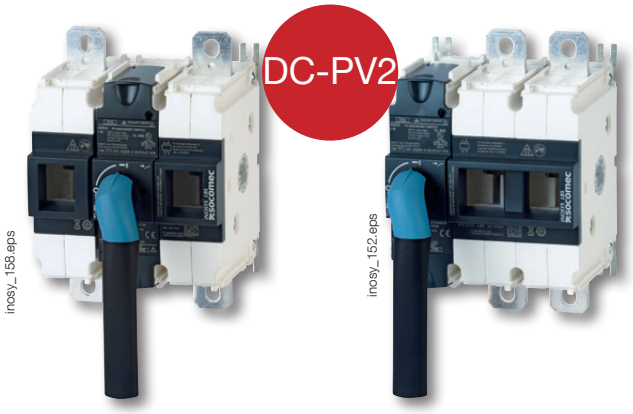
INOSYS LBS

Load break switches for DC and PV applications

160 to 630 A, up to 1500 VDC



INOSYS LBS
1 + 1 poles

INOSYS LBS
2 poles

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).

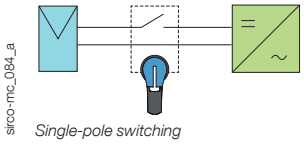
Easy to install

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

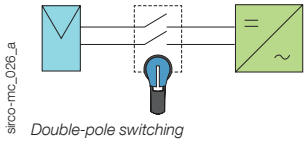
Modular solution for flexible configuration

- 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.



Single-pole switching



Double-pole switching

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

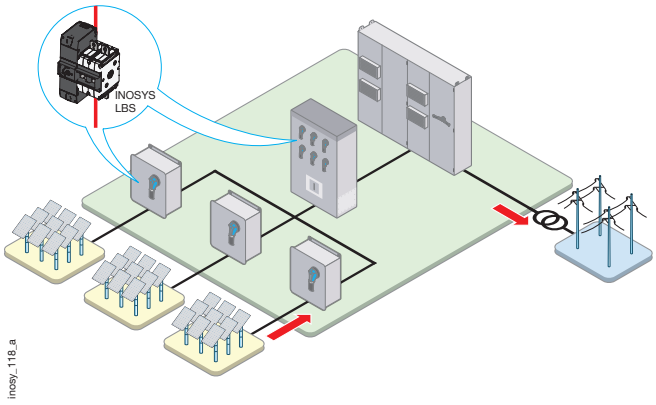
Compliance with environmental standards

- 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

socomec Innovative Power Solutions

Typical applications: local safe disconnection for DC and PV applications

PV system: Junction box, combiner box or inverter



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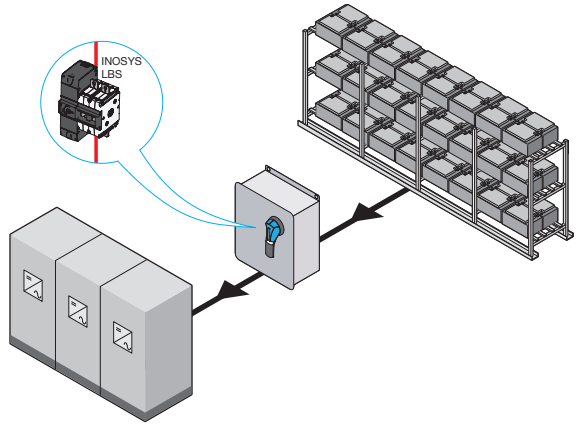
Battery isolation



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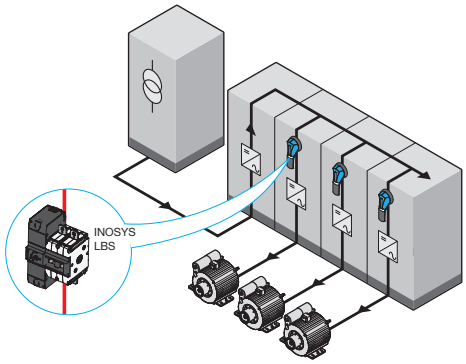
DC process isolation



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The SOCOMEC solutions

SIRCO PV

Manual PV switches

sirco-pv_059 - 060 - 061

Up to 3200 A at 1000 VDC
Up to 2000 A at 1500 VDC
Up to 4 circuits

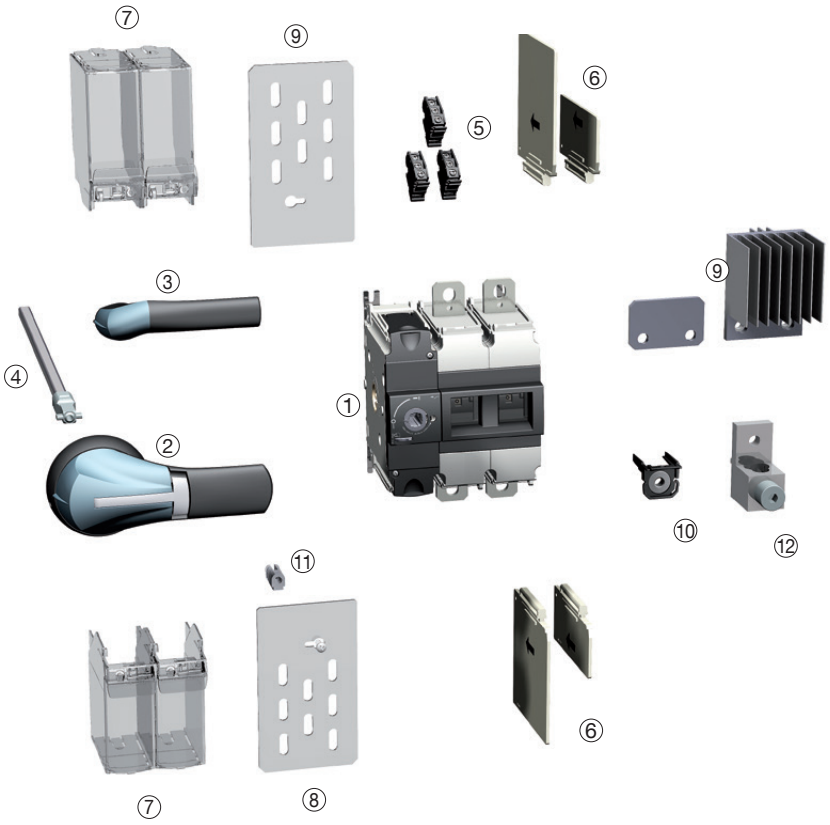
INOSYS LBS

Visible breaking switches for DC and PV applications

inosy_152

Up to 630 A (IEC) and
600 A (UL) at 1500 VDC

Introduction



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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

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**(3)		
		3 P (2 P+, 1P-)	86P0 **3016**		
250 A	F2	2 P (1 P+, 1 P-)	86P0 **2026**		
			86P1 **1026**(3)		
		3 P (2 P+, 1 P-)	86P0 **3025**		
315 A	F2	2 P (1 P+, 1 P-)	86P0 **2032**		
			86P1 **1032**(3)		
		3 P (2 P+, 1 P-)	86P0 **3031**		
400 A	F3	2 P (1 P+, 1 P-)	86P0 **2041**	Shaft 320 mm 1400 **1032** Handle type S2L Black IP 65 14AF **2111**	
			86P1 **1041**(3)		
630 A	F3	2 P (1 P+, 1 P-)	86P0 **2064**		
			86P1 **1064**(3)		

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

acces_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

acces_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 comptatible 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

acces_401_a_1_cat

Shaft guide for external operation

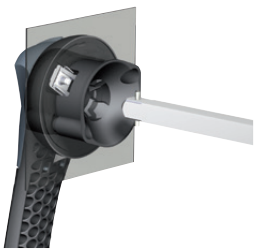
Use

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**



acces_260_a_2_cat

Auxiliary contact

Use

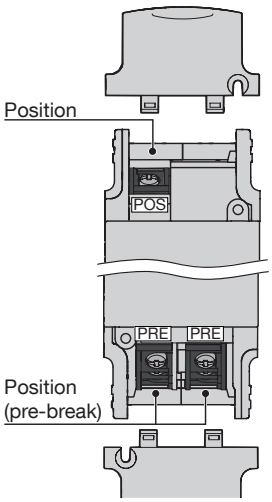
Provide information about the position and pre-break depending on installation location.

Characteristics

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

acces_402_a_1_cat

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



acces_465_a_1_gb_cat

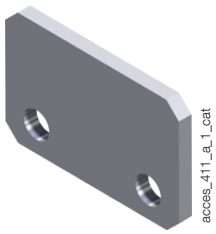
Characteristics

Type of auxiliary contact	Min. current (A)	I_{th} (A)	Operating current I_e (A)			
			24 VDC	48 VDC	230 VAC	440 VAC
			DC-14	DC-14	AC-15	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

Bridging bar for poles in series

Use

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



acces_411_a_1_1_cat

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**

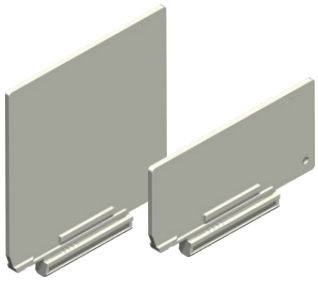
(1) Kit includes 2 identical bridging bars.

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.



acces_405_a_1_cat acces_406_a_1_cat

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**

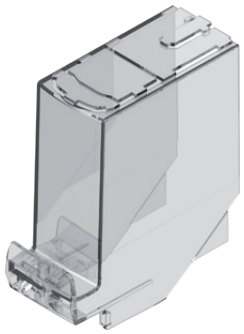
Terminal shrouds

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.



acces_407_a_1_cat

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.

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).

acces_408_a_1_cat

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**

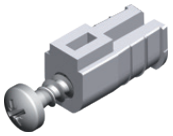
(1) Each reference comprises 2 terminal screens for top and bottom protection.

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**



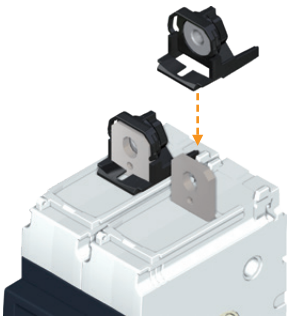
acces_409_a_1_cat

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**



acces_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**

acces_412_a_1_cat

Characteristics

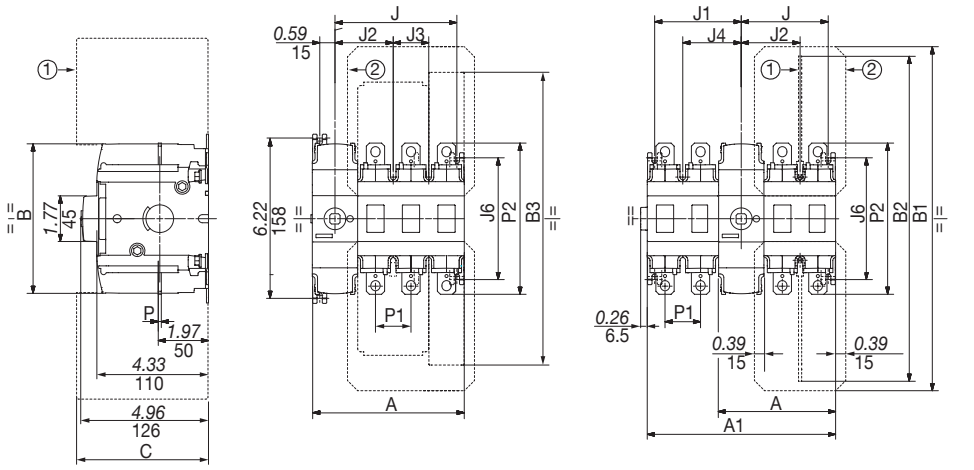
Characteristics according to IEC 60947-3

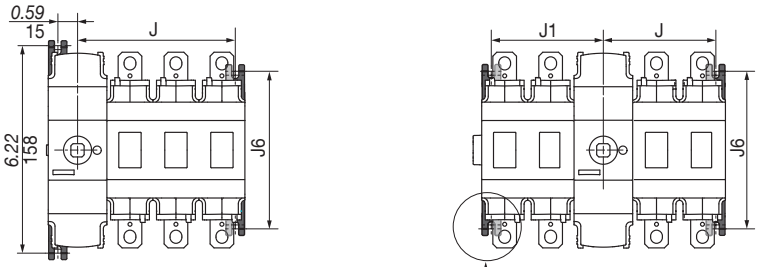
Rated current I_n			**160 A**	**250 A**	**315 A**	**400 A**	**500 A**	**630 A**
Frame size			**F2**	**F2**	**F2**	**F3**	**F3**	**F3**
Thermal current at 40 °C (A)			160	250	315	400	500	630
Thermal current at 50 °C (A)			160	250	315	400	500	630
Thermal current at 60 °C (A)			160	250	315	400	500	630
Rated 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)**	**I_e (A)**
1 circuit	1000 VDC (1)	DC-21 B	160	250	315	400	500	630
1 circuit	1500 VDC (2)	DC-21 B	160	250	315	400	500	630
Number of circuits	**Nominal voltage**	**Utilisation category**	**I_e (A)**	**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	630
2 circuits	1500 VDC (2)	PV2	-	-	-	400	500	630
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.

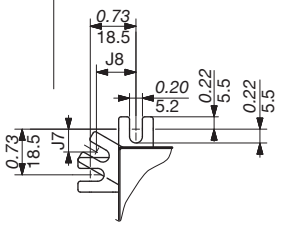
Dimensions (in/mm)

INOSYS LBS





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



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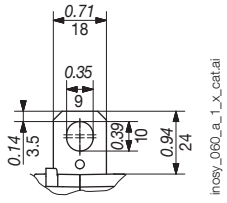
Wiring terminal F2



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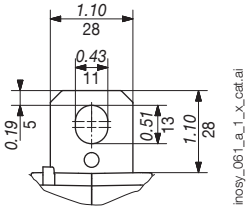
Wiring terminal F3



inosy_061_a_1_x_cat.ai

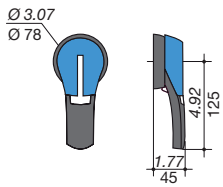
			A		A1	J	J1	J	
Rating (A)	Frame size	Units	2 P	3 P	1+1 P / 2+2 P	1+1 P / 2+2 P	1+1 P / 2+2 P	2 P	3 P
160 … 315	F2	inches	4.60	5.98	4.60 / 7.36	1.97 / 3.37	2.05 / 3.44	3.35	4.72
		mm	117	152	117 / 187	50.5 / 85.5	52.5 / 87.5	85.5	120.5
400	F3	inches	5.40	7.17	5.40 / 8.94	2.36 / 4.15	2.44 / 4.23	4.13	-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

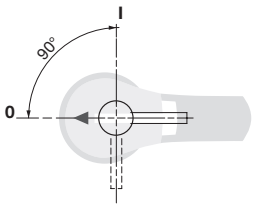
Rating (A)	Frame size	Units	B	B1	B2			B3	C		J2	J3	J4	J6	P1	P2
					IEC short	IEC long	UL		IEC	UL						
160 … 315	F2	inches	5.90	13.35	7.85	12.61	10.31	11.64	4.33	4.33	2.26	1.38	2.34	4.72	1.38	5.87
		mm	154	339	199	320	262	296	110	110	57.5	35	59.5	120	35	149
400	F3	inches	5.90	16.28	9.35	14.11	15.5	14.12	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

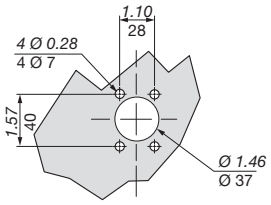
Dimensions of external handles (in/mm)

F2

Handle type	Front operation Direction of operation	Door drilling
S2 type		







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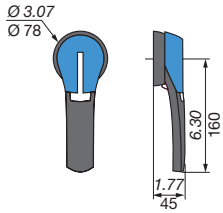
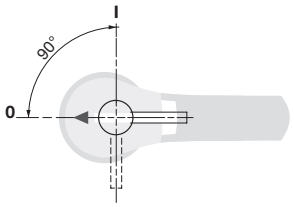
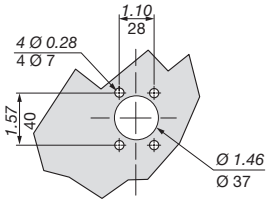
F3

Handle type	Front operation Direction of operation	Door drilling
S2L type		





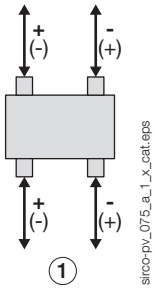


poign_069_b_1_us_cat.eps

Wiring configuration

1 circuit - 1000 VDC

F2-F3 - 2 P



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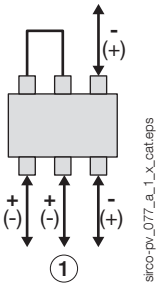
1. Circuit 1

1 circuit - 1500 VDC

F2 - 3 P



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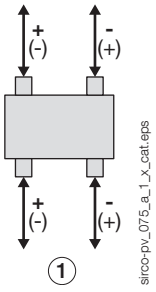
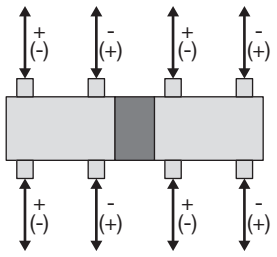
F2-F3 - 2 P



sirco-pv_075_a_1_x_cat.eps

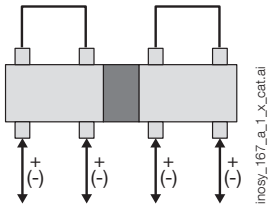
2 circuits - 1500 VDC

F3 - 2 P



inosy_165_a_1_x_cat.ai

1 circuit - 1500 VDC per polarity



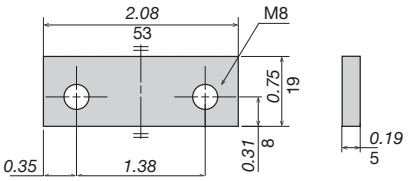
inosy_167_a_1_x_cat.ai

Bridging bars (in/mm)

F2

8409 0016(1)

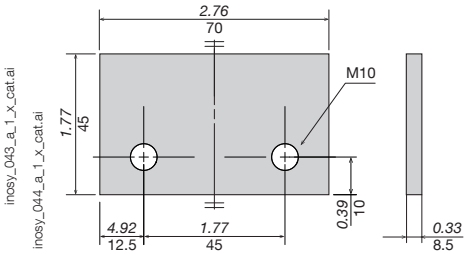
(1) Kit includes 2 identical bars.



F3

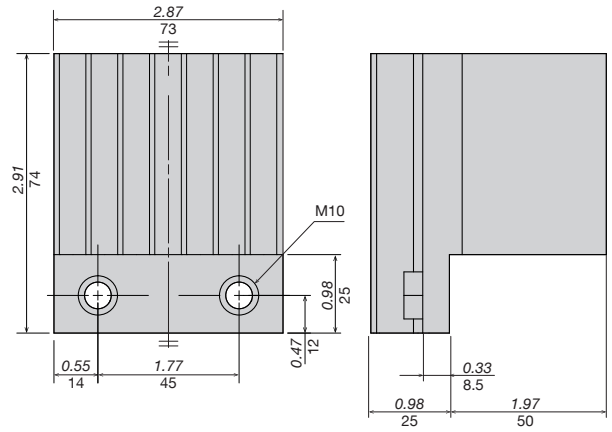
8409 0040 (1)

(1) Kit comprises 2 identical bars.

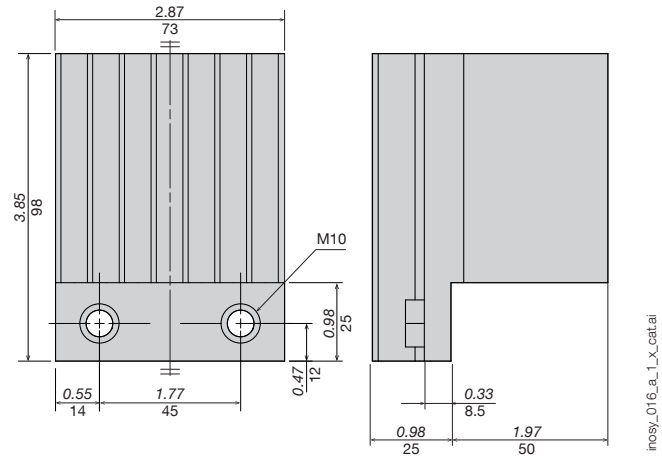


F3

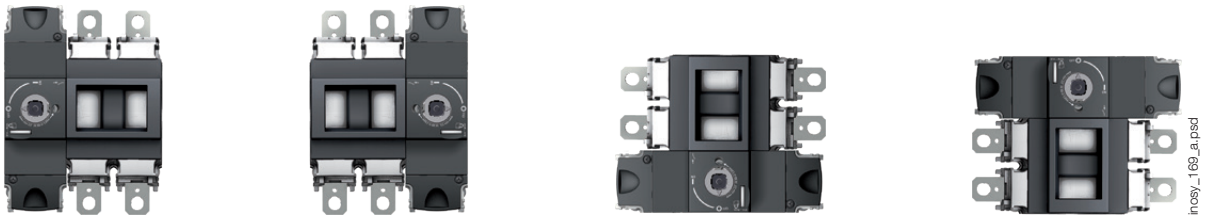
8409 0041



8409 0063



Mounting orientation

F2 - F3

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