

# *INOSYS LBS* DC IEC & UL

from 160 to 800 A  
up to 1500 VDC

Ed. 2



When **energy** matters



# INOSYS LBS

## Load Break Switches for DC & PV applications

from 160 to 800 A, up to 1500 VDC,  
with manual operation and manual operation with tripping function

Load break switches



**INOSYS LBS**  
2-poles with tripping function



**INOSYS LBS**  
2-poles without tripping function

DC-PV2

### The solution for

- > Disconnection within PV installation
- > Battery protection
- > Rapid shutdown for firefighter safety
- > Isolation of DC processes

### Strong points

- > High-performance switching in a compact frame
- > Safe & reliable operation
- > Tripping function
- > Easy to install
- > Modular solution
- > Visible contact indication

### Conformity to standards

- > IEC 60947-3, DC-21B & DC-PV2
- > UL 98B



Compatible with requirements:

- > IEC 60364-7-712
- > NEC art. 690



### Conformity to environment standards

- > IEC 60947-1 Annex Q, Level 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



## Function

**INOSYS LBS** are load break switches which are available in manual operation or manual operation with integrated tripping function. They can be operated using the handle (manual and trip versions) or remotely via tripping coils (trip version) to disconnect all or part of electrical installation.

They make and break under all load conditions, provide safety isolation for any low voltage circuits up to 1500 VDC and are suitable for emergency switching. They are available for DC-PV2 utilization category.

## Advantages

### High-performance switching in a compact frame

INOSYS LBS switches integrate a patented technology that offers high switching capacity. 500 and 750 VDC per pole provides 1500 VDC in 2 poles only with optimum arc containment and significant power loss reduction - all within a compact device.

### Safe & reliable operation

- Reliable position indication through visible contacts.
- The opening and closing of the switch is fully independent from the speed of operation, ensuring safe operation under all conditions.
- High temperature withstand: no derating up to 55°C (131°F), functional from -40 to +70°C.

### Designed for harsh environments

- Vibration testing (from 13.2 to 100 Hz at 0.7 G).
- Shock testing (15 g during three cycles).
- Humid temperature testing (2 cycles, 55 °C with 95% humidity level).
- Salt mist testing (3 cycles with humidity storage, 40 °C, 93% humidity after each cycle).

### Modular solution for a flexible configuration

- Single or dual polarity switching

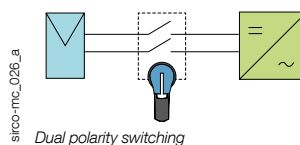
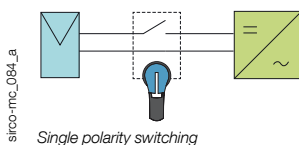
The same switch can be used for installation with either grounded or floating networks by choosing the wiring configuration.

### Easy to install

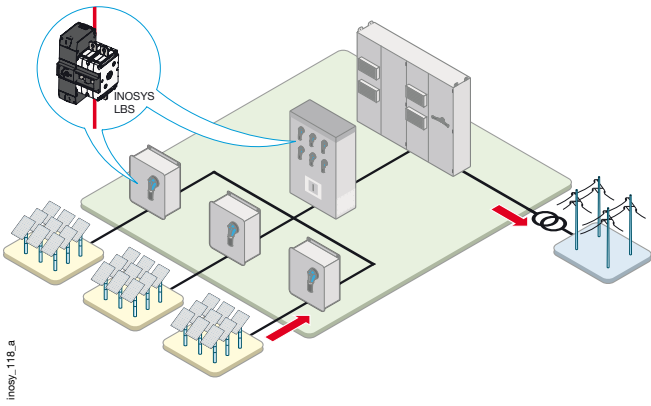
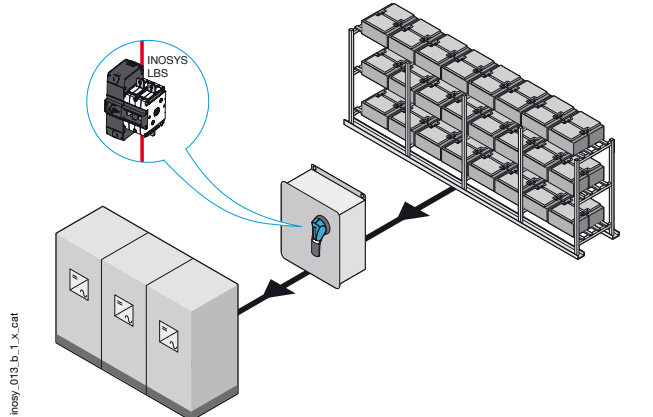
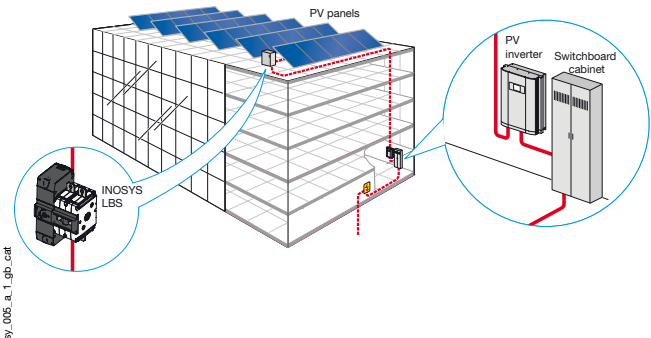
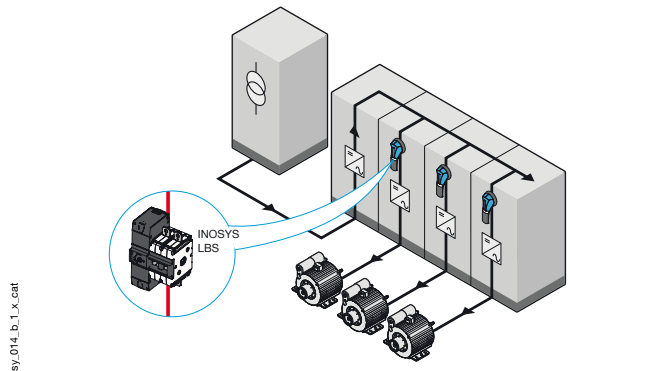
- Wiring: as the switch is non-polarised all types of wiring and connections are possible.
- Easy access without tools to integrate auxiliary contacts and tripping coil (both located within the switch footprint).

### Tripping function: flexible and robust



- Fully immune to external perturbation: no nuisance tripping.
- ON, OFF and TRIP positions are stable: resistant to voltage fluctuations.
- Trip position provides complete disconnection and isolation.
- Shunt-trip or undervoltage release from 24 to 220 VDC and from 24 to 230 VAC.
- Fast disconnection (<50 ms) for rapid firefighter shutdown, compliant with installation standards.



### Typical applications: local and remote safe disconnection for DC and PV applications

<p><b>PV installation: Combiner box, Recombiner box or Inverter</b></p>  <p>inosy_118_a</p>	<p><b>Battery protection</b></p>  <p>inosy_013_b_1_x_cat</p>
<p><b>Rapid shutdown for firefighter safety (compliant with installation standards, incl. NEC 2014)</b></p>  <p>inosy_005_a_1_gb_cat</p>	<p><b>Isolation of DC processes</b></p>  <p>inosy_014_b_1_x_cat</p>

### The SOCOMEC solutions

<p><b>SIRCO PV</b> Manual operation PV switches</p>  <p>up to 3200 A at 1000 VDC up to 2000 A at 1500 VDC up to 4 circuits</p> <p>sirco-pv_059 - 060 - 061_a</p>	<p><b>INOSYS LBS</b> Up to 1500 VDC with visible contact indication - with or without tripping function</p>  <p>Up to 630A (IEC) and 500A (UL) at 1500 VDC</p> <p>inosy_140_a - inosy_152_a</p>
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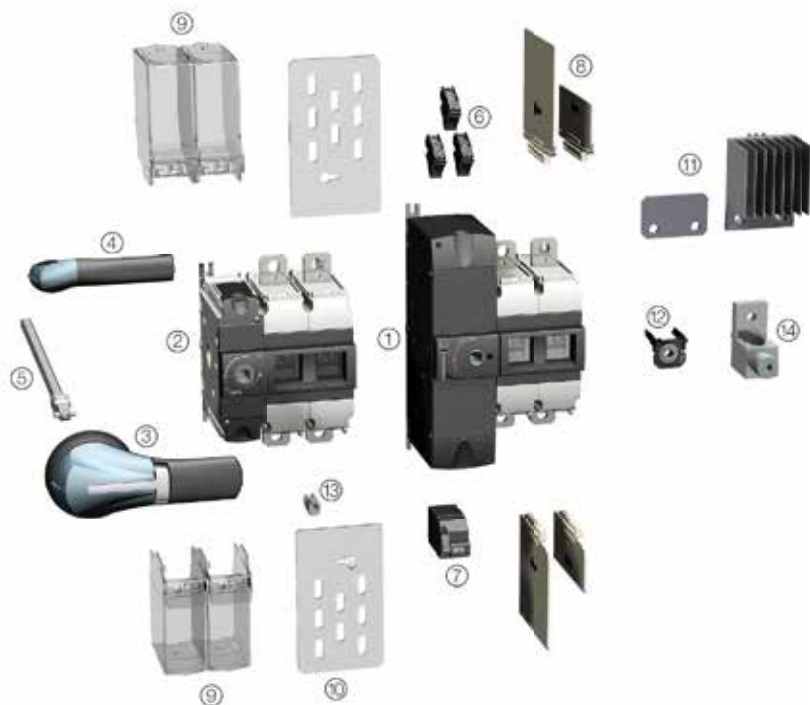
# INOSYS LBS

Load Break Switches for DC & PV applications

from 160 to 800 A, up to 1500 VDC,

with manual operation and manual operation with tripping function

## Overview



1. INOSYS LBS 400 A - 1000 VDC, with tripping function
2. INOSYS LBS 400 A - 1500 VDC, without tripping function
3. Door interlocked external operation handle
4. Direct operation handle
5. Shaft for external handle
6. Auxiliary contact
7. Tripping coil
8. Inter-phase barrier
9. Terminal shrouds
10. Terminal screens
11. Bridging bars for connection poles in series
12. Captive nut
13. Holding insert
14. Terminal lugs

inosy\_057.psd

## References (continued)

### INOSYS LBS without tripping function

#### 1000 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body <sup>(1)</sup>	External operation	Aux. Contact	Bridging Bar <sup>(2)</sup>
160 A	F2	2 P (1 P+, 1 P-)	86P0 2016	Shaft 320 mm 1400 1032  S2 type handle 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  S2L type handle Black IP65 14AF 2111		

(1) The switches are supplied without accessories.

(2) Please consult us

#### 1500 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body <sup>(1)</sup>	External operation	Aux. Contact	Bridging Bar <sup>(2)</sup>
160 A	F2	2P (1P+, 1P-)	86P0 2017 <sup>(4)</sup>	Shaft 320 mm 1400 1032  S2 type handle Black IP 65 742F 2111	NO/NC 8499 0001	-
			86P1 1017 <sup>(3)(4)</sup>			8409 0016
		3P (2P+, 1P-)	86P0 3016			-
250 A	F2	2P (1P+, 1P-)	86P0 2026 <sup>(4)</sup>			-
			86P1 1026 <sup>(3)(4)</sup>			8409 0016
315 A	F2	3P (2P+, 1P-)	86P0 3025			-
			86P0 2032 <sup>(4)</sup>	8409 0016		
400 A	F3	2P (1P+, 1P-)	86P1 1032 <sup>(3)(4)</sup>	-		
			86P0 3031	8409 0016		
630 A	F3	2P (1P+, 1P-)	86P0 2041	Shaft 320 mm 1400 1032	-	
			86P1 1041 <sup>(3)</sup>	S2L type handle Black IP 65 14AF 2111	-	
630 A	F3	2P (1P+, 1P-)	86P0 2064	-		
			86P1 1064 <sup>(3)</sup>	-		

#### 1500 VDC - 2 circuits

Rating (A)	Frame size	No. of poles per circuit	Switch body <sup>(1)</sup>	External operation	Aux. Contact	Bridging Bar <sup>(2)</sup>
400 A	F3	2P (1P+, 1P-)	86P2 2041 <sup>(3)</sup>	Shaft 320 mm 1400 1032	NO/NC 8499 0001	-
630 A			86P2 2064 <sup>(3)</sup>	S2L type handle Black IP 65 14AF 2111		

(1) The switches are supplied without accessories.

(2) For isolated networks.

(3) Centered mechanism.

(4) Availability Q4 2019.

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## References

### INOSYS LBS with tripping function

#### 1000 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body <sup>(1)</sup>	External operation	Tripping coil	Aux. Contact	Bridging Bar <sup>(2)</sup>	
160 A	F2	2 P (1P+, 1P-)	84P0 2016	Shaft 320 mm 1400 1032	Shunt trip coil 24 V AC/DC 8499 7002	NO/NC 8499 0001	-	
250 A	F2		84P0 2025		S2 type handle Black IP65 742F 2118			48 V AC/DC 8499 7004
315 A	F2		84P0 2031					230 V AC/DC 8499 7023
400 A	F3		84P0 2040	Shaft 320 mm 1400 1032	Undervoltage releases 48 VAC 8499 8104			
630 A	F3		84P0 2063		230 VAC 8499 8123			
800 A	F3		84P0 2080		S2L type handle Black IP65 74AF 2118			24 VDC 8499 8202
					48 VDC 8499 8204			

(1) The switches are supplied without accessories.

(2) Please consult us

#### 1500 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body <sup>(1)</sup>	External operation	Tripping coil	Aux. Contact	Bridging Bar <sup>(2)</sup>			
160A	F2	2P (1P+, 1P-)	84P0 2017 <sup>(4)</sup>	Shaft 320 mm 1400 1032	Shunt trip coil 24 VAC/DC 8499 7002	NO/NC 8499 0001	-			
			84P11 017 <sup>(3)</sup>					8409 0016		
250A	F2	3P (2P+, 1P-)	84P0 3016		S2 type handle Black IP 65 742F 2118		48 VAC/DC 8499 7023	Undervoltage release 48 VAC 8499 8104	-	
			84P0 2026 <sup>(4)</sup>							8409 0016
315A	F2	2P (1P+, 1P-)	84P1 1026 <sup>(3)</sup>		S2L type handle Black IP 65 74AF 2118		230 VAC/DC 8499 7023		24 VDC 8499 8202	8409 0016
			84P0 3025							
400A	F3	3P (2P+, 1P-)	84P0 2032 <sup>(4)</sup>	Shaft 320 mm 1400 1032	Undervoltage release 48 VAC 8499 8104	48 VDC 8499 8202	-			
			84P1 1032 <sup>(3)</sup>							8409 0016
630A	F3	2P (1P+, 1P-)	84P0 3031	S2L type handle Black IP 65 74AF 2118	230 VAC 8499 8123		24 VDC 8499 8202	8409 0016		
			84P0 2041							8409 8202
			84P0 2064		48 VDC 8499 8202					

(1) The switches are supplied without accessories

(2) For isolated networks

(3) Centered mechanism - consult us for availability

(4) Availability Q4 2019.

## Accessories

### Direct operation handle

#### For LBS with tripping function

Frame size	Handle type	Handle colour	Reference
F2 - F3	E3	Black	8499 <b>5032</b>



E2 type handle

access\_400\_a1\_cat

#### For LBS without tripping function

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

### Door interlocked external operation handle

#### Use

Door interlocked external operation handles include an escutcheon and are padlockable. External handles must be utilised with an extension shaft.

Note: We recommend to use IP55 for inside applications and IP65 for outside applications.

#### Example of application

As the handle is interlocked in the "ON" position the operator must safely disconnect and isolate the circuit prior to accessing the panel for maintenance procedures.

Opening the door when the switch is in the "ON" position can only be done by defeating the interlocking function with the use of a dedicated tool (authorised persons only). The interlocking function is restored when the door is re-closed.



S2 type handle

access\_150\_eps

#### For LBS with tripping function

Frame size	Handle type	Handle colour	Degree of protection	Front operation	
				Reference	
F2	S2	Black	IP55	7421 <b>2118</b>	
F2	S2	Black	IP65	742F <b>2118</b>	
F2	S2	Red	IP65	742G <b>2118</b>	
F3	S2L <sup>(1)</sup>	Black	IP55	74A1 <b>2118</b>	
F3	S2L <sup>(1)</sup>	Black	IP65	74AF <b>2118</b>	
F3	S2L <sup>(1)</sup>	Red	IP65	74AG <b>2118</b>	

(1) S2L handles have an extended grip; please refer to the dimensions section.

#### For LBS without tripping function

Frame size	Handle type	Handle colour	Degree of protection	Front operation	Lateral operation
				Reference	Reference
F2	S2	Black	IP55	7421 <b>2111</b>	
F2	S2	Black	IP65	742F <b>2111</b>	14YA <b>2111</b>
F2	S2	Red	IP65	742G <b>2111</b>	14YB <b>2111</b>
F3	S2L <sup>(1)</sup>	Black	IP55	14A1 <b>2111</b>	
F3	S2L <sup>(1)</sup>	Black	IP65	14AF <b>2111</b>	14AA <b>2111</b>
F3	S2L <sup>(1)</sup>	Red	IP65	14AG <b>2111</b>	14AB <b>2111</b>

(1) S2L handles have an extended grip; please refer to the dimensions section.

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### Accessories (continued)

#### Shaft for external handle

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 lengths: please consult us.



Shaft for S2 and S2L type handle

access\_401\_a\_1\_cat

#### Shaft guide for external handle

##### Use

To guide the shaft extension into the external handle.

This accessory enables the handle to engage the extension shaft with a misalignment of up to 15 mm / 0.59 in.

Recommend for a shaft length over 320 mm / 12.6 in.



access\_280\_a\_2\_cat

Description	Reference
Shaft guide	1429 0000

#### Alternative S-type handle cover colours

##### Use

For S2 and S2L type single grip handles.

Handle colour	Handle type	To be ordered in multiples of	Reference
Light grey	S2, S2L	50	1401 0001
Dark grey	S2, S2L	50	1401 0011

Other colours: please consult us.



access\_199\_a\_1\_cat

#### Auxiliary contact

##### Use

The same auxiliary contact can be used to provide position and tripping information. The function of the auxiliary contact depends on where it is mounted on the mechanism.

##### Characteristics

Changeover type: NO/NC, IP2X with front operation (cover tap screwed). 10 000 operations. Maximum 3 per switch.

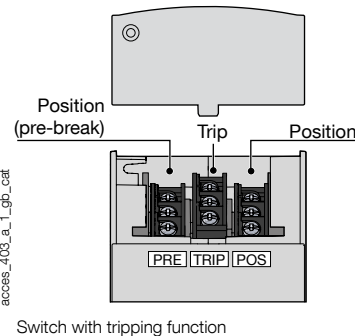
Frame size	Connection type	Type	Reference
F2 - F3	Screw	NO/NC standard	8499 0001
F2 - F3	Screw	NO/NC low level	8499 0002
F2 - F3	Screw	NC > 600 V	8499 0003



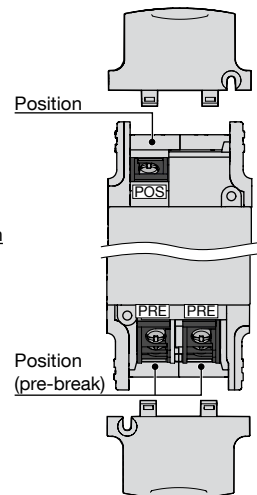
access\_402\_a\_1\_cat

##### Characteristics

Auxiliary contact type	Min. current (A)	I <sub>th</sub> (A)	Operating current I <sub>e</sub> (A)				
			24 VDC DC-14	48 VDC DC-14	230 VAC AC-15	440 VAC AC-15	690 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	-
> 600 V	10 mA / 24 V	16	1	0.2	4	4	0.5



Switch with tripping function



Switch without tripping function

access\_403\_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 for 1500 VDC in 3 poles.

Connection diagrams, see "Pole connection in series" page 14.



Frame size	Rating (A)	Quantity to be ordered for 1500 VDC configuration	Reference
F2	160 ... 315	1 <sup>(1)</sup>	8409 0016 <sup>(2)</sup>

(1) For insulated network (switching of both polarities + and -).  
 (2) Kit comprises 2 identical bridging bars.

### Tripping coil

#### Use

Allows remote activation of the switch's tripping mechanism. Shunt trip and undervoltage release coils are available.

Connection: 1.5 mm<sup>2</sup>, push in type. Maximum one tripping coil per switch. Safe and easy coil replacement by using standard tools.



Shunt trip coil

#### Shunt trip coil

Frame size	Voltage (V)	Reference
F2 - F3	24 V AC/DC	8499 7002
F2 - F3	48 V AC/DC	8499 7004
F2 - F3	110 - 127 VAC ; 110 - 125 VDC	8499 7011
F2 - F3	230 V AC/DC	8499 7023

Other voltage ratings available, please consult us.

#### Undervoltage release

Frame size	Voltage (V)	Reference
F2 - F3	48 VAC	8499 8104
F2 - F3	110 - 120 VAC	8499 8111
F2 - F3	230 - 240 VAC	8499 8123
F2 - F3	24 VDC	8499 8202
F2 - F3	48 VDC	8499 8204

Other voltage ratings available, please consult us.

### Characteristics

#### Shunt trip coils

AC type (±10%)	24 VAC	48 VAC	110 VAC	230 VAC
Inrush consumption (A); <10ms	6.85	2.95	1.25	0.73
DC type (-5% ... +20%)	24 VDC	48 VDC	110 VDC	230 VDC
Inrush consumption (A), <10ms	7.6	3.28	1.39	0.78

Max supply time 2 s.

Example to avoid permanent supply includes connection of auxiliary contact connected in series with shunt trip coil, or coil supply voltage to be taken from the load side, or electronic limitation of the duration of the supply voltage/current. For DC shunt trip coil rated above 70 VDC, external relay shall be used to disconnect the coil.

#### Undervoltage release

AC type	24 VAC	48 VAC	110 VAC	230 VAC
Max permanent consumption (VA), at 110% U <sub>n</sub>	-	1.8	1.4	1.5
DC type	24 VDC	48 VDC	110 VDC	230 VDC
Max permanent consumption (VA), at 110% U <sub>n</sub>	1.6	1.4	-	-

Holding: up to 85% x U<sub>n</sub>

Release: < 35 to 70% x U<sub>n</sub>

### Inter-phase barrier

#### Use

Provides safety isolation between the terminals, essential for use at 1000 and 1500 VDC or between 2 circuits.

Frame size	Type	Pack (unit)	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



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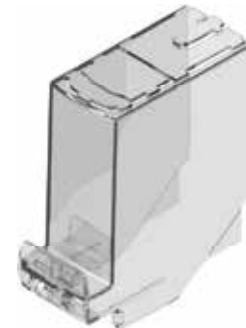
#### Terminal shroud

##### 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.



access\_407\_a\_1\_cat

Frame size	Pack (unit)	No. of poles	Position	Reference
F2	3	1 P	Top or bottom	8499 <b>4213</b> <sup>(1)</sup>
F2	4	1 P	Top or bottom	8499 <b>4214</b> <sup>(1)</sup>
F3	3	1 P	Top or bottom	8499 <b>4313</b> <sup>(1)</sup>
F3	4	1 P	Top or bottom	8499 <b>4314</b> <sup>(1)</sup>

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

#### Terminal screen

##### Use

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

##### Advantages

Perforations for thermographic inspection. Mounting requires holding inserts (supplied with the terminal screens).



access\_408\_a\_1\_cat

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

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

#### Holding insert

##### Use

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

Frame size	Pack (unit)	Reference
F2 - F3	10	8499 <b>6220</b>
F2 - F3	100	8499 <b>6221</b>



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.



acce\_3919\_a\_1\_cat

Frame size	Pack (unit)	Reference
F2	12	8499 6120
F2	120	8499 6121
F3	12	8499 6130
F3	120	8499 6131

### Voltage tap

#### Use

Allows connection of voltage sensing or power cables, with fast-on connection.



acce\_412\_a\_1\_cat

Frame size	Pack (unit)	Reference
F2	12	8499 9012
F3	12	8499 9013

## Characteristics

### Characteristics according to IEC 60947-3

Rated current $I_n$			160 A	250 A	315 A	400 A	630 A	800 A
Frame size			F2	F2	F2	F3	F3	F3
Thermal current at 40°C (A)			160	250	315	400	630	800
Thermal current at 50°C (A)			160	250	315	400	630	760
Thermal current at 60°C (A)			160	250	315	400	570	685
Rated insulation voltage U (V)			1500	1500	1500	1500	1500	1500
Rated impulse withstand voltage $U_{imp}$ (kV)			12	12	12	12	12	12
Number of circuits	Rated 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 <sup>(1)</sup>	DC-21 B	160	250	315	400	630	800
1 circuit	1500 VDC <sup>(2)</sup>	DC-21 B	160	250	315	400	630	-
Number of circuits	Rated 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 <sup>(1)</sup>	PV2	-	-	-	-	-	-
1 circuit	1500 VDC <sup>(2)</sup>	PV2	160	250	315	400	630	-
2 circuits	1500 VDC <sup>(2)</sup>	PV2	-	-	-	400	630	-
Short-circuit capacity at 1000 & 1500VDC (without protection)								
Rated short-time withstand current $I_{sw}$ 1s (kA eff.)			5	5	5	8	8	8
Rated short-circuit making capacity $I_{cm}$ (kA peak) - 60 ms			10	10	10	10	10	10
Connection								
Recommended Cu rigid cable cross-section (mm <sup>2</sup> ) <sup>(3)</sup>			70	120	185	240	2 X 185	2X 240
Recommended Cu busbar width (mm) <sup>(3)</sup>			20	20	20	25	25	25
Mechanical characteristics								
Durability (number of operating cycles)			8000	8000	8000	8000 / 6000 <sup>(4)</sup>	8000 / 6000 <sup>(4)</sup>	8000 / 6000 <sup>(4)</sup>
Number of tripping operations			1000	1000	1000	1000	1000	1000
Power loss/pole (W/Pole)			4.5	11.2	13	13	30.2	50

(1) 2 poles in series.

(2) 2 or 3 poles in series.

(3) For aluminium connection, please consult us.

(4) 8000 for LBS without tripping function and 6000 for LBS with tripping function.

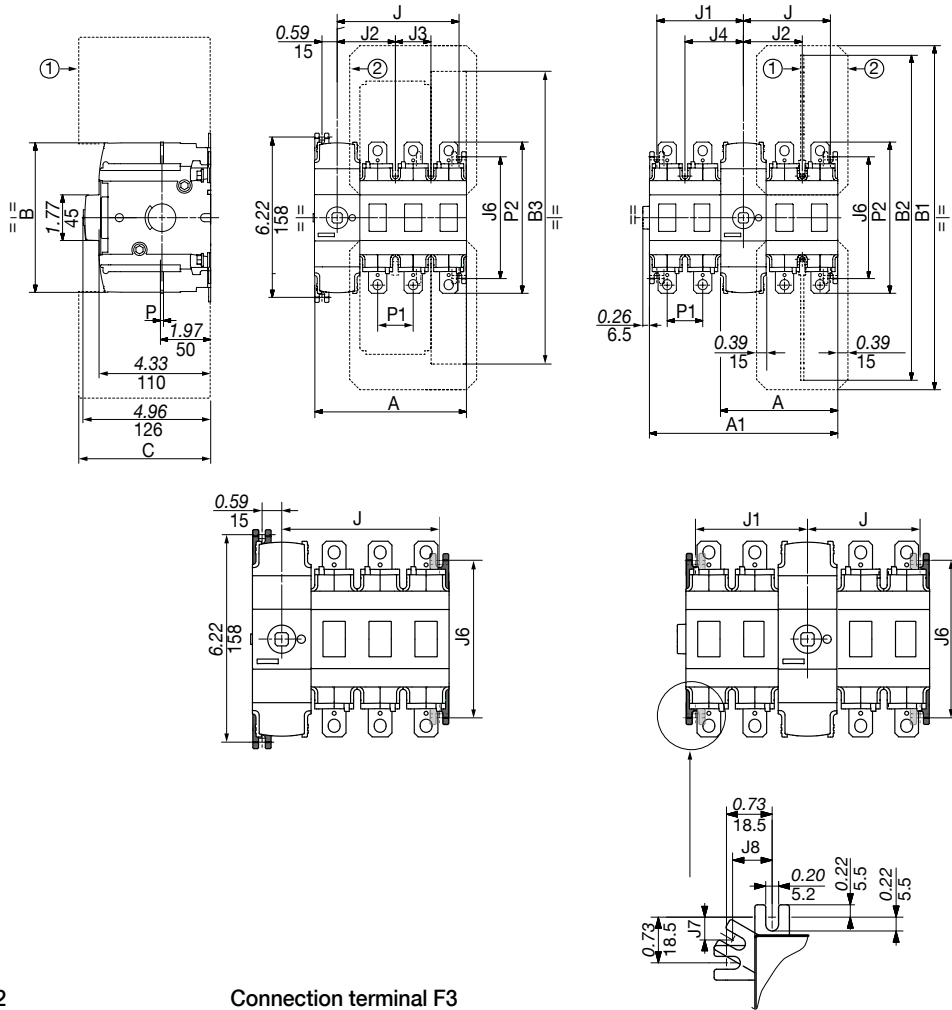
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Load Break Switches for DC & PV applications

from 160 to 800 A, up to 1500 VDC,

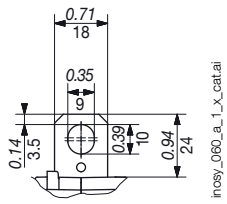
with manual operation and manual operation with tripping function

## INOSYS LBS without tripping function

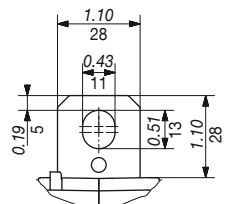


- 1. Inter-phase barrier.
- 2. Terminal screens.

### Connection terminal F2



### Connection terminal F3

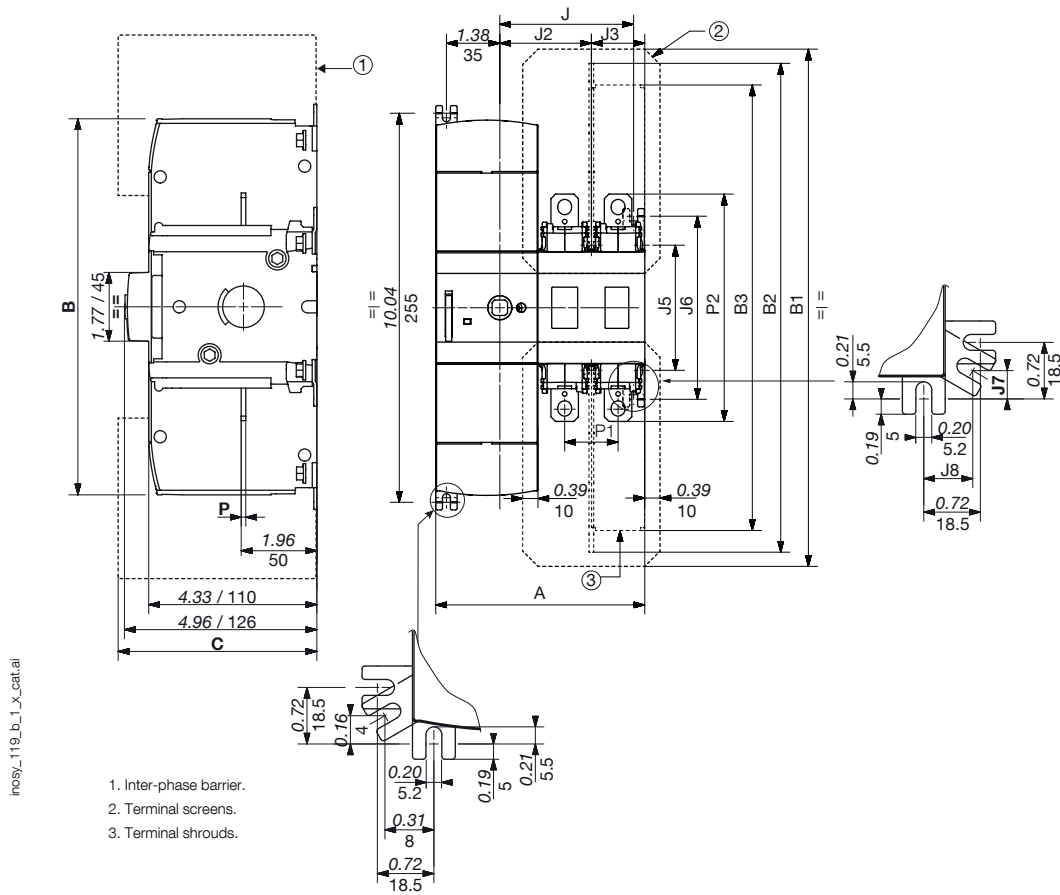


Rating (A)	Frame size	Units	A		A1		J		J1		J	
			2 P	3 P	1+1 P / 2+2 P	1+1 P / 2+2 P	1+1 P / 2+2 P	1+1 P / 2+2 P	2 P	3 P		
160 ... 315	F2	in	4.60	5.98	4.60 / 7.36	1.97 / 3.37	2.05 / 3.44	3.35	4.72			
		mm	117	152	117 / 187	50.5 / 85.5	52.5 / 87.5	85.5	120.5			
400	F3	in	5.40	7.17	5.40 / 8.94	2.36 / 4.15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

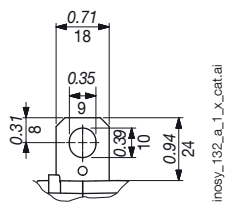
Rating (A)	Frame size	Units	B	B1	B2			B3	C		J2	J3	J4	J6	P1	P2
			IEC short	IEC long	UL	IEC	UL									
160 ... 315	F2	in	5.90	13.35	7.85	12.61	10.31	11.64	4.33	4.33	2.26	1.38	2.34	4.72	1.38	5.87
		mm	154	339	199	320	262	296	110	110	57.5	35	59.5	120	35	149
400	F3	in	5.90	16.28	9.35	14.11	15.5	14.12	4.33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

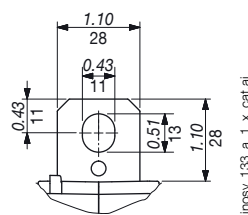
#### INOSYS LBS with tripping function



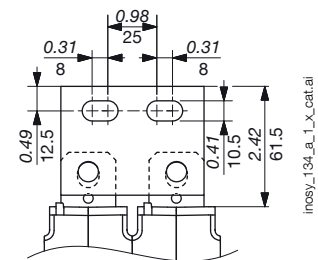
Connection terminal F2



Connection terminal F3



Parallel bridging F3



Rating (A)	Frame size	Units	A	
			2 P	3 P
160 ... 315	F2	in	5.39	6.77
		mm	137	172
400 ... 800	F3	in	6.18	-
		mm	157	-

Rating (A)	Frame size	Units	B		B2		B3	C	J2	J3	J4	J5	J6	P	P2
			short	long											
160 ... 315	F2	in	9.69	13.35	7.85	12.61	11.64	4.33	2.36	1.38	3.03	3.23	4.72	0.12	5.87
		mm	246	339	199	320	296	110	60	35	77	82	120	3	149
400 ... 800	F3	in	9.69	16.28	9.35	14.11	14.12	4.33	2.76	1.77	3.43	4.72	6.22	0.20	7.87
		mm	246	414	237	358	359	110	70	45	87	120	158	5	200

# INOSYS LBS

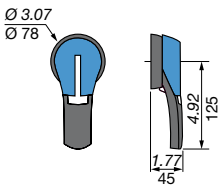
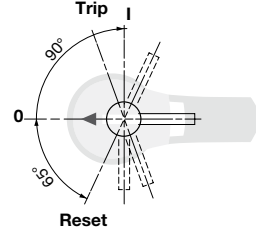
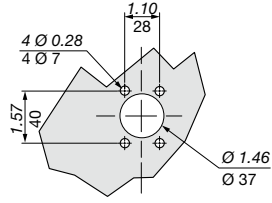
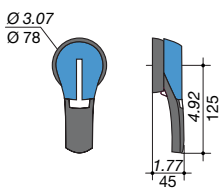
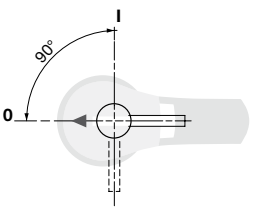
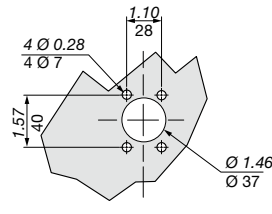
Load Break Switches for DC & PV applications

from 160 to 800 A, up to 1500 VDC,

with manual operation and manual operation with tripping function

## Dimensions for external handles (in/mm)

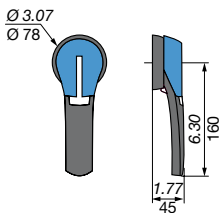
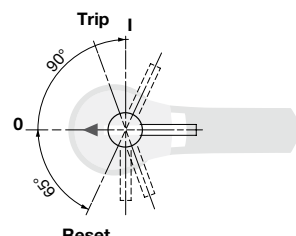
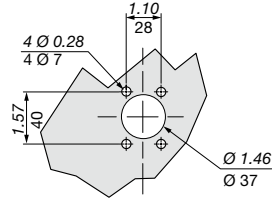
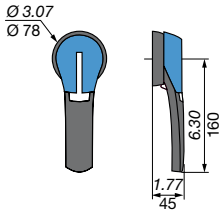
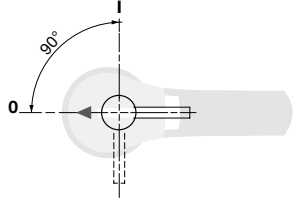
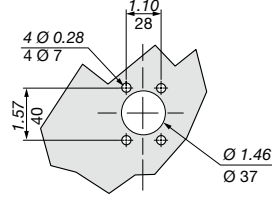
### F2 frame size

Handle type	Front operation Direction of operation	Door drilling
<b>S2 type</b> with trip 		
<b>S2 type</b> 		

poign\_057\_b\_1\_us\_cat.eps

poign\_013\_b\_1\_us\_cat.eps

### F3 frame size

Handle type	Front operation Direction of operation	Door drilling
<b>S2L type</b> with trip 		
<b>S2L type</b> 		

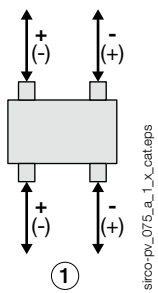
poign\_068\_b\_1\_us\_cat.eps

poign\_069\_b\_1\_us\_cat.eps

### Pole connections in series

#### 1 PV circuit - 1000 VDC

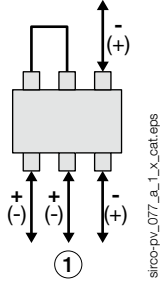
F2-F3 - 2 P



1. Circuit 1

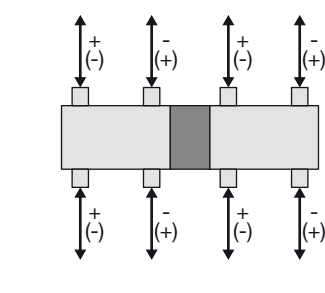
#### 1 PV circuit - 1500 VDC

F2 - 3 P



#### 2 PV circuit - 1500 VDC

F3 - 2 P

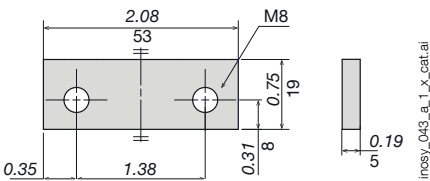


### Bridging bars (in/mm)

#### F2

8409 0016<sup>(1)</sup>

(1) Kit comprises 2 identical bars.



### Mounting orientation

#### F2 - F3

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





# INOSYS *LBS* UL 98B

## Load Break Switches for DC & PV applications

from 100 to 600 A, up to 1500 VDC,  
with manual operation and manual operation with tripping function

Load break switches



**INOSYS LBS**  
2-poles with tripping function



**INOSYS LBS**  
2-poles without tripping function

### The solution for

- Disconnection within PV installation
- Battery protection
- Rapid shutdown for firefighter safety
- Isolation of DC processes

### Strong points

- High-performance switching in a compact frame
- Safe & reliable operation
- Tripping function
- Easy to install
- Modular solution
- Visible contact indication

### Conformity to standards

- IEC 60947-3, DC-21B & DC-PV2
- UL 98B



Compatible with requirements:

- IEC 60364-7-712
- NEC art. 690



## Function

**INOSYS LBS** are load break switches which are available in manual operation or manual operation with integrated tripping function. They can be operated using the handle (manual and trip versions) or remotely via tripping coils (trip version) to disconnect all or part of electrical installation.

They make and break under all load conditions, provide safety isolation for any low voltage circuits up to 1500 VDC and are suitable for emergency switching. They are available for DC-PV2 utilization category.

## Advantages

### High-performance switching in a compact frame

INOSYS LBS switches integrate a patented technology that offers high switching capacity. 500 and 750 VDC per pole provides 1500 VDC in 2 poles only with optimum arc containment and significant power loss reduction - all within a compact device.

### Safe & reliable operation

- Reliable position indication through visible contacts.
- The opening and closing of the switch is fully independent from the speed of operation, ensuring safe operation under all conditions.
- High temperature withstand: no derating up to 55 °C (131 °F), functional from -40 to +122 °F (-40 to +50 °C).

### Designed for harsh environments

- Vibration testing (from 13.2 to 100 Hz at 0.7 g).
- Choc testing (15 g during three cycles).
- Humid temperature testing (2 cycles, 55 °C/131 °F with 95% humidity level).
- Salt mist testing (3 cycles with humidity storage, 40 °C/104 °F, 93% humidity after each cycle).

### Easy to install

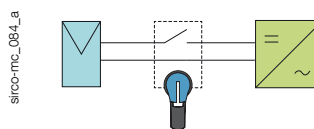
- Wiring: as the switch is non-polarised all types of wiring and connections are possible.
- Easy access without tools to integrate auxiliary contacts and tripping coil (both located within the switch footprint).
- Mechanism can be centred or left aligned (in the factory) to accommodate installation requirements.

### Tripping function: flexible and robust

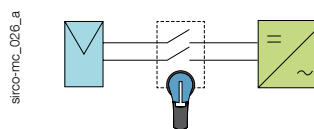
- Fully immune to external perturbation: no nuisance tripping.
- ON, OFF and TRIP positions are stable: resistant to voltage fluctuations.
- Trip position provides complete disconnection and isolation.
- Shunt-trip or undervoltage release from 24 to 220 VDC and from 24 to 230 VAC.
- Fast disconnection (<50 ms) for rapid firefighter shutdown, compliant with installation standards.
- Compatible with virtually any Arc-Fault Detection System.

### Modular solution for a flexible configuration

- Single or dual polarity switching  
The same switch can be used for installation with either grounded or floating networks by choosing the wiring configuration.



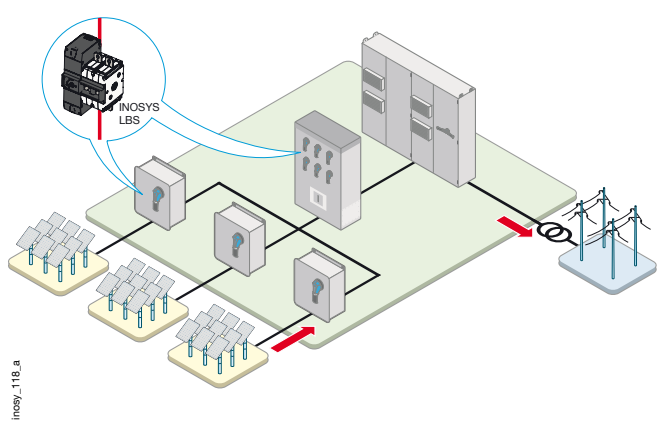
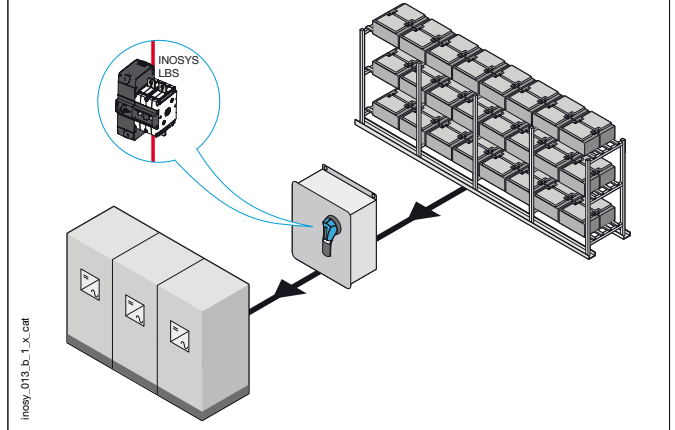
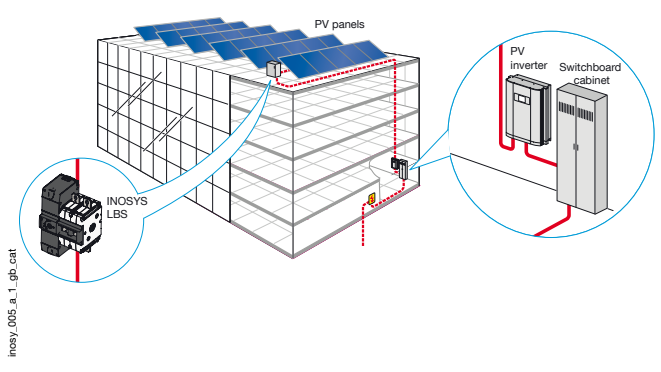
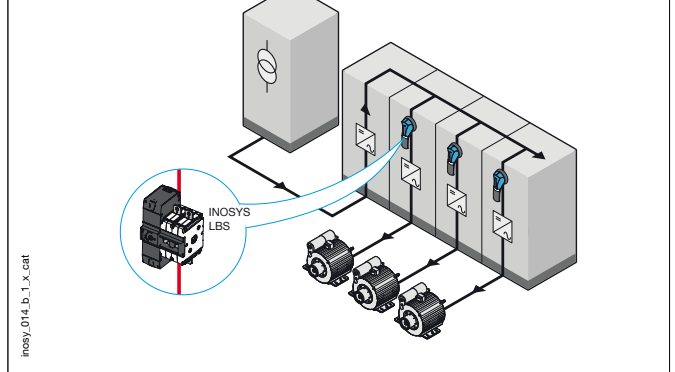
Single polarity switching



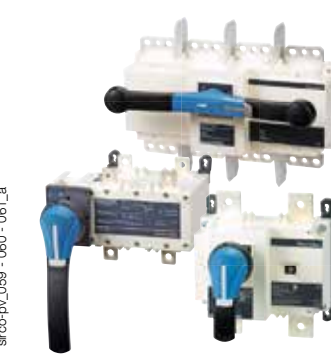

Dual polarity switching



### Typical applications: local and remote safe disconnection for DC and PV applications

<p><b>PV installation: Combiner box, Recombiner box or Inverter</b></p>  <p><small>inosy_118_a</small></p>	<p><b>Battery protection</b></p>  <p><small>inosy_013_b_1_x_cat</small></p>
<p><b>Rapid shutdown for firefighter safety (compliant with installation standards, incl. NEC 2014)</b></p>  <p><small>inosy_005_a_1_gb_cat</small></p>	<p><b>Isolation of DC processes</b></p>  <p><small>inosy_014_b_1_x_cat</small></p>

### The SOCOMEC solutions

<p><b>SIRCO PV</b> Manual operation PV switches</p>  <p><small>sirco-pv_059 - 060 - 061_a</small></p> <p>up to 3200 A at 1000 VDC up to 2000 A at 1500 VDC up to 4 circuits</p>	<p><b>INOSYS LBS</b> Up to 1500 VDC with visible contact indication - with or without tripping function</p>  <p><small>inosy_140_a - inosy_152_a</small></p> <p>up to 600 A at 1000 VDC up to 500 A at 1500 VDC</p>
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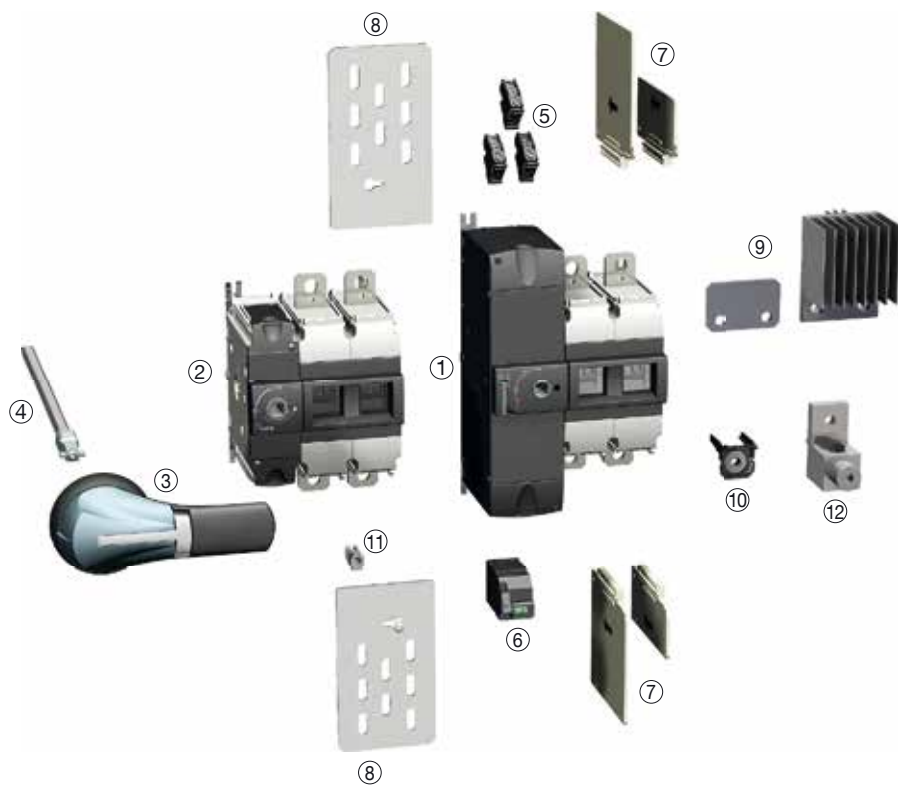
# INOSYS **LBS** UL 98B

Load Break Switches for DC & PV applications

from 100 to 600 A, up to 1500 VDC,

with manual operation and manual operation with tripping function

## Overview



1. INOSYS LBS 400 A - 1000 VDC  
with tripping function
2. INOSYS LBS 400 A - 1500 VDC  
without tripping function
3. Door interlocked external operation handle
4. Shaft for external handle
5. Auxiliary contact
6. Tripping coil
7. Inter-phase barrier  
(shipped with the switches)
8. Terminal screens
9. Bridging bars for connecting poles in series
10. Captive nut
11. Holding insert
12. Terminal lugs

References (continued)

**INOSYS LBS without tripping function**

1000 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body <sup>(1)</sup>	External operation	Aux. Contact	Bridging Bar <sup>(2)</sup>
100 A	F2	2 P	87P0 2010	Shaft 320 mm 12.6 inches 1400 1032	NO/NC 8499 0001	8409 0016
250 A	F2	2 P	87P0 2025	S2 type handle Black 3R, 12 - 4, 4X 742D 2111		
400 A	F3	2 P	87P0 2040	Shaft 320 mm 12.6 inches 1400 1032		8409 0040
500 A	F3	2 P	87P0 2050	S2L type handle Black 3R, 12 - 4, 4X 14AD 2111		8409 0041

(1) The switches are supplied without accessories.

(2) For grounded network, single polarity switching.

1500 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body <sup>(1)</sup>	External operation	Aux. Contact	Bridging Bar <sup>(2)</sup>
100 A	F2	2 P (1 P+, 1 P-)	87P0 2011 <sup>(5)</sup>	Shaft 320 mm 12.6 inches 1400 1032	NO/NC 8499 0001	8409 0016
			87P1 1011 <sup>(3)(5)</sup>			8409 0024
200 A	F2	2 P (1 P+, 1 P-)	87P0 2021 <sup>(5)</sup>	S2 type handle Black 3R, 12 - 4, 4X 742D 2111	NO/NC 8499 0001	8409 0016
			87P1 1021 <sup>(3)(5)</sup>			8409 0024
250 A	F2	2 P (1 P+, 1 P-)	87P0 2026 <sup>(5)</sup>	S2 type handle Black 3R, 12 - 4, 4X 742D 2111	NO/NC 8499 0001	8409 0016
		3 P (2 P+, 1 P-)	87P1 1026 <sup>(3)(5)</sup>			8409 0024
400 A	F3	2 P (1 P+, 1 P-)	87P0 3025	Shaft 320 mm 12.6 inches 1400 1032	NO/NC 8499 0001	2x 8409 0025
			87P0 2041			8409 0040
500 A	F3	2 P (1 P+, 1 P-)	87P1 1041 <sup>(3)</sup>	S2L type handle Black 3R, 12 - 4, 4X 14AD 2111	NO/NC 8499 0001	8409 0039
			87P0 2051			8409 0041
500 A	F3	2 P (1 P+, 1 P-)	87P1 1051 <sup>(3)</sup>			8409 0039

1500 VDC - 2 circuits

Rating (A)	Frame size	No. of poles per circuit	Switch body <sup>(1)</sup>	External operation	Aux. Contact	Bridging Bar <sup>(2)</sup>
400 A	F3	2 P (1P+, 1P-)	87P2 2041 <sup>(3)</sup>	Shaft 320 mm 12.6 inches 1400 1032	NO/NC 8499 0001	8409 0041 8409 0063 <sup>(4)</sup>
500 A			87P2 2051 <sup>(3)</sup>	S2L type handle Black 3R, 12 - 4, 4X 14AD 2111		8409 0063

(1) The switches are supplied without accessories.

(2) For isolated networks.

(3) Centered mechanism.

(4) In side mounting.

(5) Availability Q4 2019.

# INOSYS LBS UL 98B

Load Break Switches for DC & PV applications

from 100 to 600 A, up to 1500 VDC,

with manual operation and manual operation with tripping function

## References

### INOSYS LBS with tripping function

#### 1000 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body <sup>(1)</sup>	External operation	Tripping coil	Aux. Contact	Bridging Bar <sup>(2)</sup>
100 A	F2	2 P	85P0 2010	Shaft 320 mm 12.6 inches 1400 1032	Shunt trip coil	NO/NC 8499 0001	8409 0016
250 A	F2	2 P	85P0 2025	S2 type handle Black 3R, 12 - 4,4X 742D 2118	24 V AC/DC 8499 7002 48 V AC/DC 8499 7004		
400 A	F3	2 P	85P0 2040	Shaft 320 mm 12.6 inches 1400 1032  S2L type handle Black 3R, 12 - 4,4X 74AD 2118	Undervoltage releases		8409 0040
500 A	F3	2 P	85P0 2050		48 V AC 8499 8104 230 V AC 8499 8123		8409 0041
600 A	F3	2 P	85P0 2060		24 V DC 8499 8202 48 V DC 8499 8204		8409 0063

(1) The switches are supplied without accessories.

(2) For grounded network, single polarity switching.

#### 1500 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body <sup>(1)</sup>	External operation	Tripping coil	Aux. Contact	Bridging Bar <sup>(2)</sup>		
100 A	F2	2P (1P+, 1P-)	85P0 2011 <sup>(4)</sup>	Shaft 320 mm 12.6 inches 1400 1032  S2 type handle Black 3R, 12 - 4, 4X 742D 2118	Shunt trip coil 24 VAC/DC 8499 7002 48 VAC/DC 8499 7023 230 VAC/DC 8499 7023	NO/NC 8499 0001	8409 0016		
			85P1 1011 <sup>(3)</sup>				-		
200 A	F2	2P (1P+, 1P-)	85P0 2021 <sup>(4)</sup>				S2 type handle Black 3R, 12 - 4, 4X 742D 2118	Undervoltage release 48 VAC 8499 8104	8409 0016
			85P1 1021 <sup>(3)</sup>						
250 A	F2	2P (1P+, 1P-)	85P0 2026 <sup>(4)</sup>	S2L type handle Black 3R, 12 - 4, 4X 74AD 2118	Undervoltage release 48 VAC 8499 8104	8409 0016			
		3P (2P+, 1P-)	85P1 1026 <sup>(3)</sup>				-		
400 A	F3	2P (1P+, 1P-)	85P0 2041	Shaft 320 mm 12.6 inches 1400 1032  S2L type handle Black 3R, 12 - 4, 4X 74AD 2118	230 VAC 8499 8123 24 VDC 8499 8202 48 VDC 8499 8202	2x 8409 0025			
500 A	F3	2P (1P+, 1P-)	85P0 2051			8409 0040			

(1) The switches are supplied without accessories.

(2) For isolated networks.

(3) Centered mechanism - Consult us for availability.

(4) Availability Q4 2019.

## Accessories

### Door interlocked external operation handle

#### Use

Door interlocked external operation handles include an escutcheon and are padlockable. External handles must be utilised with an extension shaft.

#### Example

As the handle is interlocked in the "ON" position the operator must safely disconnect and isolate the circuit prior to accessing the panel for maintenance procedures.

Opening the door when the switch is in the "ON" position can only be done by defeating the interlocking function with the use of a dedicated tool (authorised persons only). The interlocking function is restored when the door is re-closed.



S2 type handle

access\_150.eps

#### For LBS with tripping function

Frame size	Handle type	Handle colour	Degree of protection	Front operation	
				Reference	
F2	S2	Black	3R, 12	742F	<b>2118</b>
F2	S2	Black	4,4X	742D	<b>2118</b>
F2	S2	Red	4,4X	742E	<b>2118</b>
F3	S2L <sup>(1)</sup>	Black	3R, 12	74AF	<b>2118</b>
F3	S2L <sup>(1)</sup>	Black	4,4X	74AD	<b>2118</b>
F3	S2L <sup>(1)</sup>	Red	4,4X	74AE	<b>2118</b>

(1) S2L handles have an extended grip; please refer to the dimensions section.

#### For LBS without tripping function

Frame size	Handle type	Handle colour	Degree of protection	Front operation	Lateral operation
				Reference	Reference
F2	S2	Black	3R, 12	742F	<b>2111</b>
F2	S2	Black	4,4X	742D	<b>2111</b>
F2	S2	Red	4,4X	742E	<b>2111</b>
F3	S2L <sup>(1)</sup>	Black	3R, 12	14AF	<b>2111</b>
F3	S2L <sup>(1)</sup>	Black	4,4X	14AD	<b>2111</b>
F3	S2L <sup>(1)</sup>	Red	4,4X	14AE	<b>2111</b>

(1) S2L handles have an extended grip; please refer to the dimensions section.

### Shaft for external handle

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

Other lengths: please consult us.

Shaft for S2 and S2L type handle



access\_401\_a\_1\_cat

# INOSYS LBS UL 98B

Load Break Switches for DC & PV applications

from 100 to 600 A, up to 1500 VDC,

with manual operation and manual operation with tripping function

## Auxiliary contact

### Use

The same auxiliary contact can be used to provide position and tripping information. The function of the auxiliary contact depends on where it is mounted on the mechanism.

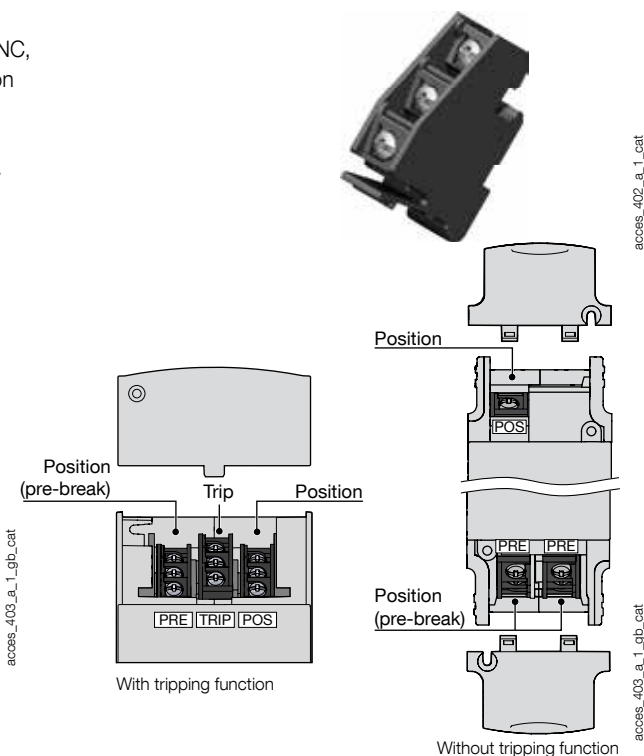
### Characteristics

Changeover type: NO/NC,  
IP2X with front operation  
(cover tap screwed).  
10 000 operations.  
Maximum 3 per switch.

Frame size	Connection type	Type	Reference
F2 - F3	Screw	NO/NC standard	8499 0001
F2 - F3	Screw	NO/NC low level	8499 0002
F2 - F3	Screw	NC > 600 V	8499 0003

### Characteristics

Auxiliary contact type	Min. current (A)	I <sub>th</sub> (A)	Electrical characteristics per UL 60947-5-1
Standard	12.5 mA / 24 V	10	A300 - R300 - Q150
Low level	1 mA / 4 V	10	A300 - R300 - Q150
> 600 V	10 mA / 24 V	10	A600



## Tripping coil

### Use

Allows remote activation of the switch's tripping mechanism. Shunt trip and undervoltage release coils are available.

Connection: 1.5 mm<sup>2</sup>, push in type.

Maximum one tripping coil per switch.

Safe and easy coil replacement by using standard tools.



Shunt trip coil

### Shunt trip coil

Frame size	Voltage (V)	Reference
F2 - F3	24 V AC/DC	8499 7002
F2 - F3	48 V AC/DC	8499 7004
F2 - F3	110 - 127 VAC ; 110 - 125 VDC	8499 7011
F2 - F3	230 V AC/DC	8499 7023

Other voltage ratings available, please consult us.

### Undervoltage release

Frame size	Voltage (V)	Reference
F2 - F3	48 VAC	8499 8104
F2 - F3	110 - 120 VAC	8499 8111
F2 - F3	230 - 240 VAC	8499 8123
F2 - F3	24 VDC	8499 8202
F2 - F3	48 VDC	8499 8204

Other voltage ratings available, please consult us.

### Characteristics

#### Shunt trip coils

AC type (±10%)	24 VAC	48 VAC	110 VAC	230 VAC
Inrush consumption (A); <10ms	6.85	2.95	1.25	0.73
DC type (-5% ... +20%)	24 VDC	48 VDC	110 VDC	230 VDC
Inrush consumption (A); <10ms	7.6	3.28	1.39	0.78

Max supply time 2 s.

Example to avoid permanent supply includes connection of auxiliary contact connected in series with shunt trip coil, or coil supply voltage to be taken from the load side, or electronic limitation of the duration of the supply voltage/current.

For DC shunt trip coil rated above 70 VDC, external relay shall be used to disconnect the coil.

#### Undervoltage release

AC type	24 VAC	48 VAC	110 VAC	230 VAC
Max permanent consumption (VA), at 110% U <sub>n</sub>	-	1.8	1.4	1.5
DC type	24 VDC	48 VDC	110 VDC	230 VDC
Max permanent consumption (VA), at 110% U <sub>n</sub>	1.6	1.4	-	-

Holding: up to 85% x U<sub>n</sub>

Release: < 35 to 70% x U<sub>n</sub>

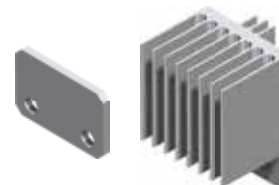
## Accessories (continued)

### Bridging bar for poles in series

#### Use

The bridging bars enable the poles to be connected in series, allowing the following configurations for 1500 VDC.

Connection diagrams, see "Pole series connection" pages, page 29.



acce\_410\_a\_1\_cat acce\_411\_a\_1\_cat

#### 1000 VDC - 1 circuit

Frame size	Rating (A)	No. of poles	Quantity to be ordered	Reference
F2	100	2 P	1	8409 0016
F2	250	2 P	1	8409 0016
F3	400	2 P	1	8409 0040
F3	500	2 P	1	8409 0041
F3	600	2 P	1	8409 0063

#### 1500 VDC - 1 circuit

Frame Size	Rating (A)	No. of poles	Quantity to be ordered	Reference
F2	100	3 P	2	8409 0016
F2	100 ... 250	2 P	1	8409 0024 <sup>(1)</sup>
F2	250	3 P	2	8409 0025
F3	400 ... 500	2 P	1	8409 0039 <sup>(1)</sup>
F3	400	2 P	1	8409 0040
F3	500	2 P	1	8409 0041 8409 0063 <sup>(2)</sup>

#### 1500 VDC - 2 circuits

Frame Size	Rating (A)	No. of poles	Quantity to be ordered	Reference
F3	400	2 P	2	8409 0041 8409 0063 <sup>(2)</sup>
F3	500	2 P	2	8409 0063

<sup>(1)</sup> Centered mechanism.

<sup>(2)</sup> In side mounting.

### Terminal screen

#### Use

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

#### Advantages

Perforations for thermographic inspection. Mounting requires holding inserts (supplied with the terminal screens).



access\_408\_a\_1\_cat

Frame size	No. of poles	Position	Reference <sup>(1)</sup>
F2	2 P	Top and bottom	8499 3222
F2	3 P	Top and bottom	8499 3232
F3	2 P	Top and bottom	8499 3722

<sup>(1)</sup> Each reference comprises 2 terminal screens for top and bottom protection.

### Holding insert

#### Use

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

Frame size	Pack (unit)	Reference
F2 - F3	10	8499 6220
F2 - F3	100	8499 6221



access\_409\_a\_1\_cat

# INOSYS **LBS** UL 98B

Load Break Switches for DC & PV applications

from 100 to 600 A, up to 1500 VDC,

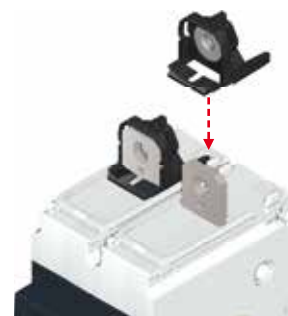
with manual operation and manual operation with tripping function

## Captive nut

### Use

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

Frame size	Pack (unit)	Reference
F2	12	8499 6120
F2	120	8499 6121
F3	12	8499 6130
F3	120	8499 6131



acce\_399\_a\_1\_cat

## Voltage tap

### Use

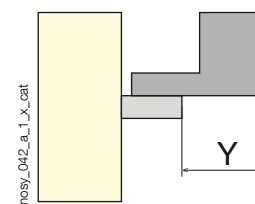
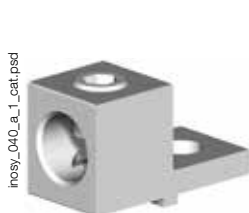
Allows connection of voltage sensing or power cables, with fast-on connection.

Frame size	Pack (unit)	Reference
F2	12	8499 9012
F3	12	8499 9013



acce\_412\_a\_1\_cat

## Terminal lugs



Version	Frame size	Number and size (min. - max.) of cables	Type of cable	Openings per lug	Quantity per reference	Dimension "Y" (mm/in)	Type	Reference <sup>(1)</sup>
With tripping function only	F2	1 conductor (#6 - 300 KCMIL)	Cu / Al	1	2	33,4 / 1.31	CMC LA300-R	3954 2020
	F2		Cu / Al		3			3954 3020
	F2		Cu / Al		4			3954 4020
	F2		Cu / Al		6			3954 6020
With and without tripping function	F2	2 conductors (#12 - 2/0)	Cu / Al	2	2	32,5 / 1.29	IHI 2S2-0-TP-STK-34-49-HEX	3954 2023 <sup>(2)</sup>
	F2		Cu / Al		3			3954 3023 <sup>(2)</sup>
	F2		Cu / Al		4			3954 4023 <sup>(2)</sup>
With tripping function only	F3	1 conductor (#4 - 600 KCMIL) 2 conductors (#1/0 - 250 KCMIL)	Cu / Al	1	2	45,7 / 1.79	CMC LA630-R	3954 2040 <sup>(2)</sup>
	F3		Cu / Al		3			3954 3040 <sup>(2)</sup>
	F3		Cu / Al		4			3954 4040 <sup>(2)</sup>
With and without tripping function	F3	2 conductors (#2 - 600 KCMIL)	Cu / Al	2	2	69,7 / 2.74	CMC PV2-600	3954 2060 <sup>(2)</sup>
	F3		Cu / Al		3			3954 3060 <sup>(2)</sup>
	F3		Cu / Al		4			3954 4060 <sup>(2)</sup>

(1) Interphase barriers must be installed on the products.

(2) Captive nut 84996xxx is mandatory.



## Characteristics

### Characteristics according to UL 98B

Rated current I <sub>n</sub>	100 A	200 A	250 A	400 A	500 A	600 A
<b>Frame size</b>	<b>F2</b>	<b>F2</b>	<b>F2</b>	<b>F3</b>	<b>F3</b>	<b>F3</b>
Number of poles(s) in series per polarity - 1000VDC	2 P	2 P	2 P	2 P	2 P	2 P
Number of poles(s) in series per polarity - 1500VDC	2 P / 3 P	2 P / 3 P	2 P / 3 P	2 P	2 P	-
Number of pole(s) of the device - 1000VDC	2 P	2 P	2 P	2 P	2 P	2 P
Number of pole(s) of the device - 1500VDC	2 P / 3 P	2 P / 3 P	2 P / 3 P	2 P	2 P	-
<b>Short-circuit capacity at 1000 &amp; 1500VDC (with protection)</b>						
Prospective short-circuit current (kA rms DC)	10 <sup>(1)</sup>	10 <sup>(1)</sup>	10 <sup>(1)</sup>	10 <sup>(1)</sup>	10 <sup>(1)</sup>	10 <sup>(1)</sup>
<b>Mechanical characteristics</b>						
Durability (number of operating cycles)	8 000	8 000	8 000	8 000 / 6 000 <sup>(2)</sup>	8 000 / 6 000 <sup>(2)</sup>	8 000 / 6 000 <sup>(2)</sup>
Number of tripping operations	1 000	1 000	1 000	1 000	1 000	1 000
Power loss/pole (W/Pole)	2	5,1	11,2	13	21,6	29,3

(1) Without fuse during 50 ms.

(2) 8 000 for LBS without tripping function and 6 000 for LBS with tripping function.

## Characteristics

### Characteristics according to IEC 60947-3

Rated current I <sub>n</sub>			160 A	250 A	315 A	400 A	630 A	800 A
<b>Frame size</b>			<b>F2</b>	<b>F2</b>	<b>F2</b>	<b>F3</b>	<b>F3</b>	<b>F3</b>
Thermal current at 40°C (A)			160	250	315	400	630	800
Thermal current at 50°C (A)			160	250	315	400	630	760
Thermal current at 60°C (A)			160	250	315	400	570	685
Rated insulation voltage U (V)			1500	1500	1500	1500	1500	1500
Rated impulse withstand voltage U <sub>imp</sub> (kV)			12	12	12	12	12	12
<b>Number of circuits</b>	<b>Rated voltage</b>	<b>Utilisation category</b>	<b>I<sub>e</sub> (A)</b>	<b>I<sub>e</sub> (A)</b>	<b>I<sub>e</sub> (A)</b>	<b>I<sub>e</sub> (A)</b>	<b>I<sub>e</sub> (A)</b>	<b>I<sub>e</sub> (A)</b>
1 circuit	1000 VDC <sup>(1)</sup>	DC-21 B	160	250	315	400	630	800
1 circuit	1500 VDC <sup>(2)</sup>	DC-21 B	160	250	315	400	630	-
<b>Number of circuits</b>	<b>Rated voltage</b>	<b>Utilisation category</b>	<b>I<sub>e</sub> (A)</b>	<b>I<sub>e</sub> (A)</b>	<b>I<sub>e</sub> (A)</b>	<b>I<sub>e</sub> (A)</b>	<b>I<sub>e</sub> (A)</b>	<b>I<sub>e</sub> (A)</b>
1 circuit	1000 VDC <sup>(1)</sup>	PV2	-	-	-	-	-	-
1 circuit	1500 VDC <sup>(2)</sup>	PV2	160	250	315	400	630	-
2 circuits	1500 VDC <sup>(2)</sup>	PV2	-	-	-	400	630	-
<b>Short-circuit capacity at 1000 &amp; 1500VDC (without protection)</b>								
Rated short-time withstand current I <sub>cw</sub> 1s (kA eff.)			5	5	5	8	8	8
Rated short-circuit making capacity I <sub>cm</sub> (kA peak) - 60 ms			10	10	10	10	10	10
<b>Connection</b>								
Recommended Cu rigid cable cross-section (mm <sup>2</sup> ) <sup>(3)</sup>			70	120	185	240	2 X 185	2X 240
Recommended Cu busbar width (mm) <sup>(3)</sup>			20	20	20	25	25	25
<b>Mechanical characteristics</b>								
Durability (number of operating cycles)			8000	8000	8000	8000 / 6000 <sup>(4)</sup>	8000 / 6000 <sup>(4)</sup>	8000 / 6000 <sup>(4)</sup>
Number of tripping operations			1000	1000	1000	1000	1000	1000
Power loss/pole (W/Pole)			4.5	11.2	13	13	30.2	50

(1) 2 poles in series.

(2) 2 or 3 poles in series.

(3) For aluminium connection, please consult us.

(4) 8000 for LBS without tripping function and 6000 for LBS with tripping function.

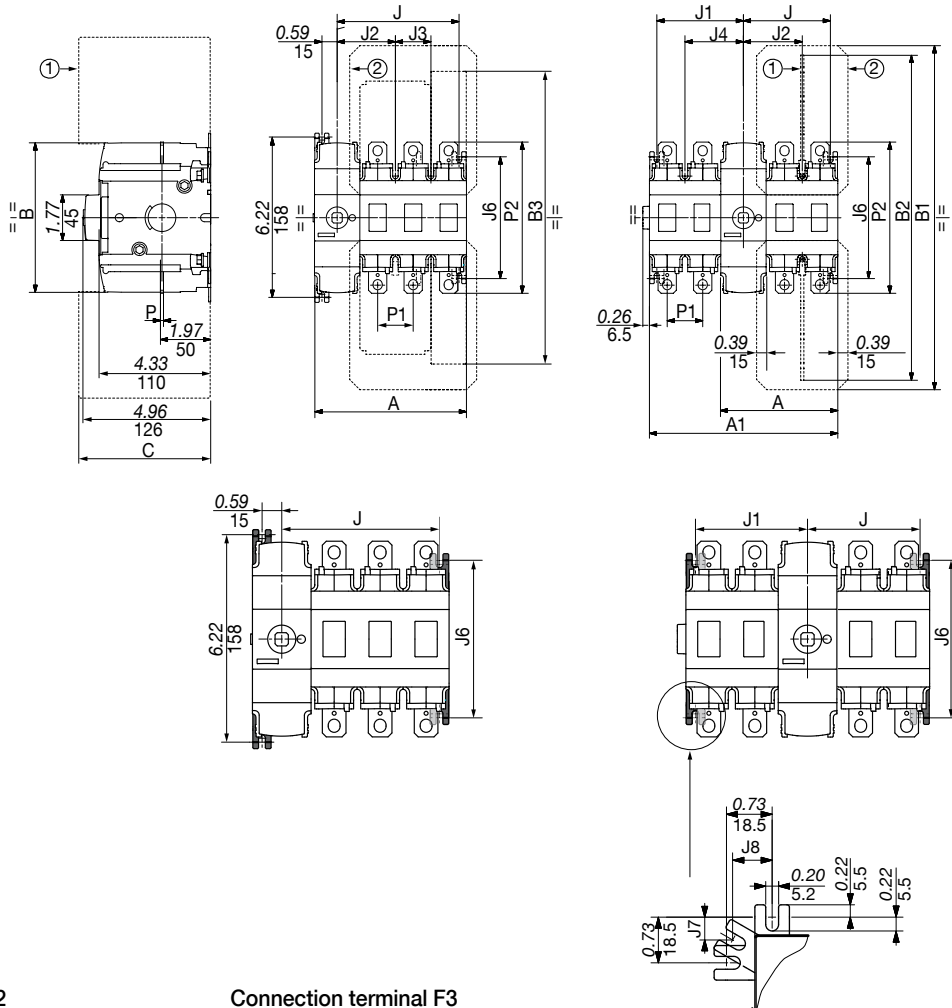
# INOSYS LBS UL 98B

Load Break Switches for DC & PV applications

from 100 to 600 A, up to 1500 VDC,

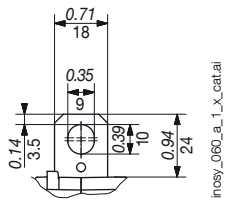
with manual operation and manual operation with tripping function

## INOSYS LBS without tripping function

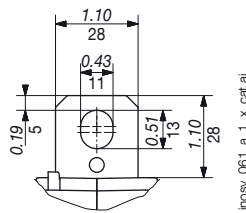


- 1. Inter-phase barrier.
- 2. Terminal screens..

### Connection terminal F2



### Connection terminal F3

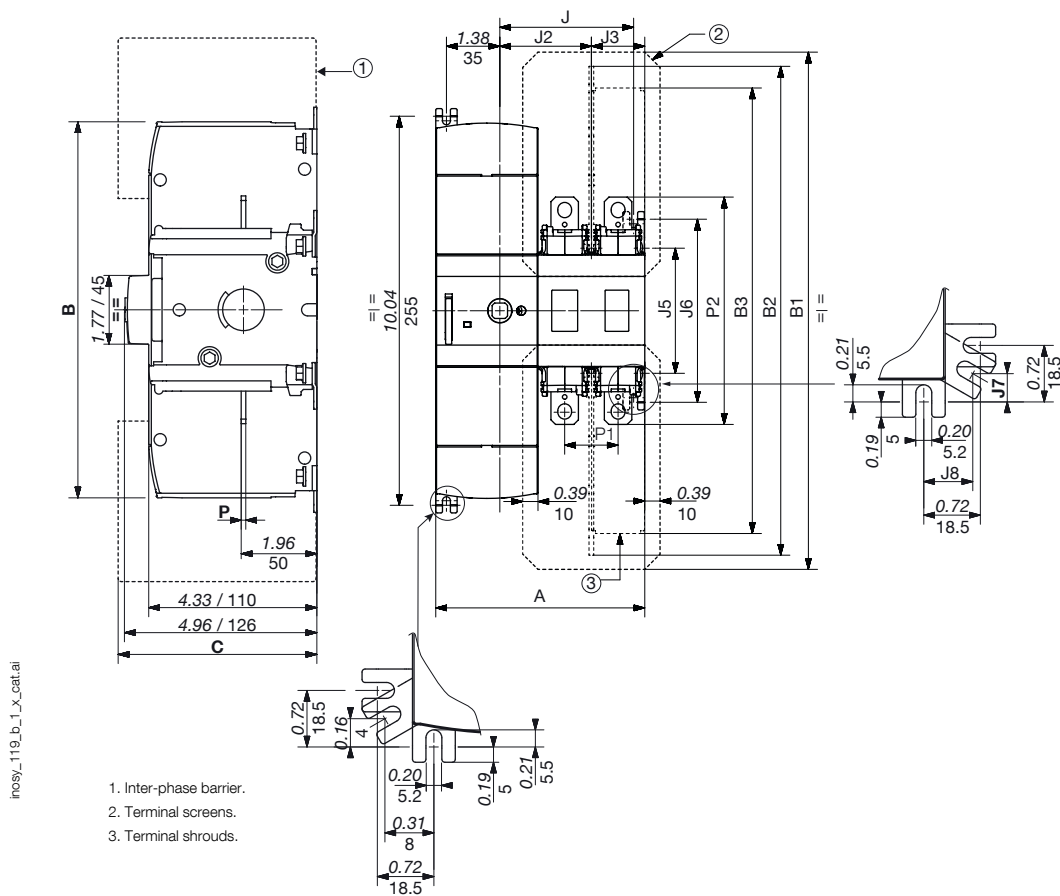


Rating (A)	Frame size	Units	A		A1		J		J1		J	
			2 P	3 P	1+1 P / 2+2 P	1+1 P / 2+2 P	1+1 P / 2+2 P	1+1 P / 2+2 P	2 P	3 P		
100 ... 250	F2	in	4.60	5.98	4.60 / 7.36	1.97 / 3.37	2.05 / 3.44	3.35	4.72			
		mm	117	152	117 / 187	50.5 / 85.5	52.5 / 87.5	85.5	120.5			
400 ... 600	F3	in	5.40	7.17	5.40 / 8.94	2.36 / 4.15	2.44 / 4.23	4.13	-			
		mm	137	182	137 / 227	60.5 / 105.5	62.5 / 107.5	105.5	-			

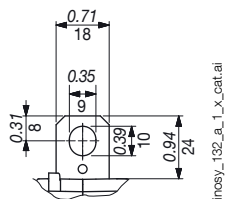
Rating (A)	Frame size	Units	B	B1	B2			B3	C		J2	J3	J4	J6	P1	P2
			IEC short	IEC long	UL	IEC	UL									
100 ... 250	F2	in	5.90	13.35	7.85	12.61	10.31	11.64	4.33	4.33	2.26	1.38	2.34	4.72	1.38	5.87
		mm	154	339	199	320	262	296	110	110	57.5	35	59.5	120	35	149
400 ... 600	F3	in	5.90	16.28	9.35	14.11	15.5	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 (in/mm)

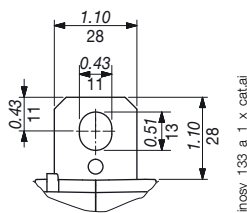
#### INOSYS LBS with tripping function



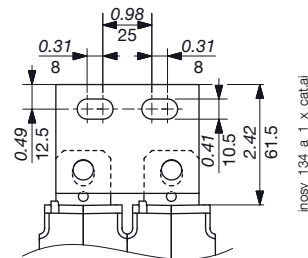
Connection terminal F2



Connection terminal F3



Parallel bridging F3



Rating (A)	Frame size	Units	A	
			2 P	3 P
100 ... 250	F2	in	5.39	6.77
		mm	137	172
400 ... 600	F3	in	6.18	-
		mm	157	-

Rating (A)	Frame size	Units	B	B1	B2	B3	C	J2	J3	J4	J5	J6	J7	J8	P	P1	P2
100 ... 250	F2	in	9.69	13.35	10.31	11.64	4.33	2.36	1.38	3.03	3.23	4.72	0.39	0.58	0.12	1.38	5.87
		mm	246	339	262	296	110	60	35	77	82	120	10	15	3	35	149
400 ... 600	F3	in	9.69	16.28	15.50	14.12	5.31	2.76	1.77	3.43	4.72	6.22	0.16	0.33	0.20	1.77	7.87
		mm	246	414	394	359	135	70	45	87	120	158	4	8	5	45	200

# INOSYS LBS UL 98B

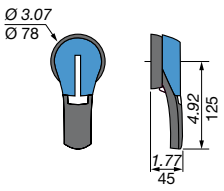
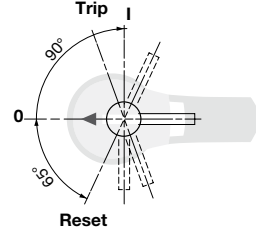
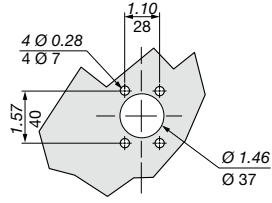
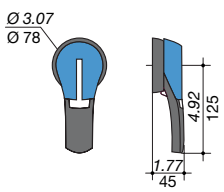
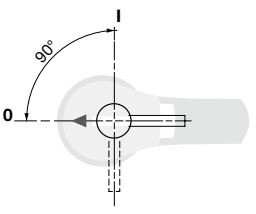
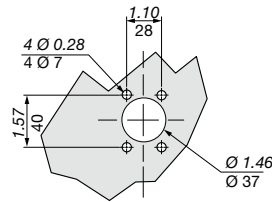
Load Break Switches for DC & PV applications

from 100 to 600 A, up to 1500 VDC,

with manual operation and manual operation with tripping function

## Dimensions for external handles (in/mm)

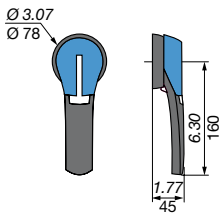
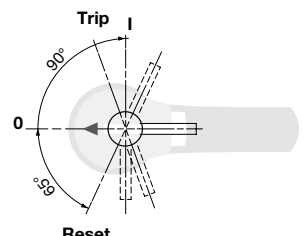
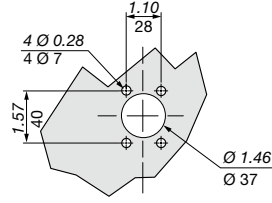
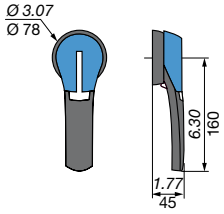
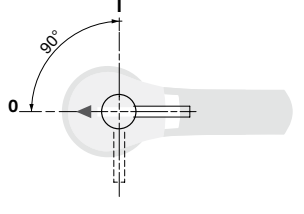
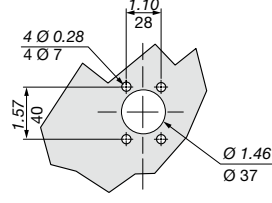
### F2 frame size

Handle type	Front operation Direction of operation	Door drilling
<b>S2 type</b> with trip 		
<b>S2 type</b> 		

poign\_057\_b\_1\_us\_cat.eps

poign\_013\_b\_1\_us\_cat.eps

### F3 frame size

Handle type	Front operation Direction of operation	Door drilling
<b>S2L type</b> with trip 		
<b>S2L type</b> 		

poign\_068\_b\_1\_us\_cat.eps

poign\_069\_b\_1\_us\_cat.eps

### Pole series connections

1 PV circuit - 1000 & 1500 VDC

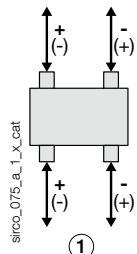
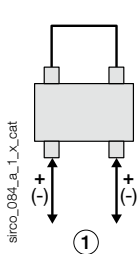
1 PV circuit - 1500 VDC

2 PV circuits - 1500 VDC

#### F2-F3 - 2 P

Grounded network

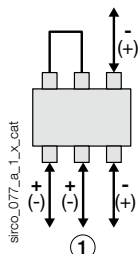
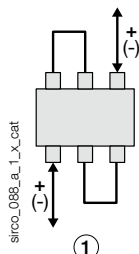
Floating network



#### F2 - 3 P

Grounded network

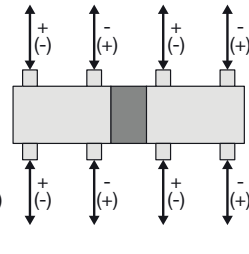
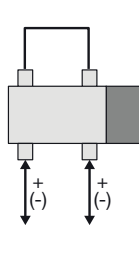
Floating network



#### F3 - 2 P

Grounded network

Floating network



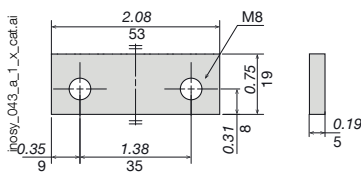
1. Circuit 1  
2. Circuit 2

### Bridging bars (in/mm)

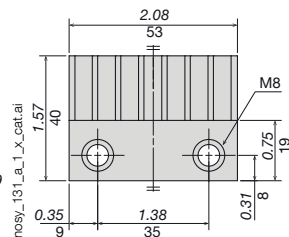
#### F2

8409 0016<sup>(1)</sup>

(1) Kit comprises 2 identical bars.



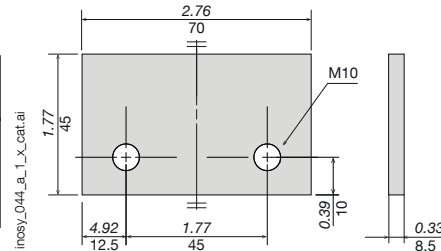
8409 0025



#### F3

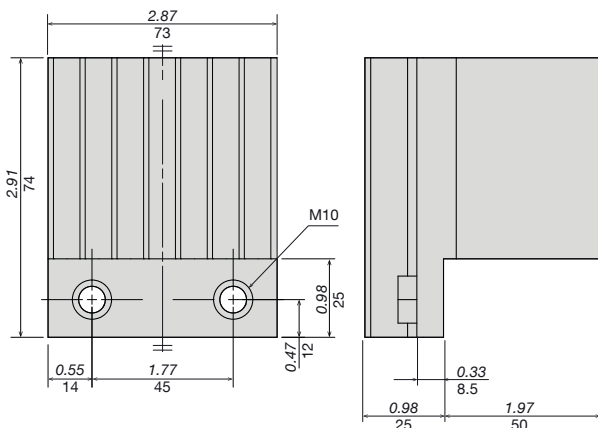
8409 0040<sup>(1)</sup>

(1) Kit comprises 2 identical bars.

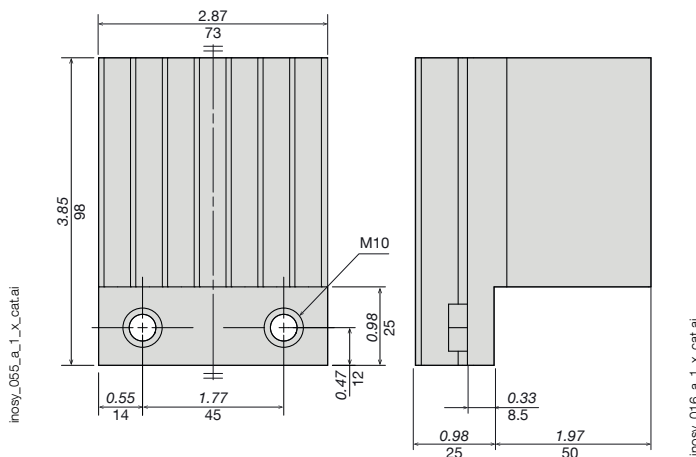


#### F3

8409 0041



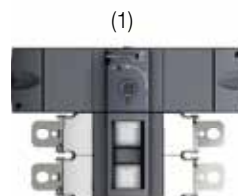
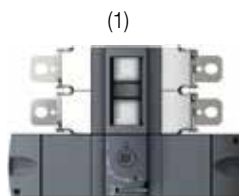
8409 0063



### Mounting orientation

#### F2 - F3

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



(1) Not UL certified with jumpers 8409 0025

inosy\_006\_a.psd





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#### SOCOMEK GROUP

SAS SOCOMEK capital 10633 100 €  
R.C.S. Strasbourg B 548 500 149  
B.P. 60010 - 1, rue de Westhouse  
F-67235 Benfeld Cedex  
Tel. +33 3 88 57 41 41 - Fax +33 3 88 57 78 78  
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