

Table 5-1 Power modules in the 1-axis version

6SN1123–1AA0– □=0/1 Internal cooling □=2 Hose cooling 6SN1124–1AA0– □= External cooling ¹⁾		0HA□	0AA□	0BA□	0CA□	0DA□	0LA□	0EA□	0FA□	0JA□	0KA□
Mounting frame external cooling 6SN1162–0BA04–		0AA□			0FA□	0BA□	0CA□		0EA□		
Type of cooling		Non–ventilated		Fan							
For operation of induction motors											
Nominal current I _n	A _{eff}	3	5	8	24	30	45	60	85	120	200
Current for S6–40% I _{S6–40%}	A _{eff}	3	5	10	32	40	60	80	110	150	250
Peak current I _{max}	A _{eff}	3	8	16	32	51	76	102	127	193	257
Inverter pulse frequency f ₀	kHz	3.2									
Derating factor X _L	%	50				55		50		55	
Power loss, total P _{Vtot}	W	30	40	74	260	320	460	685	850	1290	2170
Power loss, internal P _{Vint}	W	12	16	29	89	32	19	30	100	190	325
Power loss, external P _{Vext}	W	18	24	45	171	288	441	655	750	1100	1845
For operation of synchronous motors											
Nominal current I _n	A _{eff}	3	5	9	18	28	42	56	70	100	140
Peak current I _{max}	A _{eff}	6	10	18	36	56	64	112	140	100	210
Inverter pulse frequency f ₀	kHz	4									
Derating factor X _L	%	55			50			55			
Power loss, total P _{Vtot}	W	35	50	90	190	300	460	645	730	1300	1910
Power loss, internal P _{Vint}	W	14	19	35	65	30	25	25	90	170	250
Power loss, external P _{Vext}	W	21	31	55	125	270	435	620	640	1130	1660
General technical data for the regulated infeed											
Input voltage	V DC	Regulated: 600 V or 625 V DC, unregulated: U _{DC link} =U _{Supply} • 1.35									
Maximum output voltage	V _{eff}	U _{a_max} = U _{DC link} /1.4									
Minimum motor current I _{min} ⁵⁾	A	0.6	1.1	1.8	3.6	5.7	8.5	11	14	21	28
Transistor limit current	A	8	15	25	50	80	108	160	200	300	400
Efficiency		0.98									
Module width	mm	50				100	150		300 ²⁾		
Weight, (incl. packing) approx.											
Internal cooling	kg	5,6	5,6	5,7	6,1	8,6	10,3	10,3	17,3	20,7	22,9
External cooling	kg	5,2	5,3	5,6	5,9	8,4	12,2	12,2	16,0	16,3	18,4
Hose cooling	kg								20,4		
Maximum air flow of fan (volumetric flow, unobstructed flow per fan)	m ³ /hr	–	–	19	29	56	2x56	2x56	2x56 ³⁾	400	400
Motor connection		Connectors					Terminals				

- 1) For a module width of 300 mm with external cooling, mounting frames are required that must be separately ordered. The fan assembly required to mount the built-on fan is included in the scope of supply of the mounting frame. The built-on fan must be separately ordered! Mounting frames are also available for smaller module widths. However, these are not required if openings are cut out in the rear cabinet panel for the module heatsinks as shown in this Configuration Manual.
- 2) For 6SN1123-1AA0□–0JA□/0KA□ and 6SN1124-1AA0□–0FA□/–0JA□/–0KA□, the built-on fan 6SN1162-0BA02-0AA2 is required.
- 3) Is applicable for internal cooling. For external cooling with mounted fan 2) 400 m3/h

5.4 Current reduction/derating

5.4.4 Calculation examples

**Temperature/
installation
altitude derating**

- Supplementary conditions

Power module: 6SN1123-1AA0□-0EA1

Operating mode: FD

Inverter pulse frequency: 6.3 kHz

Installation altitude 2000 m above sea level

Ambient temperature 45 °C

$$X_L = 55\%$$

$$f_0 = 4.0 \text{ kHz}$$

$$I_N = 56 \text{ A}$$

$$I_{\max} = 112 \text{ A}$$

- Determining the derating factors

$$X_T = 100\% - \frac{(100\% - 55\%) \cdot (6.3 \text{ kHz} - 4.0 \text{ kHz})}{8.0 \text{ kHz} - 4.0 \text{ kHz}} = 74.125 \%$$

$$X_{TU} = 100\% - 2.5\% \cdot (45 \text{ °C} - 40 \text{ °C}) = 87.5\%$$

$$X_H \approx 85\%$$

- Calculating the permissible current values

$$I_{N\text{red}} = I_N \cdot X_T \cdot X_{TU} \cdot X_H = 56 \text{ A} \cdot 0.74125 \cdot 0.875 \cdot 0.85 = 30.8 \text{ A}$$

$$I_{\max\text{red}} = I_{\max} \cdot X_T \cdot X_{TU} \cdot X_H = 112 \text{ A} \cdot 0.74125 \cdot 0.875 \cdot 0.85 = 61.7 \text{ A}$$

Current reduction

Power module: 6SN1123-1AA0□-0EA1

Operating mode: FD

Inverter pulse frequency: 6.3 kHz

Installation altitude <1000 m above sea level

Ambient temperature <40 °C

$$X_L = 55\%$$

$$f_0 = 4.0 \text{ kHz}$$

$$I_N = 56 \text{ A}$$

$$I_{\max} = 112 \text{ A}$$

$$X_T = 100\% - \frac{(100\% - 55\%) \cdot (6.3 \text{ kHz} - 4.0 \text{ kHz})}{8.0 \text{ kHz} - 4.0 \text{ kHz}} = 74.125 \%$$

$$\Rightarrow I_{N6.3} = I_N \cdot X_T = 56 \text{ A} \cdot 0.74125 = 41.5 \text{ A}$$

$$\Rightarrow I_{\max 6.3} = I_{\max} \cdot X_T = 112 \text{ A} \cdot 0.74125 = 83.0 \text{ A}$$

Derating example

- Installation altitude: e.g. Puebla, Mexico, 2200 m above sea level
Derating to 83% I_N necessary!
- Temperature: e.g. internal temperature of the switchgear cabinet with 45 °C,
no air-conditioner
Derating to 87% I_N necessary!
- Power module clock cycle frequency 6SN1123-1AA0-0EA2
 $X_L = 50\%$: e.g. for a 6.3 kHz spindle application
Derating to 68% I_N necessary!

Result:

Derating for the power unit to:

$83\% \cdot 87\% \cdot 68\% \approx 50\% I_N$ required!

Derating for the line supply infeed to:

$83\% \cdot 87\% \approx 72\% I_N$ required!

11.1 Fan

Table 11-1 Fan replacement options, continued

Designation	Order No. (MLFB)	Module width [mm]	Fan spare parts (Order No.)
PM module, 2x50 A internal	6SN1123-1AB00-0CA□ ¹⁾	100	6SL3162-0AD00-0AA□
PM module, 2x50 A external	6SN1124-1AB00-0CA□ ¹⁾	100	6SL3162-0AB00-0AA□ ⁴⁾
PM module, 80 A internal	6SN1123-1AA00-0DA□ ¹⁾	100	6SL3162-0AD00-0AA□
PM module, 80 A external	6SN1124-1AA00-0DA□ ¹⁾	100	6SL3162-0AD00-0AA□
PM module, 108 A internal	6SN1123-1AA00-0LA□ ¹⁾	150	6SL3162-0AF00-0AA□
PM module, 108 A external	6SN1124-1AA00-0LA□ ¹⁾	150	6SL3162-0AF00-0AA□
PM module, 160 A internal	6SN1123-1AA00-0EA□	150	6SL3162-0AF00-0AA□
PM module, 160 A external	6SN1124-1AA00-0EA□	150	6SL3162-0AF00-0AA□
PM module, 200 A external	6SN1123-1AA01-0FA□	300	— ²⁾
PM module, 200 A Extern	6SN1124-1AA01-0FA□	300	6SN1162-0BA02-0AA□
PM module, 200 A internal/pipe cooling	6SN1123-1AA02-0FA□	300	6SN1162-0BA02-0AA□ ³⁾
PM module, 300 A internal/pipe cooling	6SN1123-1AA00-0JA□	300	6SN1162-0BA02-0AA□ ³⁾
PM module, 300 A external	6SN1124-1AA00-0JA□	300	6SN1162-0BA02-0AA□
PM module, 400 A internal/pipe cooling	6SN1123-1AA00-0KA□	300	6SN1162-0BA02-0AA□ ³⁾
PM module, 400 A external	6SN1124-1AA00-0KA□	300	6SN1162-0BA02-0AA□

1) Fan replacement possible from MLFBs with final number 2 and higher. MLFB final number < 2 means that the fan must be replaced by Siemens service!

2) Fan cannot be replaced

3) MLFB for standard mounting fans. Order designation for replacement fans, pipe cooling: GWE-000000587915. For additional spare/replacement parts of the pipe cooling, refer to the dimension drawings.

4) 2x are required