

Photovoltaic Switch 750 V d.c. and 1000 V d.c. from 100 to 800 A

➲ Function

SIRCO PV are manually operated multipolar load break switches.
They break on and off load and provide safety isolation for any low voltage circuit of photovoltaic applications.

➲ General characteristics

- Patented switching technology.
- Fully visualised breaking.
- DIN rail or panel mounting.
- Up to 1000 V d.c.

➲ What you need to know

A solar electrical installation is an application that requires switching devices 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}) modules.

To date, due to the absence of standard switchgear for PV installation, the manufacturer can only refer to IEC 60-947 and expressed his job categories depending on the type of loads and overloads of normal.

The load duty category DC21 defined withstand the device up to 1.5 times rated current of the installation with a time constant L/R 1ms, which is well above the requirements of IEC 60364-7-712 and the PV need on the basis of these criteria.

Against, the manufacturer has the responsibility to propose, according his expertise, devices whose performance respond to the specific needs identified and not necessarily standardized, because of the recent emergence of these applications.

➲ Available on request

- Other rating: consult us.
- Enclosed devices : consult us.

➲ Conformity to standards

- IEC 60947-3
- EN 60947-3
- VDE 0660-107 (1992)
- IEC 60364-4-410 (They provide safety disconnection and protection against overcurrents)
- IEC 60364-7-712 (Buildings electrical installations - Part 7-712: rules for special locations - Solar photovoltaic power supplies (PV)

➲ References

Front operation

Voltage (V d.c.)	Rating (A)	No. of poles	Switch body	Direct handle	External handle	Shaft for external handle	Auxiliary contacts	Bridging bars
750 V d.c.	100 A	3 P	26PV **3010**	Black 2699 **5052**(1) Red 2699 **5053**	Type S2 Black IP55 1421 **2111**(1) Black IP65 1423 **2111** Red IP65 1424 **2111**	200 mm 1400 **1020** 320 mm 1400 **1032**(1) 500 mm 1400 **1050**	1st contact NO/NC 2699 **0031** 2nd contact NO/NC 2699 **0032**	2609 **0025**
	125 A		26PV **3012**					
	160 A		26PV **3016**					
	200 A		26PV **3020**					
	250 A		26PV **3025**					
	315 A		26PV **3031**					
	400 A		26PV **3040**					2609 **2050**
	500 A		26PV **3050**					
	630 A		26PV **3063**					2609 **0080**
	800 A		26PV **3080**					
1000 V d.c.	100 A	4 P	26PV **4010**					2609 **2025**
	125 A		26PV **4012**					
	160 A		26PV **4016**					
	200 A		26PV **4020**					
	250 A		26PV **4025**					
	315 A		26PV **4031**					
	400 A		26PV **4040**					2609 **4050**
	500 A		26PV **4050**					
	630 A		26PV **4063**					2609 **2080**
	800 A		26PV **4080**					

(1) Standard.

➲ Accessories

Direct operation handle


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Direct handle

Rating (A)	Handle color	Reference(1)
100 … 800	Black	2699 **5052**(2)
100 … 800	Red	2699 **5053**

(1) IP: Degree of protection according to standard IEC 60529.
(2) Standard.

External operation handle


acces_150_a_1_cat

S2 type handle

Use
The door interlocked external operation handle includes a padlockable handle, an escutcheon and must be utilised with an extensions shaft.
In a combiner box, located close to the solar cell strings, or located close to the inverter, we recommand the use of a door interlocked external handle for its safety features.

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 with the use of a tool (authorized persons only).
The locking function is restored when the door is closed back.

Front operation

Rating (A)	Handle	Handle color	External IP(1)	Reference
100 … 800	S2 type	Black	IP55	1421 **2111**(2)
100 … 800	S2 type	Black	IP65	1423 **2111**
100 … 800	S2 type	Red	IP65	1424 **2111**

(1) IP: Degree of protection according to standard IEC 60529.
(2) Standard.

Shaft guide for external operation


acces_260_a_2_cat

Use
To guide the detachable external control shaft in the handle.
This accessory enables handle to engage extension shaft with a misalignment of up to 15 mm.
Required for a shaft lenght over 320 mm.

Description	Reference(1)
Shaft guide	1429 **0000**

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

S type handle adapter


acces_187_a_1_cat

Use
Enables new S type handles to be mounted using old fixing holes for replacement or retrofit applications.

Dimensions
Adds 12 mm to the depth.

Handle color	External IP [1]	To be ordered in multiples of	Reference[1]
Black	IP65	10	1493 **0000**

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

Alternative S type handle cover colours


acces_198_a_1_cat

Use
For single lever handles type S1, S2.
Other colours: consult us.

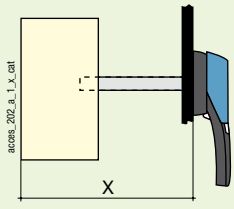
Handle color	To be ordered in multiples of	Handle	Reference[1]
Light grey	50	Type S1, S2	1401 **0001**
Dark grey	50	Type S1, S2	1401 **0011**

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

Shaft for external handle


acces_143_b_1_cat

Shaft for SIRCO PV 100 ... 800 A



Use
Standard lengths:
- 200 mm
- 250 mm
- 320 mm
- 500 mm
- 750 mm

Other lengths: consult us.

For 3/4 pole

Rating (A)	Dimension X (mm)	Shaft length (mm)	Reference
100 ... 800	135 ... 265	200 mm	1400 **1020**
100 ... 800	135 ... 315	250 mm	1400 **1025**
100 ... 800	135 ... 385	320 mm	1400 **1032**
100 ... 800	135 ... 565	500 mm	1400 **1050**
100 ... 800	135 ... 880	750 mm	1400 **1075**

Auxiliary contacts


acces_076_a_1_cat

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 AC: IP2 with front operation.

Connection to the control circuit
By 6.35 mm fast-on terminal.

Electrical characteristics
30 000 operations.

References

NO/NC contact for 3/4 poles

Rating (A)	Position AC	Reference
100 … 800	1st	2699 **0031**
100 … 800	2nd	2699 **0032**

NO+NC contact for 3/4 pole

Rating (A)	Position AC	Reference
100 … 800	1st	2699 **0141**
100 … 800	2nd	2699 **0142**

Low level NO/NC contact for 3/4 pole

Rating (A)	Position AC	Reference
100 … 800	1st	2699 **0301**
100 … 800	2nd	2699 **0302**

Characteristics according to IEC 60947-5-1

Rating (A)	Contact type	Current nominal (A)	Operating current I_e (A) 230 V a.c. AC-12	AC-13/15	400 V a.c. AC-12	AC-13/15	24 V d.c. DC-12	DC-13	DC-14	48 V d.c. DC-12	DC-13	DC-14
100 … 800	NO/NC	16	16	4	12	3	2.5	2.5	1	2.5	1.2	0.2
100 … 800	NO + NC	16	16	4	16	3	16	5	1	2.5	1.2	0.2

Door mounting kit

Use
This kit allows easy door mounting for the SIRCO PV range.

For 3/4 pôles direct front operation

Rating (A)	No. of poles	Reference
100 ... 500	3 P	2699 **3420**
100 ... 500	4 P	2699 **4420**

Terminal shrouds


acces_077_a_1_cat

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

Advantage
Perforations allowing remote thermographic inspection without removal. The terminal shrouds also provide phase separation for SIRCOs PV from 100 to 800 A.

For 3/4 pole

Rating (A)	No. of poles	Position	Reference
100 ... 500	3 P	top / bottom	2694 **3021**
100 ... 500	4 P	top / bottom	2694 **4021**
630 ... 800	3 P	top / bottom	2694 **3051**
630 ... 800	4 P	top / bottom	2694 **4051**

Terminal screens


acces_079_a_1_cat

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

For 3/4 pole

Rating (A)	No. of poles	Position	Reference
100 ... 500	3 P	top / bottom	2698 **3020**
100 ... 500	4 P	top / bottom	2698 **4020**
630 ... 800	3 P	top / bottom	2698 **3050**
630 ... 800	4 P	top / bottom	2698 **4050**

Inter phase barrier


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Use
Safety isolating separation between the terminals.
For 100 to 800 A Photovoltaic SIRCO, the inter phase barriers allow insulation between pole connected in series.

Rating (A)	No. of poles	Reference
100 ... 500	3 P	2998 **0023**
100 ... 500	4 P	2998 **0024**
630 ... 800	3 P	2998 **0013**
630 ... 800	4 P	2998 **0014**

Bridging bars for connecting pole in series

Use
The bridging bars will make easy the connection of the pole in series, allowing the following configurations:
- Bottom / Bottom
- Top / Top
- Top / Bottom
- Bottom / Top

Connection diagrams: see poles connections in serie, page 21.

Rating (A)	Pack	Number of poles of the device in series	Reference
125 ... 315	1 piece	2	2609 **0025**
125 ... 315	2 pieces	4	2609 **2025**
400 ... 500	2 pieces	2	2609 **2050**
400 ... 500	4 pieces	4	2609 **4050**
630 ... 800	1 piece	2	2609 **0080**
630 ... 800	2 pieces	4	2609 **2080**

Handle key interlocking accessories

Fig.1

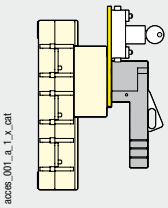
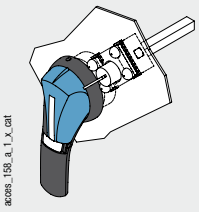

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Fig. 3


acces_158_a_1_x_cat

Use
Locking in position 0 of the front operation handle prior to any intervention on the photovoltaic installation:
- using a lock (not supplied) and the factory integrated padlocking function of the handle. From 100 to 800 A, the padlock on the external front operation handle will also lock the door,
- using padlock (not supplied): see diagrams opposite,
- using undervoltage coil: the SIRCO PV can only be switched in position "OFF" when the coil is supplied.

Locking using RONIS EL11AP lock (not supplied)

Rating (A)	No. of poles	Operation	Figure	Reference
100 … 800	3/4 P	front direct	1	2699 **6008**(1)
100 … 800	3/4 P	external front	3	1499 **7701**

(1) Front handle operation included.

Locking using 230 V a.c. Undervoltage coil (other voltages: please consult us)

Rating (A)	No. of poles	Operation	Reference
100 … 800	3/4 P	external front	2699 **9063**(1)

(1) The locking system is directly mounted on the device.

Customised solutions



coff_377_a_1_cat


coff_376_a_1_cat

When they are not mounted in empty enclosures, load break switches, changeover switches or fuse combination switches are generally delivered under enclosed. Near the installation, they guarantee:

- Disconnection under PV load between the inverters and PV generators (necessary according to the IEC 60364-712 standard).

For local safety disconnection, SOCOMEC - a leader on the market - offers the widest range of enclosed switches. Whatever the level of safety is, we are able to meet all your requirements (disconnection, switching for mechanical maintenance, emergency breaking).

Enclosed PV load break switches
Enclosed PV fuse combination switches
Enclosed PV changeover switches
Complete integrated equipment.

Available on request:
- Enclosures made of steel or stainless steel sheet metal (painted for sea environments or brushed), insulating materiels
- Specific colours (enclosure paint, handle).
- Specific dimensions
- Specific connections: speed connectors of class II

For any request of customised products, please consult us

Other specific accessories


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- 1 Mechanical coupling system to get mutipolar switches of the same or different ratings.
- Mechanical interlocking device.

➲ Characteristics according to IEC 60947-3

100 to 800 A

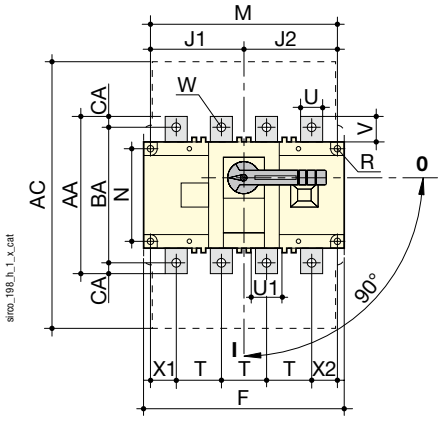
Thermal current I_{th} (40°C)				100 A	125 A	160 A	200 A	250 A	315 A	400 A	500 A	630 A	800 A
Rated insulation voltage U_i (V)				1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
Rated impulse withstand voltage U_{imp} (kV)				12(1)	12(1)	12(1)	12(1)	12(1)	12(1)	12(1)	12(1)	12	12
Rated operational currents Ie (A)													
Rated voltage	Load duty category	No. of poles	Number of pole in series per polarity	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
750 V d.c.	DC-21 B	3 P	2 P + and 1 P -	100	125	160	200	250	315	400	500	630	800
1 000 V d.c.	DC-21 B	4 P	2 P + and 2 P -	100	125	160	200	250	315	400	500	630	800
Connection													
Maximum Cu cable section (mm^2)				50	50	95	95	120	185	240	2 x 150	2 x 185	2 x 240
Maximum Cu busbar width (mm)				32	32	32	32	32	32	32	32	40	50
Tightening torque min (Nm)				20	20	20	20	20	20	20	20	40	40
Tightening torque max (Nm)				26	26	26	26	26	26	26		45	45
Mechanical characteristics													
Durability (number of operating cycles)				10 000	10 000	10 000	10 000	10 000	10 000	5 000	5 000	5 000	5 000
Operating effort (Nm)				10	10	10	10	10	10	10	10	14.5	14.5
Weight of a 3 pole device (kg)				2	2	2	2	2	2	2	2	3.5	3.5
Weight of a 4 pole device (kg)				2	2	2	2	2	2	2	2	4	4

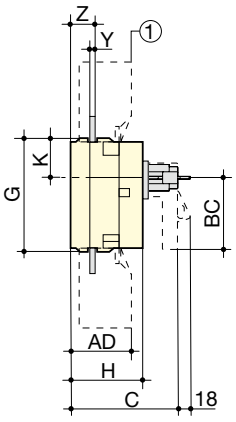
(1) The delivered spacers have to be installed

Dimensions

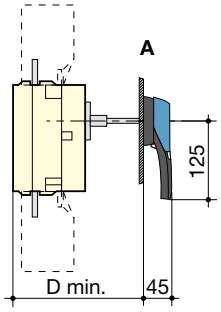
SIRCO PV 100 to 800 A

Direct front operation





External front operation



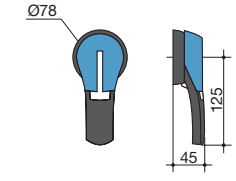
1. Terminal shrouds
A. S2 type handle

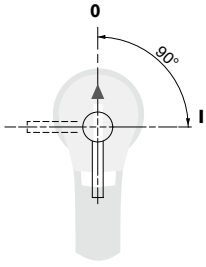
Rating	Overall dimensions		Terminal shrouds		Switch body									Switch mounting				Connection												
	C	D	AC	AD	F	F	G	H	J1	J1	J2	K	BC	M	M	N	R	T	U	U1:	V	W	X1	X1	X2	Y	Z	AA	BA	AC
(A)		min			3p.	4p.			3p.	4p.				3p.	4p.								3p.	4p.						
100	125	135	280	60	180	230	108	75	55	105	105	34	115	160	210	80	5.5	50	25	25.5	30	11	33	33	27	3.5	22.5	160	130	15
125	125	135	280	60	180	230	108	75	55	105	105	34	115	160	210	80	5.5	50	25	25.5	30	11	33	33	27	3.5	22.5	160	130	15
160	125	135	280	60	180	230	108	75	55	105	105	34	115	160	210	80	5.5	50	25	25.5	30	11	33	33	27	3.5	22.5	160	130	15
200	125	135	280	60	180	230	108	75	55	105	105	34	115	160	210	80	5.5	50	25	25.5	30	11	33	33	27	3.5	22.5	160	130	15
250	125	135	280	60	180	230	108	75	55	105	105	34	115	160	210	80	5.5	50	25	25.5	30	11	33	33	27	3.5	22.5	160	130	15
315	125	135	280	60	180	230	108	75	55	105	105	34	115	160	210	80	5.5	50	35	25.5	30	11	33	33	27	3.5	22.5	160	130	15
400	125	135	280	60	180	230	108	75	55	105	105	34	115	160	210	80	5.5	50	35	25.5	30	11	33	33	27	3.5	22.5	160	130	15
500	125	135	280	60	180	230	108	75	55	105	105	34	115	160	210	80	5.5	50	35	25.5	30	11	33	33	27	3.5	22.5	160	130	15
630	160	165	400	89	230	290	170	110	75	135	135	55	115	210	270	140	7	65	45	45.5	50	13	42.5	37.5	37.5	5	36	260	220	20
800	160	165	400	89	230	290	170	110	75	135	135	55	115	210	270	140	7	65	45	45.5	50	13	42.5	37.5	37.5	5	36	260	220	20

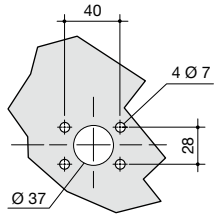
Dimensions for external handles

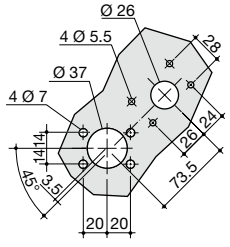
SIRCO PV 100 to 800 A

Handle type	Front operation Direction of operation	Door drilling template
S2 type	0 … 90° … I	With lock RONIS EL11AP



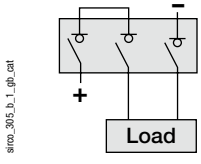




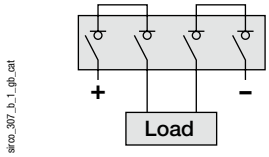


See poles connections in serie (1)

3 poles - bottom / top



4 poles - bottom / bottom



(1) Other connections: refer to mounting instructions.