

Solar Installer Range



Bright solutions

IMO is at the forefront of control component technology specifically developed for the renewable energy market and in particular solar energy. Whether meeting the demands of safe and efficient DC switching or delivering solutions that help to maximise solar energy conversion rates, you can be sure that IMO products have been developed to meet the highest technical and commercial standards.

Our carefully selected range of Solar products have been brought together, to provide today's solar installer with the products they require to keep Solar safe on all their installations.

Solar TRUE DC Isolators

Specifically developed for arduous DC disconnect applications, the IMO range of Solar Isolators features an operator independent trigger ratchet switching mechanism resulting in switching times of less than 5ms. High reliability knife edge contacts and long arc cooling chambers ensure safe and effective isolation of DC voltages within solar installations.

Available in 2 to 8 pole versions in a wide variety of mounting and handle configurations, the IMO Solar Isolator range is suitable for most OEM or site installation applications.

Solar Connectors

IMO's range of mobile connectors are used to connect PV panels in series. They also link between lengths of cabling and allow connection to Branch and Panel connectors.

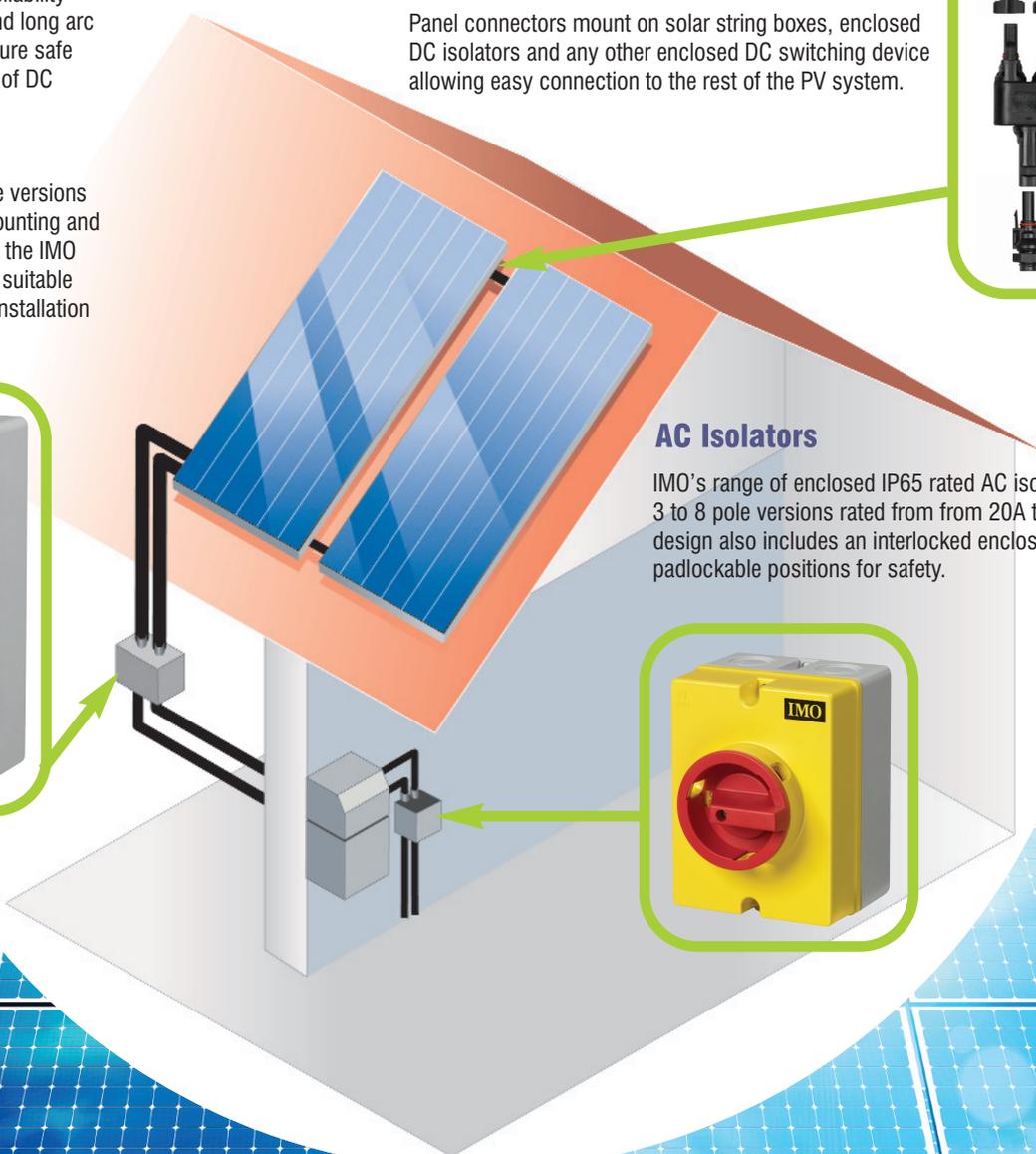
Branch connectors are used to link multiple strings together allowing, for example, a 2 pole (single string) DC isolator to switch both strings at the same time removing the need to use 2 isolators.

Panel connectors mount on solar string boxes, enclosed DC isolators and any other enclosed DC switching device allowing easy connection to the rest of the PV system.



AC Isolators

IMO's range of enclosed IP65 rated AC isolators includes 3 to 8 pole versions rated from from 20A to 80A. The design also includes an interlocked enclosure lid and 3 padlockable positions for safety.



Think PV.. ..Think Safety!

DC Switching

The IMO SI is a True DC switch not an AC version de-rated or re-wired for DC operation.

Features include:

- Operator independent switching mechanism
- High speed trigger ratchet switching (5ms max)
- IP65 rated enclosure with top and bottom M25/M20/M16/M12 push outs and rear cable entry
- Fully enclosed internal switch without additional wiring for maximum safety
- Knife edge contacts and arc cooling chambers
- High reliability rotary snap action mechanism
- Maximum 1Nm torque for easy operation
- Compact space saving design
- 16mm² box terminals for easy wiring

The IMO SI range has a switching speed that is independent of the operator. The mechanism is such that there is no direct linkage between the operator handle and the switch contacts. As the handle is moved it interacts with a spring mechanism which, upon reaching a set point, causes all the contacts to “SNAP” over thereby ensuring a very fast break/make action which means that the arcs produced by the constant DC load are normally extinguished within 5ms. Many alternative solutions, particularly those based upon AC isolator design, have a switching speed that is directly linked to operator speed. Slow operation of the handle results in slow separation of the contacts and can produce arcing times of 100ms or more.

The SI range also features a “knife edge” mechanism so that when the unit is operated there is a double break on each pole with arcing effect occurring on the corners of the switch only. The main contact is made on an area where no arcing has occurred. The rotary nature of the contact mechanism also means that when the SI is operated a self-cleaning action occurs on the arcing points, thereby producing good contact integrity over the life of the product. A secondary advantage of this type of operation in photovoltaic applications is that, in the event of a supply to earth failure, the short circuit current pulls the contacts together thereby giving an extremely high short circuit current capability in the order of up to 1700A (product dependant).

Completing the package for all your PV installation requirements is the IMO range of Solar Connectors. Rated up to 1000V 30A for 2.5-6mm² cables, the IMO connectors feature a secure easy clip and release system providing the installer with a time saving and efficient connector solution. As with all IMO PV products the connectors have been tested to the highest standards and come rated with IP67 protection, UL-94-5VA fire resistance and provide class 2 protection.



Solar Connectors

Mobile connectors are used to connect PV panels in series. They also link lengths of cabling and allow connection to Branch and Panel connectors.

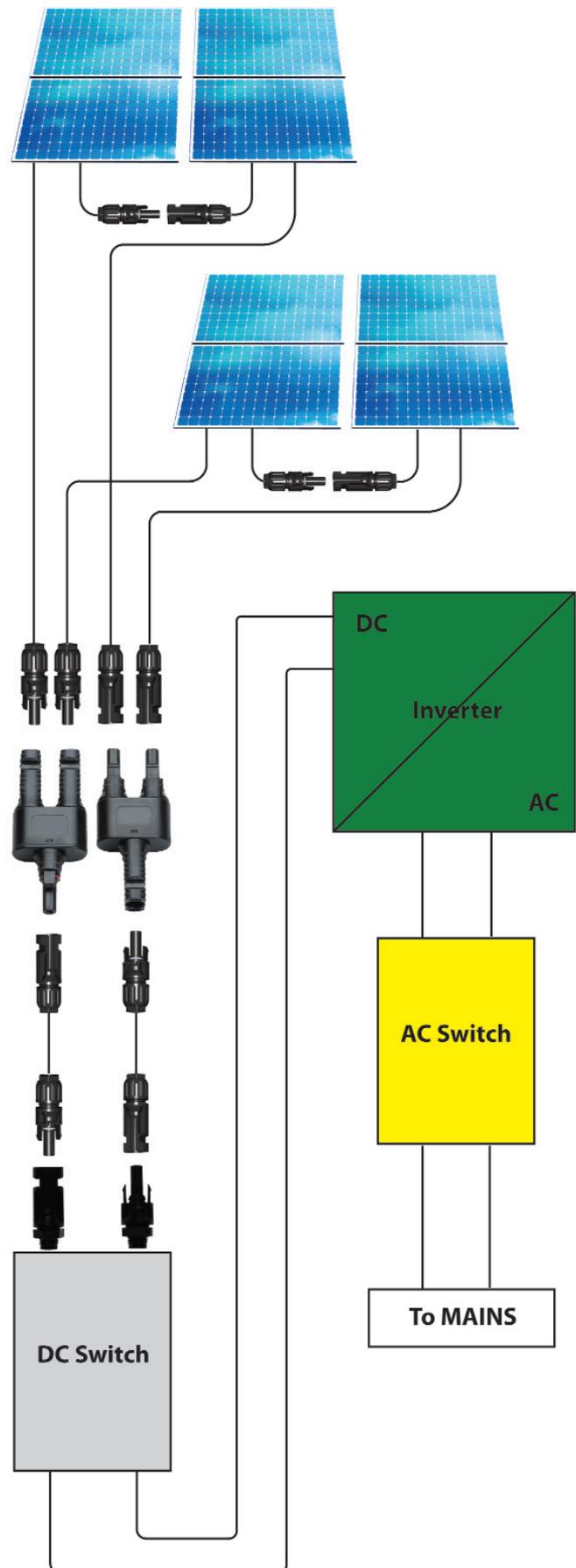
Branch connectors are used to link multiple strings together allowing, for example, a 2 pole (single string) DC isolator to switch both strings at the same time.

Panel connectors mount on solar string boxes, enclosed DC isolators and any other enclosed DC switching device allowing easy connection to the rest of the PV system.

Key Features:

- 1000V DC 30A Rated
- For 4-6mm² Cables
- Secure Easy Clip and Release System
- IP67 Protection
- UL94-5VA Fire Protection
- Class 2 Protection

Part Number	Description	Pack Quantity
SIC-M-4M	Male mobile connector	100
SIC-M-4F	Female mobile connector	100
SIC-P-4M	Male panel connector	100
SIC-P-4F	Female panel connector	100
SIC-B-4PAIR	1xMFF + 1xFMM branch connectors	1 Pair
SIC-I-4M	Male connector metal insert (spare)	100
SIC-I-4F	Female connector metal insert (spare)	100

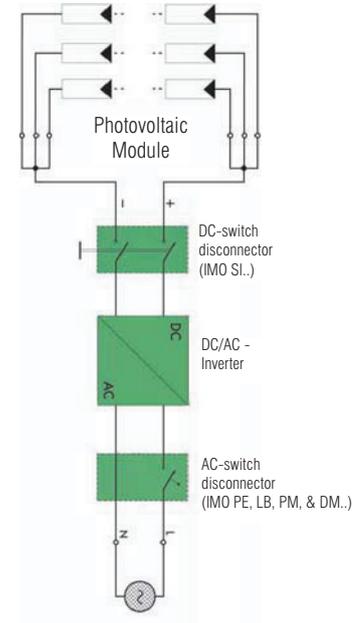


Solar Switches for Photovoltaic Applications

The IMO SI Solar Switch range has been specifically developed as a “True DC” to disconnect the DC/AC inverter from the photovoltaic panels as illustrated. All photovoltaic installations have to be equipped with DC isolators in accordance with IEC 60364-7-712.

Key Features:

- Available in 2, 4, 6 and 8 pole versions
- Operator independent trigger ratchet switching mechanism for high speed switching (5ms max)
- Knife edge self cleaning contact mechanism
- Long arc cooling chambers
- Maximum torque 1Nm for easy operation



G83/1 Compliant
We recommend installers label equipment:
“Danger - Contains live parts during daytime”.

Rotary Actuator Version



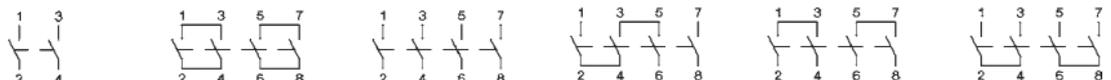
Emergency Stop Rotary Actuator Version



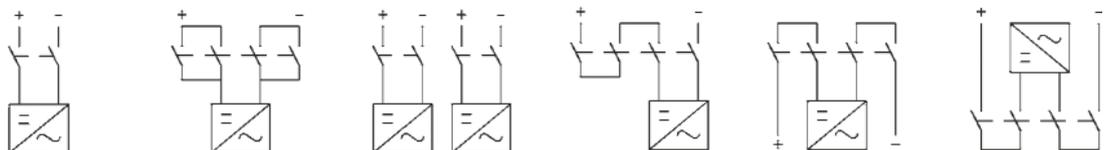
Switching Configurations

Type	2-pole	2-pole 4 Paralleled poles	4-pole	2-pole with Input on top Output bottom	2-pole with Input and Output bottom	2-pole with Input and Output on top
SI16	2	2H	4	4S	4T	4B
SI25	2	2H	4	4S	4T	4B
SI32	2	2H	4	4S	4T	4B

Contacts
Wiring diagram



Switching example



Rotary Actuator Switch - Lockable Off in Plastic Enclosure



- Rotary Actuator Switch
- Lockable Off
- Plastic Enclosure
- IP65
- NEMA Type 1



DC21B Rating							Poles in series	Number of Strings	Weight kg/pcs.	Part Number	Contact Configuration
600V	700V	800V	900V	1000V	1200V	1500V					
12A	12A	10A	9A	6A	4A	1A	2	1	0.43	SI12 PEL64R 2	
16A	16A	16A	13A	9A	6A	3A	2	1	0.43	SI16 PEL64R 2	
20A	20A	18A	14A	10A	7A	4A	2	1	0.43	SI20 PEL64R 2	
25A	23A	20A	16A	11A	8A	4A	2	1	0.43	SI25 PEL64R 2	
32A	27A	23A	20A	13A	10A	5A	2	1	0.43	SI32 PEL64R 2	
29A	16A	16A	13A	9A	6A	3A	2	1	0.49	SI16 PEL64R 2H	
45A	23A	20A	16A	11A	8A	4A	2	1	0.49	SI25 PEL64R 2H	
50A	27A	23A	20A	13A	10A	5A	2	1	0.49	SI32 PEL64R 2H	
12A	12A	10A	9A	6A	4A	1A	2	2	0.46	SI12 PEL64R 4	
16A	16A	16A	13A	9A	6A	3A	2	2	0.46	SI16 PEL64R 4	
20A	20A	18A	14A	10A	7A	4A			0.46	SI20 PEL64R 4	
25A	23A	20A	16A	11A	8A	4A	2	2	0.46	SI25 PEL64R 4	
32A	27A	23A	20A	13A	10A	5A	2	2	0.46	SI32 PEL64R 4	
16A	16A	16A	16A	16A	16A	16A	4	1	0.47	SI16 PEL64R 4S	
25A	25A	25A	25A	25A	25A	20A	4	1	0.47	SI25 PEL64R 4S	
32A	32A	32A	32A	32A	32A	23A	4	1	0.47	SI32 PEL64R 4S	
16A	16A	16A	16A	16A	16A	16A	4	1	0.47	SI16 PEL64R 4T	
25A	25A	25A	25A	25A	25A	20A	4	1	0.47	SI25 PEL64R 4T	
32A	32A	32A	32A	32A	32A	23A	4	1	0.47	SI32 PEL64R 4T	
16A	16A	16A	16A	16A	16A	16A	4	1	0.47	SI16 PEL64R 4B	
25A	25A	25A	25A	25A	25A	20A	4	1	0.47	SI25 PEL64R 4B	
32A	32A	32A	32A	32A	32A	23A	4	1	0.47	SI32 PEL64R 4B	

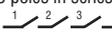
Emergency Stop Rotary Switch - Lockable Off in Plastic Enclosure



- Emergency Stop Lever Actuator Switch
- Lockable Off
- Plastic Enclosure
- IP65
- NEMA Type 1

DC21B Rating							Poles in series	Number of Strings	Weight kg/pcs.	Part Number	Contact Configuration
600V	700V	800V	900V	1000V	1200V	1500V					
12A	12A	10A	9A	6A	4A	1A	2	1	0.39	SI12 ES-PEL 2	
16A	16A	16A	13A	9A	6A	3A	2	1	0.39	SI16 ES-PEL 2	
20A	20A	18A	14A	10A	7A	4A	2	1	0.39	SI16 ES-PEL 2	
25A	23A	20A	16A	11A	8A	4A	2	1	0.39	SI25 ES-PEL 2	
32A	27A	23A	20A	13A	10A	5A	2	1	0.39	SI32 ES-PEL 2	
<hr/>											
29A	16A	16A	13A	9A	6A	3A	2	1	0.45	SI16 ES-PEL 2H	
45A	23A	20A	16A	11A	8A	4A	2	1	0.45	SI25 ES-PEL 2H	
50A	27A	23A	20A	13A	10A	5A	2	1	0.45	SI32 ES-PEL 2H	
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12A	12A	10A	9A	6A	4A	1A	2	2	0.42	SI12 ES-PEL 4	
16A	16A	16A	13A	9A	6A	3A	2	2	0.42	SI16 ES-PEL 4	
20A	20A	18A	14A	10A	7A	4A	2	2	0.42	SI20 ES-PEL 4	
25A	23A	20A	16A	11A	8A	4A	2	2	0.42	SI25 ES-PEL 4	
32A	27A	23A	20A	13A	10A	5A	2	2	0.42	SI32 ES-PEL 4	
<hr/>											
16A	16A	16A	16A	16A	16A	16A	4	1	0.43	SI16 ES-PEL 4S	
25A	25A	25A	25A	25A	25A	20A	4	1	0.43	SI25 ES-PEL 4S	
32A	32A	32A	32A	32A	32A	23A	4	1	0.43	SI32 ES-PEL 4S	
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16A	16A	16A	16A	16A	16A	16A	4	1	0.43	SI16 ES-PEL 4T	
25A	25A	25A	25A	25A	25A	20A	4	1	0.43	SI25 ES-PEL 4T	
32A	32A	32A	32A	32A	32A	23A	4	1	0.43	SI32 ES-PEL 4T	
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16A	16A	16A	16A	16A	16A	16A	4	1	0.43	SI16 ES-PEL 4B	
25A	25A	25A	25A	25A	25A	20A	4	1	0.43	SI25 ES-PEL 4B	
32A	32A	32A	32A	32A	32A	23A	4	1	0.43	SI32 ES-PEL 4B	

Technical Data

Main Contacts		Unit	SI12	SI16	SI20	SI25	SI32	
Rated thermal current I_{th}		A	12	16	20	25	32	
Rated insulation voltage U_i 1)		V	1000	1000	1000	1000	1000	
Rated insulation voltage U_i 2)		V	1500V	1500V	1500V	1500V	1500V	
Contact distance (per pole)		mm	8	8	8	8	8	
Rated operational current I_e								
DC21B L/R+ 1ms	1 pole 	500V	A	6	9	10	11	13
		600V	A	4	6	7	8	10
		800V	A	2	3	3.5	4	5
		1000V	A	1	1.5	1.75	2	2.5
	2 pole in series 	500V	A	12	16	20	25	32
		600V	A	12	16	20	25	32
		700V	A	12	16	20	23	27
		800V	A	10	16	18	20	23
		900V	A	9	13	14	16	20
		1000V	A	6	9	10	11	13
		1200V	A	-	6	-	8	10
		1500V	A	-	3	-	4	5
	2 poles in series +2 poles parallel 	500V	A	-	29	-	45	58
		600V	A	-	29	-	45	50
		700V	A	-	16	-	23	27
		800V	A	-	16	-	20	23
		900V	A	-	13	-	16	20
		1000V	A	-	9	-	11	13
		1200V	A	-	6	-	8	10
		1500V	A	-	3	-	4	5
	3 poles in series 	500V	A	12	16	20	25	32
		1000V	A	12	16	20	25	32
		1200V	A	-	12	-	14	16
		1500V	A	-	9	-	11	13
	4 poles in series 	500V	A	12	16	20	25	32
		600V	A	12	16	20	25	32
		700V	A	12	16	20	25	32
		800V	A	12	16	20	25	32
900V		A	12	16	20	25	32	
1000V		A	12	16	20	25	32	
1200V		A	-	16	-	25	32	
1500V		A	-	16	-	20	23	
Rated operational current I_e								
	1 pole 	500V	A	0.75	1	1.5	1.25	1.5
		600V	A	0.3	0.5	0.6	0.75	1
		800V	A	0.25	0.3	0.35	0.4	0.5
		1000V	A	0.5	0.15	0.15	0.2	0.25
	2 poles in series 	500V	A	5	7	7.5	8	9
		600V	A	4	5.5	5.75	6	6.5
		800V	A	1	2	2.25	2.5	3
	3 poles in series 	1000V	A	0.5	1	1.25	1.5	2
		500V	A	12	16	20	25	27
		600V	A	12	16	20	23	25
	4 poles in series 	800V	A	5	6.5	6.75	7	7.5
		1000V	A	4.5	5.5	5.75	6	6.5
		500V	A	12	16	20	25	32
		600V	A	12	16	20	25	27.5
		800V	A	8	11.5	11.75	12	12.5
		1000V	A	6	8	8.5	9	10

1) Suitable at 1000V for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): $U_{imp}=8kV$

2) Suitable at 1000V for: earthed-neutral systems, overvoltage category I to III, pollution degree 2 (min. IP55): $U_{imp} = 8kV$.

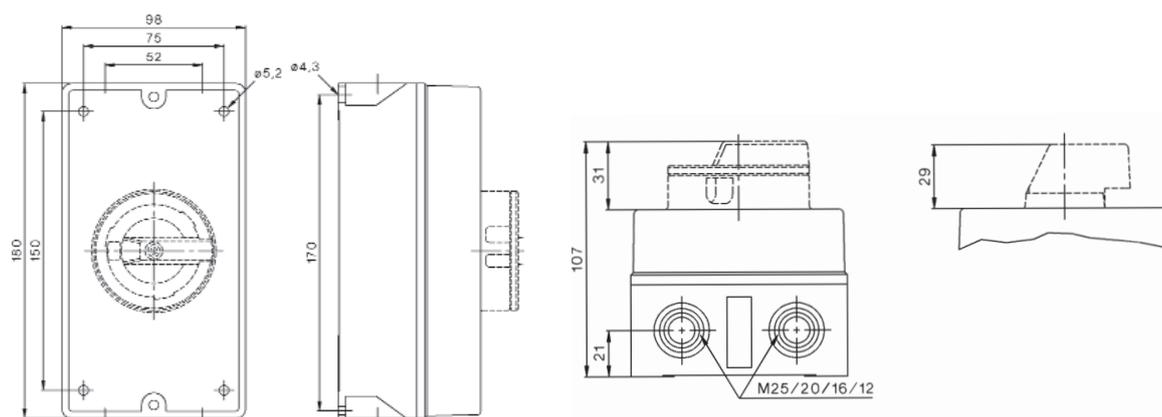
Data for other conditions on request.

Main Contacts		Unit	SI12	SI16	SI20	SI25	SI32
Rated conditional short-circuit current		kA _{eff}	5	5	5	5	5
Max. fuse size	gL (gG)	A	32	40	50	63	80
Mechanical life		x10 ³	10		10		10
Rated short-time withstand current (1s) I _{sw}	2,4 / 2H	A	800 / 1300		900 / 1500		1000 / 1700
Short circuit making capacity I _{sw}	2,4 / 2H	A	800 / 1300		900 / 1500		1000 / 1700
Maximum cable cross sections (inc. jumper SIV-B1)							
Solid or standard		mm ²				4 - 16	
flexible		mm ²				4 - 10	
flexible (+ multicore cable end)		mm ²				4 - 10	
Size of terminal screw						M4 Pz2	
Tightening torque		Nm				1.2 - 1.8	
Maximum ambient temperature							
Operation	Open	°C				-40 to +65	
	Enclosed	°C				-40 to +45	
Storage							
		°C				-50 +90	
Power loss per switch at I _{e max} DC21B							
2		W	2		5		8
2 + 2H		W	3.5		8.5		14
4		W	4		10		16

Main Contacts		Unit	SI12	SI16	SI20	SI25	SI32
Ampere-Rating "General use" (AC)							
1 pole ┌─┐	350V	A	3.5	4	4.5	5	6
	500V	A	3.5	4	4.5	5	6
	600V	A	3.5	4	4.5	5	6
2 poles in series ┌─┐ ┌─┐	350V	A	12	16	18	20	25
	500V	A	12	16	18	20	25
	600V	A	12	16	18	20	25
2 poles in series + 2 poles parallel ┌─┐ ┌─┐ ┌─┐ ┌─┐	350V	A	24	29	38	45	58
	500V	A	24	29	36	38	40
	600V	A	12	21	22	23	25
3 poles in series ┌─┐ ┌─┐ ┌─┐	350V	A	-	16	-	25	32
	500V	A	-	16	-	25	32
	600V	A	-	16	-	25	32
4 poles in series ┌─┐ ┌─┐ ┌─┐ ┌─┐	350V	A	12	16	20	25	32
	500V	A	12	16	20	25	32
	600V	A	12	16	20	25	32
Fuse size (RK5)	Industrial Control Switch						
5kA / 600V		A	32	40	50	60	80
Maximum cable cross sections (incl. jumper SIV-B1)							
Solid or stranded		AWG	12 - 10	12 - 10	12 - 10	12 - 10	12 - 10
Flexible		AWG	12 - 6	12 - 6	12 - 6	12 - 6	12 - 6
Flexible (+ multicore cable end)		AWG	12 - 6	12 - 6	12 - 6	12 - 6	12 - 6
Size of terminal screw			M4 Pz2				
Tightening torque		lb.inch	11 - 16	11 - 16	11 - 16	11 - 16	11 - 16
Rated operational current I _o							
AC21B	A2, A4	U _n max. 440V	12	16	20	25	32
	A2+2	U _n max. 440V	-	29	-	45	58

Dimensions

SI12PEL/ES-PEL
SI16PEL/ES-PEL
SI20PEL/ES-PEL
SI25PEL/ES-PEL
SI32PEL/ES-PEL



Enclosed AC Switch



- 3 and 4 Pole (6-8 Pole available on request)
- On load 20A - 80A
- Red/Yellow Handle
- 3 Padlock Positions
- IP65

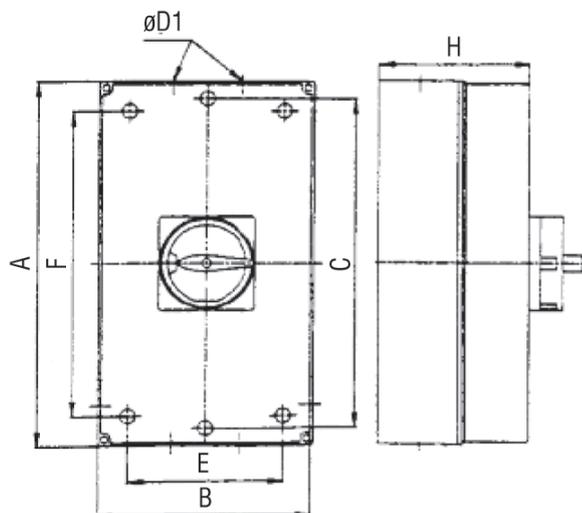


Specification

PE.. (e.g. PE69-3020)	Unit	69-3020	69-3025	69-3032	69-3040	69-3063	69-3080
		69-4020	69-4025	69-4032	69-4040	69-4063	69-4080
Rated insulation voltage	Ui	690V	690V	690V	690V	690V	690V
Rated thermal current	Ith	20A	25A	32A	40A	63A	80A
Ratings @ 415V							
AC21	A	20	25	32	40	63	80
AC22	A	20	25	32	40	63	80
AC23	Kw	5.5	7.5	11	15	18.5	22
Making capacity @ 415V	Aeff	120	150	220	300	370	44
Breaking capacity @415V	Aeff	110	135	200	250	330	380
Electrical Life @ rated load							
Mechanical Life	x10 ³	100	100	100	100	100	100
Maximum cable size	mm ²	10	10	10	10	25	25
Weight	g	0.46	0.46	0.46	0.46	0.46	0.46

Dimensions

Switch Rating	A	B	D1	E	F	H
20A to 40A	130	98	2xM20/25	75	100	77
63A and 80A	200	120	M40.5/ 32.5 + 16.5	95	165	86



Technical Data

Data according to IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

Main contacts		Type	PE69..20	PE69..25	PE69..32	PE69..40	PE69..63	PE69..80
Rated thermal I_{th} open		A	20	25	32	40	63	80
Rated thermal current I_{th} , enclosed		A	20	25	32	40	63	80
Rated insulation voltage $U_i^{(1)}$		V	690	690	690	690	690	690
Rated operational current I_p , AC21A		A	20	25	32	40	63	80
Making capacity I_{eff}		3x380-440V A	160	190	220	300	370	440
Breaking capacity		3x220-240V A	160	180	200	250	330	380
		3x380-440V A	160	180	200	250	330	380
		3x660-690V A	80	110	140	170	190	220
Disconnection properly performed up to		V	690	690	690	690	690	690
Motor Switch	AC3	3x400V A	12	16	23	30	37	37
Motor Switch	AC3	3x220-240V kW	3	4	5.5	7.5	11	11
Direct switching single motors		3x380-440V kW	5.5	7.5	11	15	18.5	18.5
		3x660-690V kW	5.5	7.5	11	15	18.5	18.5
Main Switch	AC23	3x400V A	16	20	25	32	45	45
Motor Switch	AC23A	3x220-240V kW	4	5.5	7.5	9	15	15
Main Switch	AC23B	3x380-440V kW	7.5	10	12.5	16	22	22
Safety Switch		3x660-690V kW	5.5	7.5	11	15	18.5	18.5
Rated conditional short-circuit current		kA_{eff}	10	10	10	10	10	10
Max. fuse size		gL (gG)	A	25	35	40	63	80
Mechanical life		$\times 10^3$	200	200	200	200	100	100
Rated short-time withstand current (1sec. current)		A	250	300	400	500	600	850
Maximum cable cross sections								
Solid		mm ²	10	10	10	10	25	25
		AWG	8	8	8	8	4	4
Flexible (+ multicore cable end)		mm ²	6	6	6	6	16	16
		AWG	10	10	10	10	6	6
Size of terminal screw			M3.5	M3.5	M3.5	M3.5	M5	M5
Tightening torque		Nm	0.8-1.7	0.8-1.7	0.8-1.7	0.8-1.7	2-4	2-4
		lb.inch	7-15	7-15	7-15	7-15	18-35	18-35
Auxiliary contacts								
Rated insulation voltage $U_i^{(1)}$		V	690	690	690	690	690	690
Rated thermal current I_{th} , I_{the}		A	10	10	10	10	10	10
Switching capacity		AC15 220-240V A	2.5	2.5	2.5	2.5	2.5	2.5
		AC15 380-440V A	1.5	1.5	1.5	1.5	1.5	1.5
Rated conditional short-circuit current		kA_{eff}	3	3	3	3	3	3
Max. short circuit protection		gL (gG)	A	10	10	10	10	10
Maximum cable cross sections								
Solid		mm ²	2.5	2.5	2.5	2.5	2.5	2.5
		AWG	12	12	12	12	12	12
Flexible (+ multicore cable end)		mm ²	2.5	2.5	2.5	2.5	2.5	2.5
		AWG	14	14	14	14	14	14

Data according to UL and cUL

Rated voltage		V	600	600	600	600	600	600
Ampere-Rating "General use"		A	20	25	32	40	63	80
DOL-Rating 3-Phase		110-120V HP	1	1.5	2	2	3	5
		220-240V HP	3	5	5	5	10	10
		440-480V HP	7.5	10	10	10	20	20
		550-600V HP	10	10	15	15	25	25
DOL-Rating 1-Phase		110-120V HP	1	1	1	1	2	2
		200-208V HP	1	2	2	2	3	3
		220-240V HP	2	2	3	3	5	5
Fuse size (RK5)	Manual Motor Controller	A	40	50	50	70	90	110
5kA / 600V	Motor Disconnect	A	40	50	50	50	70	70

1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): $U_{imp}=6kV$. Data for other conditions on request

2) The values after the slash are valid for switches 6-pole or more

3) Suitable for no load applications (AC20A) above 690V

4) Fuse RK1/10kA/600V

5) $U_{imp}=8kV$

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