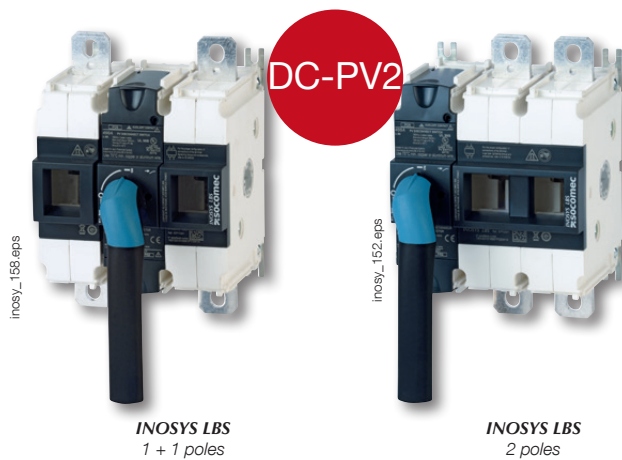


INOSYS LBS

Load break switches for DC and PV applications
160 to 630 A, up to 1500 VDC



The solution for

- > Disconnection within PV installation
- > Battery protection
- > DC equipment & process isolation

Strong points

- > High-performance switching in a compact design
- > Easy integration
- > Reinforced safety with visible contact indication
- > Efficient with low power-loss

Compliance with standards

- > IEC 60947-3, DC-21B & DC-PV2



- > UL98B
File E346418



- > KEMA-KEUR



- > CCC



Compatible with requirements

- > IEC 60364-7-712
- > NEC art. 690
- > AS/NZS 5033

Compliance with environmental standards

- > IEC 60947-1 Annex Q, Stage F
- > IEC 60068-2-1
- > IEC 60068-2-2
- > IEC 60068-2-27
- > IEC 60068-2-30
- > IEC 60068-2-52
- > IEC 60068-2-6



Functions

INOSYS LBS is a range of load break switches that can be manually controlled. These switches can be operated manually using the handle to disconnect all or part of the electrical installation. They ensure on-load opening / closing and safe disconnection of any low voltage electrical circuit up to 1500 VDC. They can also be used for emergency power switching applications. They are available for DC-PV2 utilization category.

Advantages

High performance power switching in confined spaces

INOSYS LBS load break switches incorporate patented technology that provides a breaking capacity of between 500 and 750 VDC per pole, providing 1500 VDC in just 2 poles, and significantly limiting power dissipation. All in an exceptionally compact enclosure.

Safe to use

- Direct position indicator on the bar and visible contact with containment of the electrical arc.
- The switch is completely independent of the operating speed, which ensures safe use under any conditions.
- High temperatures permitted: without derating up to 55 °C (131 °F), operational from -40 to +70 °C.

Designed for harsh environments.

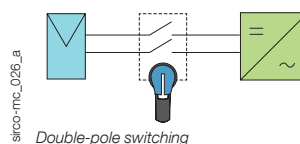
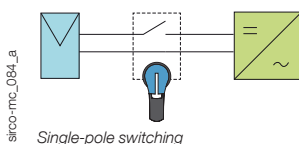
- Vibration-tested (13.2 Hz to 100 Hz at 0.7 G).
- Impact-tested (15 g for three cycles).
- Humidity-tested (2 cycles, 55 °C, 95% humidity).
- Salt spray-tested (3 cycles with storage humidity, 40 °C, 93% humidity after each cycle).

Easy to install

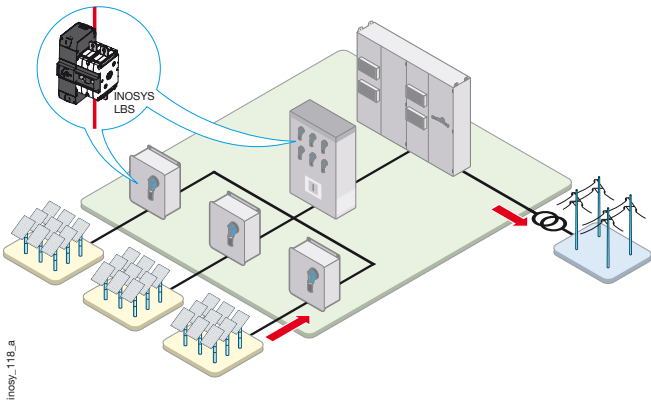
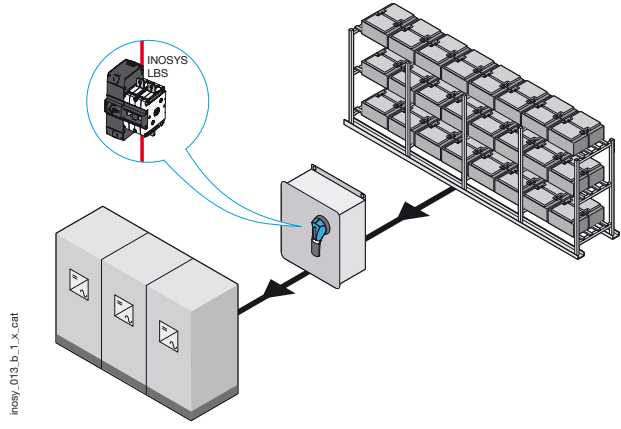
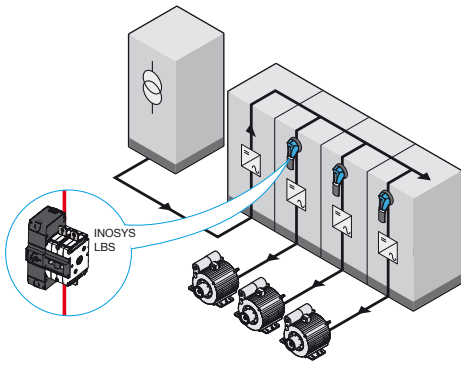
- Wiring: the non-polarisation of the switch allows for all types of wiring and connections.
- Integrated auxiliary contacts.

Modular solution for flexible configuration



- Single or double-pole switch
The same switch can be used on earth-connected or insulated networks with a simple change in the wiring configuration.



Typical applications: local safe disconnection for DC and PV applications

<p>PV system: Junction box, combiner box or inverter</p>  <p><small>inosy_118_a</small></p>	<p>Battery isolation</p>  <p><small>inosy_013_b_1_x_cat</small></p>
<p>DC process isolation</p>  <p><small>inosy_014_b_1_x_cat</small></p>	

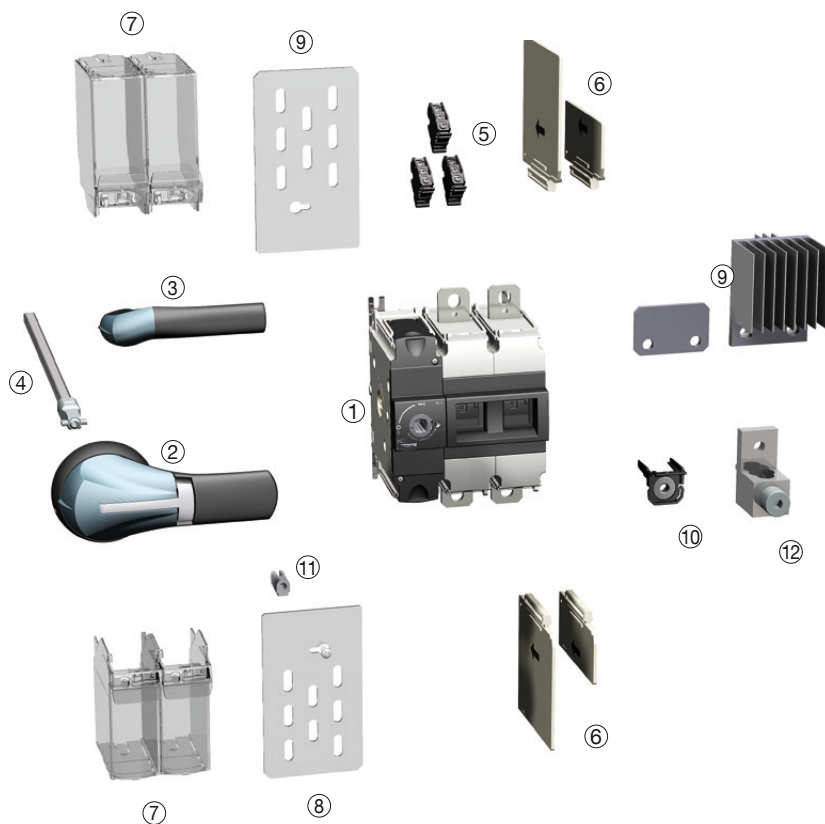
The SOCOMEC solutions

<p>SIRCO PV Manual PV switches</p>  <p><small>sirco-pv_069 - 060 - 061</small></p> <p>Up to 3200 A at 1000 VDC Up to 2000 A at 1500 VDC Up to 4 circuits</p>	<p>INOSYS LBS Visible breaking switches for DC and PV applications</p>  <p><small>inosy_152</small></p> <p>Up to 630 A (IEC) and 600 A (UL) at 1500 VDC</p>
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INOSYS LBS

Load break switches for DC and PV applications
160 to 630 A, up to 1500 VDC

Introduction



1. INOSYS LBS 400 A - 1500 V DC
2. External operation handle
3. Direct operation handle
4. Shaft for external operation
5. Auxiliary contact
6. Inter-phase barriers
7. Terminal shrouds
8. Terminal screen
9. Bridging bar to arrange the poles in series
10. Captive nut
11. Mounting insert
12. Cage terminals

REFDAM_inosy_168_a_1_x_cat.at

References

INOSYS LBS

1000 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body ⁽¹⁾	External operation	Aux. Contact
160 A	F2	2 P (1 P+, 1 P-)	86P0 2016	Shaft 320 mm 1400 1032 Handle type S2 Black IP65 742F 2111	NO/NC 8499 0001
250 A	F2	2 P (1 P+, 1 P-)	86P0 2025		
315 A	F2	2 P (1 P+, 1 P-)	86P0 2031		
400 A	F3	2 P (1 P+, 1 P-)	86P0 2040	Shaft 320 mm 1400 1032 Handle type S2L Black IP65 14AF 2111	

(1) The switches are supplied without accessories.

(2) Please contact us

1500 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body ⁽¹⁾	External operation	Aux. Contact
160 A	F2	2 P (1 P+, 1 P-)	86P0 2017	Shaft 320 mm 1400 1032 Handle type S2 Black IP 65 742F 2111	NO/NC 8499 0001
			86P1 1017 ⁽²⁾		
250 A	F2	3 P (2 P+, 1 P-)	86P0 3016		
			86P0 2026		
			86P1 1026 ⁽²⁾		
			86P0 3025		
315 A	F2	2 P (1 P+, 1 P-)	86P0 2032		
			86P1 1032 ⁽²⁾		
400 A	F3	3 P (2 P+, 1 P-)	86P0 3031		
			86P0 2041		
630 A	F3	2 P (1 P+, 1 P-)	86P1 1041 ⁽²⁾	Shaft 320 mm 1400 1032 Handle type S2L Black IP 65 14AF 2111	
			86P0 2064		
			86P1 1064 ⁽²⁾		

1500 VDC - 2 circuits

Rating (A)	Frame size	No. of poles per circuit	Switch body ⁽¹⁾	External operation	Aux. Contact
400 A	F3	2 P (1 P+, 1 P-)	86P2 2041 ⁽²⁾	Shaft 320 mm 1400 1032 Handle type S2L Black IP 65 14AF 2111	NO/NC 8499 0001
500 A			86P2 2051		
630 A			86P2 2064 ⁽²⁾		

(1) The switches are supplied without accessories.

(2) Centred mechanism.

Accessories

Direct operation handle

Frame size	Handle type	Handle colour	Reference
F2	E2	Black	8499 5022
F2	E2	Red	8499 5023
F3	E3	Black	8499 5032



E2 handle

access_400_a_1_cat

External operation handle

Use

The external control handles include a breastplate and can be padlocked. External handles should be used with a shaft extension.

Note: We recommend using IP55 for indoor and IP65 for outdoor applications.

Example of use:

When the handle is locked in the "ON" position, the operator must make sure to disconnect and isolate the circuit before accessing the board and carrying out maintenance work.

You can open the door when the switch is in the "ON" position by bypassing the lock function with a specially designed tool (authorised persons only). The lock is automatically re-applied when the door is closed.



Handle type S2

access_150_eps

Frame size	Handle type	Handle colour	Protection degree	Front operation Reference	Side operation Reference ⁽²⁾
F2	S2	Black	IP65	742F 2111	14YA 2111
F2	S2	Red	IP65	14AE 2111	
F3	S2L ⁽¹⁾	Black	IP65	14AF 2111	14AA 2111
F3	S2L ⁽¹⁾	Red	IP65	14AE 2111	

⁽¹⁾ S2L handles have an extended socket; please see the section on dimensions.

⁽²⁾ Only compatible with left mechanism version.

Shaft for external operation

Frame size	Handle type	Length (mm)	Reference
F2 - F3	S2, S2L	200	1400 1020
F2 - F3	S2, S2L	320	1400 1032
F2 - F3	S2, S2L	400	1400 1040

Other colour schemes: please contact us.



Shaft for S2 and S2L handles

access_401_a_1_cat

Shaft guide for external operation

Use

Allows you to guide the shaft for external control.

This accessory can correct any misalignment of the control shaft by up to 15 mm.

Recommended for shaft lengths over 320 mm.

Description	Reference
Shaft guide	1429 0000



access_280_a_2_cat

Auxiliary contact

Use

Provide information about the position and pre-break depending on installation location.

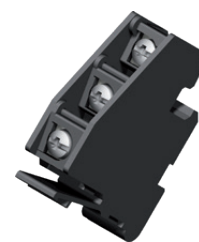
Characteristics

Switching type: NO/NC,
IP2X with front control (screw cap).
10 000 operations.
Max. 3 per switch.

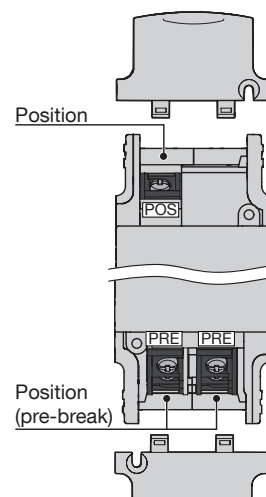
Frame size	Connection type	Type	Reference
F2 - F3	Screws	Standard NO/NC	8499 0001
F2 - F3	Screws	Low level NO/NC	8499 0002

Characteristics

Type of auxiliary contact	Min. current (A)	I _{th} (A)	Operating current I _e (A)			
			24 VDC DC-14	48 VDC DC-14	230 VAC AC-15	440 VAC AC-15
Standard	12.5 mA / 24 V	16	1	0.2	4	4
Low level	1 mA / 4 V	16	1	0.2	2	1



access_402_a_1_cat



access_465_a_1_gb_cat

Bridging bar for poles in series

Use

The bridging bars enable the poles to be connected in series, allowing the following configurations.

1500 VDC – 1 circuit – dual polarity switching

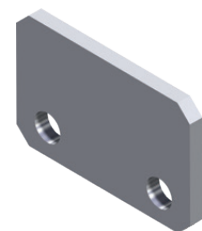
Frame size	Rating (A)	No. of poles per circuit	Quantity to order	Reference
F2	160 ... 315	3 P	1	8409 0016 ⁽¹⁾

⁽¹⁾ Kit includes 2 identical bridging bars.

1500 VDC – 1 circuit with full voltage switching per polarity / 2 circuits – single polarity switching

Frame size	Rating (A)	No. of poles per circuit	Quantity to order	Reference
F3	400	4 P / 2 P	2	8409 0040 ⁽¹⁾
F3	500	4 P / 2 P	2	8409 0041
F3	630	4 P / 2 P	2	8409 0063

⁽¹⁾ Kit includes 2 identical bridging bars.



access_411_a_1_cat

INOSYS LBS

Load break switches for DC and PV applications

160 to 630 A, up to 1500 VDC

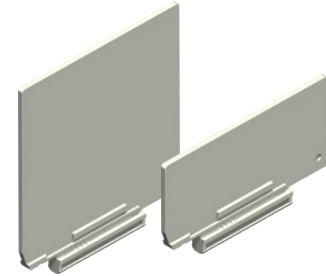
Accessories (continued)

Inter-phase barriers

Use

Safety isolating break between the terminals, essential for use at 1000 VDC and 1500 VDC or between 2 circuits.

Frame size	Type	Packaging (units)	Reference
F2 - F3	Short	2	8499 2202
F2 - F3	Short	3	8499 2203
F2 - F3	Long	2	8499 2212
F2 - F3	Long	3	8499 2213



access_405_a_1_cat access_406_a_1_cat

Terminal shrouds

Use

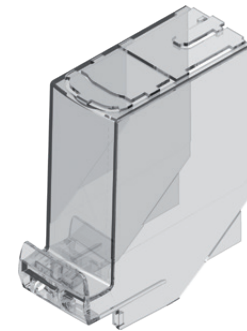
For top or bottom protection against direct contact with terminals or connection parts; provides IP4 protection and phase separation. 1 P type to cover 1 pole connection.

Advantages

Perforations for thermographic inspection / voltage check without the need to remove the shrouds. Terminal shrouds can be fixed in place with a holding insert. Includes break-off tabs for precise adaptation to cables or insulated bars.

Frame size	Packaging (units)	No. of poles	Position	Reference
F2	3	1 P	Top or bottom	8499 4213 ⁽¹⁾
F2	4	1 P	Top or bottom	8499 4214 ⁽¹⁾
F3	4	1 P	Top or bottom	8499 4314 ⁽¹⁾

(1) Compatible with the holding insert which can be fitted to lock the shrouds in place.



access_407_a_1_cat

Terminal screens

Use

Provides top and bottom protection against direct contact with terminals or connection parts.

Advantages

Perforations for thermal checks. Assembly requires mounting inserts (provided with terminal screens).

Frame size	No. of poles	Position	Reference ⁽¹⁾
F2	2 P	Top and bottom	8499 3222
F2	3 P	Top and bottom	8499 3232
F3	2 P	Top and bottom	8499 3322

(1) Each reference comprises 2 terminal screens for top and bottom protection.



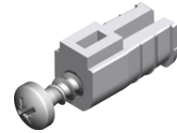
access_408_a_1_cat

Mounting insert

Use

Used to secure terminal shrouds / inter-phase barriers on the switch.

Frame size	Packaging (units)	Reference
F2 - F3	10	8499 6220
F2 - F3	100	8499 6221



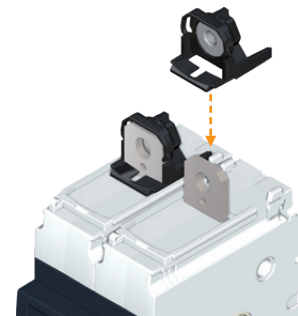
access_409_a_1_cat

Captive nut

Use

This accessory enables simple one-sided connection to the power terminals. It can be mounted on either side of the terminal for front or rear connection.

Frame size	Packaging (units)	Reference
F2	12	8499 6120
F2	120	8499 6121
F3	12	8499 6130
F3	120	8499 6131



access_399_a_1_cat

Voltage tap

Use

Allows you to connect sensors or measure voltage with a fast-on connection.

Frame size	Packaging (units)	Reference
F2	12	8499 9012
F3	12	8499 9013



access_412_a_1_cat

Characteristics

Characteristics according to IEC 60947-3

Rated current I_n		160 A	250 A	315 A	400 A	500 A	630 A
Frame size		F2	F2	F2	F3	F3	F3
Thermal current at 40 °C (A)		160	250	315	400	500	630
Thermal current at 50 °C (A)		160	250	315	400	500	630
Thermal current at 60 °C (A)		160	250	315	400	500	630
Rated insulation voltage U_i (V)		1500	1500	1500	1500	1500	1500
Rated impulse withstand voltage U_{imp} (kV)		12	12	12	12	12	12
Number of circuits	Nominal voltage	Utilisation category	I_e (A)	I_e (A)	I_e (A)	I_e (A)	I_e (A)
1 circuit	1000 VDC ⁽¹⁾	DC-21 B	160	250	315	400	500
1 circuit	1500 VDC ⁽²⁾	DC-21 B	160	250	315	400	500
Number of circuits	Nominal voltage	Utilisation category	I_e (A)	I_e (A)	I_e (A)	I_e (A)	I_e (A)
1 circuit	1000 VDC ⁽¹⁾	PV2	-	-	-	-	-
1 circuit	1500 VDC ⁽²⁾	PV2	160	250	315	400	500
2 circuits	1500 VDC ⁽²⁾	PV2	-	-	-	400	500
Short-circuit operation at 1000 VDC and 1500 VDC (unprotected)							
Current rated as short-time withstand I_{cw} 1s (kA rms)		5	5	5	8	8	8
Rated short-circuit breaking capacity I_{cm} (peak kA) – 60 ms		10	10	10	10	10	10
Connection							
Recommended Cu rigid cable cross-section ⁽³⁾		70	120	185	240	2 x 150	2 x 185
Recommended width of copper bars (mm) ⁽³⁾		20	20	20	25	25	25
Mechanical characteristics							
Durability (number of operating cycles)		8000	8000	8000	8000	8000	8000
Power dissipation per pole (W/pole)		4.5	11.2	13	13	21.6	30.2

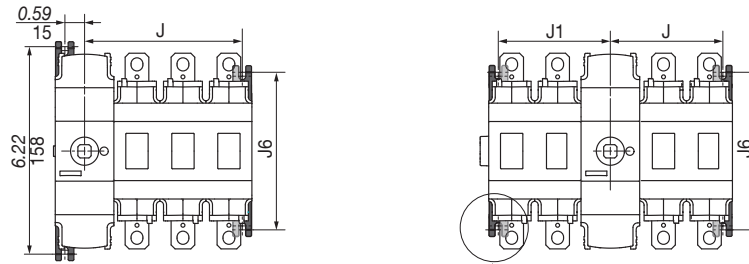
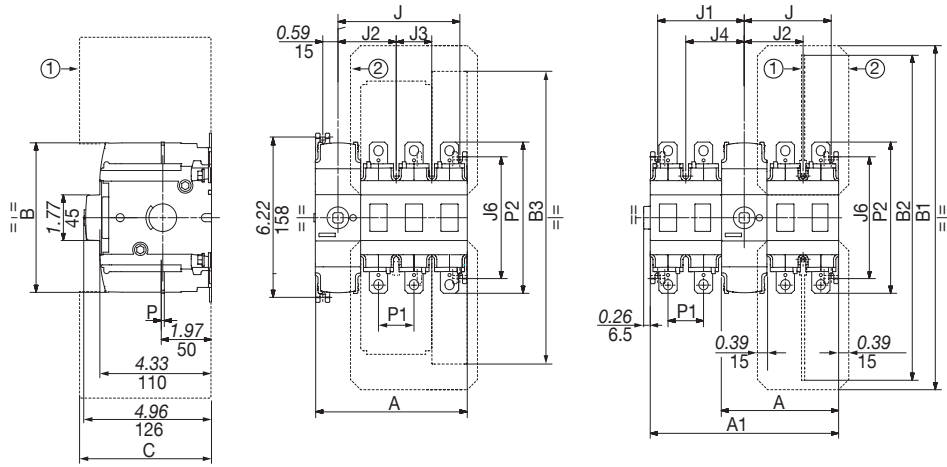
(1) 2 poles in series.

(2) 2 or 3 poles in series.

(3) For aluminium connections, please contact us.

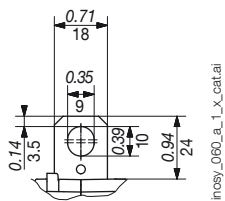
Dimensions (in/mm)

INOSYS LBS



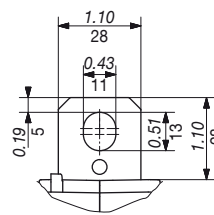
- 1. Inter-phase barrier.
- 2. Terminal screens.

Wiring terminal F2



inosy_060_a_1_x_cat.ai

Wiring terminal F3



inosy_061_a_1_x_cat.ai

inosy_166_a_1_x_cat.ai

Rating (A)	Frame size	Units	A		A1		J		J1		J	
			2 P	3 P	1+1 P / 2+2 P	1+1 P / 2+2 P	1+1 P / 2+2 P	1+1 P / 2+2 P	2 P	3 P		
160 ... 315	F2	inches	4.60	5.98	4.60 / 7.36	1.97 / 3.37	2.05 / 3.44	3.35	4.72			
		mm	117	152	117 / 187	50.5 / 85.5	52.5 / 87.5	85.5	120.5			
400	F3	inches	5.40	7.17	5.40 / 8.94	2.36 / 4.15	2.44 / 4.23	4.13	-			
		mm	137	182	137 / 227	60.5 / 105.5	62.5 / 107.5	105.5	-			

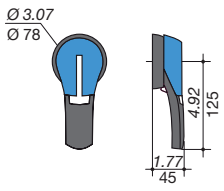
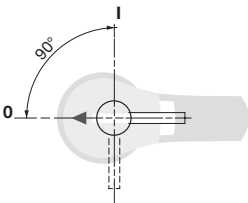
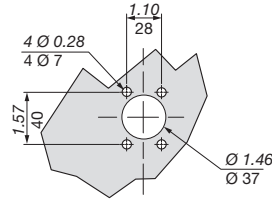
Rating (A)	Frame size	Units	B	B1	B2			B3	C		J2	J3	J4	J6	P1	P2
			IEC short	IEC long	UL	IEC	UL									
160 ... 315	F2	inches	5.90	13.35	7.85	12.61	10.31	11.64	4.33	4.33	2.26	1.38	2.34	4.72	1.38	5.87
		mm	154	339	199	320	262	296	110	110	57.5	35	59.5	120	35	149
400	F3	inches	5.90	16.28	9.35	14.11	15.5	14.12	4.33	5.31	2.64	1.77	2.72	6.22	1.77	7.87
		mm	154	414	237	358	394	359	110	135	67.5	45	69.5	158	45	200

INOSYS LBS

Load break switches for DC and PV applications
160 to 630 A, up to 1500 VDC

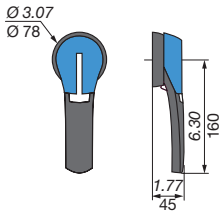
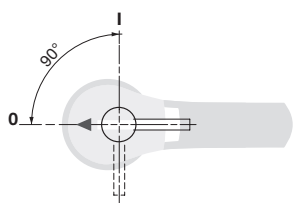
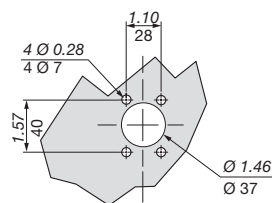
Dimensions of external handles (in/mm)

F2

Handle type	Front operation Direction of operation	Door drilling
S2 type 		

poign_013_b_1_us_cat.eps

F3

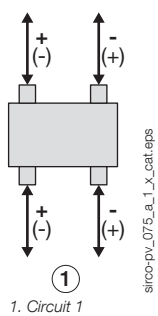
Handle type	Front operation Direction of operation	Door drilling
S2L type 		

poign_069_b_1_us_cat.eps

Wiring configuration

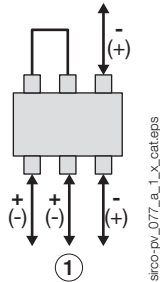
1 circuit - 1000 VDC

F2-F3 - 2 P



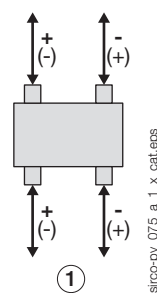
1 circuit - 1500 VDC

F2 - 3 P

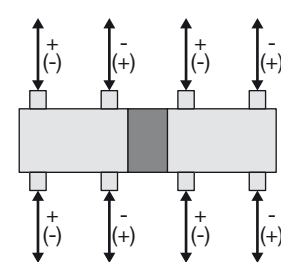


2 circuits - 1500 VDC

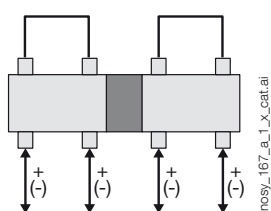
F2-F3 - 2 P



F3 - 2 P



1 circuit - 1500 VDC per polarity

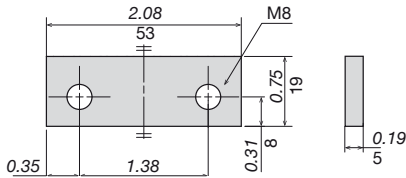


Bridging bars (in/mm)

F2

8409 0016⁽¹⁾

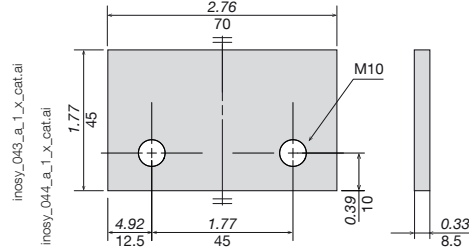
⁽¹⁾ Kit includes 2 identical bars.



F3

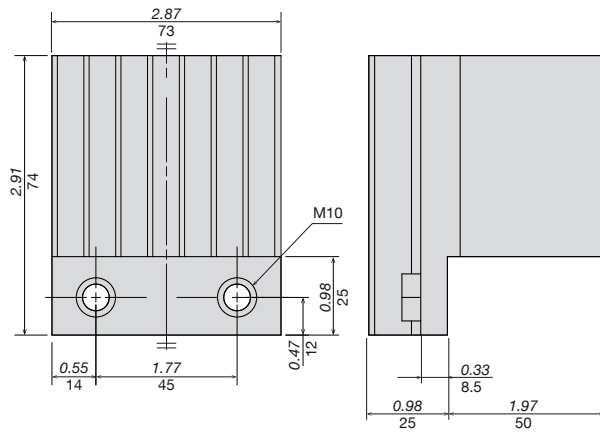
8409 0040⁽¹⁾

⁽¹⁾ Kit comprises 2 identical bars.

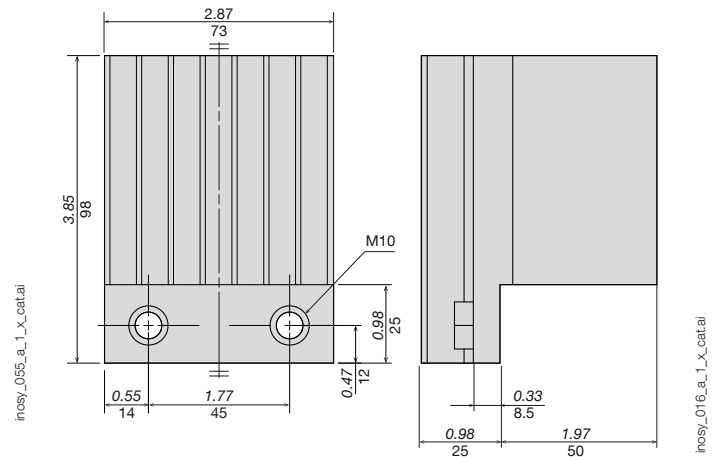


F3

8409 0041



8409 0063



Mounting orientation

F2 - F3

All mounting orientations are possible. Derating may apply - please consult us.

