

# FRONIUS SYMO

/ Smarter, lighter, more flexible.



/ PC board replacement process



/ SnapINverter technology



/ Integrated data communication



/ SuperFlex Design



/ Dynamic Peak Manager



/ Smart Grid Ready



/ The Fronius Symo's ability to communicate with the user, the PV system and the grid makes it one of the smartest inverters available. With the Fronius SnapINverter design it is also one of the lightest and easiest to install. The wide input voltage range and two MPP trackers ensure super design flexibility. 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.

## 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)

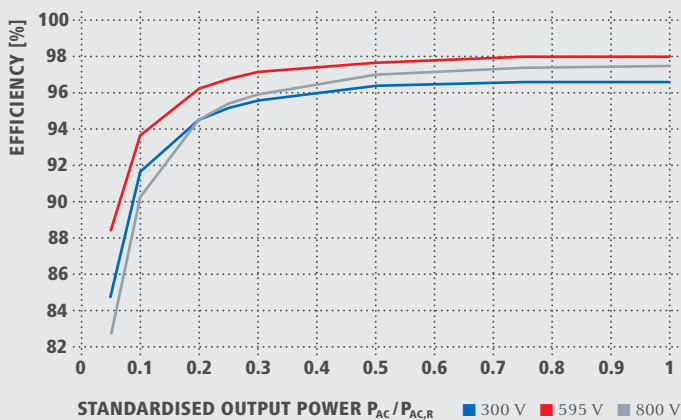
INPUT DATA	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
Max. input current ( $I_{dc\ max\ 1} / I_{dc\ max\ 2}^{1)}$ )		16.0 A / -			16.0 A / 16.0 A	
Max. array short circuit current (MPP <sub>1</sub> /MPP <sub>2</sub> <sup>1)</sup> )		24.0 A / -			24.0 A / 24.0 A	
Min. 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	
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
Max. output current ( $I_{ac\ max}$ )	4.8 A	5.9 A	7.2 A	4.8 A	5.9 A	7.2 A
Grid connection ( $U_{ac,r}$ )				3-NPE 400 V / 230 V or 3-NPE 380 V / 220 V		
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 ( $\cos\ \varphi_{ac,r}$ )		0.70 - 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 %		
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	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, UNE 206007-1, SI 4777 <sup>1)</sup> , CEI 0-21 <sup>1)</sup>					

<sup>1)</sup> This applies to Fronius Symo 3.0-3-M, 3.7-3-M and 4.5-3-M

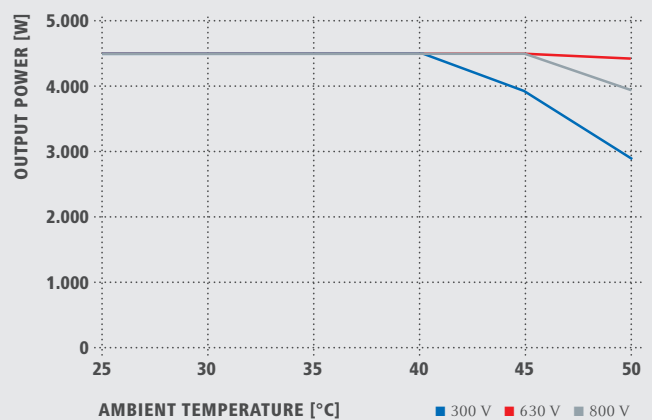
<sup>2)</sup> According to IEC 62109-1.

<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					

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 <sup>2)</sup>	Fronius Solar.web / Fronius Solar.web, Modbus TCP, JSON					
6 inputs or 4 digital in/out <sup>2)</sup>	Interface to ripple control receiver					
USB (A socket) <sup>3)</sup>	For USB sticks					
2x RS422 (RJ45 socket) <sup>3)</sup>	Fronius Solar Net. interface protocol					
Signalling output <sup>3)</sup>	Energy management (potential-free relay output)					
Datalogger and Webserver <sup>2)</sup>	Included					
External input	SO-Meter Interface / Input for overvoltage protection					

<sup>2)</sup> not included in the light version, retrofit optional

<sup>3)</sup> also available in the light version

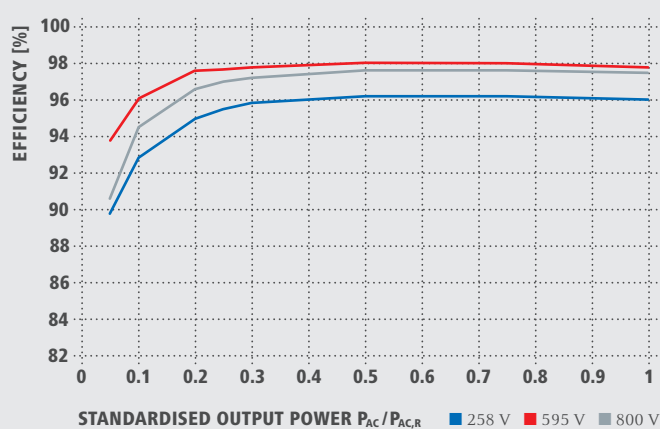
## TECHNICAL DATA FRONIUS SYMO (5.0-3-M, 6.0-3-M, 7.0-3-M, 8.2-3-M)

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 ( $MPP_1/MPP_2$ )			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 ( $U_{dc,t}$ )			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	
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 ( $P_{ac,t}$ )	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
Max. output current ( $I_{ac\ max}$ )	8.0 A	9.6 A	11.2 A	13.1 A
Grid connection ( $U_{ac,t}$ )		3-NPE 400 V / 230 V or 3-NPE 380 V / 220 V		
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 ( $\cos \varphi_{ac,t}$ )		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 %		
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	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, UNE 206007-1, S1 4777, CEI 0-21			

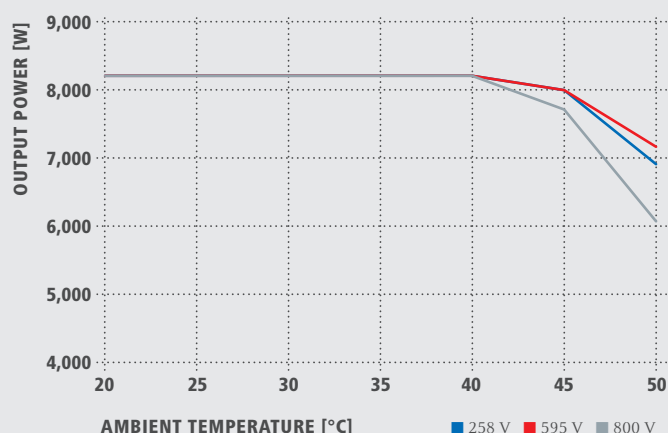
<sup>1)</sup> according to IEC 62109-1.

<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 ( $\eta_{EU}$ )	97.0 %	97.2 %	97.3 %	97.5 %
$\eta$ 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			

INTERFACES	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
WLAN / Ethernet LAN <sup>2)</sup>	Fronius Solar.web / Fronius Solar.web, Modbus TCP, JSON			
6 inputs or 4 digital in/out <sup>2)</sup>	Interface to ripple control receiver			
USB (A socket) <sup>3)</sup>	For USB-Sticks			
2x RS422 (RJ45 socket) <sup>3)</sup>	Fronius Solar Net, Interface Protokoll			
Signalling output <sup>3)</sup>	Energy management (potential-free relay output)			
Datalogger and Webserver <sup>2)</sup>	Included			
External input	S0-Meter Interface / Input for overvoltage protection			

<sup>2)</sup> not included in the light version, retrofit optional

<sup>3)</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)

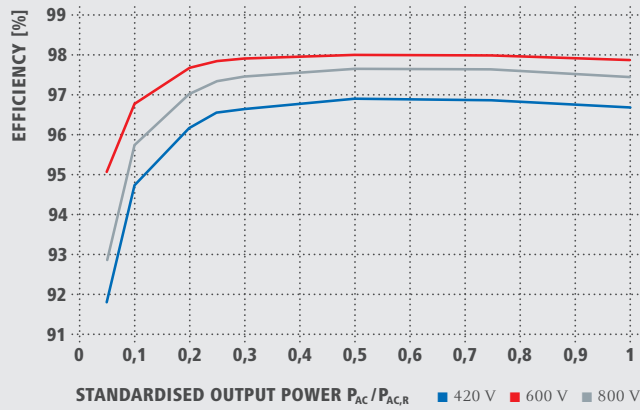
INPUT DATA	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
Max. input current ( $I_{dc\ max\ 1} / I_{dc\ max\ 2}$ )	27.0 A / 16.5 A		33.0 A / 27.0 A		
Max. array short circuit current (MPP <sub>1</sub> /MPP <sub>2</sub> )	40.5 A / 24.8 A		49.5 A / 40.5 A		
Min. input voltage ( $U_{dc\ min}$ )	200 V				
Feed-in start voltage ( $U_{dc\ start}$ )	200 V				
Nominal input voltage ( $U_{dc,r}$ )	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				

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 ( $P_{ac,r}$ )	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
Max. output current ( $I_{ac\ max}$ )	16 A	19.9 A	23.9 A	27.9 A	31.9 A
Grid connection ( $U_{ac,r}$ )	3-NPE 400 V / 230 V or 3-NPE 380 V / 220 V				
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	< 2 %				
Power factor ( $\cos \varphi_{ac,r}$ )	0 - 1 ind. / cap.				

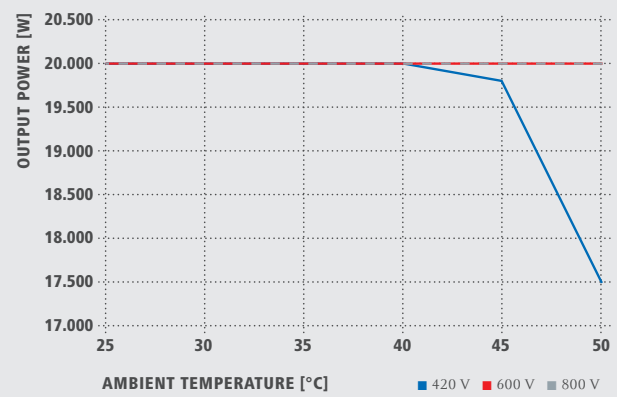
GENERAL DATA	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
Dimensions (height x width x depth)	725 x 510 x 225 mm				
Weight	34.8 kg		43.4 kg		
Degree of protection	IP 66				
Protection class	1				
Overvoltage category (DC / AC) <sup>1)</sup>	2 / 3				
Night time consumption	< 1 W				
Inverter design	Transformerless				
Cooling	Regulated air cooling				
Installation	Indoor and outdoor installation				
Ambient temperature range	-25 - +60 °C				
Permitted humidity	0 - 100 %				
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, S1 4777, CEI 0-16, CEI 0-21				

<sup>1)</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 %				
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				
INTERFACES	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
WLAN / Ethernet LAN <sup>2)</sup>	Fronius Solar.web / Fronius Solar.web, Modbus TCP, JSON				
6 inputs or 4 digital inputs/outputs <sup>2)</sup>	Interface to ripple control receiver				
USB (A socket <sup>3)</sup> )	For USB-Sticks				
2x RS422 (RJ45-socket <sup>3)</sup> )	Fronius Solar Net, interface protocol				
Signalling output <sup>3)</sup>	Energy management (potential-free relay output)				
Datalogger und Webserver <sup>2)</sup>	Included				
External input	S0-Meter Interface / Input for overvoltage protection				

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

<sup>2)</sup> not included in the light version, retrofit optional

<sup>3)</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.

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