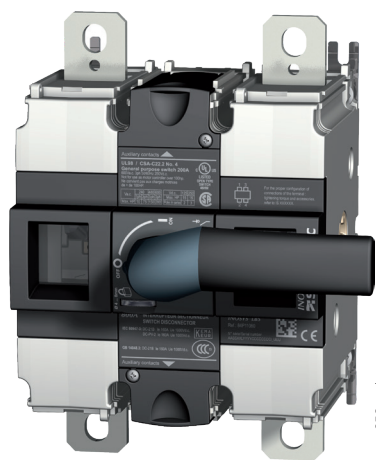


INOSYS LBS DC

Load break switches for DC and PV applications

160 to 1600 A, up to 2000 VDC



inosy_066.psd

Function

INOSYS LBS is a range of manual operation load break switches. These switches can be operated manually using the handle to disconnect all or part of the electrical installation. They make and break under load conditions and provide safe disconnection of any low voltage electrical circuit up to 2000 VDC.

They can also be used for emergency switching applications.

They are the first load break switches on the market capable of supporting 2000 VDC.

Advantages

High-performance power switching in confined spaces

- INOSYS LBS load break switches incorporate patented technology that provides a breaking capacity of 750 VDC per pole, providing 1500 VDC in just 2 poles, significantly limiting power dissipation. All in a compact device.
- Also available in 2000 VDC in 3 or 4 pole configurations. The upgrade from 1500 VDC to 2000 VDC allows load break switches to handle higher voltage applications and provide more power. The INOSYS range meets and exceeds industry standards and certifications, ensuring compliance with electrical safety regulations and guidelines.

Safe and reliable operation

- Direct position indication and visible contacts with arc containment.
- The opening and closing of the switch is fully independent of the operating speed, to ensure safe use under any conditions.
- High temperature resistance: no derating up to 55 °C, operational from -40 °C to +70 °C.

Designed for harsh environments

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

Simple installation

- Wiring: as the switch is not polarised, it allows all types of wiring and connections.
- Easy access without tools to integrate auxiliary contacts (located within the footprint of the switch).
- The mechanism can be positioned in the centre or on the left (at the factory).

Modular solution for flexible configuration

- Single or double polarity switch.
- The same switch can be used for grounded or isolated networks by simply changing the wiring configuration.

The solution for

- > Industry

Strong points

- > High-performance power switching in confined spaces
- > Safe and reliable operation
- > Designed for harsh environments
- > Simple installation
- > Modular solution for flexible configuration

Conformity to standards

- > IEC 60947-3
- > DC-21B & DC-PV2
- > UL98B
- > CCC



Sustainable advantages

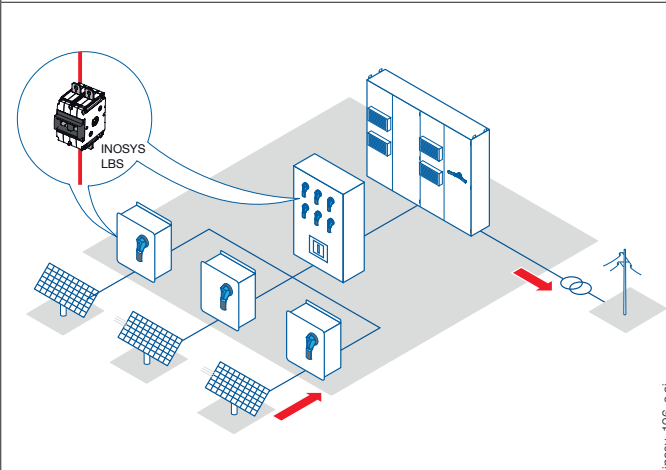
- > Robust design, using durable and stable materials to maximise product lifetime.
- > Tested beyond market standards to maximise product lifetime - even in severe operating environments.
- > Best-in-class compactness.
- > RoHS & REACH compliant.

General characteristics

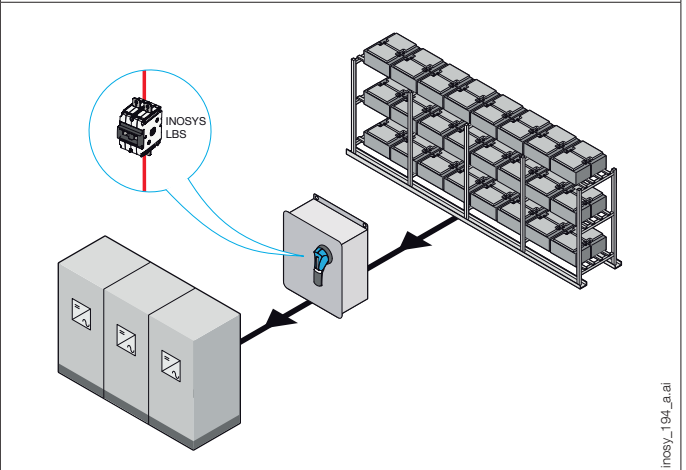
- Range 160 to 1600 A.
- Up to 2000 VDC.
- High-performance switching with a compact design.
- Easy integration.
- Enhanced safety with visible breaking.
- High efficiency, with low power loss.

Typical applications: local safety disconnection for DC and PV applications

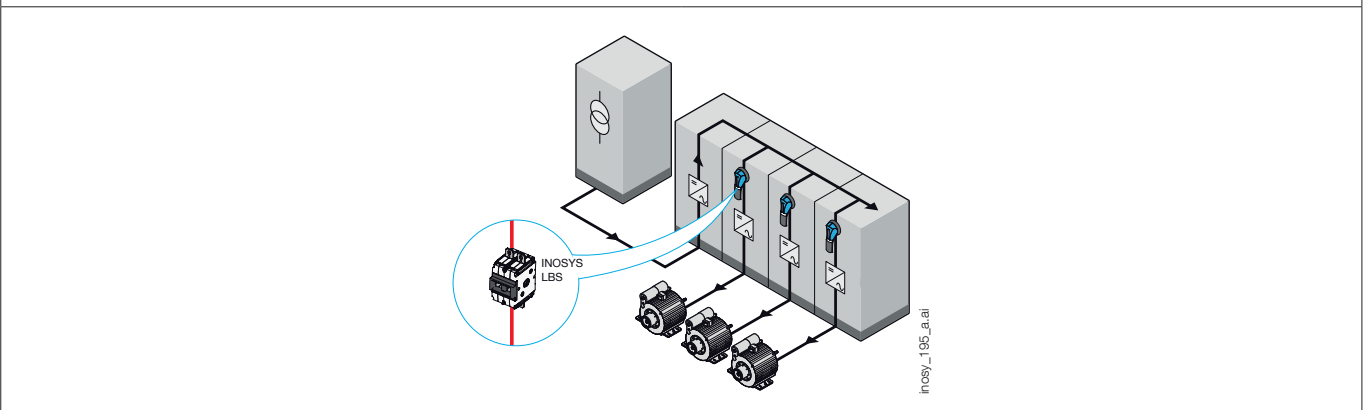
PV system: junction box, combiner box or inverter



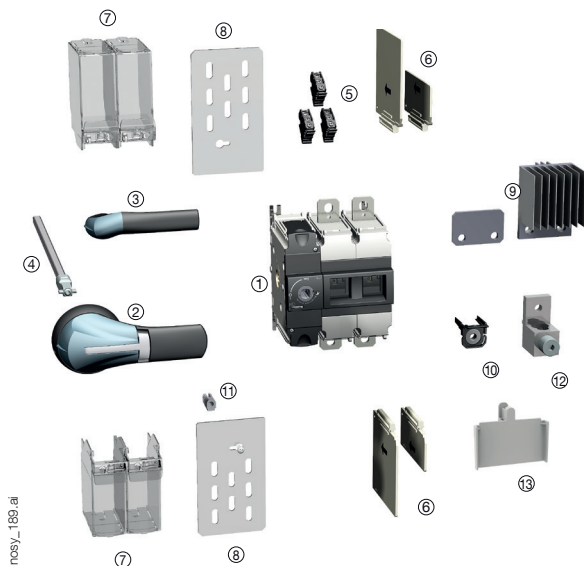
Battery protection



Isolation of DC processes



Overview



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

INOSYS LBS DC

Load break switches for DC and PV applications

160 to 1600 A, up to 2000 VDC

References

INOSYS LBS

1000 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body ⁽¹⁾	External operation	Aux. contact
160 A	F2	2 P (1 P+, 1 P-)	86P0 2016	Shaft 320 mm 1400 1032 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) Switches are delivered without accessories.

1500 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body ⁽¹⁾	External operation	Aux. contact
160 A	F2	2 P (1 P+, 1 P-)	86P0 2017	Shaft 320 mm 1400 1032 S2 type handle Black IP65 742F 2111	NO/NC 8499 0001
			86P1 1017 ⁽²⁾		
		3 P (2 P+, 1P-)	86P0 3016		
250 A	F2	2 P (1 P+, 1 P-)	86P0 2026		
			86P1 1026 ⁽²⁾		
		3 P (2 P+, 1 P-)	86P0 3025		
315 A	F2	2 P (1 P+, 1 P-)	86P0 2032		
			86P1 1032 ⁽²⁾		
		3 P (2 P+, 1 P-)	86P0 3031		
400 A	F2	2 P (1 P+, 1 P-)	86P0 2042		
			86P1 1042 ⁽²⁾		
400 A	F3	2 P (1 P+, 1 P-)	86P0 2041		
			86P1 1041 ⁽²⁾		
500 A	F3	2P (1P+, 1P-)	86P0 2051		
			86P1 1051 ⁽²⁾		
630 A	F3	2 P (1 P+, 1 P-)	86P0 2064		
			86P1 1064 ⁽²⁾		

(1) Switches are delivered without accessories.

(2) Centred mechanism.

References (continued)

INOSYS LBS

1500 VDC - 2 circuits

Rating (A)	Frame size	No. of poles per circuit	Switch body ⁽¹⁾	External operation	Aux. contact
400 A	F3	2 P (1 P+, 1 P-)	86P2 2041 ⁽²⁾	Shaft 320 mm 1400 1032	NO/NC 8499 0001
500 A			86P2 2051 ⁽²⁾	S2L type handle Black IP65 14AF 2111	
630 A			86P2 2064 ⁽²⁾		

(1) Switches are delivered without accessories.

(2) Centred mechanism.

1500 VDC - high performance

Rating (A)	Frame size	No. of poles per circuit	Switch body ⁽¹⁾	External operation	Aux. contact
800 A	F3	4P (2P // 2P)	86P2 2081	Shaft 320 mm 1400 1032 S2L type handle Black IP65 14AF 2111	NO/NC 8499 0001
1000 A			86P2 2100		
1250 A			86P2 2125		
1400 A			86P2 2140		
1600 A			86P2 2160		

(1) Switches are delivered without accessories.

2000 VDC - 1 circuit

Rating (A)	Frame size	No. of poles per circuit	Switch body ⁽¹⁾	External operation	Bridging bar
400 A	F3	3P (2P+, 1P-)	88P1 2041	Shaft 320 mm 1400 1032 S2L type handle Black IP65 14AF 2111	8409 0040
		4P (2P+, 2P-)	88P2 2041 ⁽²⁾		
500 A		3P (2P+, 1P-)	88P1 2051		8409 0041
		4P (2P+, 2P-)	88P2 2051 ⁽²⁾		
630 A		3P (2P+, 1P-)	88P1 2064		
		4P (2P+, 2P-)	88P2 2064 ⁽²⁾		

(1) Switches are delivered without accessories.

(2) Centred mechanism.

Accessories

Direct operation handle

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



Handle E2

External operating handle

Use

The external operating handles include an escutcheon and can be padlocked.

External handles should be used with a shaft extension.

Example of use:

When the handle is locked in the "ON" position, the operator must ensure that the circuit is disconnected and isolated before accessing the panel and performing maintenance procedures. You can open the door when the switch is in the "ON" position by bypassing the interlocking function with a specially designed tool (authorised persons only). The lock is automatically restored when the door is closed.

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

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

(2) Only compatible with the version with the mechanism on the left.



S2 type handle

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 available: please contact us.



Shaft for S2 and S2L handles

Insulation plate

Use

This insulation plate ensures customer safety.

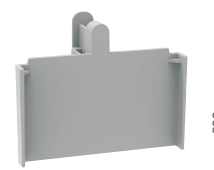
Characteristics

Products rated 800 A and above are supplied with insulation plates.

For replacement, 2 kits will need to be ordered.

Description	Quantity to order	Reference
Insulation plate	2	8499 1000 ⁽¹⁾

(1) The kit includes 2 identical insulation plates.



Accessories (continued)

Auxiliary contact

Use

The auxiliary contacts provide pre-break signalling and position information.

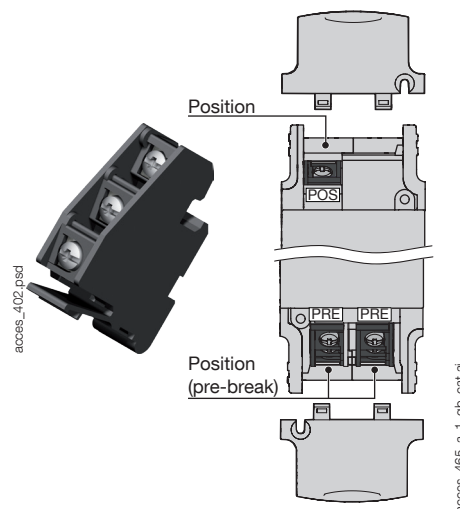
Characteristics

Switching type: NO/NC, IP2X with direct operation (screwed cover).
10,000 operations.
Max. 3 per switch.

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

Characteristics

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



Bridging bar for poles arranged in series

Use

Bridging bars connect poles arranged in series and in parallel, which allows for the following configurations in 1500 VDC and 2000 VDC.

1500 VDC - 1 circuit

Frame size	Rating (A)	No. of poles	Quantity to order	Reference
F2	160 ... 400	3 P	2	8409 0025
F3	1600	4P / 2P	2	8409 1600

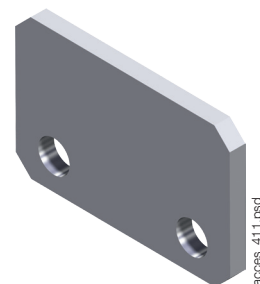
1500 VDC - 1 circuit with pole switching at full voltage per polarity

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

2000 VDC - 1 circuit

Frame size	Rating (A)	No. of poles	Quantity to order	Reference
F3	400	3P	1	8409 0040
F3	400	4P	2	8409 0040
F3	500...630	3P	1	8409 0041
F3	500...630	4P	2	8409 0041

(1) Centred mechanism.



Terminal shroud

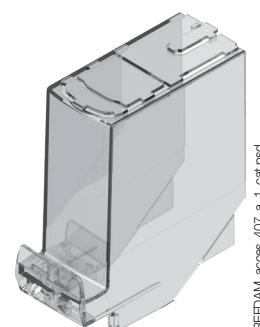
Use

Provides top or bottom protection against direct contact with IP4 terminals or connection parts, and also provides phase separation.

Advantages

Perforations for thermographic inspection / voltage check without the need to remove the shrouds. Sealable in position. Includes break marks for precise adaptation to cables or insulated bars.

Frame size	No. of poles	Type	Position	Reference
F2	3 x 1P	1P	Top or bottom	8499 4213
F2	4 x 1P	1P	Top or bottom	8499 4214
F3	4 x 1P	1P	Top or bottom	8499 4314



Accessories (continued)

Terminal screen

Use

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

Advantages

Perforations for thermographic inspection. Assembly requires mounting inserts (provided with terminal screens).

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

(1) Each reference includes 2 terminal screens for upstream and downstream protection.

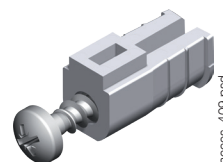


Mounting insert

Use

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

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

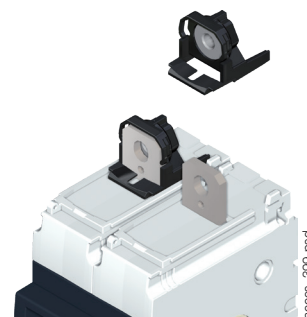


Captive nut

Use

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

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



Voltage sensing tag

Use

Allows connection of sensors or power cables with a fast-on connection.

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



Characteristics

Characteristics according to IEC 60947-3

Nominal current I_n			160 A	250 A	315 A	400 A	500 A	630 A
Frame size			F2	F2	F2	F2 / F3	F3	F3
Thermal current at 40 °C (A)			160	250	315	400	500	630
Thermal current at 50 °C (A)			160	250	315	400	500	630
Thermal current at 60 °C (A)			160	250	315	400	500	630
Thermal current at 70 °C (A)			160	250	315	400	480	580
Thermal current at 80 °C (A)			140	220	280	360	430	520
Rated insulation voltage U_i (V)			1500	1500	1500	1500	1500	1500
Rated impulse withstand voltage U_{imp} (kV)			12	12	12	12	12	12
Number of circuits	Nominal voltage	Utilisation category	I_o (A)	I_o (A)	I_o (A)	I_o (A)	I_o (A)	I_o (A)
1 circuit	1000 VDC ⁽¹⁾	DC-21 B	160	250	315	400	500	630
1 circuit	1500 VDC ⁽²⁾	DC-21 B	160	250	315	400	500	630
Number of circuits	Nominal voltage	Utilisation category	I_o (A)	I_o (A)	I_o (A)	I_o (A)	I_o (A)	I_o (A)
1 circuit	1000 VDC ⁽¹⁾	PV2	-	-	-	⁽⁴⁾	-	-
1 circuit	1500 VDC ⁽²⁾	PV2	160	250	315	400	500	630
2 circuits	1500 VDC ⁽²⁾	PV2	-	-	-	400	500	630
Short-circuit operation at 1000 and 1500 VDC (without protection)								
Rated short-time withstand current I_{cw} 1s (kA rms)			10	10	10	10	10	10
Rated short-circuit rated breaking capacity I_{cm} (peak kA) - 60 ms			10	10	10	10	10	10
Connection								
Recommended Cu rigid cable cross-section ⁽³⁾			70	120	185	240	2 x 150	2 x 185
Recommended Cu busbar width (mm) ⁽³⁾			20	20	20	25	25	25
Mechanical characteristics								
Durability (number of operating cycles)			8000	8000	8000	8000	8000	8000
Power dissipation per pole (W/pole)			4.5	11.2	13	13	21.6	30.2

(1) 2 poles in series.

(2) 2 or 3 poles in series.

(3) For aluminium connections, please contact us.

(4) Inosys F2 = PV1 400A, Inosys F3 = PV2 400A

Characteristics (continued)

Characteristics according to IEC 60947-3

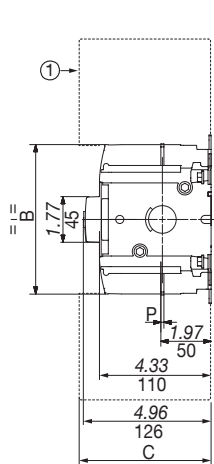
Nominal current I_n		800	1000	1250	1400	1600
		(A)	(A)	(A)	(A)	(A)
Rated insulation voltage U_i (V)		1500	1500	1500	1500	1500
Rated impulse withstand voltage U_{imp} (kV)		12	12	12	12	12
Frame size		F3	F3	F3	F3	F3
Rated voltage	Ambient temperature (°C)	(A)	(A)	(A)	(A)	(A)
1500 VDC	40	800	1000	1250	1400	1600
1500 VDC	50	800	1000	1250	1400	1480
1500 VDC	60	720	900	1120	1260	1330
1500 VDC	70	650	810	1010	1130	1200
1500 VDC	80	580	730	910	1020	1080
Rated voltage	Utilisation category	(A)	(A)	(A)	(A)	(A)
1500 VDC	DC-21 B	800	1000	1250	1400	1600
1500 VDC	PV1	800	1000	1250		
1500 VDC	PV2	800	1000			
Short-circuit capacity						
Rated short-time withstand current I_{cw} 1s (kA rms)	IEC 60947-3	20	20	20	20	20
Rated short-circuit making capacity I_{cm} (peak kA)	IEC 60947-3	20	20	20	20	20
Connection						
Recommended Cu busbar width (mm)		2 x 5 x 50	2 x 5 x 60	2 x 5 x 80	2 x 5 x 100	2 x 5 x 100
Min. tightening torque (Nm)		35	35	35	35	35
Max. tightening torque (Nm)		42	42	42	42	42
Mechanical characteristics						
Durability (number of operating cycles)		8000	8000	8000	8000	8000
Power dissipation per pole (W/pole)		12	18	28	35	46

Characteristics according to an extrapolation of IEC 60947-3

Nominal current I_n		400 A	500 A	630 A
Frame size		F3	F3	F3
Rated insulation voltage U_i (V)		2000	2000	2000
Rated impulse withstand voltage U_{imp} (kV)		12	12	12
Rated voltage	Ambient temperature (°C)	I_o (A)	I_o (A)	I_o (A)
2000 VDC	40	400	500	630
2000 VDC	50	400	500	630
2000 VDC	60	400	500	630
2000 VDC	70	400	480	580
Rated voltage	Utilisation category	I_o (A)	I_o (A)	I_o (A)
2000 VDC	DC-21B	400	500	630
Short-circuit capacity				
Rated short-circuit current I_{cw} 1s (kA)	based on IEC 60947-3	20	20	20
Rated short-circuit making capacity I_{cm} (kA)	based on IEC 60947-3	20	20	20
Connection				
Recommended Cu busbar width (mm)		240	2 x 150	2 x 185
Min. tightening torque (Nm)		35	35	35
Max. tightening torque (Nm)		42	42	42
Mechanical characteristics				
Durability (number of operating cycles)		8000	8000	8000

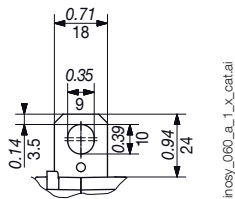
Dimensions

INOSYS LBS DC

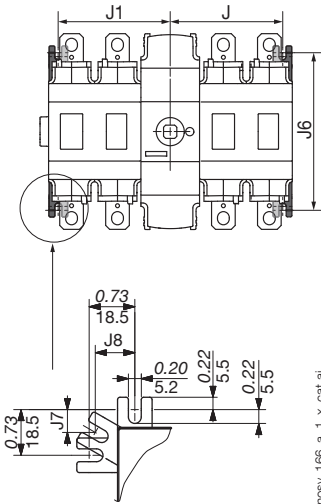
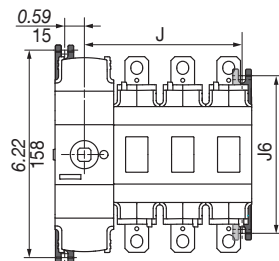
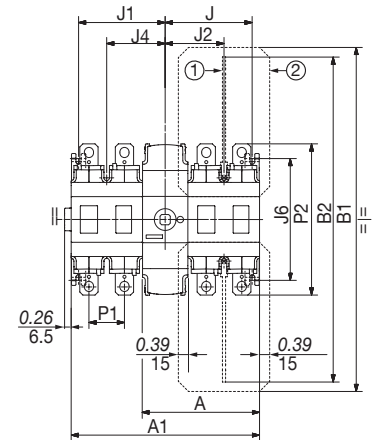
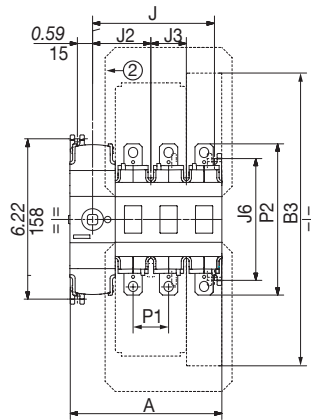
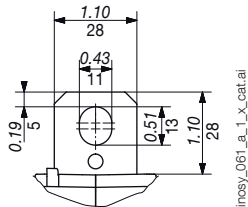


1. Inter-phase barrier.
2. Terminal shrouds.

Connection terminal F2



Connection terminal F3

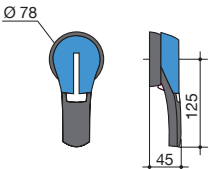
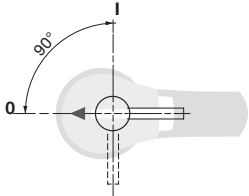
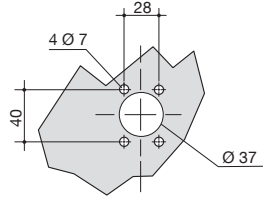


Rating (A)	Frame size	Units	A					A1			J				J1	
			2 P	3 P	1+1 P	1+2 P	2+2 P	1+1 P	1+2 P	2+2 P	2 P	3 P	1+1 P	2+2 P	1+1 P	2+2 P
100 ... 400	F2	mm	117	152	82	-	117	117	-	187	85.5	120.5	50.5	85.5	52.5	87.5
400 ... 1600	F3	mm	137	182	92	137	137	137	182	227	105.5	150.5	60.5	105.5	62.5	107.5

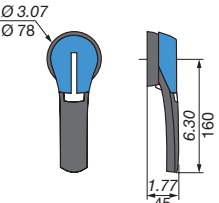
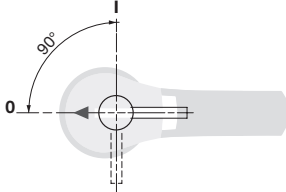
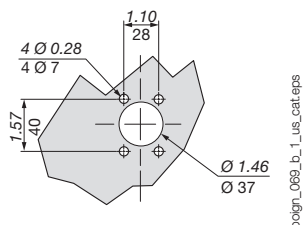
Rating (A)	Frame size	Units	B	B1	B2			B3	C		J2	J3	J4	J6	J7	J8	P1	P2
					IEC short	IEC long	UL		IEC	UL								
100 ... 400	F2	mm	154	339	199	320	262	296	110	110	57.5	35	59.5	120	10	15	35	149
400 ... 1600	F3	mm	154	414	237	358	359	359	110	135	67.5	45	69.5	158	4	8	45	200

Dimensions for external handles (in/mm)

Frame size F2

Handle type	Front operation Direction of operation	Door drilling
S2 type 		

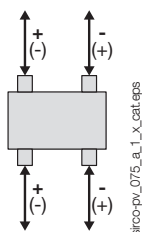
Frame size F3

Handle type	Front operation Direction of operation	Door drilling
S2L type 		

Wiring configuration

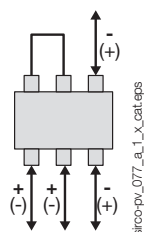
1 circuit - 1000 VDC

F2-F3 - 2 P

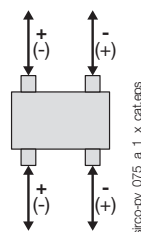


1 circuit - 1500 VDC

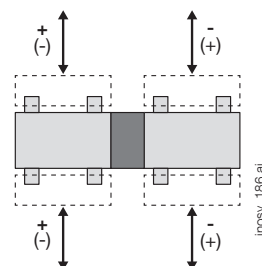
F2 - 3P



F2-F3 - 2P

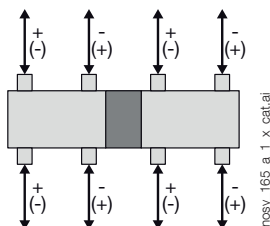


F3 - 2 P // 2P



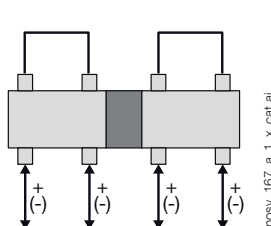
2 circuits - 1500 VDC

F3 - 2 P



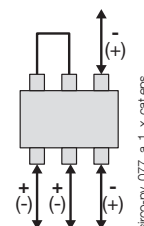
1 circuit - 1500 VDC per polarity

F3 - 2P+2P

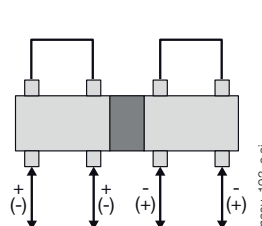


1 circuit - 2000 VDC

F3 - 3P



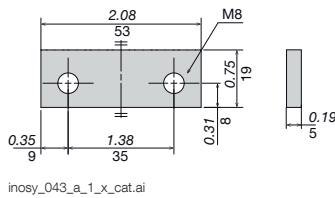
F3 - 2P+2P



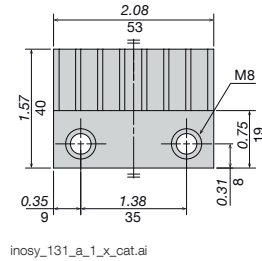
Bridging bars (in/mm)

F2

8409 0016 ⁽¹⁾

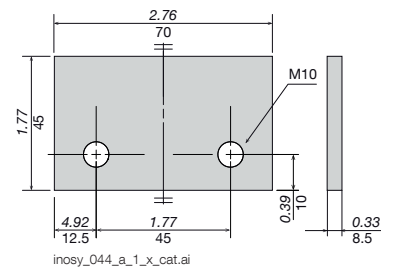


8409 0025



F3

8409 0040 ⁽¹⁾

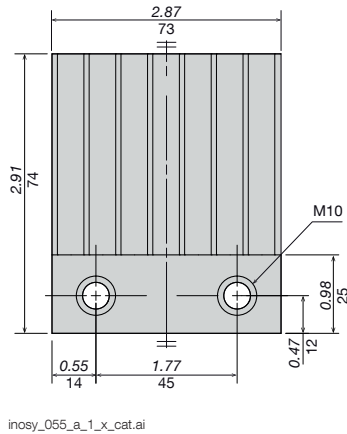


(1) Kit includes 2 identical bars.

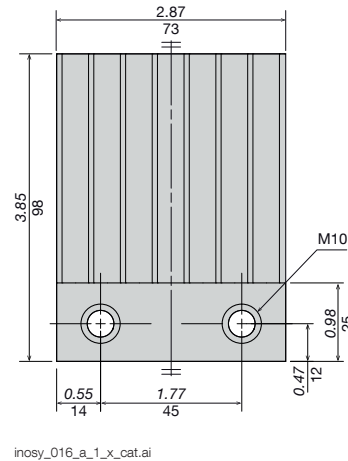
(1) Kit includes 2 identical bars.

F3

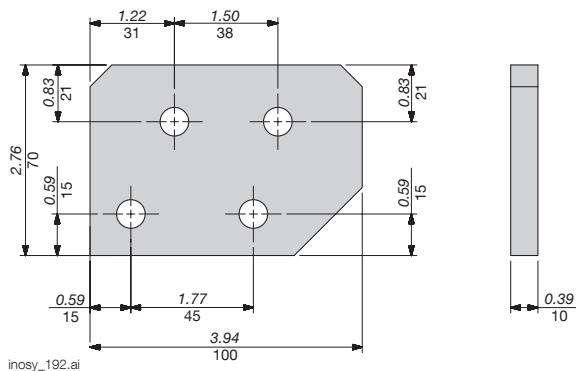
8409 0041



8409 0063



8409 1600



Mounting orientation

F2 - F3

All mounting orientations are possible. Derating may apply – please contact us.

