

## **SH-112 AC**

#### STANDARD SERIES



DESIGN: MODULAR

DEGREE OF PROTECTION: IP65

YEARS OF WARRANTY: 5

UV RESISTANCE: YES

READY TO CONNECT: YES

WEIGHT: 2.200 KG











The connection switchgear from Polish producer KENO is designed to power photovoltaic inverters in grounded and isolated photovoltaic installations. It realizes protection against the effects of short circuits and overloads, as well as protection against the effects of indirect discharges on the AC side. Due to the high degree of IP protection, outdoor installation is possible. The design of the switchgear is intended for surface mounting. Depending on the equipment, switchboards can perform various functions.

#### BASIC PARAMETERS AC SIDE

AC Surge Protector | Type

Noark | T2

Overcurrent circuit breaker

Noark B40A 3F

### ELECTRICAL AND MECHANICAL PARAMETERS OF THE HOUSING

Model	PHS 12 T
Number of fields	12
Dimensions of housing without chokes and MC4 (Length Width Height)	144.00   319.00   259.00
Design in accordance with	EN 60670-1, EN 62208
Level of security	IP65
Protection class	II
Rated insulation voltage $U_{\rm i}$	400 V AC, 1500 V DC
The incandescent rod test	650°C
Impact resistance	IK08
UV resistance	YES
Recyclable plastic	bezhalogenowy
Working temperature	-25ºC - +60ºC



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### STANDARD SERIES

Manufacturer / Model         Noark / Ex9BN 3P B40 d           Rated current         40A; 3-F           Rated operational voltage U <sub>e</sub> 230/415 VAC           -         72 V DC to the pole (1P, 2P)           -         48 V DC to the pole (3P, 4P)           Minimum voltage         12 V AC/DC           Rated impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60898-1         6 kV           Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 608947-2         6 kA           Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2         10 kA           Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2         50 kA           Rated voltage of the insulation U <sub>i</sub> 690 V AC           Number of poles         3           Frequency         50/60 Hz           Characteristic         B           Design in accordance with         IEC/EN 60898-1, IEC/EN 60947-2           Mechanical durability         20 000 connections           Electrical durability         10 000 connections           Electrical durability         3           Gategory of use         Any (top or bottom)	Overcurrent circuit breaker used (MCB) (1)				
Rated operational voltage U <sub>e</sub> 230/415 V AC  - 72 V DC to the pole (1P, 2P)  - 48 V DC to the pole (3P, 4P)  Minimum voltage 12 V AC/DC  Rated impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60898-1  Rated impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60898-1  Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60898-1  Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60898-1  Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60898-1  Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2  Rated voltage of the insulation U <sub>i</sub> 690 V AC  Number of poles 3  Frequency 50/60 Hz  Characteristic 8  Design in accordance with IEC/EN 60898-1, IEC/EN 60947-2  Mechanical durability 20 000 connections Electrical durability 10 000 connections Electrical durability 10 000 connections Energy limitation class 3  Category of use 1	Manufacturer / Model	Noark / Ex9BN 3P B40			
The stand short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Rated voltage of the insulation U <sub>i</sub> Resign in accordance with IEC 60947-2 Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Rated voltage of the insulation U <sub>i</sub> Rough Short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Rated voltage of the insulation U <sub>i</sub> Rough Short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Reted voltage of the insulation U <sub>i</sub> Rough Short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Reted voltage of the insulation U <sub>i</sub> Rough Short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Reted voltage of the insulation U <sub>i</sub> Rough Short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Reted voltage of the insulation U <sub>i</sub> Rough Short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Reted short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Reted short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Reted short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Reted impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60947-2 Reted impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60947-2 Reted impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60947-2 Reted impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60947-2 Reted impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60947-2 Reted impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60947-2 Reted impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60947-2 Reted impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60947-2 Reted short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Reted short-circuit brea	Rated current	40A; 3-F			
Minimum voltage Rated impulse withstand voltage U <sub>limp</sub> in accordance with IEC 60898-1 Rated impulse withstand voltage U <sub>limp</sub> in accordance with IEC 60947-2 Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Rated voltage of the insulation U <sub>i</sub> Rated voltage of the insulation U <sub>i</sub> Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit breaking capacity I <sub>cn</sub> in accordance with Routed short-circuit b	Rated operational voltage U <sub>e</sub>	230/415 V AC			
Minimum voltage Rated impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60898-1 Rated impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60947-2 Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Rated voltage of the insulation U <sub>i</sub> Romber of poles Rated voltage of the insulation U <sub>i</sub> Requency So/60 Hz Characteristic B Design in accordance with IEC/EN 60898-1, IEC/EN 60947-2 Rechanical durability 20 000 connections Electrical durability 10 000 connections Energy limitation class A Category of use	-	72 V DC to the pole (1P, 2P)			
Rated impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60898-1  Rated impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60947-2  Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60898-1  Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2  Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2  Rated voltage of the insulation U <sub>i</sub> 690 V AC  Number of poles  70 Sol/60 Hz  Characteristic  8 Design in accordance with  1EC/EN 60898-1, IEC/EN 60947-2  Mechanical durability  20 000 connections  Electrical durability  10 000 connections  Energy limitation class  3 Actegory of use	-	48 V DC to the pole (3P, 4P)			
with IEC 60898-1 Rated impulse withstand voltage U <sub>imp</sub> in accordance with IEC 60947-2 Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60898-1 Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60898-1 Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2 Rated voltage of the insulation U <sub>i</sub> Rated voltage of the insulation U <sub>i</sub> Frequency  Characteristic  B Design in accordance with  IEC/EN 60898-1, IEC/EN 60947-2  Mechanical durability  20 000 connections Electrical durability  10 000 connections Energy limitation class  3 Category of use	Minimum voltage	12 V AC/DC			
with IEC 60947-2Rated short-circuit breaking capacity Icn in accordance with IEC 60898-16 kARated short-circuit breaking capacity Icn in accordance with IEC 60947-210 kARated voltage of the insulation Ui690 V ACNumber of poles3Frequency50/60 HzCharacteristicBDesign in accordance withIEC/EN 60898-1, IEC/EN 60947-2Mechanical durability20 000 connectionsElectrical durability10 000 connectionsEnergy limitation class3Category of useA		6 kV			
with IEC 60898-1  Rated short-circuit breaking capacity I <sub>cn</sub> in accordance with IEC 60947-2  Rated voltage of the insulation U <sub>i</sub> Number of poles  Frequency  Characteristic  B  Design in accordance with  IEC/EN 60898-1, IEC/EN 60947-2  Mechanical durability  Electrical durability  Energy limitation class  Category of use		6 kV			
with IEC 60947-210 KARated voltage of the insulation Ui690 V ACNumber of poles3Frequency50/60 HzCharacteristicBDesign in accordance withIEC/EN 60898-1, IEC/EN 60947-2Mechanical durability20 000 connectionsElectrical durability10 000 connectionsEnergy limitation class3Category of useA		6 kA			
Number of poles3Frequency50/60 HzCharacteristicBDesign in accordance withIEC/EN 60898-1, IEC/EN 60947-2Mechanical durability20 000 connectionsElectrical durability10 000 connectionsEnergy limitation class3Category of useA		10 kA			
Frequency 50/60 Hz Characteristic B Design in accordance with IEC/EN 60898-1, IEC/EN 60947-2 Mechanical durability 20 000 connections Electrical durability 10 000 connections Energy limitation class 3 Category of use	Rated voltage of the insulation $U_{\rm i}$	690 V AC			
Characteristic B  Design in accordance with IEC/EN 60898-1, IEC/EN 60947-2  Mechanical durability 20 000 connections  Electrical durability 10 000 connections  Energy limitation class 3  Category of use A	Number of poles	3			
Design in accordance with IEC/EN 60898-1, IEC/EN 60947-2 Mechanical durability 20 000 connections Electrical durability 10 000 connections Energy limitation class 3 Category of use A	Frequency	50/60 Hz			
Mechanical durability20 000 connectionsElectrical durability10 000 connectionsEnergy limitation class3Category of useA	Characteristic	В			
Electrical durability 10 000 connections Energy limitation class 3 Category of use A	Design in accordance with	IEC/EN 60898-1, IEC/EN 60947-2			
Energy limitation class 3 Category of use A	Mechanical durability	20 000 connections			
Category of use A	Electrical durability	10 000 connections			
	Energy limitation class	3			
Feed direction Any (top or bottom)	Category of use	А			
	Feed direction	Any (top or bottom)			

Overvoltage limiter used AC (SPD)				
Manufacturer / Model	Noark Ex9UE2	Noark Ex9UE2 20 3PN 275		
Connection	L-N/PE	N-PE		
Made in accordance with	EN 61643-11			
Type of delimiter	Typee 2 (klas	Typee 2 (klasa II, C, T2)		
Making the insert	MOV (Warystor)	GDT (Iskiernik)		
Rated voltage U <sub>n</sub>	230 / 400	230 / 400 V AC		
Reference test voltage U <sub>REF</sub>	255 V	255 V AC		
Continuous working voltage $\mathrm{U}_{\mathrm{c}}$	275 V AC	255 V AC		
Frequency f	50/60	50/60 Hz		
Nominal discharge current $I_n$ (8/20 $\mu$ s)	20 kA to the pole	40 kA to the pole		



Type of system LV

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Maximum impulse current $I_{imp}$ (10/350 $\mu$ s)	-	12 kA to the pole
Maximum discharge current $I_{max}$ (8/20 $\mu$ s)	40 kA to the pole	
Voltage protection level $U_p$ for electricity $I_n$	1.4 kV	1.5 kV
Voltage protection level $U_p$ for electricity $I_{\text{max}}$	2 kV	1.5 kV
Voltage protection level $U_p$ dla 5 kA (8/20 $\mu$ s)	1 kV	-
N-PE Follow current extinguishing capability $\mathbf{I}_{\mathrm{fi}}$	-	100 A
Occasional surges U <sub>t</sub> (paused)	335 V	1200 V
Residual current I <sub>PE</sub> by U <sub>REF</sub>	≤ 1 mA	-
Limiter voltage for current 1mA	387 - 473 V	-
Response time	≤ 25 ns	≤ 100 ns
Maximum fuse protection	125 A gG	-
Ability to withstand short-circuit current	50kA	-
Short-circuit withstand I <sub>SCCR</sub>	10kA	-
Current factor k	1	kA

