CentroSolar

Inverter

Powerstocc® Excellent

Technical Operating Data

PS 3.0 Excellent
PS 3.6 Excellent
PS 4.2 Excellent
PS 5.5 Excellent
PS 8.3 Excellent
PS 10.1 Excellent

Technical operating data valid from software status 3.58

LEGAL NOTICE

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Contents

1 Introduction

This operating data sheet contains technical data for the Centrosolar Solar-inverter Powerstocc Excellent. It addresses photovoltaic system planners and installers/ electricians.

2 Safety instructions

Observe the local installation regulations applicable in your country!

Only an electrician is allowed to install the inverter and put it into operation!

Do not modify or remove the labels and markings applied on the housing by the manufacturer!

3 Layout instructions

For planning and layout of your photovoltaic system, we recommend the planning sheet, which you can download free of charge from our website www.centrosolar.com.

When laying out a photovoltaic system, you must observe the following points:

PV system planning

Observe the specifications in the technical data for all components of the PV system to be designed. The individual components must be aptly dimensioned to one another. Only then is it possible to obtain an optimal energy yield.

Special photovoltaic module

Special photovoltaic modules, such as thin film cells, reverse contact and flexible cells, exhibit other or additional operating parameters coupled to standard mono or polycrystalline cells. This particularity must be taken into consideration during the layout of a PV generator, for example with regard to the maximum system voltage, potentials coupled to ground, etc.

Optimisation of the PV generator

To obtain an optimal yield, you should aim for the highest possible PV generator voltage.

Adjust the layout ratio (layout ratio: PV generator output / nom. AC power of the inverter) to local conditions. For PV systems in extremely sunny regions, for example in southern Europe, the connected PV generator output should be somewhat lower than in less sunny regions, e.g central Europe.

Configuration of the DC inputs

It is not absolutely necessary to configure all the DC inputs of the Powerstocc Excellent inverter. Use the planning sheet for this.

Device protection

If the PV system is located in an area vulnerable to the effects of lightning, a lightning arrester should be supplied.

The lightning protection for the inverter depends on whether the building or photovoltaic system is equipped with an external lightning arrester.

If the building has been provided with an external lightning arrester, overvoltage protection type 2 is mandatory on the AC and DC side, and must be installed on-site.

If the building has **not** been provided with an external lightning protector, we recommend the installation of overvoltage protection type 2 on-site on the AC- and DC side.

We also recommend the installation of overvoltage protection for communication lines (RJ45, RS485, sensors...). When several inverters are connected, overvoltage protection must be installed on both ends of the cable.

4 Parametrisation

The switch-off parameters of the Powerstocc Excellent solar inverter can be adjusted. This may be necessary for oversized public grids, such as those sometimes found in rural areas. The precondition for modification of the switch-off parameters is generally the written permission of the local public grid operator. To modify the switch-off parameters, you will need special software which is available on request from Centrosolar. The parametrisation may only be performed by a qualified electrician.

5 Technical data

For some countries other data applies, see page 8 f.

	Unit	Powerstocc Excellent					
		3.0	3.6	4.2	5.5	8.3	10.1
Input side (DC)							
Max. DC input	W	3200	3800	4400	5800	8700	11000
Nominal DC input	W	2950	3450	4000	5250	8000	9650
Min. input voltage $U_{DC\ min}$	V	180					
Max. input voltage $U_{DC\ max}$	V	950					
Min. MPP voltage $U_{MPP\ min}$ with DC rated input in symmetrical multi-string, dual-tracker or parallel operation	V	380	340	360	360	400	420
Min. MPP voltage $U_{MPP\ min}$ with DC rated input in single-tracker operation	V	380	440	500	660	Not appropriate	Not appropriate
Max. MPP voltage $U_{MPP\ max}$ with DC rated input	V	850					
Extended MPP voltage range with partial inverter output, depending on the mode of operation	V	180 to $U_{MPP\ min}$					
Max. output ratio for transmission in extended MPP voltage range[1)]	%	ca. 70					
Rated input voltage $U_{DC,r}$ (nominal DC voltage)	V	600	600	680	680	680	680
Start input voltage $U_{DC\ start}$	V	180					
Nominal DC current	A	8	8	8	8	11.5	11.5
Nominal DC current with interconnection of DC inputs	A	not possible	12	12	not possible	20	23
Max. input current $I_{DC\ max}$	A	9	9	9	9	12.5	12.5
Max. input current with interconnection of DC inputs	A	not possible	13	13	not possible	22	25
Number of DC inputs	pc.	1	2	2	3	2	3
Number of MPP regulators	pc.	1	2	2	3	2	3

1) In addition to the nominal MPP voltage range, the Powerstocc Excellent inverters also feature an extended MPP voltage range, which can also absorb particularly low module voltage and partial output from PV generators, which e. g. were caused by architectural divisions. In this range, the MPP tracker can be operated at max. 70 % of its nominal DC input. Higher input in this lower MPP voltage range can lead to thermal limitation of the inverter.

Technical data

	Unit	Powerstocc Excellent					
		3.0	**3.6**	**4.2**	**5.5**	**8.3**	**10.1**
Output side (AC)							
Nominal AC power	W	2800	3300	3800	5000	7600	9200
Max. AC output (peak output)	W	3000	3600	4200	5500	8300	10100
Nominal AC current per phase	A	12.2	14.4	5.5	7.3	11	13.3
Max. output current $I_{AC\ max}$ per phase	A	13.1	15.7	6.1	8	12	14.6
Number of feed-in phases	pc.	1		3			
Rated frequency f_r nominal	Hz	50					
Min. grid frequency f_{min} (switch-off limit)	Hz	47.5					
Max. grid frequency f_{max} (switch-off limit)	Hz	50.2					
Rated voltage $U_{AC,r}$ AC	V	230					
Min. output voltage U_{ACmin}	V	184					
Max. output voltage U_{ACmax}	V	264.5					
Lower voltage switch-off limit	V	184					
Upper voltage switch-off limit	V	264.5					
Switch-off limit at the 10 min. average	V	253					
Reactive factor *cos*φ		1					
Distortion factor	%	< 3					
AC output characteristics		Sine					
Recommended AC pre-fuses (per phase)	A	25, type B		16, type B			25, type B
Efficiency factor (relating to nominal DC voltage)							
Feed-in from	W	25				40	
Stand-by consumption	W	< 1					
Night consumption	W	< 1					
Max. efficiency	%	94.8	94.8	96.0	95.3	96.0	96.0
European-standard efficiency	%	93.6	93.8	94.7	94.2	95.3	95.4
Efficiency with 5 % $P_{nom.}$	%	83.98	85.79	87.5	86.6	90.84	91.64
Efficiency with 10 % $P_{nom.}$	%	90.03	90.77	90.22	91.1	92.78	92.02
Efficiency with 20 % $P_{nom.}$	%	92.67	92.65	93.51	90.3	94.53	94.89
Efficiency with 25 % $P_{nom.}$	%	92.82	93.42	94.3	93.93	95.11	95.42
Efficiency with 30 % $P_{nom.}$	%	93.43	93.88	94.69	94.35	95.42	95.63
Efficiency with 50 % $P_{nom.}$	%	94.41	94.59	95.49	94.94	95.87	96
Efficiency with 75 % $P_{nom.}$	%	94.75	94.8	95.96	95.28	96.01	95.99
Efficiency with 100 % $P_{nom.}$	%	94.72	94.61	95.9	95	95.88	95.83
Design / conversion							
Design		Transformerless					
Self commuting / line commutated		self-commuting					
Power semiconductor		IGBT					
Conversion frequency	kHz	24	24	18	24	16	16
Static regulatory adjustment to PV generator		MPP tracking with 99% adjustment					

	Unit	Powerstocc Excellent					
		3.0	3.6	4.2	5.5	8.3	10.1
Safety							
Protection type		IP 55					
Protection class		SKL I					
VDEW-compatible		yes					
Switch-off parameters adjustable		yes, with the help of parametrisation software Parastocc					
ENS grid monitoring (procedure)		Frequency shifting		3-phase monitoring			
Grid voltage monitoring		yes					
Frequency monitoring		yes					
Operator protection		AFI and earth fault monitoring					
Insulation monitoring		yes					
Overload behaviour		Modification of the working point					
Disconnection device		Integrated electronic disconnection device ()					
Reverse polarity protection		Short circuit diodes on the DC side					
Overvoltage protection		Yes					
Behaviour with excess temperature (on the cooling plate)		Power limitation					
Mechanical data							
Height	mm	350				450	
Width	mm	420				520	
Depth	mm	211				230	
Weight	kg	19.8	20	20.5	21.1	33	34
Fans		yes					
Cooling		Regulated fan					
Environment							
Environmental temperature from	°C	–20					
Environmental temperature to	°C	60					
Max. environmental temperature with $P_{nom.}$	°C	40					
Derating area	°C	40…60					
Location		interior + exterior					
Relative humidity from	%	0					
Relative humidity up to	%	95					
Housing suspension		Wall mounting on frame					
DC connection type		MC 4					
AC cable connection		Spring-loaded terminal strip					

	Unit	Powerstocc Excellent					
		3.0	3.6	4.2	5.5	8.3	10.1
Data collection / communication							
Data collection		yes					
U_{DC}		yes					
I_{DC}		yes					
P_{DC}		yes					
U_{AC}		yes					
f_{AC}		yes					
P_{AC}		yes					
TEMP		yes					
E tag		yes					
E total		yes					
Operating status		yes					
Fault display		yes					
Storage capacity		400 days or 100 days					
Type of storage values		15 min or 1 hr average values					
Computer interface/type		Ethernet (RJ45), RS485					
Analog connection		optional analog modem (RJ11)					
GSM connection		optional GSM modem					
Data display		via integrated web server or evaluation software “Parastocc Master Control”					
S0 input		yes					
S0 or alarm output, configurable		yes					
Sensor interfaces for temperature, radiation and other sensors		4 analog inputs, resolution 9.8 mV per digit, max. input voltage 10 V					
Integrated sensor supply		5 V / 10 mA, optional external supply					

5.1 Divergent data for France

	Unit	Powerstocc Excellent 3.0 – Powerstocc Excellent 10.1
Output side (AC)		
Max. grid frequency f_{max} (switch-off limit)	Hz	51

5.2 Divergent data for the Czech Republic

	Unit	Powerstocc Excellent 3.0 – Powerstocc Excellent 10.1
Output side (AC)		
Lower voltage switch-off limit	V	195.5

5.3 Divergent data for Spain

	Unit	Powerstocc Excellent 3.0 – Powerstocc Excellent 10.1
Output side (AC)		
Min. grid frequency f_{min} (switch-off limit)	Hz	49
Max. grid frequency f_{max} (switch-off limit)	Hz	51
Lower voltage switch-off limit	V	195.5
Upper voltage switch-off limit	V	253

5.4 Divergent data for Portugal

	Unit	Powerstocc Excellent 3.0 – Powerstocc Excellent 10.1
Output side (AC)		
Min. grid frequency f_{min} (switch-off limit)	Hz	47
Max. grid frequency f_{max} (switch-off limit)	Hz	51
Lower voltage switch-off limit	V	195.5

5.5 Divergent data for Italy

	Unit	Powerstocc Excellent 3.0 – Powerstocc Excellent 10.1
Output side (AC)		
Min. grid frequency f_{min} (switch-off limit)	Hz	49.7
Max. grid frequency f_{max} (switch-off limit)	Hz	50.3
Upper voltage switch-off limit	V	276

5.6 Divergent data for Greece

	Unit	Powerstocc Excellent 3.0 – Powerstocc Excellent 10.1
Output side (AC)		
Min. grid frequency f_{min} (switch-off limit)	Hz	49.5 (mainland) 47.5 (islands)
Max. grid frequency f_{max} (switch-off limit)	Hz	50.5 (mainland) 51 (islands)

5.7 Divergent data for Belgium

		Powerstocc Excellent					
	Unit	3.0	3.6	4.2	5.5	8.3	10.1
Output side (AC)							
Max. AC output (peak output)	W	—	—	—	—	—	10000

6 Efficiency rate characteristic curves

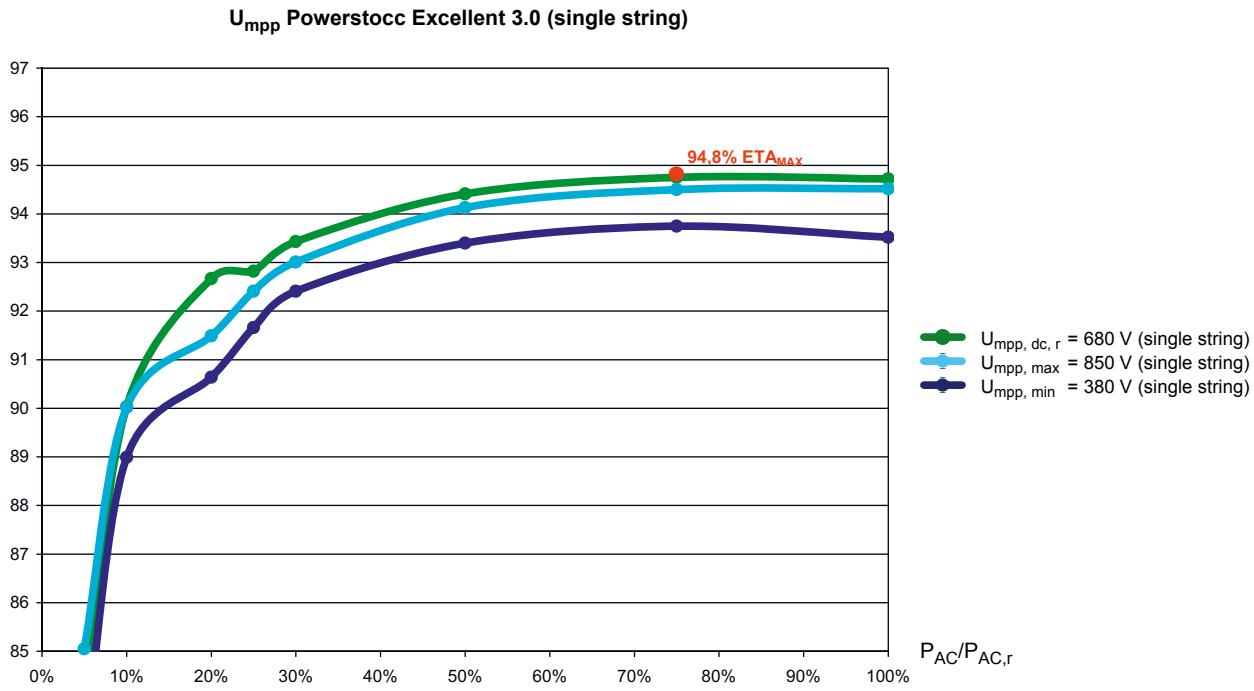

Fig. 1: Efficiency rate characteristic curves Powerstocc Excellent 3.0

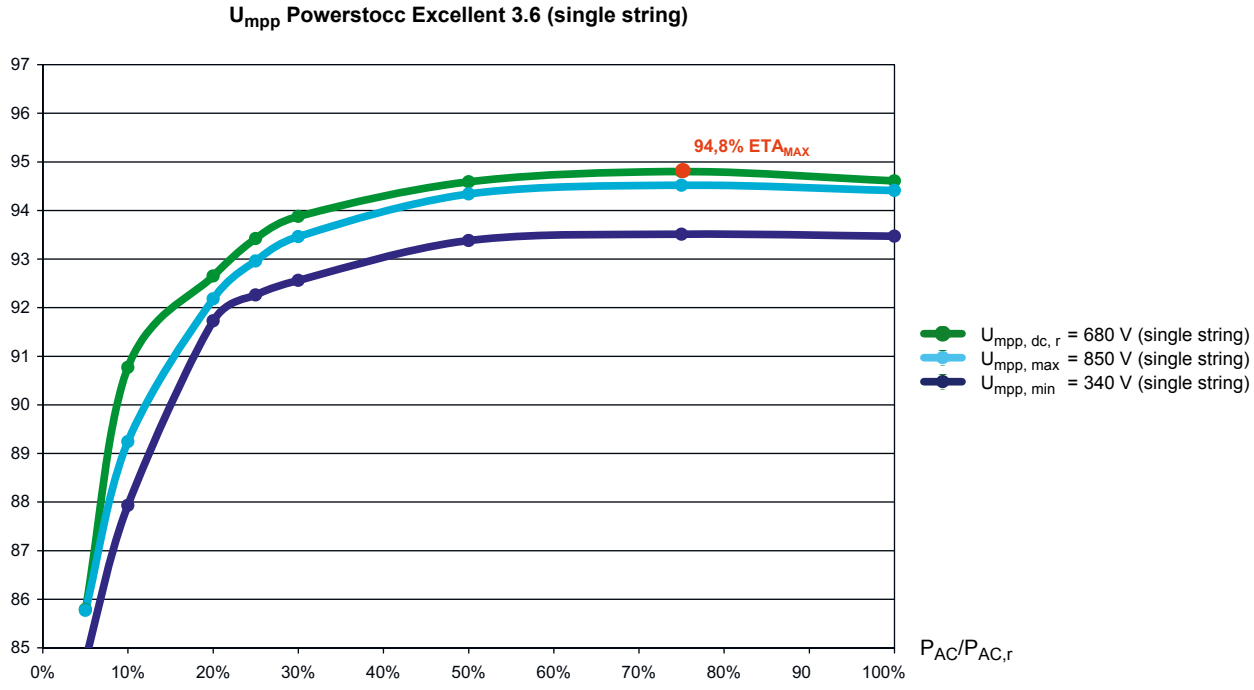

Fig. 2: Efficiency rate characteristic curves Powerstocc Excellent 3.6

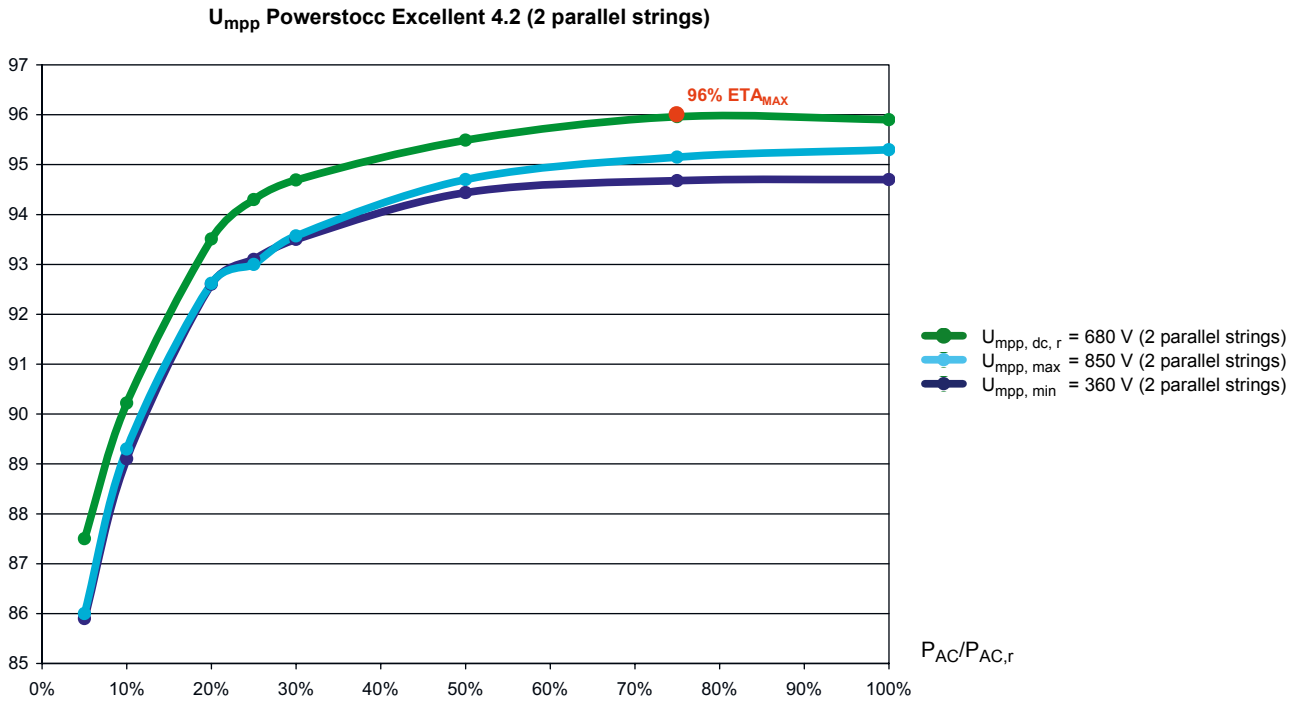

Fig. 3: Efficiency rate characteristic curves Powerstocc Excellent 4.2

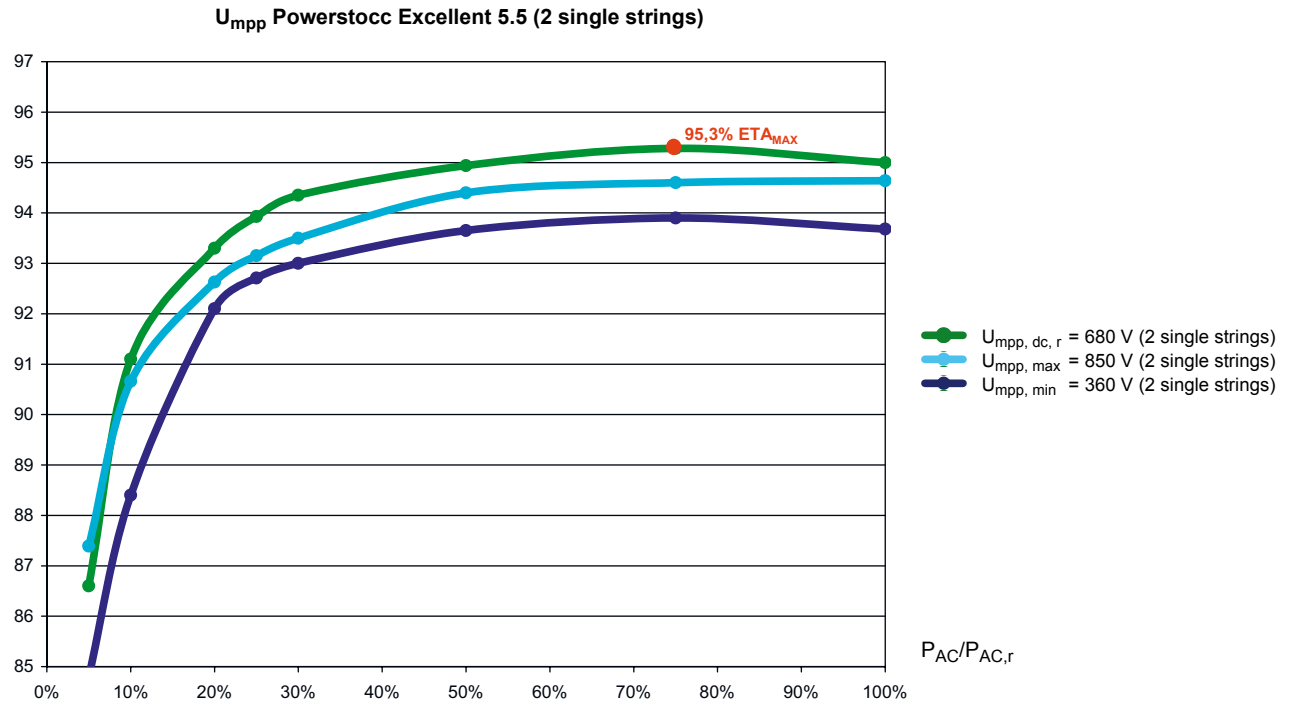

Fig. 4: Efficiency rate characteristic curves Powerstocc Excellent 5.5

Efficiency rate characteristic curves

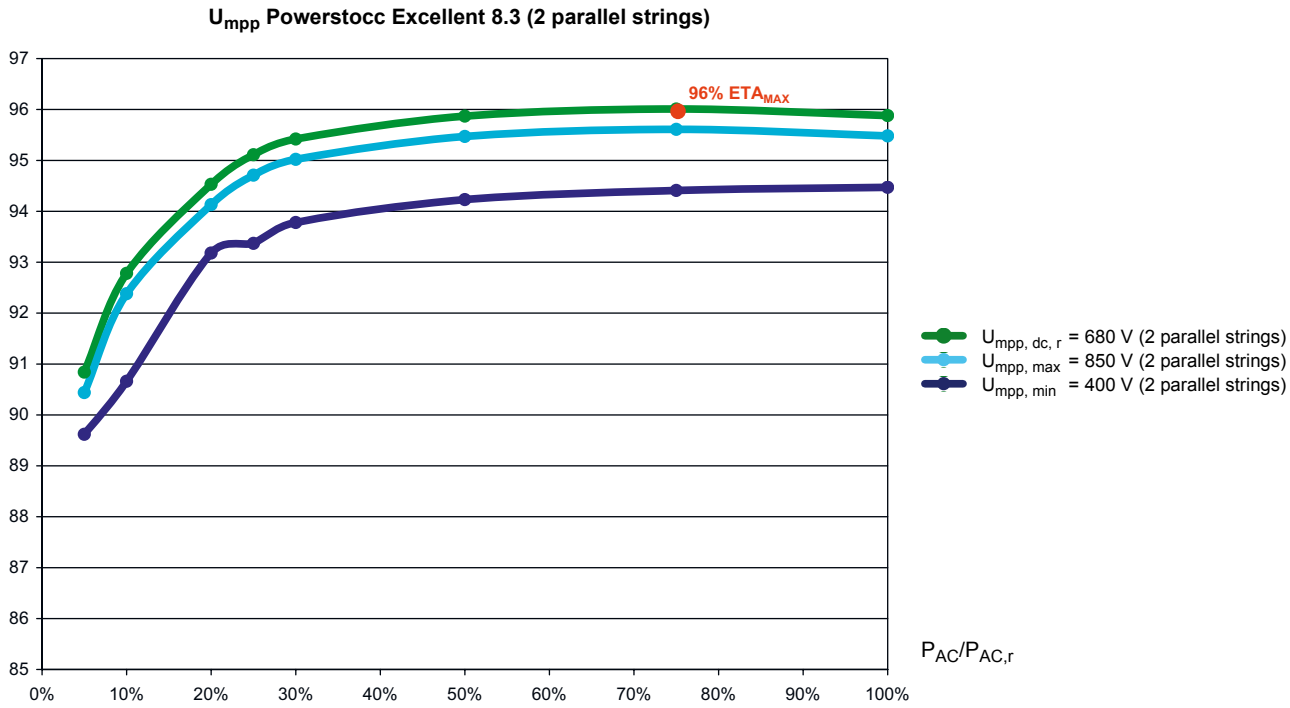

Fig. 5: Efficiency rate characteristic curves Powerstocc Excellent 8.3

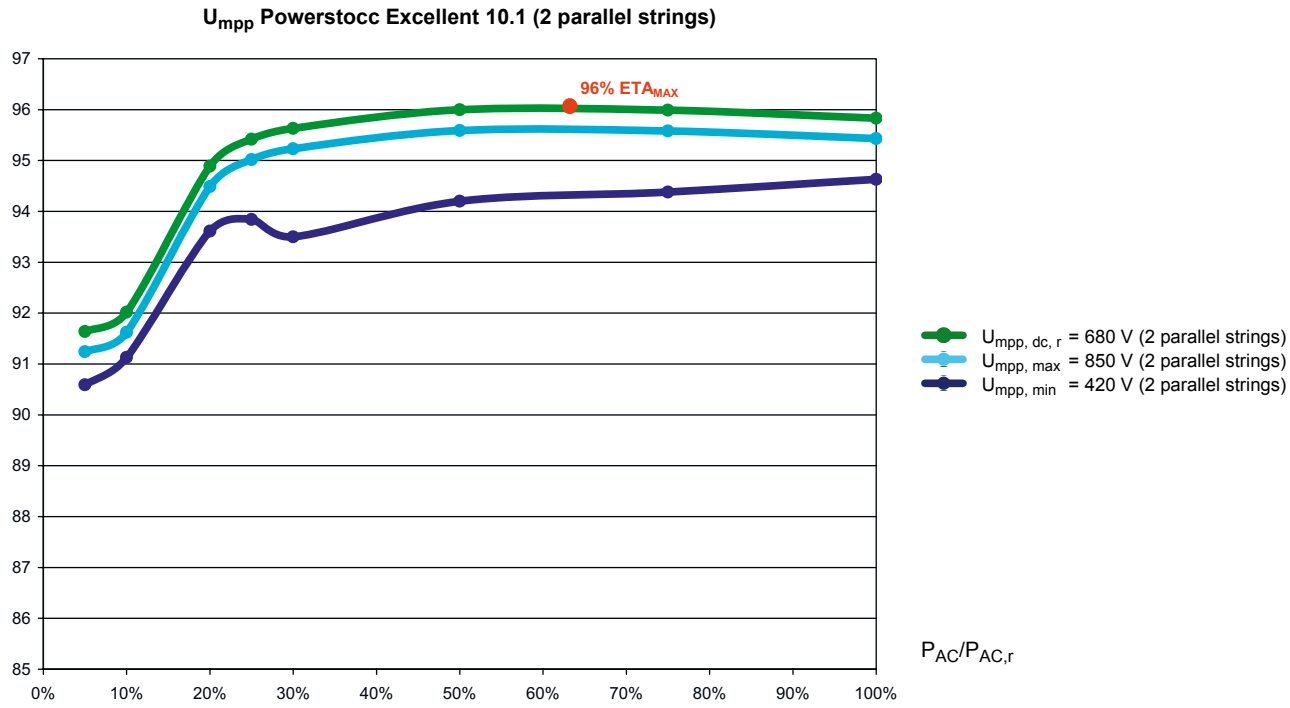

Fig. 6: Efficiency rate characteristic curves Powerstocc Excellent 10.1

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