PHOTOVOLTAIC CATALOGUE

Solutions for Control & Power

2014

socomec
Innovative Power Solutions

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An independent manufacturer

The benefit of a specialist

Founded in 1922, SOCOMEC is an industrial group with a workforce of 3000 people. Our core business - the availability, control and safety of low voltage electrical networks with increased focus on our customers' power performance.

CORPO 308 A

The culture of independence

The SOCOMEC Group's independence ensures control over its own decision-making, respecting the values advocated by its own family shareholders and shared by its employees.

With around 30 subsidiaries located on all five continents, SOCOMEC pursues international development by targeting industrial and service applications where the quality of its expertise makes all the difference.

The spirit of innovation

As undisputed specialists in UPS systems, mains supply changeover, power conversion and measurement, SOCOMEC dedicates nearly 10% of its turnover to R&D. As a result the Group can achieve its ambition of always being one technological step ahead.

The vision of a specialist

As a manufacturer with complete control over its technological processes, SOCOMEC is quite unlike the more general providers. The Group is constantly improving its fields of expertise in order to offer its clients increasingly customised, appropriate solutions.

A flexible manufacturing structure

Backed by two European centres of excellence (France and Italy), the Group also benefits from competitive production sites such as Tunisia and locations in the major emerging markets (India and China).

These sites have all implemented a system of continuous improvement based on Lean Management principles, and are therefore in a position to provide high levels of quality, and meet the deadlines and cost requirements expected by customers.

The focus on service

Our manufacturer's expertise naturally extends to a complete range of services designed to facilitate the research, implementation and operation of our solutions. Our service teams have built their reputation on reassuring guidance, flexible skills and reactivity.

Responsible growth

As a Group which is open to all cultures and firmly committed to human values, SOCOMEC promotes employee initiative and commitment. Working relationships are based on the idea of partnerships and respect for shared ethics. Through the company's commitment to achieving harmonious, lasting development, SOCOMEC fully embraces its responsibilities not only towards its shareholders, employees, customers and partners, but also towards society as a whole and its environment.

SOCOMEC has been a signatory to the Global Compact since 2003.

ENERGY SPECIALIST SINCE 1922

THE GLOBAL COMPACT WE SUPPORT

Four key applications: the know-how of a specialist

Critical Power

Ensuring the availability of high-quality power for critical applications.

Thanks to the company's wide range of continuously evolving products, solutions and services, SOCOMEC are experts in the three essential technologies that can ensure the high availability of supply to critical facilities and buildings i.e.:

- uninterruptible power supplies (UPS) that provide high-quality power and reduce distortion and interruptions to the mains supply due to their power storage backup,
- changeover of high availability sources to transfer supply to an operational backup source,
- continuous monitoring of installation facilities to prevent failures and reduce operating losses.


SITE 628A

Power Control & Safety

Managing power and protecting individuals and property.

SOCOMEC's expertise in this domain is unquestionable; the company is an undisputed leader in power switching and changeover functions, and has been a specialist manufacturer of electrical equipment since 1922. The company has long defended the benefits of fuse protection for individuals and property, and has become a major player in cutting-edge technology such as the monitoring and detection of insulation defects. SOCOMEC guarantees solutions and services which are both relevant and efficient.


APPLI 575A

Solar Power

Guaranteeing the safety and durability of photovoltaic (PV) facilities.

As experts in the solar energy equipment field, SOCOMEC has all the specialist know-how for implementing key strategic functions in on-grid and off-grid PV facilities, including:

- safety, through specially designed switch disconnectors to cut the DC current generated by solar panels regardless of the facility configuration and operating conditions,
- the reliability of DC facilities thanks to solutions preventing the degradation of insulation and electric arc failure in DC current,
- control of very high-efficiency energy conversion, via PV inverters, to transform all energy generated by the solar panels into power to be consumed locally or re-injected into the national grid,
- PV production and energy storage solutions for on-grid and off-grid applications.


SITE 441A

Energy Efficiency

Improving building and facility energy efficiency.

SOCOMEC solutions, ranging from sensors to the wide choice of innovative, modular software packages, are driven by experts in energy efficiency. They meet the essential requirements of managers or operators of tertiary, industrial or local authority buildings, and make it possible to:

- measure power consumption, identify sources of excess consumption, and raise occupant awareness,
- limit reactive energy and prevent associated tariff penalties,
- use the best tariffs, check supplier invoicing and accurately distribute energy bills amongst consumer entities.


APPLI 576A

A cutting-edge laboratory

The backing of an expert

Since 1965, the Pierre Siat test laboratory has used its expertise to guarantee the reliability and conformity of SOCOMEC products and solutions. Our customers are also welcome…

CORPO 342 A

A decisive link

Located at the Company's headquarters in Benfeld (France), the Pierre Siat test laboratory is one of SOCOMEC's main quality pillars: its contribution to the development, qualification and certification phases plays a decisive role in the process leading to the creation of a product or solution.

Global scale

This totally independent laboratory is recognised by the major certification bodies worldwide: a member of the ASEFA(1) and the LOVAG(2), it is accredited by COFRAC(3), UL (CTDP(4)), CSA (shared certification) and KEMA (SMT/WMT(5)). It also works in partnership with numerous international certification organisations(6). The quality and safety requirements specific to each country are therefore fully taken into account.

Specialist facilities

With its 100 MVA (Idc 100 kA rms 1 s) short-circuit platform, three 10 kA overload platforms and numerous other test instruments in facilities covering 1500 m^2, the Pierre Siat laboratory is currently the 2nd French power laboratory. It combines expertise in electricity and mechanics, pneumatics and computing.

Ongoing commitment

To adapt to the increasingly demanding standards and ever more innovative and high-performance products, the Pierre Siat laboratory is permanently extending the scope of its tests, investing whenever necessary in new equipment.

A vast range of tests

The laboratory submits all SOCOMEC products and solutions (including those in enclosures) to numerous tests in the following fields:

- functional: component resistance and operating tests,
- dielectric: immunity to interference, dielectric insulation, overvoltage, overcurrent,
- mechanical: endurance and mechanical shocks, etc.,
- environment: functional or electrical tests under extreme conditions (temperatures, salt spray, etc.), vibrations,
- AC/DC endurance: in operation and under controlled temperatures (arcs, LV/HV power cuts, etc.),
- temperature rise,
- electromagnetic compatibility (EMC),
- metrology,
- safety: flammability, etc.

Conducted during the design and production phases, these tests guarantee the long-term reliability of the equipment sold.

Customized services

These test facilities and expertise are also available to our partners who require assistance with the qualification and certification of their products or equipment.

We issue certificates of conformity and performance declarations upon request.

For more information, visit our web site:
www.socomec.com/testing-laboratory_en.html

(1) Association des Stations d'Essais Françaises d'Appareils électriques basse tensio (French association of low voltage electrical equipment test stations)
(2) Low Voltage Agreement Group
(3) Comité Français d'Accréditation (French accreditation body)
(4) Client test data programme
(5) Supervised Manufacturer's testing/Witnessed manufacturer's testing
(6) KEMA, CEBEC, UL, CSA, ASTA, Lloyd's Register of Shipping, Bureau Véritas, BBJ-SEP, EZU, GOST-R, etc.

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to be directly connected to our solutions

1. **Find out about products, services and systems meeting the requirements of applications for which we have a real expertise**
2. **Download documentations, pictures, logos and CAD files**
3. **Find and contact the nearest Socomec contact**
4. **Find answers to technical questions (FAQ)**
5. **Find out about our job offers**
6. **Get informed about our news: products, events and advice**

Find out more on

100% mobility

Access multimedia contents from your smartphone by scanning the codes available in our catalogues or documentations.

How?

1. Download
a QR code application from your mobile phone (QR Code Sanner Pro, Mobiletag, ScanLife flashcode, etc.).

2. Scan

3. Browse!
A few examples:

Flash banner for ATyS transfer switch

FLCD_URL_048_A_GB

Download section on the Socomec website

FLCD_URL_004_A_GB

Banners Software
Selection guides Photos
Brochures Videos
User guides **Tutorials**

SIRCO MC PV IEC

Load break switches for photovoltaic applications up to 1000 VDC and 40 A

new

***SIRCO MC PV** 25 A - 1000 VDC*
DIN rail mounting

***SIRCO MC PV** 25 A - 1000 VDC*
Door mounting

Function

SIRCO MC PV are DC load break switches. They make and break under load conditions and provide optimum safety isolation for any PV circuit.

Advantages

Compact

Thanks to its compact design, the limitation of space within the combiner box or the solar inverter is greatly reduced.

High breaking capacity up to 1000 VDC.

- Making and breaking capacity under load conditions up to 1000 VDC.
- Specific photovoltaic test beyond requirements by standard IEC 60947-3.

Safety

- Pre-bridging is factory-achieved for easier, quicker and safer connection.
- Direct access to connection terminals for adequate tightening.

Easy mounting

Three mounting possibilities are available for optimum integration and time saving:

- DIN rail or back plate mounting.
- Door mounting.
- “Quick Fix” mounting to save time when integrating into solar inverters.

SIRCO MC PV
DIN-rail mounting

SIRCO MC PV
Door mounting

The solution for

> Residential buildings.
> Buildings.
> Solar parks.

Strong points

> Compact.
> High breaking capacity up to 1000 VDC.
> Safety.
> Easy assembling.

Check it out!

> Need an enclosed switch? No problem with our specific product department. We have solutions for any requirement.

Conformity to standards

> IEC 60947-3
> UL508i(1)

(1) Please consult us.

Approvals and certifications

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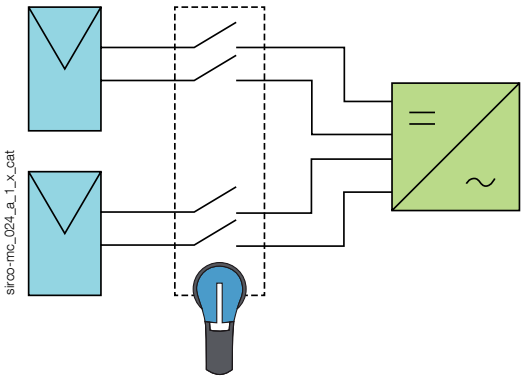
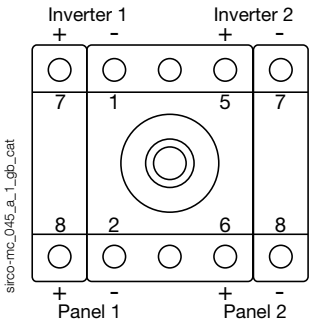
Multi-circuit breaking

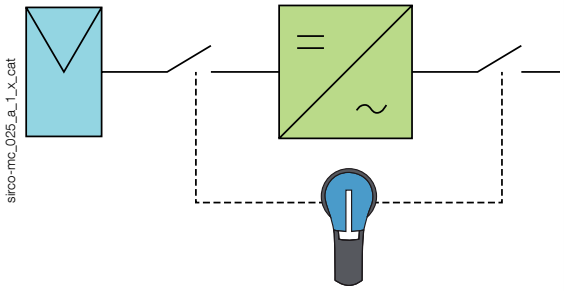
- The SIRCO MC PV for double circuits (2 MPPT: Maximum Power Point Tracking) enables connection of two independent photovoltaic panel strings to a single switch in order to reduce the costs of the global solution.

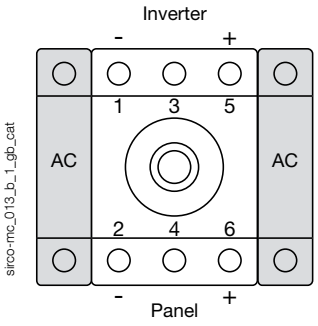




Complete inverter isolation with a single operation

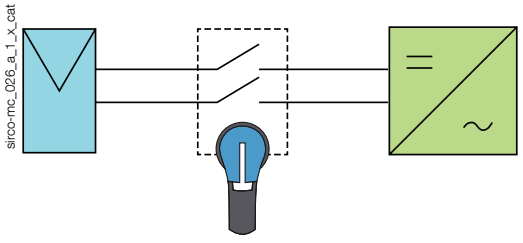
- The SIRCO MC PV with two additional AC poles can be integrated into the inverter to provide complete and simultaneous isolation of the PV and AC circuits. This improves safety and reduces the overall product size.

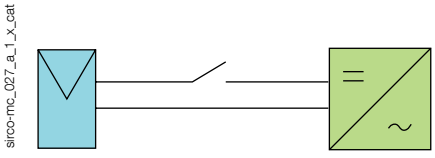




What you need to know

For grounded or ungrounded networks:
It is possible to use the SIRCO MC PV in both network systems, either switching one or both polarities.





References

SIRCO MC PV 600 VDC - DIN rail or back plate mounting

Rating (A)	Circuit type	Number of poles by PV polarity(3)	No of poles AC current	Switch body	Direct handle(1)	External handle	Shaft for external handle	Auxiliary contact
30 A	Single PV circuit	1 P+, 1 P-	-	21PV **2102**	MC0 type Blue 2119 **0012**(2) Blue MC01 type 2119 **1012**	MC1 type Black IP65 2119 **3312**(2) Red / Yellow IP65 2119 **3313**	165 … 200 mm 2107 **0516**	1 contact NC+NO 2119 **0001**
	PV + AC circuit	1 P+, 1P-	2 P	21PV **2162**				
	Double PV circuit	2 x (1P+, 1P-)	-	21PV **5102**				
40 A	Single PV circuit	2 P+, 1 P-	-	21PV **3124**				
	PV + AC circuit	2 P+, 1 P-	2 P	21PV **3184**				
	Double PV circuit	2 x (1P+, 1P-)	-	21PV **6124**	Blue MC01 type 2119 **1412**			

(1) 45 mm modular DIN front plate included.
(2) Standard handle.
(3) Default connected device (see "Connection of poles" page 18).

SIRCO MC PV 1000 VDC - DIN rail or back plate mounting

Rating (A)	Circuit type	Number of poles by PV polarity(3)	No of poles AC current	Switch body	Direct handle(1)	External handle	Shaft for external handle	Auxiliary contact
25 A	Single PV circuit	2 P+, 1 P-	Please consult us	21PV **3722**	Blue MC0 type 2119 **0012**(2) Blue MC01 type 2119 **1012**	Black MC1 type IP65 2119 **3312**(2) Red / Yellow IP65 2119 **3313**	165 … 200 mm 2107 **0516**	1 contact NO + NC 2119 **0001**
	Double PV circuit	2 x (1P+, 1P-)		21PV **6722**	Blue MC01 type 2119 **1412**			
40 A	Single PV circuit	2 P+, 2 P-		21PV **4754**	Blue MC0 type 2119 **0012**(2) Blue MC01 type 2119 **1012**			
	Double PV circuit	2 x (2 P+, 2 P-)		21PV **8154**	Blue MC01 type 2119 **1412**			

(1) 45 mm modular DIN front plate included.
(2) Standard handle.
(3) Default connected device (see "Connection of poles" page 18).

SIRCO MC PV 600 VDC - Door mounting

Rating (A)	Circuit type	Number of poles by PV polarity(1)	No of poles AC current	Switch body	External handle "switch body"	Switch body "Quick Fix"	External handle "Quick Fix"	Auxiliary contact
30 A	Single PV circuit	1 P+, 1 P-	-	21PV **2202**	Blue MC2 type IP55 2129 **0112**(2)	21PV **2302**	Blue MC3 type IP65 2139 **1212**(2) Black MC4 type IP65 2139 **3312** Red/Yellow IP65 2139 **3313**	1 contact NC+NO 2129 **0001**
	PV + AC circuit	1 P+, 1 P-	2 P	21PV **2262**		21PV **2362**		
	Double PV circuit	2 x (1P+, 1P-)	-	21PV **5202**		21PV **5302**		
40 A	Single PV circuit	2 P+, 1 P-	-	21PV **3224**		21PV **3324**		
	PV + AC circuit	2 P+, 1 P-	2 P	21PV **3284**		21PV **3384**		

(1) Default connected device (see "Connection of poles" page 18).
(2) Standard handle.

SIRCO MC PV 1000 VDC - Door mounting

Rating (A)	Circuit type	Number of poles by PV polarity(1)	No of poles AC current	Switch body	External handle "switch body"	Switch body "Quick Fix"	External handle "Quick Fix"	Auxiliary contact
25 A	Single PV circuit	2 P+, 1 P-	Please consult us	21PV **3822**	Blue MC2 type IP55 2129 **0112**	21PV **3922**	MC3 type Blue IP65 2139 **1212**(2) Black MC4 type IP65 2139 **3312** Red/Yellow IP65 2139 **3313**	1 contact NC+NO 2129 **0001**
40 A	Single PV circuit	2 P+, 2 P-		21PV **4854**		21PV **4954**		

(1) Default connected device (see "Connection of poles" page 18).
(2) Standard handle.

Accessories

Direct operation handle

Use

The direct operation conversion kit requires an additional 4 mm distance on each side of the 2 and 3 pole device.

Rating (A)	Handle colour	Type of locking	Handle	45 mm modular DIN front plate	Reference
25 … 40	Blue	-	MC0 type	yes	2119 **0012**(1)
25 … 40	Blue	1 padlock Ø 5 mm	MC01 type	yes	2119 **1012**

(1) Standard handle.

MC0 handle

acces_305_a_1_cat

2 MPPT 600 V

Rating (A)	Handle colour	Type of locking	Handle	45 mm modular DIN front plate	Reference
30	Blue	-	MC0 type	yes	2119 **0012**
30	Blue	1 padlock Ø 5 mm	MC01 type	yes	2119 **1012**
40	Blue	1 padlock Ø 5 mm	MC01 type	yes	2119 **1412**

MC01 handle

acces_293_a_1_cat

2 MPPT 1000 V

Rating (A)	Handle colour	Type of locking	Handle	45 mm modular DIN front plate	Reference
25 … 40	Blue	1 padlock Ø 5 mm	MC01 type	yes	2119 **1412**

Door interlocked external operation

Use

The external control will force the operator to safely disconnect and isolate the solar cell strings prior to any intervention.
External controls are user-friendly and adapted to meet requirements of residential installations, large roofs and ground-based generators.

DIN rail or back plate mounting

Rating (A)	Handle	Handle colour	Type of locking	External IP(1)	Reference
25 … 40	MC1 type	Black	3 padlocks Ø9 mm	IP65	2119 **3312**(2)(3)
25 … 40	MC1 type	Red/Yellow	3 padlocks Ø9 mm	IP65	2119 **3313**(3)
25 … 40	S000 type	Black	3 padlocks Ø6 mm	IP55	1461 **5111**
25 … 40	S000 type	Black	3 padlocks Ø6 mm	IP65	1463 **5111**
25 … 40	S000 type	Red/Yellow	3 padlocks Ø6 mm	IP65	1464 **5111**

(1) IP : protection degree according to IEC 60529 standard.
(2) Standard handle.
(3) No padlocking.

S000 handle

acces_307_a_1_cat

Door mounting

Rating (A)	Handle	Handle colour	Type of locking	External IP(1)	Reference
25 … 40	MC2 type	Blue	-	IP55	2129 **0112**(2)

(1) IP : protection degree according to IEC 60529 standard.
(2) Standard handle.

MC4 handle

acces_302_a_1_cat

"Quick Fix" door mounting

Rating (A)	Handle	Handle colour	Type of locking	External IP(1)	Reference
25 … 40	MC3 type	Blue	1 padlock Ø5 mm	IP65	2139 **1212**(2)
25 … 40	MC4 type	Black	3 padlocks Ø9 mm	IP65	2139 **3312**
25 … 40	MC4 type	Red/Yellow	3 padlocks Ø9 mm	IP65	2139 **3313**

MC2 handle

acces_306_a_1_cat

Shaft for external handle

Use

MC1 and S000 shafts can be adjusted and cut depending on the need.

Shaft length

MC1 type:

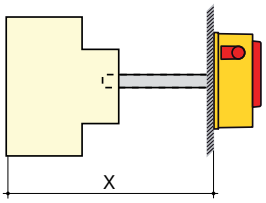
- 165 mm (ajustable up to 177 mm)

S000 type:

- 150 mm
- 200 mm
- 320 mm

S000 type shaft

acces_297_a_1_cat



acces_308_a_1_x_cat

DIN rail or back plate mounting

Rating (A)	Handle	Dimension X (mm)	Length (mm)	Reference
25 … 40	MC1 type	249 … 259	165	2107 **0516**
25 … 40	S000 type	234 … 246	150	2107 **0515**
25 … 40	S000 type	284 … 496	200	2107 **0520**
25 … 40	S000 type	404 … 416	320	2107 **0532**

Terminal shrouds

Use

Top or bottom protection against direct contact with the terminals or connection parts.
1 and 3 poles are available.

The SIRCO MC PV load break switch is pre-bridged. Terminal covers are mounted on the top or bottom free space of the device.

Possibility to assemble a terminal shroud on the bridge side by removing the insulating material of the series connection bar (irreversible step).

acces_299_a_1_cat

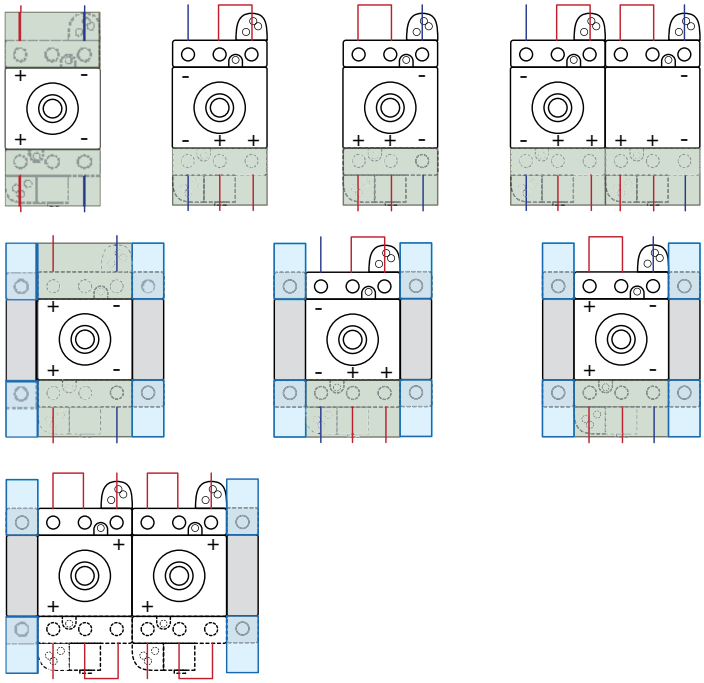
Terminal shrouds 1 pole

acces_300_a_1_cat

Terminal shrouds 3 pole

For SIRCO MC PV

Rating (A)	Type of mounting	No. of poles	Position	Reference
25 … 40	rail / door mounting	1 P	top or bottom	2194 **1004**
25 … 40	rail / door mounting	3 P	top or bottom	2194 **3004**



sirco-mc_011_e_1_cat

Accessories (continued)

Auxiliary contact

Use

These auxiliary contacts signalling position 0 and 1 can be normally open or normally closed contacts. They can be fixed on the left or right side of the switch body and/or on the power additional pole.

Connections

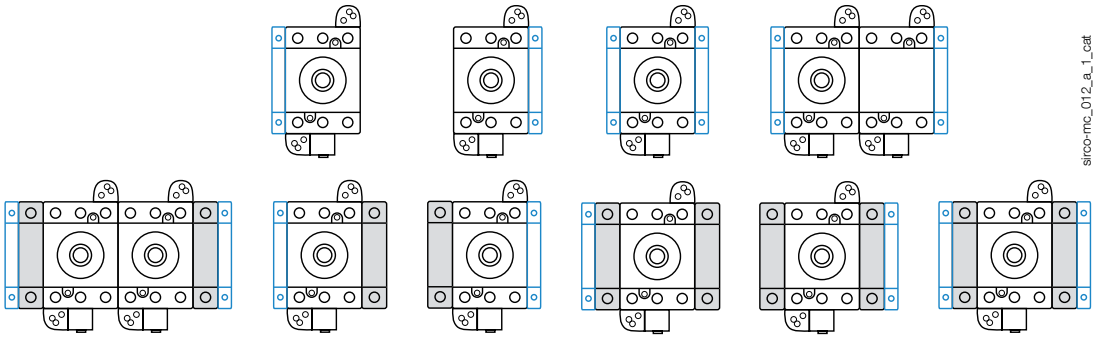
Min./max cross-sections: 1 mm²/4 mm²
Tightening torque: 0.6 Nm

Rating (A)	Type of mounting	Contact(s)	Contact type	Reference
25 … 40	DIN-rail / back plate mounted	1 contact	NO + NC	2119 **0001**
25 … 40	Door mounted	1 contact	NO + NC	2129 **0001**

Characteristics according to IEC 60947-5-1

Rating (A)	Contact type	Thermal current I_{th} (A)	Operating current I_e (A) 230 VAC AC-15	400 VAC AC-15	690 VAC AC-15
25 … 40	NO + NC	16	6	4	2

Auxiliary contacts configurations



Characteristics according to IEC 60947-3

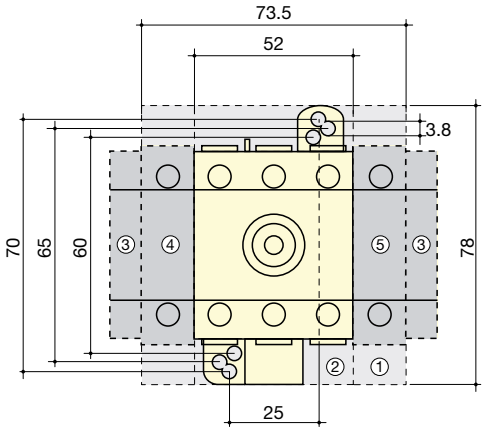
25 to 40 A

Thermal current I_{th} at 40°C(1)					25 A	30 A	40 A
Rated insulation voltage U_i (V)					1000	1000	1000
Rated impulse withstand voltage U_{imp} (kV)					8	8	8
Rated operational currents I_e (A)							
Rated voltage	**Utilization category**	**Circuit type**	**Number of poles of the device**	**Number of pole(s) in series per polarity**	**(A)**	**(A)**	**(A)**
600 VDC	DC-21 B	Single PV circuit	2 P	1 P+ and 1 P-	-	30	-
600 VDC	DC-21 B	Single PV circuit	3 P	2 P + and 1 P -	-	-	40
600 VDC	DC-21 B	Double PV circuit	4 P	2 x (1 P+ and 1 P-)	-	30	-
600 VDC	DC-21 B	Double PV circuit	6 P	2 x (2 P+ and 1 P-)	-	-	40
1000 VDC	DC-21 B	Single PV circuit	3 P	2 P + and 1 P -	25	-	-
1000 VDC	DC-21 B	Single PV circuit	4 P	2 P + and 2 P -	-	-	40
1000 VDC	DC-21 B	Double PV circuit	6 P	2 x (2 P+ and 1 P-)	25	-	-
1 000 VDC	DC-21B	Double PV circuit	8 P	2 x (2 P+ and 2 P-)	-	-	40
Connection							
Minimum Cu cable cross-section					1.5	1.5	1.5
Maximum Cu cable cross-section (mm²)					10	10	10
Tightening torque mini / maxi (Nm)					1.2	1.2	1.2
Mechanical characteristics							
Durability (number of operating cycles)					30 000	30 000	30 000
Operating effort (Nm)					0.8	0.8	0.8
Weight of 2 pole PV device (kg)					0.110	0.110	-
Weight of a 3 pole PV device (kg)					0.125	0.125	0.125
Weight of 2 a pole PV and 2 pole AC device (kg)					0.180	0.180	-
Weight of a 3 pole PV and 2 pole AC device (kg)					-	-	0.195
Weight of a 4 pole PV device (kg)					-	-	0.160
Weight of a 4 pole PV device, double PV circuit (kg)					0.145	0.145	-
Weight of a 6 pole PV device, double PV circuit (kg)					-	-	0.250
Weight of a 8 pole PV device, double PV circuit (kg)							0.320

(1) For other temperatures: Please consult us.

Dimensions

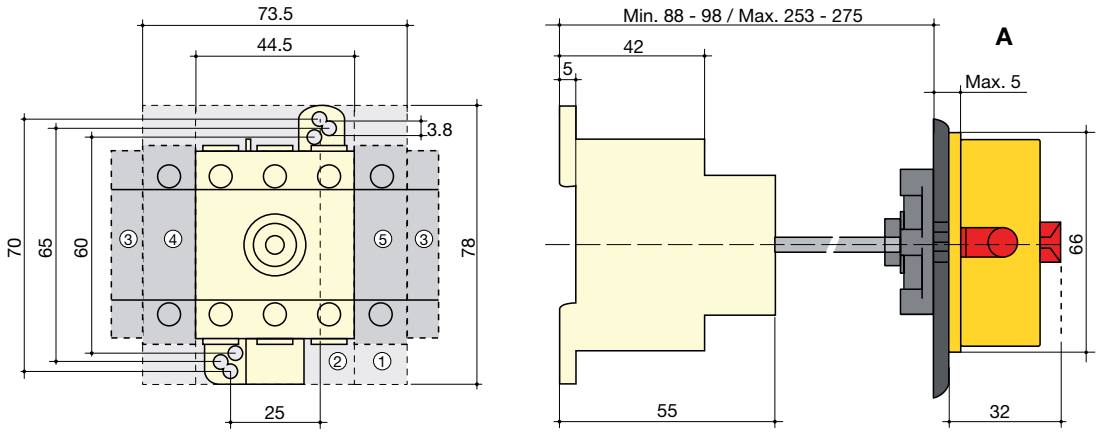
DIN rail mounting - Direct operation



1. Terminal shrouds 1P.
2. Terminal shrouds 3P.
3. Auxiliary contact.
4. AC power pole.
5. AC or PV power pole.

A. MC0 handle.
B. MC01 handle.

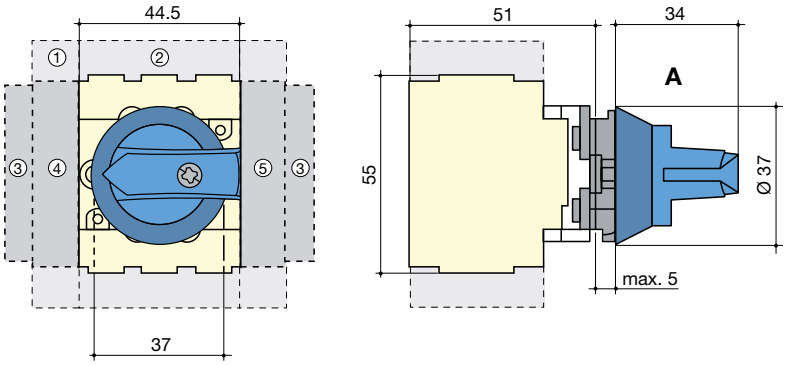
DIN rail mounting - External operation



1. Terminal shrouds 1P.
2. Terminal shrouds 3P.
3. Auxiliary contact.
4. AC power pole.
5. AC or PV power pole.

A. MC1 handle.

Door mounting

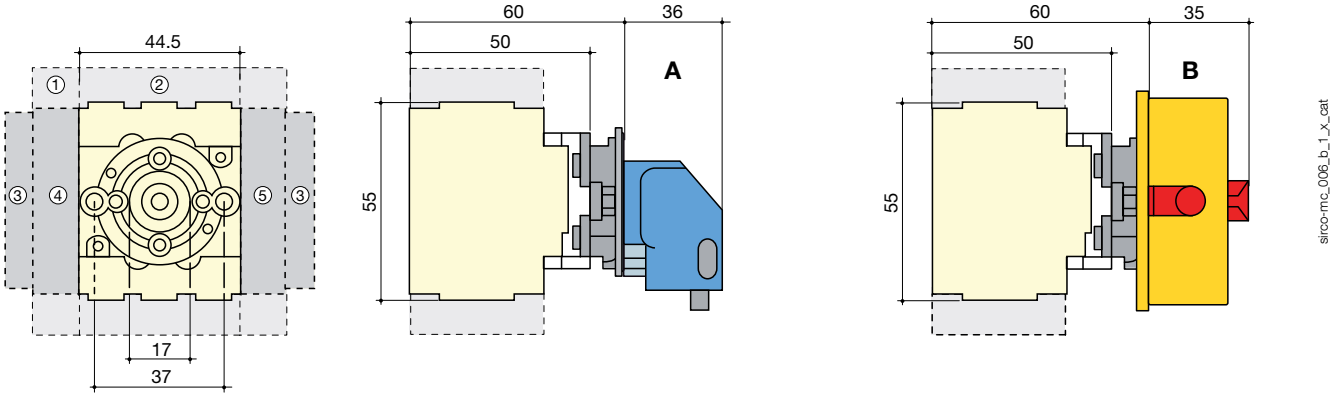


1. Terminal shrouds 1P.
2. Terminal shrouds 3P.
3. Auxiliary contact.
4. AC power pole.
5. AC or PV power pole.

A. MC2 handle.

Dimensions

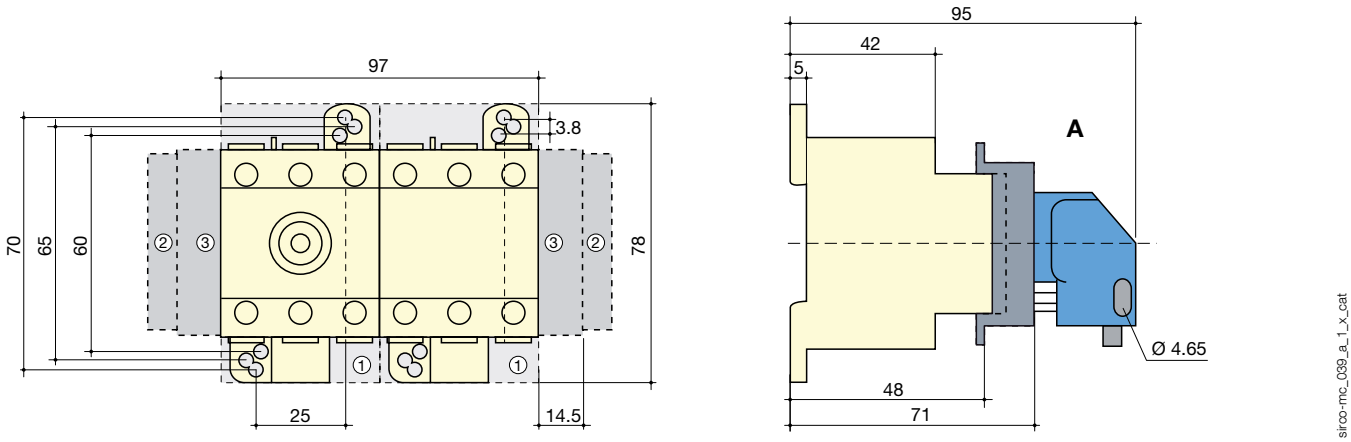
"Quick Fix" door mounting



1. Terminal shrouds 1P.
2. Terminal shrouds 3P.
3. Auxiliary contact.
4. AC power pole.
5. AC or PV power pole.

A. MC3 handle
B. MC4 handle

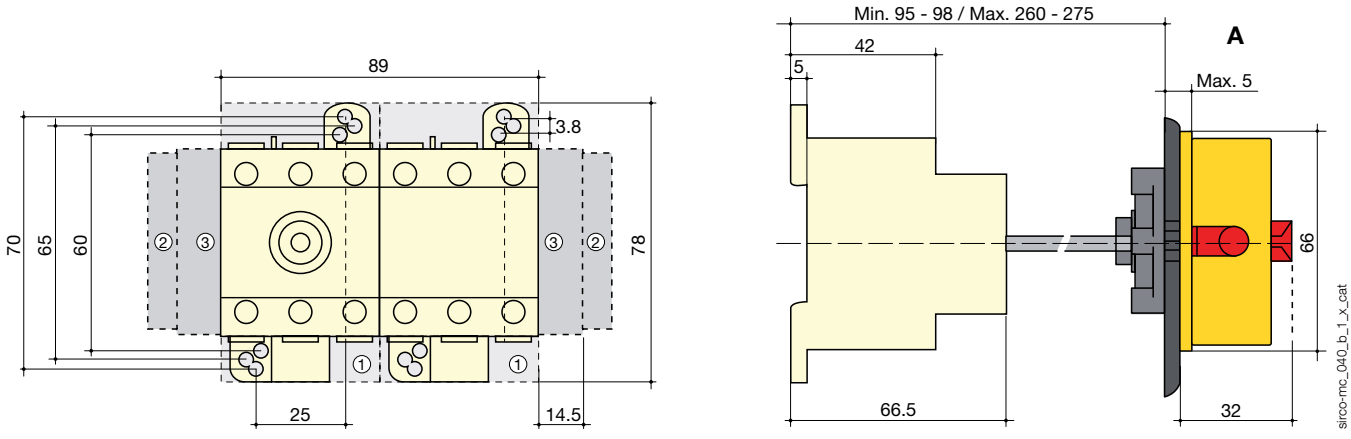
2 MPPT - 40 A - 600 VDC and 25 and 40 A - 1000 VDC - DIN-rail mounting - Direct operation



1. Terminal shrouds 3P.
2. Auxiliary contact.
3. PV power pole

A. MC01 handle.

DIN-rail mounting - External operation

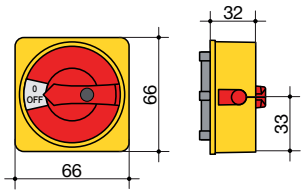
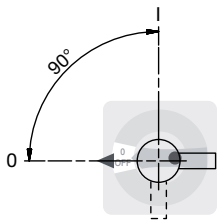
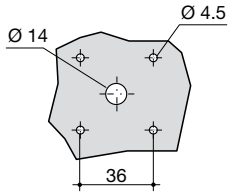
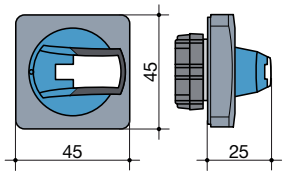
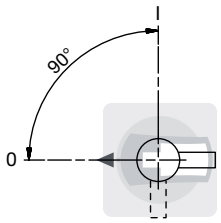
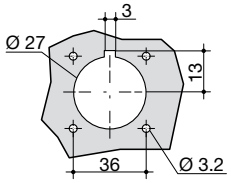


1. Terminal shrouds 3P.
2. Auxiliary contact.

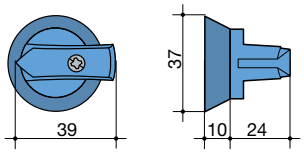
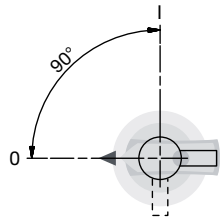
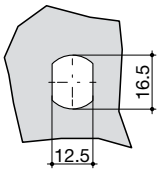
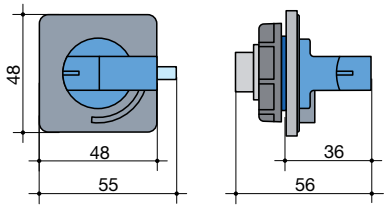
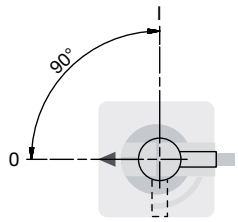
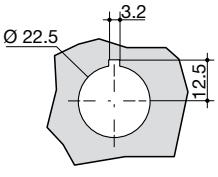
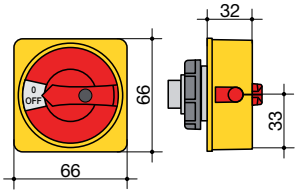
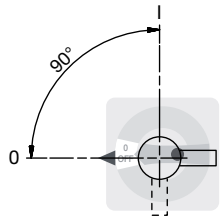
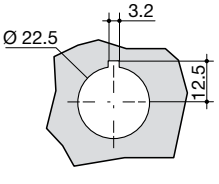
A. MC01 handle.

Dimensions for external handles

DIN rail or back plate mounting

Handle type	Front operation Direction of operation	Door drilling
MC1 type 		
S000 type 		

Door mounting

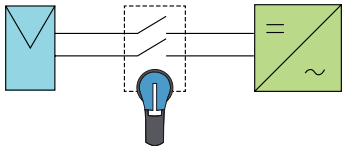
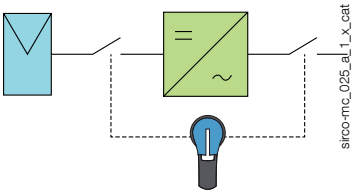
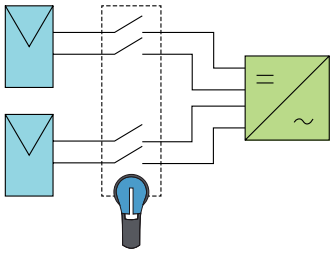
Handle type	Front operation Direction of operation	Door drilling
MC2 type 		
MC3 type Quick Fix 		
MC4 type Quick Fix 		

poign_006_a_1_gb_cat

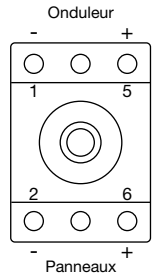
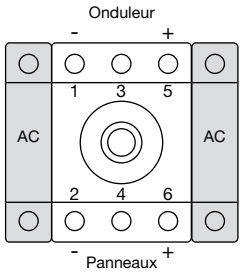
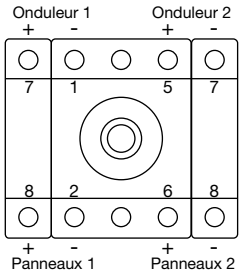
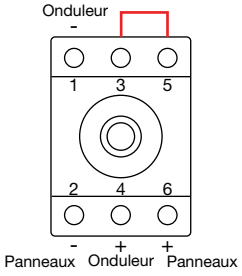
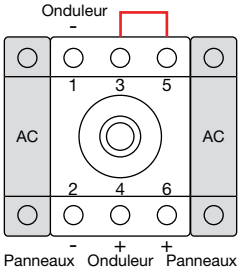
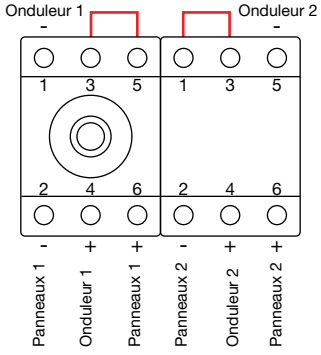
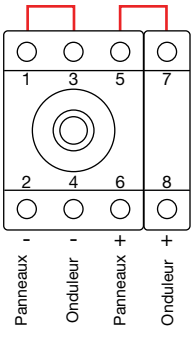
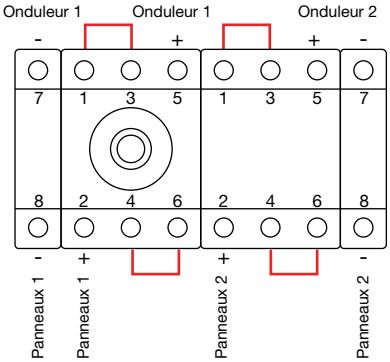
poign_007_a_1_gb_cat

Poles connections

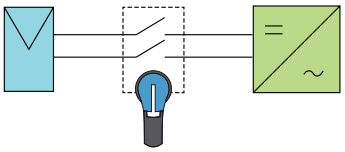
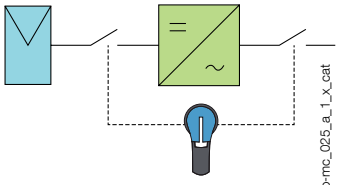
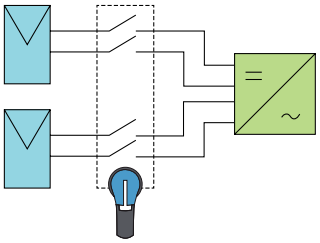
Switching of polarities + and -

Single PV circuit	PV and AC circuit	Double PV circuit
 sirco-mc_026_a_1_x_cat	 sirco-mc_025_a_1_x_cat	 sirco-mc_024_a_1_x_cat

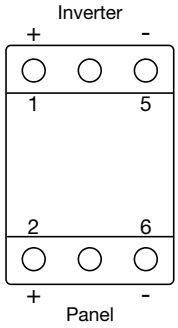
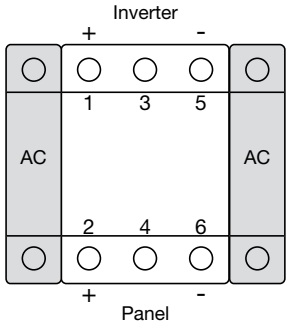
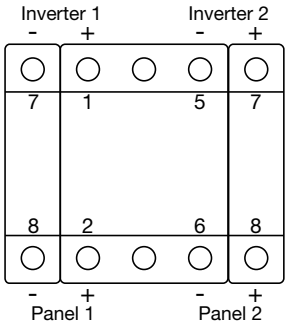
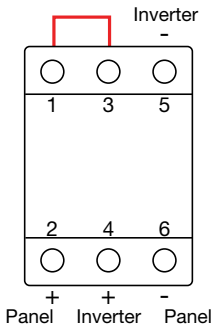
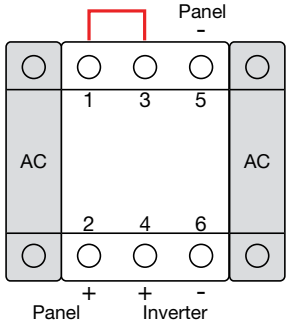
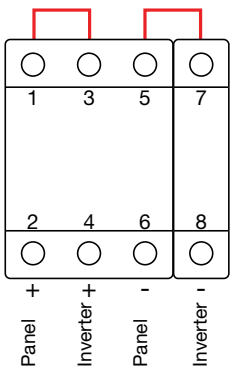
Direct operation

Rating	Single PV circuit	PV and AC circuit	Double PV circuit
25 A - 600 VDC	21PV **2102**  sirco-mc_044_a_1_fr_cat	21PV **2162**  sirco-mc_013_a_1_fr_cat	21PV **5102**  sirco-mc_045_a_1_fr_cat
40 A - 600 VDC 25 A - 1000 VDC	21PV **3124** 21PV **3722**  sirco-mc_046_a_1_fr_cat	21PV **3184**  sirco-mc_009_a_1_fr_cat	21PV **6124** 21PV **6722**  sirco-mc_047_a_1_fr_cat
40 A - 1000 VDC	21PV **4754**  sirco-mc_048_a_1_fr_cat		21PV **8154**  sirco-mc_065_a_1_fr_cat

Switching of polarities + and -

Single PV circuit	PV and AC circuit	Double PV circuit
 sirco-mc_026_a_1_x_cat	 sirco-mc_025_a_1_x_cat	 sirco-mc_024_a_1_x_cat

Door mounting

Rating	Single PV circuit	PV and AC circuit	Double PV circuit
25 A - 600 VDC	21PV **2202** 21PV **2302**  sirco-mc_049_a_1_gb_cat	21PV **2262** 21PV **2362**  sirco-mc_008_a_1_gb_cat	21PV **5202** 21PV **5302**  sirco-mc_050_a_1_gb_cat
40 A - 600 VDC 25 A - 1000 VDC	21PV **3224** 21PV **3324** 21PV **3822** 21PV **3922**  sirco-mc_051_a_1_gb_cat	21PV **3284** 21PV **3384**  sirco-mc_010_a_1_gb_cat	
40 A - 1000 VDC	21PV **4854** 21PV **4954**  sirco-mc_052_a_1_gb_cat		

SIRCO MV PV

Load break switches for solar applications

for use up to 1000 VDC from 63 to 80 A

***SIRCO MV PV** 1000 V - 80 A*
direct operation

The solution for

- Residential buildings
- Buildings
- Solar parks

Strong points

- Modular device
- Patented switching technology
- Performance - 1000 VDC

Conformity to standards

- IEC 60947-3
- IEC 60364-4-410
- IEC 60364-7-712

Approvals and certifications(1)

(1) Product reference on request.

Function

SIRCO MV PV are manually operated multipolar load break switches. They make and break under load conditions and provide optimum safety isolation for any PV circuit.

Advantages

Modular device
SIRCO MV PV are devices which are DIN rail or backplate mountable and can be integrated into a modular panel with a 45 mm front cut-out.

Patented switching technology
SIRCO MV PV with benefit from proven breaking technology based on a system of double break contacts with arc extinguishing chambers.

References

SIRCO MV PV 1000 VDC - DIN rail or back plate mounting

Rating (A)	Circuit type	No. of poles	Switch body	Direct handle	External front handle	Shaft for external front handle	Auxiliary contact	Bridging bar
63 A	Single PV circuit	4 P	22PV **4106**	Blue M0b type 2299 **5042**(1) Blue M0 type 2299 **5022**	S0 type Black IP55 1491 **0111**(1)(2) Black IP65 1493 **0111**(2) Red / Yellow IP65 1494 **0111**(2) S1 type Black IP55 1411 **2111**(2) Black IP65 1413 **2111**(2) Red / Yellow IP65 1414 **2111**(2)	S0 type 150 mm 1409 **0615** 200 mm 1409 **0620** 320 mm 1409 **0632** S1 type 200 mm 1401 **0620** 320 mm 1401 **0632** 400 mm 1401 **0640**	1 contact NC+NO 2299 **0001**(3) 1 contact 2 NC 2299 **0011**(3) 1 contact NO 3999 **0701** 1 contact NC 3999 **0702**	2 pieces 2209 **2016**
80 A		4 P	22PV **4108**					

(1) Standard.
(2) Defeatable handle.
(3) Signalling contact only.

Accessories

Direct operation handle

M0b type direct operation handle		
Rating (A)	**Handle colour**	**Reference**
63 ... 80	Blue	2299 **5042**(1)

(1) Standard.

Compact M0 type direct operation handle		
Rating (A)	**Handle colour**	**Reference**
63 ... 80	Blue	2299 **5022**

M0b handle

M0 handle

Accessories

External operation handle

Use

Door interlocked external operation handles include an escutcheon, are padlockable and must be utilised with an extension shaft.

In a combiner box, located close to the solar cell strings, or located close to the inverter, we recommend to use a door interlocked external handle for safety.

Example

The locking function of the enclosure in the "ON" position will force the operator to safely disconnect and isolate the solar cell strings prior to any intervention.

Opening the door when the switch is on "ON" position is possible by defeating the interlocking function with the use of a tool (authorised persons only). The interlocking function is restored when the door is re-closed.

acces_343_a

S0 type handle

S0 type handle - Front operation I - 0

Rating (A)	Handle	Handle colour	External IP(1)	Reference
63 ... 80	S0 type	Black	IP55	1491 **0111**(2)
63 ... 80	S0 type	Black	IP65	1493 **0111**(2)
63 ... 80	S0 type	Red/Yellow	IP65	1494 **0111**(2)

acces_149_a_1_cat

S1 type handle

S1 type handle - Front operation I - 0

Rating (A)	Handle	Handle colour	External IP(1)	Reference
63 ... 80	S1 type	Black	IP55	1411 **2111**(2)
63 ... 80	S1 type	Black	IP65	1413 **2111**(2)
63 ... 80	S1 type	Red/Yellow	IP65	1414 **2111**(2)

(1) IP: protection degree according to IEC 60529 standard.
(2) Defeatable handle.

Shaft for external handle

Use

Standard lengths:
- 150 mm
- 200 mm
- 320 mm
- 400 mm

Other lengths: please consult us.

acces_280_a_2_cat

Shaft for S0 type handle for SIRCO MV PV 63 ... 80 A

For SIRCO MV PV

Rating (A)	Handle type	Length (mm)	Reference
63 ... 80	S0 type	150 mm	1409 **0615**
63 ... 80	S0 type	200 mm	1409 **0620**
63 ... 80	S0 type	320 mm	1409 **0632**
63 ... 80	S1 type	200 mm	1401 **0620**
63 ... 80	S1 type	320 mm	1401 **0632**
63 ... 80	S1 type	400 mm	1401 **0640**

acces_369_a_1_cat

Shaft for S1 type handle for SIRCO MV PV 63 ... 80 A

Auxiliary contact

Use

M type

Signalisation of positions 0 and I by NO+NC or 2 NO auxiliary contacts. They can be mounted on the right side on the SIRCO MV PV. Up to 2 auxiliary contact modules can be installed.

U type

Pre-break and signalisation by NO or NC auxiliary contact.
Max 2 auxiliary contacts.

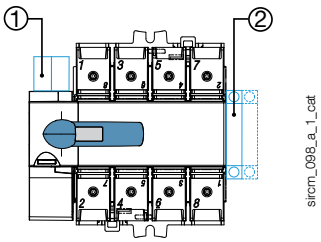
M type

U type

M type			
Rating (A)	**Contact(s)**	**Contact type**	**Reference**
63 ... 80	1 contact	NO + NC	2299 **0001**(1)
63 ... 80	1 contact	2 NC	2299 **0011**(1)

(1) Signalling contact only.

U type			
Rating (A)	**Contact(s)**	**Contact type**	**Reference**
63 ... 80	1 AC	NO	3999 **0701**
63 ... 80	1 AC	NC	3999 **0702**



M type
Auxiliary contacts configurations for SIRCO MV PV
1. Maximum 2 "U" type auxiliary contacts
2. Maximum 2 "M" type auxiliary contact modules

Terminal shrouds

Use

Top and bottom protection against direct contact with the connection parts (set of 2 units).

Advantage

Perforations allow remote thermographic inspection without the need to remove the shrouds.
The terminal shrouds also provide phase separation.

For SIRCO MV PV			
Rating (A)	**No. of poles**	**Position**	**Reference**
63 ... 80	4 P	top and bottom	2294 **4016**

Bridging bars for connecting poles in series

Use

The bridging bars facilitate the connection of poles in series, allowing the below configurations:

- Bottom/Bottom
- Top/Top
- Top/Bottom
- Top/Bottom

Connection diagrams, See "Poles connections in serie", page 25.

For SIRCO MV PV		
Rating (A)	**Pack**	**Reference**
63 ... 80	1 piece	2209 **0016**
63 ... 80	2 pieces	2209 **2016**

Characteristics according to IEC 60947-3

63 to 80 A

Thermal current I_{th} at 60°C					**63 A**	**80 A**
Rated insulation voltage U_i (V)					1000	1000
Rated impulse withstand voltage U_{imp} (kV)					8	8
Rated operational currents I_e (A)						
Rated voltage	**Utilisation category**	**Circuit type**	**No. of poles**	**Number of pole(s) in series per polarity**	**(A)**	**(A)**
1000 VDC(1)	DC-21 B	Single PV circuit	4 P	2 P + and 2 P -	63	80
Short-circuit capacity at 1000 VDC						
Rated short-time withstand current 1s. I_{cw} (kA rms)					5	5
Prospective short-circuit making capacity without fuses I_{cm} (kA peak)					5	5
Connection						
Maximum Cu rigid cable cross-section (mm^2)					70	70
Tightening torque min (Nm)					4	4
Tightening torque max (Nm)					5.5	5.5
Mechanical characteristics						
Operating effort (Nm)					4.2	4.2
Weight of a 3 pole device (kg)					0.7	0.7
Weight of a 4 pole device (kg)					0.9	0.9

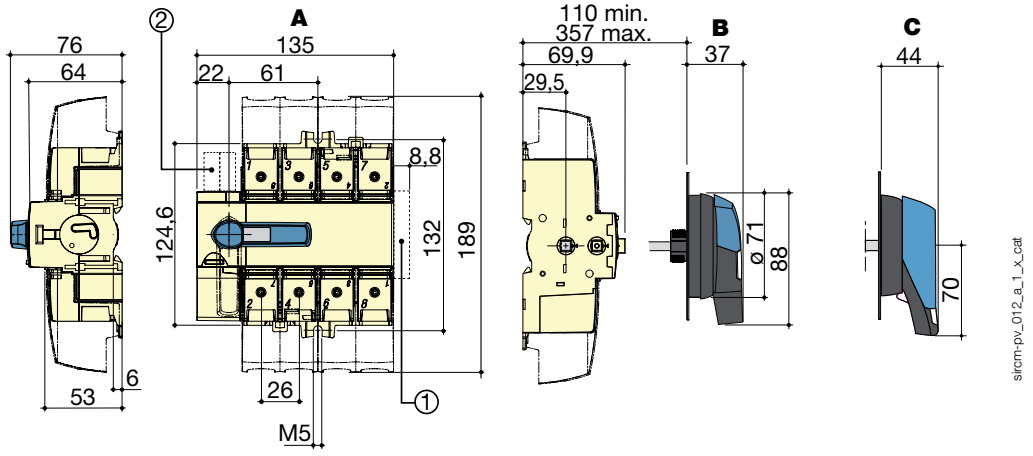
(1) Photovoltaic load break swiches SIRCO MV PV are subject to overvoltage test conditions which are 5% higher than the rated voltage. They can therefore be used at 1050 VDC in non-permanent operating conditions.

Dimensions

SIRCO MV PV 63 to 80 A

Direct front operation

External front operation

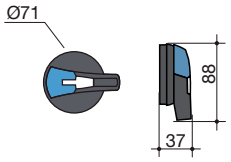
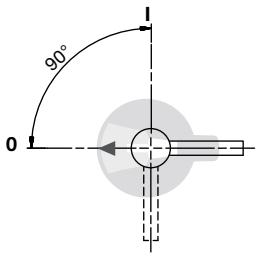
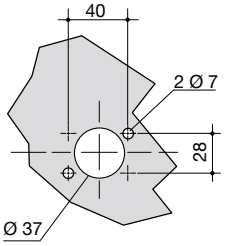
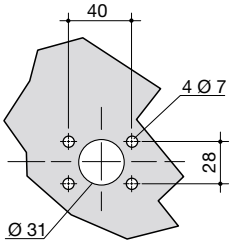
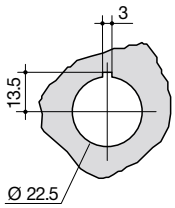


A. 4 poles
B. S0 type handle
C. S1 type handle

1. Maximum 2 "M" type auxiliary contact modules
2. Maximum 2 "U" type auxiliary contacts

Dimensions for external handles

SIRCO MV PV 63 to 80 A

Handle type	Front operation Direction of operation	Door drilling		
S0 type		IP55 with 2 fixing clips	IP65 with 4 fixing screws	With fixing nut
				

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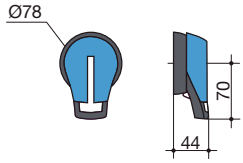
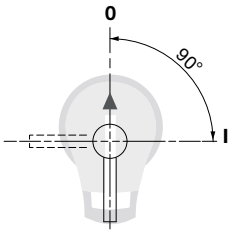
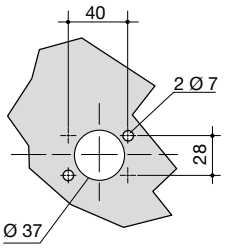
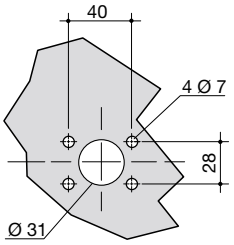
Handle type	Front operation Direction of operation	Door drilling	
S1 type		IP55 with 2 fixing clips	IP65 with 4 fixing screws
			

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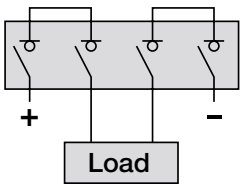
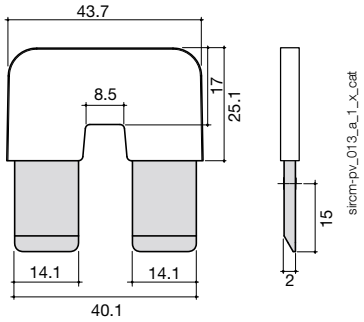
Pole series connection(1)

4 poles - bottom / bottom



(1) Other connections: refer to mounting instructions.

Bridging bars 63 to 80 A



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sircm-pv_013_a_1_x_cat

SIRCO PV IEC 60947-3

Load break switches for photovoltaic applications

from 100 to 2000 A - up to 1500 VDC

new

sirco-pv_058_a_1_cat

sirco-pv_059_a_1_cat

Function

SIRCO PV are anually operated multipole load break switches. They make and break on load and provide safety isolation for any PV circuit up to 1500 VDC.

SIRCO PV are extremely durable switches that have been tested and approved for use in the most demanding environments.

They have been designed and tested for all types of applications: earthing, floating or bipolar.

Advantages

Performance

A glass fibre reinforced polyester break chamber with an arc extinguishing system provides a patented safety disconnection system offering rapid extinguishing of the electric arc up to 1500 VDC with current interruption of up to 2000 A.

Back-to-back load break switch

Back-to-back double switches enables:

- simultanuous on load operation of two switches with a single handle,
- a compact solution when connecting two separate photovoltaic circuits compared with the use of two separate switches,
- easy connection.

The solution for

> Combiner box.
> Recombiner box.
> Inverter.

Strong points

> Patented switching technology.
> Positive break indication.
> Up to 1500 VDC as per characteristics by IEC 60947-3.
> Back-toback double load break switch.

Conformity to standards

> IEC 60947-3
> IEC 60364-7-712
> UL 98B(1)

(1) See page

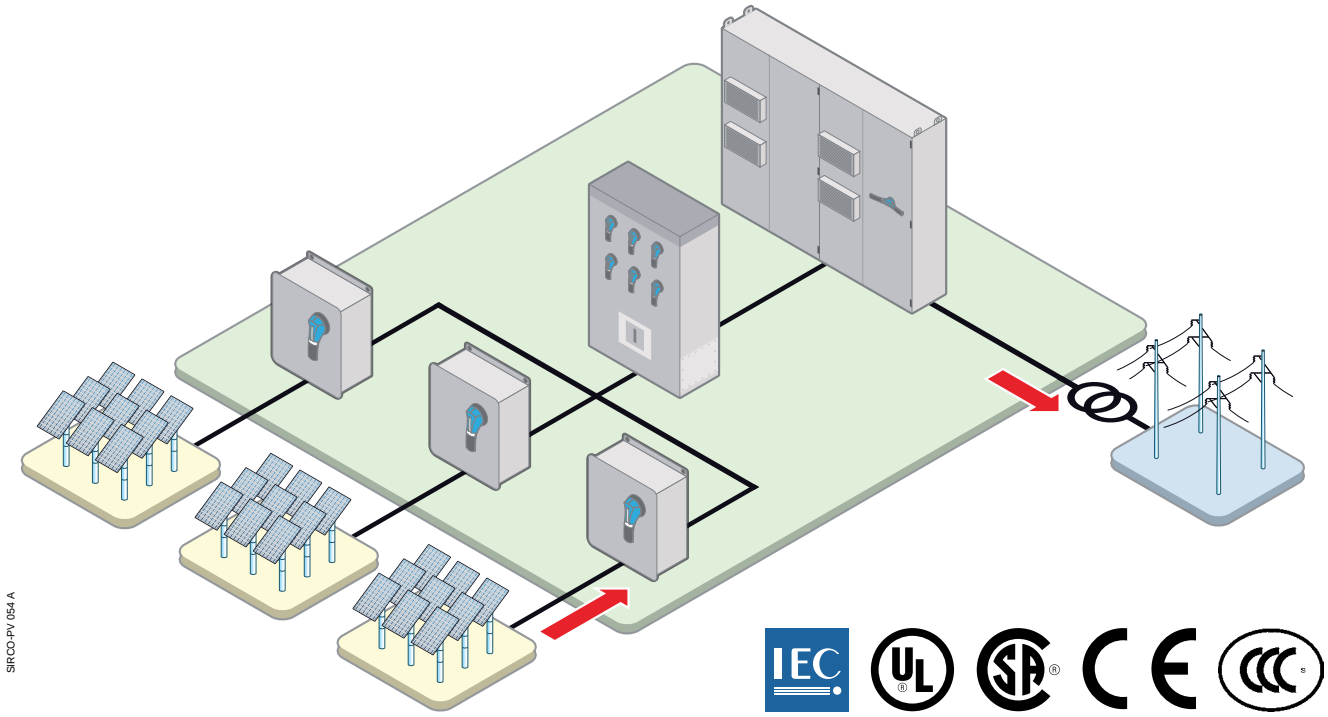
Approvals and certifications(1)

(1) Product reference on request.

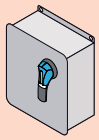
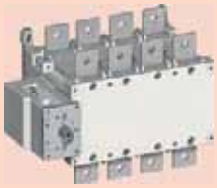
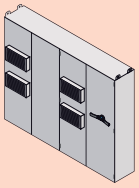
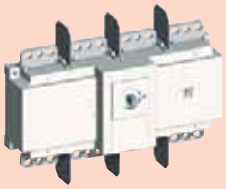
socomec Innovative Power Solutions

Typical PV architecture

The SIRCO PV range provides safe disconnection and isolation at all levels within your PV installation.



The SOCOMEC solutions

LEVEL OF INSTALLATION	SOCOMEC SOLUTIONS	
Combiner box		
		SIRCO PV One circuit up to 500 A up to 1500 VDC
Recombiner box		
		SIRCO PV 4 circuits up to 500 A at 1000 VDC 2 circuits up to 500 A at 1500 VDC
Inverter		
		SIRCO PV One circuit up to 2000 A at 1000 VDC up to 2000 A at 1500 VDC

References

1000 VDC - Back plate mounting

Rating (A)	Frame	Number of poles	Switch body	Direct handle	External handle	Shaft for external handle	Quantity to be ordered to connect two poles in series
1 PV circuit							
100 A	B4	2 P	26PV **2010**	J1 type Black 1112 **1111** Red 1113 **1111**	S2 type Black IP55 1421 **2111** Black IP65 1423 **2111** Red IP65 1424 **2111**	200 mm 1400 **1020** 320 mm 1400 **1032** 400 mm 1400 **1040**	
160 A	B4	2 P	26PV **2016**				
250 A	B4	2 P	26PV **2025**				
315 A	B4	2 P	26PV **2031**				
400 A	B4	4 P	26PV **4040**				2x 2609 **0025**
500 A	B4	4 P	26PV **4050**				
630 A	B5	4 P	26PV **4063**				1x 2609 **0080**
800 A	B5	4 P	26PV **4080**				
1250 A	B6	4 P	26PV **4120**	C2 type Black 2799 **7012** Red 2799 **7013**	S4 type Black IP65 1443 **3111** Red IP65 1444 **3111**	200 mm 1401 **1520** 320 mm 1401 **1532** 400 mm 1401 **1520**	1x 2609 **1100**
2000 A	B7	4 P	26PV **4200**				2x 2609 **1200**
2 PV circuit							
100 A	$B4_{DS}$	4 P	26PV **5010**	J2 Type Black 1122 **1111** Red 1123 **1111**	S2 type Black IP55 1421 **2111** Black IP65 1423 **2111** Red IP65 1424 **2111**	200 mm 1400 **1020** 320 mm 1400 **1032** 400 mm 1400 **1040**	
160 A	$B4_{DS}$	4 P	26PV **5016**				
250 A	$B4_{DS}$	4 P	26PV **5025**				
315 A	$B4_{DS}$	4 P	26PV **5031**				
400 A	B5	4 P	27PV **4032**	J1 type Black 1112 **1111** Red 1113 **1111**			1x 2709 **0045**
500 A	B5	4 P	27PV **4039**				
630 A	$B5_{DS}$	8 P	26PV **8063**	J2 Type Black 1122 **1111** Red 1123 **1111**			1x 2609 **0080**
800 A	$B6_{DS}$	8 P	26PV **8080**	C2 type Black 2799 **7012** Red 2799 **7013**	V1 type Black IP65 2799 **7145**	320 mm 4199 **3018**	1x 2609 **1100**
1250 A	$B6_{DS}$	8 P	26PV **8120**				
2000 A	$B7_{DS}$	8 P	26PV **8200**				1x 2609 **1200**
4 PV circuits							
275 A	$B5_{DS}$	8 P	27PV **8026**	J2 Type Black 1122 **1111** Red 1123 **1111**	S2 type Black IP55 1421 **2111** Black IP65 1423 **2111** Red IP65 1424 **2111**	200 mm 1400 **1020** 320 mm 1400 **1032** 400 mm 1400 **1040**	4x 2709 **0045**
400 A	$B5_{DS}$	8 P	27PV **8032**				
500 A	$B5_{DS}$	8 P	27PV **8039**				

1500 VDC - Back plate mounting

Rating (A)	Frame	Number of poles	Switch body	Direct handle	External handle	Shaft for external handle	Quantity to be ordered to connect two poles in series
1 PV circuit							
275 A	B5	3 P	27PV **3026**	J2 Type Black 1122 **1111** Red 1123 **1111**	S2 type Black IP55 1421 **2111** Black IP65 1423 **2111** Red IP65 1424 **2111**	200 mm 1400 **1020** 320 mm 1400 **1032** 400 mm 1400 **1040**	1x 2709 **0027**
400 A	B5	3 P	27PV **3032**				1x 2709 **0045**
500 A	B5	3 P	27PV **3039**				
630 A	$B5_{DS}$	8 P	26PV **8063**				1x 2609 **0080**
800 A	$B6_{DS}$	8 P	26PV **8080**	C2 type Black 2799 **7012** Red 2799 **7013**	V1 type Black IP65 2799 **7145**	320 mm 4199 **3018**	1x 2609 **1100**
1250 A	$B6_{DS}$	8 P	26PV **8120**				
2000 A	$B7_{DS}$	8 P	26PV **8200**				1x 2609 **1200**
2 PV circuit							
275 A	$B5_{DS}$	6 P	27PV **6026**	J2 Type Black 1122 **1111** Red 1123 **1111**	S2 type Black IP55 1421 **2111** Black IP65 1423 **2111** Red IP65 1424 **2111**	200 mm 1400 **1020** 320 mm 1400 **1032** 400 mm 1400 **1040**	1x 2709 **0027**
400 A	$B5_{DS}$	6 P	27PV **6032**				1x 2709 **0045**
500 A	$B5_{DS}$	6 P	27PV **6039**				

Accessories

Direct operation handle

Frame	Handle type	Handle colour	Reference
B4 ... B5	J1 type	Black	1112 **1111**
B4 ... B5	J1 type	Red	1113 **1111**
B6 ... B7	C2 type	Black	2799 **7012**
B6 ... B7	C2 type	Red	2799 **7013**
$B4_{DS}$ ... $B5_{DS}$	J2 type	Black	1122 **1111**
$B4_{DS}$ ... $B5_{DS}$	J2 type	Red	1123 **1111**
$B6_{DS}$ ... $B7_{DS}$	C2 type	Black	2799 **7012**
$B6_{DS}$ ... $B7_{DS}$	C2 type	Red	2799 **7013**

J1 type handle

C2 type handle

Door interlocked external operation handle

Use

Door interlocked external operation handles include an escutcheon, are padlockable and must be utilised with an extension shaft.

In a combiner box, located close to the solar cell strings, or located close to the inverter, we recommend to use a door interlocked external handle for safety.

Example

The locking function of the enclosure in the "ON" position will force the operator to safely disconnect and isolate the solar cell strings prior to any intervention.

Opening the door when the switch is on "ON" position is possible by defeating the locking function using a tool (authorised persons only).

The interlocking function is restored when the door is re-closed.

Front operation

Frame	Handle type	Handle colour	IP degree of protection	Reference
B4 ... B5 - $B4_{DS}$	S2	Black	IP55	1421 **2111**
B4 ... B5 - $B4_{DS}$	S2	Black	IP65	1423 **2111**
B4 ... B5 - $B4_{DS}$	S2	Red	IP65	1424 **2111**
$B5_{DS}$ - B6 ... B7	S4	Black	IP65	1443 **3111**
$B5_{DS}$ - B6 ... B7	S4	Red	IP65	1444 **3111**
$B6_{DS}$ - $B7_{DS}$	V1	Black	IP65	2799 **7145**

Reinforced S2 type handle

S4 type handle

V1 type handle

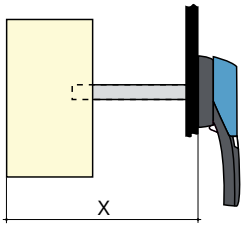
Accessories (continued)

Shaft for external handle

Use

Standard lengths:
- 200 mm,
- 320 mm,
- 400 mm.

Other lengths: please consult us.



Frame	Handle type	Dimension X (mm)	Lenght (mm)	Reference
B4	S2	150 ... 295	200	1400 **1020**
B4	S2	150 ... 415	320	1400 **1032**
B4	S2	150 ... 495	400	1400 **1040**
B5	S2	203 ... 328	200	1400 **1020**
B5	S2	203 ... 448	320	1400 **1032**
B5	S2	203 ... 525	400	1400 **1040**
B6	S4	220 ... 343	200	1401 **1520**
B6	S4	220 ... 463	320	1401 **1532**
B6	S4	220 ... 543	400	1401 **1540**
B7	S4	305 ... 366	200	1401 **1520**
B7	S4	305 ... 485	320	1401 **1532**
B7	S4	305 ... 564	400	1401 **1540**
$B4_{DS}$	S2	305 ... 363	200	1400 **1020**
$B4_{DS}$	S2	305 ... 485	320	1400 **1032**
$B4_{DS}$	S2	305 ... 561	400	1400 **1040**
$B5_{DS}$	S4	406 ... 467	200	1401 **1520**
$B5_{DS}$	S4	406 ... 589	320	1401 **1532**
$B5_{DS}$	S4	406 ... 668	400	1401 **1540**
$B6_{DS}$	V1	508 ... 714	320	4199 **3018**
$B6_{DS}$	V1	508 ... 795	400	4199 **3019**
$B7_{DS}$	V1	508 ... 714	320	4199 **3018**
$B7_{DS}$	V1	508 ... 795	400	4199 **3019**

Shaft guide for external operation

Use

To guide the shaft extension into the external handle.

This accessory enables the handle to engage the extension shaft with a misalignment of up to 15 mm.

Required for shaft lengths over 320 mm.

Description	Reference
Shaft guide	1429 **0000**

S-type handle adapter

Use

Enables S type handles to be fitted in place of existing older style SOCOMEC handles. Adapter can also be utilised as a spacer to increase the distance between the panel door and the handle lever.

Dimensions

Adds 12 mm to the depth.

Handle colour	External IP(1)	To be ordered in multiples of	Reference
Black	IP65	1	1493 **0000**

(1) IP: protection degree according to IEC 60529 standard.

Alternative S-type handle cover colours

Use

For single lever handles type S1, S2, S3.

Other colours: Please consult us.

Handle colour	Handle	To be ordered in multiples of	Reference
Light grey	S1, S2, S3 type	50	1401 **0001**
Dark grey	S1, S2, S3 type	50	1401 **0011**
Light grey	S4 type	50	1401 **0031**
Dark grey	S4 type	50	1401 **0041**

Auxiliary contact

Use

Pre-break and signalling of positions 0 and I:
- 1 to 2 NO/NC auxiliary contacts,
- 1 to 4 NO + NC auxiliary contacts,
- 1 to 2 low level NO/NC auxiliary contacts.

Characteristics

NO/NC A/C: IP2 with front operation.

Connection to the control circuit

6.35 mm fast-on terminal.

Electrical characteristics

30 000 operations.

acces_076_a_1_cat

NO/NC auxiliary contact

Frame	Position AC	Type	Reference
B4 ... B7	1 contact	NO/NC	2699 **0031**
B4 ... B7	2 contact	NO/NC	2600 **0032**
$B4_{DS}$ ... $B7_{DS}$	1 contact	NO/NC	2699 **0061**
$B4_{DS}$ ... $B7_{DS}$	2 contact	NO/NC	2699 **0062**

Low level NO/NC auxiliary contact

Frame	Position AC	Type	Reference
B4 ... B7	1 contact	NO/NC	2699 **0301**
B4 ... B7	2 contact	NO/NC	2600 **0302**

NO+NC auxiliary contact

Frame	Position AC	Type	Reference
B4 ... B7	1 contact	NO+NC	2699 **0061**
B4 ... B7	2 contact	NO+NC	2699 **0062**

Terminal screen

Use

Top or bottom protection against direct contact with terminals or connection parts.

Frame	No. of pole	Position	Pack	Reference
B4	2 P	top or bottom	1 unit	2698 **3020**
B4	4 P	top or bottom	1 unit	2698 **4020**
B5	3 P	top or bottom	1 unit	2698 **3050**
B5	4 P	top or bottom	1 unit	2698 **4050**
B6	4 P	top or bottom	1 unit	2698 **4080**
B7	4 P	top or bottom	1 unit	2698 **4120**
$B4_{DS}$	2 P	top or bottom	1 unit	1509 **3025**
$B5_{DS}$	6 P	top and bottom	2 units	1509 **3063**
$B5_{DS}$	8 P	top and bottom	2 units	1509 **4063**
$B6_{DS}$	8 P	top and bottom	2 units	1509 **4080**
$B7_{DS}$	8P	top and bottom	2 units	1509 **4199**

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Accessories (continued)

Bridging bars for connecting poles in series

Use

The bridging bars will make easy the connection of the poles in series, allowing the following configurations(1).

(1) Other connections: refer to mounting instructions.

1000 VDC

Frame	Rating (A)	Quantity to be ordered to connect two poles in series	Fig.	Reference
1 PV circuit				
B4	100	-(1)	-	-(1)
B4	160	-(1)	-	-(1)
B4	250	-(1)	-	-(1)
B4	315	-(1)	-	-(1)
B4	400	2	1	2609 **0025**
B4	500	2	1	2609 **0025**
B5	630	1	2	2609 **0080**
B5	800	1	2	2609 **0080**
B6	1250	1	3	2609 **1100**
B7	2000	1	3	2609 **1200**
2 PV circuits				
$B4_{DS}$	100	-(1)	-	-(1)
$B4_{DS}$	160	-(1)	-	-(1)
$B4_{DS}$	250	-(1)	-	-(1)
$B4_{DS}$	315	-(1)	-	-(1)
B5	400	1	4	2709 **0045**
B5	500	1	4	2709 **0045**
$B5_{DS}$	630	1	2	2609 **0080**
$B6_{DS}$	800	1	3	2609 **1100**
$B6_{DS}$	1250	1	3	2609 **1100**
$B7_{DS}$	2000	1	3	2609 **1200**
4 PV circuits				
$B5_{DS}$	500	1	4	2709 **0045**

1500 VDC

Frame	Rating (A)	Quantity to be ordered to connect two poles in series	Fig.	Reference
1 PV circuit				
B5	275	1	5	2709 **0027**
B5	315	1	5	2709 **0027**
B5	400	1	4	2709 **0045**
B5	500	1	4	2709 **0045**
$B5_{DS}$	630	1	2	2609 **0080**
$B6_{DS}$	800	1	3	2609 **1100**
$B6_{DS}$	1250	1	3	2609 **1100**
$B7_{DS}$	2000	1	3	2609 **1200**
2 PV circuits				
$B5_{DS}$	275	1	5	2709 **0027**
$B5_{DS}$	400	1	4	2709 **0045**
$B5_{DS}$	500	1	4	2709 **0045**

(1) No need for bridging bar.

Bridging bars for connecting poles in series (continued)

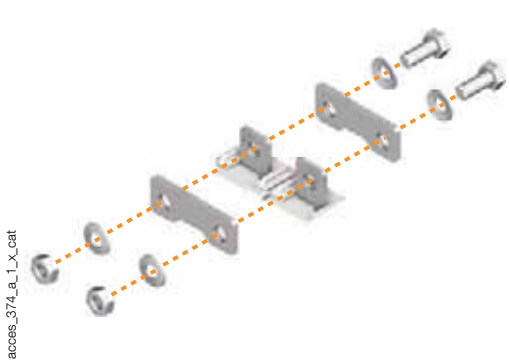


Fig. 1

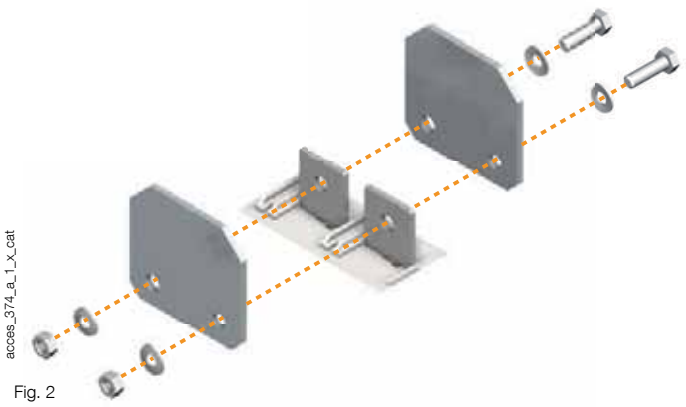


Fig. 2

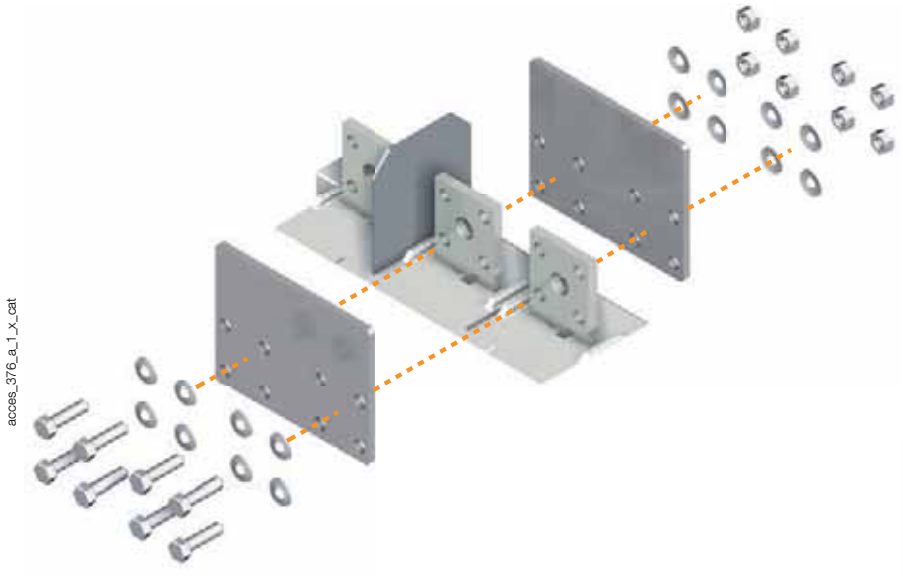


Fig. 3

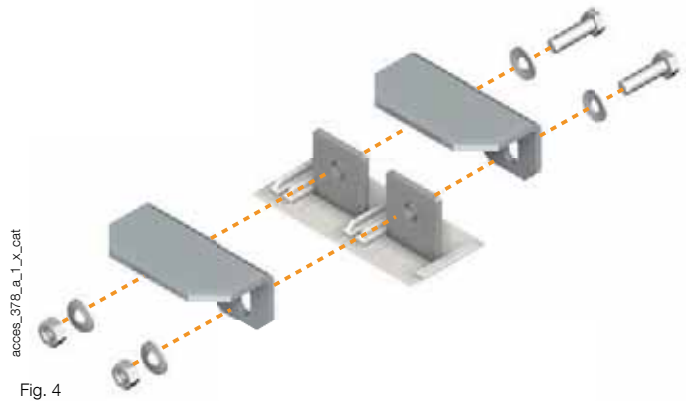


Fig. 4

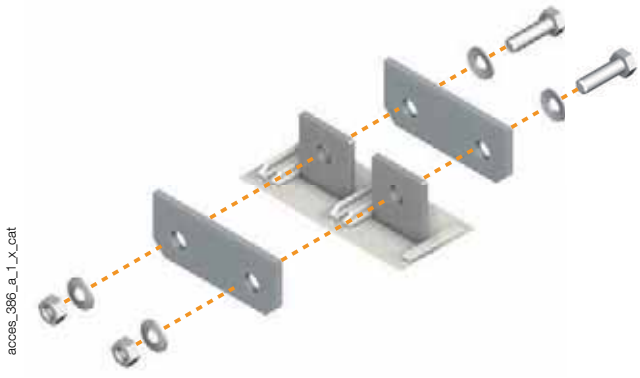


Fig. 5

Characteristics

Characteristics according to IEC 60947-3

Rated current I			**100 A**				**160 A**			
Thermal current at 40°C (A)			**100**				**160**			
Thermal current at 50°C (A)			**100**				**160**			
Thermal current at 60°C (A)			**100**				**160**			
Rated insulation voltage U_i (V) (1)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of Circuits	**Rated voltage**	**Utilisation category**	**I_e (A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**I_e (A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	DC-21B	100	1P + ; 1P -	2 P	B4	160	1P + ; 1P -	2 P	B4
1 circuit	1500 VDC	DC-21B	100	3 P + ; 1 P -	4 P	$B4_{DS}$	160	3P + ; 1P -	4 P	$B4_{DS}$
2 circuits	1000 VDC	DC-21B	100	1P + ; 1P -	4 P	$B4_{DS}$	160	1P + ; 1P -	4 P	$B4_{DS}$
Short-circuit capacity (without protection)										
Rated short-time withstand current 0.3s (kA rms)			10				10			
Rated short-time withstand current 1s (kA rms)			5				5			
Rated short-circuit making capacity I_{cm} (kA peak) - 50ms			10				10			
Connection										
Maximum Cu rigid cable cross-section (mm^2)			35				70			
Maximum Cu busbar width (mm)			32				32			
Tightening torque min (Nm)			20				20			
Tightening torque max (Nm)			26				26			
Mechanical characteristics										
Durability (number of operating cycles)			10 000				10 000			
Operating effort (N.m)			10				10			
Weight of a 2 pole device (kg)			1.8				1.8			
Weight of a 4 pole device (kg)			4.3				4.3			

Rated current I			**250 A**				**275 A**			
Thermal current at 40°C (A)			**250**				**275**			
Thermal current at 50°C (A)			**250**				**275**			
Thermal current at 60°C (A)			**250**				**275**			
Rated insulation voltage U_i (V) (1)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of Circuits	**Rated voltage**	**Utilisation category**	**I_e (A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**I_e (A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	DC-21B	250	1P + ; 1P -	2 P	B4	275	1 P + ; 1 P -	3 P	B5
1 circuit	1500 VDC	DC-21B	250	3P + ; 1P -	4 P	$B4_{DS}$	275	2 P + ; 1 P -	3 P	B5
2 circuits	1000 VDC	DC-21B	250	1P + ; 1P -	4 P	$B4_{DS}$	275	1 P + ; 1 P -	6 P	$B5_{DS}$
2 circuits	1500 VDC	DC-21B	-	-	-	-	275	2 P + ; 1 P -	6 P	$B5_{DS}$
4 circuits	1000 VDC	DC-21B	-	-	-	-	275	1 P + ; 1 P -	8 P	$B5_{DS}$
Short-circuit capacity (without protection)										
Rated short-time withstand current 0.3s (kA rms)			10				10			
Rated short-time withstand current 1s (kA rms)			5				5			
Rated short-circuit making capacity I_{cm} (kA peak) - 50ms			10				10			
Connection										
Maximum Cu rigid cable cross-section (mm^2)			120				185			
Maximum Cu busbar width (mm)			32				32			
Tightening torque min (Nm)			20				20			
Tightening torque max (Nm)			26				26			
Mechanical characteristics										
Durability (number of operating cycles)			10 000				10 000			
Operating effort (N.m)			10				10			
Weight of a 2 pole device (kg)			1.8							
Weight of a 3 pole device (kg)			-				6			
Weight of a 4 pole device (kg)			4.3							
Weight of a 6 pole device (kg)			-				12.3			
Weight of a 8 pole device (kg)			-				15			

(1) The delivered spacers have to be installed.

Characteristics according to IEC 60947-3 (continued)

Rated current I			**315 A**				**400 A**			
Thermal current at 40°C (A)			**315**				**400**			
Thermal current at 50°C (A)			**315**				**-**			
Thermal current at 60°C (A)			**315**				**-**			
Rated insulation voltage U_i (V) (1)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of Circuits	**Rated voltage**	**Utilisation category**	**I_e (A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**I_e (A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	DC-21B	315	1P + ; 1P -	2 P	B4	400	2P + ; 2P -	4 P	B4
1 circuit	1500 VDC	DC-21B	315	2 P + ; 1 P -	3 P	B5	400	2P + ; 1P-	3 P	B5
2 circuits	1000 VDC	DC-21B	315	1P + ; 1P -	4 P	$B4_{DS}$	400	1P + ; 1P -	4 P	B5
2 circuits	1500 VDC	DC-21B	-	-	-	-	400	2 P + ; 1 P -	6 P	$B5_{DS}$
4 circuits	1000 VDC	DC-21B	-	-	-	-	400	1P + ; 1P -	8 P	$B5_{DS}$
Short-circuit capacity (without protection)										
Rated short-time withstand current 0.3s (kA rms)			10				-			
Rated short-time withstand current 1s (kA rms)			5				10			
Rated short-circuit making capacity I_{cm} (kA peak) - 50ms			10				10			
Connection										
Maximum Cu rigid cable cross-section (mm^2)			185				240			
Maximum Cu busbar width (mm)			32				32			
Tightening torque min (Nm)			20				20			
Tightening torque max (Nm)			26				26			
Mechanical characteristics										
Durability (number of operating cycles)			10 000				5 000			
Operating effort (N.m)			10				10			
Weight of a 2 pole device (kg)			1.8				-			
Weight of a 3 pole device (kg)			6				6 (B4) / 3.8 (B5)			
Weight of a 4 pole device (kg)			4.3				2.3			
Weight of a 6 pole device (kg)			-				12.3			
Weight of a 8 pole device (kg)			-				15			

Rated current I			**500 A**				**630 A**			
Thermal current at 40°C (A)			**500**				**630**			
Rated insulation voltage U_i (V) (1)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of Circuits	**Rated voltage**	**Utilisation category**	**I_e (A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**I_e (A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	DC-21B	500	2P + ; 2P -	4 P	B4	630	2P + ; 2P -	4 P	B5
1 circuit	1500 VDC	DC-21B	500	2 P + ; 1 P -	3 P	B5	630	4P + ; 4P -	8 P	$B5_{DS}$
2 circuits	1000 VDC	DC-21B	500	1P + ; 1P -	4 P	B5	630	2P + ; 2P -	8 P	$B5_{DS}$
2 circuits	1500 VDC	DC-21B	500	2 P + ; 1 P -	6 P	$B5_{DS}$	-	-	-	-
4 circuits	1000 VDC	DC-21B	500	1P + ; 1P -	8 P	$B5_{DS}$	-	-	-	-
Short-circuit capacity (without protection)										
Rated short-time withstand current 1s (kA rms)			10				10			
Rated short-circuit making capacity I_{cm} (kA peak)-50ms			10				10			
Connection										
Maximum Cu rigid cable cross-section (mm^2)			2x150				2x185			
Maximum Cu busbar width (mm)			32				40			
Tightening torque min (Nm)			20				40			
Tightening torque max (Nm)			26				40			
Mechanical characteristics										
Durability (number of operating cycles)			5 000				5 000			
Operating effort (N.m)			10				14.5			
Weight of a 3 pole device (kg)			6 (B4) / 3.8 (B5)				-			
Weight of a 4 pole device (kg)			2.3				3.8			
Weight of a 6 pole device (kg)			12.3				-			
Weight of a 8 pole device (kg)			15				15			

(1) The delivered spacers have to be installed.

Characteristics (continued)

Characteristics according to IEC 60947-3 (continued)

Rated current I			**800 A**				**1250 A**			
Thermal current at 40°C (A)			**800**				**1250**			
Rated insulation voltage U_i (V) (1)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of Circuits	**Rated voltage**	**Utilisation category**	**I_e (A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**I_e (A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	DC-21B	800	2P + ; 2P -	4 P	B5	1250 A	2P + ; 2P -	4 P	B6
1 circuit	1500 VDC	DC-21B	800	4P + ; 4P -	8 P	$B6_{DS}$	1250 A	4P + ; 4P -	8 P	$B6_{DS}$
2 circuits	1000 VDC	DC-21B	800	2P + ; 2P -	8 P	$B6_{DS}$	1250 A	2P + ; 2P -	8 P	$B6_{DS}$
Short-circuit capacity (without protection)										
Rated short-time withstand current 1s (kA rms)			10				10			
Rated short-circuit making capacity I_{cm} (kA peak)-50ms			10				10			
Connection										
Maximum Cu rigid cable cross-section (mm^2)			2x240				2x240			
Maximum Cu busbar width (mm)			50				63			
Tightening torque min (Nm)			40				40			
Tightening torque max (Nm)			45				45			
Mechanical characteristics										
Durability (number of operating cycles)			5 000				4 000			
Operating effort (N.m)			14.5				37			
Weight of a 4 pole device (kg)			3.8				3.8			
Weight of a 8 pole device (kg)			15				15			

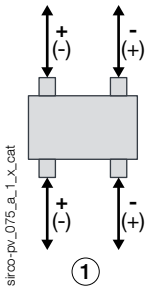
Rated current I			**2000 A**			
Thermal current at 40°C (A)			**2000**			
Rated insulation voltage U_i (V) (1)			1500			
Rated impulse withstand voltage U_{imp} (kV)			12			
Number of Circuits	**Rated voltage**	**Utilisation category**	**I_e (A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	DC-21B	2000 A	2P + ; 2P -	4 P	B7
1 circuit	1500 VDC	DC-21B	2000 A	4P + ; 4P -	8 P	$B7_{DS}$
2 circuits	1000 VDC	DC-21B	2000 A	2P + ; 2P -	8 P	$B7_{DS}$
Short-circuit capacity (without protection)						
Rated short-time withstand current 1s (kA rms)			10			
Rated short-circuit making capacity I_{cm} (kA peak)-50ms			10			
Connection						
Maximum Cu busbar width (mm)			100			
Tightening torque min (Nm)			40			
Tightening torque max (Nm)			45			
Mechanical characteristics						
Durability (number of operating cycles)			4 000			
Operating effort (N.m)			56			
Weight of a 4 pole device (kg)			22			
Weight of a 8 pole device (kg)			50			

(1) The delivered spacers have to be installed.

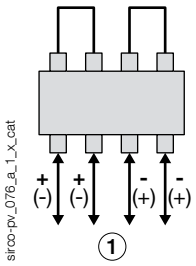
Pole connection in series

1 PV circuit - 1000 VDC

B4 - 2P

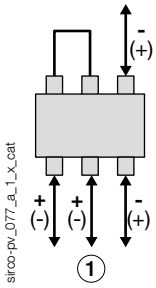


B4-B7 - 4P

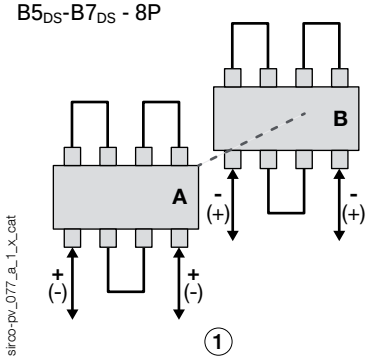


1 PV circuit - 1500 VDC

B5 - 3P

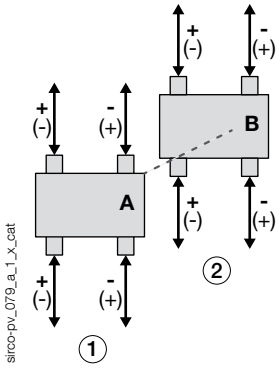


$B5_{DS}$-$B7_{DS}$ - 8P

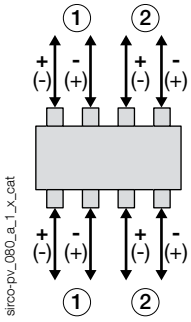


2 PV circuits - 1000 VDC

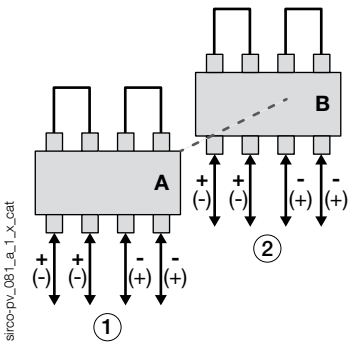
$B4_{DS}$ - 4P



B5 - 4P

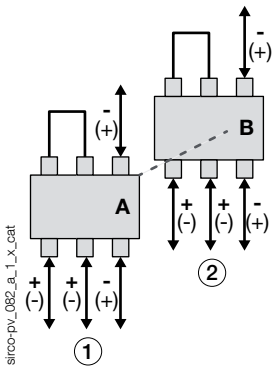


$B5_{DS}$-$B7_{DS}$ - 8P



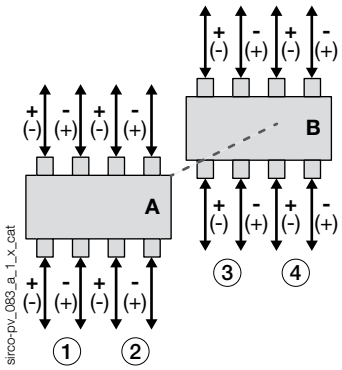
2 PV circuits - 1500 VDC

$B5_{DS}$ - 6P



4 PV circuit - 1000 VDC

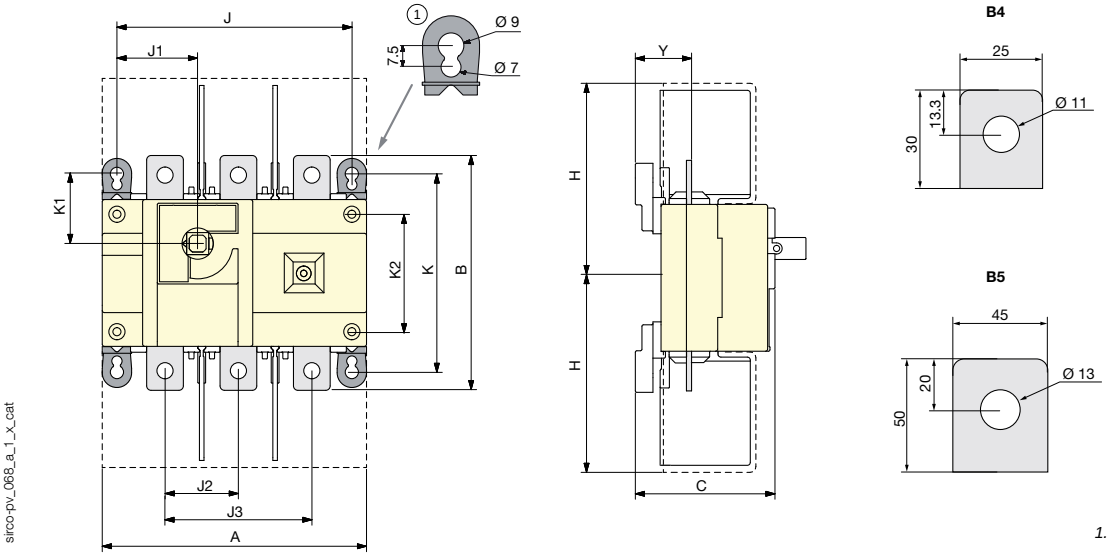
$B5_{DS}$ - 8P



A. Front switch.
B. Rear switch.

Dimensions (mm)

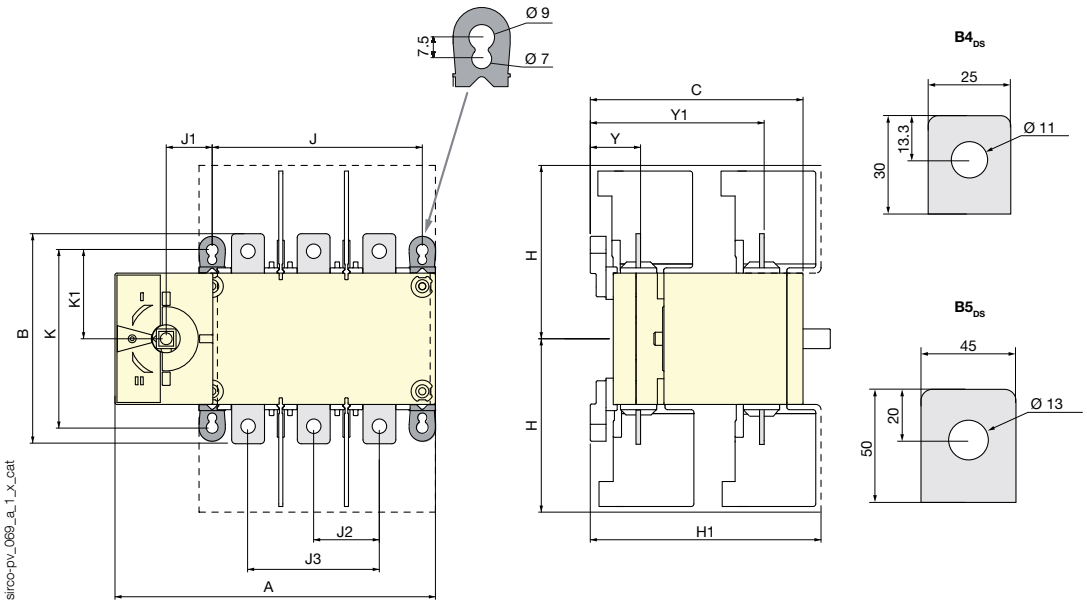
Frame B4-B5



1. Doesn't concern 400 and 500 A.

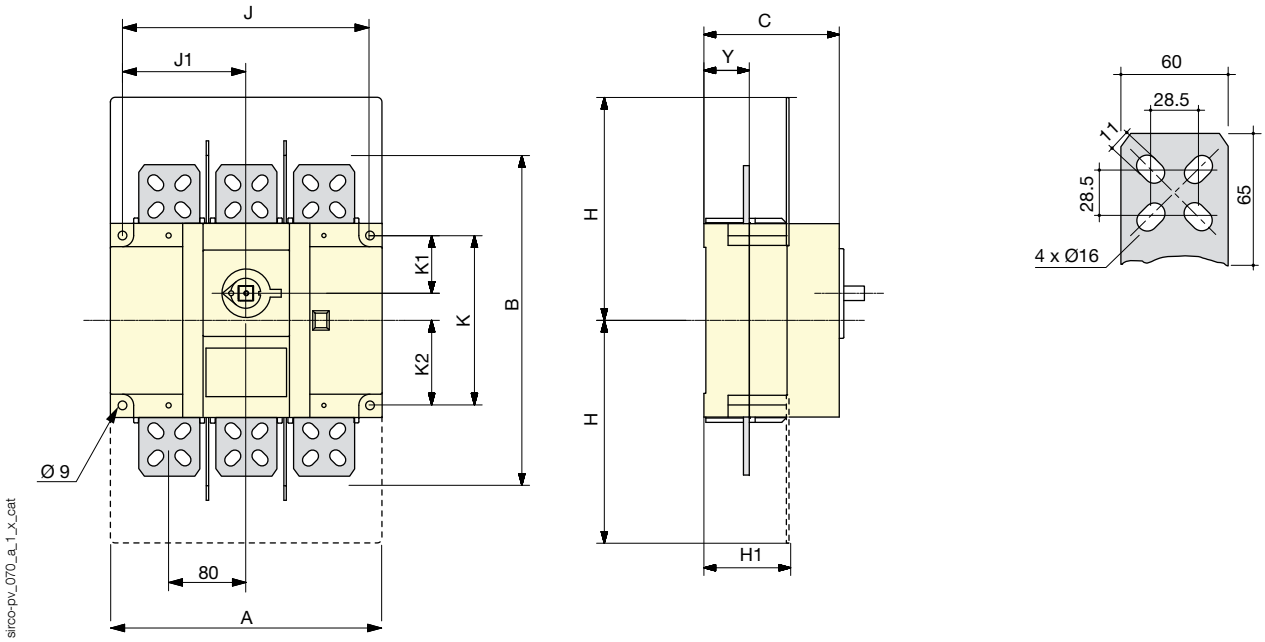
Frame	No. of pole	A	B	C	H	H1 max.	J	J1	J2	J3	K	K1	K2	Y
B4	2 P	180	160	95	132.5	107	160	55	-	100	135	48	80	38.5
B5	2 P	230	260	128	203	166	210	75	-	130	195	67.5	80	53
B5	3 P	230	260	126.5	203	166	210	75	65	-	195	67.5	80	51.5
B5	4 P	290	260	126.5	203	166	270	135	65	-	195	67.5	80	51.5

Frame $B4_{DS}$-$B5_{DS}$



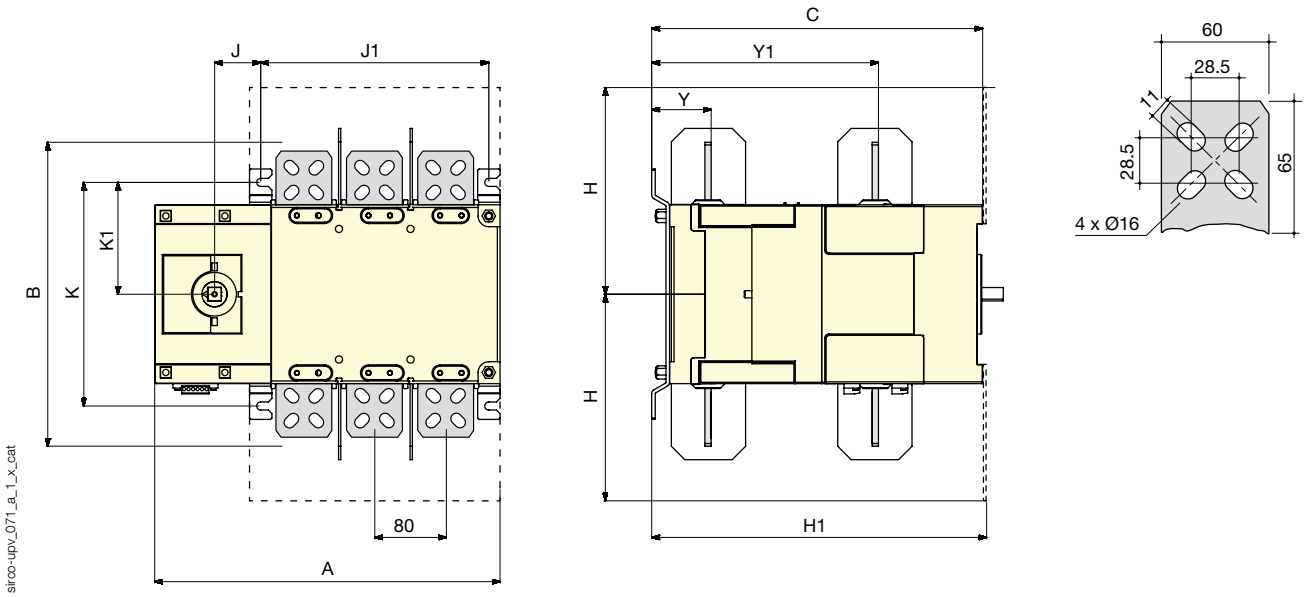
Frame	No. of pole	A	B	C	H	H1	H1 max.	J	J1	J2	J3	K	K1	Y	Y1
$B4_{DS}$	4 P	244	160	162	129	176	107	160	35	-	100	135	67.5	38.5	132.5
$B5_{DS}$	6 P	301	260	238.5	203	165.5	166	210	35	65	-	195	68.5	51.5	189
$B5_{DS}$	8 P	361	260	238.5	203	165.5	166	270	35	65	-	195	68.5	51.5	189

Frame B6



Frame	No. of pole	A	B	C	H	H1	J	J1	K	K1	K2	Y
B6	4 P	630	340	139	270	145	335	167.5	175	59.5	28	46.5

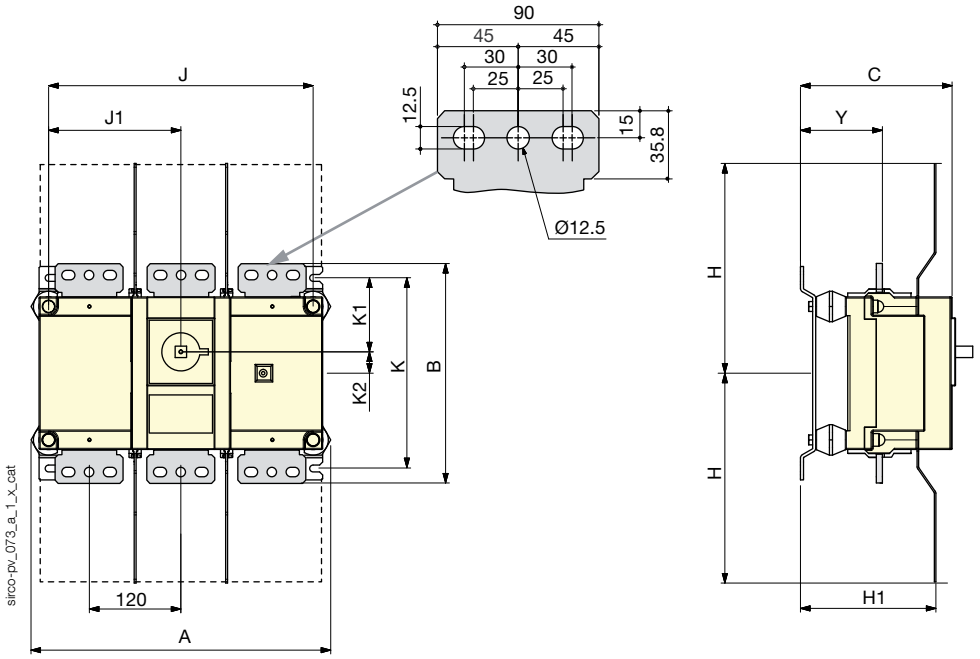
Frame $B6_{DS}$



Frame	No. of pole	A	B	C	H	H1	J	J1	K	K1	Y	Y1
$B6_{ds}$	8 P	466	340	370	270	347	335	51.5	250	125	66.5	253.5

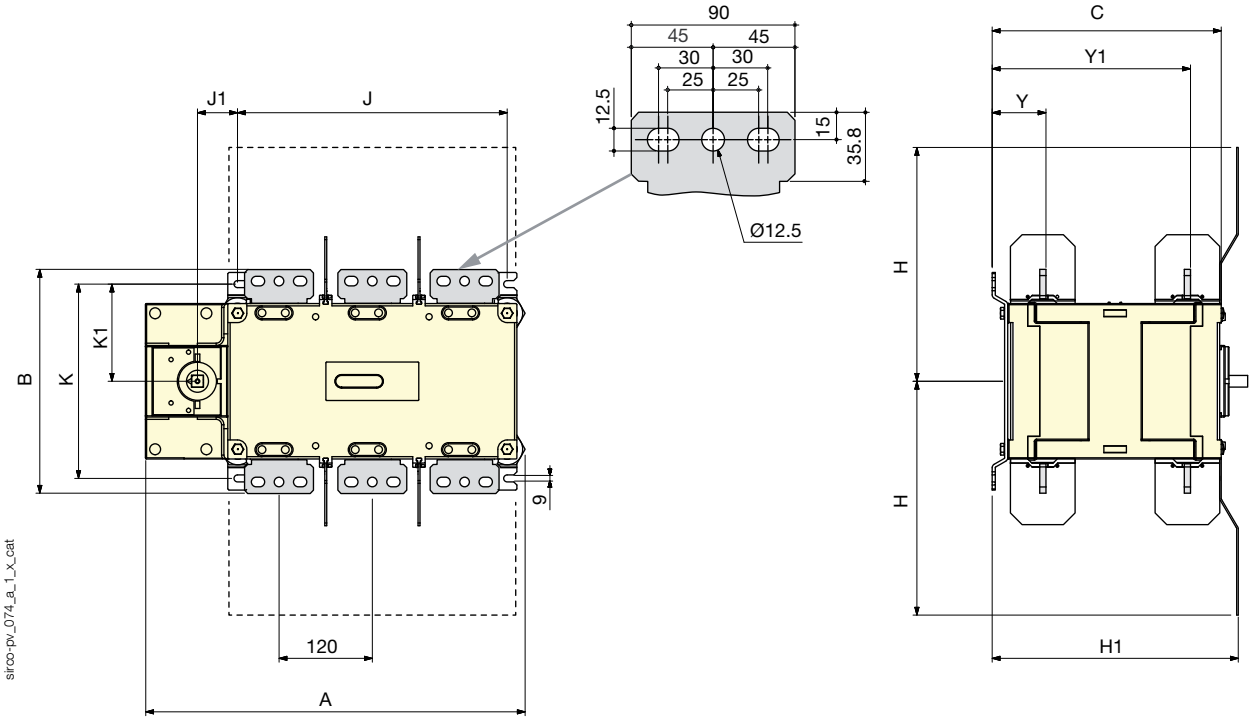
Dimensions (mm) (continued)

Frame B7



Frame	No. of pole	A	B	C	H	H1	H2	J	J1	K	K1	K2	Y
B7	4 P	513	288	200	302	211	203.5	467	233.5	250	97	28	107.5

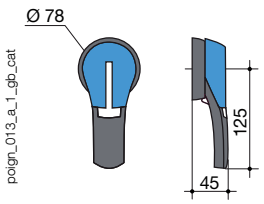
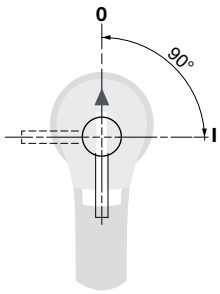
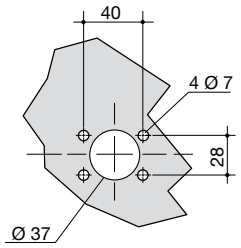
Frame $B7_{DS}$



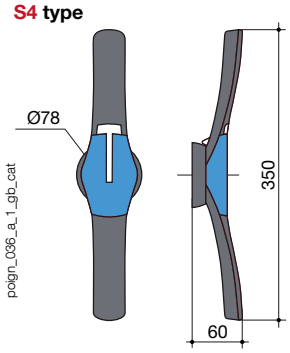
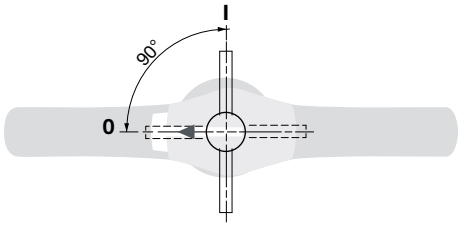
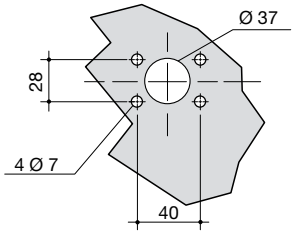
Frame	No. of pole	A	B	C	H	H1	J	J1	K	K1	Y	Y1
$B7_{DS}$	8 P	608.5	288	333	301	389	467	51.5	250	125	107.5	293.5

Dimensions for external handles (mm)

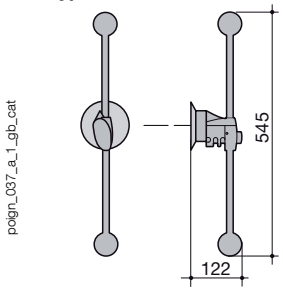
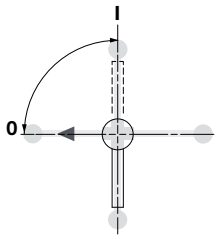
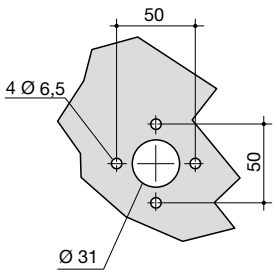
B4 - $B4_{DS}$ - B5

Handle type	Front operation Direction of operation	Door drilling
S2 type 		

$B5_{DS}$ - B6 - B7

Handle type	Front operation Direction of operation	Door drilling
S4 type 		

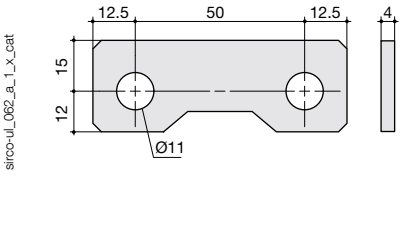
$B6_{DS}$ - $B7_{DS}$

Handle type	Front operation Direction of operation	Door drilling
V1 type 		

Bridging bars (mm)

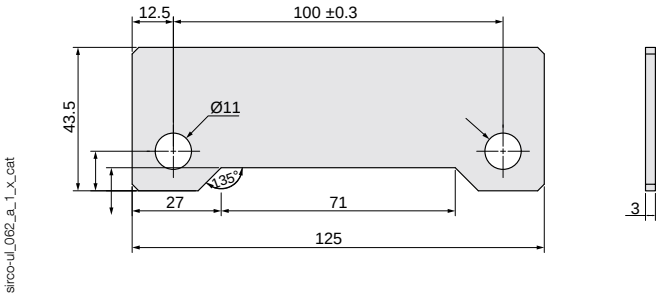
B4

2609 0025



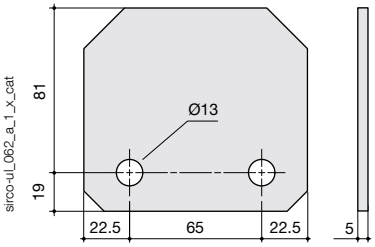
B5 - B5$_{DS}$

2709 0045

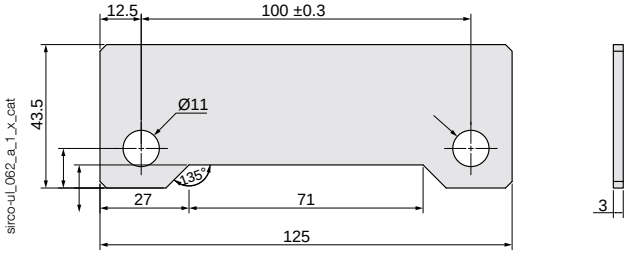


B5

2609 0080

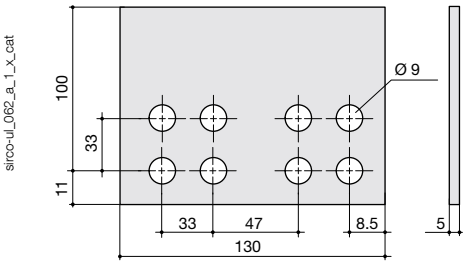


2709 0027



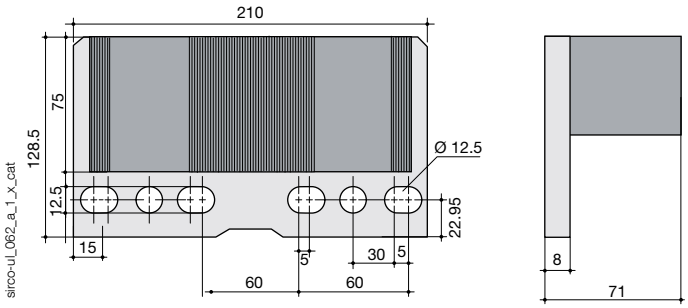
B6

2609 1100



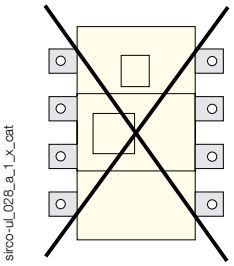
B7

2609 1200

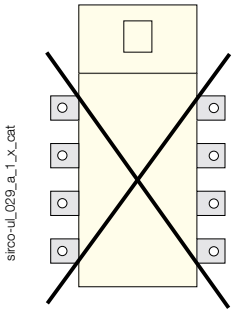


Mounting orientation

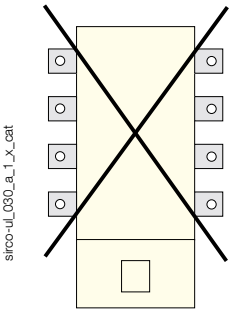
All frames



$B4_{DS}$ - $B5_{DS}$



$B6_{DS}$ - $B7_{DS}$



SIRCO PV UL98B

Load break switches for photovoltaic applications
from 100 to 2000 A - up to 1500 VDC

Strong points

- Patented switching technology.
- Positive break indication.
- Up to 1000 VDC as per characteristics by UL98B.
- Up to 1500 VDC as per characteristics by IEC 60947-3.
- Suitable for use in accordance with NEC Art. 690 2011 issue.

Conformity to standards

- UL98B Guide WHVA, file E346418
- CSA C22.2#4, Class 4651-02, file 112964
- NEC Art 690 Issue 2011
- IEC 60947-3

Approvals and certifications(1)

(1) Product reference on request.

Function

SIRCO PV UL98B are manually operated multipole load break switches. They make and break on load and provide safety isolation for any PV circuit up to 1000 VDC (as per UL98B standard). They comply with NEC Art. 690 (US National Electrical Code) concerning photovoltaic installations. They are compliant for use within solar inverters and enclosures governed by UL1741 standard.

SIRCO PV are extremely durable switches that have been tested and approved for use in the most demanding environments.
They have been designed and tested for all types of applications such as earthing, floating or bipolar.

Advantages

Performance

A glass fibre reinforced polyester break chamber with an arc extinguishing system provides a patented safety disconnection system offering rapid extinguishing of the electric arc up to 1500 VDC with current interruption of up to 2000 A.

Back-to-back double load break switch

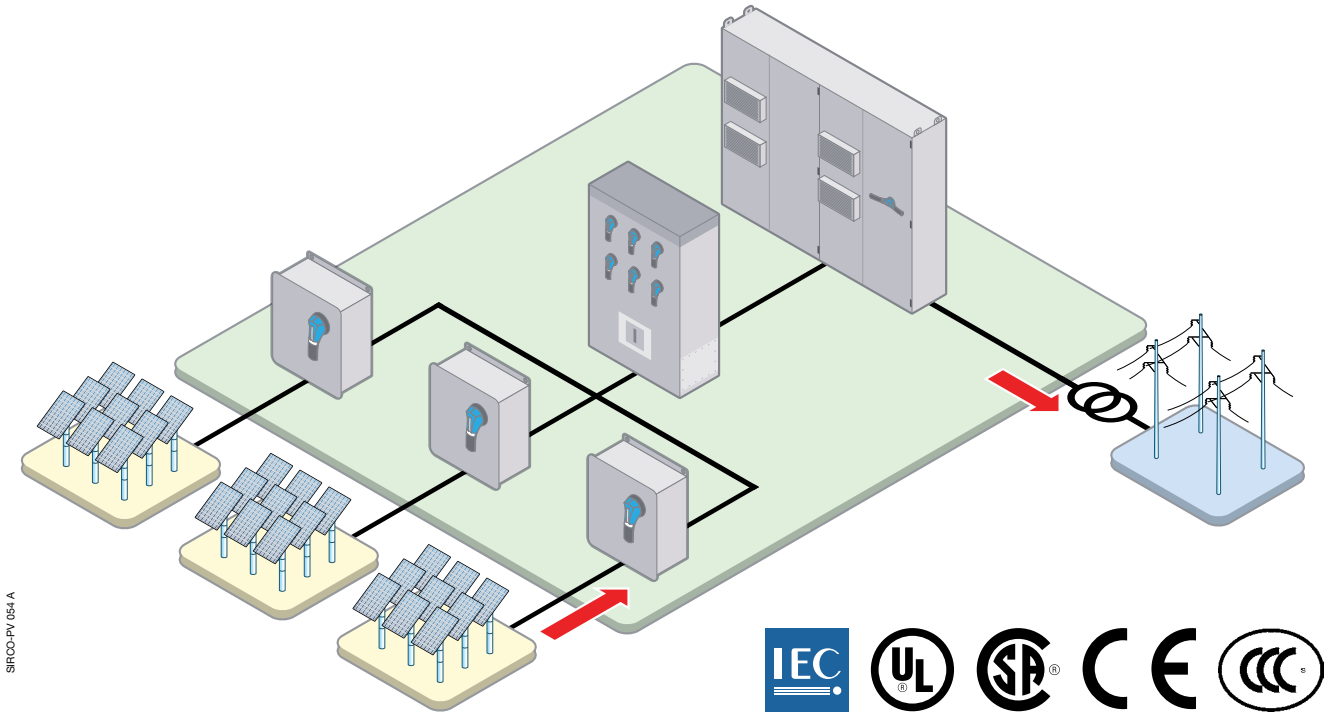
Back-to-back double switches enables:

- simultanuous on load operation of two switches with a single handle,
- a compact solution when connecting two separate photovoltaic circuits compared with the use of two separate switches,
- easy connection,
- voltages above 1000 VDC are safety broken by the use of two poles in series.

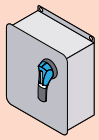
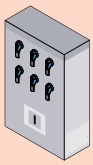
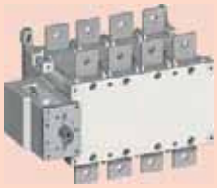
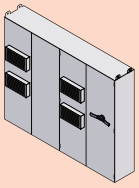
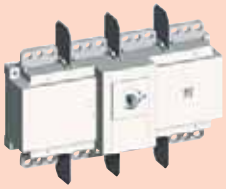
socomec Innovative Power Solutions

Typical PV architecture

The SIRCO PV range provides safe disconnection and isolation at all levels within your PV installation.



The SOCOMEC solutions

LEVEL OF INSTALLATION	SOCOMEC SOLUTIONS	
Combiner box		
		SIRCO PV One circuit 100 to 400 A up to 1500 VDC
Recombiner box		
		SIRCO PV 4 circuits 100 to 400 A at 1000 VDC 2 circuits 100 to 400 A at 1500 VDC
Inverter		
		SIRCO PV One circuit 100 to 2000 A at 1000 VDC 100 to 900 A at 1500 VDC

References

1000 VDC - Back plate mounting

Rating (A)	Frame	Number of poles	Switch body	External handle	Shaft for external handle	Bridging bar (single polarity switching)
1 PV circuit						
100 A	B4	2 P	27PV **2009**	S2 type Black 1, 3R, 12 142F **2111**(1) Red/Yellow 1, 3R, 12 142G **2111**(1) Black 4, 4X 142D **2111**(1) Red/Yellow 4, 4X 142E **2111**(1)	200 mm 7.9 inches 1400 **1020** 320 mm 12.6 inches 1400 **1032** 400 mm 15.7 inches 1400 **1040**(2)	1x 2709 **1020**
200 A	B4		27PV **2019**			
250 A	B4		27PV **2024**			
325 A	B5		27PV **2032**			1x 2709 **1041**
400 A	B5		27PV **2039**			2x 2709 **1041**
600 A	B6	4 P	27PV **4060**	S3 type Black 4, 4X 143D **3111**(1) Red/Yellow 4, 4X 143E **3111**(1)	200 mm 7.9 inches 1401 **1520** 320 mm 12.6 inches 1401 **1532** 400 mm 15.7 inches 1401 **1540**(2)	2x 2709 **0062**
800 A	B7		27DC **4081**	S4 type Black 4, 4X 144D **3111**(1) Red/Yellow 4, 4X 144E **3111**(1)		2x 2709 **0081**
1200 A	B7		27DC **4121**			2x 2709 **0121**
2000 A	$B7_{DS}$		27DC **4201**	V1 type Black 3R, 12 2799 **7145**	320 mm 12.6 inches 4199 **3018**	
2 PV circuits						
100 A	$B4_{DS}$	4 P	27PV **5009**	S2 type Black 1, 3R, 12 142F **2111**(1) Red/Yellow 1, 3R, 12 142G **2111**(1) Black 4, 4X 142D **2111**(1) Red/Yellow 4, 4X 142E **2111**(1)	200 mm 7.9 inches 1400 **1020** 320 mm 12.6 inches 1400 **1032** 400 mm 15.7 inches 1400 **1040**(2)	2x 2709 **1020**
200 A	$B4_{DS}$		27PV **5024**			4x 2709 **1020**
325 A	B5		27PV **4032**			2x 2709 **0027**
400 A	B5		27PV **4039**			2x 2709 **0045**
600 A	$B6_{DS}$	8 P	27PV **8060**	V1 type Black 3R, 12 2799 **7145**	320 mm 12.6 inches 4199 **3018**	4x 2709 **0062**
800 A	$B7_{DS}$		27DC **8081**			4x 2709 **0121**
1000 A	$B7_{DS}$		27DC **8101**			
4 PV circuits						
350 A	$B5_{DS}$	8 P	27PV **8039**	S3 type Black 4, 4X 143D **3111**(1) Red/Yellow 4, 4X 143E **3111**(1)	200 mm 7.9 inches 1401 **1520** 320 mm 12.6 inches 1401 **1532** 400 mm 15.7 inches 1401 **1540**(2)	4x 2709 **0045**

(1) Defeatable handle.
(2) Shaft guide reference 1429 0000 is required for shaft length over 15.7 inches (400mm).

1500 VDC - Back plate mounting

Rating (A)	Frame	Number of poles	Switch body	External handle	Shaft for external handle	Bridging bar (single polarity switching)
1 PV circuit						
275 A	B5	3 P	27PV **3026**	S2 type Black 1, 3R, 12 142F **2111**(1) Red/Yellow 1, 3R, 12 142G **2111**(1) Black 4, 4X 142D **2111**(1) Red/Yellow 4, 4X 142E **2111**(1)	200 mm 7.9 inches 1400 **1020** 320 mm 12.6 inches 1400 **1032** 400 mm 15.7 inches 1400 **1040**(2)	2x 2709 **0027**
325 A	B5		27PV **3032**			
400 A	B5		27PV **3039**			2x 2709 **0045**
600 A	$B6_{DS}$	8 P	27PV **8060**	V1 type Black 3R, 12 2799 **7145**	320 mm 12.6 inches 4199 **3018**	4x 2709 **0062**
800 A	$B7_{DS}$		27DC **8081**			4x 2709 **0121**
1000 A	$B7_{DS}$		27DC **8101**			
2 PV circuits						
275 A	$B5_{DS}$	6 P	27PV **6026**	S3 type Black 4, 4X 143D **3111**(1) Red/Yellow 4, 4X 143E **3111**(1)	200 mm 7.9 inches 1401 **1520** 320 mm 12.6 inches 1401 **1532** 400 mm 15.7 inches 1401 **1540**(2)	4x 2709 **0027**
350 A	$B5_{DS}$		27PV **6039**			4x 2709 **0045**

(1) Defeatable handle.
(2) Shaft guide reference 1429 0000 is required for shaft length over 15.7 inches (400mm).

Accessories

External operation

Use

In a combiner box, located close to the solar cell strings, or located close to the inverter, we recommend to use a door interlocked external handle for its safety features.

Door interlocked external operation handles include an escutcheon, are padlockable and must be utilised with an extension shaft.

Example

The locking function of the enclosure in the "ON" position will force the operator to safely disconnect and isolate the solar cell strings prior to any intervention. Opening the door when the switch is on "ON" position is possible by defeating the locking function using a tool (authorized persons only). The interlocking function is restored when the door is closed back.

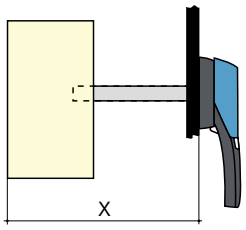
Frame	Handle type	Handle colour	NEMA degree of protection	Reference
B4 … B5 - $B4_{DS}$	S2	Black	1, 3R, 12	142F **2111**
B4 … B5 - $B4_{DS}$	S2	Red/Yellow		142G **2111**
B4 … B5 - $B4_{DS}$	S2	Black	4, 4X	142D **2111**
B4 … B5 - $B4_{DS}$	S2	Red/Yellow		142E **2111**
$B5_{DS}$ - B6	S3	Black		143D **3111**
$B5_{DS}$ - B6	S3	Red/Yellow		143E **3111**
B7	S4	Black		144D **3111**
B7	S4	Red/Yellow		144E **3111**
$B6_{DS}$ … $B7_{DS}$	V1	Black	1, 3R, 12	2799 **7145**

Shaft for external handle

Use

Standard lengths:
- 7.9 in / 200 mm,
- 12.6 in / 320 mm,
- 15.7 in / 400 mm.

Other lengths: please consult us.



Frame	Handle type	Dimension (inches)	Dimension X (mm)	Length (inches)	Length (mm)	Reference
B4	S2	6 … 11.6	150 … 295	7.9	200	1400 **1020**
B4	S2	6 … 16.3	150 … 415	12.6	320	1400 **1032**
B4	S2	6 … 19.4	150 … 495	15.7	400	1400 **1040**
B5	S2	8 … 12.9	203 … 328	7.9	200	1400 **1020**
B5	S2	8 … 17.6	203 … 448	12.6	320	1400 **1032**
B5	S2	8 … 20.7	203 … 525	15.7	400	1400 **1040**
B6	S3	8.70 … 13.50	220 … 343	7.9	200	1401 **1520**
B6	S3	8.70 … 18.23	220 … 463	12.6	320	1401 **1532**
B6	S3	8.70 … 21.38	220 … 543	15.7	400	1401 **1540**
B7	S4	12 … 14.4	305 … 366	7.9	200	1401 **1520**
B7	S4	12 … 19.1	305 … 485	12.6	320	1401 **1532**
B7	S4	12 … 22.2	305 … 564	15.7	400	1401 **1540**
$B4_{DS}$	S2	12 … 14.3	305 … 363	7.9	200	1400 **1020**
$B4_{DS}$	S2	12 … 19	305 … 483	12.6	320	1400 **1032**
$B4_{DS}$	S2	12 … 22.10	305 … 561	15.7	400	1400 **1040**
$B5_{DS}$	S3, S4	16 … 18.4	406 … 467	7.9	200	1401 **1520**
$B5_{DS}$	S3, S4	16 … 23.1	406 … 589	12.6	320	1401 **1532**
$B5_{DS}$	S3, S4	16 … 26.3	406 … 668	15.7	400	1401 **1540**
$B6_{DS}$	V1	20 … 28.1	508 … 714	12.6	320	4199 **3018**
$B6_{DS}$	V1	20 … 31.3	508 … 795	15.7	400	4199 **3019**
$B7_{DS}$	V1	20 … 28.1	508 … 714	12.6	320	4199 **3018**
$B7_{DS}$	V1	20 … 39.4	508 … 795	15.7	400	4199 **3019**

S type handle adapter

Use
For handles S2, S3 and S4.

Dimensions
Increases the distance between the handle grip and the door by 12 mm, for better handling.

Colour	NEMA degree of protection	To be ordered in multiples of	Reference
Black	1, 3R, 12	10	1493 **0000**


acces_187_a_3_cat

Alternative S type handle cover colours

Use
For handles S2, S3 and S4.

Other colours: please consult us.

Handle colour	Handle type	To be ordered in multiples of	Reference
Light grey	S2, S3	50	1401 **0001**
Dark grey	S2, S3	50	1401 **0011**
Light grey	S4	50	1401 **0031**
Dark grey	S4	50	1401 **0041**


acces_198_a_3_cat

Auxiliary contact

Use
Pre-break and signalling of positions 0 and I:
- 1 to 2 NO/NC auxiliary contacts,
- 1 to 2 low level NO/NC auxiliary contacts.

Electrical characteristics
A300.


acces_076_a_1_cat

NO/NC contact

Frame	Position AC	Type	Reference
B4 … B7	1 contact	NO/NC	2799 **0021**
B4 … B7	2 contacts		2799 **0022**
$B4_{DS}$ … $B7_{DS}$	1 contact		4159 **0021**

Low level NO/NC auxiliary contacts

Frame	Position AC	Type	Reference
B4 … B7	1 contact	NO/NC	2799 **0121**
B4 … B7	2 contacts		2799 **0122**
$B4_{DS}$ … $B7_{DS}$	1 contact		4199 **0022**

Terminal screen

Use
Top or bottom protection against direct contact with terminals or connection parts.

Frame	No. of pole	Position	Pack	Reference
B4	2 P	top or bottom	1 unit	2798 **3021**
B5	3 P	top or bottom	1 unit	2798 **3041**
B5	4 P	top or bottom	1 unit	2798 **4041**
B6	4 P	top or bottom	1 unit	2798 **4061**
B7	4 P	top or bottom	1 unit	2798 **4121**
$B4_{DS}$	2 P	top or bottom	1 unit	4158 **3021**
$B5_{DS}$	6 P	top or bottom	1 unit	4158 **3041**
$B5_{DS}$	8 P	top or bottom	1 unit	4158 **4041**
$B6_{DS}$	8 P	top and bottom	2 units	2798 **8061**
$B7_{DS}$	8 P	top or bottom	1 unit	2798 **4121**


acces_079_a_1_cat

Accessories (continued)

Bridging bars for connecting poles in series

Use

The bridging bars will make easy the connection of the poles in series, allowing the following configurations(1).

(1) Other connections: refer to mounting instructions.

1000 VDC

Frame	Rating (A)	Quantity to be ordered to connect two poles in series	Fig.	Reference
1 PV circuit				
B4	100	1	1	2709 **1020**
B4	200	1	1	2709 **1020**
B4	250	1	1	2709 **1020**
B5	325	1	1	2709 **1041**
B5	400	2	2	2709 **1041**
B6	600	2	3	2709 **0062**
B7	800	2	3	2709 **0081**
B7	1200	2	3	2709 **0121**
$B7_{DS}$	2000	2	3	2709 **0121**
2 PV circuits				
$B4_{DS}$	100	2	1	2709 **1020**
$B4_{DS}$	200	4	4	2709 **1020**
B5	325	2	5	2709 **0027**
B5	400	2	6	2709 **0045**
B5	400	2	6	2709 **0045**
$B6_{DS}$	600	4	3	2709 **0062**
$B7_{DS}$	800	4	3	2709 **0121**
$B7_{DS}$	1200	4	3	2709 **0121**
4 PV circuits				
$B5_{DS}$	350	2	6	2709 **0045**

1500 VDC

Frame	Rating (A)	Quantity to be ordered to connect two poles in series	Fig.	Reference
1 PV circuit				
B5	275	2	5	2709 **0027**
B5	325	2	5	2709 **0027**
B5	400	2	6	2709 **0045**
$B6_{DS}$	600	4	3	2709 **0062**
$B7_{DS}$	800	4	3	2709 **0121**
$B7_{DS}$	1000	4	3	2709 **0121**
2 PV circuits				
$B5_{DS}$	275	4	5	2709 **0027**
$B5_{DS}$	350	4	6	2709 **0045**

Bridging bars for connecting poles in series (continued)

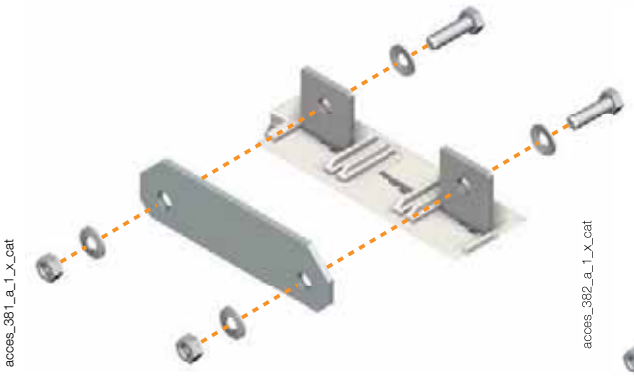


Fig. 1

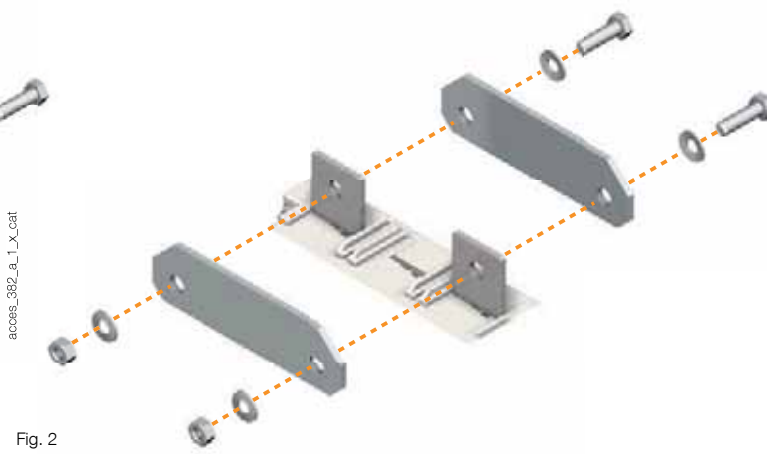


Fig. 2

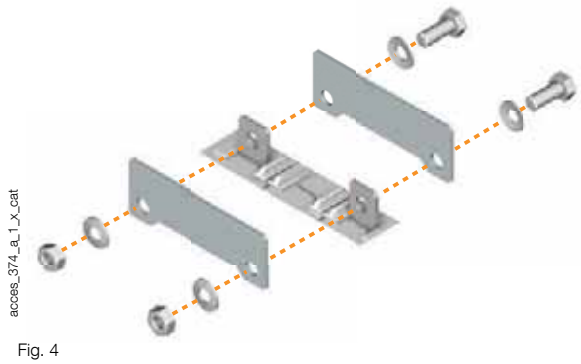


Fig. 4

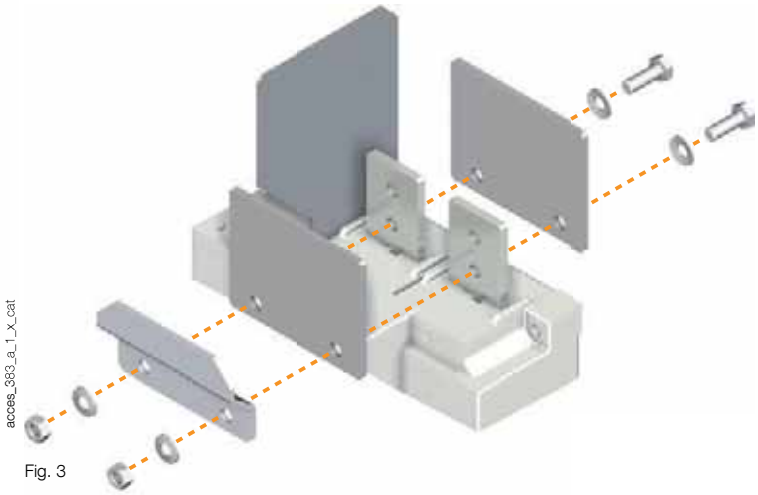


Fig. 3

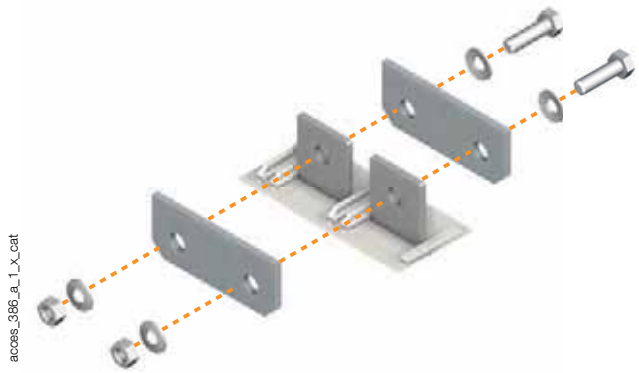


Fig. 5

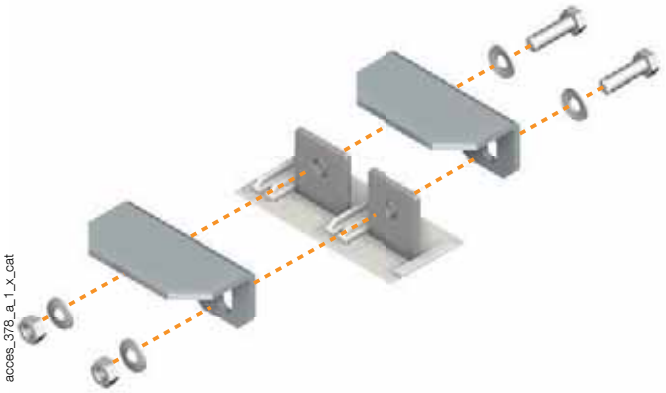


Fig. 6

Accessories (continued)

Cage terminals

Use

For the connection of bare copper cables onto the terminals (without lugs).
Optional fan out kit for ratings of 800 to 1200 A for connecting several cables to the switch.

Frame	Rating max (A)	Numbrer and size of cables	Max. number of connections per terminal	Type of cable	Quantity	Reference
B4 - $B4_{DS}$	100 … 200	1 conductor (#6-300MCM)	1	Cu / Al	2 lugs	3954 **2020**
B4 - $B4_{DS}$	100 … 200	2 conductors (#4-2/0)	1	Cu / Al	2 lugs	3954 **2025**
B4 - $B4_{DS}$	325 … 400	1 conductor (#2-600MCM)	1	Cu / Al	2 lugs	3954 **2040**
B4 - $B4_{DS}$	325 … 400	2 conductors (#6-350MCM)	1	Cu / Al	2 lugs	3954 **2041**
B6 - $B6_{DS}$	600	2 conductors (#2-600MCM)	1	Cu / Al	2 lugs	3954 **2060**
B7	800 … 1200	2 conductors (#2-600MCM)	2	Cu / Al	2 lugs	3954 **2060**
B7	800 … 1200	2 conductors (#2-600MCM)	3(1)	Cu / Al	3 lugs	3954 **3060**
$B7_{DS}$	2000	2 conductors (#2-600MCM)	2(2)	Cu / Al	2 lugs	3954 **2060**
$B7_{DS}$	2000	2 conductors (#2-600MCM)	3(3)	Cu / Al	3 lugs	3954 **3060**

(1) Order a fan out kit reference 2709 1203 for connecting 3 connectors per terminal (6 in total for the switch).
(2) 2 connectors per terminal with the connection kit 2729 1200.
(3) 3 connectors per terminal with the connection kits 2729 1201 and 2709 1202.

Copper bar connection kits

Use

To allow connection between the two power terminals from a same pole for 2000 A ratings. (Fig. 1, Fig. 2 and Fig. 3)

Top or bottom flat connection

Frame	Rating (A)	Figure	Quantity to order per pole	Number of terminals	Reference
$B7_{DS}$	800 … 1000	1	1	2	2729 **1200**
	800 … 1000	2	1	3	2729 **1202**
	2000	1	1	2	2729 **1200**
	2000	2	1	3	2729 **1202**

Top or bottom edgewise connection

Frame	Rating (A)	Figure	Quantity to order per pole	Number of terminals	Reference
$B7_{DS}$	800 … 2000	3	1	3	2729 **1201**

Fig. 1

Fig. 3

Fig. 2

Characteristics

as per UL98B standards

Rating (A)		100 A				200 A			
Number of circuits	**Rated voltage**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	100	2 P	2 P	B4	200	2 P	2 P	B4
2 circuits	600 VDC	100	1 P	2 P	B4	130	1 P	2 P	B4
2 circuits	1000 VDC	100	2 P	4 P	$B4_{DS}$	200	2 P	4 P	$B4_{DS}$
4 circuits	600 VDC	100	1 P	4 P	$B4_{DS}$	130	1 P	4 P	$B4_{DS}$
Short-circuit capacity at 1000 VDC (any circuit breaker)									
Prospective short-circuit current (kA rms DC)		10(1)				10(1)			
Connection terminals									
Min. connection wire range/ AWG		#6				#6			
Max. connection wire range/ AWG		300MCM				300MCM			
Mechanical characteristics									
Durability (number of operating cycles)		10 000				10 000			
Operating effort (lbs.in/Nm)		88.5/10				88.5/10			
Auxiliary contact									
Electrical characteristics		A300				A300			

as per IEC 60947-3 standard

Thermal current at 40°C (A)			**160**				**250**			
Thermal current at 50°C (A)			**160**				**250**			
Thermal current at 60°C (A)			**160**				**250**			
Rated insulation voltage U_i (V)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilisation category**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	DC-21B	160	2 P	2 P	B4	250	2 P	2 P	B4
1 circuit	1500 VDC	DC-21B	160	4 P	4 P	$B4_{DS}$	250	4 P	4 P	$B4_{DS}$
2 circuits	1000 VDC	DC-21B	160	2 P	4 P	$B4_{DS}$	250	2 P	4 P	$B4_{DS}$
4 circuits	600 VDC	DC-21B	125	1 P	4 P	$B4_{DS}$	160	1 P	4 P	$B4_{DS}$

(1) Without fuse during 50 ms.

Characteristics (continued)

as per UL98B standards

Rating (A)		250 A				275 A			
Number of circuits	**Rated voltage**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	250	2 P	2 P	B4	275	2 P	2 P	B5
2 circuits	600 VDC	130	1 P	2 P	B4	215	1 P	2 P	B5
2 circuits	1000 VDC	-	-	-	-	275	2 P	4 P	B5
4 circuits	600 VDC	-	-	-	-	215	1 P	4 P	B5
4 circuits	1000 VDC	-	-	-	-	215	2 P	8 P	$B5_{DS}$
6 circuits	600 VDC	-	-	-	-	215	1 P	6 P	$B5_{DS}$
8 circuits	600 VDC	-	-	-	-	215	1 P	8 P	$B5_{DS}$
Short-circuit capacity at 1000 VDC (any circuit breaker)									
Prospective short-circuit current (kA rms DC)		10[1]				10[1]			
Connection terminals									
Min. connection wire range/ AWG		#6				2x#6			
Max. connection wire range/ AWG		300MCM				600MCM			
Mechanical characteristics									
Durability (number of operating cycles)		10 000				6 000			
Operating effort (lbs.in/Nm)		88.5/10				128.3/14.5			
Auxiliary contact									
Electrical characteristics		A300				A300			

as per IEC 60947-3 standard

Thermal current at 40°C (A)			**315**				**275**			
Thermal current at 50°C (A)			**315**				**275**			
Thermal current at 60°C (A)			**315**				**275**			
Rated insulation voltage U_i (V)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilisation category**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	DC-21B	315	2 P	2 P	B4	275	2 P	2 P	B5
1 circuit	1500 VDC	DC-21B	315	4 P	4 P	$B4_{DS}$	275	2 P	3 P	B5
2 circuits	1000 VDC	DC-21B	315	2 P	4 P	$B4_{DS}$	275	2 P	4 P	B5
4 circuits	600 VDC	DC-21B	160	1 P	4 P	$B4_{DS}$	275	1 P	4 P	B5
4 circuits	1000 VDC	DC-21B	-	-	-	-	275	2 P	8 P	$B5_{DS}$
6 circuits	600 VDC	DC-21B	-	-	-	-	275	1 P	6 P	$B5_{DS}$
8 circuits	600 VDC	DC-21B	-	-	-	-	275	1 P	8 P	$B5_{DS}$

(1) Without fuse during 50 ms.

as per UL98B standards

Rating (A)		325 A				350 A			
Number of circuits	**Rated voltage**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	325	2 P	2 P	B5	-	-	-	-
2 circuits	600 VDC	215	1 P	2 P	B5	-	-	-	-
2 circuits	1000 VDC	325	2 P	4 P	B5	350	3 P	6 P	$B5_{DS}$
4 circuits	600 VDC	215	1 P	4 P	B5	-	-	-	-
4 circuits	1000 VDC	325	2 P	8 P	$B5_{DS}$	350	2 P	8 P	$B5_{DS}$
6 circuits	600 VDC	215	1 P	6 P	$B5_{DS}$	215	1 P	6 P	$B5_{DS}$
8 circuits	600 VDC	215	1 P	8 P	$B5_{DS}$	215	1 P	8 P	$B5_{DS}$
Short-circuit capacity at 1000 VDC (any circuit breaker)									
Prospective short-circuit current (kA rms DC)		10[1]				10[1]			
Connection terminals									
Min. connection wire range/ AWG		2x#6				2x#6			
Max. connection wire range/ AWG		600MCM				600MCM			
Mechanical characteristics									
Durability (number of operating cycles)		6 000				6 000			
Operating effort (lbs.in/Nm)		128.3/14.5				128.3/14.5			
Auxiliary contact									
Electrical characteristics		A300				A300			

as per IEC 60947-3 standard

Thermal current at 40°C (A)			**400**				**500**			
Thermal current at 50°C (A)			**400**				**500**			
Thermal current at 60°C (A)			**400**				**500**			
Rated insulation voltage U_i (V)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilisation category**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	DC-21B	400	2 P	2 P	B5	-	-	-	-
2 circuits	1000 VDC	DC-21B	400	2 P	4 P	B5	500	3 P	6 P	$B5_{DS}$
4 circuits	600 VDC	DC-21B	275	1 P	4 P	B5	-	-	-	-
4 circuits	1000 VDC	DC-21B	400	2 P	8 P	$B5_{DS}$	500	2 P	8 P	$B5_{DS}$
6 circuits	600 VDC	DC-21B	275	1 P	6 P	$B5_{DS}$	275	1 P	6 P	$B5_{DS}$
8 circuits	600 VDC	DC-21B	275	1 P	8 P	$B5_{DS}$	275	1 P	8 P	$B5_{DS}$

(1) Without fuse during 50 ms.

Characteristics (continued)

as per UL98B standards

Rating (A)		400 A				600 A			
Number of circuits	**Rated voltage**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	400	2 P	2 P	B5	600	4 P	4 P	B6
2 circuits	600 VDC	215	1 P	2 P	B5	600	3 P	6 P	$B6_{DS}$
2 circuits	1000 VDC	400	2 P	4 P	B5	600	4 P	8 P	$B6_{DS}$
4 circuits	600 VDC	215	1 P	4 P	B5	-	-	-	-
Short-circuit capacity at 1000 VDC (any circuit breaker)									
Prospective short-circuit current (kA rms DC)		10(1)				10(1)			
Connection terminals									
Min. connection wire range/ AWG		2x#6				2x#2			
Max. connection wire range/ AWG		600MCM				2 x 600MCM			
Mechanical characteristics									
Durability (number of operating cycles)		6 000				6 000			
Operating effort (lbs.in/Nm)		128.3/14.5				327.5/37			
Auxiliary contact									
Electrical characteristics		A300				A300			

as per IEC 60947-3 standard

Thermal current at 40°C (A)			**500**				**800**			
Thermal current at 50°C (A)			**500**				**-**			
Thermal current at 60°C (A)			**500**				**-**			
Rated insulation voltage U_i (V)			1500				1500(2)			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilisation category**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	DC-21B	500	2 P	2 P	B5	800	4 P	4 P	B6
1 circuit	1500 VDC	DC-21B	500	2 P	3 P	B5	800	8 P	8 P	$B6_{DS}$
2 circuits	1000 VDC	DC-21B	500	2 P	4 P	B5	800	4 P	8 P	$B6_{DS}$
4 circuits	600 VDC	DC-21B	275	1 P	4 P	B5	-	-	-	-

(1) Without fuse during 50 ms.
(2) 1200 VDC for B6.

as per UL98B standards

Rating (A)		800 A				1200 A			
Number of circuits	**Rated voltage**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	800	4 P	4 P	B7	1200	4 P	4 P	B7
2 circuits	600 VDC	800	3 P	6 P	$B7_{DS}$	1200	3 P	6 P	$B7_{DS}$
2 circuits	1000 VDC	800	4 P	8 P	$B7_{DS}$	1200	4 P	8 P	$B7_{DS}$
Short-circuit capacity at 1000 VDC (any circuit breaker)									
Prospective short-circuit current (kA rms DC)		10(1)				10(1)			
Connection terminals									
Min. connection wire range/ AWG		4x#2				4x#2			
Max. connection wire range/ AWG		6x 600MCM(2)				6x 600MCM(2)			
Mechanical characteristics									
Durability (number of operating cycles)		3 500				3 500			
Operating effort (lbs.in/Nm)		495.7/56				663.9/75			
Auxiliary contact									
Electrical characteristics		A300				A300			

as per IEC 60947-3 standard

Thermal current at 40°C (A)			**1000**				**1400**			
Rated insulation voltage U_i (V)			1500(3)				1500(3)			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilisation category**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	DC-21B	1000	4 P	4 P	B7	1400	4 P	4 P	$B7_{DS}$
1 circuit	1500 VDC	DC-21B	1000	8 P	8 P	$B7_{DS}$	1000	8 P	8 P	$B7_{DS}$
2 circuits	1000 VDC	DC-21B	1000	4 P	8 P	$B7_{DS}$	1000	4 P	8 P	$B7_{DS}$

(1) Without fuse during 50 ms.
(2) Maximum 6 x 600MCM with fan out kit 2729 1203.
(3) 1200 VDC for B7.

Characteristics (continued)

as per UL98B standards

Rating (A)		2000 A			
Number of circuits	**Rated voltage**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	2000	8 P	8 P	$B7_{DS}$
Short-circuit capacity at 1000 VDC (any circuit breaker)					
Prospective short-circuit current (kA rms DC)		10(1)			
Connection terminals					
Min. connection wire range/ AWG		4x#2			
Max. connection wire range/ AWG		6x 600MCM(2)			
Mechanical characteristics					
Durability (number of operating cycles)		3 500			
Operating effort (lbs.in/Nm)		663.9/75			
Auxiliary contact					
Electrical characteristics		A300			

as per IEC 60947-3 standard

Thermal current at 40°C (A)			2200			
Rated insulation voltage U_i (V)			1200			
Rated impulse withstand voltage U_{imp} (kV)			12			
Number of circuits	**Rated voltage**	**Utilisation category**	**(A)**	**Number of pole(s) in series (per circuit)**	**Number of pole(s) of the switch**	**Frame**
1 circuit	1000 VDC	DC-21B	2000	8 P	8 P	$B7_{DS}$

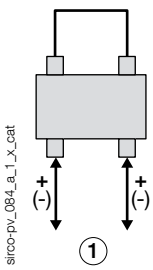
(1) Without fuse during 50 ms.
(2) Maximum 6 x 600MCM with fan out kit 2729 1203.

Pole connection in series

1 PV circuit - 1000 VDC

B4-B5- 2P

Grounded



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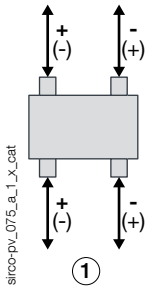
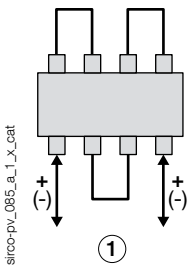


B6-B7 - 4P

Grounded



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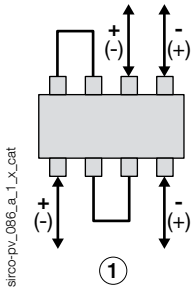

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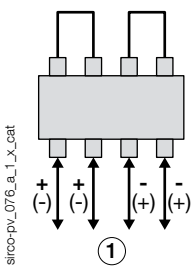
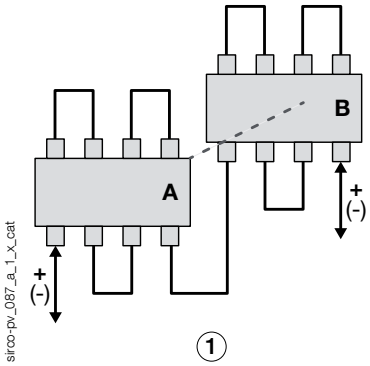


$B7_{DS}$- 8P

Grounded



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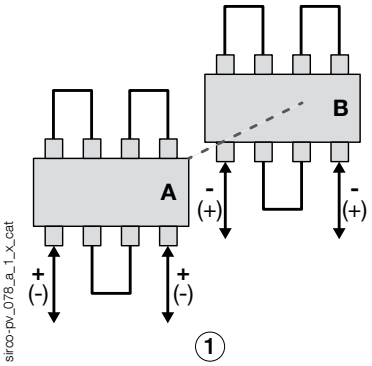
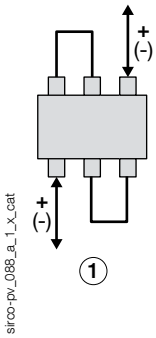


A. Front switch.
B. Rear switch.

1 PV circuit - 1500 VDC

B4-B5- 2P

Grounded



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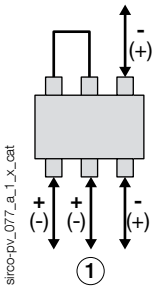
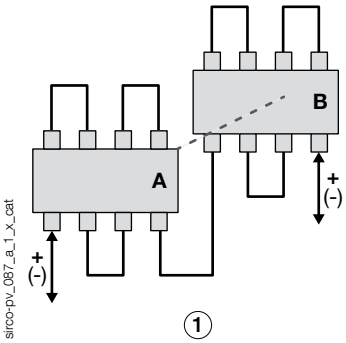


$B6_{DS}$-$B7_{DS}$- 8P

Grounded



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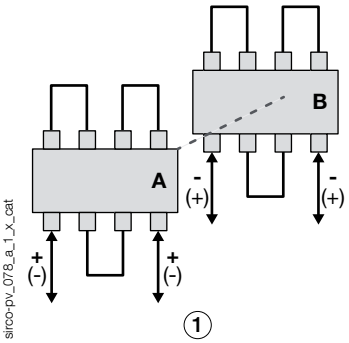


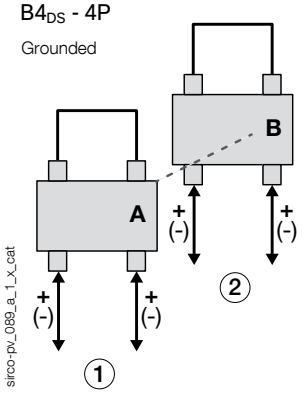
A. Front switch.
B. Rear switch.

Pole connection in series (continued)

2 PV circuits - 1000 VDC

$B4_{DS}$ - 4P

Grounded



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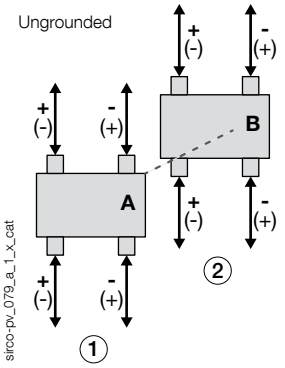
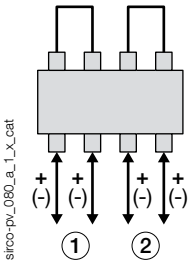


B5 - 4P

Grounded



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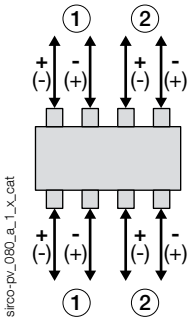
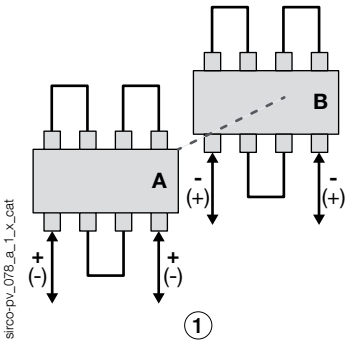


$B5_{DS}$-$B7_{DS}$ - 8P

Grounded



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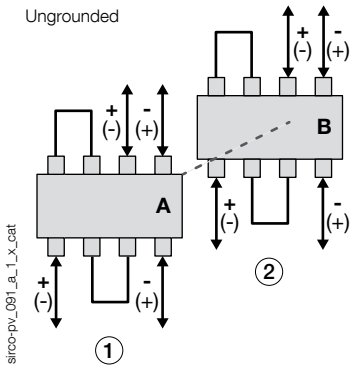
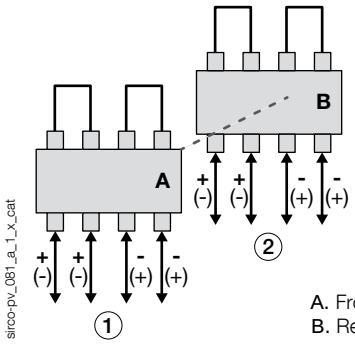


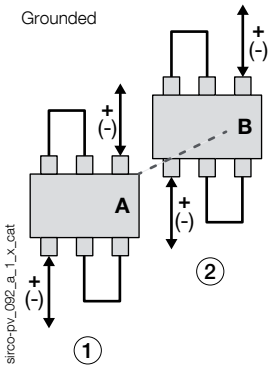


A. Front switch.
B. Rear switch.

2 PV circuits - 1500 VDC

$B5_{DS}$ - 6P

Grounded



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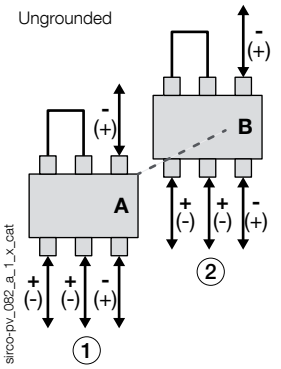
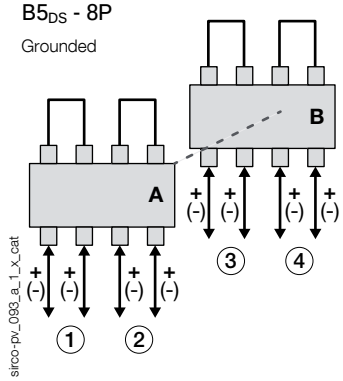


A. Front switch.
B. Rear switch.

4 PV circuit - 1000 VDC

$B5_{DS}$ - 8P

Grounded



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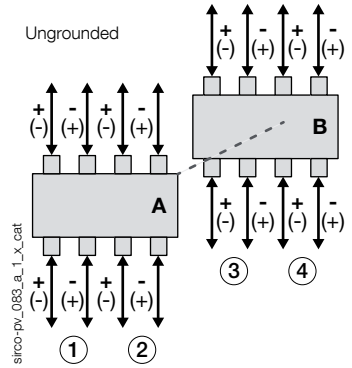

A. Front switch.
B. Rear switch.

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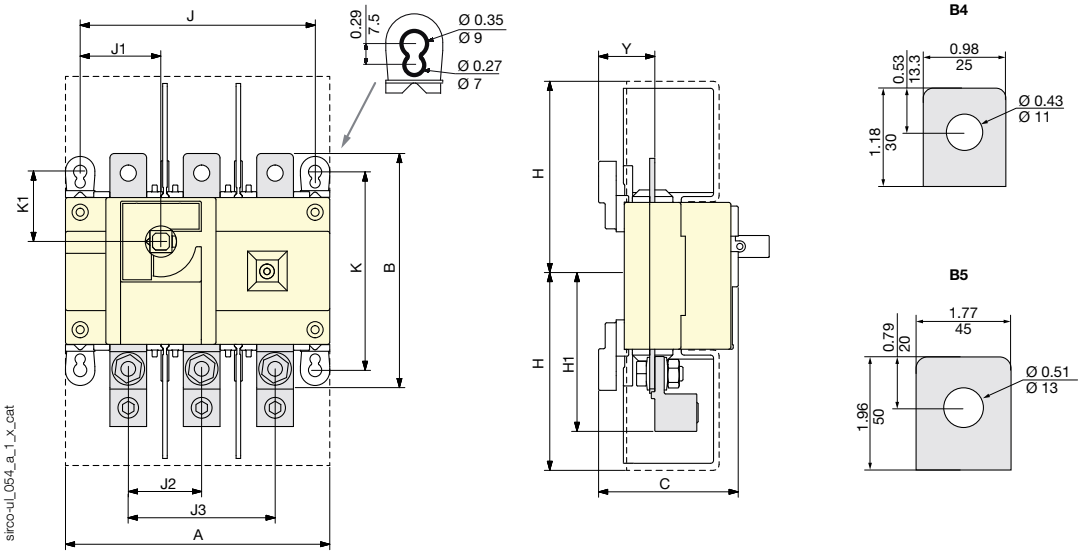
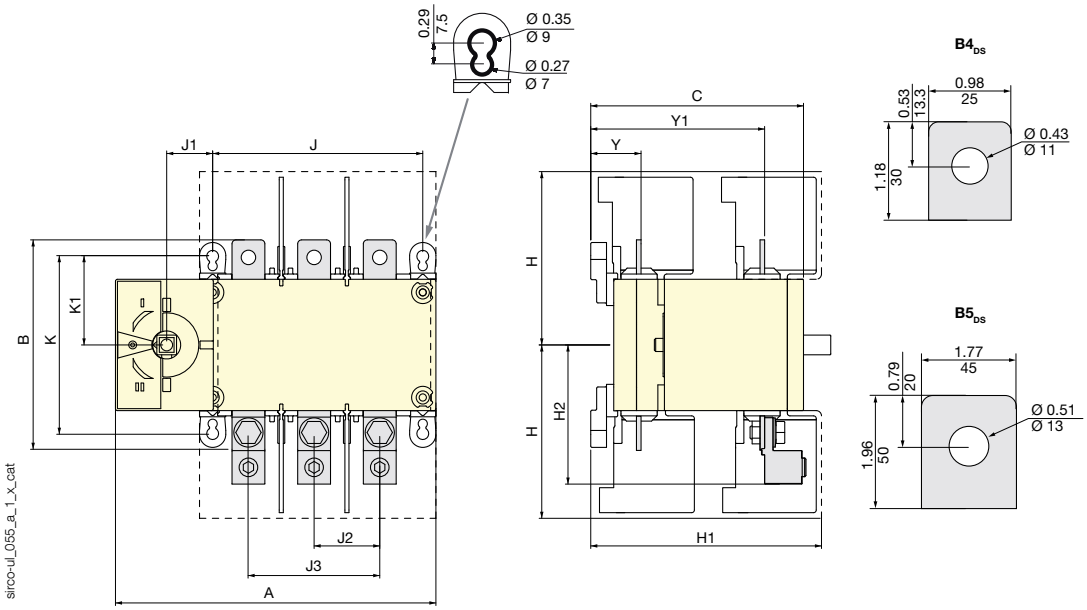
Dimensions (in / mm)

Frame B4-B5



Frame	No. of pole	Measurement	A	B	C	H	H1 max.	J	J1	J2	J3	K	K1	Y
B4	2 P	inches	7.08	6.30	3.74	5.21	4.21	6.30	2.16	-	3.94	5.31	1.89	1.51
B4	2 P	mm	180	160	95	132.5	107	160	55	-	100	135	48	38.5
B5	2 P	inches	9.05	1.23	4.92	8	6.53	8.26	2.95	-	5.12	7.67	2.65	2.08
B5	2 P	mm	230	260	128	203	166	210	75	-	130	195	67.5	53
B5	3 P	inches	9.05	10.23	4.98	8	6.53	8.26	2.95	2.56	-	7.67	2.65	2.02
B5	3 P	mm	230	260	126.5	203	166	210	75	65	-	195	67.5	51.5
B5	4 P	inches	11.41	10.23	4.98	8	6.53	10.63	5.31	2.56	-	7.67	2.65	2.02
B5	4 P	mm	290	260	126.5	203	166	270	135	65	-	195	67.5	51.5

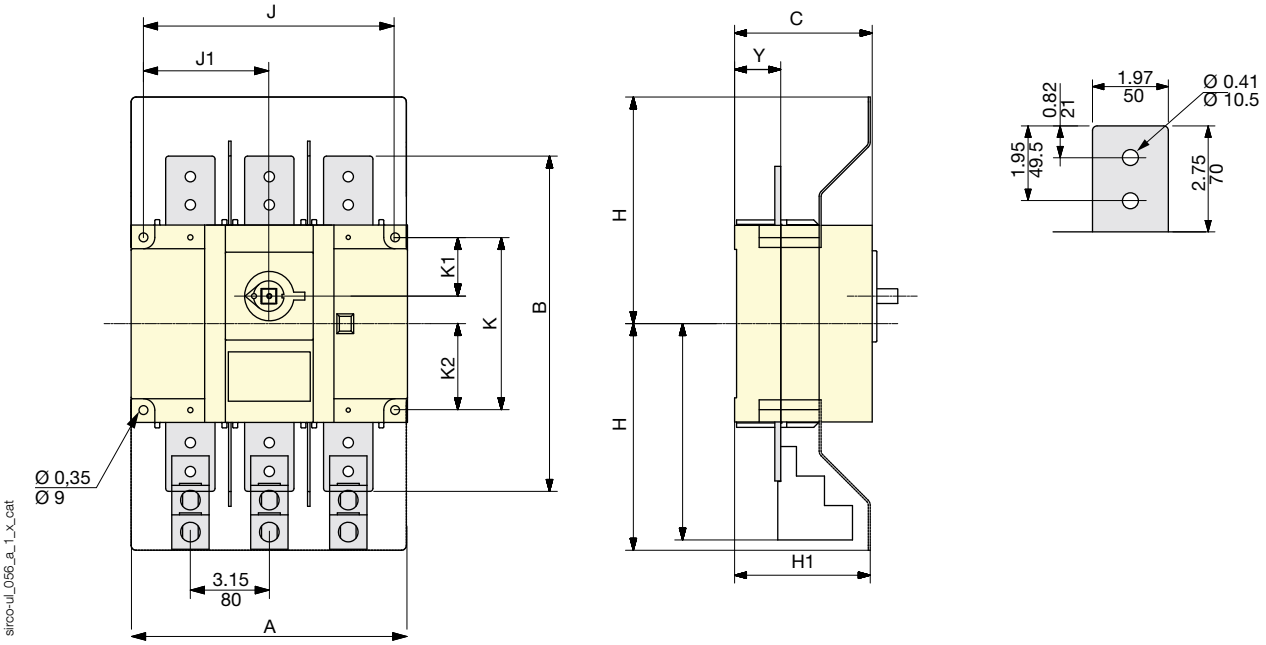
Frame $B4_{DS}$-$B5_{DS}$



Frame	No. of pole	Measurement	A	B	C	H	H1	H1 max.	J	J1	J2	J3	K	K1	Y	Y1
$B4_{DS}$	4 P	inches	9.60	6.30	6.37	5.08	6.93	4.21	6.30	1.37	-	3.93	5.31	2.65	1.51	5.21
$B4_{DS}$	4 P	mm	244	160	162	129	176	107	160	35	-	100	135	67.5	38.5	132.5
$B5_{DS}$	6 P	inches	11.85	10.23	9.39	8	6.51	6.53	6.26	1.37	2.56	-	7.67	2.70	2.02	7.44
$B5_{DS}$	6 P	mm	301	260	238.5	203	165.5	166	210	35	65	-	195	68.5	51.5	189
$B5_{DS}$	8 P	inches	14.21	10.23	9.39	8	6.51	6.53	10.63	1.37	2.56	-	7.67	2.70	2.02	7.44
$B5_{DS}$	8 P	mm	361	260	238.5	203	165.5	166	270	35	65	-	195	68.5	51.5	189

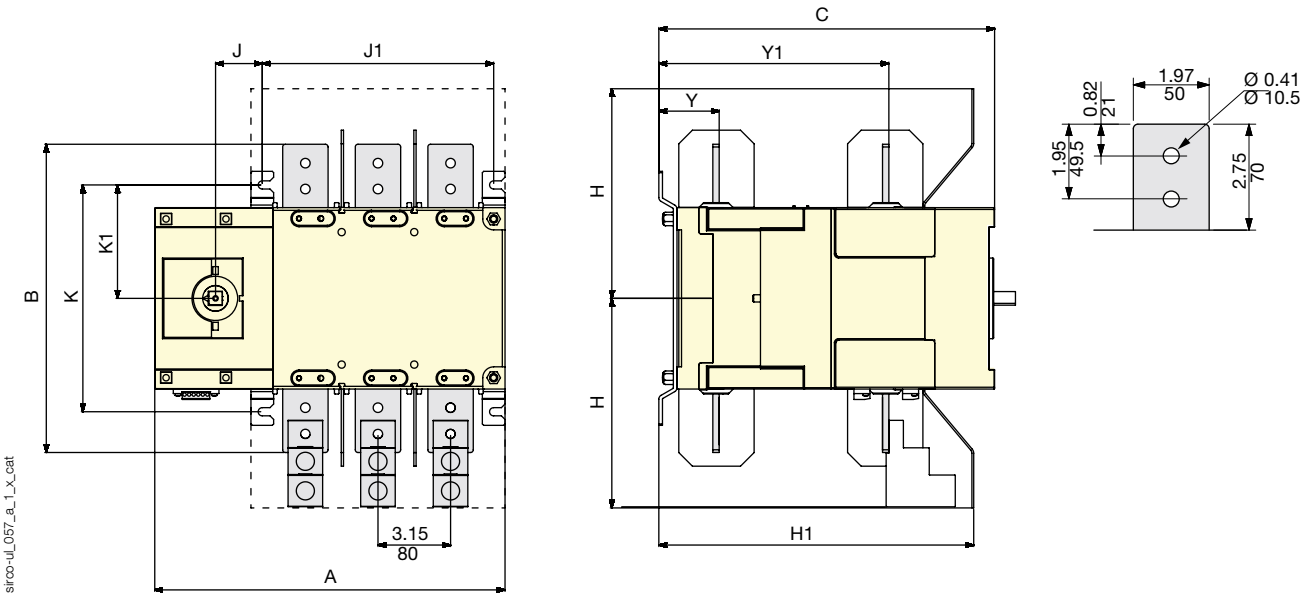
Dimensions (in / mm) (continued)

Frame B6



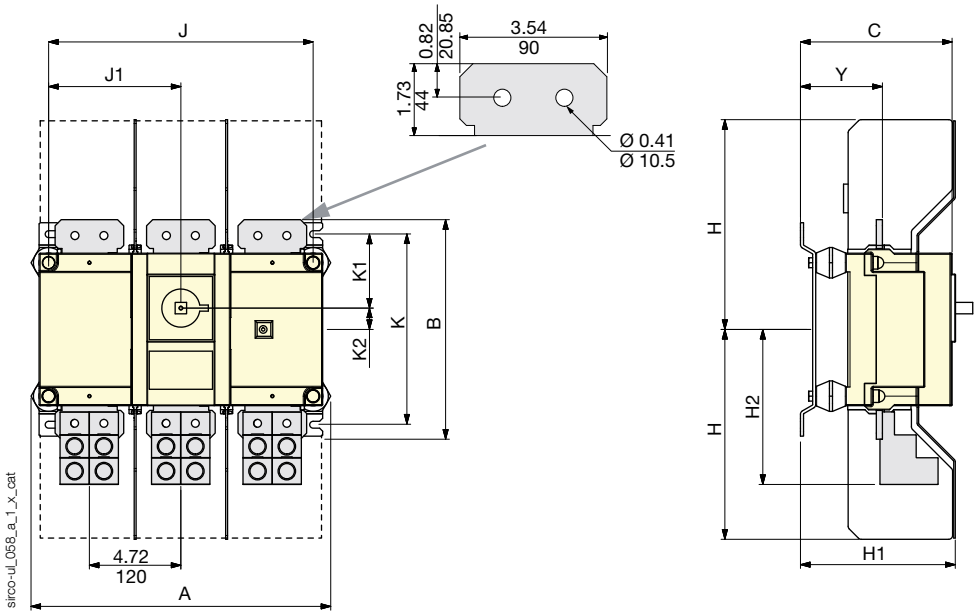
Frame	No. of pole	Measurement	A	B	C	H	H1	J	J1	K	K1	K2	Y
B6	4 P	inches	14.17	13.38	5.47	10.63	5.70	13.19	6.59	6.88	2.34	1.10	1.83
	4 P	mm	630	340	139	270	145	335	167.5	175	59.5	28	46.5

Frame $B6_{DS}$



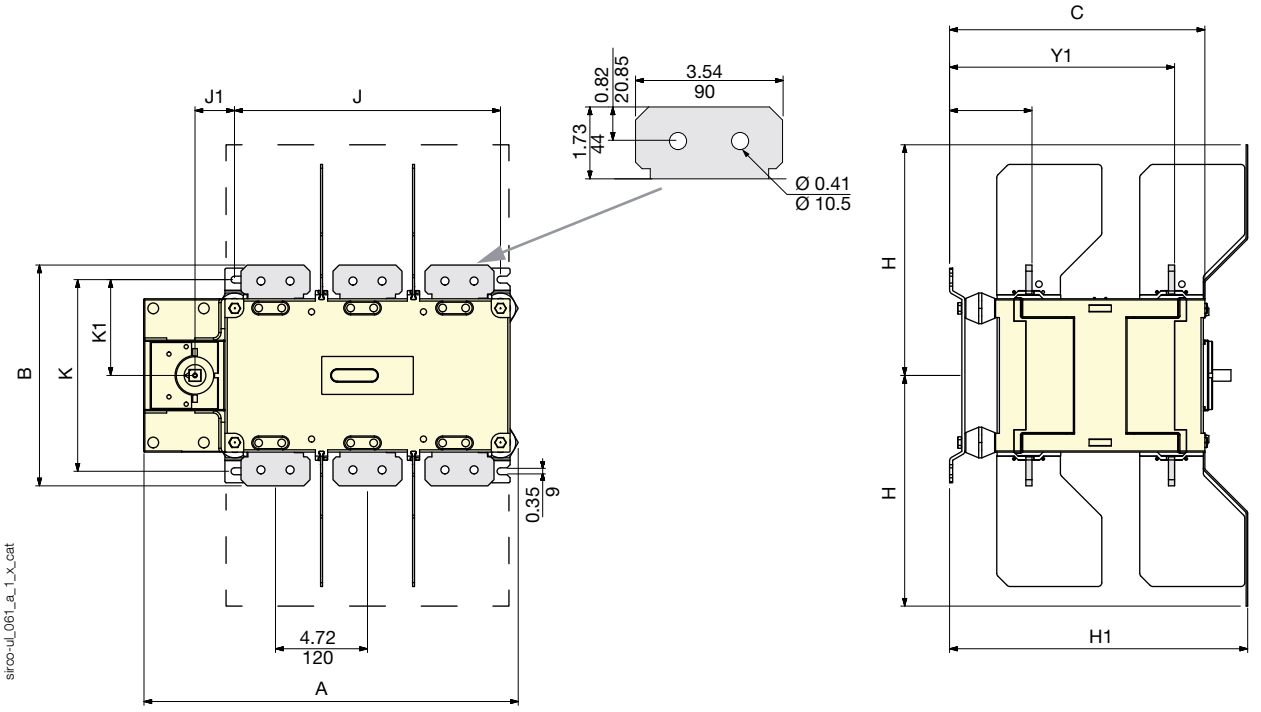
Frame	No. of pole	Measurement	A	B	C	H	H1	J	J1	K	K1	Y	Y1
$B6_{ds}$	8 P	inches	18.34	13.8	14.56	10.63	13.66	13.18	2.02	9.84	4.92	2.61	9.98
	8 P	mm	466	340	370	270	347	335	51.5	250	125	66.5	253.5

Frame B7



Frame	No. of pole	Measurement	A	B	C	H	H1	H2	J	J1	K	K1	K2	Y
B7	4 P	inches	20.19	11.33	7.97	11.89	8.30	8.01	18.38	9.19	9.84	3.82	1.10	4.23
	4 P	mm	513	288	200	302	211	203.5	467	233.5	250	97	28	107.5

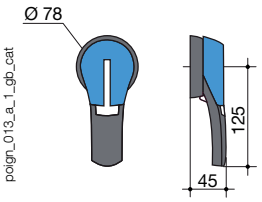
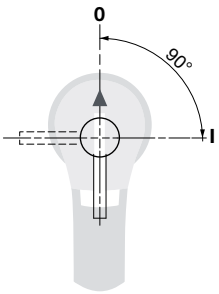
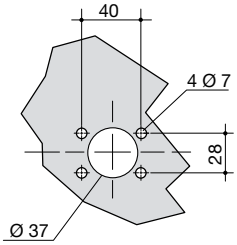
Frame $B7_{DS}$



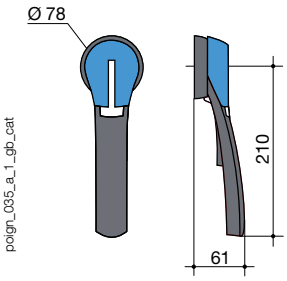
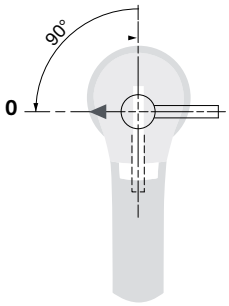
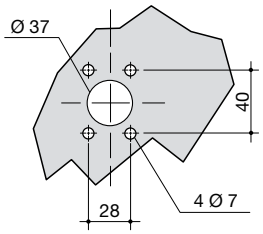
Frame	No. of pole	Measurement	A	B	C	H	H1	J	J1	K	K1	Y	Y1
$B7_{DS}$	8 P	inches	23.95	11.33	13.11	11.85	15.31	18.38	2.02	9.84	4.92	4.23	11.55
	8 P	mm	608.5	288	333	301	389	467	51.5	250	125	107.5	293.5

Dimensions for external handles (in / mm)

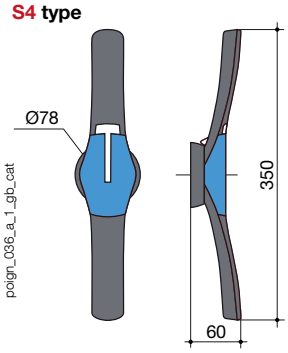
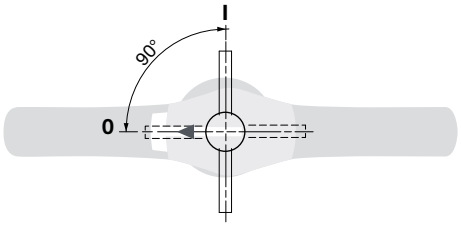
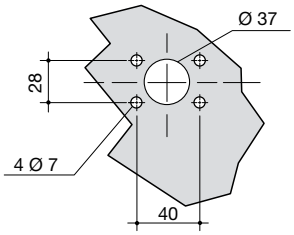
B4 - $B4_{DS}$ - B5

Handle type	Front operation Direction of operation	Door drilling
S2 type 		

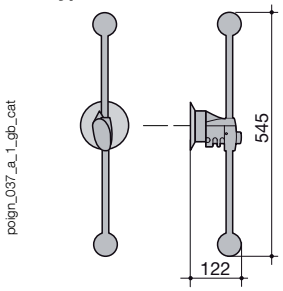
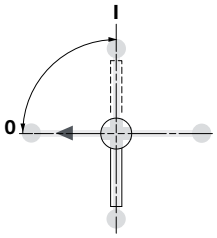
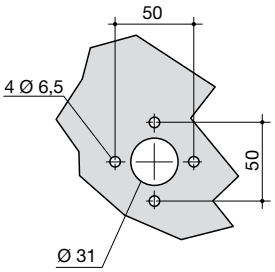
$B5_{DS}$ - B6

Handle type	Front operation Direction of operation	Door drilling
S3 type 		

B7

Handle type	Front operation Direction of operation	Door drilling
S4 type 		

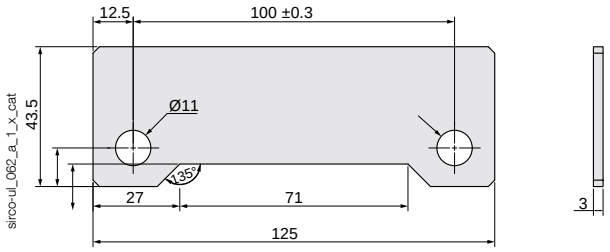
B6DS - B7DS

Handle type	Front operation Direction of operation	Door drilling
V1 type 		

Bridging bars (in / mm)

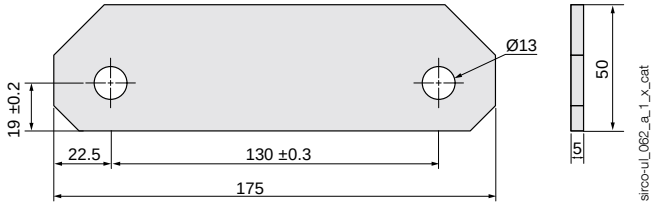
B4 - B4$_{DS}$

2709 1020

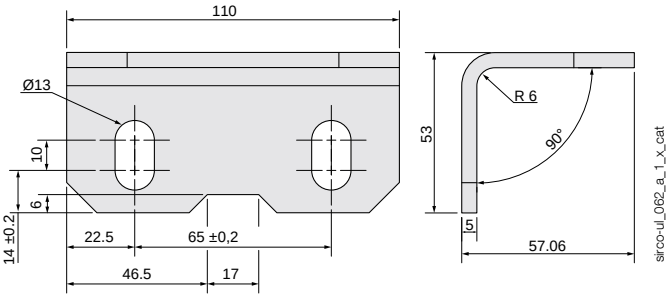


B5 - B5$_{DS}$

2709 1041

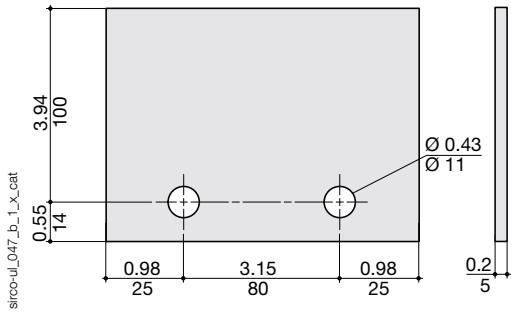


2709 0045

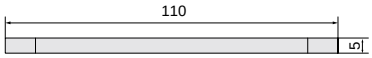


B6 - B6$_{DS}$

2709 0062

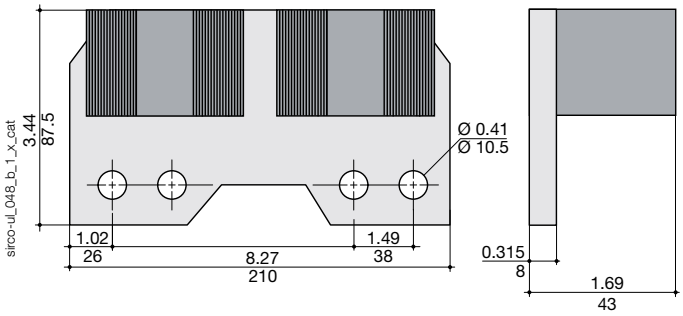


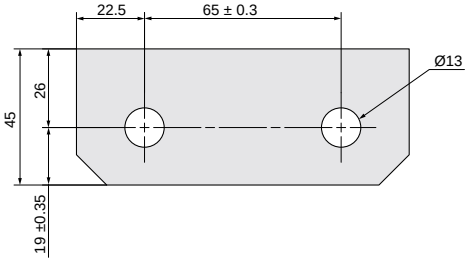
2709 0027



B7

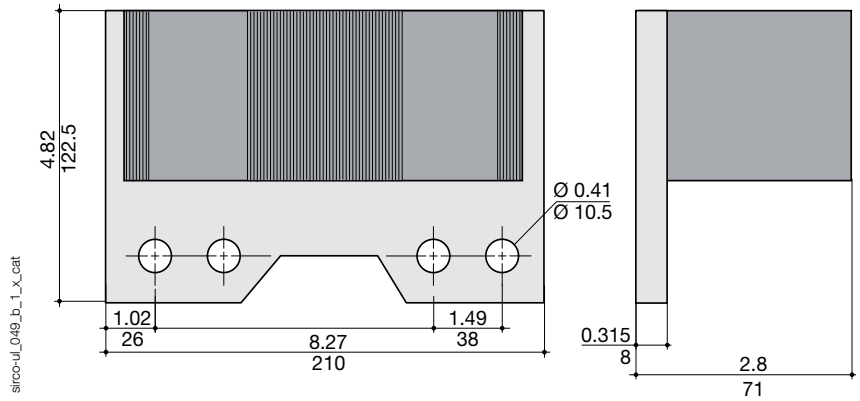
2709 0081





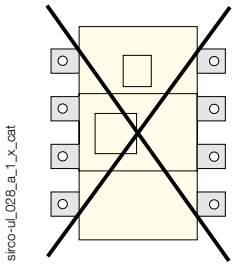
B7 - B7$_{DS}$

2709 0121

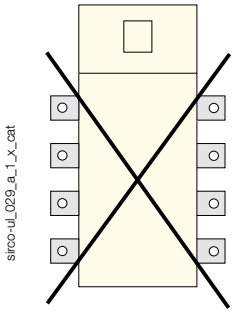


Mounting orientation

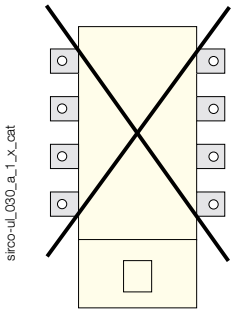
All frames



B4DS - B5DS

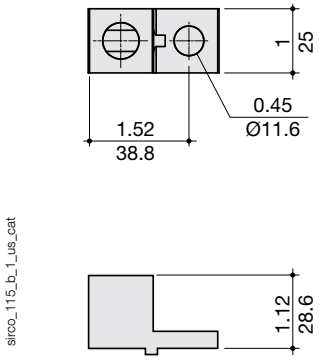


B6DS - B7DS



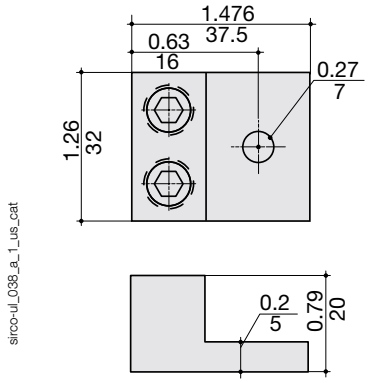
Terminal lugs (in / mm)

100 to 250 A



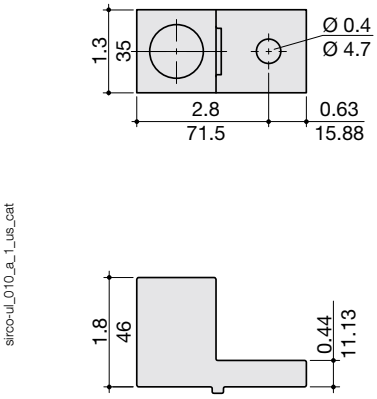
300MCM

100 to 250 A



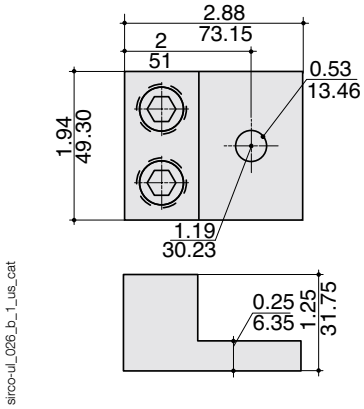
2/0

400 A



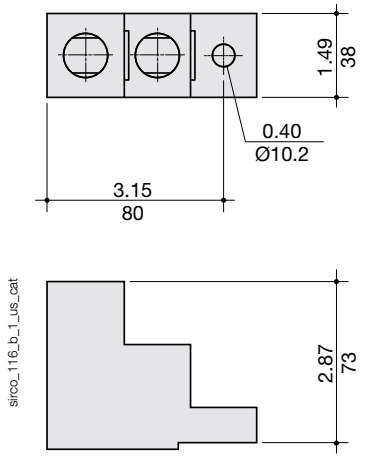
600MCM

400 A



2 x 350MCM

600 to 2000 A



2 x 600MCM

SIRCO MOT PV

Motorised load break switches for photovoltaic applications
for use up to 1000 VDC from 200 to 630 A

SIRCO MOT PV 4x400 A

The solution for

> Buildings.
> Solar parks.

Strong points

> Patented safety disconnection system for firefighters.
> Manual emergency operation.

Conformity to standards

> IEC 60947-3
> IEC 60364-4-410
> IEC 60364-7-712

A complete solution

> SUNSYS IFB
(Intelligent Field Box).
Smart connection box to link solar panels to the inverter.

Function

SIRCO MOT PV are three or four pole motorised load break switches.
They make and break under load conditions and provide safety isolation for any low voltage circuit dedicated to photovoltaic applications.

Advantages

Patented safety disconnection system for firefighters

With its remote electrical control, the SIRCO MOT PV can be utilised to provide safety disconnection for firefighters, meeting the remote disconnection requirements of the installation, closing to facilitate periodic tests and short-circuit control for maintenance and cleaning work.

Manual emergency operation

In addition to its motorised operation, the SIRCO MOT PV also includes a manual operation facility, enabling the switch position to be changed directly on the device if required.

General characteristics

- 2 stable positions (I, 0).
- Positive break indication.
- AUTO / MANU selector.
- Padlocking in 0 position (position I with option).
- Up to 1000 VDC.
- IP20 devices and accessories.

socomec
Innovative Power Solutions

References

SIRCO MOT PV 750 VDC

Rating (A)	Circuit type	No. of poles	Switch body	Bridging bars for connecting poles in series	Auxiliary contact	Terminal screens	Terminal shrouds
200 A	Single PV circuit	3 P	19PV **3020**	2 P 2609 **0025**(1) 4 P 2609 **2025**(1)	1st contact NO/NC included 2nd contact NO/NC 4109 **0021**	3 P 1509 **3025**(2) 4 P 1509 **4025**(2)	3 P 2694 **3021**(3) 4 P 2694 **4021**(3)
250 A			19PV **3025**				
400 A			19PV **3040**	2 P 2609 **0063**(1) 4 P 2609 **2063**(1)		3 P 1509 **3063** 4 P 1509 **4063**	3 P 2694 **3051**(3) 4 P 2694 **4051**(3)
500 A			19PV **3050**				
630 A			19PV **3063**				

SIRCO MOT PV 1000 VDC

Rating (A)	Circuit type	No. of poles	Switch body	Bridging bars for connecting poles in series	Auxiliary contact	Terminal screens	Terminal shrouds
200 A	Single PV circuit	4 P	19PV **4020**	2 P 2609 **0025**(1) 4 P 2609 **2025**(1)	1st contact NO/NC included 2nd contact NO/NC 4109 **0021**	3 P 1509 **3025**(2) 4 P 1509 **4025**(2)	3 P 2694 **3021**(3) 4 P 2694 **4021**(3)
250 A			19PV **4025**				
400 A			19PV **4040**	2 P 2609 **0063**(1) 4 P 2609 **2063**(1)		3 P 1509 **3063** 4 P 1509 **4063**	3 P 2694 **3051**(3) 4 P 2694 **4051**(3)
500 A			19PV **4050**				
630 A			19PV **4063**				

(1) Connection in series of 2 or 4 poles of the device
(2) 2 pieces: one for top side and another for bottom side
(3) Terminal shrouds cannot be mounted when bridging bars for connecting poles in series are present.

Accessories

Bridging bars for connecting poles in series

Use

The bridging bars facilitate the connection of poles in series, allowing the below configurations:

- Bottom/Bottom
- Top/Top
- Top/Bottom
- Top/Bottom

Connection diagrams: See "Poles connections in serie", page 73.

Rating (A)	Number of poles of the device in series	Pack	Reference
200 ... 250	2	1 piece	2609 **0025**
200 ... 250	4	2 pieces	2609 **2025**
400 ... 630	2	1 piece	2609 **0063**
400 ... 630	4	2 pieces	2609 **2063**

Auxiliary contact

Use

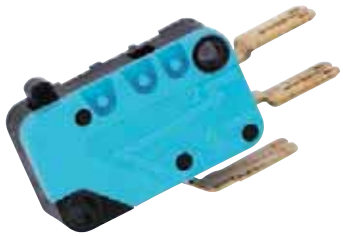
Pre-break and signalisation of position I:
1 to 2 NO/NC auxiliary contacts (1 as standard).
Low level auxiliary contacts:
Please consult us.

Connection to the control circuit

By 6.35 mm fast-on terminal.

Electrical characteristics

30 000 operations.



acces_065_a_1_cat

svr_058_a_1_cat

Characteristics					
		Operating current Ie (A)			
Rating (A)	Nominal current (A)	250 VAC AC-13	400 VAC AC-13	24 VDC AC-13	48 VDC AC-13
200 ... 630	16	12	8	14	6

References

NO/NC changeover contact		
Rating (A)	Contact(s)	Reference
200 ... 630	2nd	4109 **0021**

Terminal shrouds

Use

Protection against direct contact with terminals or connecting parts.
Not compatible for terminals with bridging bars connected.

Advantage of terminal shrouds

Perforations allow remote thermographic inspection without the need to remove the shrouds.

acces_206_a_2_cat

Rating (A)	No. of poles	Position	Reference
200 ... 250	3 P	top and bottom	2694 **3021**
200 ... 250	4 P	top and bottom	2694 **4021**
400 ... 630	3 P	top and bottom	2694 **3051**
400 ... 630	4 P	top and bottom	2694 **4051**

Terminal screens

Use

Top and bottom protection against direct contact with terminals or connection parts.

acces_207_a_2_cat

Rating (A)	No. of poles	Position	Reference
200 ... 250	3 P	top and bottom	1509 **3025**
200 ... 250	4 P	top and bottom	1509 **4025**
400 ... 630	3 P	top and bottom	1509 **3063**
400 ... 630	4 P	top and bottom	1509 **4063**

2 position padlocking (I-0)

Use

Enables padlocking in position I (product can be padlocked in position 0 as standard).

atys_125_a_1_cat

Rating (A)	Reference
200 ... 630	1599 **0003**

Accessories (continued)

Key handle interlocking system

Use

With the product in manual mode, it enables locking in position 0 using a RONIS EL11AP lock. Factory fitted.

Locking in both positions (I-0) requires, in addition, the “2 position padlocking” accessory.

Rating (A)	Reference
200 … 630	1509 **1006**

Other specific accessories

- Low level auxiliary contacts.

Characteristics according to IEC 60947-3

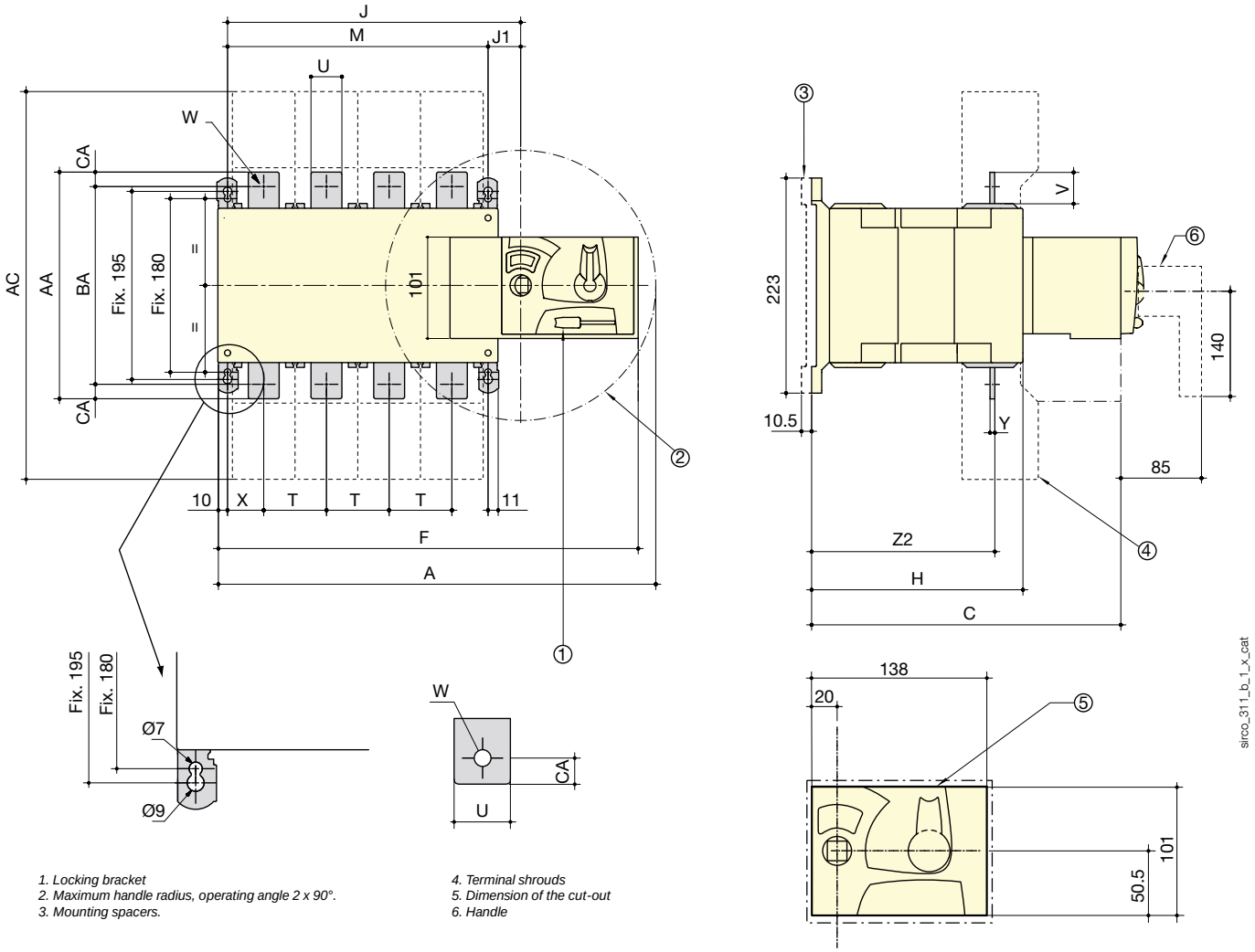
200 to 630 A

Thermal current I_{th} at 40°C					**200 A**	**250 A**	**400 A**	**500 A**	**630 A**
Rated insulation voltage U_i (V)					1200	1200	1200	1200	1200
Rated impulse withstand voltage U_{imp} (kV)					8	8	12	12	12
Rated operational currents I_e (A)									
Rated voltage	**Utilisation category**	**Circuit type**	**Number of poles of the device**	**Number of pole(s) in series per polarity**	**(A)**	**(A)**	**(A)**	**(A)**	**(A)**
750 VDC	DC-21 B	Single PV circuit	3 P	2 P + and 1 P -	200	250	400	500	630
1000 VDC	DC-21 B	Single PV circuit	4 P	2 P + and 2 P -	200	250	400	500	630
Switching time (Standard setting)									
I - 0 (s)					0.85	0.85	0.85	0.85	0.85
Power supply									
230 VAC min./max. (VAC)					176/288	176/288	176/288	176/288	176/288
Control supply power demand									
Supply 230 VAC inrush / nominal (VA)					420/100	420/100	420/100	420/110	450/120
Connection									
Rigid Cu cable cross-section (mm^2)					95	120	240	2 x 150	2 x 185
Maximum Cu busbar width (mm)					32	32	40	40	40
Tightening torque min (Nm)					20	20	40	40	40
Mechanical characteristics									
Durability (number of operating cycles)(1)					8000	8000	5000	5000	5000
Weight of a 3 pole device (kg)					5	5	7	7	7
Weight of a 4 pole device (kg)					6	6	8	8	8

(1) Improved endurances: Please consult us.

Dimensions

SIRCO MOT PV 200 to 630 A



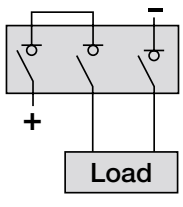
sirco_311_b_1_x_cat

1. Locking bracket
2. Maximum handle radius, operating angle 2 x 90°.
3. Mounting spacers.
4. Terminal shrouds
5. Dimension of the cut-out
6. Handle

Rating (A)	Overall dimensions			Terminal shrouds	Switch body					Switch mounting		Connection										
	A 3p.	A 4p.	C	AC	F 3p.	F 4p.	H	J 3p.	J 4p.	M 3p.	M 4p.	T	U	V	W	X 3p.	X 4p.	Y	Z	Z1	AA	BA	CA
200	345	395	244.5	280	328	378	151	154	184	160	210	50	25	30	11	33	33	3.5	39.5	134.5	160	130	15
250	345	395	244.5	280	328	378	151	154	184	160	210	50	25	30	11	33	33	3.5	39.5	134.5	160	130	15
400	394	459	320.5	400	377	437	221	244	304	210	270	65	45	50	13	42.5	37.5	5	53	190	260	220	20
500	394	459	320.5	400	377	437	221	244	304	210	270	65	45	50	13	42.5	37.5	5	53	190	260	220	20
630	394	459	320.5	400	377	437	221	244	304	210	270	65	45	50	13	42.5	37.5	5	53	190	260	220	20

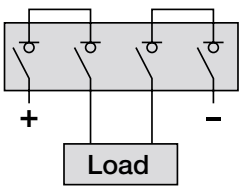
Pole connections in series (1)

3 poles - bottom / top



sirco_305_b_1_gb_cat

4 poles - bottom / bottom



sirco_307_b_1_gb_cat

(1) Other connections: refer to mounting instructions

Photovoltaic fuses

gPV curve

from 1 to 600 A, up to 1500 VDC

new

Function

SOCOMEC **gPV fuses** protect the installation against the inverse over-currents which could occur in photovoltaic installations.

Advantages

Breaking capacity up to 1500 VDC
High breaking capacity at 1500 VDC.

Product dedicated to PV installations
Operating ranges adjusted for small over-currents specific to PV installations.

High reliability
- Absolute protection over time guaranteed by the simplicity of manufacture and function (Joule effect).
- No downgrading of fuse characteristics over time.

Improved safety
The energy released whilst eliminating the fault (fuse blowing) is contained within the cartridge (no degassing).

The solution for

> Photovoltaic protection

Strong points

> Breaking capacity up to 1500 VDC
> Product dedicated to PV installations
> High reliability
> Improved safety

Large range

> Additional range of disconnect switches and fuse bases - dedicated connection accessories.

Conformity to standards

> IEC 60269-6
> IEC 60269-1
> IEC 60269-2

What you need to know

Used characteristics
- I_{SC}:short circuit current of the string
- $I_{SC\ MAX.}$: short circuit current of the string related to maximum sunlight density
- I_{RM}: maximum admitted reverse current
- I_n: fuse rating or fuse rated current (at 25C in a RM disconnect switch)
- N_c: number of strings connected in parallel
- U_e: maximum fuse rated voltage
- $U_{OC\ MAX.}$: maximum open circuit voltage in the lowest temperature conditions.

When to protect
A PV string requires an over-current protection when its own maximum admissible reverse current characteristic (Irm) is less than the current generated by the rest of the installation (current generated by the "Nc-1" other strings).

How to protect
The overload protection is to be applied at each of the two polarities, regardless of whether the DC installation is earthed or not.

How to choose the fuse protection

Voltage

$U_e > U_{OC\ MAX}$

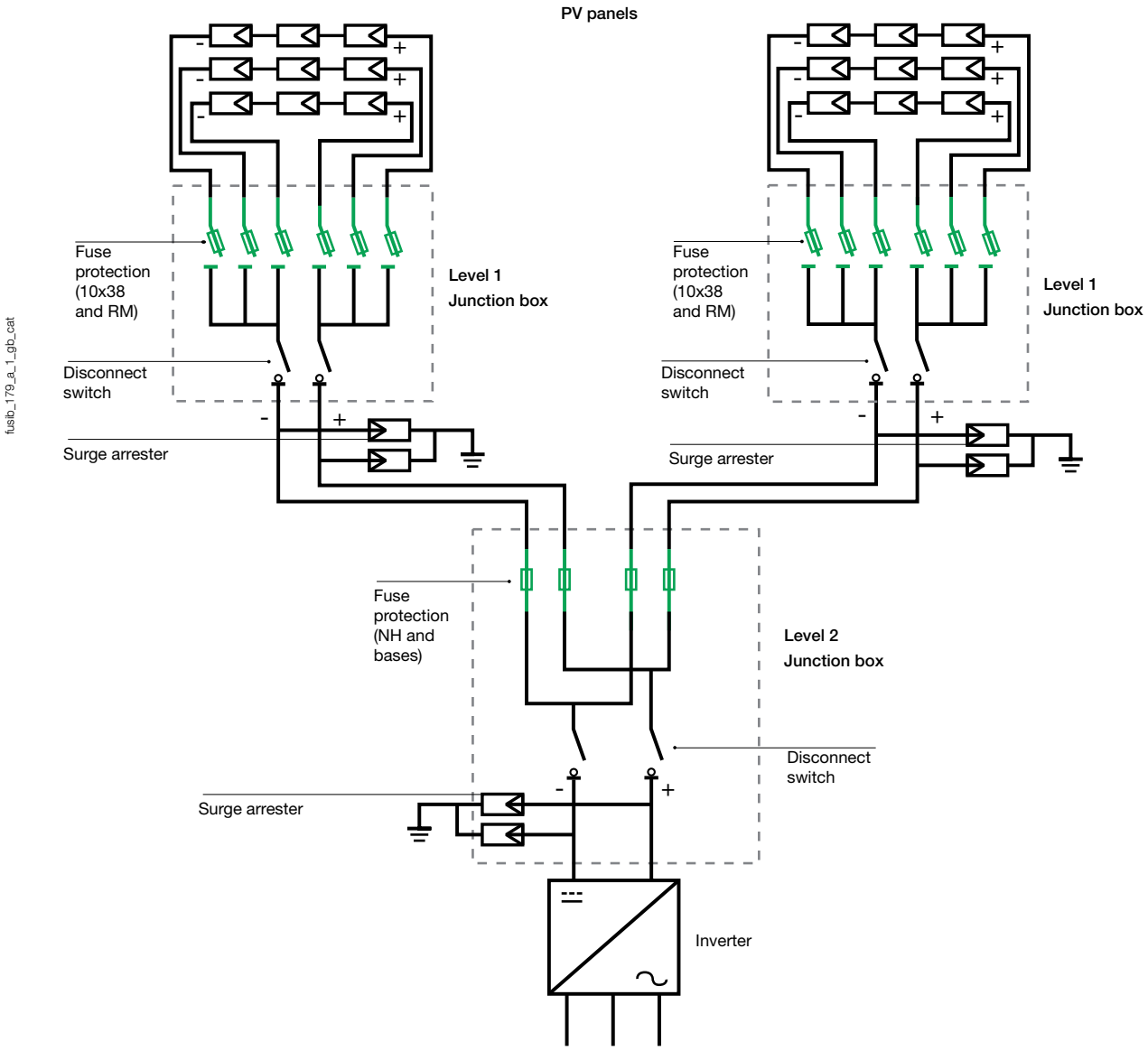
In the absence of complementary information use $U_{OC\ MAX} = 1,2\ U_{OC}$.

Fuse rating determination

Determination of the fuse rated current consists of choosing a protection capable of:

- Supporting without fusing the normal overload current during the periods of maximum sunlight density at the ambient temperature of the enclosure in which the fuse is installed, $I_n > I_{SC\ MAX}$
  In the absence of complementary information, use $I_{SC\ MAX} = 1,4\ I_{SC}$

- Melting and reliably clearing the fault before the PV modules are damaged by the reverse current. $I_n < I_{RM}$



Photovoltaic fuses

gPV curve

from 1 to 600 A

References

Rated voltage 1000 VDC

Rating (A)	Fuse size	Dissipated power W@ In	Dissipated power W @ 0.8 In	Breaking capacity	Reference
1	10 x 38	0,76	0,43	30 kA	60PV **0001**
2	10 x 38	1,54	0,84	30 kA	60PV **0002**
3	10 x 38	1,35	0,74	30 kA	60PV **0003**
4	10 x 38	1,84	1,08	30 kA	60PV **0004**
6	10 x 38	2,50	1,40	30 kA	60PV **0006**
8	10 x 38	2,57	1,47	30 kA	60PV **0008**
10	10 x 38	2,58	1,51	30 kA	60PV **0010**
12	10 x 38	2,61	1,42	30 kA	60PV **0012**
15	10 x 38	2,44	1,08	30 kA	60PV **0015**
16	10 x 38	2,70	1,56	30 kA	60PV **0016**
20	10 x 38	2,99	1,75	30 kA	60PV **0020**
25	14 x 51	5,1	2,7	10 kA	60PV **0C25**
32	14 x 51	6,2	3,3	10 kA	60PV **0C25**
32	NH1	8,5	4,3	50 kA	60PV **0032**
40	NH1	9	4,6	50 kA	60PV **0040**
50	NH1	10,5	5,4	50 kA	60PV **0050**
63	NH1	12	6,1	50 kA	60PV **0063**
80	NH1	15,5	7,9	50 kA	60PV **0080**
100	NH1	16,5	8,4	50 kA	60PV **0100**
125	NH1	17,5	8,9	50 kA	60PV **0125**
160	NH1	24	12,2	50 kA	60PV **0160**
200	2XL	50	28	33 kA	60PV **0200**
250	2XL	60	34	33 kA	60PV **0250**
315	2XL	66	40	33 kA	60PV **0315**
355	2XL	68	42	50 kA	60PV **0355**
400	3L	82	48	50 kA	60PV **0400**
500	3L	85	50	50 kA	60PV **0500**
600	3L	118	92	50 kA	60PV **0600**

Rated voltage 1500 VDC

Rating (A)	Fuse size	Dissipated power W@ In	Dissipated power W @ 0,7 In	Dissipated power W @ 0.8 In	Breaking capacity	Reference
2	10x85	3,42	1,28		10	61PV **0002**
4	10x85	2,91	1,16		10	61PV **0004**
6	10x85	2,65	1,1		10	61PV **0006**
8	10x85	2,79	1,16		10	61PV **0008**
10	10x85	4,38	1,81		10	61PV **0010**
12	10x85	4,43	1,83		10	61PV **0012**
16(1)	10x85	4,13	1,75		10	61PV **0016**
20(1)	10x85	5,14	2,13		10	61PV **0020**
25(1)	10x85	5,48	2,28		10	61PV **0025**
200	1XL	61		31	30	61PV **0200**
400	3L	91		49	30	61PV **0400**

(1) Rated voltage 1200 VDC.

gPV knife edge fuse

Description of accessories	Size NH1 Reference	Size 1XL Reference	Size 2XL Reference	Size 3L Reference
Fuse blown auxiliary contact	56PV **9901**	56PV **9901**	56PV **9901**	56PV **9901**
Fuse base recommended	65PV **1011**	-	65PV **1112**	65PV **1113**

Ambient temperature derating factor

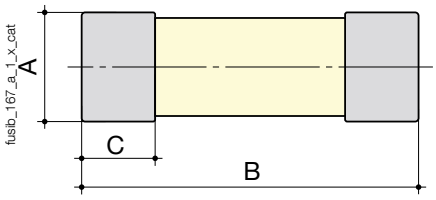
$$I_{nf} = I_{cgens}/K_t$$

I_{nf} - *gPV fuse rated current.*
I_{scgen} - *PV generator short circuit current under STC.*
K_t - *derating factor.*

Max. ambient temperature (C)	Kt: Derating factor
20	1
40	0,92
45	0,90
50	0,87
55	0,85
60	0,82
65	0,79
70	0,76

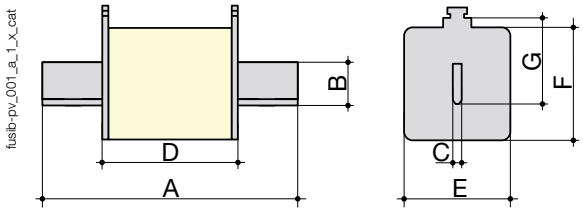
Standard dimensions (mm) as per IEC 60269-2

gPV cylindrical Fuses



Size	Striker	A	B	C
10 x 38	without	10,3	38	10,5
14 x 51	without	14,3	51,5	10,10
10 X 85	without	10,3	85	10,5

gPV knife edge fuse



Size	Striker	A maxi	B	C	D maxi	E maxi	F maxi	G
NH1	without	137	20	6	67,7	39,65	52,9	40
1XL	without	189,8	20	5,8	127,8	51	51	39,8
2XL	without	204,5	26	5,8	123,3	59,2	59,2	47,9
3L	without	204,9	32,3	6	122,3	73,5	73,5	60

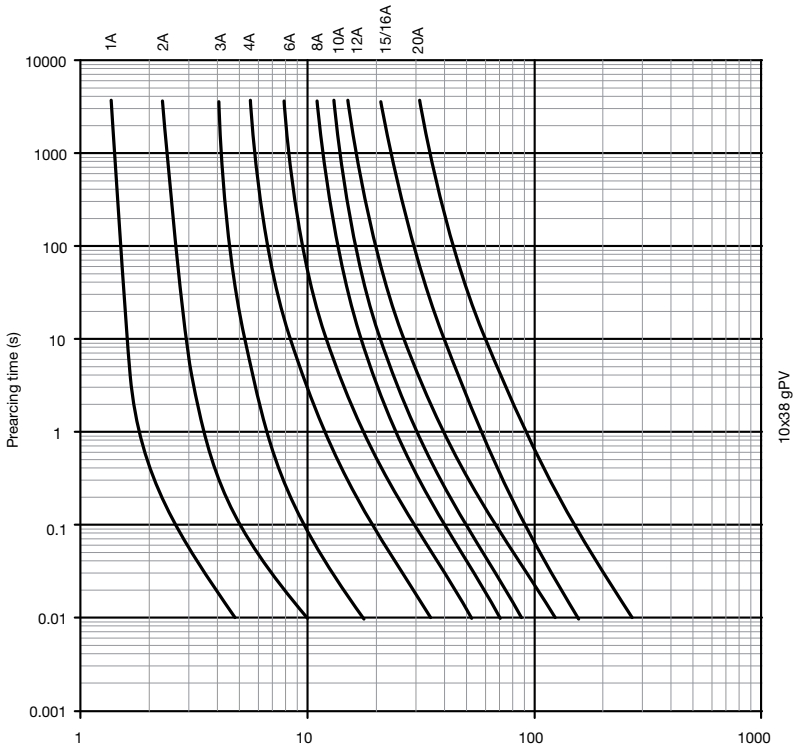
Photovoltaic fuses

gPV curve

from 1 to 600 A

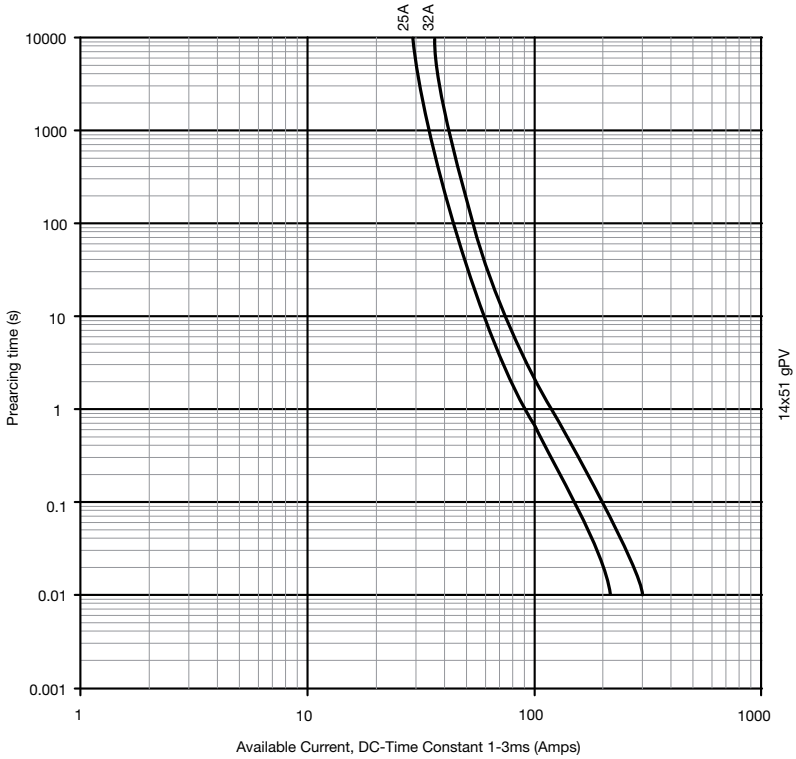
Time/current operation characteristics

gPV cylindrical fuses 10x38



fusib-pv_002_a_1_gb_cat

gPV cylindrical fuses 14x51



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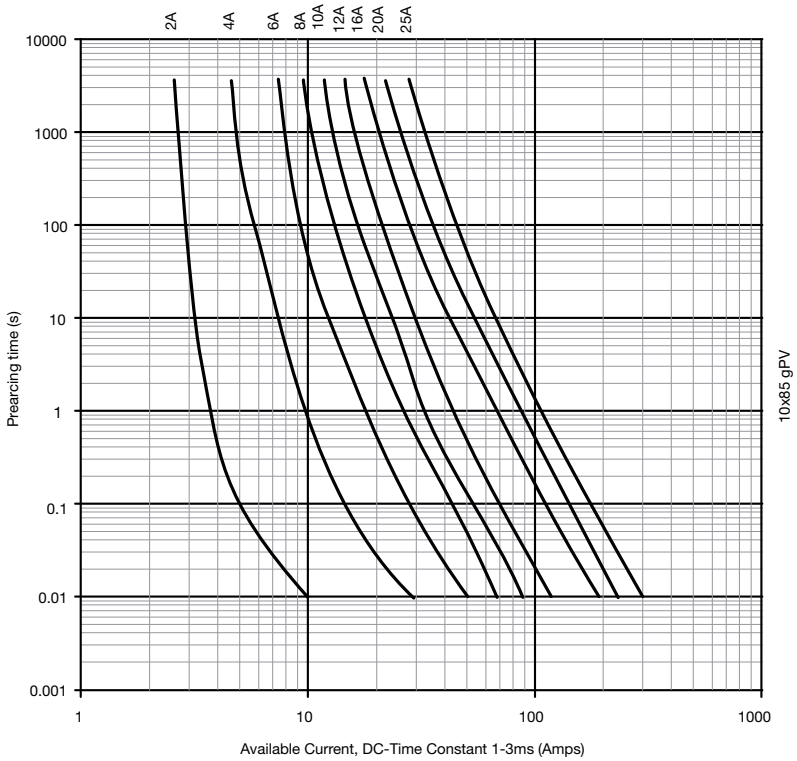
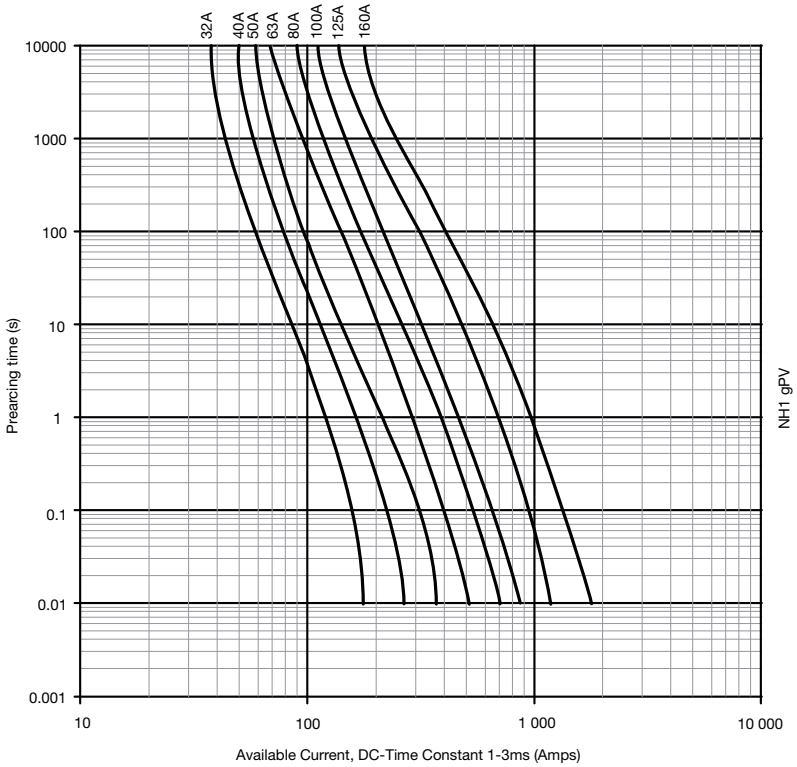
gPV cylindrical fuses 10x85 gPV



fusib-pv_027_a_1_gb_cat

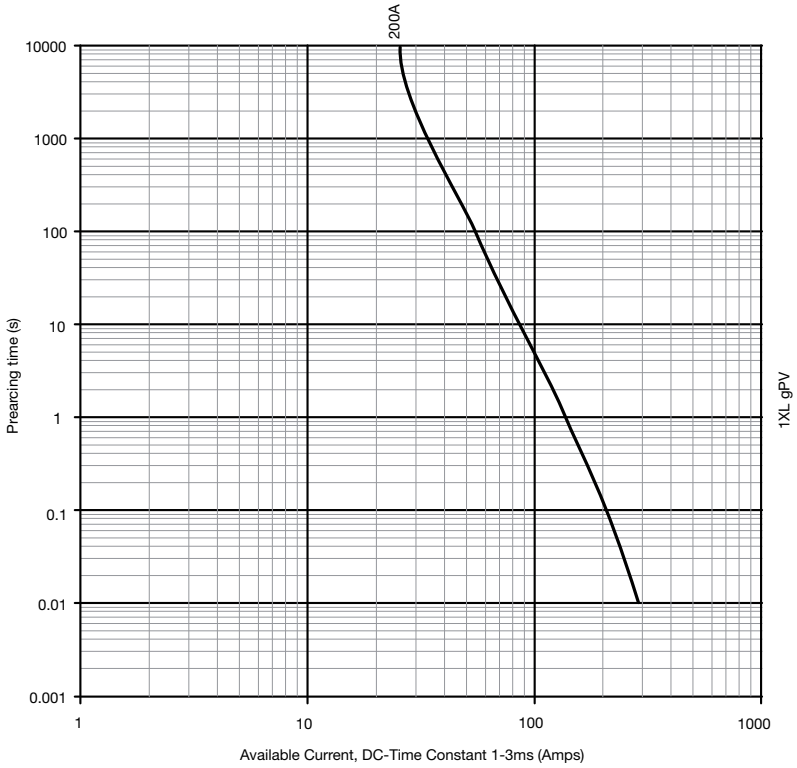
gPV knife edge fuse (NH1)



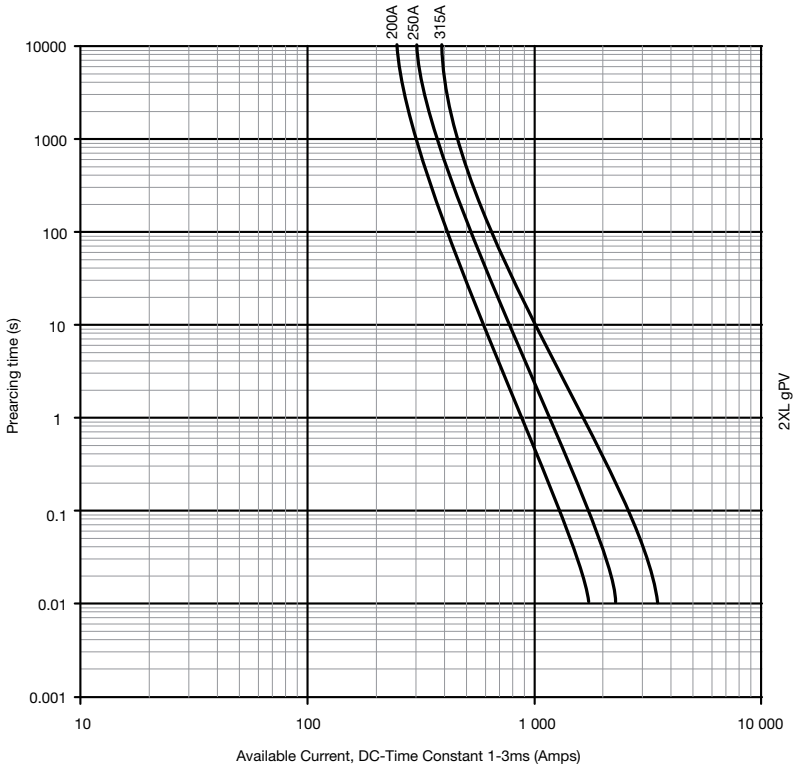
fusib-pv_004_b_1_gb_cat

Time/current operation characteristics (continued)

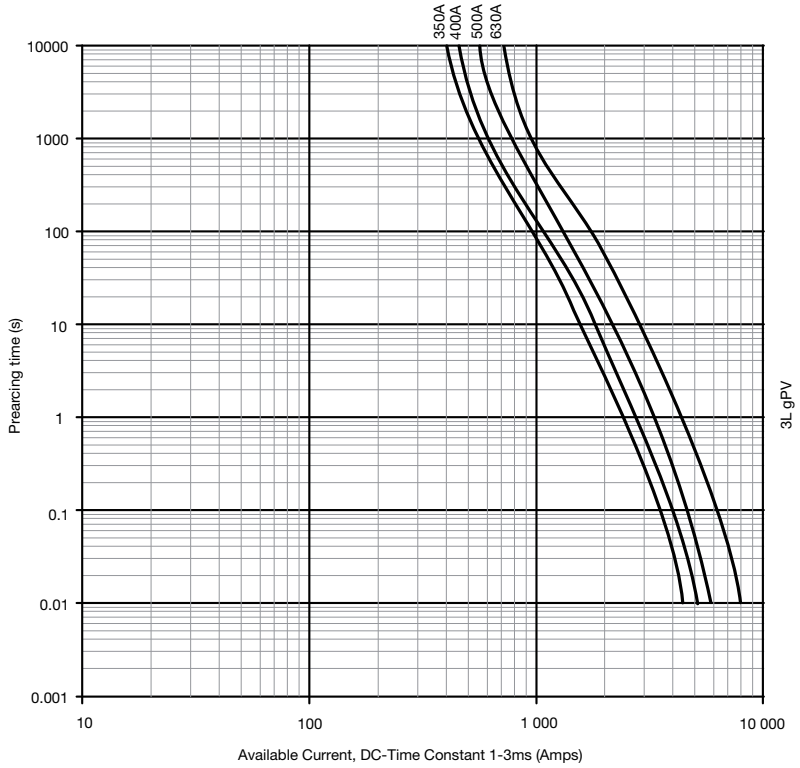
gPV knife edge fuse (1XL)



gPV knife edge fuse (2XL)

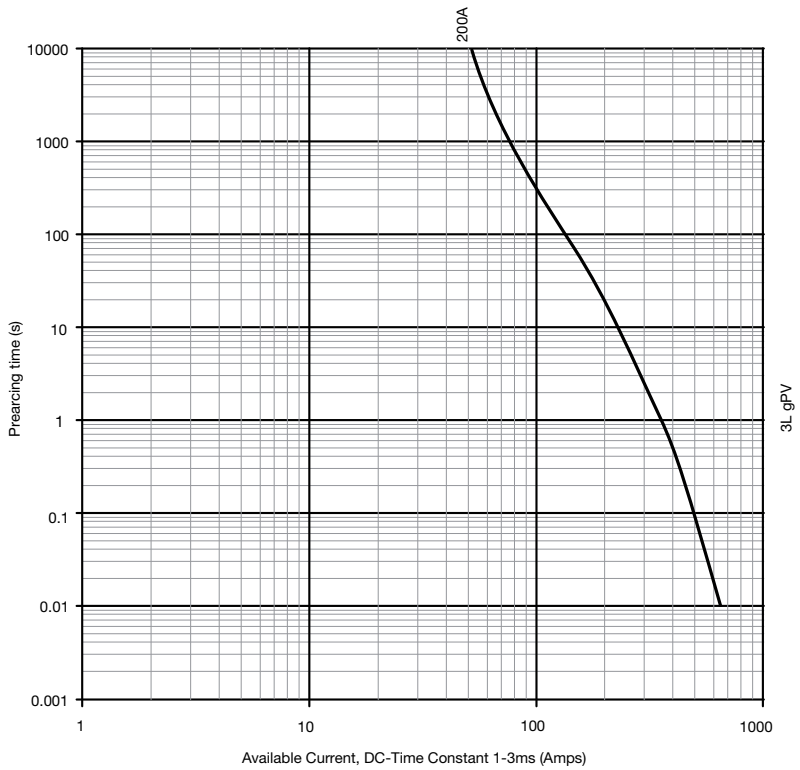


gPV knife edge fuse (3L) - Rated voltage 1000 VDC



fusb-pv_006_b_1_gb_cat

gPV knife edge fuse (3L) - Rated voltage 1500 VDC



fusb-pv_029_a_1_gb_cat

RM PV

Fuse disconnect switches
for PV cylindrical fuses 10x38 and 14x51

new

***RM PV** 10x38*
32 A

***RM PV** 10x38*
50 A

The solution for

> Small installations up to large PV farms.

Strong points

> Improved safety.
> Product dedicated to PV applications.
> Specific format and accessories.

Conformity to standards

> IEC 60947-3
> IEC 60269
> NF EN 60269-1
> VDE 0636-10
> DIN 43620

Function

RM PV are modular fuse disconnect switches for cylindrical gPV fuses. They provide safety disconnection and protection against overcurrents in any low DC voltage photovoltaic applications.
RM PV are fuse disconnect switches with or without light indicators for fuses without striker.

Advantages

Improved safety
- Rated voltage of 1000 VDC.
- Self-extinguishing thermoplastic material.
- Protection IP2X.

Product dedicated to PV applications.
Protection against reverse currents thanks to gPV fuses dedicated to PV applications.

Specific format and accessories.
- Modular DIN 45 mm cut-out.
- Interlocking with accessory available.

References

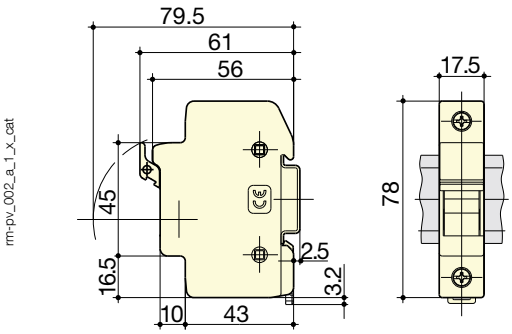
No. of poles	32 A 10 x 38 Reference	50 A 14 x 51 Reference
1 P	57PV **0015**	57PV **0020**
1 P with signalling	57PV **0L15**	

Characteristics according to IEC 60947-3

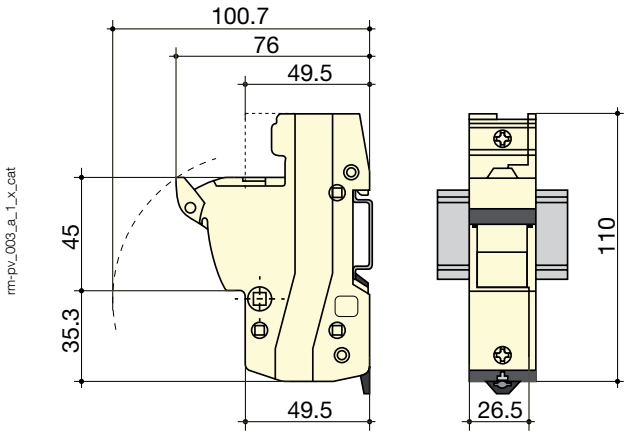
Thermal current I_{th}	**32 A**	**50 A**
Fuse size	10 x 38	14 x 51
Rated insulation voltage U_i (V)	1000	1000
Fuse rating		
Fuse rating (A)	1 … 20	25 … 32
Power		
Rated dissipated power (W)	3	5
Design current derating coefficient for N pole side by side		
N = 1 … 3	1	1
N = 4 … 6	0.8	0.8
N = 7 … 9	0.7	0.7
N ≥ 10	0.6	0.6
Connection		
Minimum Cu cable cross-section (mm^2)	0.75	1.5
Maximum Cu rigid cable cross-section (mm^2)	10	35
Tightening torque (Nm)	2.5	2.5 … 3
Mechanical characteristics		
Weight of 1 P (kg)	0.1	0, 15

Dimensions

RM PV 10 x 38



RM PV 14 x 51



PV fuse bases

Fuse bases for PV applications

For NH gPV fuses 32 to 600 A

new

Base
size 1

Base
size 2

The solution for

> Small installations up to large PV farms

Strong points

> Improved safety.
> Product dedicated to PV applications.
> Fuse blown indication.
> Different fixing types.

Conformity to standards

> IEC 60269
> NF EN 60269-1
> VDE 0636-10
> DIN 43620

Function

SOCOMEC **fuse bases** provide fixed, unipolar or multipolar support for knife edge fuses dedicated to PV applications.

Advantages

Improved safety
- Rated voltage of 1000 VDC.
- Self-extinguishing thermoplastic material.
- Kit IP2X (depending on models).

Product dedicated to PV applications.
Protection against reverse currents thanks to gPV fuses dedicated to PV applications.

Fuse blown indication
Possibility to collect the fuse blown indication (Please see section PV fuses).

Different fixing types
DIN rail or back plate mounting available (depending on models).

References

Back plate mounted device

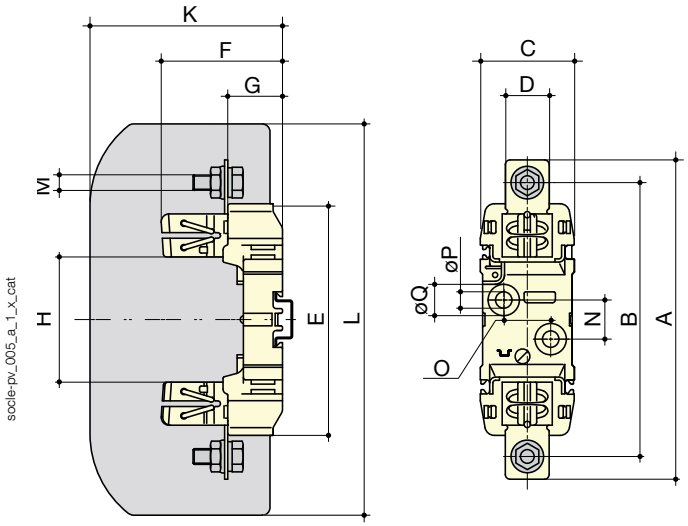
Rating Fuse size No. of poles	30-160 A NH1 Reference	200-355 A 2XL Reference	400-600 A 3L Reference
1 P	65PV **1011**	65PV **1112**	65PV **1113**

Accessories for NH1 fuses	Reference
Connecting block - set of 1 piece	6500 **0031**
Phase separation shield - set of 1 piece	6500 **0003**
Terminal shrouds - set of 1 piece	6500 **0012**
Fuse cover - set of 1 piece	6500 **0022**
Kit IP20 1 P	6511 **1011**(1)

(1) IP20 single-pole kit consisting of 2 connecting blocks, 2 phase separation shields, 2 terminal shrouds and 1 fuse cover.

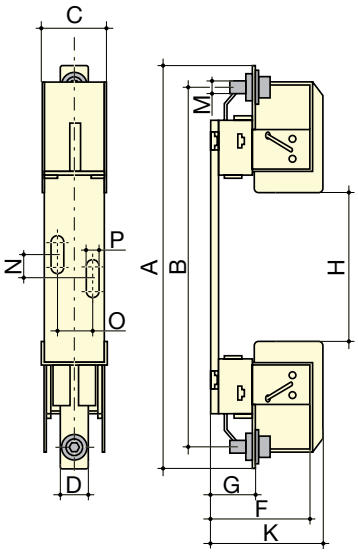
Dimensions

Fuse bases 30 to 160 A - NH1 size



socle-pv_005_a_1_x_cat

Fuse bases 200 to 600 A - 2XL and 3L sizes



socle-pv_001_a_1_x_cat

Rating (A)	Fuse size	A	W	C	D	E	F	G	H	K	L	M	N	O	P	Q
30 … 160	NH1	200	175	60	28	148	77.5	35	80	123	250	M10	25	30	10.5	20.5
200 … 355	2XL	287	257	64	30	-	100	37	140	103	-	M10	17.5	30	10.5	-
400 … 600	3L	307	270	68	40	-	103	38	140	-	-	M12	25	30	10.5	-

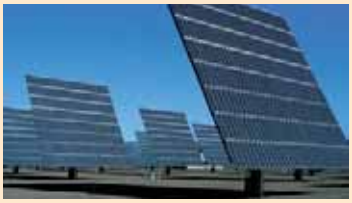
SIRCOVER PV

Changeover switches for photovoltaic applications
from 200 to 630 A

svr-pv_003_a_1_cat

The solution for

- Energy management.
- Continuity of supply for PV applications.



Strong points

- Stable positions.
- Secured breaking.
- Patented safety disconnection.

Conformity to standards

- IEC 60947-3

A compact solution.

- The products are available in enclosures.

Function

SIRCOVER PV switches are manual multipolar changeover switches with positive break indication. They ensure source inversion or changeover under load of two photovoltaic installation circuits.

Advantages

Stable positions
SIRCOVER PV switches have three stable positions which are not affected by voltage drops or vibrations.

Secured breaking
Simultaneous upstream and downstream isolation and positive break indication.

Patented safety disconnection
A glass fibre reinforced polyester break chamber with an arc extinguishing system provides a patented safety disconnection system offering rapid extinguishing of the electric arc up to 1000 VDC and current interruption up to 630 A.

What you need to know

A photovoltaic electrical installation is an application that requires switching devices which fully meet the needs of operational reliability and operational safety intervention for this type of installation.

According to IEC 60364 (Part 7-7-12), the characteristics must withstand overcurrents up to 1.25 times the rated short-circuit current (I_{sc}, S_{tc}).

To date, as there is no specific standard regarding 'switchgear for PV installation', the manufacturer can only refer to IEC 60947 and related use categories depending on the type of loads and normal overload conditions.

The utilisation category DC21 defines a device withstand capacity up to 1.5 times the rated current of the installation, with a time constant L/R 1ms, which is significantly above the requirements by the standard IEC 60364-7-712 and PV needs on the basis of these criteria.

However, the manufacturer has the responsibility to propose, according to his expertise, devices meeting the specific requirements of these applications, even if they are not necessarily defined in standards.

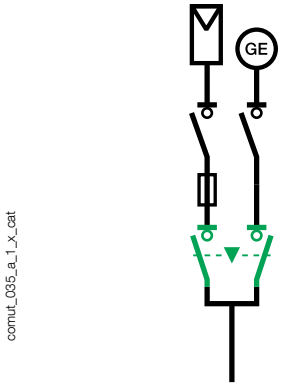
socomec Innovative Power Solutions

Application

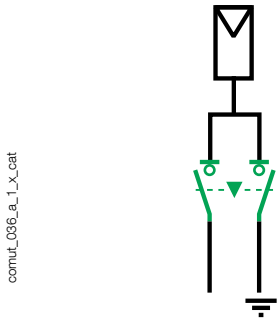
The choice of the material cannot be separated from the concept of energy management.
Many applications may require continuous power supply during a PV generator fault, when an isolated site has been electrified, in developing countries, in telecommunications or pumping. SIRCOVER PV changeover switches ensure source inversion or switching under load between two circuits.

Example: Switching from DC to AC photovoltaic grid.

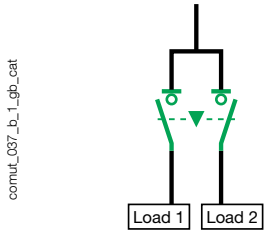
Source transfer: manual changeover between two photovoltaic sources or a photovoltaic source and a generator set.



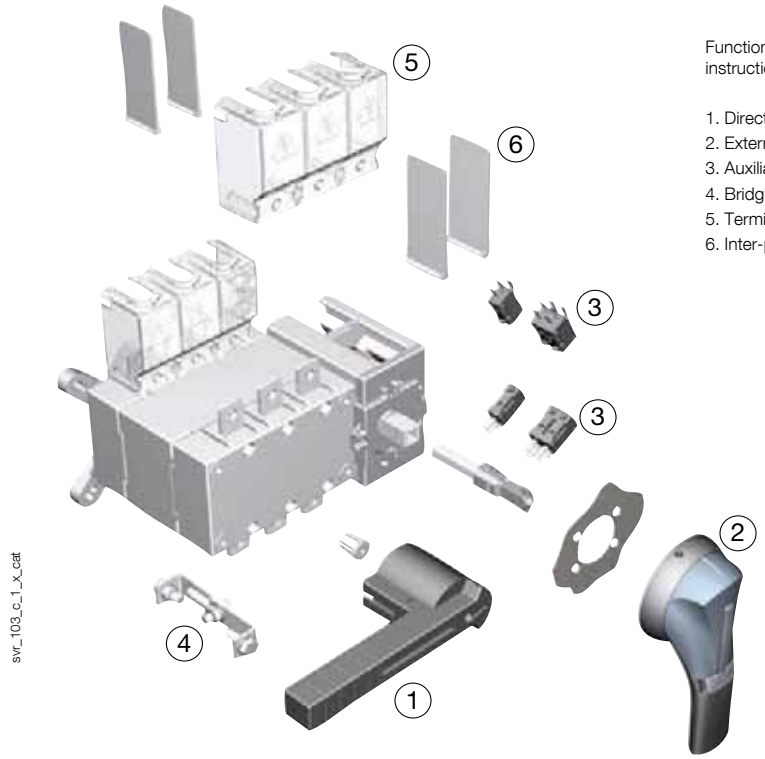
Equipment earthing as for a string of photovoltaic panels.



Load inverter : switching the power supply from one load to another in order to guarantee continuous power supply during maintenance operations.



Functional diagram



Functional diagram (for further details see the installation instructions supplied with the product).

1. Direct front operation
2. External front operation
3. Auxiliary contacts
4. Bridging bar.
5. Terminal shrouds.
6. Inter-phase barrier.

SIRCOVER PV

Changeover switches for photovoltaic applications

from 200 to 630 A

References

SIRCOVER PV I-0-II

Rating (A)	No. of poles	Switch body	Direct handle	External handle	Shaft for external handle	Bridging bar	Auxiliary contact	Terminal screens	Terminal shrouds
200 A	3 P	41PV **3020**	Black 4199 **5012**	S2 type Black IP55 1421 **2113** Black IP65 1423 **2113**(1)	200 mm 1400 **1020** 320 mm 1400 **1032**(1)	2 P 4109 **2025**	2nd contact NO/NC 4109 **0021**(2)	3 P 1509 **3025** 4 P 1509 **4025**	
	4 P	41PV **4020**							
250 A	3 P	41PV **3025**							
	4 P	41PV **4025**							
400 A	3 P	41PV **3040**		S3 type Black IP65 1433 **3113**	200 mm 1401 **1520** 320 mm 1401 **1532**(1)	2 P 4109 **2063**		3 P 1509 **3063**(3) 4 P 1509 **4063**(3)	3 P 2694 **3051**(4) 4 P 2694 **4051**(4)
	4 P	41PV **4040**							
500 A	3 P	41PV **3050**							
	4 P	41PV **4050**							
630 A	3 P	41PV **3063**							
	4 P	41PV **4063**							

(1) Standard.
(2) 2 pieces: one for position I and one for position II.
(3) 2 pieces: one for top side and another for bottom side
(4) To shroud switch top and bottom 2 references required.

Accessories

Direct operation handle

Rating (A)	Handle colour	Handle type	Reference
200 … 630	Black	Single lever	4199 **5012**

External operation handle

Use

Door interlocked external front operation handles include an escutcheon, are padlockable and must be utilised with an extension shaft.

Rating (A)	External IP(1)	Handle type	Reference
200 … 250	IP55	S2 type	1421 **2113**
200 … 250	IP65	S2 type	1423 **2113**
400 … 630	IP65	S3 type	1433 **3113**

(1) IP: protection degree according to IEC 60529 standard.

S2 type handle

S3 type handle

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S-type handle adapter

Use

Enables S type handles to be fitted in place of existing older style SOCOMEC handles. Adapter can also be utilised as a spacer to increase the distance between the panel door and the handle lever.

Dimensions

Adds 12 mm to the depth.

Handle colour	External IP(1)	To be ordered in multiples of	Reference
Black	IP65	1	1493 **0000**

(1) IP: protection degree according to IEC 60529 standard.

Alternative S-type handle cover colours

Use

For single lever handles type S2 and S3.

Other colours: Please consult us.

Colour	To be ordered in multiples of	Handle	Reference
Light grey	50	S2, S3 type	1401 **0001**
Dark grey	50	S2, S3 type	1401 **0011**

Shaft guide for external operation

Use

To guide the shaft extension into the external handle.

This accessory enables the handle to engage the extension shaft with a misalignment of up to 15 mm.

Required for a shaft length over 320 mm.

Description	Reference
Shaft guide	1429 **0000**

Shaft for external handle

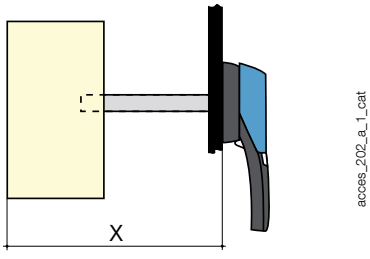
Use

Standard lengths:
- 200 mm,
- 320 mm.

Other lengths: Please consult us.

Type 10x10

Type 10x10



Rating (A)	Length (mm)	Dimension X (mm)	Type	Reference
200 … 250	200	210 … 310	10 x 10	1400 **1020**
200 … 250	320	210 … 430	10 x 10	1400 **1032**
400 … 630	200	425 … 577	15 x 12	1401 **1520**
400 … 630	320	425 … 697	15 x 12	1401 **1532**

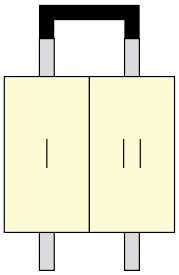
Accessories (continued)

Bridging bars

Use

For creating a common connection between switches I & II, on the top or bottom side of the SIRCOVER, to enable, for example, the load to be fed from either incoming source (I or II).

Rating (A)	No. of poles	Section (mm)	Mounting	Reference
200 … 250	1 P	25 x 2.5	client	4109 **0025**
200 … 250	2 P	25 x 2.5	client	4109 **2025**
400 … 630	1 P	50 x 5	client	4109 **0063**
400 … 630	2 P	50 x 5	client	4109 **2063**


svr_124_a_1_cat


acces_205_a_2_cat

Bridging bars for connecting poles in series

Use

The bridging bars facilitate the connection of the poles in series, allowing the following configurations:

Bottom/Bottom

Top/Top

Top/Bottom

Top/Bottom

Connection diagrams: See "Poles connections in serie", page 93.

Rating (A)	Number of poles of the device in series	Pack	Reference
200 … 250	2(1)	1 piece	2609 **0025**
200 … 250	4(1)	2 pieces	2609 **2025**
400 … 630	2(1)	1 piece	2609 **0063**
400 … 630	4(1)	2 pieces	2609 **2063**

(1) on one source

Auxiliary contact

Use

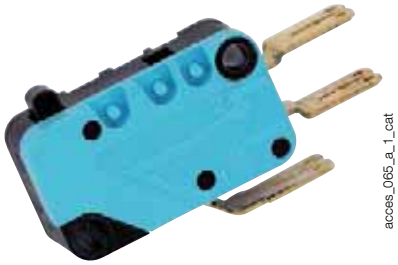
Pre breaking and signalling of positions I and II: 1 or 2 NO/NC auxiliary contacts in each position. Low level auxiliary contacts: please consult us.

Connection to the control circuit

6.35 mm fast-on terminal.

Electrical characteristics

30 000 operations.


acces_065_a_1_cat


svr_058_a_1_cat

Characteristics

Rating (A)	Nominal current (A)	Operating current I_e (A) 250 VAC AC-13	400 VAC AC-13	24 VDC AC-13	48 VDC AC-13
200 … 630	16	12	8	14	6

References

NO/NC changeover contact		
Rating (A)	**Contact(s)**	**Reference**
200 … 630	$1^{st}/2^{nd}$	4109 **0021**

Terminal shrouds

Use

Protection against direct contact with terminals or connecting parts.

Advantage

Perforations allow remote thermographic inspection without the need to remove the shrouds.

Rating (A)	No. of poles	Position	Reference
400 … 630	3 P	top / bottom	2694 **3051**(1)
400 … 630	4 P	top / bottom	2694 **4051**(1)

(1) To shroud switch top and bottom 2 references required.


acces_206_a_2_cat

Terminal screens

Use

Top and bottom protection against direct contact with terminals or connection parts.

Rating (A)	No. of poles	Position	Pack	Reference
200 … 250	3 P	top / bottom	1	1509 **3025**
200 … 250	4 P	top / bottom	1	1509 **4025**
400 … 630	3 P	top / bottom	2	1509 **3063**
400 … 630	4 P	top / bottom	2	1509 **4063**

Key handle interlocking system

Use

Using padlock (not supplied).This device is factory mounted in the direct or external operation handle and allows the use of up to 3 padlocks.

Locking:

- a special handle which receives the lock bolt on SIRCOVER CD 125 to CD 630 A (Fig. 2)

The interlocking positions are either determined as standard or configured by the user by removing the pre-formed tabs.

Padlocking and locking can be combined.

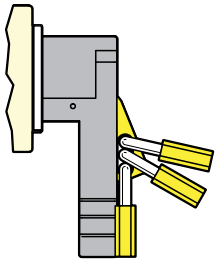


Fig. 1

Padlocking in position I, 0 or II			
Rating (A)	**Operation**	**Figure**	**Reference**
200 … 250	external	1	1423 **2813**

Locking using RONIS EL11AP lock in position 0 (not supplied)			
Rating (A)	**Operation**	**Figure**	**Reference**
200 … 630	direct	2	4109 **1006**(1)
200 … 630	external	3	1499 **7701**

(1) Specific handle included.

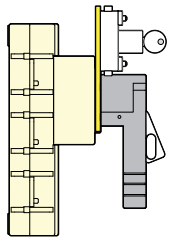


Fig.2

Locking using RONIS EL11AP lock in positions I, 0, II (not supplied)			
Rating (A)	**Operation**	**Figure**	**Reference**
200 … 630	direct	2	4109 **1002**(1)
200 … 250	external	3	1499 **7701**

(1) Specific handle included.

Locking using type K CASTELL lock (not supplied)			
Rating (A)	**Operation**	**Figure**	**Reference**
200 … 630	external	3	1499 **7702**

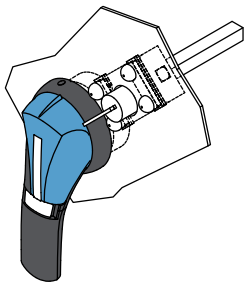


Fig. 3

Other specific accessories

- Low level auxiliary contacts.

Characteristics according to IEC 60947-3

200 to 630 A

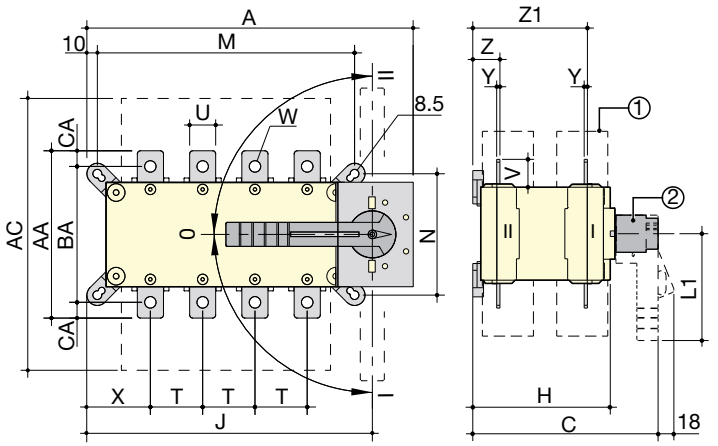
Thermal current I_{th} at 40°C				**200 A**	**250 A**	**400 A**	**500 A**	**630 A**
Rated insulation voltage U_i (V)				1200	1200	1200	1200	1200
Rated impulse withstand voltage U_{imp} (kV)				8	8	12	12	12
Rated operational currents I_e (A)								
Rated voltage	**Utilisation category**	**Number of poles of the device**	**Number of pole(s) in series per polarity**	**(A)**	**(A)**	**(A)**	**(A)**	**(A)**
750 VDC	DC-21 B	3 P	2 P + and 1 P -	200	250	400	500	630
1000 VDC	DC-21 B	4 P	2 P + and 2 P -	200	250	400	500	630
Connection								
Rigid Cu cable cross-section (mm²)				95	120	240	2 x 150	2 x 185
Maximum Cu busbar width (mm)				32	32	32	40	40
Tightening torque min (Nm)				20	20	20	40	40
Mechanical characteristics								
Durability (number of operating cycles)(1)				10000	10000	5000	5000	5000
Weight of a 3 pole device (kg)				3,8	3,8	9	9	9
Weight of a 4 pole device (kg)				4,6	4,6	11	11	11

(1) Improved endurances: Please consult us.

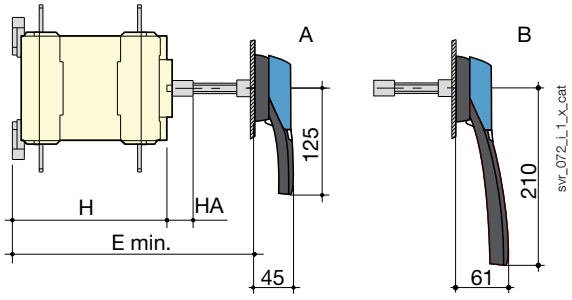
Dimensions

SIRCOVER 200 to 630 A

Direct front operation



External front operation



A. S2 type handle for external operation: 200 to 400 A.
B. S3 type handle for external operation: 500 to 630 A.

1. Terminal shrouds.
2. Direct handle operation:

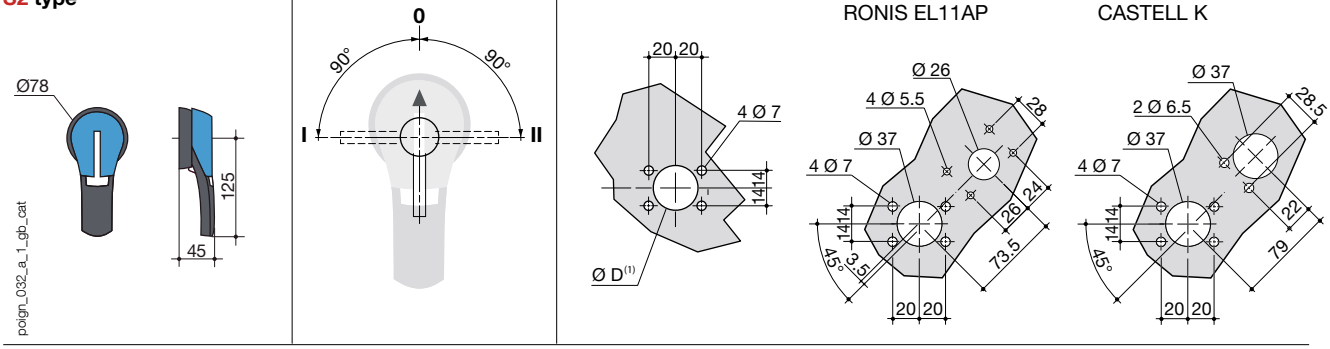
- 200 to 400 A: L1 = 140 mm.
- 500 to 630 A: L1 = 210 mm.

Rating (A)	**Overall dimensions**				**Terminal shrouds**	**Switch body**				**Switch mounting**			**Connection**											
	A 3p.	**A 4p.**	**C**	**E min**	**AC**	**H**	**HA**	**J 3p.**	**J 4p.**	**M 3p.**	**M 4p.**	**N**	**T**	**U**	**V**	**W**	**X 3p.**	**X 4p.**	**Y**	**Z**	**Z1**	**AA**	**BA**	**CA**
200	262	312	218	208 … 436	280	148	25	223	273	196	246	116	50	25	30	11	61	61	3,5	30	124	160	130	15
250	262	312	218	208 … 436	280	148	25	223	273	196	246	116	50	25	30	11	61	61	3,5	30	124	160	130	15
400	319	379	295	285 … 514	400	225	25	272	332	246	306	176	65	45	50	13	70.5	65.5	5	43	180	260	220	20
500	319	379	295	285 … 514	400	225	25	272	332	246	306	176	65	45	50	13	70.5	65.5	5	43	180	260	220	20
630	319	379	295	285 … 514	400	225	25	272	332	246	306	176	65	45	50	13	70.5	65.5	5	43	180	260	220	20

Dimensions for external handles

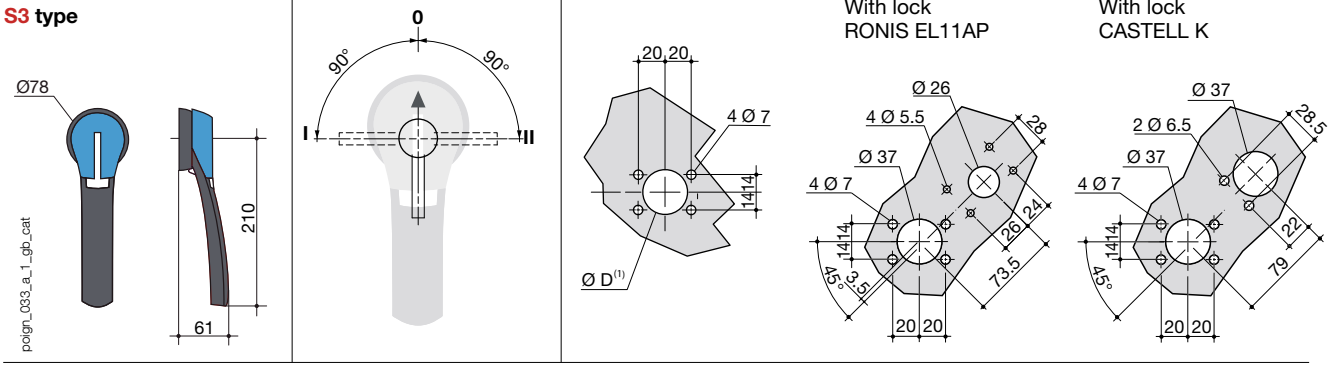
SIRCOVER 200 to 600 A

Handle type	Front operation Direction of operation	Door drilling	
		With lock RONIS EL11AP	With lock CASTELL K
S2 type			



(1) Ø31 to Ø37: Rear screw mounting Ø37: front clip mounting.

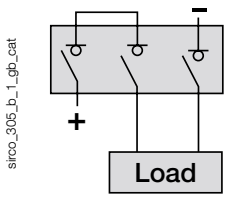
Handle type	Front operation Direction of operation	Door drilling	
		With lock RONIS EL11AP	With lock CASTELL K
S3 type			



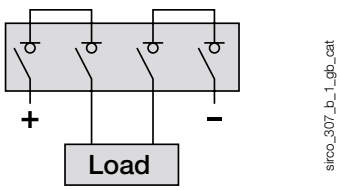
(1) Ø31 to Ø37: Rear screw mounting Ø37: front clip mounting.

Pole connections in series(1)

3 poles - bottom / top



4 poles - bottom / bottom



(1) Other connections: refer to mounting instructions

SURGYS® G51-PV

Surge arrester - Type 2
for photovoltaic installations

new

SURGYS G51 - 1000 PV

Function

SURGYS G51-PV surge Protective Device is designed to ensure protection for photovoltaic supply networks against transient overvoltages. It is compliant with test requirements UTE 61-740-51 and EN 50-539-11 as well as with installation requirements UTE C 15-712-1.

Advantages

Monobloc base with plug-in module
The SURGYS is supplied complete and ready for installation. Its Monobloc base is fitted with replaceable plug-in modules which, at the end of their service life, can be easily and quickly replaced without having to disconnect the Monobloc base.

Remote signalling
The remote plug-in signalling contact allows alarm report to a supervision station.

New 1500 VDC version
Adapted to the protection of high power installations.

The solution for

> Solar energy.

Strong points

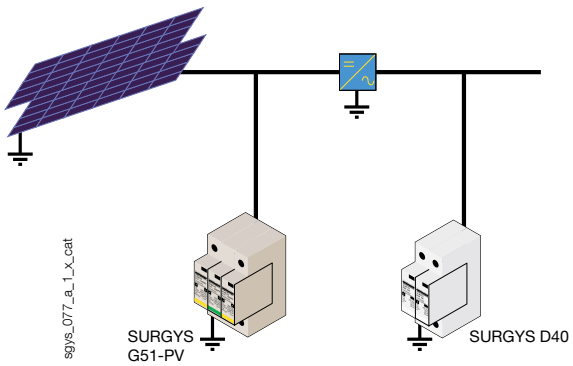
> Monobloc base with plug-in module.
> Remote signalling.
> New 1500 VDC version.

Approvals and certifications

> Compliant with test guide UTE C61-740-51 and NF EN 50 539-11
> Compliant with installation guide UTE C15-712-1 (2010).

Applications

Main incoming protection in a photovoltaic network:
- SURGYS G51-PV is installed on the DC side, in the combiner box, close to the solar cell strings, for protecting the downstream DC equipment from the indirect effects of lightning.
- SURGYS AC, SURGYS D40 for instance, is installed downstream of the inverter for load protection.



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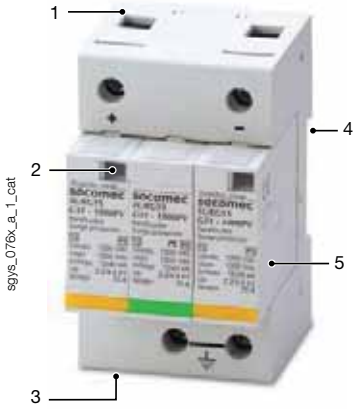
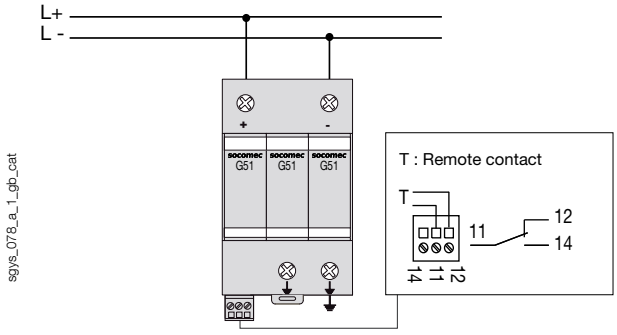
Front panel



1. Monobloc base.
2. End of service life indicator.
3. Remote signalling contact.
4. DIN rail mounting.
5. Plug-in module.

Connection

Common mode / differential mode protection

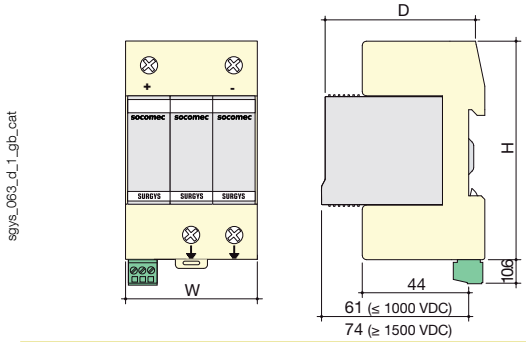


Characteristics

Network	
Network type	500 VDC / 600 VDC / 800 VDC / 1000 VDC / 1500 VDC
PV voltage U_{ocSTC}	500 VDC / 600 VDC / 800 VDC / 1000 VDC / 1500 VDC
Max. voltage U_{CPV}	600 VDC (version 500 V) / 720 VDC (version 600 V) / 960 VDC (version 800 V) / 1200 VDC (version 1000 V) / 1500 VDC (version 1500 V)
Protection characteristics	
Mode of protection	MC(1): 500 V / 600 V / 800 V / 1000 V / 1500 V MD(2): 800 V / 1000 V / 1500 V
Level of protection MC ($U_{p\ MC}$)	2,2 kV (500 V) / 2,8 kV (600 V) / 2 kV (800 V) / 2,2 kV (1000 V) / 3,2 kV (1500 V)
Level of protection MD ($U_{p\ MD}$)	- / - / 3,6 kV (800 V) / 4,4 kV (1000 V) / 4,5 kV (1500 V)
Short circuit current (I_{SCWPV})	1000 A
Maximum discharge current (1 shock 8/20 µs) I_{max}	40 kA
Nominal discharge current (15 shocks 8/20 µs) I_n	15 kA
Associated characteristics	
Residual current I_c	500 / 600 V : < 0.1 mA 800 / 1000 / 1500 V : 0 mA
Response time t_r	< 25 ns
Follow current I_f	none
End of life mode	thermal disconnection
Type of disconnection indicator	mechanical
Number of disconnection indicators	1
Remote signalling contact	
Contact type	inverter
AC making capacity	0.5 A
DC making capacity	3 A
AC nominal voltage	250 VAC
DC nominal voltage	30 VDC
Sustained current	2 A
Connection type	plug-in screw terminal
Max. cross-section of terminal connections	1.5 mm²
Operating conditions	
Operating temperature	-40 … +85 °C
Storage temperature	-40 … +85 °C

(1) Common mode. (2) MD: Differential mode.

Case



Type	monobloc design
2 modules dimensions W x H x D ≤ 800 VDC	36 x 90 x 67 mm
3 modules dimensions W x H x D ≤ 1000 VDC	54 x 90 x 67 mm
3 modules dimensions W x H x D ≥ 1500 VDC	54 x 90 x 77 mm
Case degree of protection	IP20
Terminal block degree of protection	IP20
Case material	UL94-V0 thermoplastic
Network connection cross-section	4 ... 25 mm²
Earth connection cross-section	6 ... 25 mm²

References

Network voltage	Description	No. of poles	Mode of protection	Number of modules	SURGYS® G51-PV Reference
500 VDC	without remote signal	2	MC(1)	2	4982 **2500**
500 VDC	with remote signal	2	MC(1)	2	4982 **2501**
600 VDC	without remote signal	2	MC(1)	2	4982 **2530**
600 VDC	with remote signal	2	MC(1)	2	4982 **2531**
800 VDC	without remote signal	2	MC / MD(2)	3	4982 **2510**
800 VDC	with remote signal	2	MC / MD(2)	3	4982 **2511**
1000 VDC	without remote signal	2	MC / MD(2)	3	4982 **2520**
1000 VDC	with remote signal	2	MC / MD(2)	3	4982 **2521**
1500 VDC	without remote signal	2	MC / MD(2)	3	4982 **2540**
1500 VDC	with remote signal	2	MC / MD(2)	3	4982 **2541**

Description of accessories	Mode of protection	Reference
Spare plug-in module m-G51 for 500 VDC	MC(1)	4982 **2509**
Spare plug-in module m-G51 for 600 VDC	MC(1)	4982 **2539**
Spare plug-in module m-G51 for 800 VDC	MC / MD(2)	4982 **2519**
Spare plug-in module m-G51 for 1000 VDC	MC / MD(2)	4982 **2529**
Spare plug-in module m-G51 for 1500 VDC	MC / MD(2)	4982 **2549**

(1) Common mode. *(2) MD: Differential mode.*

References list

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Innovative Power Solutions

Note

Note

Model : SOCOMEC
Production : SOCOMEC
Photography : Martin Bernhart et Studio Objectif
Printing :

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