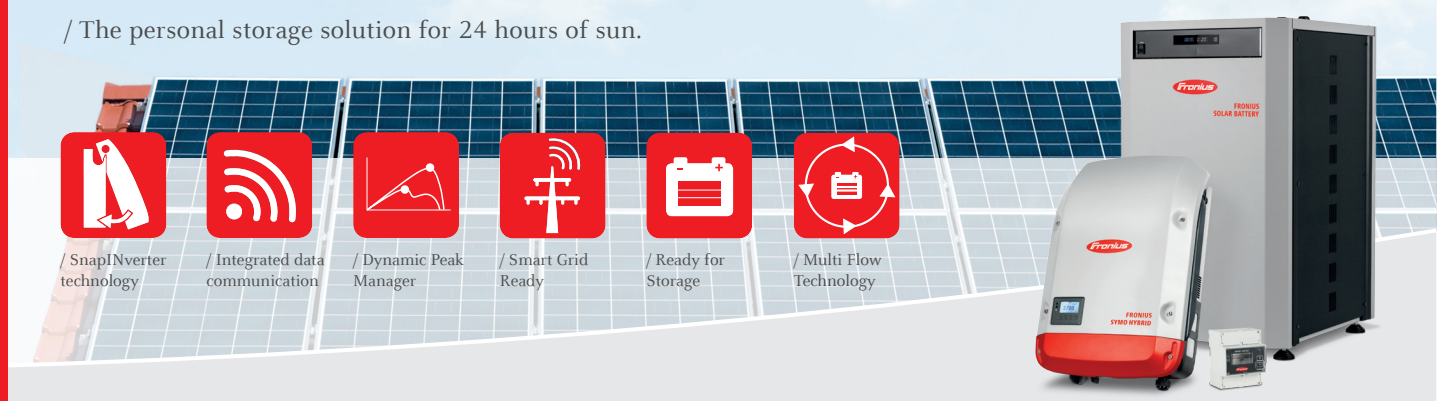
/ Perfect Welding / Solar Energy / Perfect Charging

SHIFTING THE LIMITS

# FRONIUS ENERGY PACKAGE

/ The personal storage solution for 24 hours of sun.



/ SnapINverter technology

/ Integrated data communication

/ Dynamic Peak Manager

/ Smart Grid Ready

/ Ready for Storage

/ Multi Flow Technology




/ 24 hours of 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 24 hours of 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 the Fronius Solar 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.

## FLEXIBLE

/ Emergency power function and battery can be retrofitted
/ Range of storage capacities available (4.5 - 12.0 kWh)
Retrofittable to existing PV systems

## 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
/ Grid phase balancing support

## REVOLUTIONARY

/ User-friendly interface
/ Integrated WLAN and Ethernet
/ Unlimited usage options thanks to Multi Flow Technology

## TECHNICAL DATA FRONIUS SYMO HYBRID

/ The Fronius Symo Hybrid is the heart of the storage solution for 24 hours of sun - the Fronius Energy Package. With power categories from 3.0 to 5.0 kW, the three-phase inverter allows surplus energy from a photovoltaic system to be temporarily stored in the Fronius Solar Battery. The built-in Multi Flow Technology enables the energy flows to be intelligently managed.


| INPUT DATA | SYMO HYBRID 3.0-3-S | SYMO HYBRID 4.0-3-S | SYMO HYBRID 5.0-3-S |
|---|---|---|---|
| Max. 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 | | |
| Usable MPP voltage range ($U_{mpp\ min}$ – $U_{mpp\ max}$) | 150 - 800 V | | |
| MPP voltage range at nominal power ($U_{mpp\ min}$ – $U_{mpp\ max}$) | 200 - 800 V | 255 - 800 V | 320 - 800 V |
| Number of MPP trackers | 1 | | |
| Number of DC connections (PV) | 2 | | |

| BATTERY CONNECTION | SYMO HYBRID 3.0-3-S | SYMO HYBRID 4.0-3-S | SYMO HYBRID 5.0-3-S |
|---|---|---|---|
| Maximum total charging power (AC + DC) | Depends on connected Fronius Solar Battery | | |
| Maximum discharging power | Depends on connected Fronius Solar Battery | | |

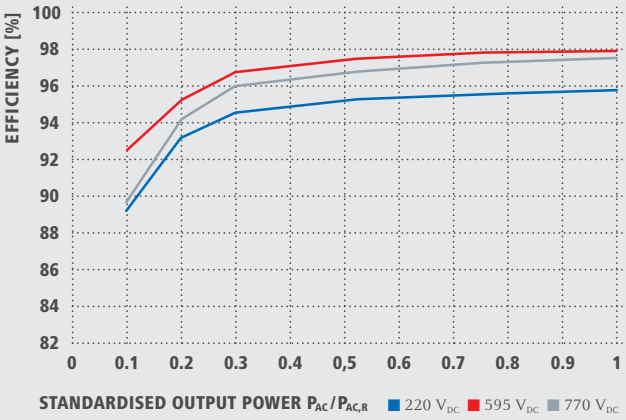
| OUTPUT DATA | SYMO HYBRID 3.0-3-S | SYMO HYBRID 4.0-3-S | SYMO HYBRID 5.0-3-S |
|---|---|---|---|
| AC nominal output ($P_{ac,r}$) | 3,000 W | 4,000 W | 5,000 W |
| Max. output power | 3,000 VA | 4,000 VA | 5,000 VA |
| Max. charging power from AC | 3,000 VA | 4,000 VA | 5,000 VA |
| AC output current ($I_{ac\ nom}$) | 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 | | |
| Emergency power function [2] | Optional | | |
| Emergency power function switch-over time | 5 sec. | | |

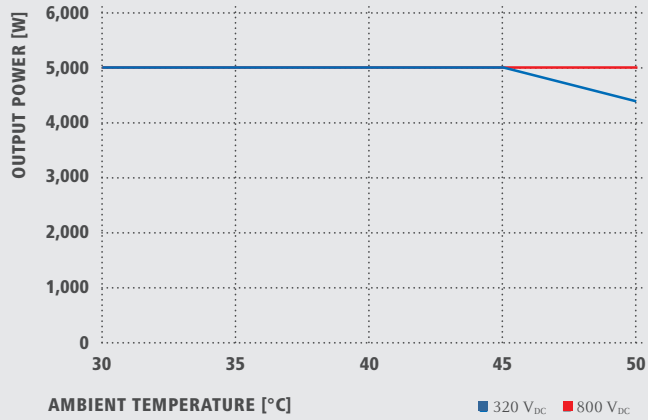
| EFFICIENCY | SYMO HYBRID 3.0-3-S | SYMO HYBRID 4.0-3-S | SYMO HYBRID 5.0-3-S |
|---|---|---|---|
| Max. efficiency (PV - grid) | 97.7 % | 97.9 % | |
| Max. efficiency (PV - battery - grid) | > 90.0 % | > 90.0 % | > 90.0 % |
| Europ. efficiency (PV - grid) | 95.2 % | 95.7 % | 96.0 % |
| η at 5 % Pac,r [3] | 78.5 % / 77.3 % / 66.9 % | 80.1 % / 79.5 % / 70.1 % | 81.6 % / 81.6 % / 73.4 % |
| η at 10 % Pac,r [3] | 83.1 % / 83.8 % / 76.6 % | 86.2 % / 88.1 % / 83.2 % | 89.2 % / 92.5 % / 89.7 % |
| η at 20 % Pac,r [3] | 90.0 % / 93.0 % / 90.6 % | 91.6 % / 94.2 % / 92.4 % | 93.2 % / 95.3 % / 94.2 % |
| η at 25 % Pac,r [3] | 91.2 % / 93.9 % / 91.9 % | 93.2 % / 95.3 % / 94.2 % | 94.0 % / 96.5 % / 95.3 % |
| η at 30 % Pac,r [3] | 92.4 % / 94.7% / 93.3 % | 93.9 % / 96.2 % / 95.1 % | 94.5 % / 96.7 % / 96.0 % |
| η at 50 % Pac,r [3] | 94.5 % / 96.7 % / 96.0 % | 94.9 % / 97.1 % / 96.4 % | 95.3 % / 97.5 % / 96.8 % |
| η at 75 % Pac,r [3] | 95.1 % / 97.3 % / 96.6 % | 95.4 % / 97.7 % / 97.0 % | 95.6 % / 97.9 % / 97.3 % |
| η at 100 % Pac,r [3] | 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] Max 15% of the time. This function can easily be added to the Fronius Symo Hybrid from mid-2016 with a software update
[3] 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 | Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON) | | |
| 6 inputs or 4 digital in/out | Interface to ripple control receiver, Energy management | | |
| USB (A socket) | For USB sticks | | |
| 2x RS422 (RJ45 socket) | Fronius Solar Net. Interface Protocol | | |
| Signalling output | Energy management (potential-free relay output) | | |
| External input | S0-Meter Interface / Input for overvoltage protection | | |
| 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.

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

| 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.

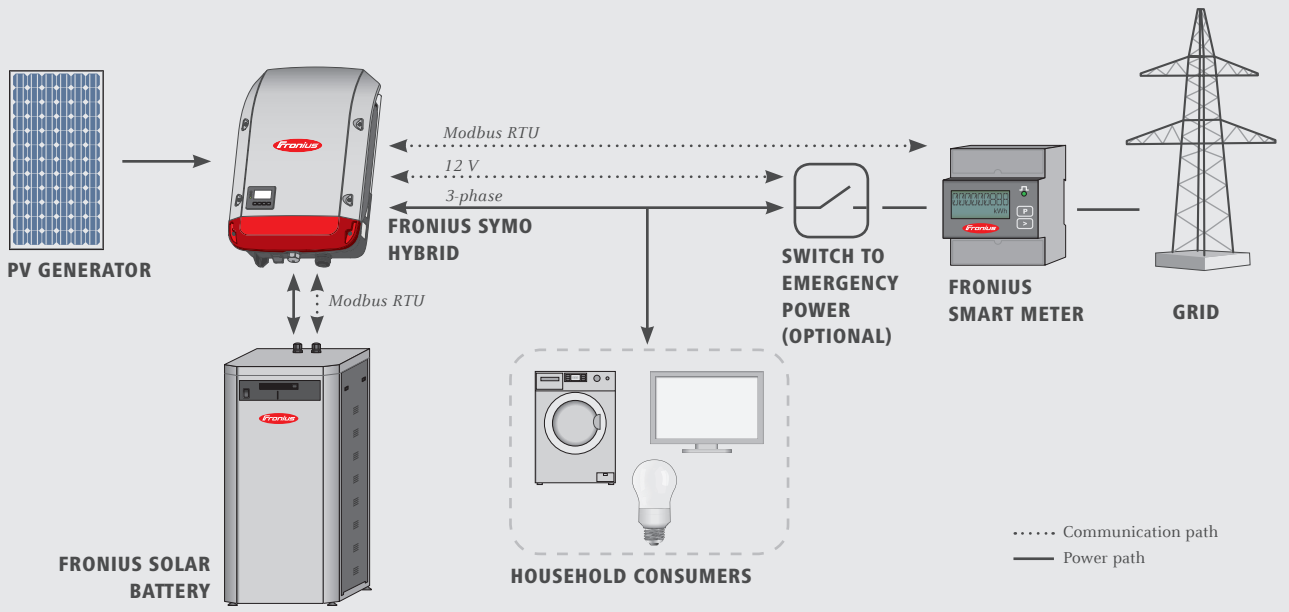
## TECHNICAL DATA FRONIUS BATTERY MODULE

/ The storage capacity of the Fronius Solar Battery can be adapted to meet customer's individual needs and can also be expanded retrospectively. [2]

| GENERAL DATA | BATTERY MODULE 1.5 RF |
|---|---|
| Nominal capacity | 1.5 kWh |
| 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 |

[2] The system can be expanded by purchasing additional modules up to 30 months after delivery by Fronius International GmbH.

## 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.

v05 May 2015 EN



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

**Fronius Australia Pty Ltd.**
90-92 Lambeck Drive
Tullamarine VIC 3043
Australia
pv-sales-australia@fronius.com
www.fronius.com.au

**Fronius International GmbH**
Froniusplatz 1
4600 Wels
Austria
pv-sales@fronius.com
www.fronius.com

M,06,0176,EN v11 Dec 2015 as17