EN

1 Extended technical Data

1.1 KACO blueplanet 100 NX3

AC-Power				
Inverter power nominal	100 kVA			
Inverter power maximal	100 kVA			
Rated current (In)	144,3 A			
Contribution to short circuit current continuous (max output fault current)	3 x 182,66 A			
Power electronics type	IGBT-MLI (self-commutated)			
Rated operating voltage	400 V			
cos phi nominal	≈ 0.80 ind ...0.80 cap			
Grid connection	Three-phase			
Impedance at 165 Hz	RSer = 3,92 Ω, XSer = -4,4 Ω, RPar = 8,95 Ω, XPar = 7,98 Ω			
Impedance at 175 Hz	RSer = 4,23 Ω, XSer = -4,2 Ω, RPar = 8,41 Ω, XPar = 8,55 Ω			

Operating behaviour in the event of a short circuit at the inverter output				
Contribution to peak short-circuit current (îp)	343,2 A			
Contribution to the initial short-circuit alternating current (Ik" first single period effective value)	190,2 A			

Power quality characteristics				
Max. number of switching operations, N_{10}	10			
Max. number of switching operations, N_{120}	120			
Case of switching operation	Cut-in at 10 % of rated power			
Grid impedance angle	30°	50°	70°	85°
Flicker step factor [kf(ψk)]	0,11	0,10	0,08	0,07
Voltage change factor [ku(ψk)]	0,19	0,18	0,15	0,13
Maximum inrush current factor [ki,max]	0,13			
Maximum inrush current factor (transient only)	0,09			

Case of switching operation	Cut-in at 100 % of rated power			
Grid impedance angle	30°	50°	70°	85°
Flicker step factor [kf(ψk)]	0,95	0,75	0,46	0,22
Voltage change factor [ku(ψk)]	0,88	0,69	0,41	0,17
Maximum inrush current factor [ki,max]	1,01			
Maximum inrush current factor (transient only)	0,62			

Case of switching operation	Service disconnection at rated power			
Description of the service disconnection procedure	Disconnection by the DC-switch			
Grid impedance angle	30°	50°	70°	85°
Flicker step factor [kf(ψk)]	0,58	0,45	0,28	0,15
Voltage change factor [ku(ψk)]	1,00	0,76	0,51	0,26
Maximum inrush current factor [ki,max]	1,01			
Worst case over all switching operations	1,01			

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Note: $S_{k,fic}/S_n$ in the fictitious grid was set to	20			
Flicker				
Grid impedance angle	30°	50°	70°	85°
Flicker step factor [C(ψk)]	0,60	0,57	0,59	0,62
Short term flicker [Pst]	0,03	0,03	0,03	0,03
Note: $S_{k,fic}/S_n$ in the fictitious grid was set to	20			

Injection of DC currents

A converter must not feed in more than 0.5% of its rated current or a maximum of 20 mA (whichever is higher) as direct current.

P_{bin} [% P_n]	$P_{bin,eval}$ [% P_n]	P kW]	$I_{DCcmp\ L1}$ [mA]	$I_{DCcmp\ L2}$ [mA]	$I_{DCcmp\ L3}$ [mA]	$I_{DCcmp\ L1}$ [% I_n]	$I_{DCcmp\ L2}$ [% I_n]	$I_{DCcmp\ L3}$ [% I_n]
0	3,00	-2,76	-35,85	134,31	-104,99	-0,025%	0,093%	-0,073%
10	10,00	-10,19	-10,78	116,33	-118,56	-0,007%	0,081%	-0,082%
20	20,00	-20,39	-12,39	103,54	-107,17	-0,009%	0,072%	-0,074%
30	33,00	-33,17	-24,42	161,09	-156,79	-0,017%	0,112%	-0,109%
40	40,00	-40,38	-22,34	163,41	-158,66	-0,015%	0,113%	-0,110%
50	50,00	-50,35	-14,27	153,19	-159,56	-0,010%	0,106%	-0,111%
60	60,00	-60,32	-11	148,53	-157,79	-0,008%	0,103%	-0,109%
70	70,00	-70,29	69,08	186,56	-277,4	0,048%	0,129%	-0,192%
80	80,00	-80,01	0,19	202,1	-227,91	0,000%	0,140%	-0,158%
90	90,00	-89,73	-6	203,64	-220,19	-0,004%	0,141%	-0,144%
100	100,00	-99,72	-42,53	207,3	-193,09	-0,029%	0,144%	-0,129%

Tab. 1: DC-Injection measurement values

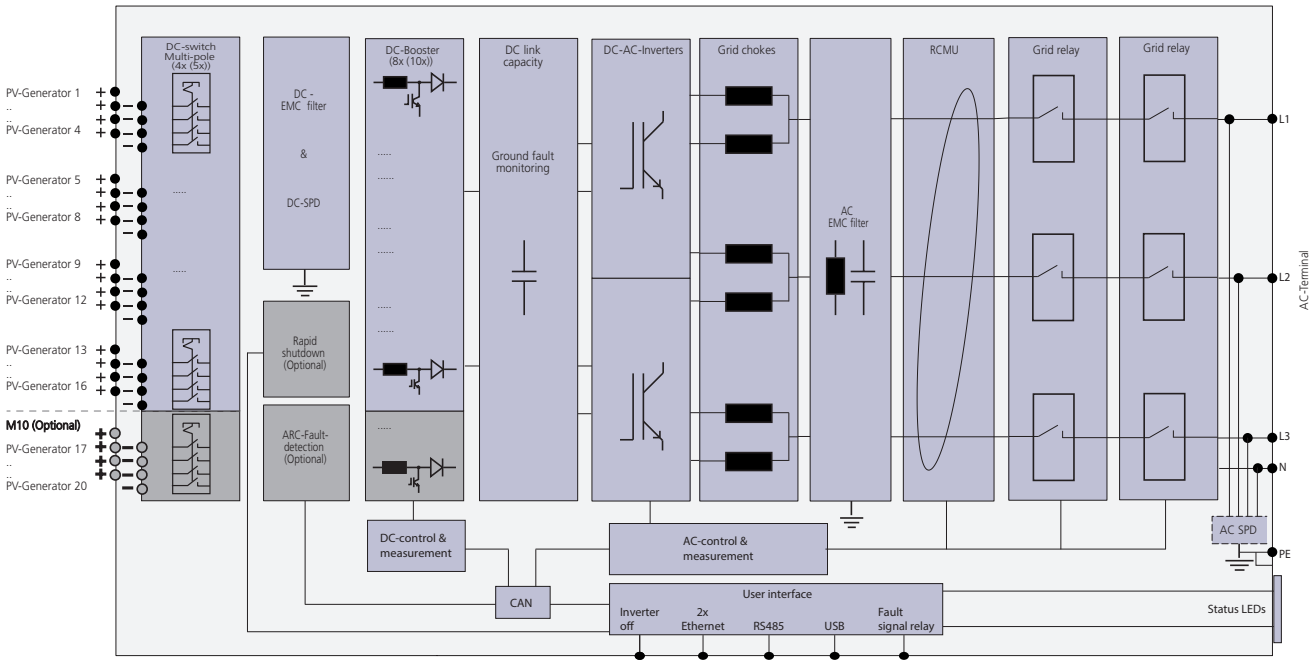

Fig. 1: Block schema blueplanet 100-125 NX3

Harmonics 50 Hz		
	[A]	**[% In]**
1	144,3	99,08
2	0,377	0,26
3	0,145	0,10
4	0,363	0,25
5	2,176	1,49
6	0,145	0,10
7	1,160	0,80
8	0,160	0,11
9	0,174	0,12
10	0,189	0,13
11	1,015	0,70
12	0,102	0,07
13	0,986	0,68
14	0,073	0,05
15	0,131	0,09
16	0,102	0,07
17	0,450	0,31
18	0,044	0,03
19	0,479	0,33
20	0,044	0,03
21	0,073	0,05
22	0,044	0,03
23	0,189	0,13
24	0,029	0,02
25	0,218	0,15
26	0,029	0,02
27	0,029	0,02

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Harmonics 50 Hz		
	[A]	[% In]
28	0,015	0,01
29	0,087	0,06
30	0,015	0,01
31	0,102	0,07
32	0,015	0,01
33	0,015	0,01
34	0,015	0,01
35	0,029	0,02
36	0,015	0,01
37	0,058	0,04
38	0,015	0,01
39	0,015	0,01
40	0,015	0,01
41	0,015	0,01
42	0,015	0,01
43	0,029	0,02
44	0,015	0,01
45	0,015	0,01
46	0,015	0,01
47	0,015	0,01
48	0,015	0,01
49	0,015	0,01
50	0,015	0,01

Tab. 2: Harmonics 50 Hz

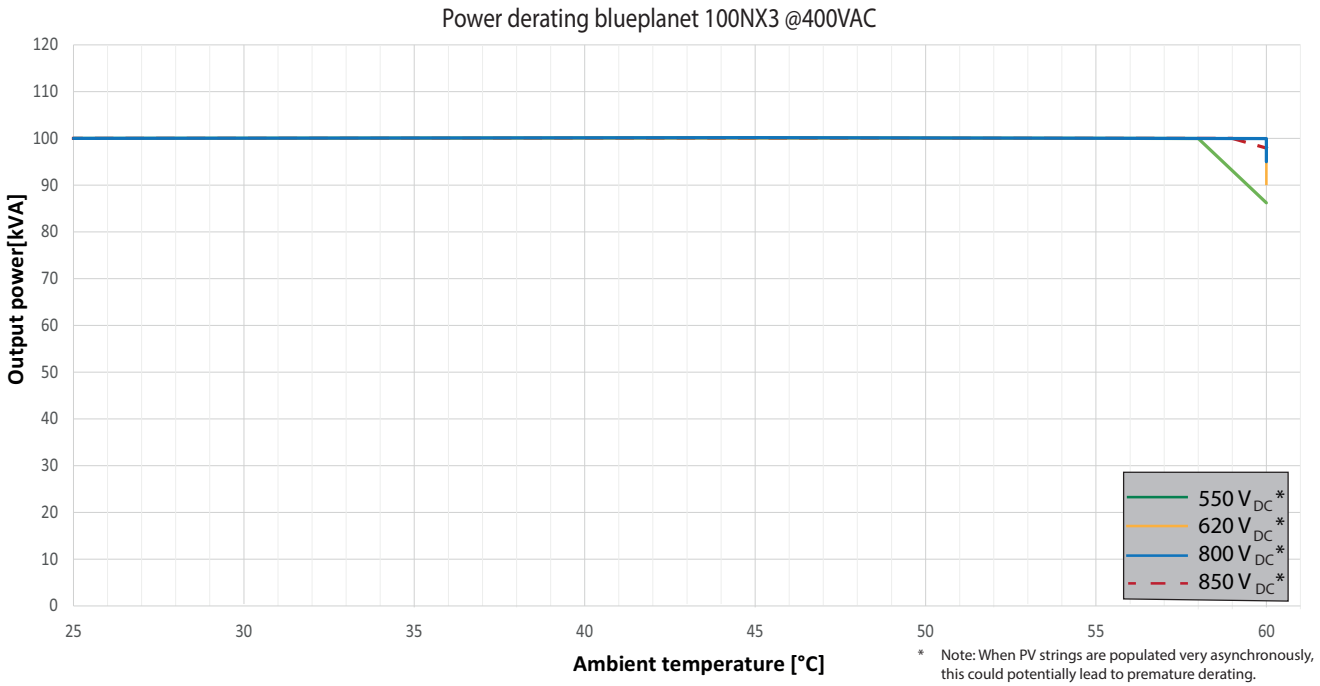

Fig. 2: Power derating blueplanet 100 NX3

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Efficiency characteristic

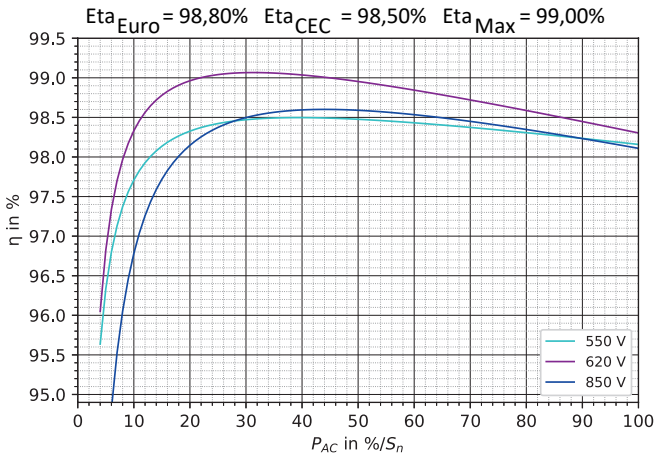

Fig. 3: 2D Diagram blueplanet 100 NX3

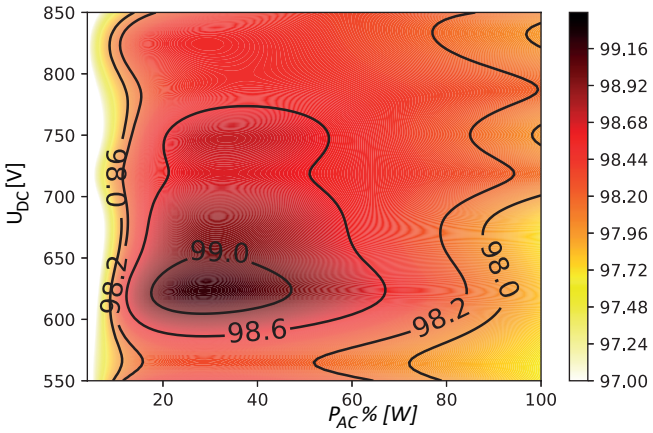

Fig. 4: 3D Diagram blueplanet 100 NX3

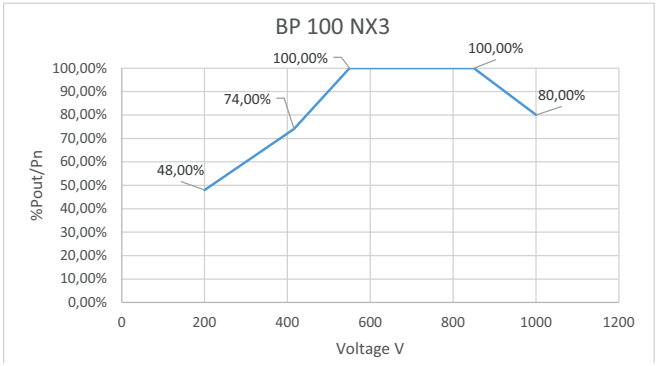

Fig. 5: 2D Diagram %Pout/Pn vs Voltage 100 NX3 M8/M10

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1.2 KACO blueplanet 125 NX3

AC-Power				
Inverter power nominal	125 kVA			
Inverter power maximal	125 kVA			
Rated current (In)	180,4 A			
Contribution to short circuit current continuous (max output fault current)	3 x 182,66 A			
Power electronics type	IGBT-MLI (self-commutated)			
Rated operating voltage	400 V			
cos phi nominal	≈ 0.80 ind ...0.80 cap			
Grid connection	Three-phase			
Impedance at 165 Hz	RSer = 3,92 Ω, XSer = -4,4 Ω, RPar = 8,95 Ω, XPar = 7,98 Ω			
Impedance at 175 Hz	RSer = 4,23 Ω, XSer = -4,2 Ω, RPar = 8,41 Ω, XPar = 8,55 Ω			

Operating behaviour in the event of a short circuit at the inverter output				
Contribution to peak short-circuit current (îp)	343,2 A			
Contribution to the initial short-circuit alternating current (Ik" first single period effective value)	190,2 A			

Power quality characteristics				
Max. number of switching operations, N_{10}	10			
Max. number of switching operations, N_{120}	120			
Case of switching operation	Cut-in at 10 % of rated power			
Grid impedance angle	30°	50°	70°	85°
Flicker step factor [kf(ψk)]	0,11	0,10	0,08	0,07
Voltage change factor [ku(ψk)]	0,19	0,18	0,15	0,13
Maximum inrush current factor [ki,max]	0,13			
Maximum inrush current factor (transient only)	0,09			
Case of switching operation	Cut-in at 100 % of rated power			
Grid impedance angle	30°	50°	70°	85°
Flicker step factor [kf(ψk)]	0,95	0,75	0,46	0,22
Voltage change factor [ku(ψk)]	0,88	0,69	0,41	0,17
Maximum inrush current factor [ki,max]	1,01			
Maximum inrush current factor (transient only)	0,62			
Case of switching operation	Service disconnection at rated power			
Description of the service disconnection procedure	Disconnection by the DC-switch			
Grid impedance angle	30°	50°	70°	85°
Flicker step factor [kf(ψk)]	0,58	0,45	0,28	0,15
Voltage change factor [ku(ψk)]	1,00	0,76	0,51	0,26
Maximum inrush current factor [ki,max]	1,01			
Worst case over all switching operations	1,01			
Note: $S_{k,fic}/S_n$ in the fictitious grid was set to	20			

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Flicker				
Grid impedance angle	30°	50°	70°	85°
Flicker step factor [C(ψk)]	0,59	0,59	0,62	0,68
Short term flicker [Pst]	0,03	0,03	0,03	0,03
Note: $S_{k,fic}/S_n$ in the fictitious grid was set to	20			

Injection of DC currents
A converter must not feed in more than 0.5% of its rated current or a maximum of 20 mA (whichever is higher) as direct current.

P_{bin} [% P_n]	$P_{bin,\ e\ val}$ [% P_n]	P kW]	$I_{DCcmp\ L1}$ [mA]	$I_{DCcmp\ L2}$ [mA]	$I_{DCcmp\ L3}$ [mA]	$I_{DCcmp\ L1}$ [% I_n]	$I_{DCcmp\ L2}$ [% I_n]	$I_{DCcmp\ L3}$ [% I_n]
0	3,00	-3,4	-31,53	101,77	-98,95	-0,017%	0,056%	-0,055%
10	10,00	-12,13	-10,11	120,04	-120,42	-0,006%	0,067%	-0,067%
20	20,00	-24,77	-22,59	114,83	-106,07	-0,013%	0,064%	-0,059%
30	30,00	-37,62	-19,08	120,21	-120,51	-0,011%	0,067%	-0,067%
40	40,00	-50,09	0,61	122,1	-145,03	0,000%	0,068%	-0,08%
50	50,00	-62,57	-2,41	127,27	-145,08	-0,001%	0,071%	-0,08%
60	60,00	-75,02	-10,06	137,88	-148,97	-0,006%	0,076%	-0,083%
70	70,00	-87,48	-10,99	154,5	-166,88	-0,006%	0,086%	-0,092%
80	80,00	-99,91	-6,26	175,08	-192,78	-0,003%	0,097%	-0,107%
90	90,00	-112,31	-24,54	193,51	-196,27	-0,014%	0,107%	-0,109%
100	100,00	-125,12	-97,62	145,99	-75,07	-0,054%	0,081%	-0,042%

Tab. 3: DC-Injection measurement values

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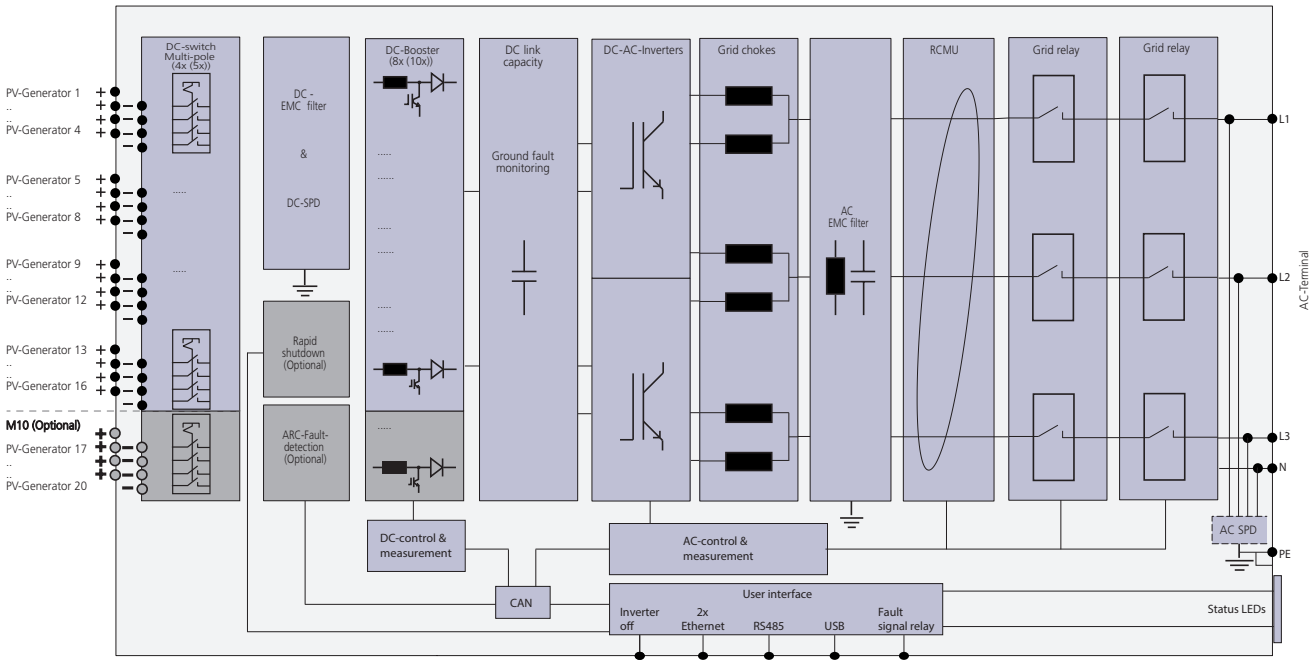

Fig. 6: Block schema blueplanet 100-125 NX3

Harmonics 50 Hz		
	[A]	**[% In]**
1	180,4	98,84
2	0,545	0,30
3	0,182	0,10
4	0,363	0,20
5	2,035	1,12
6	0,145	0,08
7	1,163	0,64
8	0,182	0,10
9	0,164	0,09
10	0,182	0,10
11	0,927	0,51
12	0,109	0,06
13	0,854	0,47
14	0,091	0,05
15	0,127	0,07
16	0,109	0,06
17	0,400	0,22
18	0,055	0,03
19	0,400	0,22
20	0,036	0,02
21	0,055	0,03
22	0,036	0,02
23	0,164	0,09
24	0,018	0,01
25	0,182	0,10
26	0,018	0,01
27	0,018	0,01

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Harmonics 50 Hz		
	[A]	[% In]
28	0,018	0,01
29	0,073	0,04
30	0,018	0,01
31	0,109	0,06
32	0,018	0,01
33	0,018	0,01
34	0,018	0,01
35	0,036	0,02
36	0,018	0,01
37	0,055	0,03
38	0,018	0,01
39	0,018	0,01
40	0,018	0,01
41	0,018	0,01
42	0,018	0,01
43	0,036	0,02
44	0,018	0,01
45	0,018	0,01
46	0,018	0,01
47	0,018	0,01
48	0,018	0,01
49	0,018	0,01
50	0,018	0,01

Tab. 4: Harmonics 50 Hz

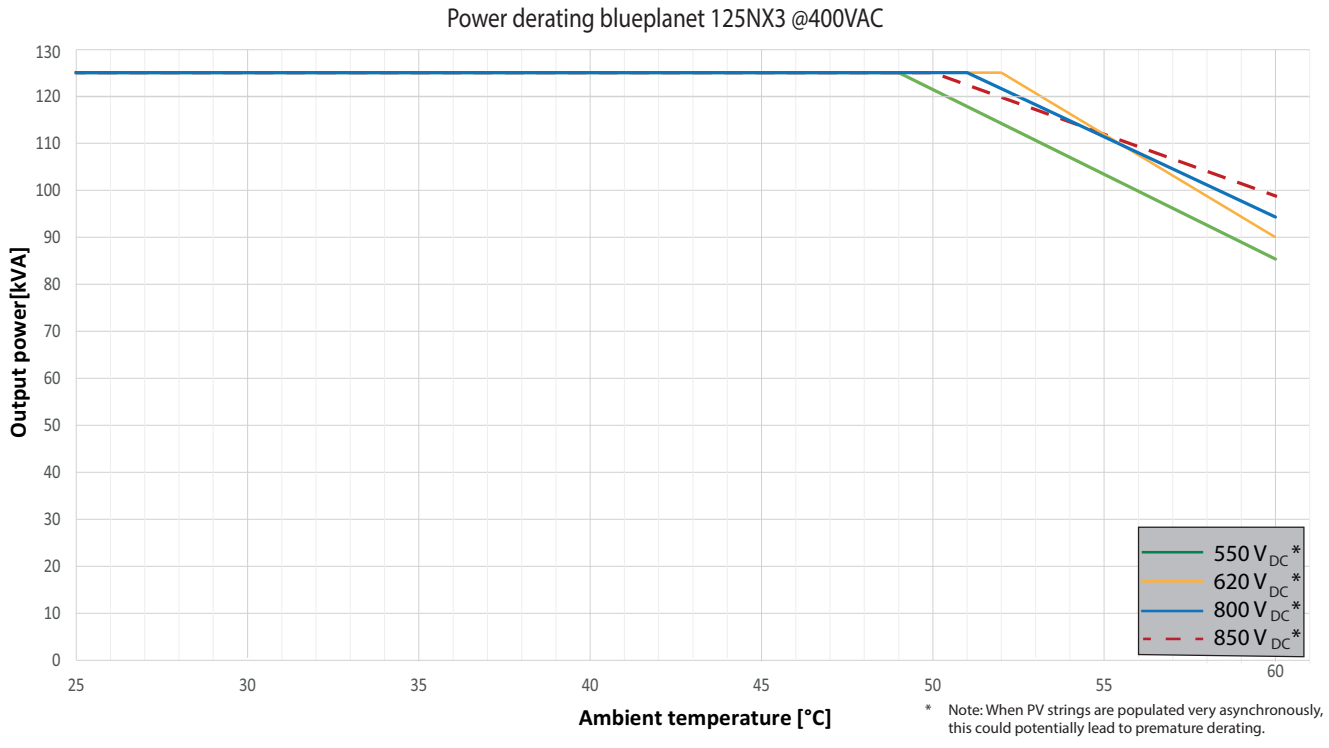

Fig. 7: Power-derating blueplanet 125 NX3

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Efficiency characteristic

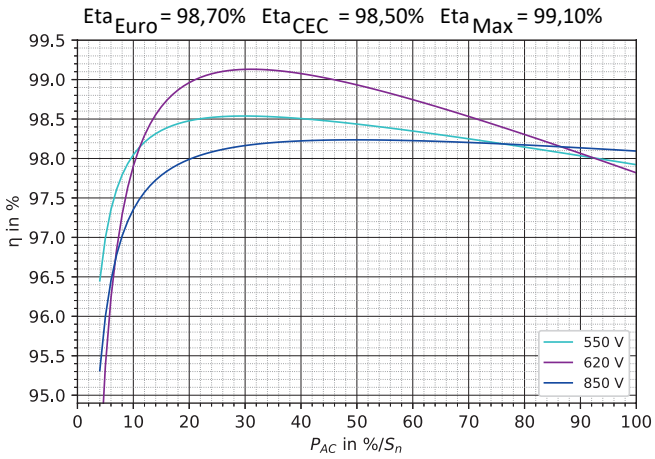

Fig. 8: 2D Diagram blueplanet 125 NX3

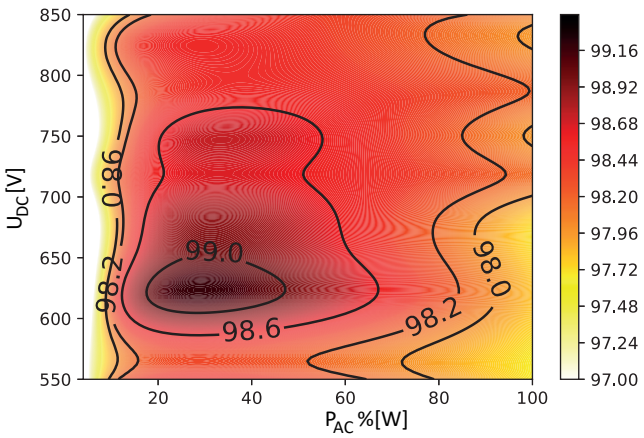

Fig. 9: 3D diagram blueplanet 125 NX3

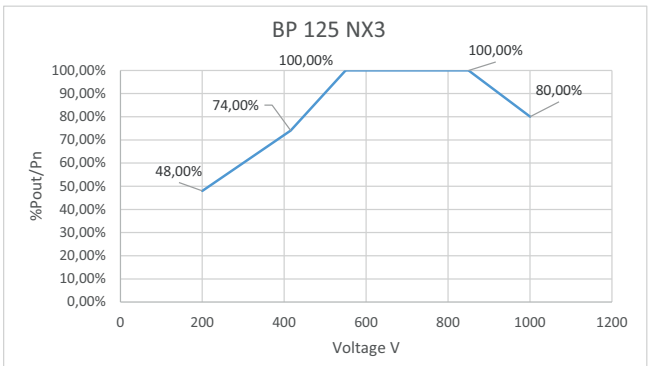

Fig. 10: 2D Diagram %Pout/Pn vs Voltage 125 NX3 M8/M10

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