

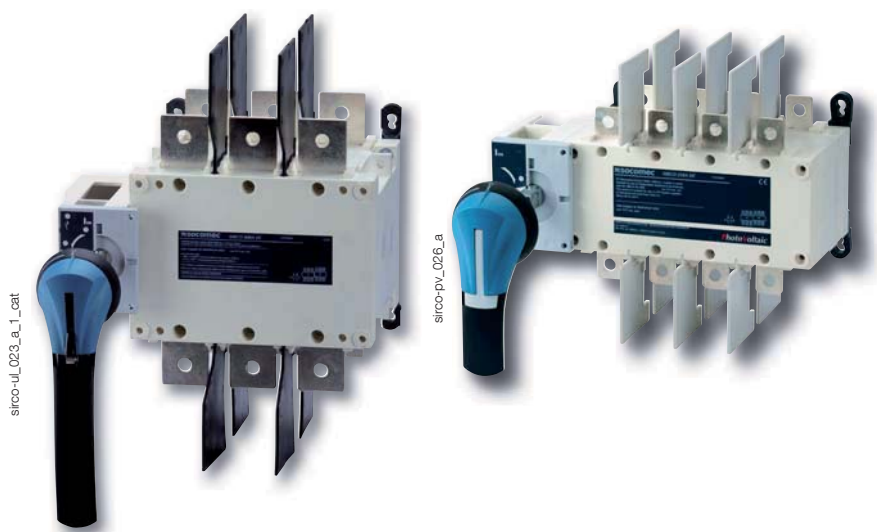


SIRCO DC

Double Stacker UL98B

Load break switches for solar applications

Load break switches



Strong points

- > Patented switching technology.
- > Positive break indication.
- > Up to 1500 VDC
- > Suitable for use in accordance with NEC Art 690 edition 2011.

Conformity to standards

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



Function

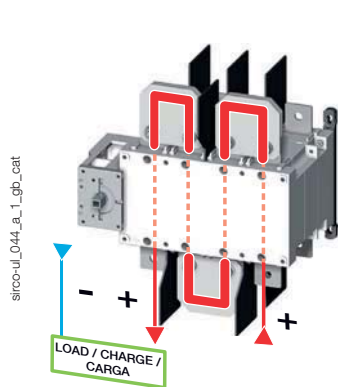
It is possible to operate on load two switches with one handle.
 Space saving: the overall footprint is similar to the footprint of a standard 3 or 4 pole device. Thus providing significant space saving opportunities within the overall assembly and specifically compared to using separate switches.

Easier connection and integration.
 Higher voltage: by connecting the two switches in series it is possible to switch on load higher voltage than 1000 VDC.
 Double the rating: by connecting the two switches in parallel on the outgoing side.

General characteristics

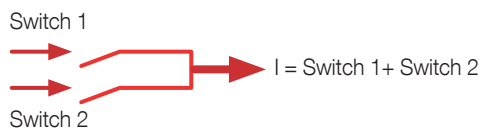
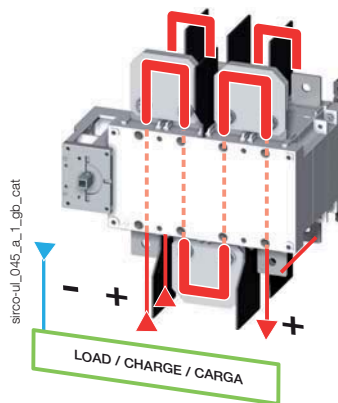
- Patented switching technology.
- Positive break indication.
- Up to 1000 VDC according to UL98B/CSA C22.2#4.
- Suitable for use in accordance with NEC Art 690 edition 2011.
- Up to 1500VDC according to IEC 60947-3.

1 handle to disconnect 2 networks



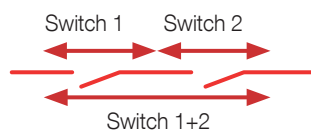
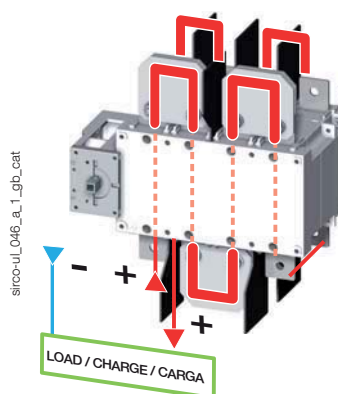
- The double stack disconnect from SOCOMEC interlocks mechanically 2 disconnects 3 or 4 poles. With one handle the user can operate on load both disconnects synchronously.
- Each disconnect are fully rated.
- Disconnect two 600VDC networks on load with a 6 poles double stacked disconnect or two 1000VDC networks with a 8 poles.
- Perfect product for BIPOLAR SYSTEMS. The user can disconnect on the same device two legs with opposite polarities.
+/- 600VDC on a 6 poles disconnect to get a 1200VDC bipolar network.
+/- 1000VDC on a 8 poles disconnect to get a 2000VDC bipolar network.

Paralleling the outputs on the disconnect to double the current rating



- As both disconnects are operating synchronously the user can link the output of each device.
- Following the Kirchhoff's law "At any node (junction) in an electrical circuit, the sum of currents flowing into that node is equal to the sum of currents flowing out of that node" or in our case $I_{switch1} + I_{switch2} = I_{output}$.
- As an example a user could disconnect 800 A with a double 400 A.
- This solution really reduces the footprint of the disconnect.

Wire more poles in series to increase the voltage



- Following the second Kirchhoff's law "The principle of conservation of energy implies that the directed sum of the electrical potential differences (voltage) around any closed network is zero".
- On the schematic above this would mean that $V_{switch1} + V_{switch2} = V_{total}$.
- And this implies that more poles are in series, higher is the achievable voltage.
- Following this principle SOCOMEC created a disconnect with 8 poles in series which allows the user to disconnect ON LOAD 1500 VDC.
- As voltages higher than 1000 VDC are not recognized by UL, SOCOMEC self certified this configuration in its laboratory in France.

References

6 & 8 poles switches

Rating (A)	Max Number of circuits	Max Breaking Voltage (VDC)	No. of poles	Switch body	External handle	Shaft for external handle	Jumpers for connecting poles in series
100 A Frame 2x4	2	2 x 600 VDC	6 P	27DC 6011	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	1 piece 2709 0021 (100 to 200 A)
	2	2 x 1000 VDC or 1x 1500 VDC	8 P	27DC 8011			
250 A Frame 2x4	2	2 x 600 VDC	6 P	27DC 6021	S3 type Black 4, 4X 143D 3111 ⁽¹⁾ Red/Yellow 4, 4X 143E 3111 ⁽¹⁾	320 mm 12.6 inches 1400 1032	2 pieces 2 x 2709 0021 (250 A)
	2	2 x 1000 VDC or 1x 1500 VDC	8 P	27DC 8021			
400 A Frame 2x5	2	2 x 600 VDC	6 P	27DC 6041	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	1 piece 2709 0041
	2	2 x 1000 VDC or 1x 1500 VDC	8 P	27DC 8041			
600 A Frame 2x6	2	2 x 600 VDC	6 P	27PV 6060	V1 type Black 1,3R,12 2799 7145	320 mm 12.6 inches 4199 3018	1 piece 2709 0061
	2	2 x 1000 VDC or 1x 1500 VDC	8 P	27PV 6060			
800 A Frame 2x7	2	2 x 750 VDC	6 P	27DC 6080	V1 type Black 1,3R,12 2799 7145	320 mm 12.6 inches 4199 3018	1 piece 2709 0081
	2	2 x 1000 VDC or 1x 1500 VDC	8 P	27DC 8080			
1000 A Frame 2x7	2	2 x 750 VDC	6 P	27DC 6100	V1 type Black 1,3R,12 2799 7145	320 mm 12.6 inches 4199 3018	1 piece 2709 0121
	2	2 x 1000 VDC or 1x 1500 VDC	8 P	27DC 8100			

(1) Defeatable handle.

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

Accessories

S type handle Raiser

Use

S type handle raiser.
Handle raiser for S1 to S4 handles.

Dimensions

Adds 12 mm to the depth.

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



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Accessories

External handle

Use

The interlocking function of the front external handle prevents the user from opening the door of the enclosure when the switch is in the "ON" position (if the handle is door mounted S-type handles only).

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 interlocking function is restored when the door is closed back.

Front operation I - 0, 6/8 poles

Rating (A)	Handle	Handle colour	Nema degree of protection	Reference
100 ... 250	S2 type	Black	1, 3R, 12	142F 2111 ⁽¹⁾
100 ... 250	S2 type	Red/Yellow	1, 3R, 12	142G 2111 ⁽¹⁾
100 ... 250	S2 type	Black	4, 4X	142D 2111 ⁽¹⁾
100 ... 250	S2 type	Red/Yellow	4, 4X	142E 2111 ⁽¹⁾
400	S3 type	Black	4, 4X	143D 3111 ⁽¹⁾
400	S3 type	Red/Yellow	4, 4X	143E 3111 ⁽¹⁾
600 ... 1000	S5 type	Black	1, 3R, 12	145F 8113 ⁽¹⁾
600 ... 1000	V1 type	Black	1, 3R, 12	2799 7145 ⁽¹⁾

(1) Defeatable handle.

Front operation I - 0 heavy duty, 6/8 poles

Rating (A)	Handle	Handle colour	Nema degree of protection	Reference
100 ... 250	S2 type	Black	4, 4X	142D 2911 ⁽¹⁾⁽²⁾
100 ... 250	S2 type	Red/Yellow	4, 4X	142E 2911 ⁽¹⁾⁽²⁾
400	S3 type	Black	4, 4X	143D 3911 ⁽¹⁾⁽²⁾
400	S3 type	Red/Yellow	4, 4X	143E 3911 ⁽¹⁾⁽²⁾
600 ... 1000	V1 type	Black	1, 3R, 12	2799 7145 ⁽¹⁾

(1) Locking bracket in metal.

(2) Defeatable handle.



Alternative colour S-type handle cover

Use

For handles S1 to S4.

Other colours: Please, consult us.

Handle colour	Handle	To be ordered by multiples of	Reference
Light grey	S1 to S3 type	50	1401 0001
Dark grey	S1 to S3 type	50	1401 0011
Light grey	S4 type	50	1401 0031
Dark grey	S4 type	50	1401 0041



Shaft for external handle

Use

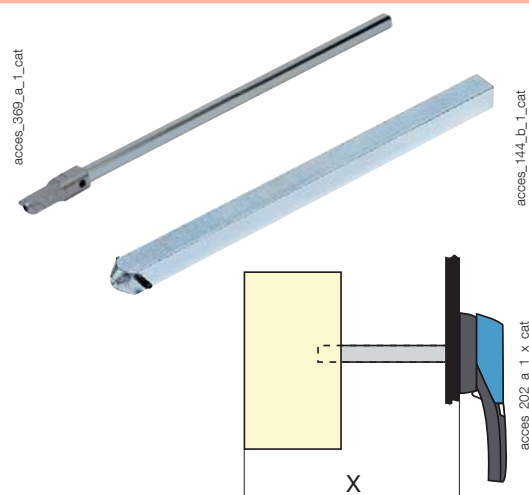
Standard lengths:

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

Other lengths: Please, consult us.

For 6/8 poles

Rating (A)	Dimension X (inches)	Dimension X (mm)	Handle	Length (inches)	Length (mm)	Reference
100 ... 200	12 ... 14.3	305 ... 362	S2 type	7.9	200	1400 1020
100 ... 200	12 ... 19	305 ... 482	S2 type	12.6	320	1400 1032
100 ... 200	12 ... 22.1	305 ... 562	S2 type	15.7	400	1400 1040
400	16 ... 18.4	406 ... 467	S3 type	7.9	200	1401 1520
400	16 ... 23.1	406 ... 587	S3 type	12.6	320	1401 1532
400	16 ... 26.3	406 ... 667	S3 type	15.7	400	1401 1540
600 ... 1000	20 ... 28.1	508 ... 714	V1/S5 type	12.6	320	4199 3018
600 ... 1000	20 ... 31.3	508 ... 794	V1/S5 type	15.7	400	4199 3019



Accessories (continued)

Shaft guide for external handle

Use

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



Description	Reference
Shaft guide for S1 to S4 type handles	1429 0000

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.



NO/NC contact for 6/8 poles			
Rating (A)	Position AC	Type	Reference
100 ... 1000		NO/NC	4159 0021

Low level NO/NC contact for 6/8 poles			
Rating (A)	Position AC	Type	Reference
100 ... 1000	1 st contact	NO/NC	4159 0022

Terminal screen

Use

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



For 6/8 poles			
Rating (A)	No. of poles	Position	Reference
100 ... 200	6 P	top and bottom	4158 3021
100 ... 200	8 P	top and bottom	4158 4021
400	6 P	top or bottom	4158 3041 ⁽¹⁾
400	8 P	top or bottom	4158 4041 ⁽¹⁾
600	6 P	top or bottom	1609 3063 ⁽¹⁾
600	8 P	top or bottom	1609 4063 ⁽¹⁾
800 ... 1000	6 P	top or bottom	2798 6120
800 ... 1000	8 P	top or bottom	2798 8120

⁽¹⁾ Please order 2 reference sfor line and load protection.

Terminal lugs

Use

Connection of bare copper cables onto the terminals (without lugs).

Rating max (A)	Type of luge	Number of lugs per terminal	Type of cable	Package	Reference
100 ... 250	1 conductor (#6-300MCM)	1	Cu / Al	2 lugs	3954 2020
100 ... 250	2 conductors (#4-2/0)	1	Cu / Al	2 lugs	3954 2025
400	1 conductor (#2-600MCM)	1	Cu / Al	2 lugs	3954 2040
400	2 conductors (#6-350MCM)	1	Cu / Al	2 lugs	3954 2041
600	2 conductors (#2-600MCM)	1	Cu / Al	2 lugs	3954 2060
800 ... 1200	2 conductors (#2-600MCM)	2 ⁽¹⁾	Cu / Al	2 lugs	3954 2060
800 ... 1200	2 conductors (#2-600MCM)	3 ⁽²⁾	Cu / Al	3 lugs	3954 3060

⁽¹⁾ 2 lugs per terminal with connection kit 2729 1200.

⁽²⁾ 3 lugs per terminal with connection kits 2729 1201 and 2709 1202.



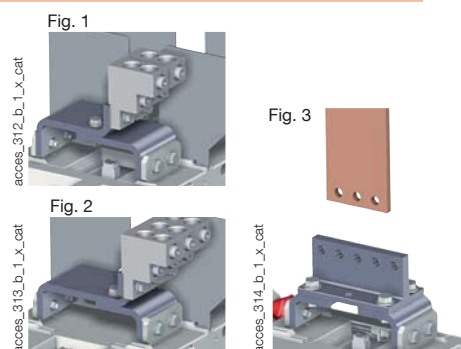
Copper bars connection kits

Use

To allow connection between the two power terminals from a same pole for 800 to 1000 A ratings (Fig. 1, Fig. 2 and Fig. 3).

Top or bottom flat connection			
Rating (A)	Quantity to order per switch	Nb lug capacity	Reference
800...1000 Fig. 1	1	2	2729 1200
800...1000 Fig. 2	1	3	2729 1202

Top or bottom edgewise connection			
Rating (A)	Quantity to order per switch	Nb lug capacity	Reference
800...1000 Fig. 3	1	3	2729 1201



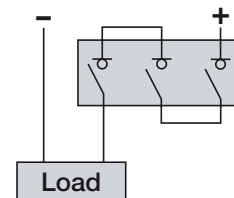
Jumpers for poles in series

Use

The jumpers will make easy the connection of the pole in series, allowing the following configurations⁽¹⁾.

Connection diagrams:

⁽¹⁾ Other connections: refer to mounting instructions.



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Rating (A)	Reference
100 ... 250	2709 0021 ⁽¹⁾
400 reduced design (availability to be confirmed)	2709 0040
400	2709 0041
600	2709 0062
800 ... 1000	2709 0081

⁽¹⁾ For 100 to 200 A: 1 piece per pole in series. For 250 A: 2 pieces per pole in series.

Characteristics

Characteristics according UL98/CSA22.4#4 and UL98B

Rating (A)		100 A	250 A	400 A	600 A	800 A	1000 A
General use rating with 200% overload extra test - UL98B							
Rated voltage	Number of pole in series of the device	(A)	(A)	(A)	(A)	(A)	(A)
600 VDC	3 P	100	250	400	600	800	1000
1000 VDC	4 P	100	250	400	600	800	1000
Short circuit rating at 600 VDC							
Prospective short-circuit current (kA rms)		20	20	20	-	-	-
Type of fuse		A70P100	A70P100	LDC	-	-	-
Associated fuse rating (A)		200	200	400	-	-	-
Short circuit rating at 1000 VDC any breaker							
Prospective short-circuit current (kA rms)		10 ⁽¹⁾	10 ⁽¹⁾	10 ⁽¹⁾	10 ⁽¹⁾	10 ⁽¹⁾	10 ⁽¹⁾
Connection terminals							
Min. connection section / AWG ⁽²⁾		#6	#6	2x #6	2x #2	4x #2	4x #2
Max. connection section / AWG ⁽²⁾		300MCM	300MCM	600MCM	2x 600	6x 600MCM ⁽⁴⁾	6x 600MCM ⁽⁴⁾
Mechanical characteristics							
Durability (number of operating cycles)		10 000	10 000	6 000	6 000	3 500	3 500
Operating torque (lbs.in/Nm)		88.5/10	88.5/10	128.3/14.5	327.5/37	495.7/56	495.7/56
Auxiliary contacts							
Electrical characteristics		A300	A300	A300	A300	A300	A300

⁽¹⁾ 50 ms without fuse.

⁽²⁾ AWG : dimensions of the American cable.

⁽³⁾ Increased endurances: Please consult us.

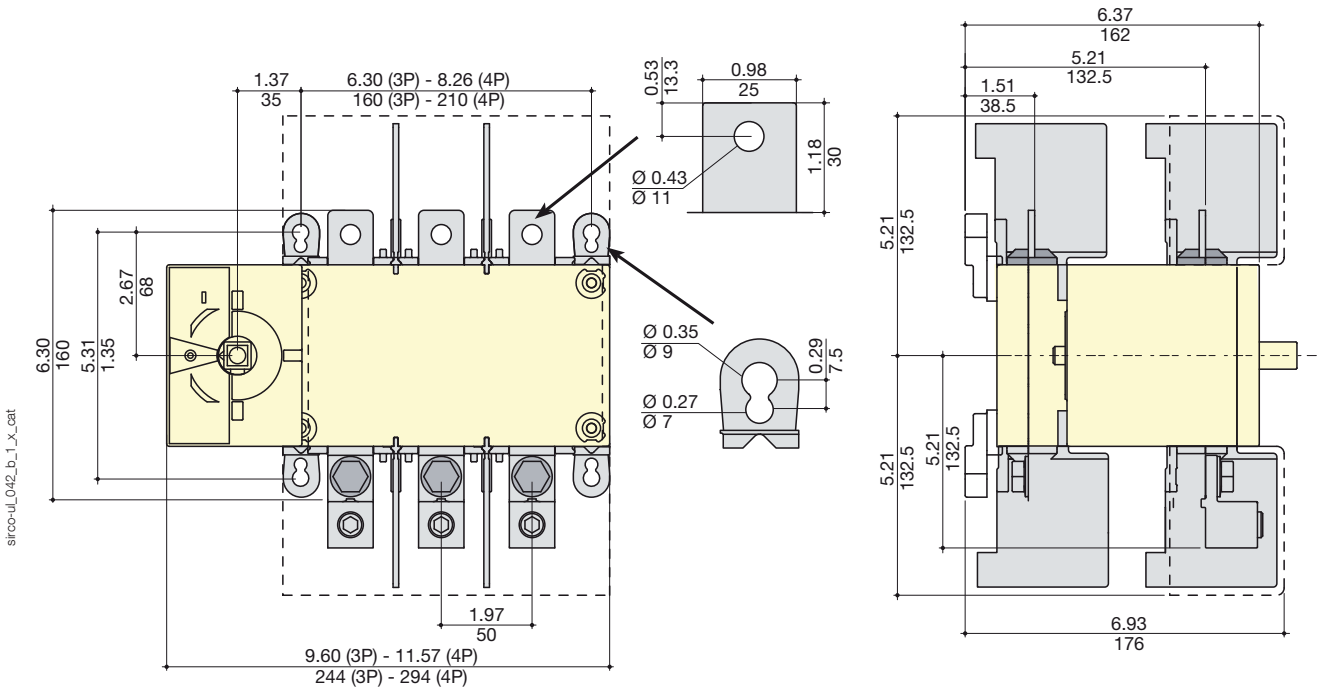
⁽⁴⁾ max 6x 600MCM with spreader 2729 1203.

Characteristics according to IEC 60947-3

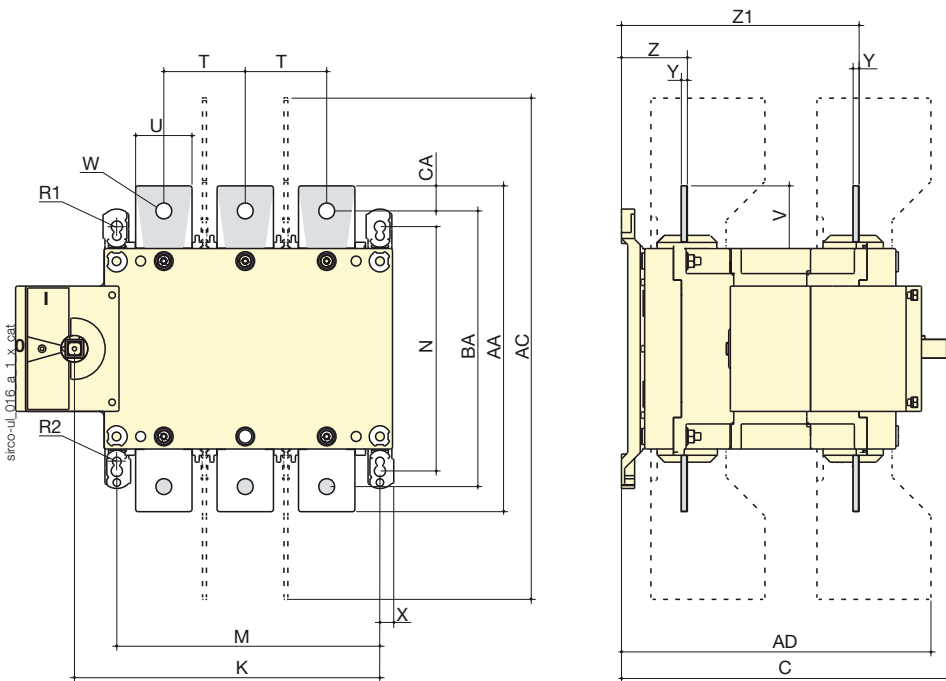
Thermal current I _{th} (40°C)		160 A	250 A	630 A	800 A	1000 A	1200 A
Rated insulation voltage U _i (V)		1 200	1 200	1 200	1 200	1 200	1 200
Rated impulse withstand voltage U _{imp} (kV)		12	12	12	12	12	12
Rated operational currents I _e (A), DC-22 B							
Rated voltage	Number of pole in series of the device	(A)	(A)	(A)	(A)	(A)	(A)
750 VDC	3 P	160	250	630	800	1 000	1 200
1 000 VDC	4 P	160	250	630	800	1 000	1 200
1 500 VDC	8 P	100	250	400	600	800	1000

Dimensions (in / mm)

100 to 250 A



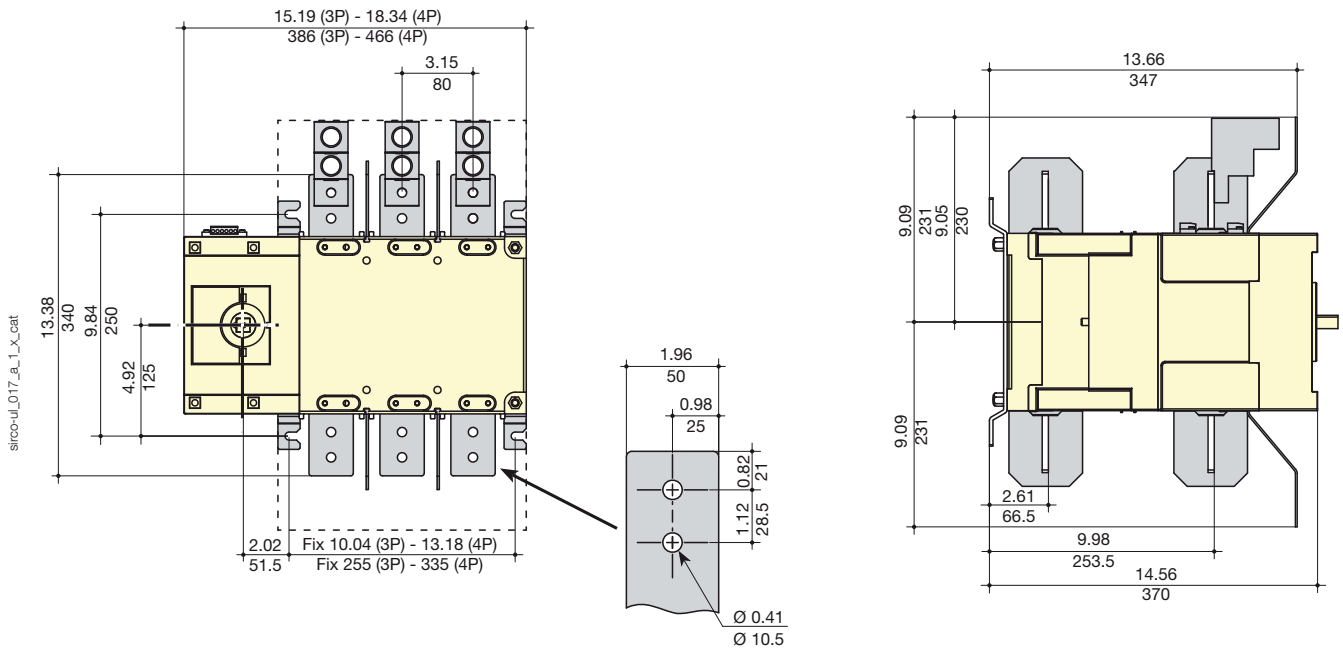
400 A



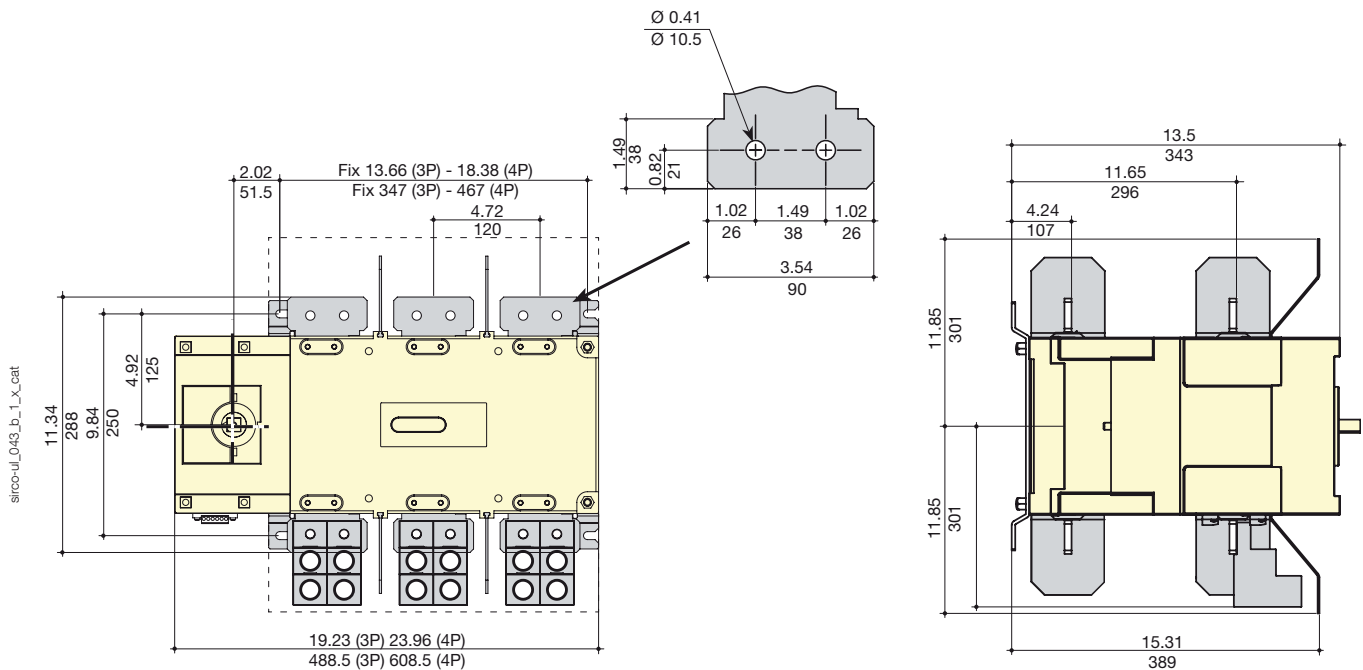
- 1. Terminal shrouds.
- A. S2 type handle.

Rating (A)	Mesurement	Overall dimensions C	Terminal shrouds		Case		Switch mounting					Connection										
			AC	AD	K 3p.	K 4p.	M 3p.	M 4p.	N	R1	R2	T	U	V	W	X	Y	Z	Z1	AA	BA	AC
400	in	10.39	15.75	9.72	9.61	11.97	8.27	10.63	7.68	0.35	0.27	2.56	1.77	1.97	0.50	0.43	0.20	2.07	7.48	10.24	8.66	0.79
400	mm	264	400	247	244	304	210	270	195	9	7	65	45	50	12.7	11	5	52.6	190	260	220	20

600 A

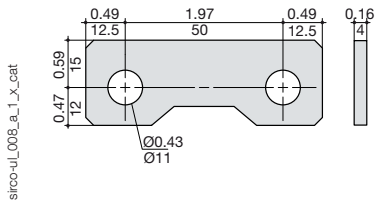


800 to 1000 A

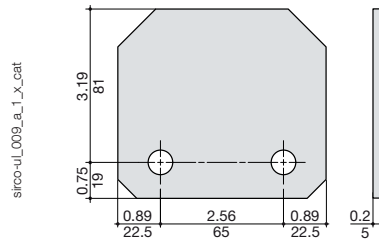


Jumpers (in / mm)

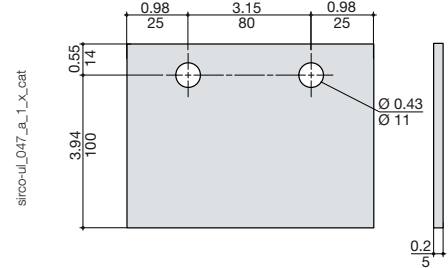
100 to 250 A



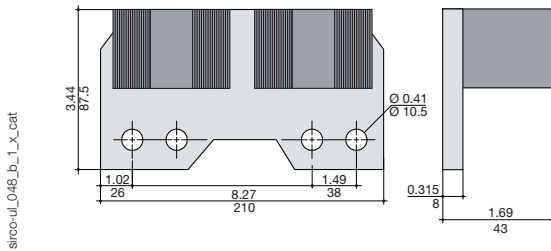
400 A



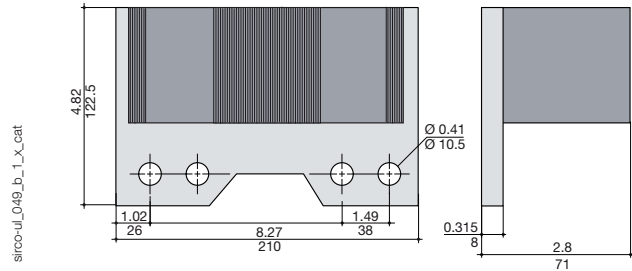
600 A



800 A

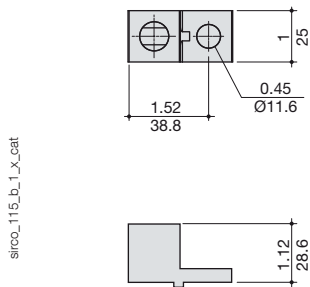


1000 A

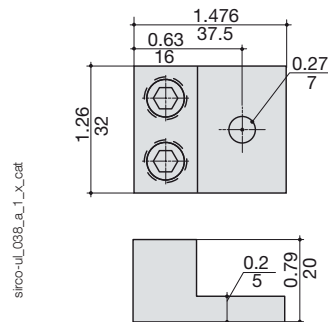


Cage terminals (in / mm)

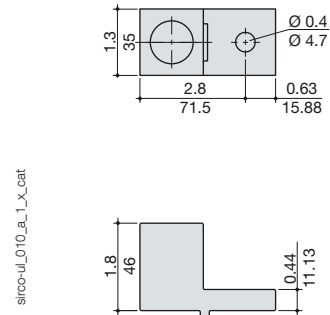
100 to 250 A



100 to 250 A

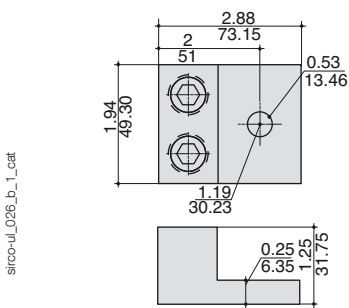


400 A



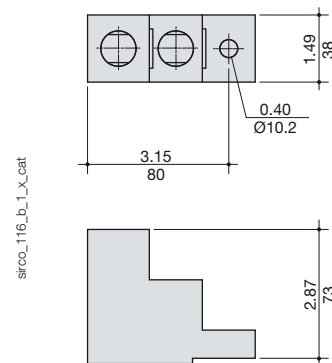
300MCM

400 A



2 x 350MCM

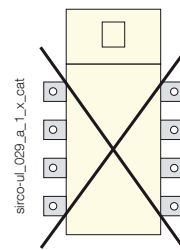
600 to 1000 A



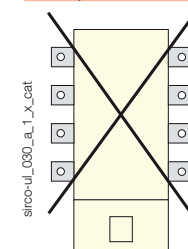
2x 600MCM

Mounting orientation

6/8 pole - 100 to 400 A

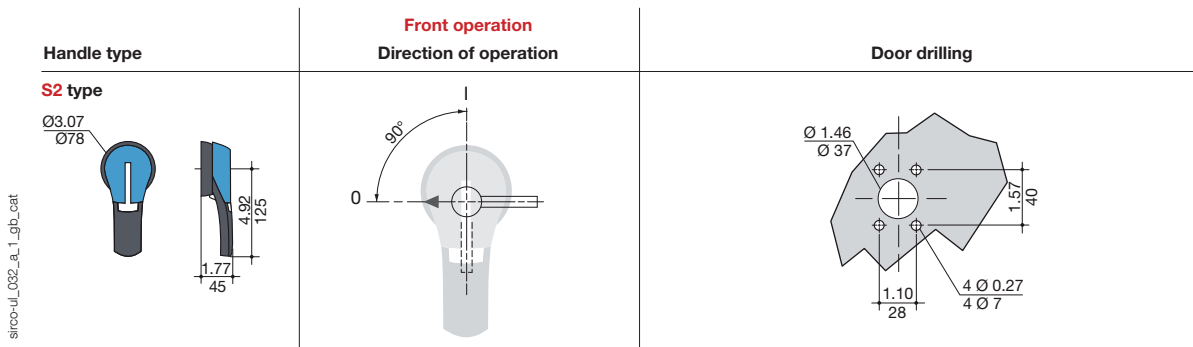


6/8 pole - 600 A



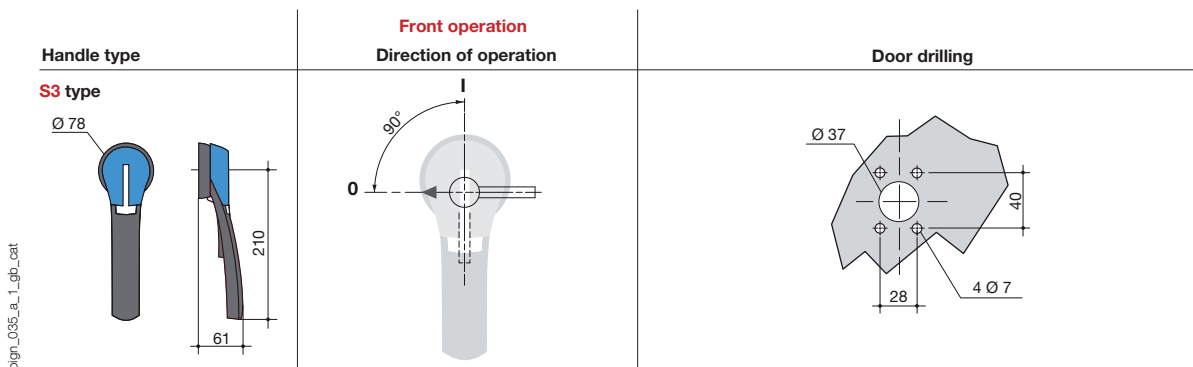
Dimensions for external handles (in / mm)

100 to 200 A



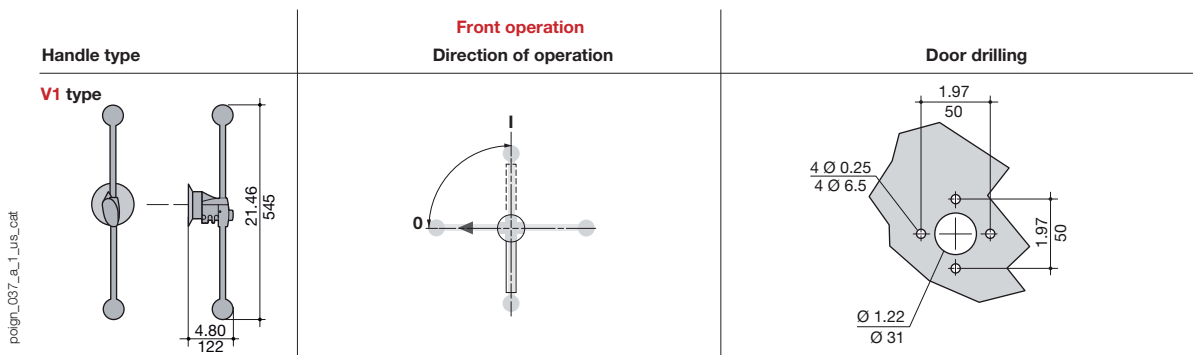
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400 A

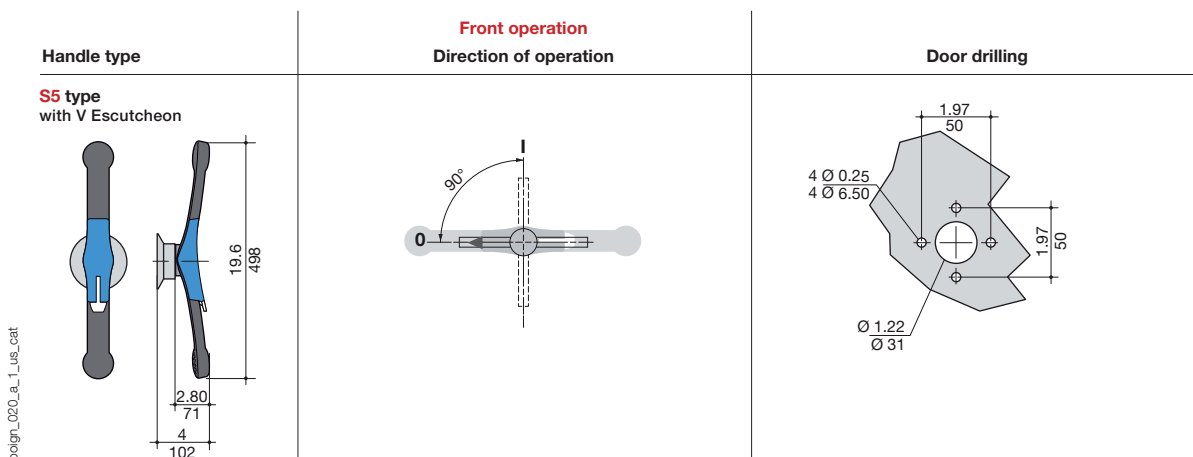


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600 to 1000 A



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