SIRCO PV

Disconnect switches for photovoltaic applications from 100 to 3200 A, up to 1500 VDC

UL 98B & IEC 60947-3

your energy
our expertise

socomec
Innovative Power Solutions

You deserve safe & reliable PV installations

As a PV expert, you are challenged to differentiate yourself from the global competition with geographical disperse markets. Photovoltaic energy producers demand equipment and installations that combine a high production output, consistent reliability and safety with a low maintenance cost. Besides a high-efficiency production, the equipment must support the specificity and technical constraints of the severe environments related to solar applications. Specifically designed for photovoltaic applications, SIRCO PV solar disconnect switches have been tested for use in applications with high performance characteristics that meet or exceed of the latest industry standard requirements.

SOCOMEC - your best asset

European industrial group
- Created in 1922.
- Over 3100 employees.
- Present on five continents.

A culture of independence
- Family shareholders.
- Full control of the decision-making process.
- Respect for human values.

The spirit of innovation
- 10 % of turnover is reinvested in R&D.

A flexible manufacturing structure
- Competitive production sites.
- Lean Management.
- Lead times, quality and cost guaranteed.

The vision of a specialist
- Expertise in technological modules.
- Custom adaptations to customer requirements.

A focus on service
- Advice, interventions, training.
- Teams located across the globe.

ENERGY SPECIALIST SINCE 1922

THE GLOBAL COMPACT WE SUPPORT

SIRCO PV

A complete offer for any photovoltaic application
The spirit of innovation combined with proven technology

As an expert in solar switching equipment, SOCOMEC has the specialised know-how for implementing key strategic functions in PV facilities.

GAMME 407 A

Switches from 100 to 3200 A up to 1500 VDC.

Four key applications: the know-how of a specialist

Ensuring the availability and storage of high quality power.

Managing power and protecting persons and facilities.

Managing the energy performance of buildings.

Enabling available, safe and efficient energy.

New patented switching technology to break 500 VDC per pole

Most PV systems today are designed at 1000 VDC. Our new range of switches allows on-load breaking of 1000 VDC on just 2 poles. This innovation provides an extremely compact solution.

Classic solution
Example of connection of a 1000 VDC disconnect.

New
With our new range we can break 1000 VDC with 2 poles in series.

Optimise your investment

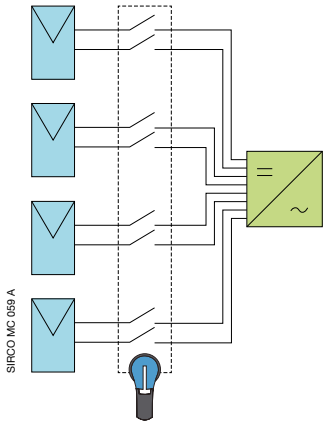
- Limit costs by reducing the number of jumpers per device.
- Gain time by having a less number of jumpers to install.
- Reduce the overall heat dissipation of the switch. A 2 pole SIRCO PV switch takes direct advantage of this, leading to **possibility to use a smaller enclosure**.

Limit potential risk

PV equipment is subject to extreme variation in temperature. Point of connection are therefore subject to potential loosening of connection due to breaking cooling effect. Limiting the number of poles greatly reduces the risk of a loose connection.

Allows to disconnect up to 4 circuits with one switch ("The Worlds first")

A compact and cost effective solution for recombiner applications.
Allows to break up to 24 circuits by respecting the NEC article 690.



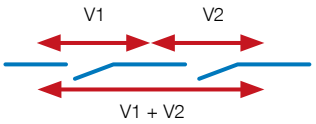
4 MPPT switches, 4 circuits are switched together.

SIRCO PV 350 A
1000 VDC 4 circuits.

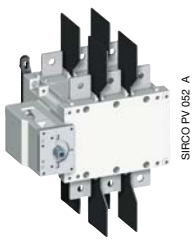
Achieving 1500 VDC characteristics in a compact footprint

SOCOMEC's new technology enables utilisation at 1500 VDC by connecting three poles in series.

- Each pole of a switch has a maximum voltage breaking capacity. To break a high DC voltage it is necessary to connect poles in series. The global on-load breaking capacity of a switch is determined by multiplying the max voltage breaking capacity per pole by the number of poles in series.
- Paralleling the poles on our double-stack design permits a higher current rating to be achieved.



SIRCO PV 400 A
1500 VDC.



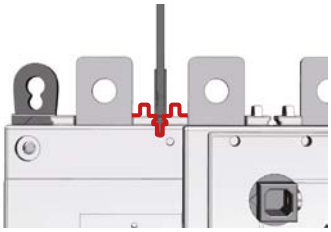
SIRCO PV 800 A
1500 VDC with a 400 A double stack switch.

Benefit from the experience of a world leader in industrial switching

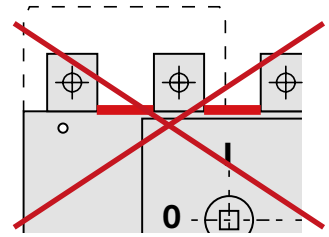
PV applications are one of the most stringent for disconnect switches. Extreme fluctuations in temperature, condensation, dust, UV exposure and oversized connection cables stress components. Our SIRCO range has been adapted to exceed industry standards and current solutions fully take into account the specific requirements of PV applications.

Guarantee isolation over time

Today most photovoltaic systems operate at 1000 VDC with voltages now moving towards 1500 VDC.
Aging of plastic due to high fluctuations in temperature combined with external elements (dust, condensation) may through time increase the risk of electrical breakdown. The creepage distance over insulation material between live parts is key in preventing this. SOCOMEC decided to exceed the requirements of IEC standard and increased this distance from 25 mm to 53 mm. A distance of 50 mm/2 inches is the mandatory distance comply with UL standards.



SOCOMEC design with 53 mm creepage distance over surface. This is true externally as well as internally.



Other manufacturers concept os often with a shorter distance. Note that external shrouding does not extend the creepage distance.

Ensure safe operation

The mechanism is completely independent from manual operation and provides quick make & quick break operations, thereby reducing the arc duration.
A reliable position indicator clearly shows the true state of the switch contacts.

Long lasting stable raw material

SIRCO PV is an extremely robust product, with all casings made from fiber glass reinforced polyester materials that allows:
- high mechanical withstand,
- high stability to temperatures (RTI of 130 °C),
- high dielectric performance (high CTI/tested according to ASTM D 2303).

The SIRCO PV range includes a heavy duty assortment of handles
- Door interlocked the ON position.
- Possibility to defeat the door interlock with the use of a tool.
- Padlockable in the OFF position whilst including a door interlock.
- High index of protection: up to IP65 IEC and 4, 4X UL.
- UV rated according to UL50.

A fully tested range…

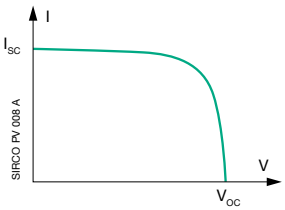
Using tested and certified components is key for the success of the design for any photovoltaic system. The SIRCO PV range is tested and certified according to main standards used in the photovoltaic industry.

Global approvals

Our SIRCO PV solar disconnect range meets UL98B, IEC947-3 Standards and bear the CE mark. Using the SOCOMEC range in your design is therefore a unique opportunity to standardise your components and use the same switches on 5 continents.

PV critical current

Under particular conditions (cloudy, days, evenings…) PV systems can deliver a low current at high voltage. This type of current is extremely difficult to interrupt. Standard AC or DC products are usually not tested in these particular conditions and could therefore be unable to interrupt low currents at high DC voltage. If the electrical arc produced is not interrupted it may result in operator injury or fire. The SIRCO PV range has been specifically designed and tested to interrupt the current under all current/voltage conditions.



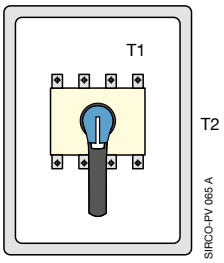
Current (I)/Voltage (V) curve of a PV system. When the current decreases (in the evening or when cloudy) the voltage may increase.
SC = Short-circuit, OC = Open-circuit

Short Circuit

The complete range is tested to withstand a short circuit of 10 kA for a duration of 50 ms without any specific protection. This allows the use of any overcurrent protection device for line protection.

Thermal current test

Thermal tests have been performed according to both IEC and UL standards.



According to UL Standard 98B, the maximum difference authorised between T1 (temperature of terminals) and T2 is 40 °K when the switch is fully loaded.

According to IEC947, switches are tested in free air. Maximum temperature elevation on terminals is 70 °K.

OUR SWITCHES ARE CERTIFIED UP TO 60 °C AMBIENT WITHOUT DERATING

One of Europe's largest power laboratories

Tesla Lab laboratory has guaranteed the reliability and compliance of Socomec products since 1965. Accredited by COFRAC, UL (CTDP), CSA and DEKRA (WMT), it also works in partnership with certification organisations such as ASEFA and LOVAG to ensure that the safety and quality requirements in specific countries are addressed fully.

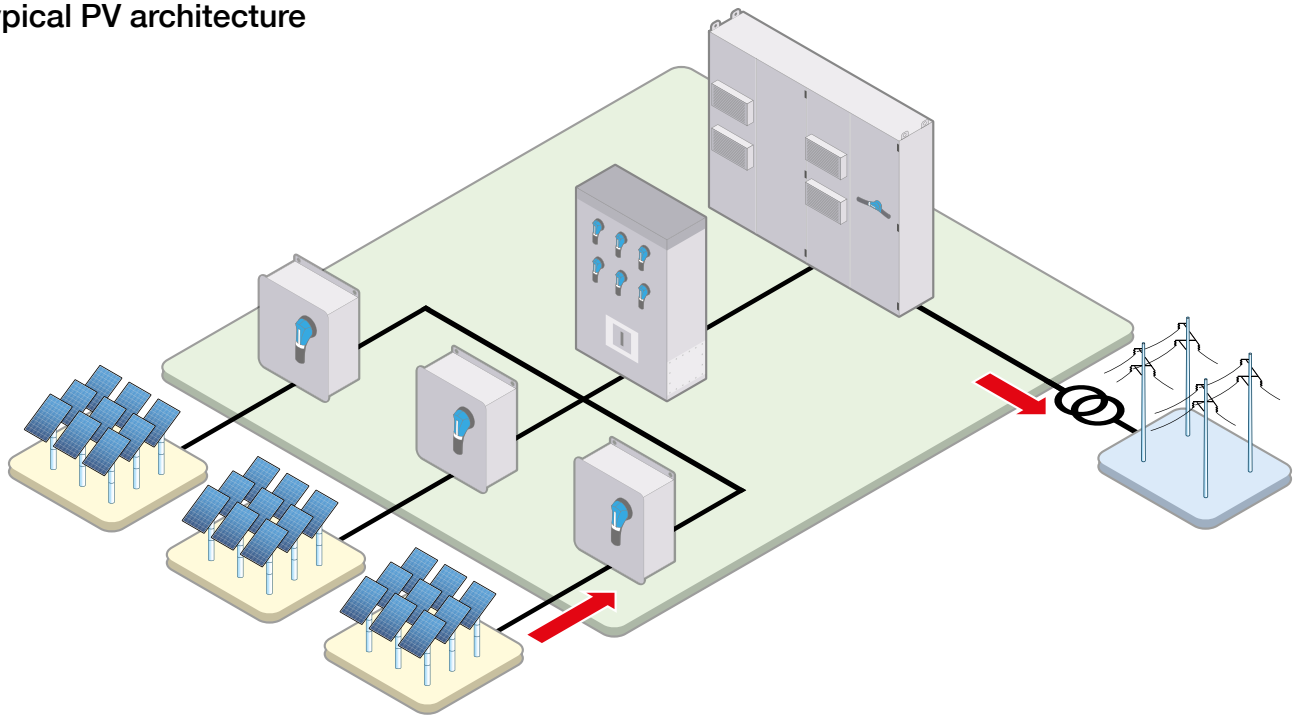
CORPO 342 A

CORPO 349 A

… for all your PV applications

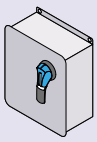
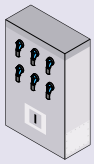
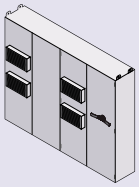
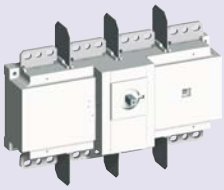
The SIRCO PV range will provide safe disconnection and isolation at all levels of your PV installation.

Typical PV architecture



SIRCO-PV 054 B

SOCOMEC solutions

LEVEL OF INSTALLATION	SOCOMEC SOLUTIONS
Combiner box 	SIRCO PV One circuit 100 to 500 A up to 1500 VDC
Recombiner box 	SIRCO PV 4 circuits 100 to 500 A at 1000 VDC 2 circuits 100 to 500 A at 1500 VDC
Inverter 	 SIRCO PV One circuit 100 to 3200 A at 1000 VDC 100 to 3200 A at 1500 VDC

The widest range on the market

Which standard ?

IEC 60947-3

		100 A	160 A	250 A	315 A
1 circuit	up to 1000 VDC	26PV 2010 B4 2P(2)	26PV 2016 B4 2P(2)	26PV 2025 B4 2P(2)	26PV 2031 B4 2P(2)
	1500 VDC			27PV 3026 275 A B5 3P(2)	27PV 3032 B5
2 circuits	up to 1000 VDC	26PV 5010 B4DS 2P(2)	26PV 5016 B4DS 2P(2)	26PV 5025 B4DS 2P(2)	26PV 5031 B4DS 2P(2)
	1500 VDC			27PV 6026 275 A B5DS 3P(2)	

UL98B IEC 60947-3

		100 A	200 A	250 A	325 A
1 circuit	up to 1000 VDC	27PV 2009 B4 2P(2)	27PV 2019 B4 2P(2)	27PV 2024 B4 2P(2)	27PV 2032 B5 2P(2)
	1500 VDC(1)			27PV 3026 275 A B5 3P(2)	27PV 3032 B5 3P(2)
2 circuits	up to 1000 VDC	27PV 5009 B4DS 2P(2)	27PV 5024 B4DS 2P(2)	27PV 4032 B5 2P(2)	
	1500 VDC(1)			27PV 6026 275 A B5DS 3P(2)	27PV 6032 B5DS 3P(2)

4 circuits 1000 VDC - Ref. 27PV 8026, IEC 275 A - UL 275 A
Ref. 27PV 8039, IEC 500 A - UL 350 A.
1 circuit 1000 VDC 3200 A is also available, please contact us.

(1) The 1500 VDC range is self-certified based on 1000 VDC UL standards at 1500 VDC. The UL standard at 1500 VDC has not yet been released.
(2) Number of poles to reach the characteristic indicated per PV circuit.

How many circuits ? → Which voltage ? → Which rating ?

400 A	500 A	630 A	800 A	1250 A	2000 A
26PV 4040 B4	26PV 4050 B4	26PV 4063 B5	26PV 4080 B5	26PV 4120 B6	26PV 4200 B7
4P(2)	4P(2)	4P(2)	4P(2)	4P(2)	4P(2)
27PV 3032 B5	27PV 3039 B5	26PV 8063 B5DS	26PV 8080 B6DS	26PV 8120 B6DS	26PV 8200 B7DS
3P(2)	3P(2)	8P(2)	8P(2)	8P(2)	8P(2)
27PV 4032 B5	27PV 4039 B5	26PV 8063 B5DS	26PV 8080 B6DS	26PV 8120 B6DS	26PV 8200 B7DS
2P(2)	2P(2)	4P(2)	4P(2)	4P(2)	4P(2)
27PV 6032 B5DS	27PV 6039 B5DS				
3P(2)	3P(2)				

400 A	600 A	800 A	1200 A	2000 A
27PV 2039 B5	27PV 4060 B6	27DC 4081 B7	27DC 4121 B7	27DC 4201 B7
2P(2)	4P(2)	4P(2)	4P(2)	8P(2)
27PV 3039 B5	27PV 8060 B6DS	27DC 8081 B7DS	27DC 8101 1000 A B7DS	
3P(2)	8P(2)	8P(2)	8P(2)	
27PV 4039 B5	27PV 8060 B6DS	27DC 8081 B7DS	27DC 8101 1000 A B7DS	
2P(2)	4P(2)	4P(2)	4P(2)	
27PV 6039 350 A B5DS				
3P(2)				

The *PV* range

A complete offer of load break switches for photovoltaic applications from 25 to 3200 A

SIRCO MC PV from 25 up to 45 A - 1000 VDC

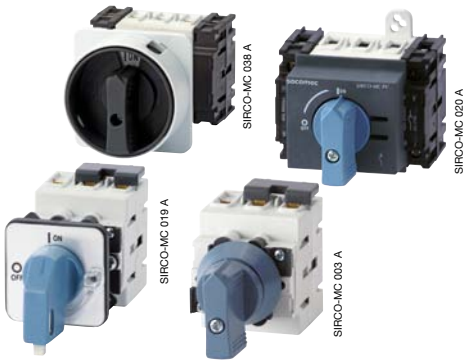
Compact
Thanks to its compact design, the limited space within the combiner box or the solar inverter maybe utilised better.

High breaking capacity up to 1000 VDC
- Making and breaking capacity under load conditions up to 1000 VDC.
- Specific photovoltaic test beyond IEC 60947-3 standard requirements.
- Compliant with UL 508i.

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

Easy mouting
Three mounting possibilities are available for optium integration and time saving.
- DIN rail or back plate mounting.
- Door mounting.
- Quick Fix mounting to save time when integrating into solar inverters.

Multi-circuit breaking
The SIRCO MC PV for double circuits enables connection of two independent PV panel strings to a single switch. This will reduce the cost of the overall solution.



SIRCO MOT PV up to 3200 A - up to 1500 VDC

Main characteristics
- Up to 1500 VDC.
- 2 stable positions (I, 0).
- AUTO/MANU selector.
- Padlocking in 0 position.
- Full range of accessories.

Remote disconnection system
With its remote motorised control, the SIRCO MOT PV can be utilised to provide safety disconnection for firefighters by meeting the remote disconnection requirements of the installation.

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 on load in a safe and easy way.

INOSYS LBS Load Break Switches incorporating tripping function from 160 to 1250 A, up to 1500 VDC

INOSYS LBS are multiple pole load break switches that have been specifically designed for PV applications that require a tripping function. They can be operated manually using the handle or remotely via tripping coils to disconnect part or all of the electrical installation.
They make and break under load conditions and provide safety isolation for any low voltage circuits up to 1500 VDC and are suitable for emergency switching.

To meet the requirements of harsh PV environments, the INOSYS LBS can be easily integrated in any location of the PV installation (combiner box, recombiner box or inverter) and are also particularly suitable for safety applications such as firefighter switches.
It's the right choice for PV and DC distribution applications that require a high reliability and low maintenance trip function through a shunt trip coil or an undervoltage release.

INOSYS 003 A

INOSYS 002 A

IEC

Also available

SIRCO
Load break switches for power distribution
- From 63 to 5000 A.
- Up to 690 VAC - AC23.
- Reliability and performance.
- Simplicity.
- Easy to install.

SIRCO-AC 001 A

ATyS
Remotely operated and automatic transfer switching equipment
- from 125 to 3200 A
- plug & play solution
- manual emergency control
- easy maintenance
- compliant with IEC 60947-6-1 & IEC 60947-3

ATYS-P 001 B

DIRIS
Multifunction meters
- Monitor all electrical parameters of the installation.
- Detects wiring errors.
- Compliant with IEC 61557-12 UL 61010-1.

DIRIS 744 A

IEC UL CSA CE CCC

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