/ Perfect Welding / Solar Energy / Perfect Charging

FRONIUS SMART METER TS

The bidirectional meter for intelligent energy management

The Fronius Smart Meter TS is a bidirectional meter, which optimises self-consumption, records the load curve and controls the various energy flows. Thanks to highly accurate measurements and rapid communication via the Modbus RTU interface, dynamic feed-in control when feed-in limits are imposed is faster and more accurate than with the S0 meter.

Together with the Fronius Solar.web, the Smart Meter TS presents a clear overview of the power consumption. In combination with the Fronius storage solutions, the device ensures a perfect coordination of various energy flows, which optimises the entire energy management. The Fronius Smart Meter TS is ideally suited for use with the GEN24 Plus and Tauro, as well as all Fronius inverters with the Fronius Datamanager 2.0.

FRONIUS SMART METER TS

TECHNICAL DATA	FRONIUS SMART METER TS 100A -1	FRONIUS SMART METER TS 65A -3	FRONIUS SMART METER TS 5KA -3
Nominal voltage	230 V	208 - 400 V	400 - 480 V
Operating voltage range	-30% - +20%	-20% - +20%	-20% - +15%
Nominal frequency		50 to 60 Hz	
Grid frequency range		45 to 65 Hz	
Maximum current	1 x 100 A	3 x 65 A	3 x 5000 A
Power line cross section	1 - 25 mm²	1 - 16 mm²	1 - 4 mm²
Neutral line cross section	1 - 25 mm²	0.05 - 1.5mm²	1 - 4 mm²
Communication line cross section		0.05 - 1.5 mm²	
Power consumption		<=1W	
Starting current	40 mA	20 mA	10 mA
Accuracy class		1	
Active energy accuracy		Class 1 (EN62053-21) / Class B (EN50470-3)	
Reactive energy accuracy		Class 2 (EN 62053-23)	
Short-time overcurrent	3000A/10ms	1950A/10ms	30A/500ms
Mounting		Indoors (DIN rail)	
Housing	2 modules DIN 43880	3 modules DIN 43880	3 modules DIN 43880
Degree of protection		IP 51 (front frame), IP 20 (terminals)	
Ambient temperature range		-25 to +65°C	
Dimensions (Height x Width x Depth)	91.5 x 35.8 x 63.0	91.5 x 53.8 x 63.0 mm	91.5 x 53.8 x 63.0 mm
Interface to inverter		Modbus RTU (RS485)	
Display		3 x 8 digit / Touchscreen	

THE ADVANTAGES AT A GLANCE

/ Fast and accurate dynamic feed-in control

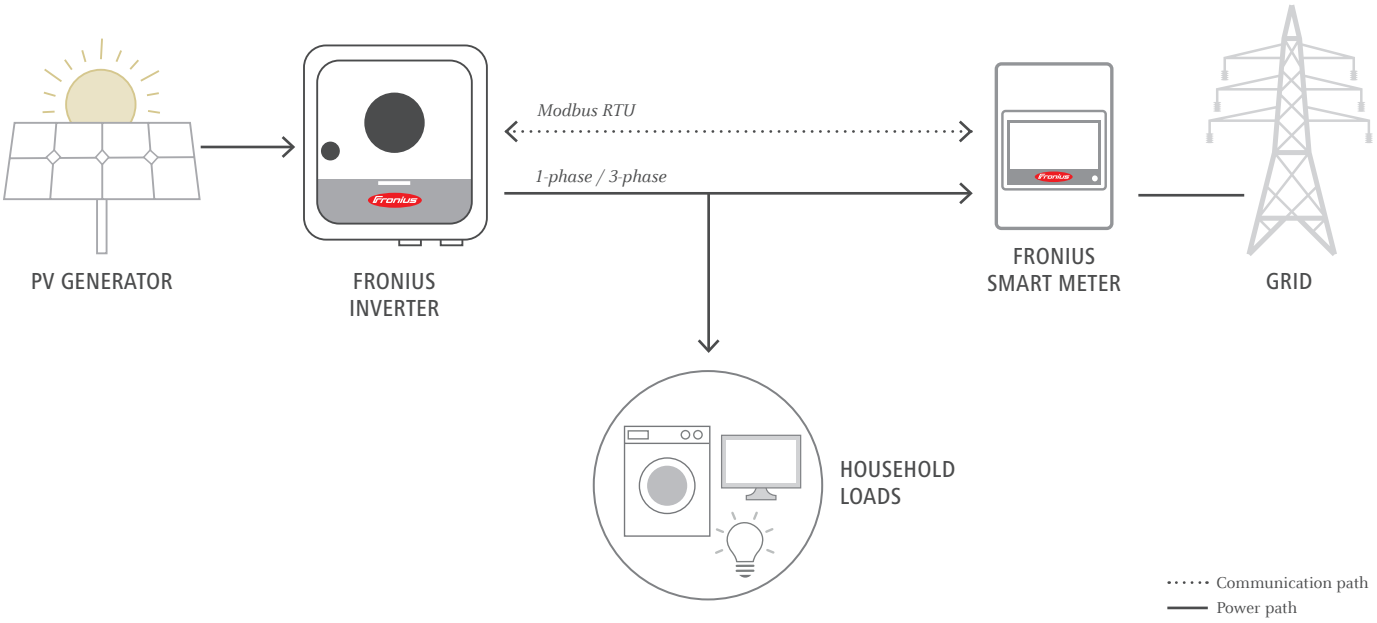
/ Clear overview of power consumption in Fronius Solar.web

/ Energy management with Fronius storage solutions

/ Identifiying opportunities to optimize the pv system

/ Monitoring and analyzing heavy loads

CONFIGURATION DIAGRAM



The Fronius Smart Meter is compatible with all inverters with an RS485 interface (Modbus RTU). The Fronius Smart Meter can be retrofitted at any time together with the Fronius Datamanager 2.0 in inverters that have already been installed.

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EN v02 Aug 2020 as17

Designed to rely on.

Product advantages

01 More safety features included
02 Endless freedom
03 Optimal performance as standard

The Fronius Symo Advanced impresses not only with levels of performance and flexibility that have been proven a million times over, but also with its new equipment. The highlight in terms of safety is the integrated Fronius Arc Guard technology, which ensures the Fronius Symo Advanced exceeds the highest standards and is the future-proof and reliable choice for commercial photovoltaic systems of any size.
Fronius Symo Advanced. Designed to rely on.

Developed with safety in mind:

The Fronius Symo Advanced opens the next chapter in the Fronius SnapINverter portfolio. Performance proven a million times over meets new safety technology, making the Fronius Symo Advanced more than ever a future-proof choice for installers and their customers.

01 More safety features included

Detect, intervene, learn – the new Fronius Arc Guard technology follows this principle to protect against dangerous arcs. The algorithm developed by Fronius reliably detects arcing and shuts down the photovoltaic system before a fire can occur. The Fronius Arc Guard is being continuously trained by the manufacturer to make the Arc Fault Circuit Interrupter more precise and to optimize system protection.

02 Endless freedom

Easily plan complex roofs thanks to SuperFlex Design. The PV modules can be flexibly aligned and connected as the Fronius Symo Advanced is able to handle a wide range of input voltages as well as very high PV module currents.

03 Optimal performance as standard

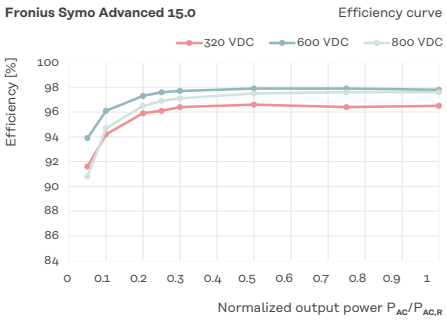
Maximum yield even when the PV modules are partially in the shade is possible thanks to the Dynamic Peak Manager feature of the Fronius Symo Advanced. The intelligent software-based shade management tool is installed as standard and requires no additional components.

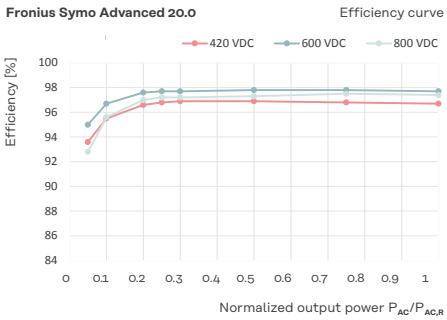
Fronius Symo Advanced

Impressive power data

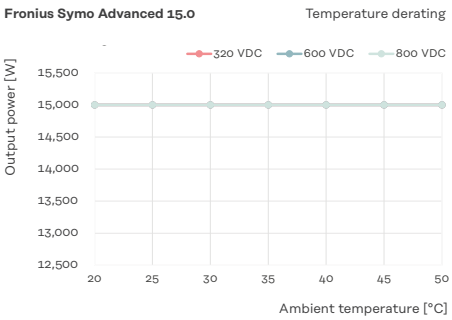
The Fronius Symo Advanced impresses with its flexible system design and the highest safety standards.

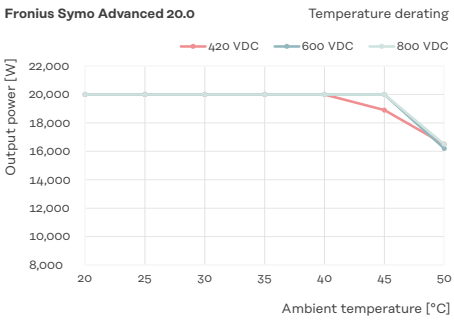
Efficiency





Power derating





Technical data
10.0 / 12.5 / 15.0 kW

			Symo Advanced					
			10.0-3-M		12.5-3-M		15.0-3-M	
Input data	Number of MPP trackers		2		2		2	
			MPPT1	MPPT2	MPPT1	MPPT2	MPPT1	MPPT2
	Max. input current ($I_{dc\ max}$)	A	27.0	16.5[1]	27.0	16.5[1]	33.0	27.0
	Max. usable input current ($I_{dc\ max\ MPPT\ 1+2}$)	A	43.5		43.5		51.0	
			MPPT1	MPPT2	MPPT1	MPPT2	MPPT1	MPPT2
	Max. array short circuit current MPPT1/MPPT2 ($I_{sc\ pv}$)[2]	A	55.7	34	55.7	34	68	55.7
	DC input voltage range ($U_{dc\ min}$ - $U_{dc\ max}$)	V	200–1000		200–1000		200–1000	
	Feed-in start-up input voltage ($U_{dc\ start}$)	V	200		200		200	
	Usable MPP voltage range	V	200–800		200–800		200–800	
	MPP Voltage range (at rated power) ($U_{mpp\ min}$ - $U_{mpp\ max}$)	V	270–800		320–800		320–800	
			MPPT1	MPPT2	MPPT1	MPPT2	MPPT1	MPPT2
	Number of DC connections		3	3	3	3	3	3
	Max. PV generator output ($P_{dc\ max}$)	Wpeak	15,000		18,800		22,500	
Output data	AC nominal output ($P_{ac,r}$)	W	10,000		12,500		15,000	
	Max. output power / rated apparent power	VA	10,000		12,500		15,000	
			380 VAC	400 VAC	380 VAC	400 VAC	380 VAC	400 VAC
	AC output current ($I_{ac\ nom}$)	A	15.2	14.4	18.9	18	22.7	21.7
	Grid connection (voltage range)		3-NPE 400 V / 230 V or 3~NPE 380 V / 220 V (+20 % / -30 %)					
	Frequency (frequency range)	Hz	50 / 60 (45 - 65)		50 / 60 (45 - 65)		50 / 60 (45 - 65)	
	Total harmonic distortion	%	< 1.75		< 2.0		< 1.5	
	Power factor ($\cos \varphi_{ac,r}$)		0–1 ind. / cap.					
General data	Dimensions (height x width x depth)	mm	725 x 510 x 225					
	Weight (inverter/with packaging)	kg	35.4/38.4		35.4/38.4		41.96/44.96	
	Protection class		IP 66		IP 66		IP 66	
	Safety class		1		1		1	
			DC	AC	DC	AC	DC	AC
	Overvoltage category (DC/AC)[3]		2	3	2	3	2	3
	Night consumption	W	<1		<1		<1	
	Inverter concept		Transformerless					
	Cooling		Active Cooling technology					
	Installation		Indoor and outdoor installation					
	Ambient temperature range	°C	-25 - +60		-25 - +60		-25 - +60	
	Permissible humidity	%	0–100		0–100		0–100	
			unrestricted / restricted voltage range					
	Max. altitude above sea level	m	2,000/3,400		2,000/3,400		2,000/3,400	
	DC connection technology	mm²	6x DC+ and 6x DC screw terminals 2.5 - 16 mm²					
	AC connection technology	mm²	5-pin AC screw terminals 2.5 - 16mm2					
	Certificates and compliance with standards		IEC 62109-1/-2, IEC 62116, IEC 61727, VDE 0126-1-1/A1, VDE AR-N 4105, G98/1, G99/1, AS/NZS 4777.2, UNE 206007-1, CEI 0-21, CEI 0-16, NRS 097-2-1, TOR Erzeuger Typ A, VDE AR-N 4110, EN 50549-1/-2, IEC 61683, IEC60068, IEC 63027:2023					
	Country of manufacture		Austria					

[1] *14.0 A at voltages < 420 V*
[2] *Isc pv = Isc max. ≥ Isc (STC) x 1.25 according to e.g. IEC 60364-7-712, NEC 2020, AS/NZS 5033:2021.*
[3] *In line with IEC 62109-1. DIN rail for optional surge protection device type 1 + 2 or type 2 present.*
For further information on the availability of the inverters in your country, please visit www.fronius.com.

			Symo Advanced		
			10.0-3-M	12.5-3-M	15.0-3-M
Efficiency	Max. efficiency	%	97.8	97.8	97.9
	Europ. efficiency (ηEU)	%	97.1	97.4	97.6
	MPP adaptation efficiency	%	> 99.9	> 99.9	> 99.9
Protection devices	Arc Fault Circuit Interrupter - AFCI (Fronius Arc Guard)		Integrated		
	DC isolation measurement		Integrated		
	Overload performance		Operating point shift, power limiter		
	DC disconnector		Integrated		
	Reverse polarity protection		Integrated		
	RCMU		Integrated		
Interfaces	WLAN / Ethernet LAN		Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)		
	6 inputs and 4 digital inputs/outputs		Connection to ripple control receiver		
	USB (type A socket)[4]		Datalogging, inverter updating using a USB thumb drive		
	2x RS422 (RJ45 socket)[4]		Fronius Solar Net		
	Message output[4]		Energy management (potential-free relay output)		
	Datalogger and web server		Integrated		
	External input [4]		S0-Meter Interface / Input for overvoltage protection		
	RS485		Modbus RTU SunSpec or meter connection		

[4] *Also available in a light version.*

Technical data
17.5 / 20.0 kW

			Symo Advanced			
			17.5-3-M		20.0-3-M	
Input data	Number of MPP trackers		2		2	
			MPPT1	MPPT2	MPPT1	MPPT2
	Max. input current ($I_{dc\ max}$)	A	33.0	27.0	33.0	27.0
	Max. usable input current ($I_{dc\ max\ MPPT\ 1+2}$)	A	51.0		51.0	
			MPPT1	MPPT2	MPPT1	MPPT2
	Max. array short circuit current MPPT1/MPPT2 ($I_{sc\ pv}$)[2]	A	68	55.7	68	55.7
	DC input voltage range ($U_{dc\ min}$ - $U_{dc\ max}$)	V	200–1000		200–1000	
	Feed-in start-up input voltage ($U_{dc\ start}$)	V	200		200	
	Usable MPP voltage range	V	200–800		200–800	
	MPP Voltage range (at rated power) ($U_{mpp\ min}$ - $U_{mpp\ max}$)	V	370–800		420–800	
			MPPT1	MPPT2	MPPT1	MPPT2
	Number of DC connections		3	3	3	3
	Max. PV generator output ($P_{dc\ max}$)	Wpeak	26,300		30,000	
Output data	AC nominal output ($P_{ac,r}$)	W	17,500		20,000	
	Max. output power / rated apparent power	VA	17,500		20,000	
			380 VAC	400 VAC	380 VAC	400 VAC
	AC output current ($I_{ac\ nom}$)	A	26.5	25.3	30.3	28.9
	Grid connection (voltage range)		3-NPE 400 V / 230 V or 3~NPE 380 V / 220 V (+20 % / -30 %)			
	Frequency (frequency range)	Hz	50 / 60 (45 - 65)		50 / 60 (45 - 65)	
	Total harmonic distortion	%	< 1.5		< 1.25	
	Power factor ($\cos \varphi_{ac,r}$)		0–1 ind. / cap.			
General data	Dimensions (height x width x depth)	mm	725 x 510 x 225			
	Weight (inverter/with packaging)	kg	41.96/44.96		41.96/44.96	
	Protection class		IP 66		IP 66	
	Safety class		1		1	
			DC	AC	DC	AC
	Overvoltage category (DC/AC)[3]		2	3	2	3
	Night consumption	W	<1		<1	
	Inverter concept		Transformerless			
	Cooling		Active Cooling technology			
	Installation		Indoor and outdoor installation			
	Ambient temperature range	°C	-25 - +60		-25 - +60	
	Permissible humidity	%	0–100		0–100	
			unrestricted / restricted voltage range			
	Max. altitude above sea level	m	2,000/3,400		2,000/3,400	
	DC connection technology	mm²	6x DC+ and 6x DC screw terminals 2.5 - 16 mm²			
	AC connection technology	mm²	5-pin AC screw terminals 2.5 - 16mm2			
	Certificates and compliance with standards		IEC 62109-1/-2, IEC 62116, IEC 61727, VDE 0126-1-1/A1, VDE AR-N 4105, G98/1, G99/1, AS/NZS 4777.2, UNE 206007-1, CEI 0-21, CEI 0-16, NRS 097-2-1, TOR Erzeuger Typ A, VDE AR-N 4110, EN 50549-1/-2, IEC 61683, IEC60068, IEC 63027:2023			
	Country of manufacture		Austria			

[2] *Isc pv = Isc max. ≥ Isc (STC) x 1.25 according to e.g. IEC 60364-7-712, NEC 2020, AS/NZS 5033:2021.*
[3] *In line with IEC 62109-1. DIN rail for optional surge protection device type 1 + 2 or type 2 present.*
For further information on the availability of the inverters in your country, please visit www.fronius.com.

Fronius Symo Advanced. Designed to rely on.

			Symo Advanced	
			17.5-3-M	20.0-3-M
Efficiency	Max. efficiency	%	97.9	97.9
	Europ. efficiency (ηEU)	%	97.6	97.6
	MPP adaptation efficiency	%	> 99.9	> 99.9
Protection devices	Arc Fault Circuit Interrupter - AFCI (Fronius Arc Guard)		Integrated	
	DC isolation measurement		Integrated	
	Overload performance		Operating point shift, power limiter	
	DC disconnector		Integrated	
	Reverse polarity protection		Integrated	
	RCMU		Integrated	
Interfaces	WLAN / Ethernet LAN		Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)	
	6 inputs and 4 digital inputs/outputs		Connection to ripple control receiver	
	USB (type A socket)[4]		Datalogging, inverter updating using a USB thumb drive	
	2x RS422 (RJ45 socket)[4]		Fronius Solar Net	
	Message output[4]		Energy management (potential-free relay output)	
	Datalogger and web server		Integrated	
	External input[4]		S0-Meter Interface / Input for overvoltage protection	
	RS485		Modbus RTU SunSpec or meter connection	

[4] *Also available in a light version.*

Further information: www.fronius.com/commercial-inverters

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FRONIUS SYMO GEN24 PLUS

The hybrid allrounder with individual backup power

Integrated Data Communication

Dynamic Peak Manager

Multi Flow Technology

SuperFlex Design

Full backup [1]

PV Point basic grid backup

The Fronius Symo GEN24 Plus, with power categories of between 3 and 10 kW, is the ideal hybrid inverter for private households. With many features as standard, the three-phase device covers all customer requirements.

The GEN24 Plus leaves nothing to be desired with numerous features such as energy management functions, WLAN connection as standard, Ethernet connectivity and easy integration of third-party components. Thanks to a selection of backup power options (PV Point, full backup[1]) in particular, it ensures the highest degree of power supply reliability.

TECHNICAL DATA FRONIUS SYMO GEN24 PLUS (3.0, 4.0, 5.0)

INPUT DATA	SYMO GEN24 3.0 PLUS	SYMO GEN24 4.0 PLUS	SYMO GEN24 5.0 PLUS
Number of MPP trackers		2	
Max. usable input current ($I_{dc\ max\ MPPT1\ /\ MPPT2}$)		12.5 A / 12.5 A	
Max. array short circuit current (MPPT1/MPPT2)		18.75 A / 18.75 A	
DC input voltage range ($U_{dc\ min}$ - $U_{dc\ max}$)		80 V - 1000 V	
Nominal input voltage ($U_{dc,r}$)		610 V	
Feed-in start voltage ($U_{dc\ start}$)		80 V	
Usable MPP voltage range		80 V - 800 V	
Number of DC connections (MPPT1 / MPPT2)		2 / 1	
Max. usable DC power (MPPT1/MPPT2/total)	3,150 / 3,150 / 3,150 W	4,180 / 4,180 / 4,180 W	5,200 / 5,200 / 5,200 W
Max. PV generator power (MPPT1/MPPT2/total)	4.5 / 4.5 / 4.5 kW_{peak}	6 / 6 / 6 kW_{peak}	6.5 / 6.5 / 7.5 kW_{peak}

OUTPUT DATA	SYMO GEN24 3.0 PLUS	SYMO GEN24 4.0 PLUS	SYMO GEN24 5.0 PLUS
AC nominal output ($P_{ac,r}$)	3000 W	4000 W	5000 W
Max. output power / rated apparent power	3000 VA	4000 VA	5000 VA
Nom. AC output current (380Vac / 400Vac)	4.5 / 4.3 A	6.1 / 5.8 A	7.6 / 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 Hz – 66 Hz)	
Total harmonic distortion		< 3.5 %	
Power factor (cos $\phi_{ac,r}$)		0.7 - 1 ind. / cap.	

OUTPUT DATA PV POINT	SYMO GEN24 3.0 PLUS	SYMO GEN24 4.0 PLUS	SYMO GEN24 5.0 PLUS
Nom. output power PV Point		3000 VA	
Grid connection PV Point		1 ~ NPE 220 V / 230 V	
Switchover time		< 90 seconds	

[1] The Full Backup Option is available for the **Symo GEN24 6.0 - 10.0 Plus.** For the Full Backup, additional external components for grid separation are required. You can find more information on this in the operating instructions.

TECHNICAL DATA FRONIUS SYMO GEN24 PLUS (3.0, 4.0, 5.0)

BATTERY CONNECTION	SYMO GEN24 3.0 PLUS	SYMO GEN24 4.0 PLUS	SYMO GEN24 5.0 PLUS
Number of DC connections		1	
Max. input current ($I_{dc\ max}$)		12.5 A	
DC input voltage range ($U_{dc\ min}$ - $U_{dc\ max}$)		160 V - 531 V	
Max. DC input / output power [2]	3,150 W	4,180 W	5,200 W
Max. charging power with AC coupling	3,000 W	4,000 W	5,000 W

GENERAL DATA	SYMO GEN24 3.0 PLUS	SYMO GEN24 4.0 PLUS	SYMO GEN24 5.0 PLUS
Dimensions (height x width x depth)		530 x 474 x 165 mm	
Weight (inverter / with packaging)		15,6 / 19,4	
Degree of protection		IP 66	
Protection class		1	
Nighttime power loss		< 10 W	
Overvoltage category (DC/AC) [3]		2 / 3	
Inverter design		Transformerless	
Cooling		Regulated air cooling	
Installation		Indoor and outdoor installation	
Ambient temperature range		- 25 - +60 °C	
Permitted humidity		0 - 100 %	
Noise Emission		< 36 dB (A)	
Max. altitude		3,000 m / 4,000 m (unrestricted / restricted voltage range)	
DC PV connection technology		3x DC+ and 3x DC- push-in spring terminals 2.5 - 10 mm²	
DC battery connection technology		1x BATT+ and 1x BATT- push-in spring terminals 2.5 - 10 mm²	
AC connection technology		5 pole AC push-in spring terminals 1.5 - 10 mm² 3 pole backup power push-in spring terminals 1.5mm² - 10mm² 5x PE-screw terminals 2.5 - 16 mm²	
Certificates and compliance with standards		IEC 62109, IEC 62116, IEC 61727, IEC 62909, VDE 0126, VDE AR-N4105, AS/NZS 4777.2, EN 50549, CEI 0-21, G 98, R25 [4]	
Back-up power functions		PV Point	
Compatible batteries		BYD Battery-Box Premium HVS/HVM [5]	
Country of manufacture		Austria	

EFFICIENCY	SYMO GEN24 3.0 PLUS	SYMO GEN24 4.0 PLUS	SYMO GEN24 5.0 PLUS
Max. efficiency	98.1 %	98.2 %	98.2 %
Europ. efficiency (ηEU)	96.7 %	97.2 %	97.5 %
MPP-tracking efficiency		> 99.9 %	

PROTECTIVE DEVICES	SYMO GEN24 3.0 PLUS	SYMO GEN24 4.0 PLUS	SYMO GEN24 5.0 PLUS
DC insulation measurement		Yes	
DC insulation measurement		Operating point shift. Power limitation	
DC disconnector		Yes	
Reverse polarity protection		Yes	

INTERFACES	SYMO GEN24 3.0 PLUS	SYMO GEN24 4.0 PLUS	SYMO GEN24 5.0 PLUS
WLAN / 2x Ethernet LAN		Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)	
6x digital in/out + 6x digital in		Interface to ripple control receiver, energy management	
Emergency stop (WSD)		Yes	
Datalogger and webserver		Included	
2x RS485		Modbus RTU SunSpec (third-party supplier) / Fronius Smart Meter, battery, Fronius Ohmpilot	

[2] Depending on the connected battery
[3] According to IEC 62109-1. Optional retrofit surge protection device DC SPD type 1+2 for 2 MPP trackers available under the following article number: 4,240,313,CK
[4] For the current certificates, please see **www.fronius.com**
[5] Except HVS 12.8 and HVM 8.3

For further information on the availability of this inverter in your country please see **www.fronius.com.**

TECHNICAL DATA FRONIUS SYMO GEN24 PLUS (6.0, 8.0, 10.0)

INPUT DATA	SYMO GEN24 6.0 PLUS	SYMO GEN24 8.0 PLUS	SYMO GEN24 10.0 PLUS
Number of MPP trackers		2	
Max. usable input current ($I_{dc\ max\ MPPT1\ /\ MPPT2}$)		25 A / 12,5 A	
Max. array short circuit current (MPPT1/MPPT2)		37.5 A / 18.75 A	
DC input voltage range ($U_{dc\ min}$ - $U_{dc\ max}$)		80 V - 1,000 V	
Nominal input voltage ($U_{dc,r}$)		610 V	
Feed-in start voltage ($U_{dc\ start}$)		80 V	
Usable MPP voltage range		80 V - 800 V	
Number of DC connections (MPPT1 / MPPT2)		2 / 1	
Max. usable DC power (MPPT1/MPPT2/total)	6,220 / 6,000 / 6,220 W	8,260 / 6,000 / 8,260 W	10,300 / 6,000 / 10,300 W
Max. PV generator power (MPPT1/MPPT2/total)	7.5 / 6.5 / 9 kW_{peak}	10 / 7 / 12 kW_{peak}	12.5 / 7.5 / 15 kW_{peak}

OUTPUT DATA	SYMO GEN24 6.0 PLUS	SYMO GEN24 8.0 PLUS	SYMO GEN24 10.0 PLUS
AC nominal output ($P_{ac,r}$)	6,000 W	8,000 W	10,000 W
Max. output power / rated apparent power	6,000 VA	8,000 VA	10,000 VA
Nom. AC output current (380Vac / 400Vac)	9.1 / 8.7 A	12.1 / 11.6 A	15.2 / 14.5 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 Hz – 66 Hz)	
Total harmonic distortion		< 3.5 %	
Power factor ($\cos \phi_{ac,r}$)		0.7 - 1 ind. / cap.	
Backup power		3~NPE 400 V / 230 V	

OUTPUT DATA PV POINT / FULL BACKUP [1]	SYMO GEN24 6.0 PLUS	SYMO GEN24 8.0 PLUS	SYMO GEN24 10.0 PLUS
Nom. output power PV Point / full backup	3,000 VA / 6,000 VA	3,000 VA / 8,000 VA	3,000 VA / 10,000 VA
Nominal power per phase full backup		3.68 kVA	
Grid connection (voltage range) PV Point		1 ~ NPE 220 V / 230 V	
Grid connection (voltage range) full backup		3~NPE 400V/230V or 3~NPE 380V/220V	
Switchover time		< 90 seconds	

[1] The Full Backup Option is available for the **Symo GEN24 6.0** - **10.0 Plus.** For the Full Backup, additional external components for grid separation are required.
You can find more information on this in the operating instructions.

TECHNICAL DATA FRONIUS SYMO GEN24 PLUS (6.0, 8.0, 10.0)

BATTERY CONNECTION	SYMO GEN24 6.0 PLUS	SYMO GEN24 8.0 PLUS	SYMO GEN24 10.0 PLUS
Number of DC connections		1	
Max. input current ($I_{dc\ max}$)		22 A	
DC input voltage range ($U_{dc\ min}$ - $U_{dc\ max}$)		160 V - 531 V	
Max. DC input / output power [2]	6,220 W	8,260 W	10,300 W
Max. charging power with AC coupling	6,000 W	8,000 W	10,000 W

GENERAL DATA	SYMO GEN24 6.0 PLUS	SYMO GEN24 8.0 PLUS	SYMO GEN24 10.0 PLUS
Dimensions (height x width x depth)		595 x 529 x 180 mm	
Weight (inverter / with packaging)		23,4 / 28,5 kg	
Degree of protection		IP 66	
Protection class		1	
Nighttime power loss		< 10 W	
Overvoltage category (DC/AC) [3]		2 / 3	
Inverter design		Transformerless	
Cooling		Regulated air cooling	
Installation		Indoor and outdoor installation	
Ambient temperature range		-25 - +60 °C	
Permitted humidity		0 - 100 %	
Noise Emission		< 47 dB (A)	
Max. altitude		3,000 m / 4,000 m (unrestricted / restricted voltage range)	
DC PV connection technology		3x DC+ and 3x DC- push-in spring terminals 2.5 - 10 mm²	
DC battery connection technology		1x BATT+ and 1x BATT- push-in spring terminals 2.5 - 10 mm²	
AC connection technology		5 pole AC push-in spring terminals 1.5 - 10 mm² 3 pole backup power push-in spring terminals 1.5mm² - 10mm² 5x PE-screw terminals 2.5 - 16 mm²	
Certificates and compliance with standards		IEC 62109, IEC 62116, IEC 61727, IEC 62909, VDE 0126, VDE AR-N4105, AS/NZS 4777.2, EN 50549, CEI 0-21, G 98, R25 [4]	
Back-up power functions		PV Point or Full Backup	
Compatible batteries		BYD Battery-Box Premium HVS/HVM [5]	
Country of manufacture		Austria	

EFFICIENCY	SYMO GEN24 6.0 PLUS	SYMO GEN24 8.0 PLUS	SYMO GEN24 10.0 PLUS
Max. efficiency		98.2 %	
Europ. efficiency (ηEU)	97.7 %	97.8 %	97.9 %
MPP-tracking efficiency		> 99.9 %	

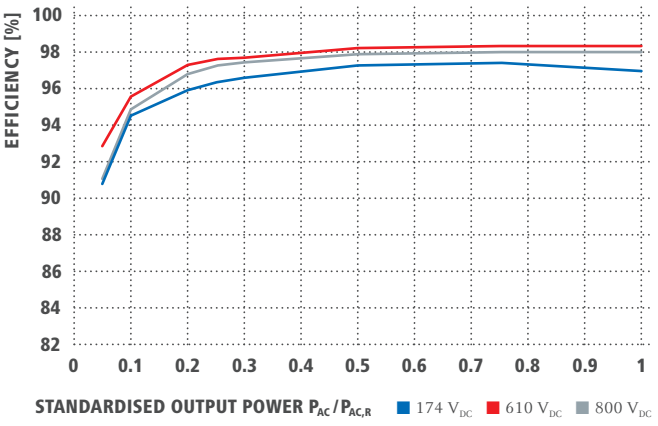
PROTECTIVE DEVICES	SYMO GEN24 6.0 PLUS	SYMO GEN24 8.0 PLUS	SYMO GEN24 10.0 PLUS
DC insulation measurement		Yes	
Overload behaviour		Operating point shift. Power limitation	
DC disconnector		Yes	
Reverse polarity protection		Yes	

INTERFACES	SYMO GEN24 6.0 PLUS	SYMO GEN24 8.0 PLUS	SYMO GEN24 10.0 PLUS
WLAN / 2x Ethernet LAN		Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)	
6x digital in/out + 6x digital in		Interface to ripple control receiver, energy management	
Emergency stop (WSD)		Yes	
Datalogger and webserver		Included	
2x RS485		Modbus RTU SunSpec (third-party supplier) / Fronius Smart Meter, battery, Fronius Ohmpilot	

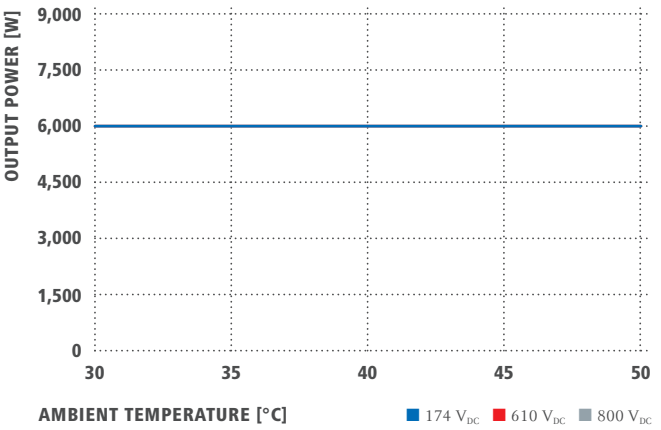
[2] Depending on the connected battery
[3] According to IEC 62109-1. Optional retrofit surge protection device DC SPD type 1+2 for 2 MPP trackers available under the following article number: 4,240,313,CK
[4] For the current certificates, please see **www.fronius.com**
[5] Except HVS 12.8 and HVM 8.3

For further information on the availability of this inverter in your country please see **www.fronius.com.**

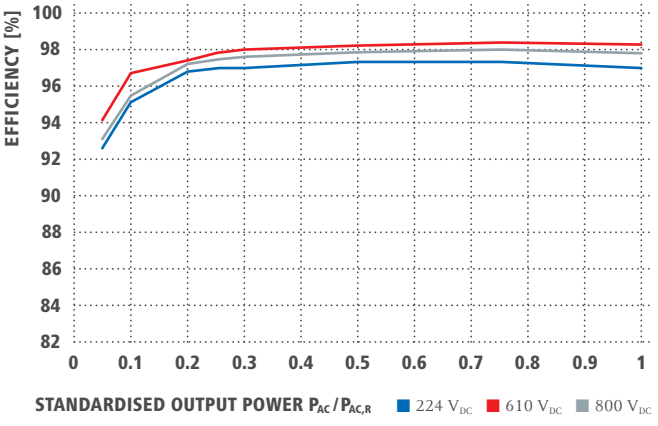
FRONIUS SYMO GEN24 PLUS 6.0 EFFICIENCY CURVE



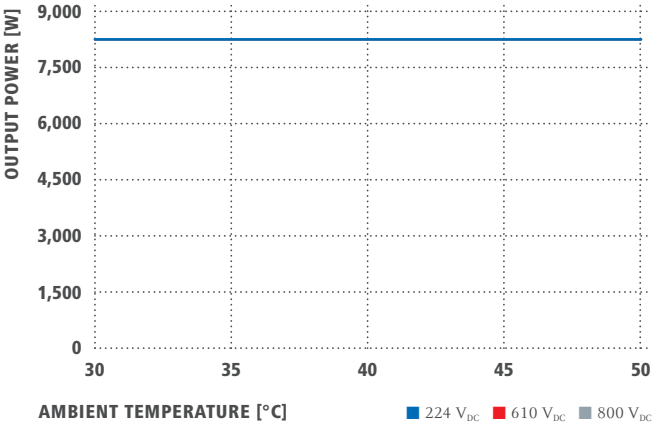
FRONIUS SYMO GEN24 PLUS 6.0 TEMPERATURE DERATING



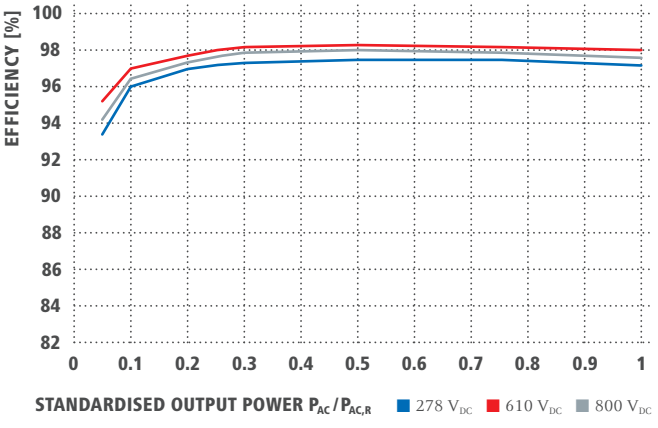
FRONIUS SYMO GEN24 PLUS 8.0 EFFICIENCY CURVE



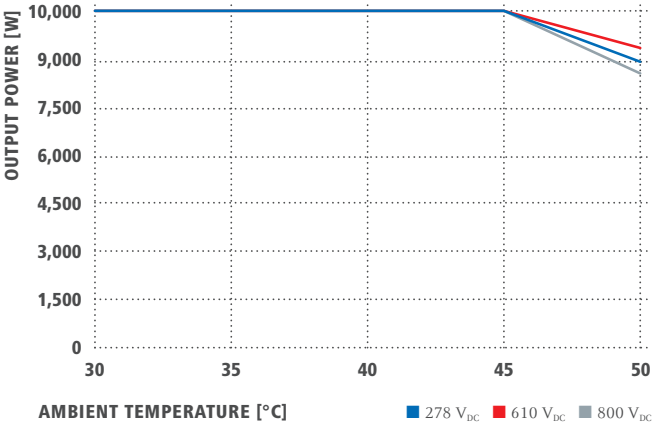
FRONIUS SYMO GEN24 PLUS 8.0 TEMPERATURE DERATING



FRONIUS SYMO GEN24 PLUS 10.0 EFFICIENCY CURVE



FRONIUS SYMO GEN24 PLUS 10.0 TEMPERATURE DERATING



THREE BUSINESS UNITS, ONE GOAL: TO SET THE STANDARD THROUGH TECHNOLOGICAL ADVANCEMENT.

What began in 1945 as a one-man operation now sets technological standards in the fields of welding technology, photovoltaics and battery charging. Today, the company has around 5,660 employees worldwide and 1,321 patents for product development show the innovative spirit within the company. Sustainable development means for us to implement environmentally relevant and social aspects equally with economic factors. Our goal has remained constant throughout: to be the innovation leader.

PERFECT WELDING

Our mission is Perfect Welding; a task we have approached with passion and skill for decades in order that our customers can join materials with the perfect weld seam. With our outstanding technologies and services and together with our customer‘s applications, not only do we solve their specific welding technology problems, but we also make a substantial contribution to increasing their productivity.

SOLAR ENERGY

Our mission is to achieve 24 hours of sun. Day after day we are hard at work turning this vision of a future in which 100% of the world‘s energy needs are covered by renewable sources into a reality. We are therefore concentrating on solutions to intelligently, efficiently and economically generate, store, distribute and consume solar energy.

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.

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

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M2.00.0008, EN v16 Jun 2022

/ Perfect Welding / Solar Energy / Perfect Charging

FRONIUS TAURO

Direct variant.

System design flexibility

Max. performance up to 50° C

Direct sunlight

Optimizing costs

Active Double Wall Cooling

Power stage replacement

The three-phase Fronius Tauro in the 50 and 100 kW power classes promises maximum performance for decentral systems even under the harshest conditions.

With its smart hardware design, it offers not just BOS cost optimization but unprecedented flexibility in system design. Simple installation and the fastest service on the market ensure maximum yield.

TECHNICAL DATA FRONIUS TAURO

INPUT DATA	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Number of MPP trackers	3		1	
Max. input current ($I_{dc\ max}$)	134 A	87.5 A	175 A	
Max. input current module field (PV1 / PV2 / PV3)	36 / 36 / 72 A	75 / 75 / - A	75 / 75 / 75 A	
Max. short circuit current (PV1/ PV2/ PV3)	72 / 72 / 125	125 / 125 / -	125 / 125 / 125	
Max. short circuit current ($I_{scmax,\ inverter}$)	240	178	355	
DC input voltage range ($U_{dc\ min}$ - $U_{dc\ max}$)	200 - 1000 V		580 - 1000 V	
Feed-in start voltage ($U_{dc\ start}$)	200 V		650 V	
Usable MPP voltage range ($U_{mpp\ min}$ - $U_{mpp\ max}$)	400 - 870 V		580 - 930 V	
Number of DC connections (PV1 / PV2 / PV3)	4 / 3 / 7	7 / 7 / -	7 / 7 / 8	
Max. PV generator power ($P_{dc\ max}$)	75 kW_{peak}		150 kW_{peak}	

OUTPUT DATA	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
AC nominal output ($P_{ac,r}$)	50,000 W		99,990 W	100,000 W
Max. output power / rated apparent power	50,000 VA		99,990 VA	100,000 VA
AC output current ($I_{ac\ max}$)	76 A		152 A	
Grid connection ($U_{ac,r}$)	3~ NPE 400/230 V ; 3~ NPE 380/220 V			
Frequency (frequency range f_{min} - f_{max})	50 Hz / 60 Hz (45 - 65 Hz)			
Power factor (cos $\phi_{ac,r}$)	0 - 1 ind. / cap.			

GENERAL DATA	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Dimensions (height x width x depth)	755 x 1109 x 346 mm (without wall mount)			
Weight	92 kg	74 kg	103 kg	
Degree of protection	IP 65			
Protection class	1			
Night-time consumption	< 16 W			
Cooling	Active cooling technology and double wall system			
Installation	Indoor and outdoor[1]			
Ambient temperature range	-40 - +65 °C [2]			
Certificates and compliance with standards[3]	AS/NZS 4777.2:2020, IEC62109-1/-2, VDE-AR-N 4105:2018, IEC62116, EN50549-1:2019 & EN50549-2:2019, VDE-AR-N 4110:2018, CEI 0-16:2019, CEI 0-21:2019			
Country of manufacture	Austria			

[1] Direct under the sun is possible

[2] Optional AC-disconnect mounted inside the inverter: from -30 to +65 °C

[3] These are planned certificates. For the current certificates, please see **www.fronius.com/tauro-cert**

TECHNICAL DATA FRONIUS TAURO

AC CONNECTION TECHNOLOGY	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Cable cross section	35 - 240 mm²		70 - 240 mm²	
AC conductor material	Al and Cu			
Connection terminals	Cable lug or V clamps			
Single core option (single core cable)	Cable gland: 5 x M40 (10 - 28 mm)			
Multi core option (multi core cable)	Cable gland: 1 x multi core connection ø 16 - 61.4 mm + 1 x M32			
AC Daisy Chaining option (single core cable)	Cable gland: 10 x M32 (10 - 25 mm)			

DC CONNECTION TECHNOLOGY	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Cable cross section	4 - 6 mm²			
AC conductor material	Cu			
Connection terminals	DC-direct connection Stäubli Multi Contact MC4			

EFFICIENCY	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Max. efficiency	98.6 %	98.5 %		
European efficiency (ηEU)	98.1 %	98.2 %		
MPP adaptation efficiency	> 99.9 %			

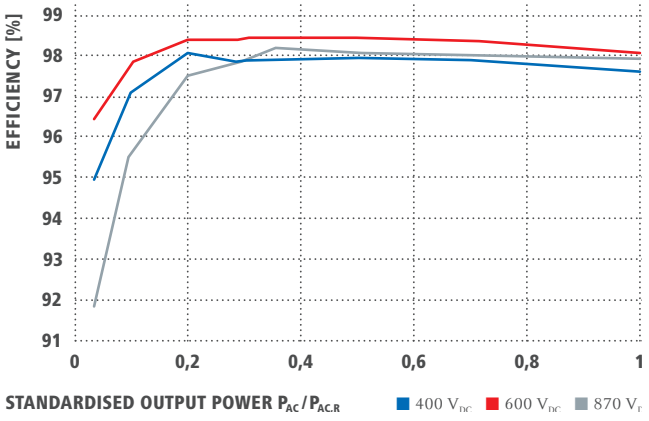
PROTECTION DEVICES	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
DC disconnector	integrated			
Overload behaviour	Operating point shift, power limitation			
Reverse polarity protection	integrated			
RCMU	integrated			
DC insulation measurement	integrated			
DC/AC surge protection	Type 1 + 2 integrated, Type 2 optional			
DC string fusing	integrated, 15 A or 20 A			

INTERFACES	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Wi-Fi	Fronius Solar.web, Modbus TCP Sunspec, Fronius Solar API (JSON)			
Ethernet LAN RJ45 [4]	10/100Mbit; max. 100m Fronius Solar.web, Modbus TCP Sunspec, Fronius Solar API (JSON)			
USB (type A socket)	1A @5V max.[3]			
Wired Shutdown (WSD)	Emergency stop			
2x RS485	Modbus RTU SunSpec			
6 digital inputs / 6 digital I/Os	Programmable interface for ripple control receiver, energy management, load control			
Datalogger and Webserver [4]	Integrated			

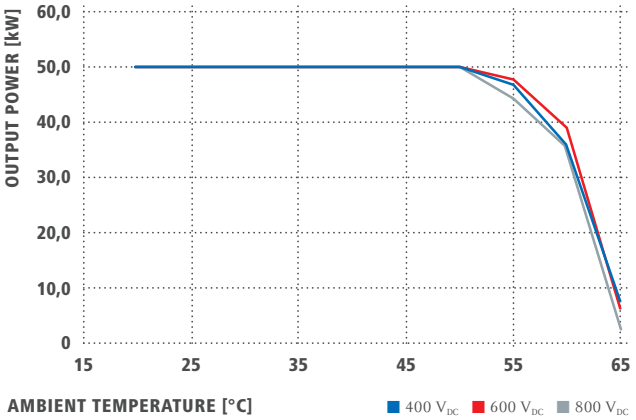
[3] for power supply only

[4] an Ethernet star-configuration is used for communication with multiple inverters. Each individual inverter communicates independently with the network/Internet via its integrated data logger

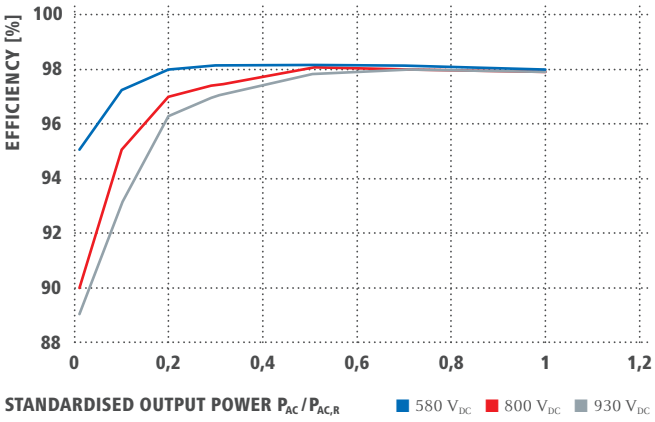
FRONIUS TAURO 50-3-D EFFICIENCY CURVE



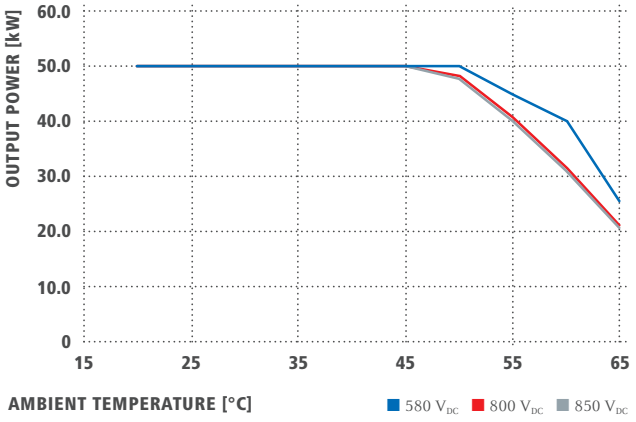
FRONIUS TAURO 50-3-D TEMPERATURE DERATING



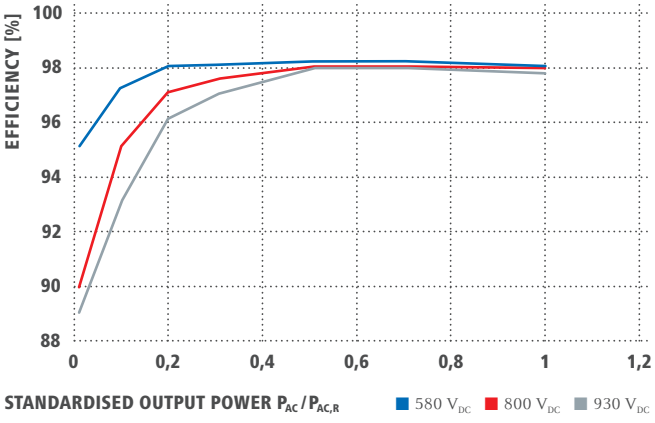
FRONIUS TAURO ECO 50-3-D EFFICIENCY CURVE



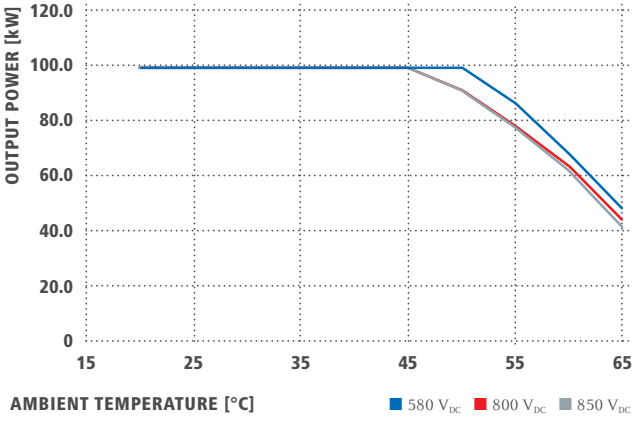
FRONIUS TAURO ECO 50-3-D TEMPERATURE DERATING



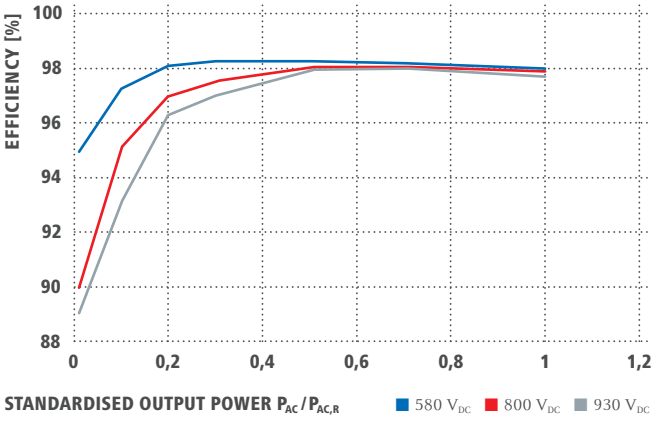
FRONIUS TAURO ECO 99-3-D EFFICIENCY CURVE



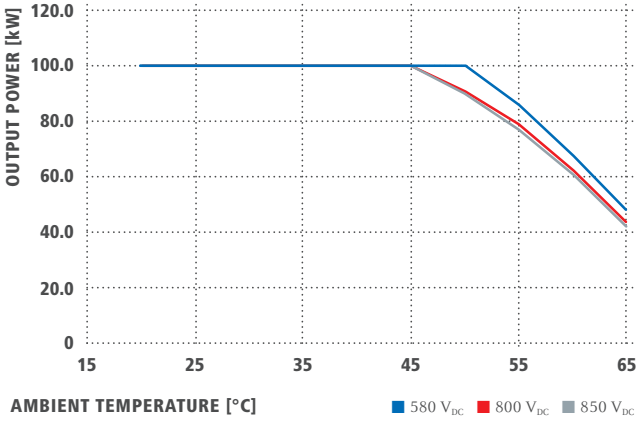
FRONIUS TAURO ECO 99-3-D TEMPERATURE DERATING



FRONIUS TAURO ECO 100-3-D EFFICIENCY CURVE



FRONIUS TAURO ECO 100-3-D TEMPERATURE DERATING



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EN v14 Dec 2021

FRONIUS WATTPILOT

The intelligent charging solution for all electric car drivers that leaves nothing to be desired

With the Fronius Wattpilot, every electric car driver can decide how they would like to charge their car. Charging is extremely affordable in combination with a variable electricity tarif.

The Fronius Wattpilot is available in two versions: the permanently mounted Wattpilot Home for the household and the mobile Wattpilot Go for on the move. The device can be operated using the associated Solar.wattpilot app, which also provides an overview of the charging process at the same time. The intelligent plug and play charging solution has two different charging modes called Eco and Next Trip. What's more, the Wattpilot is PV-optimised, meaning that the car can be charged particularly cost-effectively and sustainably in ampere increments of surplus solar energy.

TECHNICAL DATA FRONIUS WATTPILOT

INPUT DATA	WATTPILOT GO 11 J	WATTPILOT GO 22 J	WATTPILOT HOME 11 J
Maximum charging power	11 kW	22 kW	11 kW
Mains supply types	TT / TN / IT		
Mains connection	CEE16 plug red 5-pin / 30 cm including neutral conductor	CEE32 plug red 5-pin / 30 cm including neutral conductor	5-pin cable / 200 cm including neutral conductor
Optional adapter set	CEE32 red fused, CEE blue camping plug, safety plug 16A	CEE16 red, CEE blue camping plug, safety plug 16A	–
Nominal voltage	230 V (1-phase) / 400 V (3-phase)		
Nominal current (configurable)	6-16A 1-phase or 3-phase	6-32A 1-phase or 3-phase	6-16A 1-phase or 3-phase
Grid frequency	50 Hz		
Power consumption for standby	1.9 W (LED not lit), 4.2 W (LED brightly lit)		
Charging socket	Type 2 infrastructure socket with mechanical lock		
Residual current device	30 mA AC, 6 mA DC		
Supply line cable cross-section	Min. 2.5 mm²	Min. 6 mm²	Min. 2.5 mm²

GENERAL DATA	WATTPILOT GO 11 J	WATTPILOT GO 22 J	WATTPILOT HOME 11 J
PV optimisation	Dynamic PV surplus charging from 1.38-11 kW (automatic 1-/3-phase switching)	Dynamic PV surplus charging from 1.38-22 kW (automatic 1-/3-phase switching)	Dynamic PV surplus charging from 1.38-11 kW (automatic 1-/3-phase switching)
Network connection	WLAN*		
Use	Indoors or outdoors		
Type of installation	Hanging upright		
Protection class	IP 54 (IP 44 with type 2 cable plugged in)		
Standards / guidelines	IEC 61851-1, IEC 62196		
Dimensions (LxWxH)	25.1 x 14.6 x 9.6 cm		
Weight	1.6 kg	1.9 kg	
Average ambient temperature over 24 hours	Max. 35° C		
Ambient temperature	-25 °C to +40 °C (without direct sunlight)		
Humidity	Between 5% and 95%		
Altitude	0 - 2,000 m		
Impact resistance	IK08		

* The Fronius Wattpilot supports WLAN standards 802.11 b/g/n in the 2.4 GHz band with WEP, WPA, WPA2 and WPA3

SAFETY FUNCTIONS:

/ RFID access control: charging can only be started by selected persons with a valid ID-Chip (RFID).
/ Theft-proof charging socket lock.
/ Additional cable protection can be fitted for the charging box (lock not included in scope of supply): the Wattpilot cannot be removed by simply disconnecting it.
/ Residual current device with direct current detection: 30mA AC, 6mA DC.
/ Phase and voltage testing of the input voltage prevents damage to the charging unit of the electric car if a phase is missing.
/ Auxiliary contact on the relays for checking the switching function (faulty relays are detected).
/ Earthing detection (can be switched off, “Norway function”).
/ Three-phase current sensor to evaluate the charging current.
/ Miniature fuse for internal electronics that can be changed by the customer prevents a fault if the supply line is connected incorrectly.
/ Adapter recognition with automatic reduction to 16A (only for Wattpilot Go 22 J).
/ Temperature monitoring: current is reduced if the temperature is too high.

THE ADVANTAGES AT A GLANCE:

/ **Cost-effective charging with variable green electricity tariffs**
The electric car can be charged very cheaply from the grid with green electricity through the use of variable green electricity tariffs, particularly at night during low-tariff periods.

/ **Standalone app: “Solar.wattpilot”**
To operate the Wattpilot, the Solar.wattpilot app (iOS and Android) is available for electric car owners. The device can be put into operation with just a few clicks, charging settings can be made and charging processes visualised.

/ **Dynamic PV surplus charging**
Dynamic PV surplus charging can be used to charge the electric car with ampere increments of surplus PV by means of 1/3-phase switching. This results in higher self-consumption rates and the PV system paying for itself more quickly.

/ **Two different charging modes: Eco and Next Trip**
Depending on customer requirements, the electric car can either be charged in an extremely environmentally friendly manner or in a way that is tailored perfectly to the next journey.

/ **Network connection via WLAN**

/ **Can be used anywhere**
With the mobile Wattpilot Go, the electric car can be charged anywhere – at home, at work or on holiday.

Check out our how-to videos on Youtube.

/ Perfect Welding / Solar Energy / Perfect Charging

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