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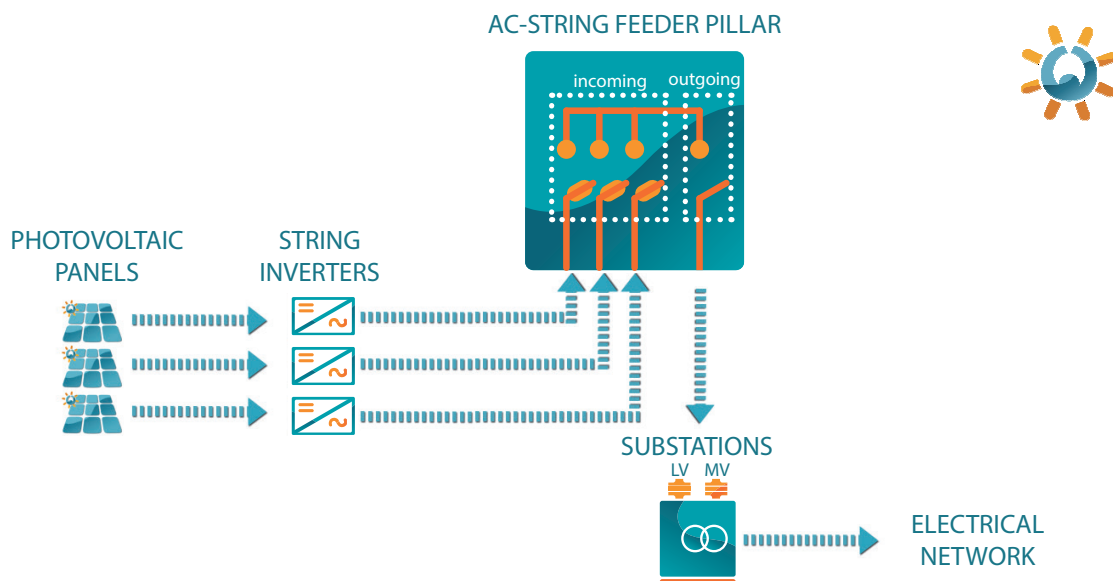
Photovoltaic plants in AC grids
800V AC Switchgear for photovoltaic



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1 800 V AC Switchgear for Photovoltaic

New trend of photovoltaic installations and where our products are needed



Tested switching capacity at 800 V AC as per IEC60947-3

Design of more competitive photovoltaic plants

Less power losses

PV energy shouldn't be considered any more an alternative source of energy. As it is becoming more cost-competitive, it is now an increasing reality.

One of the main reason for this, is the reduction of installations and maintenance cost. New trend consist in designing photovoltaic distribution network in **800 V AC** instead of DC voltages with smaller string inverters close to the photovoltaic panels.

At the same time, the transmission of energy at higher voltages make possible to reduce power losses and the cost of the installation.

By using upper section cables, up to 300 mm² for NH 1 and NH 3, the voltage drop is reduced. In this way, the tendency in last inverters generation is to transmit at 800 V AC.

► GORLAN SWITCHGEAR RANGE | Pronutec and Telergon

- Pronutec | Incoming
- Telergon | Outgoing

INCOMING pronutec
gorlan

TRIVER+ 800 LV Vertical Fuse Switches of Pronutec for 800 V AC



OUTGOING telergon
gorlan

Switch disconnectors high performances range of Telergon for 800 V AC



► LV VERTICAL FUSE SWITCHES OF PRONUTEC FOR 800 V AC



TRIVER+ 800

Pronutec introduces the range TRIVER+ 800. A range of vertical fuse switches for photovoltaic application specifically designed for the protection and distribution of electric networks from the new string inverters with rated operational voltage levels of 800 V AC.

The AC distribution and the higher voltage, allow a more cost-competitive design of power networks in photovoltaic applications and less power losses. Another features are the safety of the range TRIVER+ 800 and the breaking capacity at these voltage levels.

Maintaining the well known advantages and features in Pronutec TRIVER+ family, this new range offers additional advantages:

Less power losses

- Tested switching capacity up to 800 V.
- Tested short circuit protection up to 120 kA.
- Reliable protection by a consolidated technology based in DIN standard.
- All operations can be made comfortably using the established protection equipment and insulated tools.
- Compatible with 185 mm and 100 mm distance busbars.
- Available in sizes NH00/1/3, allows any combination for a flexible configuration and adaptable to any project.
- Complete range of connections for copper and aluminum terminals for different cable sections.

▶ RANGE OF FUSE SWITCHES



NH 00 | 100 mm busbar distance

Reference	Type	Current	Fuse-link	Switching	Connections	Busbar spacing
453.61.10.XX.YY.E8	BTVC-DT	125 A	NH 00	Three pole	Top / Bottom reversible	100 mm

* For one pole switching options, please, consult.

Terminal options



XX Code	Type of terminal	Torque (Nm)	Cross section (mm ²)			
22	Prism terminal - 95	2,5	10-95	10-95	35-95	50-95
01	M8 screw Stainless Steel	12	Cable lugs DIN 46235 Max. 95 mm ²			
02	M8 screw Zn	12				
03*	M8-M5 screw Stainless Steel (15 mm)	12				
04**	M8-M5 screw Stainless Steel (18 mm)	12				

* Compatible with Prism terminal-70 and Bridge clamp.
** Compatible with Prism terminal-95.

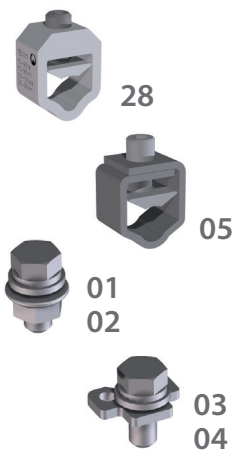


NH 00 | 185 mm busbar distance

Reference	Type	Current	Fuse-link	Switching	Connections	Busbar spacing
443.72.10.XX.YY.E8	BTVC-DT / Depth 00	125 A	NH 00	Three pole	Top / Bottom reversible	185 mm
443.72.12.XX.YY.E8	BTVC-DT / Depth 2	125 A	NH 00	Three pole	Top / Bottom reversible	185 mm

* For one pole switching options, please, consult.

Terminal options

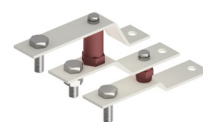


Reference	XX Code	Type of terminal	Torque (Nm)	Cross section (mm ²)			
101.01.122	28	Aluminum "V" Terminal	15	10-95	10-95	25-120	25-150
101.01.114	05	Steel "V" Terminal	15	10-70	10-70	25-95	20-120
-	01	M8 screw A2/M8	12	Cable lugs DIN 46235 Max. 120 mm ²			
-	02	M8 screw Zn / M8	12				
-	03*	M8 screw A2+M5 (15 mm)	12				
-	04**	M8 screw A2+M5/M8 (18 mm)	12				

* Compatible with Prism terminal-70 and Bridge clamp.
** Compatible with Prism terminal-95.

Adaptor plates

YY Code	Adaptor plates
16	Set of 3 adaptor plates to connect 185 mm ² cross section cables



Micro-switch available for all sizes









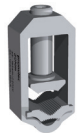
NH 1/3 | 185 mm busbar distance

Reference	Type	Current	Fuse-link	Switching	Connections	Busbar spacing
438.71.10.XX.YY.E8	BTVC-DT	315 A	NH 1	Three pole	Top / Bottom reversible	185 mm
438.73.10.XX.YY.E8	BTVC-DT	500 A	NH 3	Three pole	Top / Bottom reversible	185 mm

* For one pole switching options, please, consult.

Terminal options

Reference	XX Code	Type of terminal	Torque (Nm)	Cross section (mm ²)			
							
101.01.130	46	Aluminum Double "V" Terminal	25-30	50-240	70-300	70-240	95-300
101.01.129	42	Aluminum Double "V" Terminal	30	35-120	35-150	50-185	35-240
101.01.103	05	Aluminum "V" Terminal with reversible pressure pad	25	16-185	16-240	35-240	35-300
-	00	M10 Bolt	32	Cable lugs DIN 46235 2x25 - 300 mm ² (Max. width 43 mm)			
-	01	M10 Bolt Stainless Steel	32				
-	02	M12 Bolt	40				
-	03	M12 Bolt Stainless Steel	40				



46



42



05



00
01



02
03

Cross section up to 300 mm², the voltage drop is reduced

Micro-switch available for all sizes



Vertical Switch Disconnectors

Size	Current
NH 3	1000 A

Please, consult.

▶ OTHER PRODUCTS



One pole Fuse Bases - 800 V AC

Size	Current
NH 00	Contact our commercial department
NH 1	
NH 3	



1 pole LV Fuse Switches - 800 V AC

Size	Current
NH 00	Contact our commercial department
NH 1	



Horizontal design fuse switch disconnecter NH 00

Reference	Type	Current	Type of terminal	Connections	Fuse Link	Power Losses (W)*
432.12.01.01.00.E8	Panel mounting	125A	Bridge terminal	Bottom/Top connection	NH 00	12
432.12.01.02.00.E8	Panel mounting	125 A	Connection screw M8	Bottom/Top connection	NH 00	12
432.42.01.01.00.E8	Panel mounting	125 A	Bridge terminal	Long Contact Cover	NH 00	12
432.42.01.02.00.E8	Panel mounting	125 A	Connection screw M8	Long Contact Cover	NH 00	12

Fuse Supervision Control - FSC Modbus

Fuse monitoring unit for 3 phases, compatible with NH00, 1, 2 and 3 fuse switches. One LED per phase shows the status of each fuse with red /green light. FSC sends blown fuse alarms by RS485 modbus protocol to any third party RTU, so that it could be integrated into an Scada system.



Measuring instruments - Panel meters

Description	Rated operational voltage U_e
Current transformer + Panel meter PNT MASTER 3840	400/500/690 V
Current transformer + Panel meter for 800 V AC	800V



► TECHNICAL DATA

IEC/EN 60947-3		Type	BTVC BTVC-DT			
			NH 00 (453)	NH 00 (443)	NH 1 (438)	NH 3 (438)
Electrical characteristics	Rated operational voltage	U_e (V)	AC 800			
	Rated operational current	I_e (A)	125	125	315	500
	Conventional free air thermal current with fuses	I_{th} (A)	125		315	500
	Conventional free air thermal current with solid links	I_{th} (A)	250		760	
	Rated frequency	(Hz)	50/60			
	Rated insulation voltage	U_i (V)	1000			
	Rated impulse withstand voltage	U_{imp} (kV)	8		8	
	Rated conditional short-circuit current	(kA_{eff})	120	120	120	90
	Utilization category	-	AC-22B			
	Rated making capacity	(A)	375	375	1260	1500
Rated breaking capacity	(A)	375	375	1260	1500	
Mechanical characteristics	Weight	(kg)	1,520	2,260	4,250	5,600
	Busbar distance	(mm)	100		185	
	Panel front opening	(mm)	600/650			
Fuse links	Size to IEC/EN 60269	-	00	00	1	3
	Max. permis. power loss per fuse-link	P_v (W)	12	12	23	48

IEC/EN 60947			Type	BTVC BTVC-DT			
				NH 00 (453)	NH 00 (443)	NH 1 (438)	NH 3 (438)
Terminals	Bolt terminal	Diameter	-	M8		M10/M12	
		Cable lug (S/DIN 46235)	(mm ²)	10-95	10-120	2x 25-300	2x 25-300
		Torque	(Nm)	12		32	
	Prism terminal	Terminal cross section	(mm ²)	16-70		-	
		Torque	(Nm)	2.5		-	
	"V" Terminal	Terminal cross section	(mm ²)	-	10-95	35-300	35-300
		Torque	(Nm)	-	15	25	25
	Protection degree	Front operated switchgear fitted		-	IP30		
	Operating conditions	Ambient temperature		(°C)	-25 to +55 ^{*(1)}		
Rated operating mode		-	Continuous operation				
Actuation		-	Dependant manual operation				
Altitude		(m)	Up to 2000				
Pollution degree		-	3				
Overvoltage category		-	III	IV			

*⁽¹⁾ 35°C normal temperature, at 55 °C with reduced operating current.



► SIBA NH FUSES

Pronutec recommends SIBA NH fuses for optimal protection of the new generation of PV String Inverters

The new series of SIBA NH fuses with operating class: gRL (gS) has been developed for the line protection of the new String Inverters.

Due to the use of special geometries of melting elements, in comparison to the conventional line protection fuses of operating class: gG, a considerably faster operation at short circuits and thus optimum protection of the inverters has been realized. In the space-saving NH standard designs, the fuse links achieve a maximum breaking capacity of 120 kA with a test voltage of 800V. The power losses of series NH 000/00/1/2/3 have been designed for the respective maximum power acceptance of the corresponding NH fuse bases and fuse switches.



Fuse links - 800 V AC gG	
Size	Current
NH 000	from 6 to 16 A
NH 00	from 20 to 63 A
NH 1	from 50 to 160 A
NH 2	from 160 to 200 A

Fuse links - 800 V AC gRL (gS)	
Size	Current
NH 00	from 32 to 125 A
NH 1	from 80 to 200 A
NH 2	from 125 to 250 A
NH 3	from 200 to 400 A

Operation class gG		
Size Reference	Rated Current (A)	Power loss (W)
NH 000 2030813	6	2
	10	2,5
	16	4
NH 00 2030913	20	2,5
	25	3,0
	32	4
	40	4,5
	50	5,0
	63	6,5
	63	6,5
NH 1 2031113	50	5,0
	63	6,5
	80	7,5
	100	9,0
	125	10
NH2 2031213	160	13
	200	20
NH 3 2031313	160	13
	250	20

Operation class gRL (gS)		
Size Reference	Rated Current (A)	Power loss (W)
NH 00 2030934	32	5
	35	6
	40	7
	50	8
	63	10
	80	11
	100	12
NH 1 2031134	125	13
	150	15
	160	18
	180	19
	200	20
	200	21
NH 2 2031234	125	18
	160	19
	200	21
NH 3 2031334	250	26
	200	-
	250	26
	315	31
	350	35
	400	41



More info at:
www.pronutec.com



► SWITCH DISCONNECTORS HIGH PERFORMANCES RANGE OF TELERGON FOR 800 VAC



Functional and ergonomic handle

- Good grip and excellent torque/resistance.
- Padlockable handle in **O OFF** position (up to three locks Ø 5-8 mm) .
- Door interlock in **ON I** position.
- When lock  in **O OFF** position, door is interlocked.
- Defeatable feature in **ON I** position (with the use of a tool for maintenance operations). Handle interlock is restored when closing.
- Self-centering shaft for door handle.



The switch-disconnectors **S5 & S6** for high performances range, are manufactured with high safety self-extinguishing materials, providing an excellent level of electrical insulation, low smoke emission and high resistance to electromechanical stress.

They comply with environmental requirements and undergo strict quality controls for a reliable product that meets the most demanding requirements.

They consist of a sandwich-type body containing self-cleaning blade type contacts, with pre-arc zones to ensure long term, fault-free energy transmission and coated with silver alloy for long electromechanical life. The detent mechanism provides quick and independent switching due to the accumulation of elastic potential energy, which is transmitted at high speed to the contacts for arc extinction.

Motorized unit kit

- Equipped with a selector for automatic-manual-lock operating modes.
- The kit concept simplifies both logistics and maintenance.
- Easy and simple assembly.






▶ RANGE

According to:
IEC 60947-3



Manual switch disconnectors S6 / S5 3 poles (O - I) 800 V AC ^{*(1)}			Manual handle 	
Current	Size	Code	External ^{*(2)}	Direct
			Code	Code
250 A	1	S6-04003PD0	DS-SA11	DS-SI11
630 A	2	S6-08003PD0	DS-LA21	DS-LI21
1600 A	4	S5-18003PS0	DS-LA41	DS-LI41
3200 A ^{*(3)}		SSN18006PS0P87		

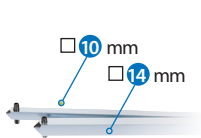
^{*(1)} AC21B, for other electrical ranges or 3P+N switches, please consult.

^{*(2)} Padlockable handle in OFF position. Possibility of unlocking the door in ON 1 position (with the use of a tool). Door interlock by a padlock in OFF 0 position.

^{*(3)} 6P switch-disconnector with common outputs up to 3200 A.



Motorized switch disconnectors S6 / S5 3 poles (O - I) 800 V AC ^{*(1)}			UM-S Motorized unit kit	
Current	Size	Code	230Vac	
			Code	
250 A	1	S6-04003PDC	UM-S1A230Z	
630 A	2	S6-08003PDC	UM-S2A230Z	
1600 A	4	S5-18003PSC	UM-S41230M	
3200 A		SSN18006PSCP87		



Shaft extensions				Auxiliary contacts		Spacers	Phase barriers	Terminal shrouds
Size	Size □	Type 1 & 2		1NO+1NC	2NO+2NC	(4 units)	(2 units)	Code
		L	Code	Code	Code	Code	Code	
1	10	375	DS-EP14	D5LAU01	D5LAU02	DR-EL11	DR-SF12	DR-CU12
		536	DS-EP15					
2	14	345	DS-EP23	D5LAU01	D5LAU02	DR-EL21	DR-SF22	DR-CU22
		535	DS-EP24					
4	14	485	DS-EP44	D5LAU01	D5LAU02	-	-	DS-CU41* ⁽¹⁾
		635	DS-EP45					

^{*(1)} This terminal shroud is only available for switch disconnectors S5-18003PS0.

Due to the continuous improvement & modifications of our products, the details included in this catalogue can be modified at any time without prior consent.



AUTOMATIC SWITCH DISCONNECTORS

ACB 220S 4P-65 kA



ACB 332S 4P-85 kA



MCCB XV250NE 3P
FC 800 V AC



Code	Description	Type	Rated operational voltage U_e	Current
1012786	MCCB E630NE 4P FC	MCCB 3P+N Type TB2 Moulded case	400/500/690V	630 A
1012791	MCCB S800CJ 4P FC	MCCB 3P+N Type TB2 Moulded case		800 A
10127100	MCCB S1000SE 4P FC	MCCB 3P+N Type TB2 CMoulded case		1000 A
1012775	MCCB S1250SE 4P FC	MCCB 3P+N Type TB2 Moulded case		1250 A
1012782	MCCB S1600SE 4P FC	MCCB 3P+N Type TB2 Moulded case		1600 A
Confirm	ACB 220S 4P - 65 kA	ACB 4P Fixed type		2000 A
Confirm	ACB 325S 4P - 85 kA	ACB 4P Fixed type	2500 A	
Confirm	ACB 332S 4P - 85 kA	ACB 4P Fixed type	3200 A	
Confirm	MCCB XV250NE 3P FC 800Vac	MCCB 3P Type XV Moulded case	800 V	250 A
Confirm	MCCB XV400NE 3P FC 800Vac	MCCB 3P Type XV Moulded case		400 A
Confirm	MCCB XV630PE 3P FC 800Vac	MCCB 3P Type XV Moulded case		630 A
Confirm	MCCB XV800PE 3P FC 800Vac	MCCB 3P Type XV Moulded case		800 A
Confirm	MCCB XV1250NE 3P FC 800Vac	MCCB 3P Type XV Moulded case		1250 A
Confirm	ACB 320H-V8 3P 800Vac - 30 kA	ACB 3P AR V8 Withdrawable type		2000 A
Confirm	ACB 325H-V8 3P 800Vac - 30 kA	ACB 3P AR V8 Withdrawable type		2500 A
Confirm	ACB 332H-V8 3P 800Vac - 30 kA	ACB 3P AR V8 Withdrawable type		3200 A
Confirm	AR440SB-V8 800Vac - 50kA	ACB 3P AR V8 Withdrawable type		2000 A
Confirm	AR440SB-V8 800Vac - 50kA	ACB 3P AR V8 Withdrawable type		2500 A
Confirm	AR440SB-V8 800Vac - 50kA	ACB 3P AR V8 Withdrawable type		3200 A
Confirm	AR440SB-V8 800Vac - 50kA	ACB 3P AR V8 Withdrawable type		3600 A



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