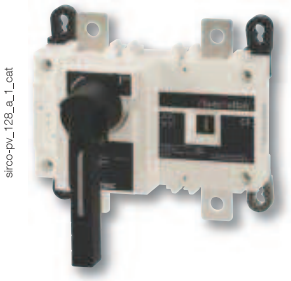
SIRCO PV IEC 60947-3

Load break and isolation switches for photovoltaic applications

from 100 to 3200 A, up to 1500 VDC



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The solution for

- Combiner box
- Inverter

Strong points

- Patented switching technology up to 500 VDC/pole
- Positive break indication
- Up to 1500 VDC as per characteristics by IEC 60947-3

Conformity to standards

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

(1) Consult us.

Function

SIRCO PV are manually operated multipolar load break switches.
Making and breaking capacity under load conditions up to 1500 VDC.
These extremely durable switches have been tested and approved for use in the most demanding applications.
They have been designed and tested for all types of applications: earthing, floating or bipolar.

Advantages

Optimise your investment

- Thanks to a reduced number of bridging bars, you can limit your costs and save mounting time.
- A 2 pole SIRCO PV will reduce heat and can be placed in a smaller enclosure.

High quality materials

SIRCO PV is an extremely robust device in a glass fibre reinforced polyester frame.
This material provides:

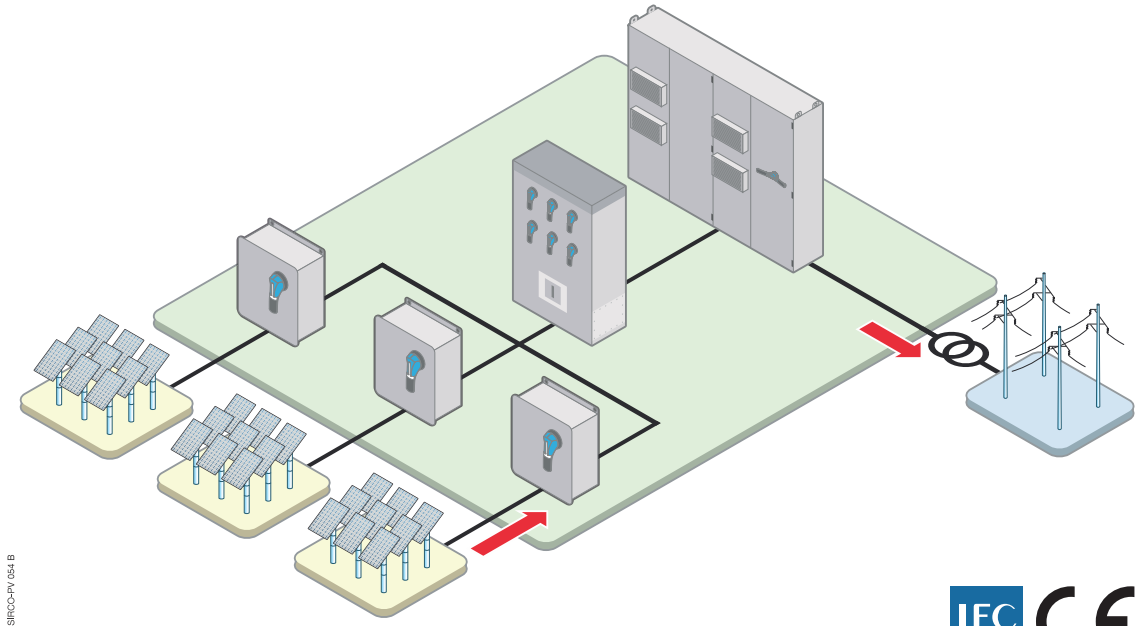
- high mechanical strength,
- stability to temperature variations (RTI of 130°C),
- high dielectric strength (high CTI / tested as per standard ASTM D 2303).

Reliability and performance

Our range of SIRCO PV load break switches is compliant to standards IS/IEC 60947-3.
SIRCO PV have been tested to break critically low currents and withstand 10 kA short-circuit during 300 ms without any specific protection.

Typical PV architecture

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



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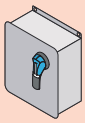
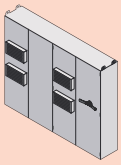
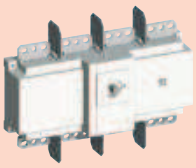
The SOCOMEC solutions

LEVEL OF INSTALLATION	SOCOMEC SOLUTIONS	
Combiner box		
		SIRCO PV One circuit up to 500 A at 1500 VDC
Inverter		
		SIRCO PV One circuit up to 3200 A at 1000 VDC up to 2000 A at 1500 VDC

References - SIRCO PV kits and accessories

1000 VDC

Rating (A) / Frame size	No. of poles	Kit 1 with direct handle(1)	Kit 2 with external handle(2)	Auxiliary contacts	Terminal screens	Interphase barriers (Top or Bottom)
1 circuit PV						
100 A / B4	2 P	26P1 **2010A**	26P2 **2010A**	1st NO/NC contact 2699 **0031A** 2nd NO/NC contact 2699 **0032A**	2 P 2698 **3020A** 4 P 2698 **4020A**	-
160 A / B4	2 P	26P1 **2016A**	26P2 **2016A**			
250 A / B4	2 P	26P1 **2025A**	26P2 **2025A**			
315 A / B4	2 P	26P1 **2031A**	26P2 **2031A**			
400 A / B4	2 P	26P1 **2039A**	26P2 **2039A**			
400 A / B4	4 P	26P1 **4040A**	26P2 **4040A**			4 P 2998 **0024A**
500 A / B4	4 P	26P1 **4050A**	26P2 **4050A**			
630 A / B5	4 P	26P1 **4063A**	26P2 **4063A**		4 P 2698 **4050A**	B5 frame 2998 **0014A**
800 A / B5	4 P	26P1 **4080A**	26P2 **4080A**			
1250 A / B6	4 P	26P1 **4120A**	26P2 **4120A**		4 P 2698 **4080A**	Included
2000 A / B7	4 P	26P1 **4200A**	26P2 **4200A**		4 P 2698 **4120A**	
2 circuit PV						
630 A / $B5_{DS}$	8 P	26P1 **8063A**	26P2 **8063A**	1st NO/NC contact 2699 **0061A** 2nd NO/NC contact 2699 **0062A**	1509 **4063A**	-
800 A / $B6_{DS}$	8 P	26P1 **8080A**	26P2 **8080A**		1509 **4080A**	Included
1250 A / $B6_{DS}$	8 P	26P1 **8120A**	26P2 **8120A**			
2000 A / $B7_{DS}$	8 P	26P1 **8200A**	26P2 **8200A**		2698 **4199A**	

(1) Kit 1 includes: Switch body + direct handle + Bridging bars.
(2) Kit 2 includes Switch body + external handle + 200 mm shaft + Bridging bars.

1500 VDC

Rating (A) / Frame size	No. of poles	Kit 1 with direct handle(1)	Kit 2 with external handle(2)	Auiliary contacts	Terminal screens	Interphase barriers (Top or Bottom)
275 A / B5	3 P	26P1 **3026A**	26P2 **3026A**	1st NO/NC contact 2699 **0031A** 2nd NO/NC contact 2699 **0032A**	Top 2798 **3041A** Bottom 2798 **8041A**	2998 **0013A**
315 A / B5	3 P	26P1 **3032A**	26P2 **3032A**			
400 A / B5	3 P	26P1 **3041A**	26P2 **3041A**			
500 A / B5	3 P	26P1 **3051A**	26P2 **3051A**			
630 A / B5	4 P	26P1 **4064A**	26P2 **4064A**		2698 **4050A**	
800 A / $B6_{DS}$	8 P	26P1 **8080A**	26P2 **8080A**	1st NO/NC contact 2699 **0061A** 2nd NO/NC contact 2699 **0062A**	1509 **4080A**	Included
1250 A / $B6_{DS}$	8 P	26P1 **8120A**	26P2 **8120A**			
2000 A / $B7_{DS}$	8 P	26P1 **8200A**	26P2 **8200A**		2698 **4199A**	

(1) Kit 1 includes: Switch body + direct handle + Bridging bars.
(2) Kit 2 includes Switch body + external handle + 200 mm shaft + Bridging bars.

Also available

> For 3200 A rating consult us.

Accessories (continued)

Auxiliary contact

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

Characteristics
IP2 with front operation.
Connection to the control circuit
By 6.35 mm fast-on terminal.
Electrical characteristics
30 000 operations.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NO/NC changeover auxiliary contacts

Frame size	Position AC	Type	Reference
B4 ... B7	1 contact	NO/NC	2699 **0031A**
B4 ... B7	2 contacts	NO/NC	2699 **0032A**
$B5_{DS}$ ... $B7_{DS}$	1 contact	NO/NC	2699 **0061A**
$B5_{DS}$ ... $B7_{DS}$	2 contacts	NO/NC	2699 **0062A**

Terminal screen

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

Frame size	No. of poles	Position	No of pieces	Reference
B4	2 P	top or bottom	1	2698 **3020A**
B4	4 P	top or bottom	1	2698 **4020A**
B5	3 P	top	1	2698 **3041A**
B5	3 P	bottom	1	2698 **8041A**
B5	4 P	top or bottom	1	2698 **4050A**
B6	4 P	top or bottom	1	2698 **4080A**
B7	4 P	top or bottom	1	2698 **4120A**
$B5_{DS}$	8 P	top and bottom	2	1509 **4063A**
$B6_{DS}$	8 P	top and bottom	2	1509 **4080A**
$B7_{DS}$	8P	top and bottom	2	2698 **4199A**


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Characteristics

Characteristics according to IEC 60947-3

Rated current I_n			**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)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilisation category**	**I_e (A)**	**No. of pole(s) in series per circuit**	**No. of pole(s) of the device**	**Frame size**	**I_e (A)**	**No. of pole(s) in series per circuit**	**No. of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	DC-21 B	100	1 P + ; 1 P	2 P	B4	160	1 P + ; 1 P	2 P	B4
Short-circuit capacity (without protection)										
Rated short-time withstand current 0.3 s. (kA eff)			10				10			
Rated short-time withstand current 1 s. (kA eff)			5				5			
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 (Nm)			10				10			
Weight of a 2 pole device (kg)			1.8				1.8			

Rated current I_n			**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)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilisation category**	**I_e (A)**	**No. of pole(s) in series per circuit**	**No. of pole(s) of the device**	**Frame size**	**I_e (A)**	**No. of pole(s) in series per circuit**	**No. of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	DC-21 B	250	1 P + ; 1 P	2 P	B4	275	1 P + ; 1 P -	3 P	B5
1 circuit	1500 VDC	DC-21 B	-	-	-	-	275	2 P + ; 1 P -	3 P	B5
Short-circuit capacity (without protection)										
Rated short-time withstand current 0.3 s. (kA eff)			10				10			
Rated short-time withstand current 1 s. (kA eff)			5				5			
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 (Nm)			10				10			
Weight of a 2 pole device (kg)			1.8				-			
Weight of a 3 pole device (kg)			-				6			

Characteristics according to IEC 60947-3 (continued)

Rated current I_n			**315 A / 400 A**				**400 A**			
Thermal current at 40°C (A)			**315 / 400**				**400**			
Thermal current at 50°C (A)			**315 / 400**				**400**			
Thermal current at 60°C (A)			**315 / 400**				**400**			
Rated insulation voltage U_i (V)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilisation category**	**I_e (A)**	**No. of pole(s) in series per circuit**	**No. of pole(s) of the device**	**Frame size**	**I_e (A)**	**No. of pole(s) in series per circuit**	**No. of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	DC-21 B	315	1 P + ; 1 P -	2 P	B4	400	2 P + ; 2 P -	4 P	B4
1 circuit	1500 VDC	DC-21 B	-	-	-	-	400	2 P + ; 1 P -	3 P	B5
Short-circuit capacity (without protection)										
Rated short-time withstand current 0.3 s. (kA eff)			10				-			
Rated short-time withstand current 1 s. (kA eff)			5				10			
Rated peak withstand current (kA peak)(1)			30				30			
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 (Nm)			10				10			
Weight of a 2 pole device (kg)			1.8				-			
Weight of a 3 pole device (kg)			-				3.8 (B5)			
Weight of a 4 pole device (kg)			-				2.3			

(1) For a rated operational voltage U_e = 400 VAC.

Rated current In			**500 A**				**630 A**			
Thermal current at 40°C (A)			**500**				**630**			
Thermal current at 50°C (A)			**500**				**630**			
Thermal current at 60°C (A)			**B4: 475 / B5: 500**				**560**			
Rated insulation voltage U_i (V)			1500							
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilisation category**	**I_e (A)**	**No. of pole(s) in series per circuit**	**No. of pole(s) of the device**	**Frame size**	**I_e (A)**	**No. of pole(s) in series per circuit**	**No. of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	DC-21 B	500	2 P + ; 2 P -	4 P	B5	630	2 P + ; 2 P -	4 P	B5
1 circuit	1500 VDC	DC-21 B	500	2 P + ; 1 P -	3 P	B5	630	2P + ; 2P -	4 P	B5
2 ciruits	1000 VDC	DC-21 B	-	-	-	-	630	2 P + ; 2 P -	8 P	$B5_{DS}$
Short-circuit capacity (without protection)										
Rated short-time withstand current 1 s. (kA eff)			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 (Nm)			10				14.5			
Weight of a 3 pole device (kg)			3.8 (B5)				-			
Weight of a 4 pole device (kg)			2.3				3.8			
Weight of an 8 pole device (kg)			-				15			

Characteristics (continued)

Characteristics according to IEC 60947-3 (continued)

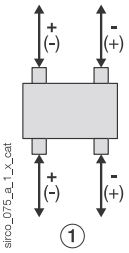
Rated current In			**800 A**				**1250 A**			
Thermal current at 40°C (A)			**800**				**1250**			
Thermal current at 50°C (A)			**800**				**1250**			
Thermal current at 60°C (A)			**B5: 650 / B6: 800**				**1125**			
Rated insulation voltage U_i (V)			1500				1500			
Rated impulse withstand voltage U_{imp} (kV)			12				12			
Number of circuits	**Rated voltage**	**Utilisation category**	**I_e (A)**	**No. of pole(s) in series per circuit**	**No. of pole(s) of the device**	**Frame size**	**I_e (A)**	**No. of pole(s) in series per circuit**	**No. of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	DC-21 B	800	2 P + ; 2 P -	4 P	B5	1250 A	2 P + ; 2 P -	4 P	B6
1 circuit	1500 VDC	DC-21 B	800	4 P + ; 4 P -	8 P	$B6_{DS}$	1250 A	4 P + ; 4 P -	8 P	$B6_{DS}$
2 circuits	1000 VDC	DC-21 B	800	2 P + ; 2 P -	8 P	$B6_{DS}$	1250 A	2 P + ; 2 P -	8 P	$B6_{DS}$
Short-circuit capacity (without protection)										
Rated short-time withstand current 1 s. (kA eff)			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 (Nm)			14.5				37			
Weight of a 4 pole device (kg)			3.8				3.8			
Weight of an 8 pole device (kg)			15				15			

Rated current In			**2000 A**			
Thermal current at 40°C (A)			**2000**			
Thermal current at 50°C (A)			**1850**			
Thermal current at 60°C (A)			**1600**			
Rated insulation voltage U_i (V)			1500			
Rated impulse withstand voltage U_{imp} (kV)			12			
Number of circuits	**Rated voltage**	**Utilisation category**	**I_e (A)**	**No. of pole(s) in series per circuit**	**No. of pole(s) of the device**	**Frame size**
1 circuit	1000 VDC	DC-21 B	2000 A	2 P + ; 2 P -	4 P	B7
1 circuit	1500 VDC	DC-21 B	2000 A	4 P + ; 4 P -	8 P	$B7_{DS}$
2 circuits	1000 VDC	DC-21 B	2000 A	2 P + ; 2 P -	8 P	$B7_{DS}$
Short-circuit capacity (without protection)						
Rated short-time withstand current 1 s. (kA eff)			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)			4000			
Operating effort (Nm)			56			
Weight of a 4 pole device (kg)			22			
Weight of an 8 pole device (kg)			50			

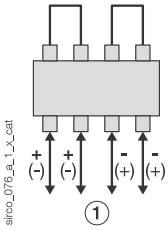
Pole connections in series

1 PV circuit - 1000 VDC

B4 - 2P

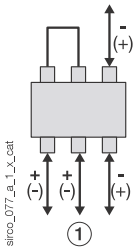


B4-B7 - 4P

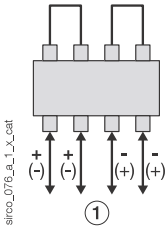


1 PV circuit - 1500 VDC

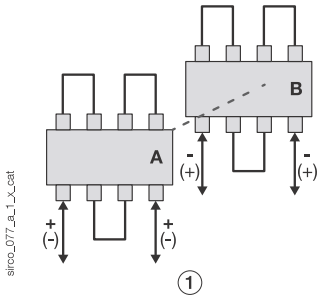
B5 - 3P



B5 - 4P

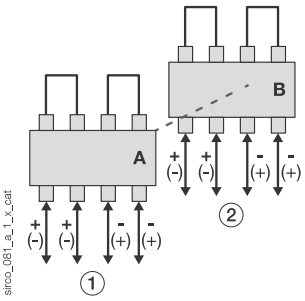


$B5_{DS}$-$B7_{DS}$ - 8P



2 PV circuits - 1000 VDC

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



A. Front switch.
B. Rear switch.

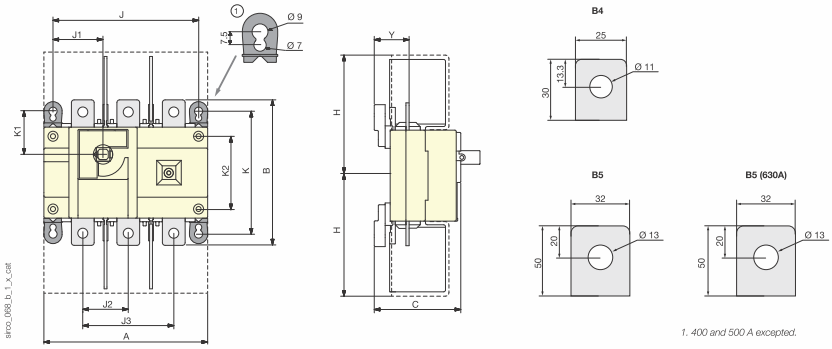
1. Utility 1
2. Utility 2

SIRCO PV IEC 60947-3

Load break and isolation switches for photovoltaic applications
from 100 to 3200 A, up to 1500 VDC

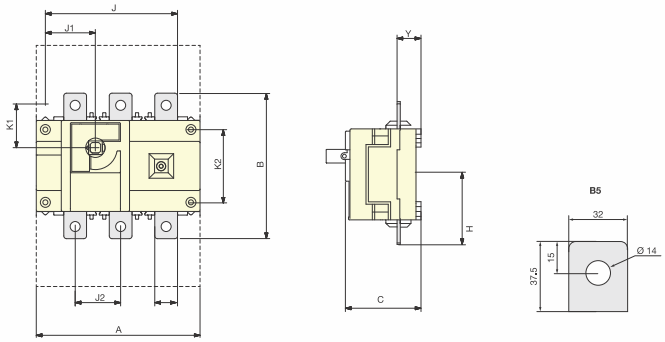
Dimensions (mm)

B4 - B5 (1000VDC)



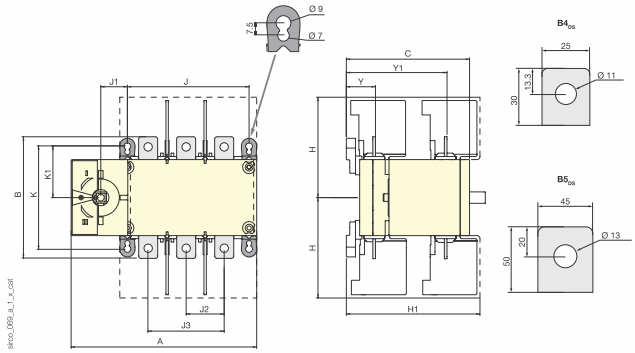
Frame size	No. of poles	A	B	C	H	J	J1	J2	J3	K	K1	K2	Y
B4	2 P	180	160	95	132.5	160	55	-	100	135	48	80	38.5
B4	4 P	230	170	79	132.5	210	105	50	-	-	-	80	22.5
B5	4 P	290	260	126.5	203	270	135	65	-	195	67.5	80	51.5
B5 (630 A)	4 P	290	260	126.5	203	270	135	65	-	195	67.5	80	51.5

B5 (1500VDC)



Frame size	No. of poles	A	B	C	H	J	J1	J2	J3	K	K1	K2	Y
B5	3 P	230	235	111	-	210	75	75	-	-	-	140	36

$B5_{DS}$



Frame size	No. of poles	A	B	C	H	H1	J	J1	J2	J3	K	K1	Y	Y1
$B5_{DS}$	8 P	361	260	239.2	203	165.5	270	35	65	-	195	97.5	52.7	189.6

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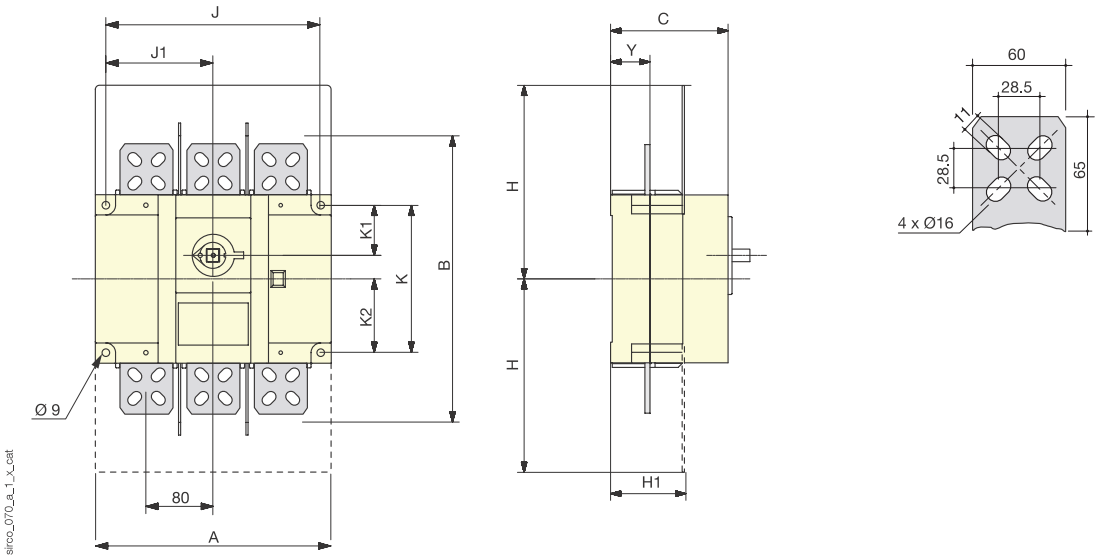
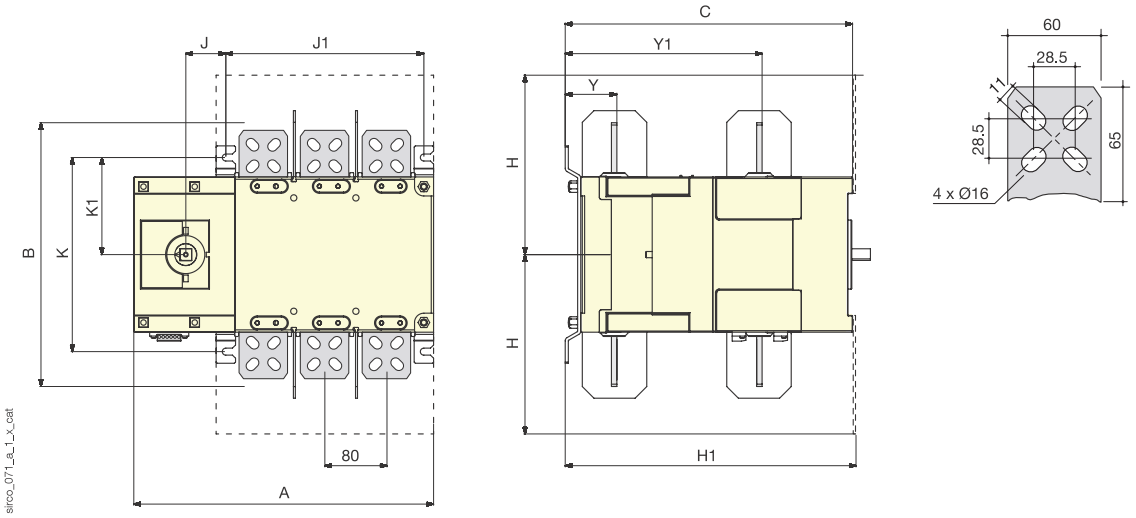


Frame size	No. of poles	A	B	C	H	H1	J	J1	K	K1	K2	Y
B6	4 P	630	340	139	270	145	335	167.5	175	59.5	28	46.5

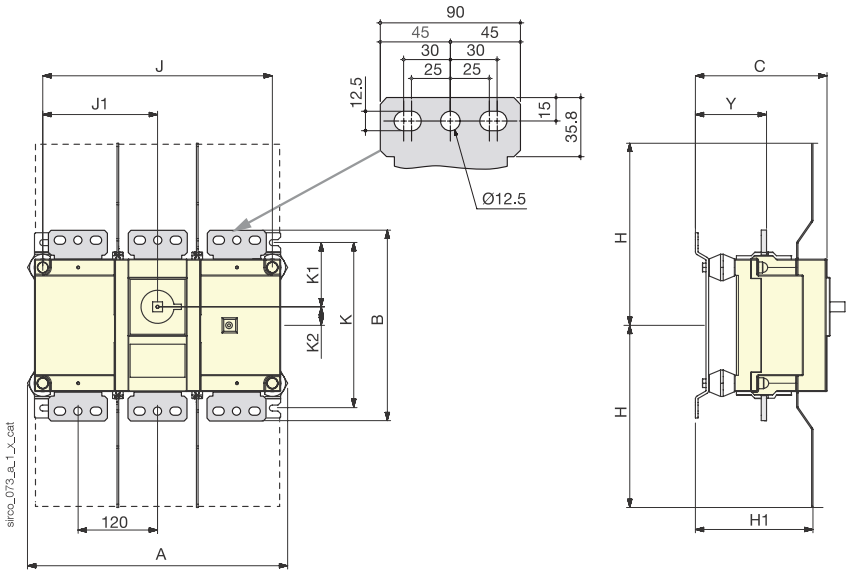
B6$_{DS}$



Frame size	No. of poles	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

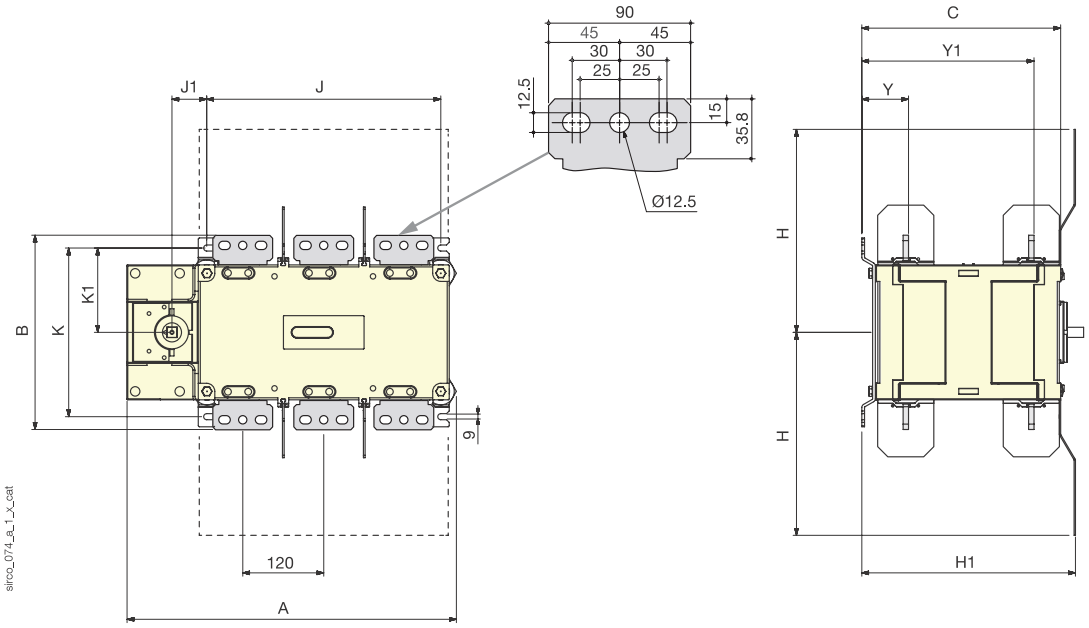
Dimensions (mm) (continued)

B7



Frame size	No. of poles	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

$B7_{DS}$

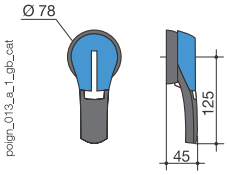
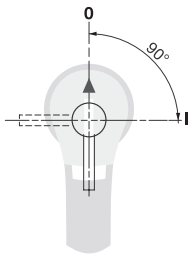
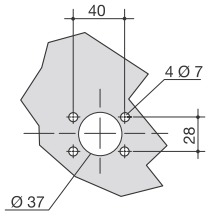


Frame size	No. of poles	A	B	C	H	H1	J	J1	K	K1	Y	Y1
$B7_{DS}$	8 P	608.5	288	333	301	389	467	51.5	250	125	107.5	293.5

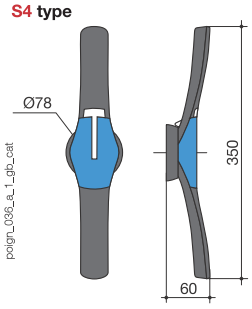
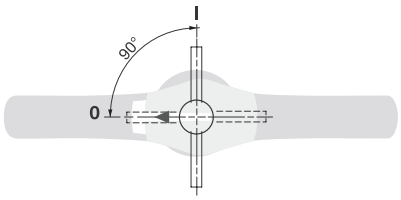
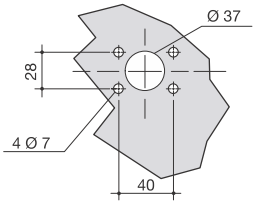
Dimensions of SIRCO PV 3200A - 1000 VDC - B8, please consult us.

Dimensions for external handles (mm)

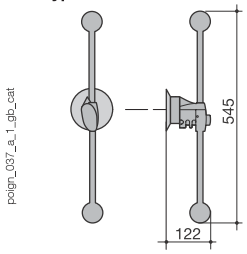
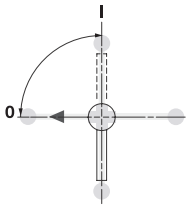
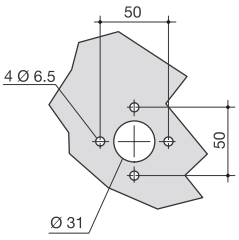
B4 - B5

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 		

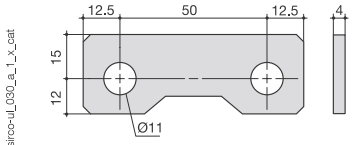
B6$_{DS}$ - B7$_{DS}$

Handle type	Front operation Direction of operation	Door drilling
V1 type 		

Bridging bars (mm)

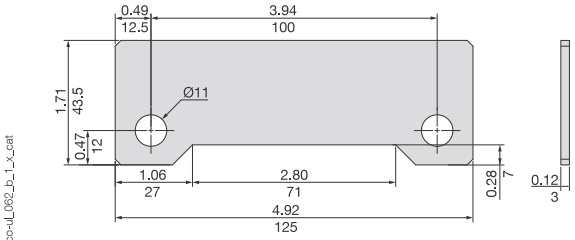
B4

2609 0025A



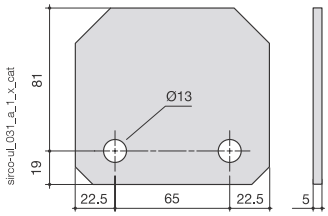
B5

2709 0045A



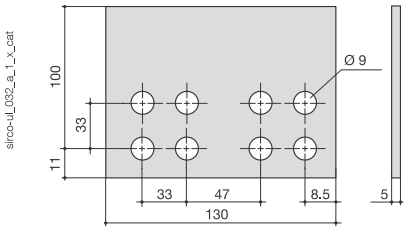
B5 - B5DS

2609 0080A



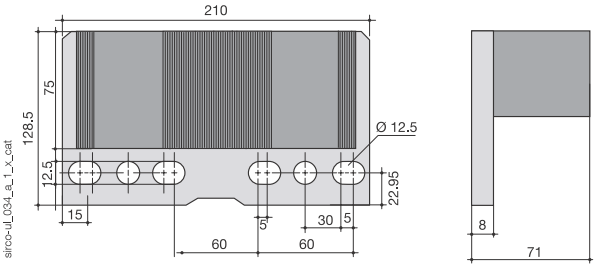
B6 - B6DS

2609 1100A



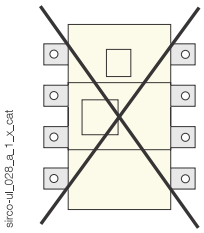
B7 - B7DS

2609 1200A

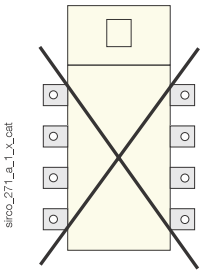


Mounting orientation

All frames



$B5_{DS}$



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