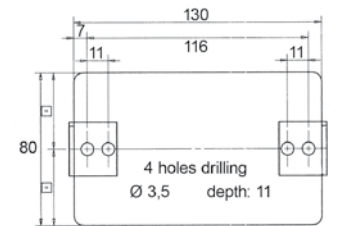


Dimensions SP36122-123



NH Fusehandle for long fuses

Catalog Number	Reference Number
POIGNEEPM12	Y210402A



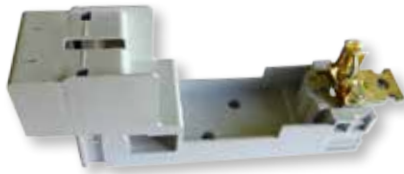
PRODUCT OFFERING

Photovoltaic Fuse-holders 1500VDC - protected version

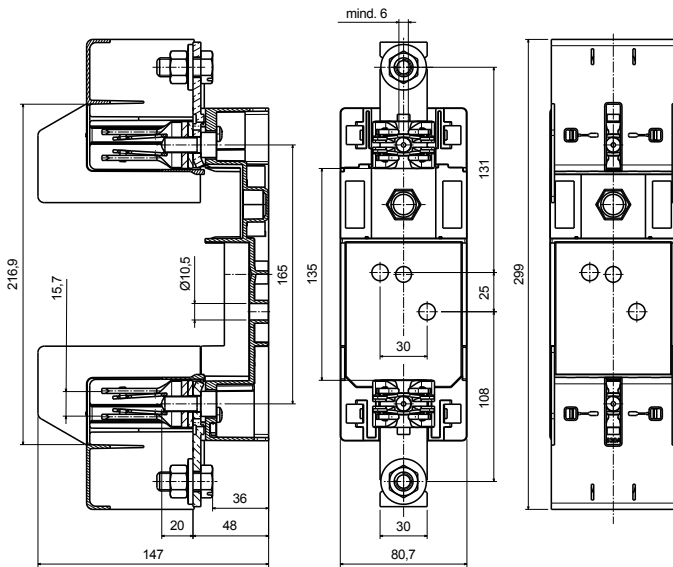
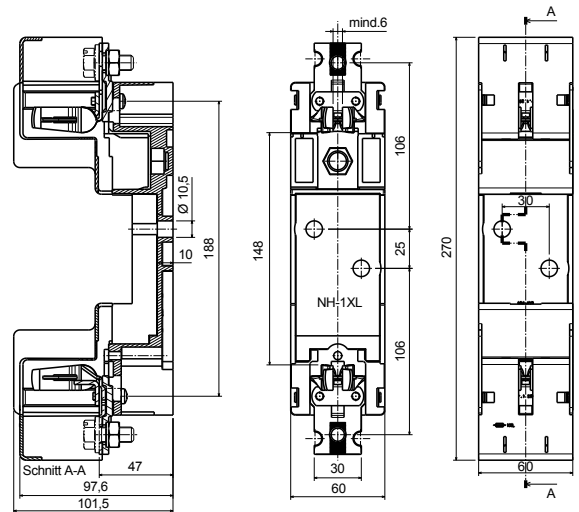
Protected fuse-bases for NH long fuse-links gPV up to 1500VDC, one pole, SCCR 15kA

Catalog Number	Reference Number	Power acceptance	Rated impulse withstand voltage U_{imp}	Rating	Design	Package
HPBB1XL1PPFS	Y1039598	40	8kV	250A	With touch protection, screwmounting, for NH1XL fuse-links*	3
HPBB2XL3L1PPFS	Z1039599	70	8kV	500A	With touch protection, screwmounting, for NH2XL and NH3L fuse-links**	3
HPBB2XL3L1PBFS	A1039600	70	8kV	500A	With touch protection, screwmounting, busbar output, for NH2XL and NH3L fuse-links	3

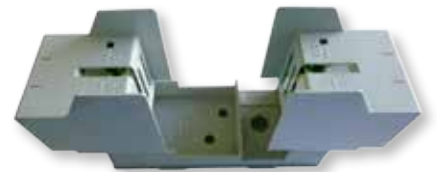
* can accept Mersen gPV fuse-links size 121 and NH2XL rated 250A with derating.
** can accept NH3L fuses up to 630A with derating.



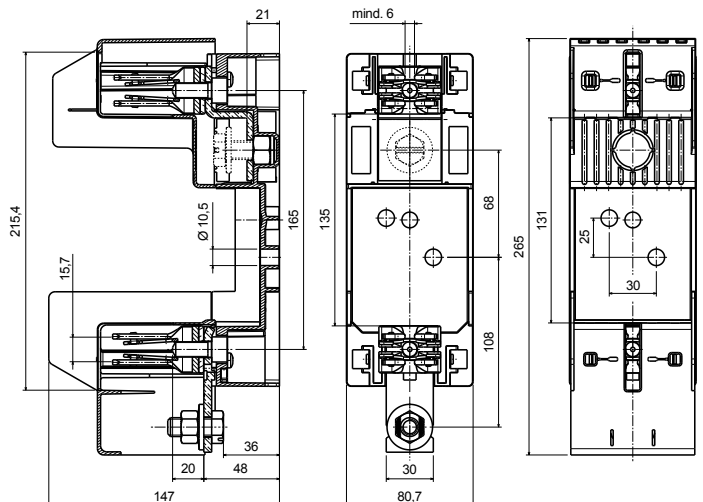
HPBB1XL1PPFS



HPBB2XL3L1PPFS



HPBB2XL3L1PBFS





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