

REFU^{sol} 100K

The next generation of solar string inverters

SUITABLE FOR
REPOWERING
APPLICATIONS

- High design flexibility
- Best serviceability
- Maximum power density
- Minimized BOS costs

With maximum power density, REFU's next generation inverter family combines compatibility, installation flexibility, serviceability and connectivity in a revolutionary design.

Compatibility: This inverter can be connected to any grid voltage between 200 and 460 VAC, offering maximum power between 48 and 100 kVA.

Installation Flexibility: The inverter can be mounted in a vertical or horizontal position as demanded on site. The roomy ConnectionBox is available with either fused direct string connections for decentralized designs, or with single DC input for centralized designs.

Serviceability: The PowerUnit can be quickly detached from the ConnectionBox for trouble-shooting and measurements without disconnecting the power cables on the DC or AC side.

Connectivity: The inverter can be commissioned via the REFU App (available for iOS and Android) which connects seamlessly via Bluetooth® to the inverter. The integrated, fail-safe Ethernet daisy chain (alternatively RS485) allows cost efficient high-speed monitoring without special accessories. Each inverter can be individually connected to the REFUlog portal for remote monitoring, configuration and updates.



TECHNICAL DATA – INVERTER

	REFUsol 83K (380 VAC)	REFUsol 88K (400 VAC)	REFUsol 98K (440 VAC)	REFUsol 100K (460 VAC)
DC DATA				
Max. voltage DC (V)			1,100	
Nominal voltage DC (V)	600	620	670	695
MPPT range at nominal power (V)	555... 900	585... 900	640... 900	670... 900
DC operation range (V)	555... 1,000	585... 1,000	640... 1,000	670... 1,000
DC start-up input voltage (V)	625	660	725	750
Max. operational current DC (A)	154	155	156	153
Max. short circuit current ISC of PV system (A)			250	
Rated input power (kW)	85.5	90.5	100.0	102.5
MPP trackers			1	
DC input	Central: 1 Plus, 1 Minus (M16 Threaded Stud Connection 50 ... 300 mm ²) Distributed: 20 Plus, 20 Minus (MC4 or Push in Clamps 6 ... 16 mm ²)			
DC/AC Ratio			1.5	

AC DATA				
AC rated power (kVA)	83.3	88.0	97.5	100.0
Rated voltage AC (V)	380	400	440	460
Voltage range AC (V)	304... 456	320... 480	352... 528	368... 552
AC grid connection			3 Phases, PE	
Nominal Power Factor / Range			1 / 0.3i ... 0.3c	
Rated Frequency / Frequency Range (Hz)			50, 60 / 45 ... 65	
Max. AC current (A)			128	
THD (%)			< 3	
Max. Efficiency (%)	98.3	98.4	98.4	98.5
European Efficiency (%)	97.9	98.0	98.0	98.1
Night-time power loss (W)			< 1	
AC connection	L1, L2, L3, PE: M12 Bolt Terminals 50 ... 240 mm ²			

AMBIENT CONDITIONS	
Cooling	Smart active cooling
Max. temp. for nominal power (°C)	45
Ambient temperature (°C)	-25...+60
Rel. Air humidity (%)	0... 100
Max. elevation (m above sea level)	3,000
Environment classification (IEC 60721-3-4)	4K4H
Type of protection (PowerUnit/ConnectionBox) (IEC 60529)	IP65/IP54

SAFETY AND PROTECTION FUNCTIONS	
DC circuit breaker / AC circuit breaker	integrated / optional
Surge Protection Devices	see technical data ConnectionBox
String Fuses	Integrated in decentral ConnectionBox
Grid monitoring	Voltage, Frequency, Passive and Active Anti-Islanding, DC injection
Grid separation	Gate Block / Redundant Grid Relay
Residual Current Monitoring (RCD) / Isolation Monitoring	Type 2 / yes
AFCI / Rapid Shutdown	optional / optional

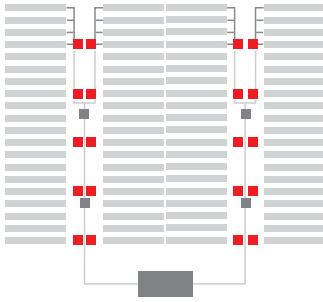
GENERAL DATA	
Status display	4 LED's (DC status, AC status, Fault, Bluetooth®)
Interfaces	2 × Ethernet Daisy-Chain or 2 × RS485, Bluetooth® BLE, 4 × Digital In
Communication protocols	Sunspec (Modbus TCP, Modbus RTU), USS (Ethernet, RS485)
Dimensions PowerUnit W × H × D (mm)	675 × 627 × 322
Weight PowerUnit (kg)	62

FLEXIBLE INSTALLATION POSSIBILITIES

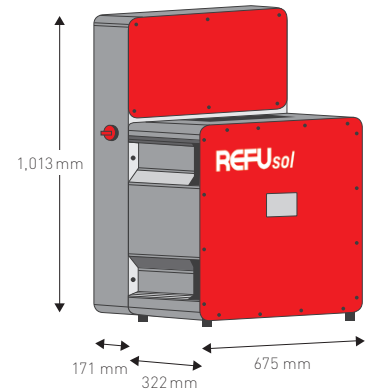
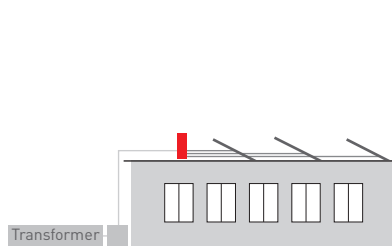
REFU's next generation platform support different plant designs from large commercial rooftops to multi-MW ground mount systems. You can choose to place the inverter being near the solar panels (decentralized) or near the transformer station (centralized).

DECENTRALIZED VARIANT

GROUND MOUNTED SYSTEMS

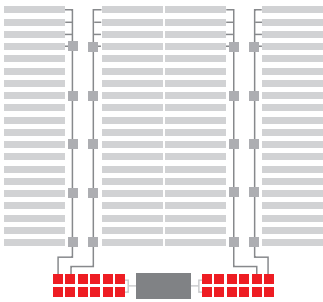


ROOFTOP SYSTEMS

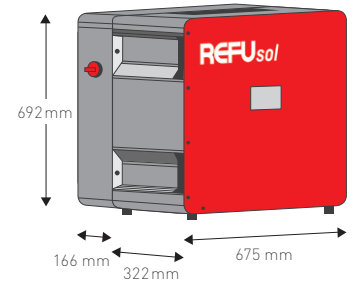
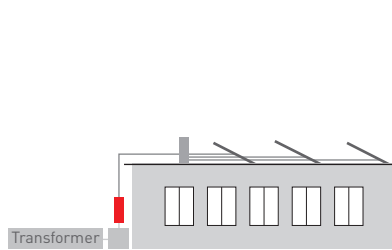


CENTRALIZED VARIANT

GROUND MOUNTED SYSTEMS



ROOFTOP SYSTEMS



■ REFU sol inverter ■ DC combiner box ■ AC combiner — DC cable — AC cable

Decentral ConnectionBox

Central ConnectionBox

Type	CBID 100K (1100V-PM-DCS-DC2)	CBID 100K (1100V-PM-DCS-DC2-AC2-ACS)	CBID 100K (1100V-PM-DCS-DC12-AC12-ACS)	CBIC 100K (1100V-DCS-DC2)	CBIC 100K (1100V-R-DCS-DC2-AC2-ACS)
Art. No. (Push in Clamps)	936P211.1000	936P211.1110	936P211.2210	936P001.1000	936P001.1110
Art. No. (MC4)	936P111.1000	936P111.1110	936P111.2210	-	-

INPUT

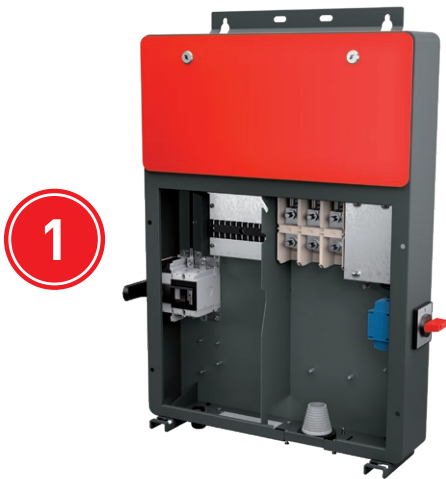
Rated DC Voltage (VDC)	1,100			1,100	
Max. Current per input	10A per string input			250 A	
DC Connection (+ / -)	20 Strings Push in Clamp 6 ... 16 mm ² / 20 Strings MC4			Ring terminal block (50 ... 300 mm ²)	
DC Fuses	Plus and Minus integrated (gPV, 15A, 1,100 VDC, 14 × 51 mm)			-	
DC Circuit Breaker	integrated			integrated	
AC Overvoltage Protection	SPD Type 2	SPD Type 2	SPD Type 1&2	SPD Type 2	

OUTPUT

AC Overvoltage Protection	none	SPD Type 2	SPD Type 1&2	none	SPD Type 2
AC Circuit Breaker	none	integrated	integrated	none	integrated
Dimensions ConnectionBox W × H × D (mm)	750 × 1,013 × 171			750 × 692 × 166	
Weight ConnectionBox (kg)	40			25	

INSTALLATION MADE EASY

Vertical, horizontal and pole mounting is made possible by the new design of the REFU's next generation inverter platform which is super flexible. The ConnectionBox and PowerUnit can be delivered individually in separate shipments. The ConnectionBox can be installed during cable work, and the PowerUnit just before commissioning thereby optimizing your investment and project cash flow.



Install and wire the ConnectionBox.



Hang in PowerUnit before commissioning.



Start feed-in.