

## REFU*sol* 08K ... 23K

The new generation

Future-proof

Worldwide use

Flexibly decentralized

The new generation is based on the successful platform which delivers maximum yields with no maintenance. Working hand-in-hand with our customers, we have further improved the devices, making them even more future-proof, user-friendly and reliable.

Whether you add accumulators in future, integrate the PV system in smart grids or the regulations change – the new software means you're well equipped for the future.

Plan and build your decentralized PV project flexibly. The simple layout can be rapidly multiplied, particularly with large systems. Partial systems connected to the grid during the construction phase provide early yields.

The devices are designed for worldwide use, with special versions for North America (UL version) and Japan (JP version).



Now with  
Sunclix DC connection technology:  
Permanently good contact with  
no special tools

UL-version for  
North America available.

JP-version for Japan available

Technical Data	REFUsol 08K (867)	REFUsol 10 K (867)	REFUsol 13K (867)	REFUsol 17K (867)	REFUsol 20K (867)	REFUsol 23K-MV (867)
Art.No.	867P008.010	867P010.010	867P013.010	867P017.010	867P020.010	867P023.010

### DC DATA

Max. recommended PV power (kWp)	9.9	12.0	15.6	20.4	24.0	27.6
MPPT Range at nominal power (V)	370 ... 850	410 ... 850	480 ... 850	460 ... 850	490 ... 850	575 ... 850
max. voltage DC (V)	1000					
DC start voltage (V)	350					
Max. operational current DC (A)	23.0	25.0	31.1	38.3	41.8	41.0
Max. short circuit current ISC of PV system (A)	50					
MPP trackers	1					
No. DC inputs	6 x Plus, 6 x Minus Phoenix Sunclix®					

### AC DATA

AC Nominal power (kW)	8.25	10.00	13.00	17.00	20.00	23.00
Max. apparent power (kVA)	8.25	10.00	13.00	17.00	20.00	23.00
AC grid connection / Feed-in phases	L1, L2, L3, N, PE					
Nominal Power Factor / Range	1 / 0.8i ... 0.8c					
Nominal voltage AC (V)	400					
Voltage range AC (V)	320 ... 460					
Nominal Frequency / Frequency Range (Hz)	50, 60 / 45...65					
Max. AC current (A)	3 x 12					
Max. THD (%)	2.5%	2.5%	2.5%	1.8%	1.8%	1.8%
Max. Efficiency (%)	98.0%	98.0%	98.0%	98.2%	98.2%	98.3%
European Efficiency (%)	97.3%	97.4%	97.5%	97.8%	97.8%	98.1%
Feed-in from (W)	20					
Self consumption night (W)	< 0.5					

### AMBIENT CONDITIONS

Cooling	natural convection
Ambient Temperature (°C)	-25 ... +55
Rel. Air humidity (%)	0 ... 100%
Max. Elevation (m above sea level)	4000
Noise (dBA)	< 45
Environment classification (IEC 721-3-4)	4K4H
Pollution degree (IEC 62109-6-3)	3
Type of protection (IEC 60529)	IP65

No responsibility is taken for the correctness of this information. Subject to modification.

## SAFETY AND PROTECTION FUNCTIONS

DC circuit breaker	yes
Isolation monitoring	yes
String Fuses	external
Grid monitoring	Voltage, Frequency, Anti Islanding, DC injection
Grid separation	Redundant Grid Relay according to VDE 0126-1-1
Residual Current Monitoring (RCD)	yes
Internal Overvoltage Protection (EN 61643-11)	Type 3
Protection Class (IEC 62103)	I
Overvoltage Category (EN 60664-1)	DC: II, AC: III

## GENERAL DATA

Interfaces	Ethernet, RS485, Irradiation and Temperature Sensor
Communication Protocols	Sunspec (Modbus TCP, Modbus RTU), USS (Ethernet, RS485)
Dimensions W x H x D (mm)	535 x 601 x 277
Weight (kg)	38,4
Certification	VDE V 0126-1-1, IEC 62109-1, IEC 62109-2, IEC 62116, IEC 61727, IEC 61683, IEC 60364-7-712, BDEW, AR-N 4105, G59/3, CEI 0-21, CEI 0-16, EN 50438, AS 4777 (latest certificates you find at <a href="http://www.refusol.com">www.refusol.com</a> )

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