

## 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 energy storage 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).



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

Art. No.	REFU <b>sol</b> 08K 867P008.010	REFU <b>sol</b> 10K 867P010.010	REFU <b>sol</b> 13K 867P013.010	REFU <b>sol</b> 17K 867P017.010	REFU <b>sol</b> 20K 867P020.010	REFU <b>sol</b> 23K-MV 867P023.010
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**DC DATA**

Max. recommended PV power (kWp)	12.4	18.0	19.5	25.5	30.0	34.5
MPPT Range at nominal power (V)	370 ... 850	410 ... 850	480 ... 850	460 ... 850	490 ... 850	575 ... 850
Max. voltage DC (V)	1,000					
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 × Plus, 6 × Minus Phoenix Sunclix®					

**AC DATA**

AC nominal power (kW)	8.25	10	13	17	20*)	23
AC grid connection	L1, L2, L3, N, PE					
Nominal power factor / Range	1 / 0,8i ... 0,8c					
Nominal voltage AC (V)	400	400	400	400	400	460
Voltage range AC (V)	320 ... 460	320 ... 460	320 ... 460	320 ... 460	320 ... 460	368 ... 529
Nominal frequency / Frequency range (Hz)	50, 60 / 45 ... 65					
Max. AC current (A)	3 × 12	3 × 16	3 × 21	3 × 29.2	3 × 29.2	3 × 29.2
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) / Self consumption night	20 / < 0.5					

**AMBIENT CONDITIONS**

Cooling	natural convection					
Ambient temperature (°C)	- 25 ... + 55					
Rel. air humidity (%)	4 ... 100					
Noise (dBA)	< 45					
Type of protection (IEC 60529)	IP65					

**SAFETY AND PROTECTION**

DC switch / Isolation monitoring	yes / yes					
Grid monitoring	Voltage, Frequency, Anti Islanding, DC injection					
Grid separation	Redundant grid relay according to VDE 0126-1-1					
Residual Current Monitoring (RCD)	yes					
Protection class (IEC 62103) / Overvoltage category (EN 60664-1)	I / DC: II, AC: III					

**GENERAL DATA**

Interfaces	Ethernet, RS485, Sensor (Temperature- / Irradiationsensor / Remote stop signal)					
Dimensions W × H × D (mm) / Weight (kg)	535 × 601 × 277 / 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.refu-sol.com">www.refu-sol.com</a> )					

\*) 19.2 kW / kVA at 380 V grid voltage