

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



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.

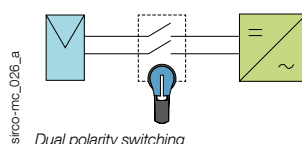
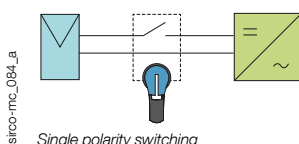
Designed for harsh environments

- 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).

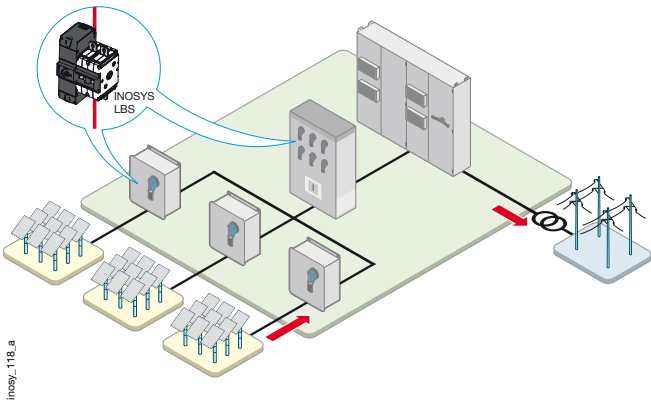
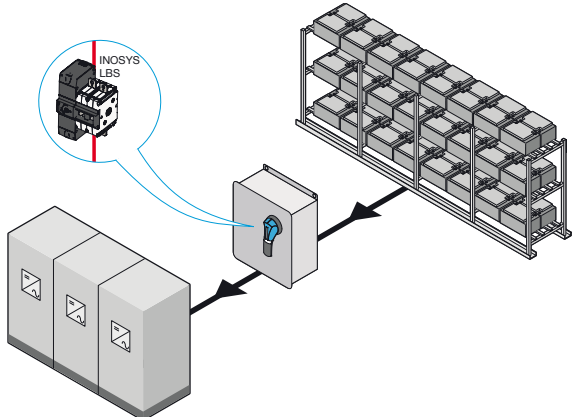
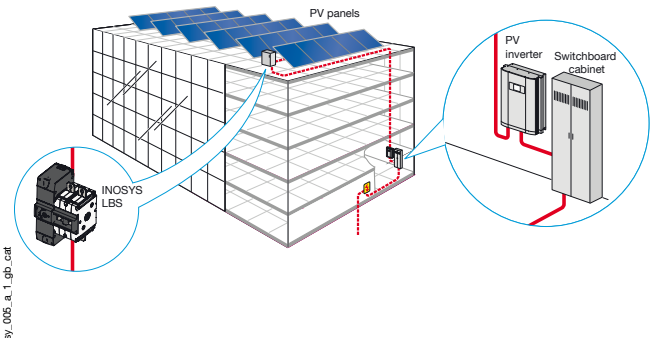
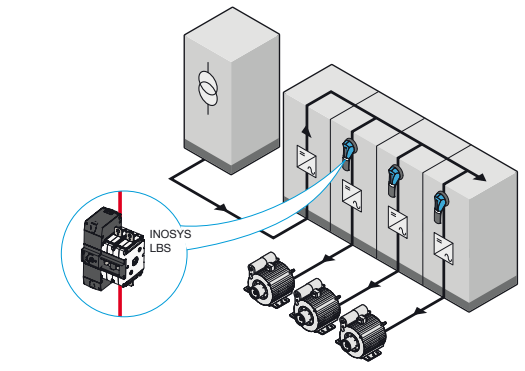
Modular solution for a flexible configuration

- Single or dual polarity switching



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



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

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>PV installation: Combiner box, Recombiner box or Inverter</p>  <p>inosy_118_a</p> | <p>Battery protection</p>  <p>inosy_013_b_1_x_cat</p> |
| <p>Rapid shutdown for firefighter safety (compliant with installation standards, incl. NEC 2014)</p>  <p>inosy_005_a_1_gp_cat</p> | <p>Isolation of DC processes</p>  <p>inosy_014_b_1_x_cat</p> |

The SOCOMEC solutions

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>SIRCO PV 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>INOSYS LBS 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> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

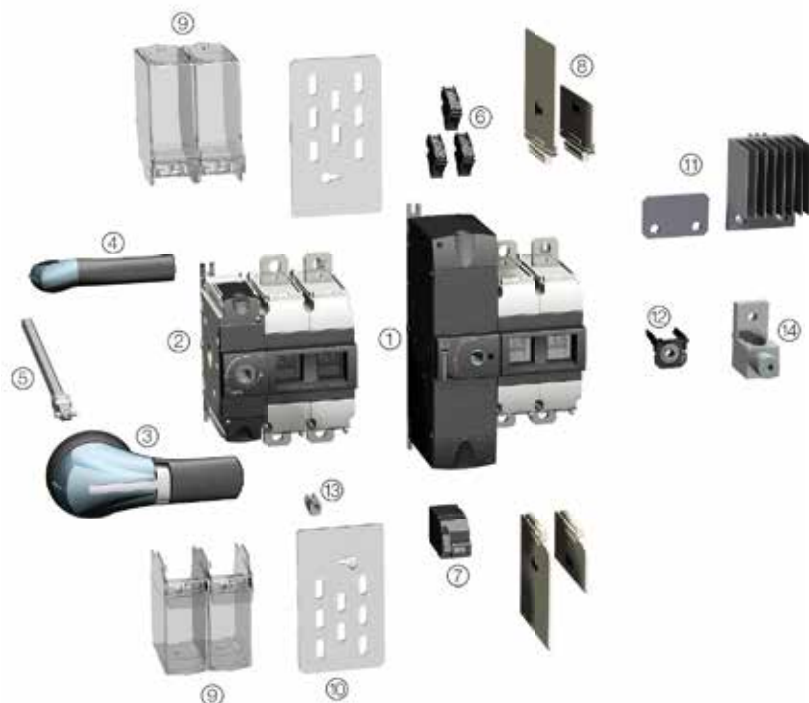
INOSYS LBS

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

1500 VDC - 2 circuits

| Rating (A) | Frame size | No. of poles per circuit | Switch body ⁽¹⁾ | External operation | Aux. Contact | Bridging Bar ⁽²⁾ |
|------------|------------|--------------------------|----------------------------|---------------------------------------------|--------------------|-----------------------------|
| 400 A | F3 | 2P (1P+, 1P-) | 86P2 2041 ⁽³⁾ | Shaft 320 mm 1400 1032 | NO/NC 8499 0001 | - |
| 630 A | | | 86P2 2064 ⁽³⁾ | 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.

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

References

INOSYS LBS with tripping function

1000 VDC - 1 circuit

| Rating (A) | Frame size | No. of poles per circuit | Switch body ⁽¹⁾ | External operation | Tripping coil | Aux. Contact | Bridging Bar ⁽²⁾ |
|------------|------------|--------------------------|----------------------------|--------------------------------------------------------------------------------|------------------------------------------------|--------------------|-----------------------------|
| 160 A | F2 | 2 P (1 P+, 1 P-) | 84P0 2016 | Shaft 320 mm 1400 1032 S2 type handle Black IP65 742F 2118 | Shunt trip coil 24 V AC/DC 8499 7002 | NO/NC 8499 0001 | - |
| 250 A | F2 | | 84P0 2025 | | 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 S2L type handle Black IP65 74AF 2118 | Undervoltage releases 48 VAC 8499 8104 | | |
| 630 A | F3 | | 84P0 2063 | | 230 VAC 8499 8123 | | |
| 800 A | F3 | | 84P0 2080 | | 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 ⁽¹⁾ | External operation | Tripping coil | Aux. Contact | Bridging Bar ⁽²⁾ |
|------------|------------|--------------------------|---------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------|-----------------------------|
| 160A | F2 | 2P (1P+, 1P-) | 84P0 2017 ⁽⁴⁾ | Shaft 320 mm 1400 1032 S2 type handle Black IP 65 742F 2118 | Shunt trip coil 24 VAC/DC 8499 7002 | NO/NC 8499 0001 | - |
| | | | 84P11 017 ⁽³⁾ | | | | 8409 0016 |
| | | 3P (2P+, 1P-) | 84P0 3016 | | | | - |
| 250A | F2 | 2P (1P+, 1P-) | 84P0 2026 ⁽⁴⁾ | | 48 VAC/DC 8499 7023 | | - |
| | | | 84P1 1026 ⁽³⁾ | | 230 VAC/DC 8499 7023 | | 8409 0016 |
| | | 3P (2P+, 1P-) | 84P0 3025 | | Undervoltage release 48 VAC 8499 8104 | | - |
| 315A | F2 | 2P (1P+, 1P-) | 84P0 2032 ⁽⁴⁾ | 230 VAC 8499 8123 | - | | |
| | | | 84P1 1032 ⁽³⁾ | 24 VDC 8499 8202 | 8409 0016 | | |
| | | 3P (2P+, 1P-) | 84P0 3031 | 48 VDC 8499 8202 | - | | |
| 400A | F3 | 2P (1P+, 1P-) | 84P0 2041 | S2L type handle Black IP 65 74AF 2118 | - | | |
| 630A | F3 | 2P (1P+, 1P-) | 84P0 2064 | | - | | |

(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 5032 |



E2 type handle

access_400_a1_cat

For LBS without tripping function

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

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 2118 |
| F2 | S2 | Black | IP65 | 742F 2118 |
| F2 | S2 | Red | IP65 | 742G 2118 |
| F3 | S2L ⁽¹⁾ | Black | IP55 | 74A1 2118 |
| F3 | S2L ⁽¹⁾ | Black | IP65 | 74AF 2118 |
| F3 | S2L ⁽¹⁾ | Red | IP65 | 74AG 2118 |

(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 Reference | Lateral operation Reference |
|------------|--------------------|---------------|----------------------|---------------------------|-----------------------------|
| F2 | S2 | Black | IP55 | 7421 2111 | |
| F2 | S2 | Black | IP65 | 742F 2111 | 14YA 2111 |
| F2 | S2 | Red | IP65 | 742G 2111 | 14YB 2111 |
| F3 | S2L ⁽¹⁾ | Black | IP55 | 14A1 2111 | |
| F3 | S2L ⁽¹⁾ | Black | IP65 | 14AF 2111 | 14AA 2111 |
| F3 | S2L ⁽¹⁾ | Red | IP65 | 14AG 2111 | 14AB 2111 |

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

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.

| Description | Reference |
|-------------|-----------|
| Shaft guide | 1429 0000 |



access_280_a_2_cat

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.

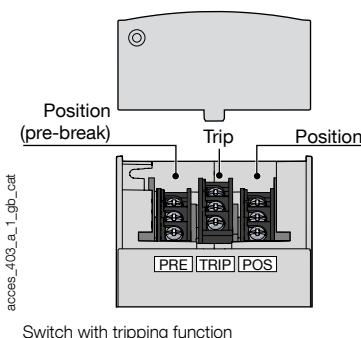
| Frame size | Connection type | Type | Reference |
|------------|-----------------|-----------------|-----------|
| F2 - F3 | Screw | NO/NC standard | 8499 0001 |
| F2 - F3 | Screw | NO/NC low level | 8499 0002 |
| F2 - F3 | Screw | NC > 600 V | 8499 0003 |



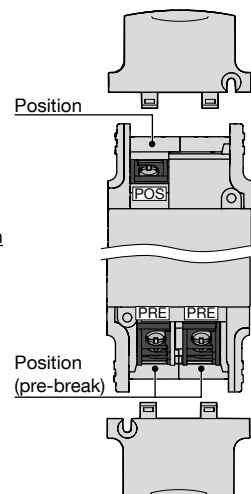
access_402_a_1_cat

Characteristics

| Auxiliary contact type | Min. current (A) | I _{th} (A) | Operating current I _e (A) | | | | |
|------------------------|------------------|---------------------|--------------------------------------|--------|---------|---------|---------|
| | | | 24 VDC | 48 VDC | 230 VAC | 440 VAC | 690 VAC |
| 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

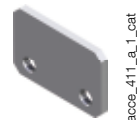
Use

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 ⁽¹⁾ | 8499 0016 ⁽²⁾ |

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



acce_411_a_1_cat

Tripping coil

Use

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

Connection: 1.5 mm², push in type.
Maximum one tripping coil per switch.
Safe and easy coil replacement by using standard tools.

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.



Shunt trip coil

access_404_a_1_cat

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 _n | - | 1.8 | 1.4 | 1.5 |
| DC type | 24 VDC | 48 VDC | 110 VDC | 230 VDC |
| Max permanent consumption (VA), at 110% U _n | 1.6 | 1.4 | - | - |

Holding: up to 85% x U_n

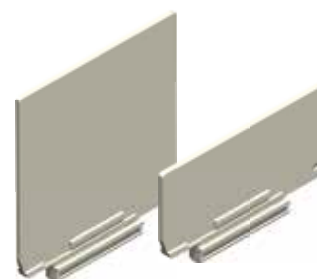
Release: < 35 to 70% x U_n

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 |



access_405_a_1_cat access_406_a_1_cat

Accessories (continued)

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_a1_cat

| Frame size | Pack (unit) | 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 | 3 | 1 P | Top or bottom | 8499 4313 ⁽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 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_a1_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.

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 |



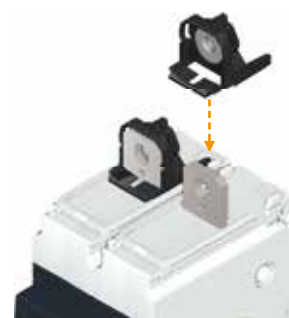
access_409_a1_cat

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 | Pack (unit) | Reference |
|------------|-------------|-----------|
| F2 | 12 | 8499 6120 |
| F2 | 120 | 8499 6121 |
| F3 | 12 | 8499 6130 |
| F3 | 120 | 8499 6131 |



acce_3919_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

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 ⁽¹⁾ | DC-21 B | 160 | 250 | 315 | 400 | 630 | 800 |
| 1 circuit | 1500 VDC ⁽²⁾ | 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 ⁽¹⁾ | PV2 | - | - | - | - | - | - |
| 1 circuit | 1500 VDC ⁽²⁾ | PV2 | 160 | 250 | 315 | 400 | 630 | - |
| 2 circuits | 1500 VDC ⁽²⁾ | PV2 | - | - | - | 400 | 630 | - |
| Short-circuit capacity at 1000 & 1500VDC (without protection) | | | | | | | | |
| Rated short-time withstand current I_{cw} 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 (mm²) ⁽³⁾ | | | 70 | 120 | 185 | 240 | 2 X 185 | 2X 240 |
| Recommended Cu busbar width (mm) ⁽³⁾ | | | 20 | 20 | 20 | 25 | 25 | 25 |
| Mechanical characteristics | | | | | | | | |
| Durability (number of operating cycles) | | | 8000 | 8000 | 8000 | 8000 / 6000 ⁽⁴⁾ | 8000 / 6000 ⁽⁴⁾ | 8000 / 6000 ⁽⁴⁾ |
| Number of tripping operations | | | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| Power loss/pole (W/Pole) | | | 4.5 | 11.2 | 13 | 13 | 30.2 | 50 |

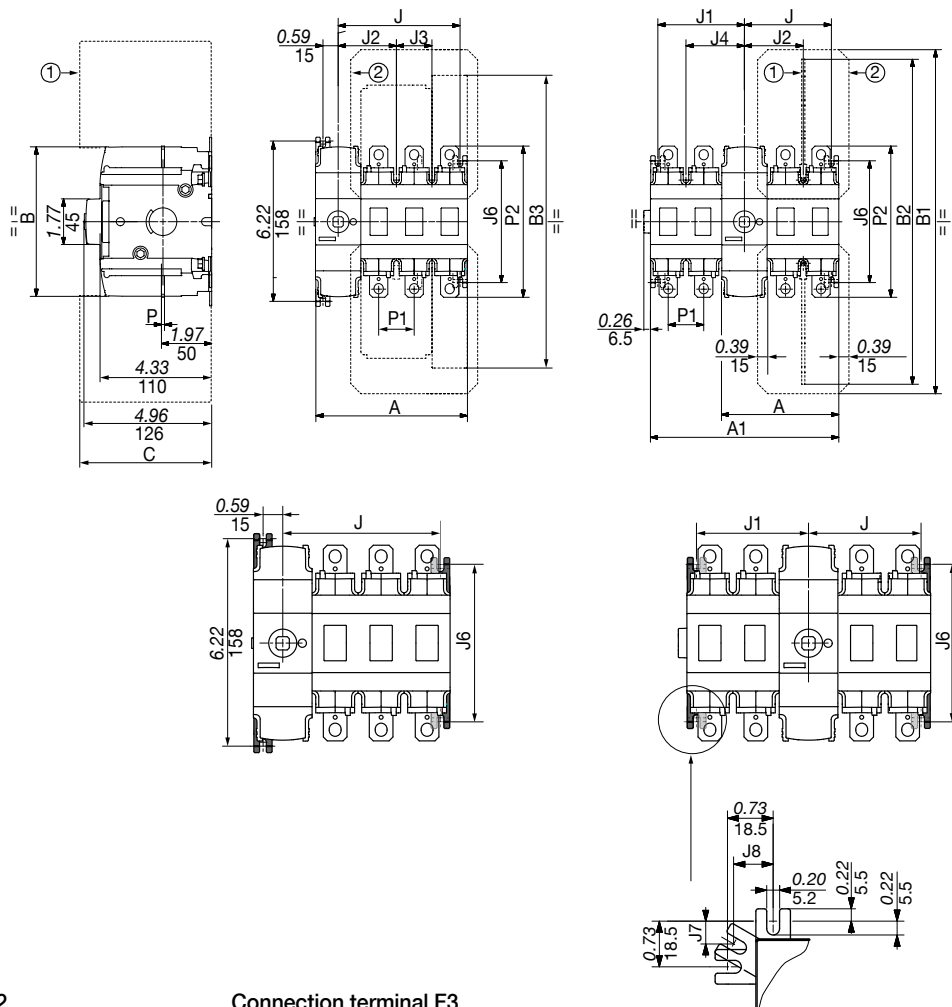
(1) 2 poles in series.

(2) 2 or 3 poles in series.

(3) For aluminium connection, please consult us.

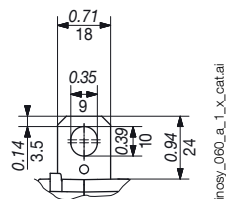
(4) 8000 for LBS without tripping function and 6000 for LBS with tripping function.

INOSYS LBS without tripping function

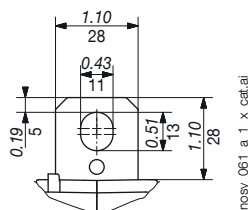


1. Inter-phase barrier.
2. Terminal screens.

Connection terminal F2



Connection terminal F3

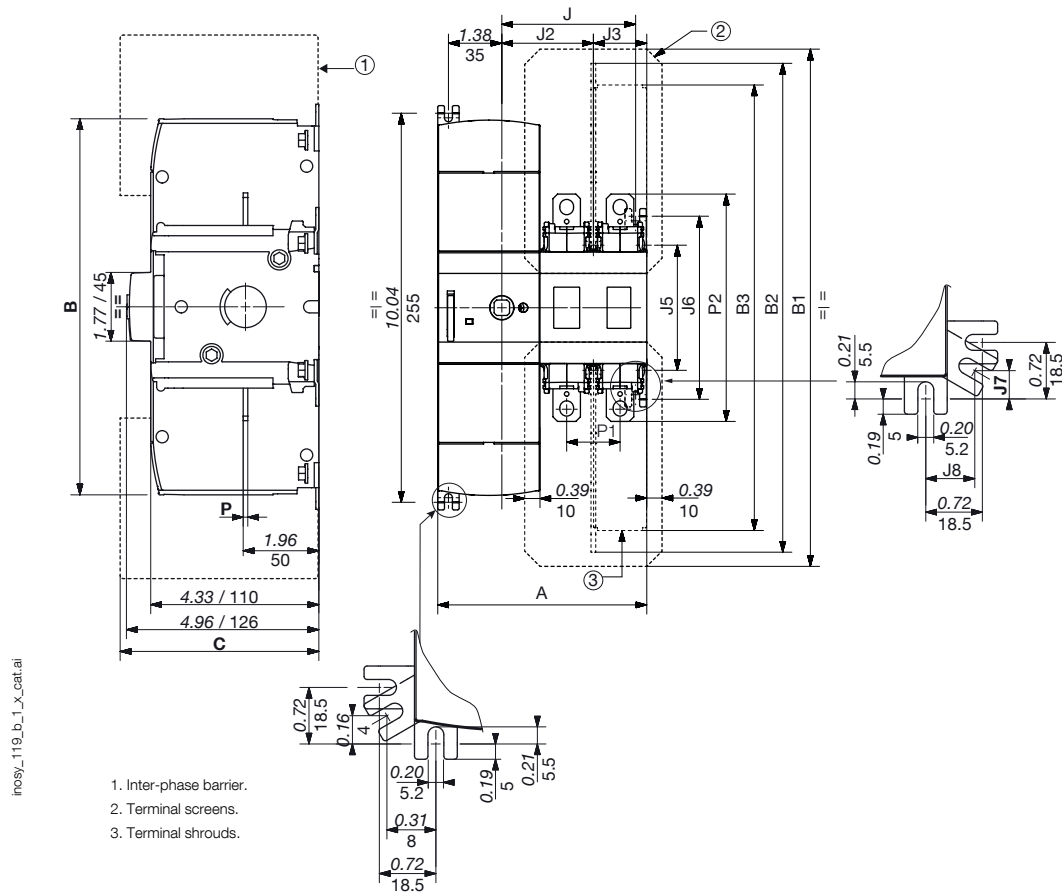


| Rating (A) | Frame size | Units | A | | A1 | J | J1 | J | |
|-------------|------------|-------|------|------|---------------|---------------|---------------|-------|-------|
| | | | 2 P | 3 P | 1+1 P / 2+2 P | 1+1 P / 2+2 P | 1+1 P / 2+2 P | 2 P | 3 P |
| 160 ... 315 | F2 | in | 4.60 | 5.98 | 4.60 / 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 | - |

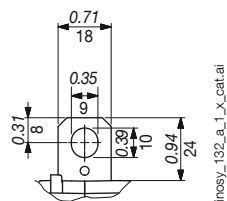
| Rating (A) | Frame size | Units | B | B1 | B2 | | | B3 | C | | J2 | J3 | J4 | J6 | P1 | P2 |
|-------------|------------|-------|------|-------|-----------|----------|-------|-------|------|------|------|------|------|------|------|------|
| | | | | | IEC short | IEC long | UL | | IEC | UL | | | | | | |
| 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)

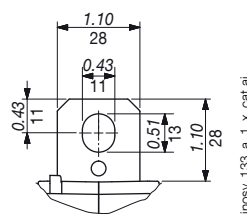
INOSYS LBS with tripping function



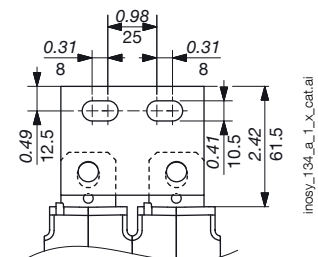
Connection terminal F2



Connection terminal F3



Parallel bridging F3

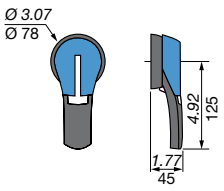
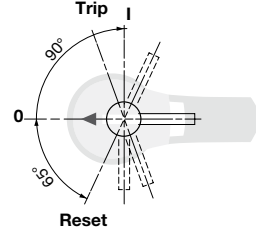
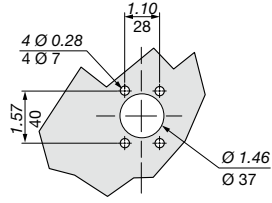
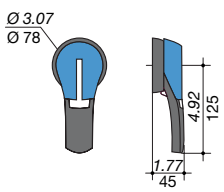
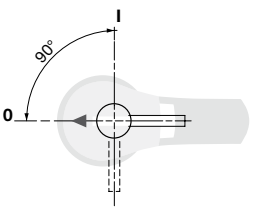
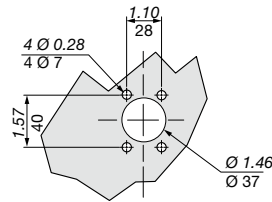


| Rating (A) | Frame size | Units | A | |
|-------------|------------|-------|------|------|
| | | | 2 P | 3 P |
| 160 ... 315 | F2 | in | 5.39 | 6.77 |
| | | mm | 137 | 172 |
| 400 ... 800 | F3 | in | 6.18 | - |
| | | mm | 157 | - |

| Rating (A) | Frame size | Units | B2 | | B3 | C | J2 | J3 | J4 | J5 | J6 | P | P2 | | |
|-------------|------------|-------|------|-------|------|-------|-------|------|------|------|------|------|------|------|------|
| | | | B | B1 | | | | | | | | | | | |
| 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 |

Dimensions for external handles (in/mm)

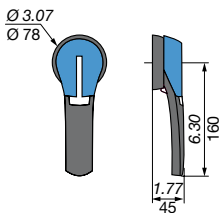
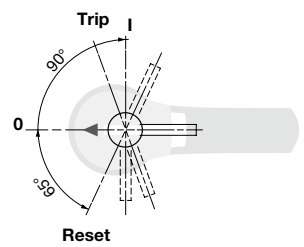
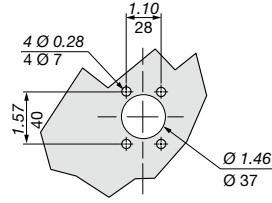
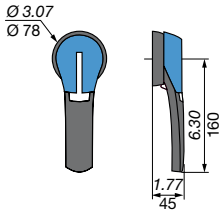
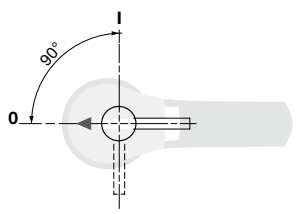
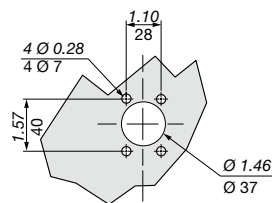
F2 frame size

| Handle type | Front operation Direction of operation | Door drilling |
|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| S2 type with trip  |  |  |
| S2 type  |  |  |

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 |
|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| S2L type with trip  |  |  |
| S2L type  |  |  |

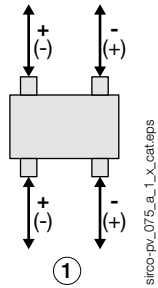
poign_068_b_1_us_cat.eps

poign_069_b_1_us_cat.eps

Pole connections in series

1 PV circuit - 1000 VDC

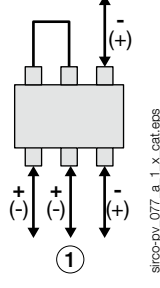
F2-F3 - 2 P



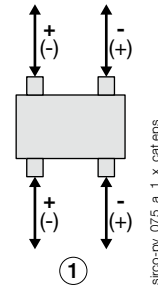
1. Circuit 1

1 PV circuit - 1500 VDC

F2 - 3 P

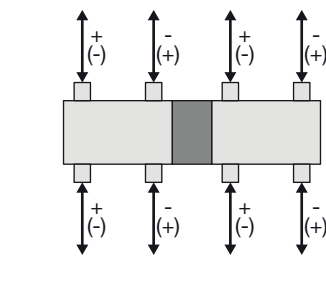


F2-F3 - 2 P



2 PV circuit - 1500 VDC

F3 - 2 P

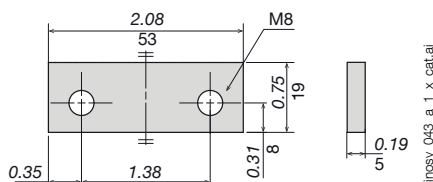


Bridging bars (in/mm)

F2

8409 0016⁽¹⁾

(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



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

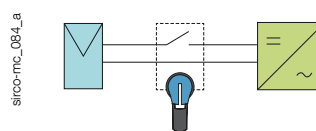
- Wiring: as the switch is non-polarised all types of wiring and connections are possible.
- Easy access without tools to integrate auxiliary contacts and tripping coil (both located within the switch footprint).
- Mechanism can be centred or left aligned (in the factory) to accommodate installation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

Tripping function: flexible and robust

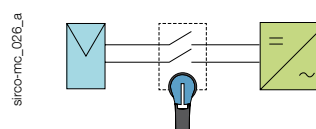
- Fully immune to external perturbation: no nuisance tripping.
- ON, OFF and TRIP positions are stable: resistant to voltage fluctuations.
- Trip position provides complete disconnection and isolation.
- Shunt-trip or undervoltage release from 24 to 220 VDC and from 24 to 230 VAC.
- Fast disconnection (<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.

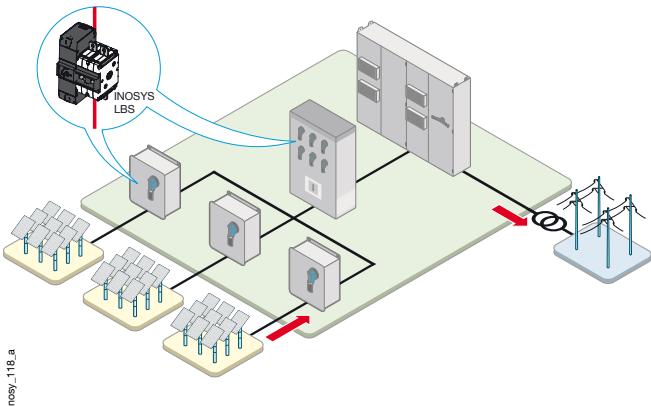
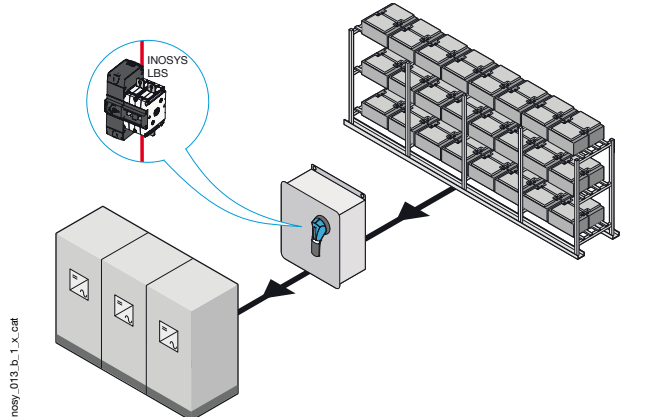
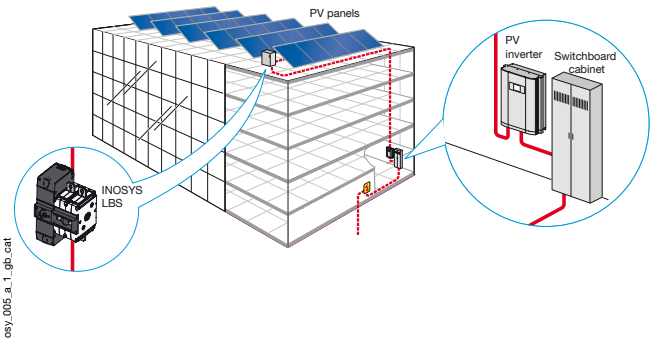
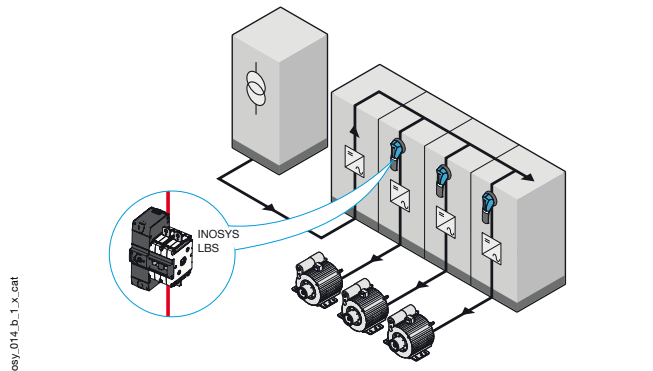


Single polarity switching





Dual polarity switching

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

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

The SOCOMEC solutions

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>SIRCO PV 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>INOSYS LBS Up to 1500 VDC with visible contact indication - with or without tripping function</p>  <p>up to 600 A at 1000 VDC up to 500 A at 1500 VDC</p> <p>inosy_140_a - inosy_152_a</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

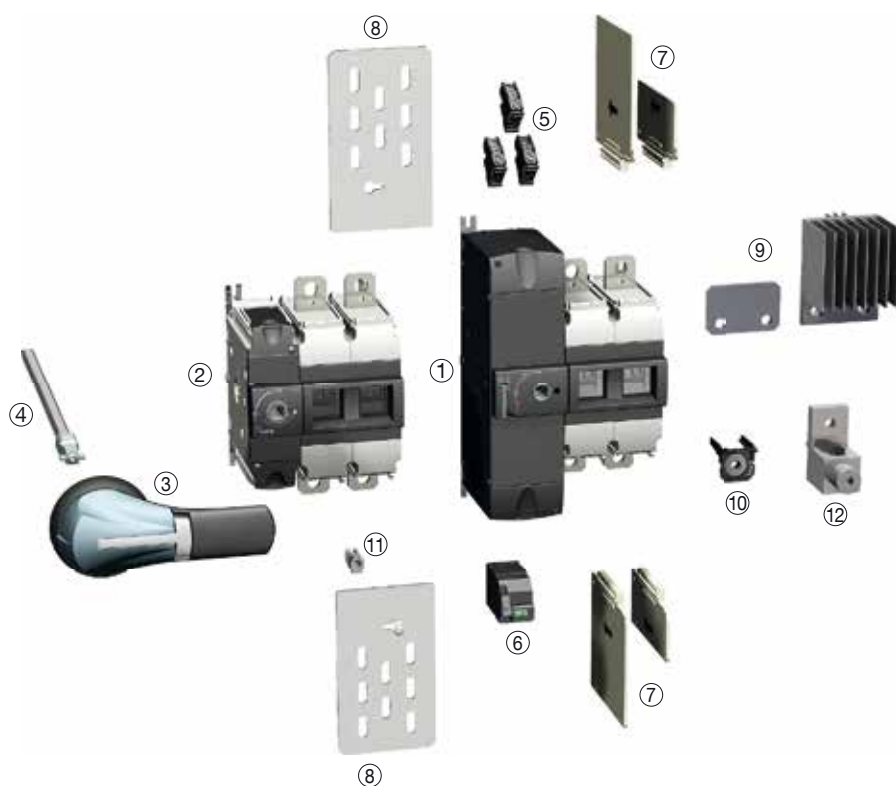
INOSYS *LBS* UL 98B

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

inosy_058_a_1_x_cat.ai

References (continued)

INOSYS LBS without tripping function

1000 VDC - 1 circuit

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

1500 VDC - 2 circuits

| Rating (A) | Frame size | No. of poles per circuit | Switch body ⁽¹⁾ | External operation | Aux. Contact | Bridging Bar ⁽²⁾ |
|------------|------------|--------------------------|----------------------------|---------------------------------------------------------|--------------------|---------------------------------------|
| 400 A | F3 | 2 P (1 P+, 1 P-) | 87P2 2041 ⁽³⁾ | Shaft 320 mm 12.6 inches 1400 1032 | NO/NC 8499 0001 | 8409 0041 8409 0063 ⁽⁴⁾ |
| 500 A | | | 87P2 2051 ⁽³⁾ | 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 ⁽¹⁾ | External operation | Tripping coil | Aux. Contact | Bridging Bar ⁽²⁾ |
|------------|------------|--------------------------|----------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------------|-----------------------------|
| 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 48 V AC 8499 8104 | | 8409 0040 |
| 500 A | F3 | 2 P | 85P0 2050 | | 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 ⁽¹⁾ | External operation | Tripping coil | Aux. Contact | Bridging Bar ⁽²⁾ |
|------------|------------|--------------------------|------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------|-----------------------------|
| 100 A | F2 | 2P (1P+, 1P-) | 85P0 2011 ⁽⁴⁾ 85P1 1011 ⁽³⁾ | 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 | NO/NC 8499 0001 | 8409 0016 |
| 200 A | F2 | 2P (1P+, 1P-) | 85P0 2021 ⁽⁴⁾ 85P1 1021 ⁽³⁾ | | 230 VAC/DC 8499 7023 | | - |
| 250 A | F2 | 2P (1P+, 1P-) | 85P0 2026 ⁽⁴⁾ 85P1 1026 ⁽³⁾ | | Undervoltage release 48 VAC | | 8409 0016 |
| | | 3P (2P+, 1P-) | 85P0 3031 | | 230 VAC 8499 8104 | | - |
| 400 A | F3 | 2P (1P+, 1P-) | 85P0 2041 | | 24 VDC 8499 8202 48 VDC 8499 8202 | | 2x 8409 0025 |
| 500 A | F3 | 2P (1P+, 1P-) | 85P0 2051 | S2L type handle Black 3R, 12 - 4, 4X 74AD 2118 | | | 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 2118 |
| F2 | S2 | Black | 4,4X | 742D 2118 |
| F2 | S2 | Red | 4,4X | 742E 2118 |
| F3 | S2L ⁽¹⁾ | Black | 3R, 12 | 74AF 2118 |
| F3 | S2L ⁽¹⁾ | Black | 4,4X | 74AD 2118 |
| F3 | S2L ⁽¹⁾ | Red | 4,4X | 74AE 2118 |

(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 2111 | |
| F2 | S2 | Black | 4,4X | 742D 2111 | 142J 6111 |
| F2 | S2 | Red | 4,4X | 742E 2111 | |
| F3 | S2L ⁽¹⁾ | Black | 3R, 12 | 14AF 2111 | |
| F3 | S2L ⁽¹⁾ | Black | 4,4X | 14AD 2111 | 14AJ 2111 |
| F3 | S2L ⁽¹⁾ | Red | 4,4X | 14AE 2111 | |

(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 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

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.

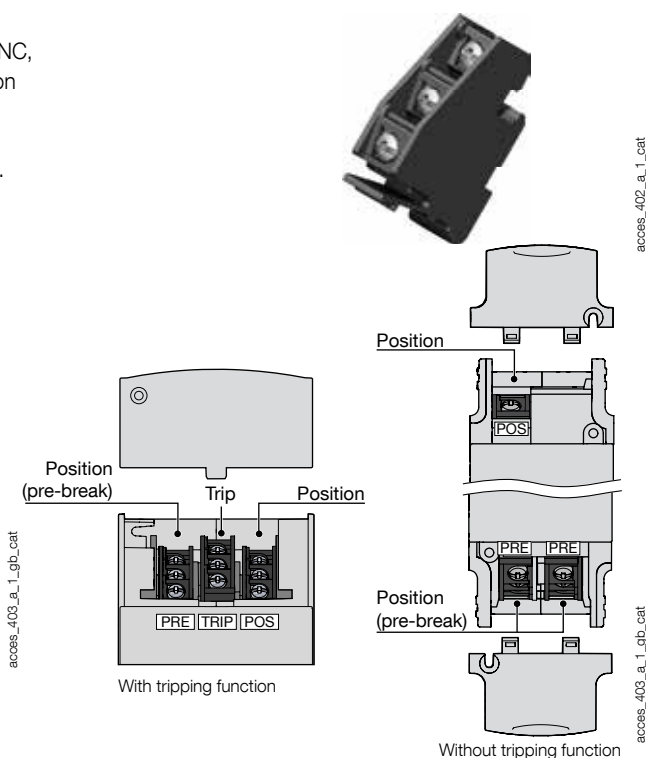
Characteristics

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 _{th} (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 mm², 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 _n | - | 1.8 | 1.4 | 1.5 |
| DC type | 24 VDC | 48 VDC | 110 VDC | 230 VDC |
| Max permanent consumption (VA), at 110% U _n | 1.6 | 1.4 | - | - |

Holding: up to 85% x U_n

Release: < 35 to 70% x U_n

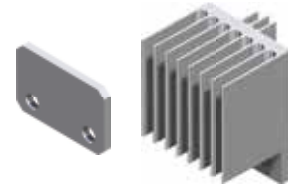
Accessories (continued)

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.


 acca_411_a_1_cat
acce_410_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 ⁽¹⁾ |
| F2 | 250 | 3 P | 2 | 8409 0025 |
| F3 | 400 ... 500 | 2 P | 1 | 8409 0039 ⁽¹⁾ |
| F3 | 400 | 2 P | 1 | 8409 0040 |
| F3 | 500 | 2 P | 1 | 8409 0041 8409 0063 ⁽²⁾ |

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 ⁽²⁾ |
| F3 | 500 | 2 P | 2 | 8409 0063 |

⁽¹⁾ Centered mechanism.

⁽²⁾ 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).



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 3722 |

⁽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 6220 |
| F2 - F3 | 100 | 8499 6221 |



acces_409_a_1_cat

INOSYS **LBS** UL 98B

Load Break Switches for DC & PV applications

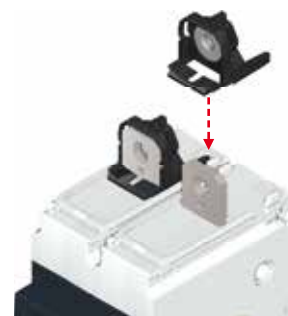
from 100 to 600 A, up to 1500 VDC,

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.



acce_399_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.

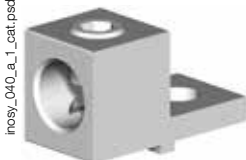


acce_412_a_1_cat

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

Terminal lugs

inosy_040_a_1_cat.psd



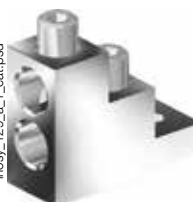
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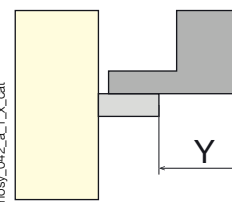
inosy_127_a_1_cat.psd



inosy_128_a_1_cat.psd



inosy_042_a_1_x_cat



| 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 ⁽¹⁾ |
|------------------------------------|------------|-----------------------------------------------------------------------|---------------|------------------|------------------------|-----------------------|----------------------------|--------------------------|
| 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 ⁽²⁾ |
| | F2 | | Cu / Al | | 3 | | | 3954 3023 ⁽²⁾ |
| | F2 | | Cu / Al | | 4 | | | 3954 4023 ⁽²⁾ |
| With tripping function only | F3 | 1 conductor (#4 - 600 KCMIL) 2 conductors (#1/0 - 250 KCMIL) | Cu / Al | 1 2 | 2 | 45,7 / 1.79 | CMC LA630-R | 3954 2040 ⁽²⁾ |
| | F3 | | Cu / Al | | 3 | | | 3954 3040 ⁽²⁾ |
| | F3 | | Cu / Al | | 4 | | | 3954 4040 ⁽²⁾ |
| With and without tripping function | F3 | 2 conductors (#2 - 600 KCMIL) | Cu / Al | 2 | 2 | 69,7 / 2.74 | CMC PV2-600 | 3954 2060 ⁽²⁾ |
| | F3 | | Cu / Al | | 3 | | | 3954 3060 ⁽²⁾ |
| | F3 | | Cu / Al | | 4 | | | 3954 4060 ⁽²⁾ |

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

(2) Captive nut 84996xxx is mandatory.

Characteristics

Characteristics according to UL 98B

| Rated current I _n | 100 A | 200 A | 250 A | 400 A | 500 A | 600 A |
|------------------------------------------------------------|-------------------|-------------------|-------------------|------------------------------|------------------------------|------------------------------|
| Frame size | F2 | F2 | F2 | F3 | F3 | F3 |
| 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 | - |
| Short-circuit capacity at 1000 & 1500VDC (with protection) | | | | | | |
| Prospective short-circuit current (kA rms DC) | 10 ⁽¹⁾ | 10 ⁽¹⁾ | 10 ⁽¹⁾ | 10 ⁽¹⁾ | 10 ⁽¹⁾ | 10 ⁽¹⁾ |
| Mechanical characteristics | | | | | | |
| Durability (number of operating cycles) | 8 000 | 8 000 | 8 000 | 8 000 / 6 000 ⁽²⁾ | 8 000 / 6 000 ⁽²⁾ | 8 000 / 6 000 ⁽²⁾ |
| 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 _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 ⁽¹⁾ | DC-21 B | 160 | 250 | 315 | 400 | 630 | 800 |
| 1 circuit | 1500 VDC ⁽²⁾ | 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 ⁽¹⁾ | PV2 | - | - | - | - | - | - |
| 1 circuit | 1500 VDC ⁽²⁾ | PV2 | 160 | 250 | 315 | 400 | 630 | - |
| 2 circuits | 1500 VDC ⁽²⁾ | PV2 | - | - | - | 400 | 630 | - |
| Short-circuit capacity at 1000 & 1500VDC (without protection) | | | | | | | | |
| Rated short-time withstand current I _{cs} 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 ²) ⁽³⁾ | | | 70 | 120 | 185 | 240 | 2 X 185 | 2X 240 |
| Recommended Cu busbar width (mm) ⁽³⁾ | | | 20 | 20 | 20 | 25 | 25 | 25 |
| Mechanical characteristics | | | | | | | | |
| Durability (number of operating cycles) | | | 8000 | 8000 | 8000 | 8000 / 6000 ⁽⁴⁾ | 8000 / 6000 ⁽⁴⁾ | 8000 / 6000 ⁽⁴⁾ |
| 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.

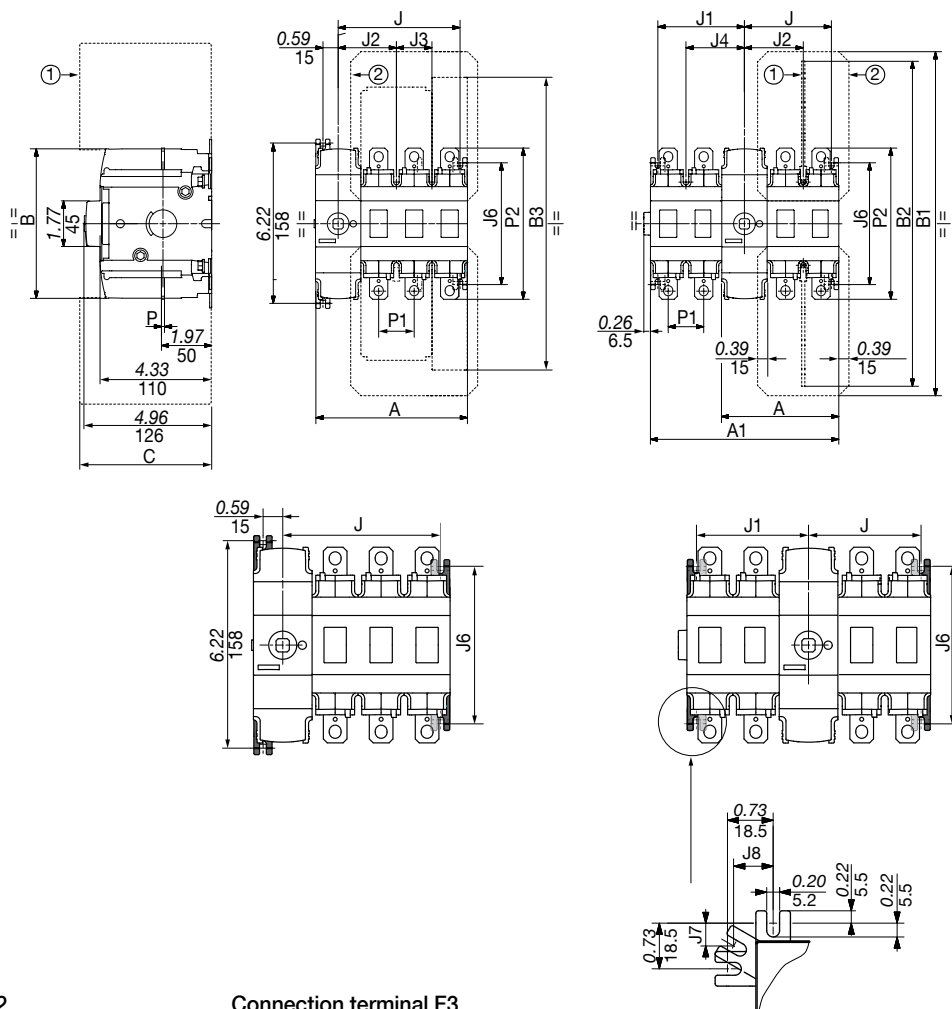
INOSYS LBS UL 98B

Load Break Switches for DC & PV applications

from 100 to 600 A, up to 1500 VDC,

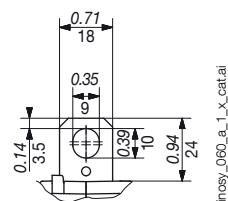
with manual operation and manual operation with tripping function

INOSYS LBS without tripping function

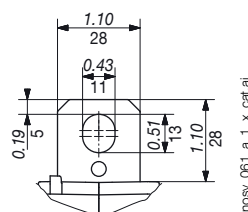


1. Inter-phase barrier.
2. Terminal screens..

Connection terminal F2



Connection terminal F3

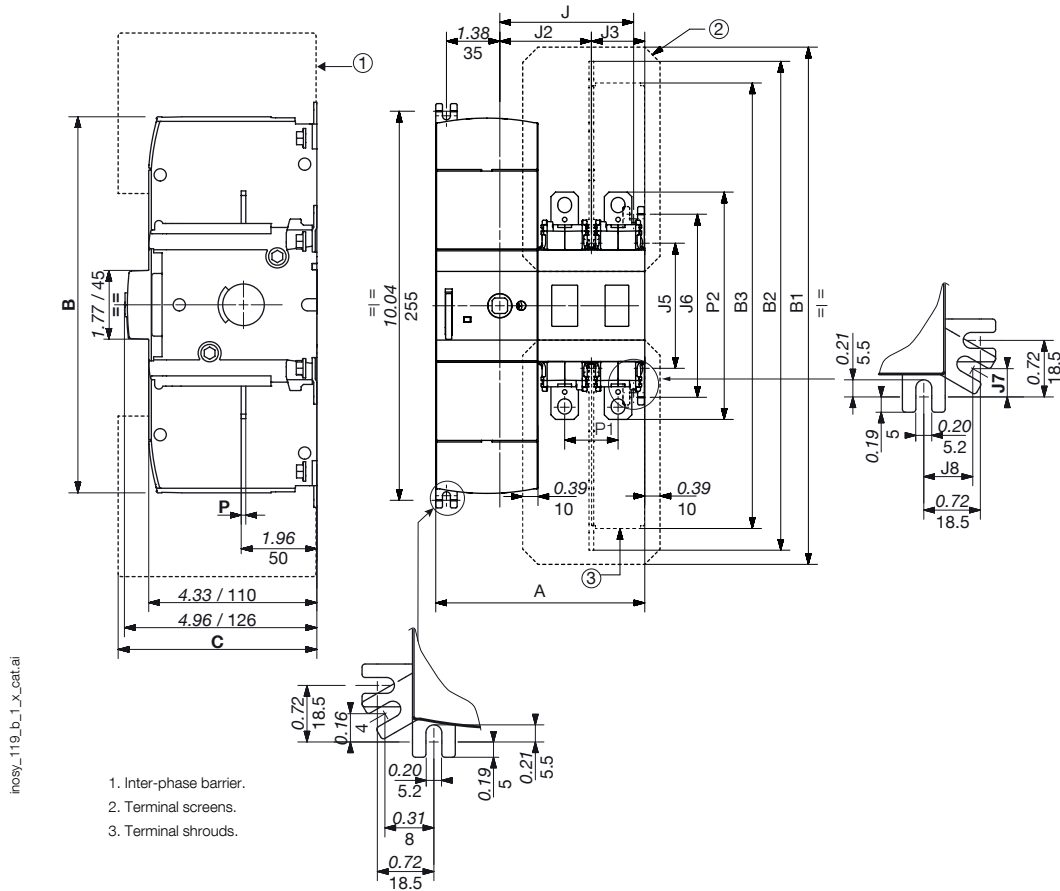


| Rating (A) | Frame size | Units | A | | A1 | J | J1 | J | |
|-------------|------------|-------|------|------|---------------|---------------|---------------|-------|-------|
| | | | 2 P | 3 P | 1+1 P / 2+2 P | 1+1 P / 2+2 P | 1+1 P / 2+2 P | 2 P | 3 P |
| 100 ... 250 | F2 | in | 4.60 | 5.98 | 4.60 / 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 | - |

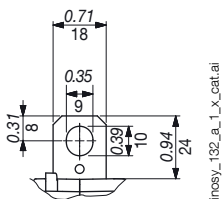
| Rating (A) | Frame size | Units | B | B1 | B2 | | | B3 | C | | J2 | J3 | J4 | J6 | P1 | P2 |
|-------------|------------|-------|------|-------|-----------|----------|-------|-------|------|------|------|------|------|------|------|------|
| | | | | | IEC short | IEC long | UL | | IEC | UL | | | | | | |
| 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)

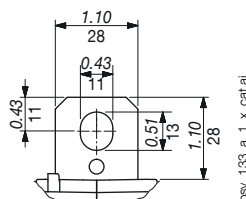
INOSYS LBS with tripping function



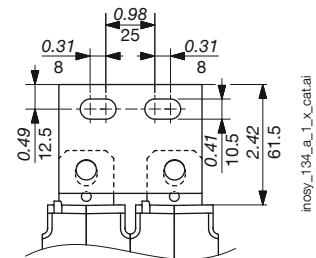
Connection terminal F2



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

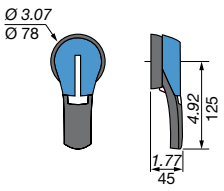
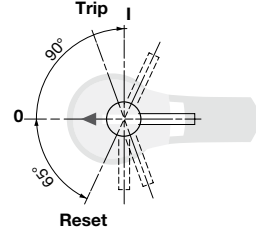
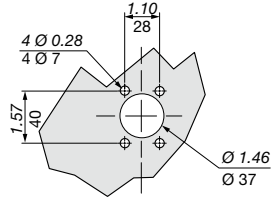
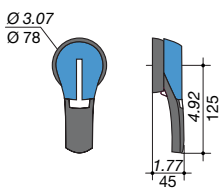
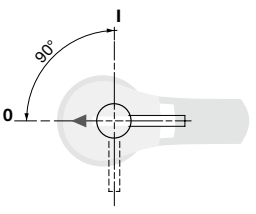
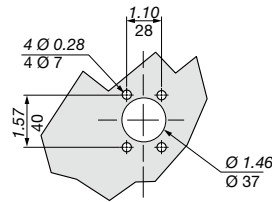
Load Break Switches for DC & PV applications

from 100 to 600 A, up to 1500 VDC,

with manual operation and manual operation with tripping function

Dimensions for external handles (in/mm)

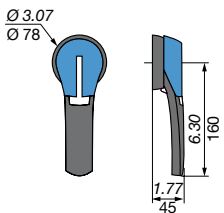
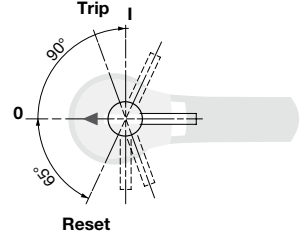
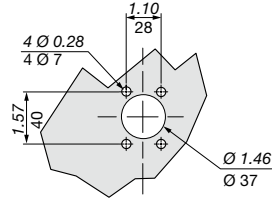
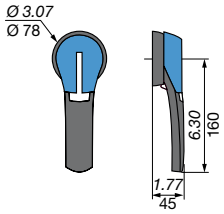
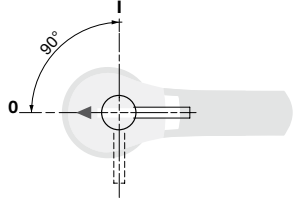
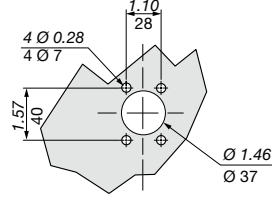
F2 frame size

| Handle type | Front operation Direction of operation | Door drilling |
|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| S2 type with trip  |  |  |
| S2 type  |  |  |

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 |
|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| S2L type with trip  |  |  |
| S2L type  |  |  |

poign_068_b_1_us_cat.eps

poign_069_b_1_us_cat.eps

Pole series connections

1 PV circuit - 1000 & 1500 VDC

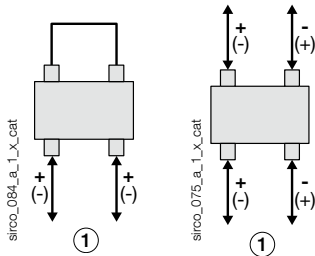
1 PV circuit - 1500 VDC

2 PV circuits - 1500 VDC

F2-F3 - 2 P

Grounded network

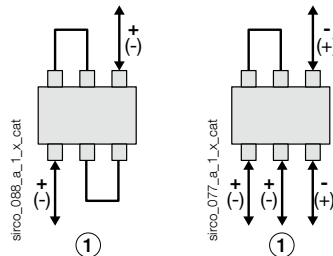
Floating network



F2 - 3 P

Grounded network

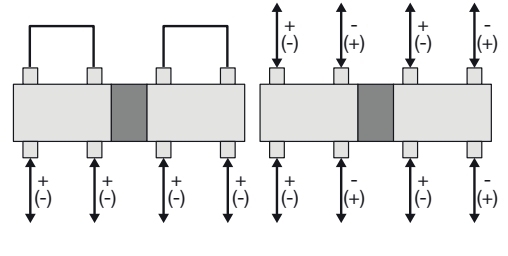
Floating network



F3 - 2 P

Grounded network

Floating network



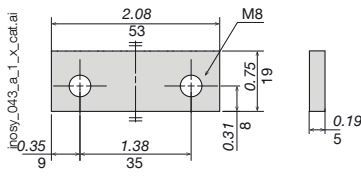
1. Circuit 1
2. Circuit 2

Bridging bars (in/mm)

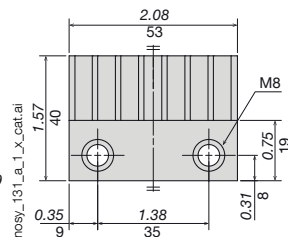
F2

8409 0016⁽¹⁾

(1) Kit comprises 2 identical bars.



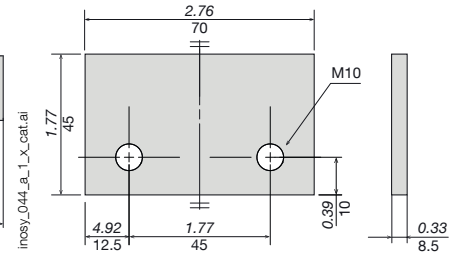
8409 0025



F3

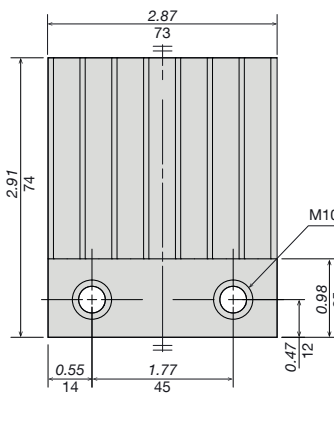
8409 0040⁽¹⁾

(1) Kit comprises 2 identical bars.

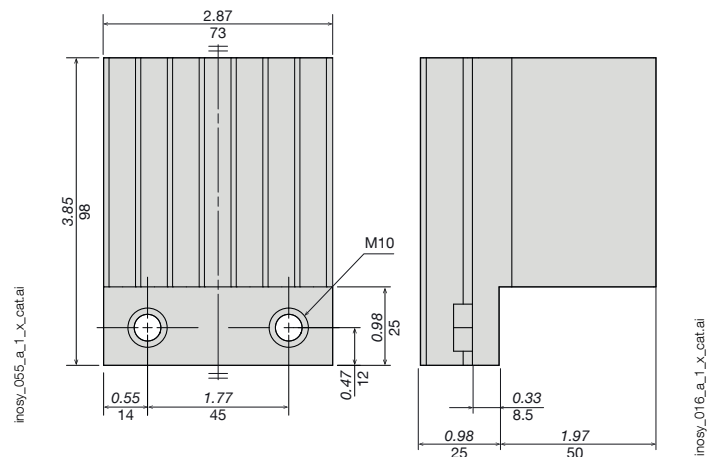


F3

8409 0041



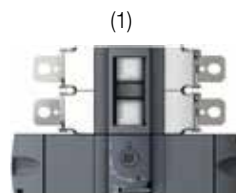
8409 0063



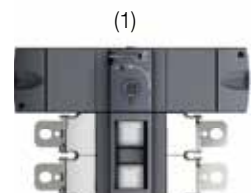
Mounting orientation

F2 - F3

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



(1) Not UL certified with jumpers 8409 0025



inosy_006_a.psd

Note

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SAS SOCOMEK capital 10 633 100 €
R.C.S. Strasbourg B 548 500 149
B.P. 60010 - 1, rue de Westhouse
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Tel. +33 3 88 57 41 41 - Fax +33 3 88 57 78 78
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