



# SIRCO PV

Disconnect switches for photovoltaic applications  
From 100 to 3200 A, up to 1500 VDC  
UL 98B & IEC 60947-3



# 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.



## SOCOMEK - your **best asset**

### European industrial group

- Created in 1922.
- Over 3000 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

- Almost 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.



# 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.



From 100 to 3200 A up to 1500 VDC.

GAMME 407 A

## Four key applications: the know-how of a specialist

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



Managing power and protecting individuals and property.

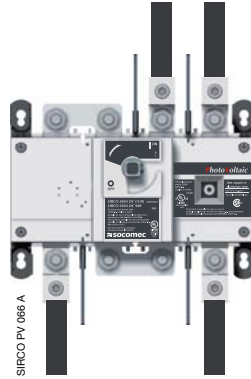
Improving the energy efficiency of buildings and facilities.



Guaranteeing the safety and durability of photovoltaic facilities.

# 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

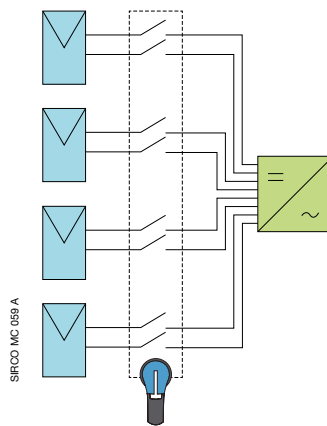
- Limit costs by reducing the number of jumpers per device.
- Gain time by having a less number of jumpers to install.
- Reduce the overall heat dissipation of the switch. A 2 pole SIRCO PV switch takes direct advantage of this, leading to **possibility to use a smaller enclosure.**

## 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.

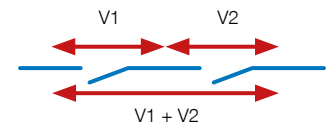


350 A 1000 VDC 4 circuits.

## Achieving 1500 VDC characteristics in a compact footprint

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

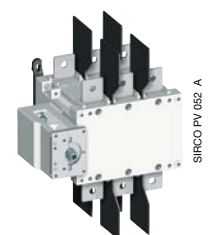
- Each pole of a switch has a maximum voltage breaking capacity. To break a high DC voltage it is necessary to connect poles in series. The global on-load breaking capacity of a switch is determined by multiplying the max voltage breaking capacity per pole by the number of poles in series.



- Paralleling the poles on our double-stack design permits a higher current rating to be achieved.



400 A 1500 VDC



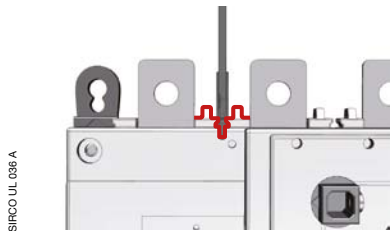
800 A 1500 VDC with a 400 A double stack switch.

# Benefit from the experience of a world leader in industrial switching

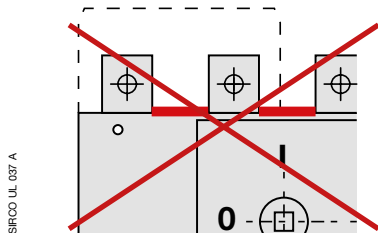
PV applications are one of the most stringent for disconnect switches. Extreme fluctuations in temperature, condensation, dust, UV exposure and oversized connection cables stress components. Our SIRCO range has been adapted to exceed industry standards and current solutions fully take into account the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



SIRCO UL 0316 A  
SOCOMEC design with 53 mm creepage distance over surface. This is true externally as well as internally.



SIRCO UL 0317 A  
Other manufacturers concept as 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.

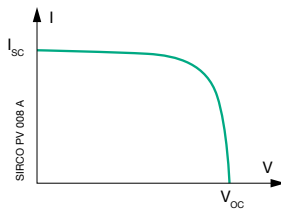
## Global approvals

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.



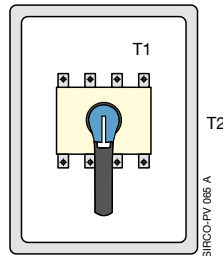
Current (I)/Voltage (V) curve of a PV system. When the current decreases (in the evening or when cloudy) the voltage may increase. SC = Short-circuit, OC = Open-circuit

## 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**

## The 5th largest European power laboratory

Since 1965, the Pierre Siat test laboratory has used its expertise to guarantee the reliability and compliance of SOCOMEC products and solutions.

This totally independent laboratory is recognised by the major certification bodies worldwide: member of UL, CSA and KEMA. It also works in partnership with numerous international certification organisations (CEBEC, ASTA, Lloyd's, Bureau Veritas, GOST-R, etc.). The quality and safety requirements specific to each country are therefore fully taken into account.

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



CORPO 346 A

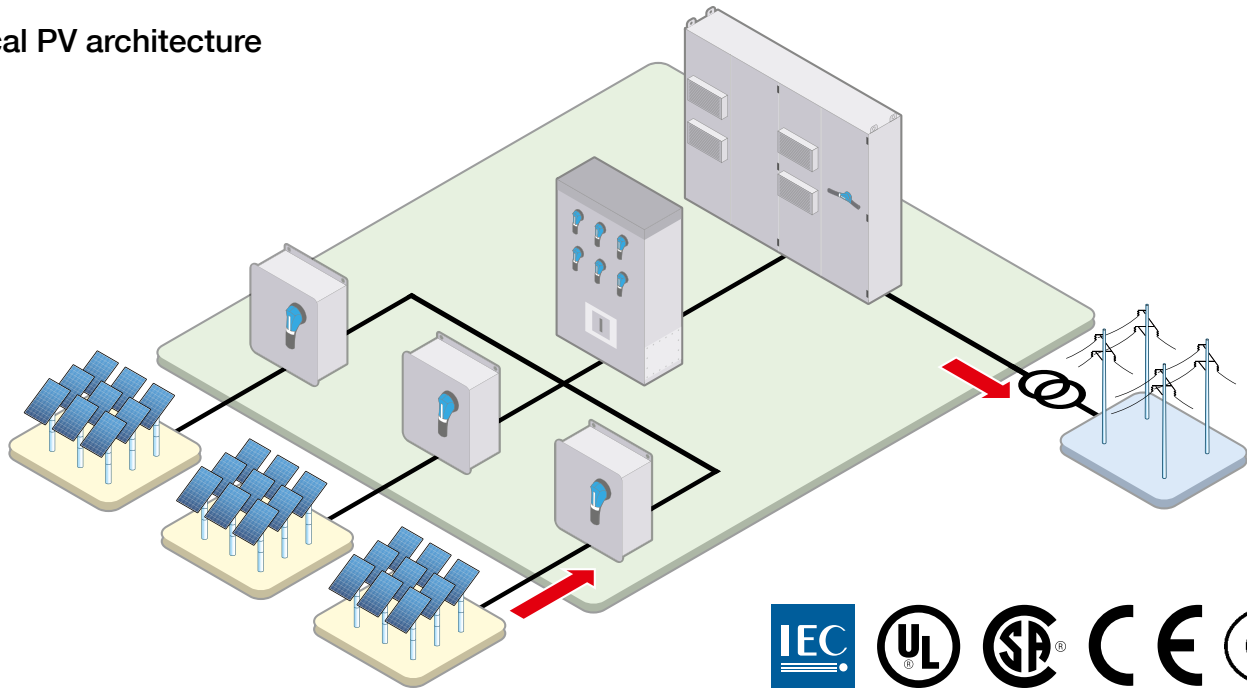


CORPO 346 A

# ... for all your PV applications

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

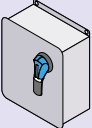

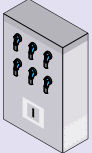
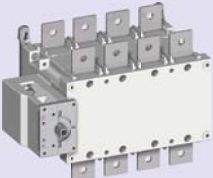
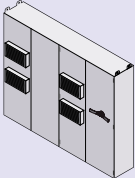
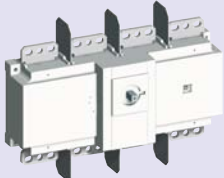
## Typical PV architecture



SIRCO-PV 054 A

























## SOCOMEK solutions

LEVEL OF INSTALLATION	SOCOMEK SOLUTIONS
<p>Combiner box</p> 	 <p>SIRCO PV One circuit 100 to 400 A up to 1500 VDC</p>
<p>Recombiner box</p> 	 <p>SIRCO PV 4 circuits 100 to 400 A at 1000 VDC 2 circuits 100 to 400 A at 1500 VDC</p>
<p>Inverter</p> 	 <p>SIRCO PV One circuit 100 to 2000 A at 1000 VDC 100 to 2000 A at 1500 VDC</p>

# The widest range on the market

Which standard?

		100 A		160 A		250 A		315 A	
1 circuit	up to 1000 VDC	26PV 2010  2P <sup>(2)</sup>	B4	26PV 2016  2P <sup>(2)</sup>	B4	26PV 2025  2P <sup>(2)</sup>	B4	26PV 2031  2P <sup>(2)</sup>	B4
	1500 VDC					27PV 3026  3P <sup>(2)</sup>	275 A	B5	27PV 3032  B5
2 circuits	up to 1000 VDC	26PV 5010  2P <sup>(2)</sup>	B4ds	26PV 5016  2P <sup>(2)</sup>	B4ds	26PV 5025  2P <sup>(2)</sup>	B4ds	26PV 5031  2P <sup>(2)</sup>	B4ds
	1500 VDC					27PV 6026  3P <sup>(2)</sup>	275 A	B5ds	

		100 A		200 A		250 A		325 A	
1 circuit	up to 1000 VDC	27PV 2009  2P <sup>(2)</sup>	B4	27PV 2019  2P <sup>(2)</sup>	B4	27PV 2024  2P <sup>(2)</sup>	B4	27PV 2032  2P <sup>(2)</sup>	B5
	1500 VDC <sup>(1)</sup>					27PV 3026  3P <sup>(2)</sup>	275 A	B5	27PV 3032  3P <sup>(2)</sup>
2 circuits	up to 1000 VDC	27PV 5009  2P <sup>(2)</sup>	B4ds	27PV 5024  2P <sup>(2)</sup>	B4ds	27PV 4032  2P <sup>(2)</sup>			B5
	1500 VDC <sup>(1)</sup>					27PV 6026  3P <sup>(2)</sup>	275 A	B5ds	27PV 6032  3P <sup>(2)</sup>

**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 <sup>(2)</sup>		4P <sup>(2)</sup>		4P <sup>(2)</sup>		4P <sup>(2)</sup>		4P <sup>(2)</sup>		4P <sup>(2)</sup>
27PV 3032	B5	27PV 3039	B5	26PV 8063	B5 <sub>DS</sub>	26PV 8080	B6 <sub>DS</sub>	26PV 8120	B6 <sub>DS</sub>	26PV 8200	B7 <sub>DS</sub>
	3P <sup>(2)</sup>		3P <sup>(2)</sup>		8P <sup>(2)</sup>		8P <sup>(2)</sup>		8P <sup>(2)</sup>		8P <sup>(2)</sup>
27PV 4032	B5	27PV 4039	B5	26PV 8063	B5 <sub>DS</sub>	26PV 8080	B6 <sub>DS</sub>	26PV 8120	B6 <sub>DS</sub>	26PV 8200	B7 <sub>DS</sub>
	2P <sup>(2)</sup>		2P <sup>(2)</sup>		4P <sup>(2)</sup>		4P <sup>(2)</sup>		4P <sup>(2)</sup>		4P <sup>(2)</sup>
27PV 6032	B5 <sub>DS</sub>	27PV 6039	B5 <sub>DS</sub>								
	3P <sup>(2)</sup>		3P <sup>(2)</sup>								

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 <sup>(2)</sup>		4P <sup>(2)</sup>		4P <sup>(2)</sup>		4P <sup>(2)</sup>		8P <sup>(2)</sup>
27PV 3039	B5	27PV 8060	B6 <sub>DS</sub>	27DC 8081	B7 <sub>DS</sub>	27DC 8101 1000 A	B7 <sub>DS</sub>		
	3P <sup>(2)</sup>		8P <sup>(2)</sup>		8P <sup>(2)</sup>		8P <sup>(2)</sup>		
27PV 4039	B5	27PV 8060	B6 <sub>DS</sub>	27DC 8081	B7 <sub>DS</sub>	27DC 8101 1000 A	B7 <sub>DS</sub>		
	2P <sup>(2)</sup>		4P <sup>(2)</sup>		4P <sup>(2)</sup>		4P <sup>(2)</sup>		
27PV 6039 350 A	B5 <sub>DS</sub>								
	3P <sup>(2)</sup>								

# 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.

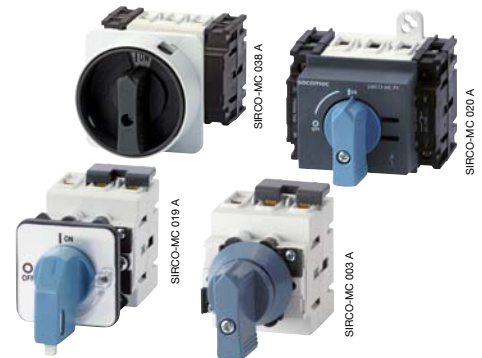
### Easy mouting

Three mounting possibilities are available for optimum 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 2000 A - up to 1500 VDC

### Main characteristics

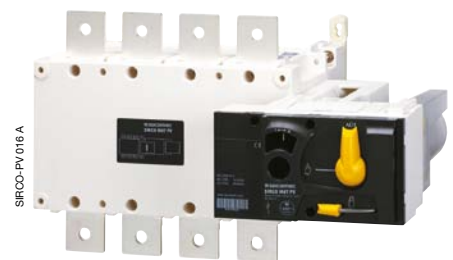
- Up to 1500 VDC.
- 2 stable positions (I, 0).
- AUTO/MANU selector.
- Padlocking in 0 position.
- Full range of accessories.

### 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.



## SIRCO PV PA tripping from 100 A up to 800 A – 1000 VDC

SIRCO PV PA (Pneumatic Actuator) are PV switch disconnectors actuated by a pneumatic cylinder. Specially designed for roof-mounted PV installations, they ensure safe on-load breaking and making to provide safe isolation of PV circuits. Actuator can be activated with a compressed air cartridge or a compressed air network. The pneumatic power supply systems for safety are recognized and recommended by firefighters. This system operates in the same way as smoke extraction systems.

SOCOMECS is the first company to provide PV switch disconnectors and pneumatic actuators that are fully compliant with UTE C 15 712-1/-2 guide issued on 10/09/2012 and NF S 61-937 standard issued on 12/1990.



### Also available

#### SIRCO

Load break switches for power distribution

- From 125 to 5000 A.
- Up to 690 VAC - AC23.
- Reliability and performance.
- Simplicity.
- Easy to install.



#### FUSERBLOC

Industrial fuse combination switches

- From 20 to 1250 A.
- Up to 690 VAC.
- Improved safety.
- High breaking capacity.
- SCCR 100 kA.



#### DIRIS

Multifunction meters

- Monitor all electrical parameters of the installation.
- Compliant with UL 61010-1.
- Detects wiring errors.



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## YOUR DISTRIBUTOR

