/ Perfect Welding / Solar Energy / Perfect Charging

SHIFTING THE LIMITS

FRONIUS ENERGY PACKAGE

/ The personal storage solution for 24H Sun.

/ SnapINverter technology

/ Integrated data communication

/ Dynamic Peak Manager

/ Smart Grid Ready

/ Ready for Storage

/ Multi Flow Technology

/ "24H sun" is the Fronius vision of how energy will be supplied in the coming decades. The Fronius Symo Hybrid is the heart of the storage solution for 24H Sun - the Fronius Energy Package. Boasting power categories ranging from 3.0 to 5.0 kW, the three-phase inverter allows excess energy from a photovoltaic system to be stored in a battery. The result: maximum self-consumption of the available power and maximum energy independence. Excess solar power can thus be used at times when generating conditions are poor or impossible. With the emergency power function, the household can enjoy an optimum electricity supply even during power outages (Retrofitting of the emergency power function is possible from mid 2016, using a software update). Perfect system configuration and visualisation are provided by the built-in web server with graphical interface, WLAN and Ethernet. In addition, the DC coupling on the battery guarantees maximum efficiency of the overall system.

MODULAR

/ Emergency power function and battery can be retrofitted
/ Range of different storage capacities available (4.5 - 12.0 kWh)

EFFICIENT

/ DC-coupled system
/ No multiple conversions between AC and DC
/ High-performance lithium iron phosphate technology

THREE-PHASE

/ Maximisation of self-consumption
/ Three-phase emergency power supply

REVOLUTIONARY

/ User-friendly interface
/ Integrated WLAN and Ethernet
/ Setup wizard for straightforward configuration

TECHNICAL DATA FRONIUS SYMO HYBRID

/ The Fronius Symo Hybrid is the heart of the storage solution for 24H Sun - the Fronius Energy Package. From a simple inverter one minute, the battery and emergency power function can be added in no time. The result: sun by day, sun by night and sun during power outages.

INPUT DATA	SYMO HYBRID 3.0-3-S	SYMO HYBRID 4.0-3-S	SYMO HYBRID 5.0-3-S
PV input power	5.0 kW	6.5 kW	8.0 kW
Max. input current ($I_{dc\ max}$)		1 x 16 A	
Max. short circuit current, module array		24 A	
Min. input voltage ($U_{dc\ min}$)		150 V	
Feed-in start voltage ($U_{dc\ start}$)		200 V	
Nominal input voltage ($U_{dc,r}$)		595 V	
Max. input voltage ($U_{dc\ max}$)		1000 V	
MPP voltage range ($U_{mpp\ min}$ – $U_{mpp\ max}$)	200 - 800 V	255 - 800 V	320 - 800 V
Number of MPP trackers		1	
Number of DC connections (PV)		2	

BATTERY INPUT	SYMO HYBRID 3.0-3-S	SYMO HYBRID 4.0-3-S	SYMO HYBRID 5.0-3-S
Maximum output power to battery		Depends on connected Fronius Solar Battery	
Maximum input power from battery		Depends on connected Fronius Solar Battery	

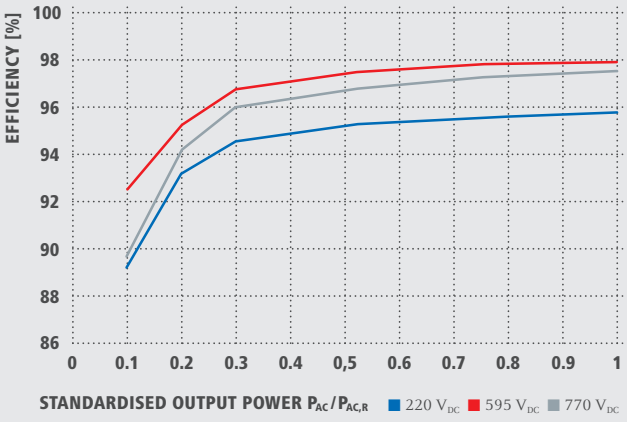
OUTPUT DATA	SYMO HYBRID 3.0-3-S	SYMO HYBRID 4.0-3-S	SYMO HYBRID 5.0-3-S
AC nominal output ($P_{ac,r}$)	3,000 W	4,000 W	5,000 W
Max. output power	3,000 VA	4,000 VA	5,000 VA
Max. power from grid to battery	3,000 VA	4,000 VA	5,000 VA
AC output current ($I_{ac\ nom}$)	4.3 A	5.8 A	7.2 A
Grid connection (voltage range)		3-NPE 400 V / 230 V or 3-NPE 380 V / 220 V (+20 % / -30 %)	
Frequency (frequency range)		50 Hz / 60 Hz (45 - 65 Hz)	
Total harmonic distortion		< 3 %	
Power factor (cos $\varphi_{ac,r}$)		0.85 - 1 ind. / cap.	

GENERAL DATA	SYMO HYBRID 3.0-3-S	SYMO HYBRID 4.0-3-S	SYMO HYBRID 5.0-3-S
Dimensions (height x width x depth)		645 x 431 x 204 mm	
Weight		19.9 kg	
Degree of protection		IP 65	
Protection class		1	
Overvoltage category (DC / AC) [1]		2 / 3	
Inverter design		Transformerless	
Cooling		Regulated air cooling	
Installation		Indoor and outdoor installation	
Ambient temperature range		-25 - +60°C	
Permitted humidity		0 - 100 %	
Max. altitude		2,000 m (unrestricted voltage range)	
DC PV connection technology		2x DC+ and 2x DC- screw terminals 2.5 - 16 mm²	
DC battery connection technology		1x DC+ and 1x DC- screw terminals 2.5 - 16 mm²	
AC connection technology		5-pin AC screw terminals 2.5 - 16 mm²	
Certificates and compliance with standards		VDE AR N 4105, ÖVE / ÖNORM E 8001-4-712, DIN V VDE 0126-1-1	
Stand-alone		Yes	
Emergency power function switchover time		5 sec.	

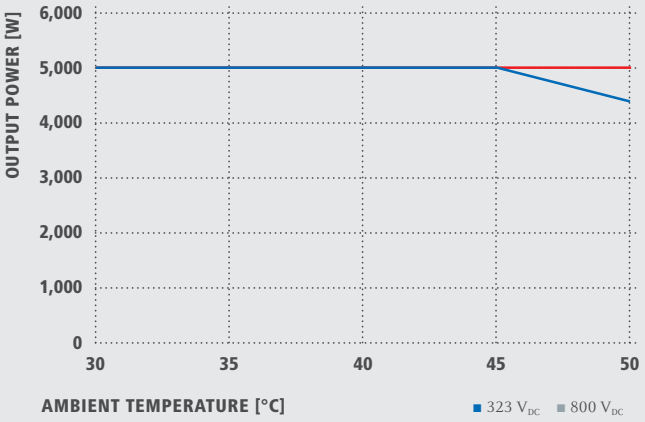
EFFICIENCY	SYMO HYBRID 3.0-3-S	SYMO HYBRID 4.0-3-S	SYMO HYBRID 5.0-3-S
Max. efficiency (PV - grid)	97.5 %	97.6 %	
Max. efficiency (PV - battery - grid)	> 90.0 %	> 90.0 %	> 90.0 %
Europ. efficiency (PV - grid)	95.2 %	95.7 %	96.0 %
η at 5 % Pac,r [2]	78.5 % / 77.3 % / 66.9 %	80.1 % / 79.5 % / 70.1 %	81.6 % / 81.6 % / 73.4 %
η at 10 % Pac,r [2]	83.1 % / 83.8 % / 76.6 %	86.2 % / 88.1 % / 83.2 %	89.2 % / 92.5 % / 89.7 %
η at 20 % Pac,r [2]	90.0 % / 93.0 % / 90.6 %	91.6 % / 94.2 % / 92.4 %	93.2 % / 95.3 % / 94.2 %
η at 25 % Pac,r [2]	91.2 % / 93.9 % / 91.9 %	93.2 % / 95.3 % / 94.2 %	94.0 % / 96.5 % / 95.3 %
η at 30 % Pac,r [2]	92.4 % / 94.7% / 93.3 %	93.9 % / 96.2 % / 95.1 %	94.5 % / 96.7 % / 96.0 %
η at 50 % Pac,r [2]	94.5 % / 96.7 % / 96.0 %	94.9 % / 97.1 % / 96.4 %	95.3 % / 97.5 % / 96.8 %
η at 75 % Pac,r [2]	95.1 % / 97.3 % / 96.6 %	95.4 % / 97.7 % / 97.0 %	95.6 % / 97.9 % / 97.3 %
η at 100 % Pac,r [2]	95.4 % / 97.7 % / 97.0 %	95.6 % / 97.9 % / 97.3 %	95.8 % / 97.9 % / 97.5 %
MPP adaptation efficiency		> 99.9 %	

[1] Testing to IEC 62109-1. [2] And at Umpp min / Udc,r / Umpp max
Further information regarding the availability of the inverters in your country can be found at **www.fronius.com**.

FRONIUS SYMO HYBRID 5.0-3-S EFFICIENCY CURVE



FRONIUS SYMO HYBRID 5.0-3-S TEMPERATURE DERATING



TECHNICAL DATA FRONIUS SYMO HYBRID

PROTECTION DEVICES	SYMO HYBRID 3.0-3-S	SYMO HYBRID 4.0-3-S	SYMO HYBRID 5.0-3-S
DC disconnector	Included		
Overload behaviour	Operating point shift, power limitation		
DC insulation measurement	Included		
Integral RCMU	Yes		

INTERFACES	SYMO HYBRID 3.0-3-S	SYMO HYBRID 4.0-3-S	SYMO HYBRID 5.0-3-S
WLAN / Ethernet LAN	Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)		
Datalogger and web server	Included		
Interface to battery and meter	Modbus RTU (RS485)		

TECHNICAL DATA FRONIUS SMART METER

/ The Fronius Smart Meter is a bidirectional meter which optimises self-consumption and records the household's load curve. In conjunction with the Fronius Solar.web online portal, the Fronius Smart Meter provides a clear overview of a user's own power consumption.

GENERAL DATA	FRONIUS SMART METER 63A-3	FRONIUS SMART METER 50kA-3 [1]
Nominal voltage	400 - 415 V	
Operating range	340 - 460 V	210 - 440 V
Maximum current	3 x 63 A	3 x 50,000 A
Cable cross-section, power path	1 - 16 mm²	0.05 - 4 mm²
Cable cross-section, communication	0.05 - 4 mm²	
Mounting	DIN rail	
Housing	4 solar modules DIN 43880	
Dimensions (height x width x depth)	89.0 x 71.2 x 65.6 mm	
Accuracy class	1	
Interface to inverter	Modbus RTU (RS485)	
Display	8-digit LCD	
Voltage transformation ratio (adjustable)	-	1 - 500
Current transformation ratio (adjustable)	-	1 - 9,999
Pulse output	No	Yes

[1] Delivered without current sensors, secondary current 1 A and 5 A. The Fronius Smart Meter 50kA-3 is available by the end of 2015.

TECHNICAL DATA FRONIUS SOLAR BATTERY

/ The Fronius Solar Battery is a perfect example of high-performance lithium iron phosphate technology. A long service life, short charging times and high depth of discharge are therefore guaranteed.

ELECTRICAL PARAMETERS	BATTERY 4.5	BATTERY 6.0	BATTERY 7.5	BATTERY 9.0	BATTERY 10.5	BATTERY 12.0
Nominal capacity	4.5 kWh	6.0 kWh	7.5 kWh	9.0 kWh	10.5 kWh	12.0 kWh
Usable capacity (80% DoD)	3.6 kWh	4.8 kWh	6.0 kWh	7.2 kWh	8.4 kWh	9.6 kWh
Cycle stability (80% DoD)	8,000 [1]					
Voltage range	120 - 170 V	160 - 230 V	200 - 290 V	240 - 345 V	280 - 400 V	320 - 460 V
Nominal charging power	2,400 W	3,200 W	4,000 W	4,800 W	5,600 W	6,400 W
Nominal discharge power	2,400 W	3,200 W	4,000 W	4,800 W	5,600 W	6,400 W
Max. charging current	16 A					
Max. discharge current	16 A					

GENERAL DATA	BATTERY 4.5	BATTERY 6.0	BATTERY 7.5	BATTERY 9.0	BATTERY 10.5	BATTERY 12.0
Battery technology	LiFePO4					
Dimensions (height x width x depth)	955 x 570 x 611 mm					
Weight	91 kg	108 kg	125 kg	142 kg	159 kg	176 kg
Degree of protection	IP 20					
Protection class	1					
Installation type	Indoor installation					
Ambient temperature range	5 - 35°C					
Permitted humidity	0 - 95 %					
DC connection technology	Screw terminals 2.5 - 16 mm²					
Calendar service life	> 20 Years [1]					
Certificates and compliance with standards	IEC/EN 62133; EN 61000-6-2:2005, EN 61000-6-3:2007 + A1:2011, EN 62311:2008, FCC Part 15 Subpart B:2012 ClassB, UN 38.3					

INTERFACES	BATTERY 4.5	BATTERY 6.0	BATTERY 7.5	BATTERY 9.0	BATTERY 10.5	BATTERY 12.0
Connection to inverter	Modbus RTU (RS485)					

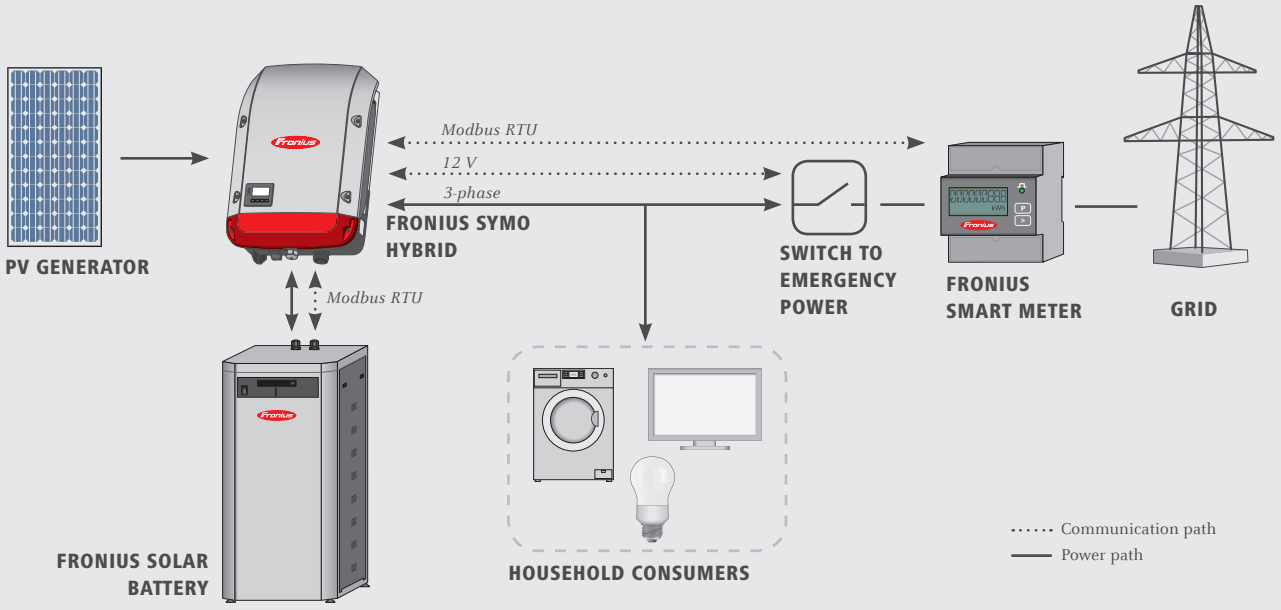
[1] At 23°C ambient temperature.

TECHNICAL DATA FRONIUS BATTERY MODULE

/ The storage capacity of the Fronius Solar Battery can be adapted to meet individual customer needs.

GENERAL DATA	BATTERY MODULE 1.5 RF
Usable capacity	1.2 kWh
Nominal voltage	51.2 V
Dimensions (height x width x depth)	80 x 432 x 421 mm
Weight	18 kg

CONFIGURATION DIAGRAM FRONIUS ENERGY PACKAGE



Retrofitting of the emergency power function is possible from mid 2016, using a software update.

WE HAVE THREE DIVISIONS AND ONE PASSION: SHIFTING THE LIMITS OF POSSIBILITY.

/ What Günter Fronius started in 1945 in Pettenbach, Austria, has now become a modern day success story. Today, the company has around 3,300 employees worldwide and has been granted more than 900 patents. Our goal has remained constant throughout: to be the innovation leader. We shift the limits of what's possible. While others progress step by step, we innovate in leaps and bounds. The responsible use of our resources forms the basis of our corporate policy.

PERFECT WELDING

/ We develop products and complete systems - both manual and automated - as well as the corresponding services for our customers in the global welding technology market. We have made it our goal to decode the "DNA of the arc".

SOLAR ENERGY

/ The challenge is to make the leap to a regenerative energy supply. Our vision is to use renewable energy to achieve energy independence. With our services, inverters and energy-storage systems for optimising energy yields, we are one of the leading suppliers in the photovoltaics sector.

PERFECT CHARGING

/ As know-how leaders in the world of battery charging, we deliver exceptional solutions to create the maximum benefit for our customers. For the intralogistics sector, we are committed to energy flow optimisation for electric forklift trucks and are constantly striving for the next innovation. Our powerful charging systems for vehicle workshops guarantee safe and reliable processes.

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Further information about all Fronius products and our global sales partners and representatives can be found at **www.fronius.com**

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