REFUstore 50K / 88K

The next generation of bidirectional high power battery inverters

- Drastic reduction in BOS costs
- Maximum power density
- Easy serviceability
- Suitable for 2nd Life Battery Application



The REFUstore 88K is based on the new inverter platform from REFU. This inverter is specifically designed for all high voltage batteries. With a rated power of 88 kW at 400V, it is perfectly suited for commercial behind-the-meter applications such as self-consumption optimization or peak-shaving.

Future Proof: The AC-coupled REFUstore 88K can be easily integrated with existing PV systems. The highly modular solution allows it to be used in systems from 88 kW up to MWs in size to meet the demands of both energy and power applications.

Maximum Performance: The REFUstore 88K is highly efficient over a wide range of operation maximizing return on investment. With fast response times, the inverter achieves high control performance, making it suitable for time-critical applications.

Design Flexibility: The REFUstore 88K allows different communication protocols like Modbus RTU/TCP and Sunspec/MESA. The higher flexibility in system design reduces BOS costs drastically.

2nd Life Application: With a min. DC voltage of 280V, the REFUstore 50K can be used in 2nd life battery applications with ease to support the grid for applications such as frequency regulation, optimizing self-consumption, peak shaving etc.

MADE IN GERMANY

TECHNICAL DATA – POWERUNIT

Art. No.	REFUstore 88K 420P088.010		REFUstore 50K 420P050.010	
Operation Mode	**88 kVA @ 400 VAC**	**83 kVA @ 380 VAC**	**50kVA @ 380 VAC**	**2nd life application**
DC DATA				
Max. voltage DC (V)	1,000			
Nominal voltage DC (V)	620	600	600	Usdc + 50
DC voltage range at nominal power (V)	585 ...900	555 ...900	555 ...900	1.63 × Uac ...900
DC start-up open circuit voltage, Usdc (V)	585	555	555	1.63 × Uac
Max. operational current DC (A)	153	153	87	153
DC connection PowerUnit - ConnectionBox	1 Plus, 1 Minus: Connector with Button Activated Coupling			
AC DATA				
Apparent power (kVA)	88.0	83.3	50.0	0.222 × Uac
Rated voltage AC 3-Phase, Uac (V)	400	380	380	180 ... 400
Voltage range AC (V)	180 ... 528			
AC grid connection / Grid types	3 Phases, PE / TT, TN-C, TN-S			
Nominal power factor / Range	1 / 0.3i ... 0.3c			
Rated frequency / Frequency Range (Hz)	50, 60 / 45 ... 65			
Max. AC current, Imax (A)	128			
Max. AC short circuit current (A rms)	64 (3 period average)			
Inrush current (peak / duration)	25 A / 0.5 ms			
Max. THD (%)	< 3			
Max. efficiency (%)	98.4	98.3	98.4	96.8
Maximum admissible external AC fuse	160 A (consider the triggering characteristic), gG, UN = 500 V			
Peak current (Ip) / Initial short circuit current (Ik˝) acc. IEC 60690-0 (A)	128 / 325			
AC connection PowerUnit - ConnectionBox	Connector with Button Activated Coupling			
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			
Noise level (dBA)	< 70			
Environment classification (IEC 60721-3-4)	4K4H			
Type of protection	IP65			
Installation type	Indoor / outdoor, Vertical / flat / pole mounting			
SAFETY AND PROTECTION FUNCTIONS				
Safety and protection devices	Refer to ConnectionBox			
Grid monitoring (acc. DIN V VDE V 0126-1-1)	Voltage, Frequency, Passive and Active Anti-Islanding, DC injection			
Grid separation	Gate Block / redundant Grid Relays			
Residual current monitoring (RCD) / Isolation monitoring	Type 2 / yes			
Compatibility external RCD	Type A / Type B			
Protection class (IEC 62109)	1			
Overvoltage category (IEC 60664-1)	DC: II / AC: III			

TECHNICAL DATA – POWERUNIT

REFUenergy

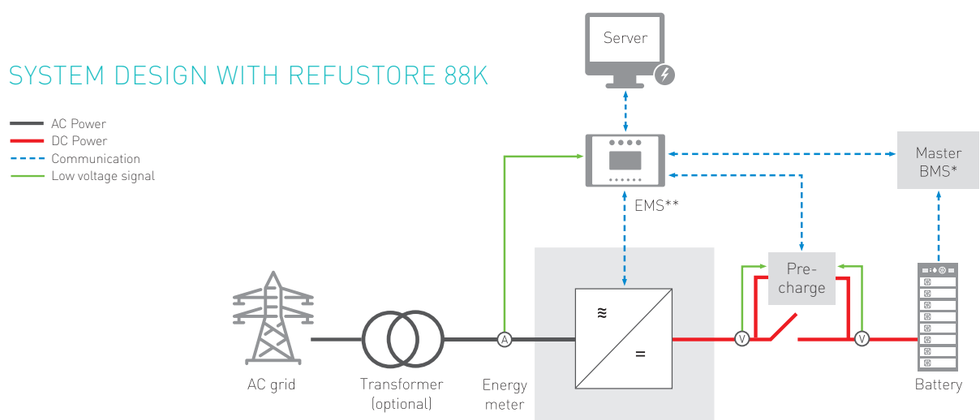
Art. No.	REFUstore 88K 420P088.010		REFUstore 50K 420P050.010	
Operation Mode	**88 kVA @ 400 VAC**	**83 kVA @ 380 VAC**	**50kVA @ 380 VAC**	**2nd life application**
GENERAL DATA				
Topology	Transformerless			
DC pole grounding	not allowed			
Status display / Keys	4 LED's (DC status, AC status, Fault, Bluetooth®) / 2 Keys (Connect, Clear)			
Interfaces	2 × Ethernet Daisy-Chain / 2 × RS485, Bluetooth® BLE, 1 × Remote Off Signal			
Communication protocols	Sunspec (Modbus TCP, Modbus RTU), USS (Ethernet, RS485)			
Dimensions PowerUnit (W × H × D) (mm)	673 × 626 × 321			
Weight PowerUnit (kg)	69			
CERTIFICATES*				
EU Directive	2006/95/EC, 2004/108/EC			
Product	IEC 62109-1, IEC 62109-2, IEC 62116, IEC 61727, IEC 61683, IEC 62477-1			
EMC	IEC 61000-6-2, IEC 61000-6-4			
Environment	IEC 60068-2-1, -2-2, -2-30, -2-78, -2-14, -2-6, -2-27, -3-2, -2-75, IEC 60529, IEC 60034-9			
Grid Codes	DIN VDE V 0126-1-1, VDE AR-N 4105, BDEW Prototype Declaration, TOR D4, Önorm E 8001-4-712, UTE C15-712-1 , EN 50438			

* all certificates are available at www.refu.com

TECHNICAL DATA – CONNECTIONBOX

Art. No.	CBBS 88K (1000V-BR) 940P300.0000
GENERAL DATA	
DC Connection (+ / -)	Ring terminal block (50 ... 240 mm²)
AC Connection	L1, L2, L3: M10 PE: M8 Bolt Terminals 50 ... 150 mm²
Type of protection (IEC 60529)	IP54
Dimensions ConnectionBox W × H × D (mm)	760 × 692 × 166
Weight (kg)	25
Optional Accessories	DC Fuses, AC Circuit Breaker, DC/AC SPD's, Pre Charge Circuit

SYSTEM DESIGN WITH REFUSTORE 88K



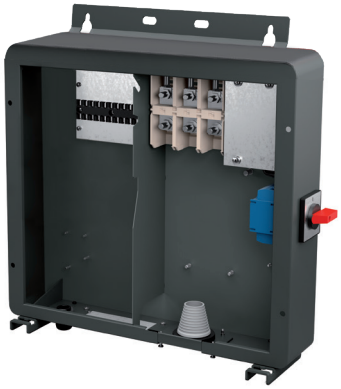
*Master-BMS = Master Battery Management System
**EMS = Energy Management System

INSTALLATION MADE EASY

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 investment and project cash flow.

This two-piece design also offers easiest 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 sides.

1



Install and wire
the ConnectionBox.

2



Hang in PowerUnit
just before
commissioning.



3

Ready.

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

REFU Elektronik GmbH | Marktstraße 185 | 72793 Pfullingen | Germany | Tel. +49 7121 4332-0 | Fax +49 7121 4332-140 | info@refu.com | www.refu.com

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