

# FRONIUS SYMO

/ Smarter, Lighter, More Flexible



/ SnapInverter technology



/ Integrated data communication



/ SuperFlex Design



/ Smart Grid Ready



/ PC board replacement



/ Zero feed-in



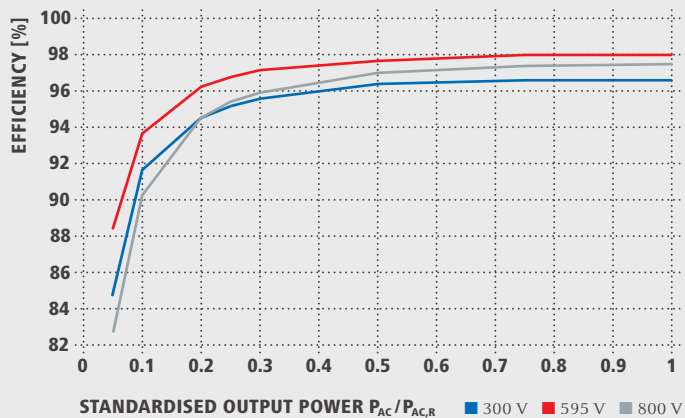
/ Boasting power categories ranging from 3.0 to 20.0 kW, the transformerless Fronius Symo is the three-phase inverter for systems of every size. Owing to the SuperFlex Design, the Fronius Symo is the perfect answer to irregularly shaped or multi-oriented roofs. The standard interface to the internet via WLAN or Ethernet and the ease of integration of third-party components make the Fronius Symo one of the most communicative inverters on the market.

## TECHNICAL DATA FRONIUS SYMO (3.0-3-S, 3.7-3-S, 4.5-3-S, 3.0-3-M, 3.7-3-M, 4.5-3-M)

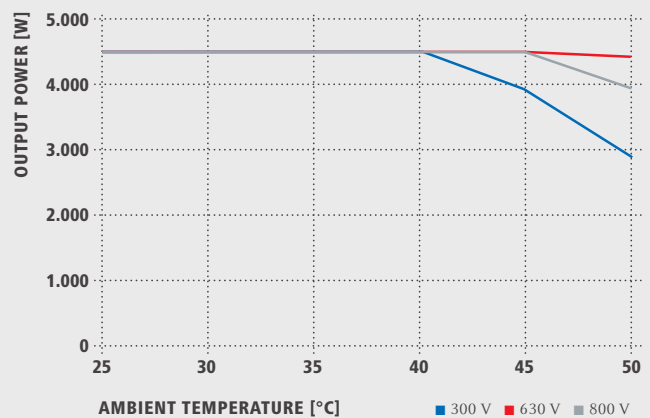
INPUT DATA	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
Max. input current ( $I_{dc\ max\ 1} / I_{dc\ max\ 2}^{1)}$ )			16.0 A / 16.0 A			
Max. array short circuit current (MPP <sub>1</sub> /MPP <sub>2</sub> <sup>1)</sup> )			24.0 A / 24.0 A			
Min. input voltage ( $U_{dc\ min}$ )			150 V			
Feed-in start voltage ( $U_{dc\ start}$ )			200 V			
Nominal input voltage ( $U_{dc,r}$ )			595 V			
Max. input voltage ( $U_{dc\ max}$ )			1,000 V			
Usable MPP voltage range ( $U_{mpp\ min} - U_{mpp\ max}$ )			150V - 800V			
MPP voltage range at nominal power ( $U_{mpp\ min} - U_{mpp\ max}$ )	200 - 800 V	250 - 800 V	300 - 800 V		150 - 800 V	
Number MPP trackers		1			2	
Number of DC connections		3			2+2	
Max total PV array size ( $P_{dc\ max}$ )	6.0kW <sub>peak</sub>	7.4 kW <sub>peak</sub>	9.0 kW <sub>peak</sub>	6.0 kW <sub>peak</sub>	7.4 kW <sub>peak</sub>	9.0 kW <sub>peak</sub>
OUTPUT DATA	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
AC nominal output ( $P_{ac,r}$ )	3,000 W	3,700 W	4,500 W	3,000 W	3,700 W	4,500 W
Max. output power	3,000 VA	3,700 VA	4,500 VA	3,000 VA	3,700 VA	4,500 VA
AC output current ( $I_{ac\ max}$ )	4.3 A	5.3 A	6.5 A	4.3 A	5.3 A	6.5 A
Grid connection ( $U_{ac,r}$ )			3-NPE 400 V / 230 V or 3-NPE 380 V / 220 V (+20 % / -30 %)			
Min. output voltage ( $U_{ac\ min}$ )			260 / 150 V			
Max. output voltage ( $U_{ac\ max}$ )			485 / 280 V			
Frequency ( $f_r$ )			50 Hz / 60 Hz (45 - 65 Hz)			
Frequency range ( $f_{min} - f_{max}$ )			45 - 65 Hz			
Total harmonic distortion			< 3 %			
Power factor ( $\cos\ \varphi_{ac,r}$ )		0.70 - 1 ind. / cap.			0.85 - 1 ind. / cap.	
GENERAL DATA	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
Dimensions (height x width x depth)			645 x 431 x 204 mm			
Weight		16.0 kg			19.9 kg	
Degree of protection			IP 65			
Protection class			1			
Overvoltage category (DC / AC) <sup>2)</sup>			2 / 3			
Night time consumption			< 1 W			
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 / 3,400 m (unrestricted / restricted voltage range)				
DC connection technology	3x DC+ and 3x DC- screw terminals 2.5 - 16 mm <sup>2</sup>			4x DC+ and 4x DC- screw terminals 2.5 - 16mm <sup>2</sup> <sup>3)</sup>		
Mains connection technology	5-pole AC screw terminals 2.5 - 16 mm <sup>2</sup>			5-pole AC screw terminals 2.5 - 16mm <sup>2</sup> <sup>3)</sup>		
Certificates and compliance with standards	ÖVE / ÖNORM E 8001-4-712, DIN V VDE 0126-1-1/A1, VDE AR N 4105, IEC 62109-1/-2, IEC 62116, IEC 61727, AS 3100, AS 4777-2, AS 4777-3, CER 06-190, G83/2, UNE 206007-1, SI 4777 <sup>1)</sup> CEI 0-211), NRS 097					

<sup>1)</sup> This applies to Fronius Symo 3.0-3-M, 3.7-3-M and 4.5-3-M. <sup>2)</sup> According to IEC 62109-1. <sup>3)</sup> 16 mm<sup>2</sup> without wire end ferrules

## FRONIUS SYMO 4.5-3-S EFFICIENCY CURVE



## FRONIUS SYMO 4.5-3-S TEMPERATURE DERATING



## TECHNICAL DATA FRONIUS SYMO (3.0-3-S, 3.7-3-S, 4.5-3-S, 3.0-3-M, 3.7-3-M, 4.5-3-M)

EFFICIENCY	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
Max. efficiency	98.0 %					
European efficiency ( $\eta_{EU}$ )	96.2 %	96.7 %	97.0 %	96.5 %	96.9 %	97.2 %
$\eta$ at 5 % $P_{AC,r}$ <sup>1)</sup>	80.3 / 83.6 / 79.1 %	83.4 / 86.4 / 80.6 %	84.8 / 88.5 / 82.8 %	79.8 / 85.1 / 80.8 %	81.6 / 87.8 / 82.8 %	83.4 / 90.3 / 85.0 %
$\eta$ at 10 % $P_{AC,r}$ <sup>1)</sup>	87.8 / 91.0 / 86.2 %	90.1 / 92.5 / 88.7 %	91.7 / 93.7 / 90.3 %	86.5 / 91.6 / 87.7 %	87.9 / 93.6 / 90.5 %	89.2 / 94.1 / 91.2 %
$\eta$ at 20 % $P_{AC,r}$ <sup>1)</sup>	92.6 / 95.0 / 92.6 %	93.7 / 95.7 / 93.6 %	94.6 / 96.3 / 94.5 %	90.8 / 95.3 / 93.0 %	91.9 / 96.0 / 94.1 %	92.8 / 96.5 / 95.1 %
$\eta$ at 25 % $P_{AC,r}$ <sup>1)</sup>	93.4 / 95.6 / 93.8 %	94.5 / 96.4 / 94.7 %	95.2 / 96.8 / 95.4 %	91.9 / 96.0 / 94.2 %	92.9 / 96.6 / 95.2 %	93.5 / 97.0 / 95.8 %
$\eta$ at 30 % $P_{AC,r}$ <sup>1)</sup>	94.0 / 96.3 / 94.5 %	95.0 / 96.7 / 95.4 %	95.6 / 97.2 / 95.9 %	92.8 / 96.5 / 95.1 %	93.5 / 97.0 / 95.8 %	94.2 / 97.3 / 96.3 %
$\eta$ at 50 % $P_{AC,r}$ <sup>1)</sup>	95.2 / 97.3 / 96.3 %	96.9 / 97.6 / 96.7 %	96.4 / 97.7 / 97.0 %	94.3 / 97.5 / 96.5 %	94.6 / 97.7 / 96.8 %	94.9 / 97.8 / 97.2 %
$\eta$ at 75 % $P_{AC,r}$ <sup>1)</sup>	95.6 / 97.7 / 97.0 %	96.2 / 97.8 / 97.3 %	96.6 / 98.0 / 97.4 %	94.9 / 97.8 / 97.2 %	95.0 / 97.9 / 97.4 %	95.1 / 98.0 / 97.5 %
$\eta$ at 100 % $P_{AC,r}$ <sup>1)</sup>	95.6 / 97.9 / 97.3 %	96.2 / 98.0 / 97.5 %	96.6 / 98.0 / 97.5 %	95.0 / 98.0 / 97.4 %	95.1 / 98.0 / 97.5 %	95.0 / 98.0 / 97.6 %
MPP adaptation efficiency	> 99.9 %					

<sup>1)</sup> and at  $U_{mpp, min} / U_{dcr} / U_{mpp, max}$

PROTECTIVE DEVICES	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
DC insulation measurement	Yes					
Overload behaviour	Operating point shift, power limitation					
DC disconnecter	Yes					
Reverse polarity protection	Yes					

INTERFACES	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
WLAN / Ethernet LAN	Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)					
6 inputs and 4 digital in/out	Interface to ripple control receiver					
USB (A socket) <sup>2)</sup>	Datalogging, inverter update via USB flash drive					
2x RS422 (RJ45 socket) <sup>2)</sup>	Fronius Solar Net					
Signalling output <sup>2)</sup>	Energy management (potential-free relay output)					
Datalogger and Webservice	Included					
External input <sup>2)</sup>	S0-Meter Interface / Input for overvoltage protection					
RS485	Modbus RTU SunSpec or meter connection					

<sup>1)</sup> And at  $U_{mpp, min} / U_{dcr} / U_{mpp, max}$ .

<sup>2)</sup> Also available in the light version.

## TECHNICAL DATA FRONIUS SYMO (5.0-3-M, 6.0-3-M, 7.0-3-M, 8.2-3-M)

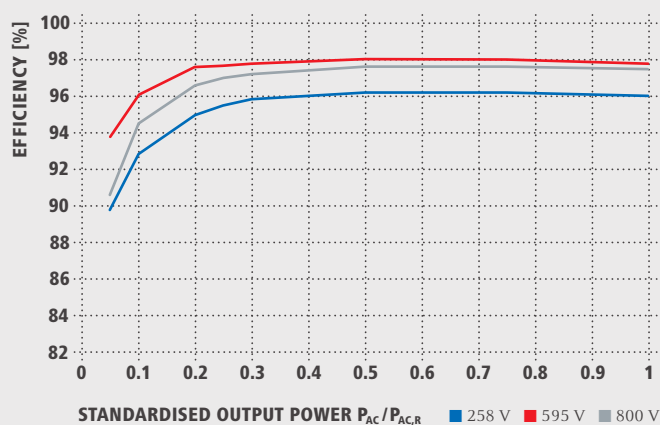
INPUT DATA	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
Max. input current ( $I_{dc \max 1} / I_{dc \max 2}$ )			16.0 A / 16.0 A	
Max. array short circuit current (MPP <sub>1</sub> /MPP <sub>2</sub> )			24.0 A / 24.0 A	
Min. input voltage ( $U_{dc \min}$ )			150 V	
Feed-in start voltage ( $U_{dc \text{ start}}$ )			200 V	
Nominal input voltage ( $U_{dc,r}$ )			595 V	
Max. input voltage ( $U_{dc \max}$ )			1,000 V	
Usable MPP voltage range ( $U_{mpp \min} - U_{mpp \max}$ )			150 V - 800 V	
MPP voltage range at nominal power ( $U_{mpp \min} - U_{mpp \max}$ )	163 - 800 V	195 - 800 V	228 - 800 V	267 - 800 V
Number MPP trackers			2	
Number of DC connections			2 + 2	
Max total PV array size ( $P_{dc \max}$ )	10.0kW <sub>peak</sub>	12.0kW <sub>peak</sub>	14.0kW <sub>peak</sub>	16.4kW <sub>peak</sub>
OUTPUT DATA	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
AC nominal output ( $P_{ac,r}$ )	5,000 W	6,000 W	7,000 W	8,200 W
Max. output power	5,000 VA	6,000 VA	7,000 VA	8,200 VA
AC output current ( $I_{ac \max}$ )	7.2 A	8.7 A	10.1 A	11.8 A
Grid connection ( $U_{ac,r}$ )		3-NPE 400 V / 230 V or 3-NPE 380 V / 220 V (+20 % / -30 %)		
Min. output voltage ( $U_{ac \min}$ )		260 / 150 V		
Max. output voltage ( $U_{ac \max}$ )		485 / 280 V		
Frequency ( $f_r$ )		50 Hz / 60 Hz		
Frequency range ( $f_{\min} - f_{\max}$ )		45 - 65 Hz		
Total harmonic distortion		< 3 %		
Power factor ( $\cos \varphi_{ac,r}$ )		0.85 - 1 ind. / cap.		
GENERAL DATA	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
Dimensions (height x width x depth)		645 x 431 x 204 mm		
Weight	19.9 kg			21.9 kg
Degree of protection		IP 65		
Protection class		1		
Overvoltage category (DC / AC) <sup>1)</sup>		2 / 3		
Night-time consumption		< 1 W		
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 / 3,400 m (unrestricted / restricted voltage range)		
DC connection technology		4x DC+ and 4x DC- Screw terminals 2.5 - 16mm <sup>2,2)</sup>		
Mains connection technology		5-pole AC Screw terminals 2.5 - 16mm <sup>2,2)</sup>		
Certificates and compliance with standards	ÖVE / ÖNORM E 8001-4-712, DIN V VDE 0126-1-1/A1, VDE AR N 4105, IEC 62109-1/-2, IEC 62116, IEC 61727, AS 3100, AS 4777-2, AS 4777-3, CER 06-190, G83/2, UNE 206007-1, SI 4777, CEI 0-21, NRS 097			

<sup>1)</sup> according to IEC 62109-1.

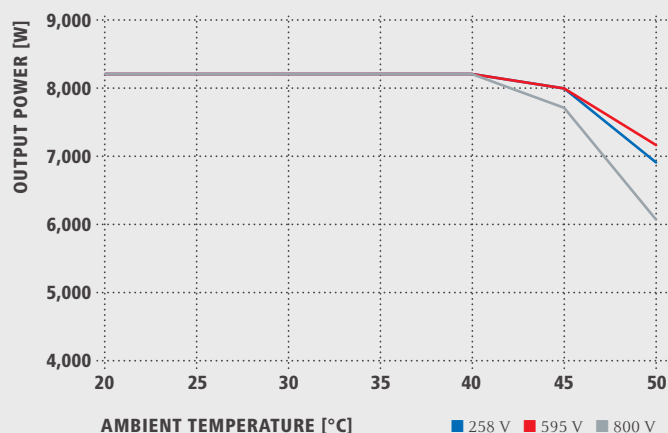
<sup>1)</sup> 16 mm<sup>2</sup> without wire end ferrules.

<sup>2)</sup> 16 mm<sup>2</sup> without wire end ferrules

## FRONIUS SYMO 8.2-3-M EFFICIENCY CURVE



## FRONIUS SYMO 8.2-3-M TEMPERATURE DERATING



## TECHNICAL DATA FRONIUS SYMO (5.0-3-M, 6.0-3-M, 7.0-3-M, 8.2-3-M)

EFFICIENCY	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
Max. efficiency	98.0 %			
European efficiency ( $\eta_{EU}$ )	97.3 %	97.5 %	97.6 %	97.7 %
$\eta$ at 5 % $P_{AC,r}$ <sup>1)</sup>	84.9 / 91.2 / 85.9 %	87.8 / 92.6 / 87.8 %	88.7 / 93.1 / 89.0 %	89.8 / 93.8 / 90.6 %
$\eta$ at 10 % $P_{AC,r}$ <sup>1)</sup>	89.9 / 94.6 / 91.7 %	91.3 / 95.6 / 93.0 %	92.0 / 95.9 / 94.7 %	92.8 / 96.1 / 94.5 %
$\eta$ at 20 % $P_{AC,r}$ <sup>1)</sup>	93.2 / 96.7 / 95.4 %	94.1 / 97.1 / 95.9 %	94.5 / 97.3 / 96.3 %	95.0 / 97.6 / 96.6 %
$\eta$ at 25 % $P_{AC,r}$ <sup>1)</sup>	93.9 / 97.2 / 96.0 %	94.7 / 97.5 / 96.5 %	95.1 / 97.6 / 96.7 %	95.5 / 97.7 / 97.0 %
$\eta$ at 30 % $P_{AC,r}$ <sup>1)</sup>	94.5 / 97.4 / 96.5 %	95.1 / 97.7 / 96.8 %	95.4 / 97.7 / 97.0 %	95.8 / 97.8 / 97.2 %
$\eta$ at 50 % $P_{AC,r}$ <sup>1)</sup>	95.2 / 97.9 / 97.3 %	95.7 / 98.0 / 97.5 %	95.9 / 98.0 / 97.5 %	96.2 / 98.0 / 97.6 %
$\eta$ at 75 % $P_{AC,r}$ <sup>1)</sup>	95.3 / 98.0 / 97.5 %	95.7 / 98.0 / 97.6 %	95.9 / 98.0 / 97.6 %	96.2 / 98.0 / 97.6 %
$\eta$ at 100 % $P_{AC,r}$ <sup>1)</sup>	95.2 / 98.0 / 97.6 %	95.7 / 97.9 / 97.6 %	95.8 / 97.9 / 97.5 %	96.0 / 97.8 / 97.5 %
MPP adaptation efficiency	> 99.9 %			

<sup>1)</sup> and at  $U_{mpp \min} / U_{dc,r} / U_{mpp \max}$

PROTECTIVE DEVICES	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
DC insulation measurement	Yes			
Overload behaviour	Operating point shift, power limitation			
DC disconnecter	Yes			
Reverse polarity protection	Yes			

INTERFACES	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
WLAN / Ethernet LAN	Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)			
6 inputs and 4 digital in/out	Interface to ripple control receiver			
USB (A socket) <sup>2)</sup>	Datalogging, inverter update via USB flash drive			
2x RS422 (RJ45 socket) <sup>2)</sup>	Fronius Solar Net			
Signalling output <sup>2)</sup>	Energy management (potential-free relay output)			
Datalogger and Webservice	Included			
External input <sup>2)</sup>	S0-Meter Interface / Input for overvoltage protection			
RS485	Modbus RTU SunSpec or meter connection			

<sup>1)</sup> And at  $U_{mpp \min} / U_{dc,r} / U_{mpp \max}$ .

<sup>2)</sup> Also available in the light version.

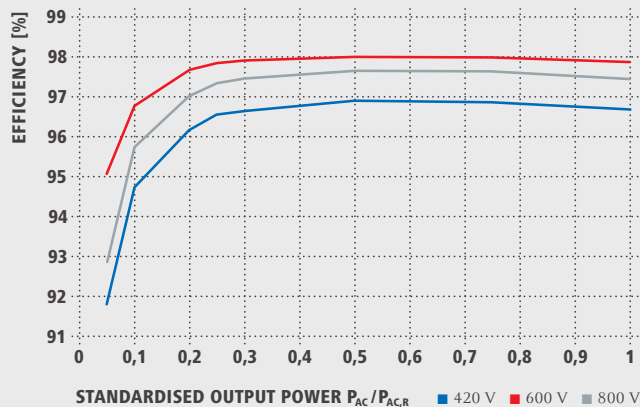
## TECHNICAL DATA FRONIUS SYMO (10.0-3-M, 12.5-3-M, 15.0-3-M, 17.5-3-M, 20.0-3-M)

INPUT DATA	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
Max. input current ( $I_{dc \max 1} / I_{dc \max 2}$ )	27.0 A / 16.5 A <sup>1)</sup>		33.0 A / 27.0 A		
Max. usable input current total ( $I_{dc \max 1} / I_{dc \max 2}$ )	43.5 A		51.0 A		
Max. array short circuit current (MPP <sub>1</sub> /MPP <sub>2</sub> )	40.5 A / 24.8 A		49.5 A / 40.5 A		
Min. input voltage ( $U_{dc \min}$ )			200 V		
Feed-in start voltage ( $U_{dc \text{ start}}$ )			200 V		
Nominal input voltage ( $U_{dc \text{ r}}$ )			600 V		
Max. input voltage ( $U_{dc \max}$ )			1,000 V		
Usable MPP voltage range ( $U_{mpp \min} - U_{mpp \max}$ )			200 V - 800 V		
MPP voltage range at nominal power ( $U_{mpp \min} - U_{mpp \max}$ )	270 - 800 V	320 - 800 V		370 - 800 V	420 - 800 V
Number MPP trackers			2		
Number of DC connections			3+3		
Max total PV array size ( $P_{dc \max}$ )	15.0 kW <sub>peak</sub>	18.8kW <sub>peak</sub>	22.5 kW <sub>peak</sub>	26.3 kW <sub>peak</sub>	30.0 kW <sub>peak</sub>
OUTPUT DATA	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
AC nominal output ( $P_{ac \text{ r}}$ )	10,000 W	12,500 W	15,000 W	17,500 W	20,000 W
Max. output power	10,000 VA	12,500 VA	15,000 VA	17,500 VA	20,000 VA
AC output current ( $I_{ac \max}$ )	14.4 A	18.0 A	21.7 A	25.3 A	28.9 A
Grid connection ( $U_{ac \text{ r}}$ )	3-NPE 400 V / 230 V or 3-NPE 380 V / 220 V (+20 % / -30 %)				
Min. output voltage ( $U_{ac \min}$ )	260 / 150 V				
Max. output voltage ( $U_{ac \max}$ )	485 / 280 V				
Frequency ( $f_r$ )	50 Hz / 60 Hz				
Frequency range ( $f_{\min} - f_{\max}$ )	45 - 65 Hz				
Total harmonic distortion	1.8 %	2.0 %	1.5 %	1.5 %	1.3 %
Power factor ( $\cos \varphi_{ac \text{ r}}$ )	0 - 1 ind. / cap.				
GENERAL DATA	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
Dimensions (height x width x depth)	725 x 510 x 225 mm				
Weight	34.8 kg		43.4 kg		
Degree of protection	IP 66				
Protection class	1				
Overvoltage category (DC / AC) <sup>1)</sup>	2 / 3				
Night-time consumption	< 1 W				
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 / 3,400 m (unrestricted / restricted voltage range)				
DC connection technology	6x DC+ and 6x DC- screw terminals 2.5 - 16 mm <sup>2)</sup>				
Mains connection technology	5-pole AC screw terminals 2.5 - 16 mm <sup>2)</sup>				
Certificates and compliance with standards	AS 4777-2, AS 4777-3, AS 3100, IEC 62109-1/-2, DIN V VDE 0126-1-1/A1, VDE AR N 4105, IEC 62116, IEC 61727, CER 06-190, G83/2, G59/3, UNE 206007-1, SI 4777, CEI 0-16, CEI 0-21				

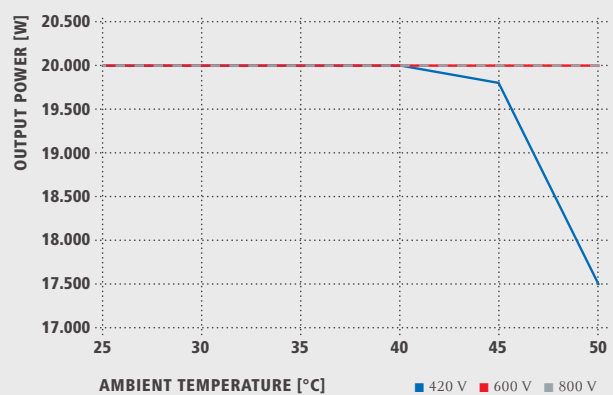
<sup>1)</sup> 14.0 A for voltages < 420 V

<sup>2)</sup> According to IEC 62109-1. DIN rail for optional overvoltage protection (type 2) is included.

## FRONIUS SYMO 20.0-3-M EFFICIENCY CURVE



## FRONIUS SYMO 20.0-3-M TEMPERATURE DERATING



## TECHNICAL DATA FRONIUS SYMO (10.0-3-M, 12.5-3-M, 15.0-3-M, 17.5-3-M, 20.0-3-M)

EFFICIENCY	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
Max. efficiency	98.0 %			98.1 %	
European efficiency ( $\eta_{EU}$ )	97.5 %	97.6 %	97.8 %	97.8 %	97.9 %
$\eta$ at 5 % $P_{Ac,r}$ <sup>1)</sup>	87.9 / 92.5 / 89.2 %	88.7 / 93.1 / 90.1 %	91.2 / 94.8 / 92.3 %	91.6 / 95.0 / 92.7 %	91.9 / 95.2 / 93.0 %
$\eta$ at 10 % $P_{Ac,r}$ <sup>1)</sup>	91.2 / 94.9 / 92.8 %	92.9 / 96.1 / 94.6 %	93.4 / 96.0 / 94.4 %	94.0 / 96.4 / 95.0 %	94.8 / 96.9 / 95.8 %
$\eta$ at 20 % $P_{Ac,r}$ <sup>1)</sup>	94.6 / 97.1 / 96.1 %	95.4 / 97.3 / 96.6 %	95.9 / 97.4 / 96.7 %	96.1 / 97.6 / 96.9 %	96.3 / 97.8 / 97.1 %
$\eta$ at 25 % $P_{Ac,r}$ <sup>1)</sup>	95.4 / 97.3 / 96.6 %	95.6 / 97.6 / 97.0 %	96.2 / 97.6 / 97.0 %	96.4 / 97.8 / 97.2 %	96.7 / 97.9 / 97.4 %
$\eta$ at 30 % $P_{Ac,r}$ <sup>1)</sup>	95.6 / 97.5 / 96.9 %	95.9 / 97.7 / 97.2 %	96.5 / 97.8 / 97.3 %	96.6 / 97.9 / 97.4 %	96.8 / 98.0 / 97.6 %
$\eta$ at 50 % $P_{Ac,r}$ <sup>1)</sup>	96.3 / 97.9 / 97.4 %	96.4 / 98.0 / 97.5 %	96.9 / 98.1 / 97.7 %	97.0 / 98.1 / 97.7 %	97.0 / 98.1 / 97.8 %
$\eta$ at 75 % $P_{Ac,r}$ <sup>1)</sup>	96.5 / 98.0 / 97.6 %	96.5 / 98.0 / 97.6 %	97.0 / 98.1 / 97.8 %	97.0 / 98.1 / 97.8 %	97.0 / 98.1 / 97.7 %
$\eta$ at 100 % $P_{Ac,r}$ <sup>1)</sup>	96.5 / 98.0 / 97.6 %	96.5 / 97.8 / 97.6 %	97.0 / 98.1 / 97.7 %	96.9 / 98.1 / 97.6 %	96.8 / 98.0 / 97.6 %
MPP adaptation efficiency	> 99.9 %				
PROTECTIVE DEVICES	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
DC insulation measurement	Yes				
Overload behaviour	Operating point shift, power limitation				
DC disconnecter	Yes				
Reverse polarity protection	Yes				
INTERFACES	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 6.0-1	PRIMO 8.2-1	
WLAN / Ethernet LAN	Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)				
6 inputs and 4 digital in/out	Interface to ripple control receiver				
USB (A socket) <sup>2)</sup>	Datalogging, inverter update via USB flash drive				
2x RS422 (RJ45 socket) <sup>2)</sup>	Fronius Solar Net				
Signalling output <sup>2)</sup>	Energy management (potential-free relay output)				
Datalogger and Webservice	Included				
External input <sup>2)</sup>	S0-Meter Interface / Input for overvoltage protection				
RS485	Modbus RTU SunSpec or meter connection				

<sup>1)</sup> And at  $U_{mpp\ min} / U_{dc,r} / U_{mpp\ max}$ .

<sup>2)</sup> Also available in the light version.

/ Perfect Welding / Solar Energy / Perfect Charging

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

/ Whether welding technology, photovoltaics or battery charging technology – our goal is clearly defined: to be the innovation leader. With around 3,300 employees worldwide, we shift the limits of what's possible - our record of over 900 granted patents is testimony to this. While others progress step by step, we innovate in leaps and bounds. Just as we've always done. The responsible use of our resources forms the basis of our corporate policy.

Further information about all Fronius products and our global sales partners and representatives can be found at [www.fronius.com](http://www.fronius.com)

v05 May 2015 EN

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