

3 Description

3.1 Applications

Series 6RA70 SIMOREG DC MASTER converters are fully digital, compact units for three-phase supply which supply the armature and field of variable-speed DC drives with rated armature currents of between 15A and 2000A. The compact converters can be connected in parallel to supply currents of up to 10000A. The field circuit can be supplied with currents of up to 40A (current levels depend on the armature rated current).

3.2 Design

Series 6RA70 SIMOREG DC MASTER converters are characterized by their compact, space-saving construction. Their compact design makes them particularly easy to service and maintain since individual components are readily accessible. The electronics box contains the basic electronic circuitry as well as any supplementary boards.

All SIMOREG DC MASTER units are equipped with a PMU simple operator panel mounted in the converter door. The panel consists of a five-digit, seven-segment display, three LEDs as status indicators and three parameterization keys. The PMU also features connector X300 with a USS interface in accordance with the RS232 or RS485 standard.

The panel provides all the facilities for making adjustments or settings and displaying measured values required to start up the converter.

The OP1S optional converter operator panel can be mounted either in the converter door or externally, e.g. in the cubicle door. For this purpose, it can be connected up by means of a 5 m long cable. Cables of up to 200 m in length can be used if a separate 5 V supply is available. The OP1S is connected to the SIMOREG via connector X300. The OP1S can be installed as an economic alternative to control cubicle measuring instruments which display physical measured quantities. The OP1S features an LCD with 4 x 16 characters for displaying parameter names in plaintext. German, English, French, Spanish and Italian can be selected as the display languages. The OP1S can store parameter sets for easy downloading to other devices.

The converter can also be parameterized on a standard PC with appropriate software connected to the serial interface on the basic unit. This PC interface is used during start-up, for maintenance during shutdown and for diagnosis in operation. Furthermore, converter software upgrades can be loaded via this interface for storage in a Flash memory.

On single-quadrant converters, the armature is supplied via a fully controlled three-phase bridge B6C and, on four-quadrant devices, via two fully controlled three-phase bridges in circulating-current-free, inverse-parallel connection (B6)A(B6)C.

The field is supplied via a single-phase, branch-pair half-controlled 2-pulse bridge connection B2HZ.

The frequencies of the armature and field supply voltages may be different (in a range from 45 to 65 Hz). The armature circuit supply phase sequence is insignificant.

For converters with 15A to 850A (1200A at 400V supply voltage) rated DC current, the power section for armature and field is constructed of isolated thyristor modules. The heat sink is thus electrically isolated. On devices with a higher rated DC current, the power section for the armature circuit is constructed of disk thyristors and heat sinks (thyristor assemblies) at voltage potential. The housing and terminal covers on power connections provide protection against accidental contact for operators working in the vicinity. All connecting terminals are accessible from the front.

The power section cooling system is monitored by means of temperature sensors.

3.2.1 Special features of devices with 460V rated connection voltage

- This device series is available with rated direct currents of 30A to 1200A.
- Devices with rated direct currents of 450A to 1200A are equipped with a 1-phase fan.
- On devices with rated direct currents of 60A to 850A, the power terminals are located on the underside and on the top of the device.

3.3 Mode of operation

All open-loop and closed-loop drive control and communication functions are performed by two powerful microprocessors. Drive control functions are implemented in the software as program modules which can be "wired up" by parameters.

The rated DC currents (continuous DC currents), load class I, specified on the rated plate can be exceeded by 180%, the permissible overload during being dependent on individual converters. The microprocessor calculates the current I^2t value of the power section cyclically to ensure that the thyristors are not damaged in overload operation.

A selection table for overload operation can be found in Section 9 "Description of functions".

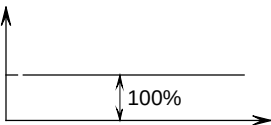
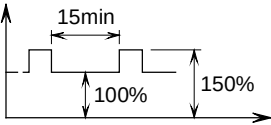
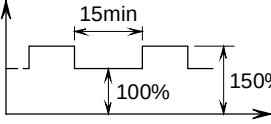
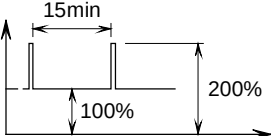
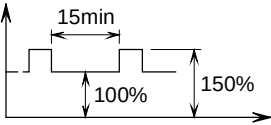
Converters self-adapt to the frequency of the available supply voltage in the range from 45 to 65 Hz (armature and field are independent)

3.4 Technical data

3.4.1 Load types

To adapt the SIMOREG DC Master to the load profile of the working machine as efficiently as possible, you can dimension it using the load cycle.

The setting on the SIMOREG DC Master is made in parameter P067.

Load class	Load for converter	Load cycle
DC I (P067=1)	$I_{DC I}$ continuous (I_{dN})	
DC II (P067=2)	$I_{DC II}$ for 15 min and $1.5 \times I_{DC II}$ for 60 s	
DC III (P067=3)	$I_{DC III}$ for 15 min and $1.5 \times I_{DC III}$ for 120 s	
DC IV (P067=4)	$I_{DC IV}$ for 15 min and $2 \times I_{DC IV}$ for 10 s	
US rating (P067=5)	I_{US} for 15 min and $1.5 \times I_{US}$ for 60 s Note: In this setting, an ambient or coolant temperature of 45°C is permissible for all device types.	

3.4.1.1 Load cycles for 1Q applications

Recommended SIMOREG DC Master	Load cycles									
	Tu	DC I	DC II		DC III		DC IV		US rating Tu=45°C	
		continuous	15min 100%	60sec 150%	15min 100%	120 sec 150%	15min 100%	10sec 200%	15min 100%	60sec 150%
	° C	A	A	A	A	A	A	A	A	A
400V, 1Q										
6RA7018-6DS22	45	30	25,0	37,5	24,0	36,0	22,4	44,8	25,0	37,5
6RA7025-6DS22	45	60	51,0	76,5	50,0	75,0	46,5	93,0	51,0	76,5
6RA7028-6DS22	45	90	74,0	111,0	72,0	108,0	66,0	132,0	74,0	111,0
6RA7031-6DS22	45	125	105,0	158,0	100,0	150,0	95,0	190,0	105,0	158,0
6RA7075-6DS22	40	210	165,0	247,5	161,0	241,5	137,0	274,0	158,0	237,0
6RA7078-6DS22	40	280	227,0	340,5	218,0	327,0	202,0	404,0	216,0	324,0
6RA7081-6DS22	40	400	290,0	435,0	281,0	421,5	244,0	488,0	276,0	414,0
6RA7085-6DS22	40	600	463,0	694,5	446,0	669,0	415,0	830,0	443,0	664,5
6RA7087-6DS22	40	850	652,0	978,0	622,0	933,0	610,0	1220,0	620,0	930,0
6RA7091-6DS22	40	1200	880,0	1320,0	850,0	1275,0	790,0	1580,0	850,0	1275,0
6RA7093-4DS22	40	1600	1250,0	1875,0	1210,0	1815,0	1140,0	2280,0	1190,0	1785,0
6RA7095-4DS22	40	2000	1510,0	2265,0	1454,0	2181,0	1390,0	2780,0	1436,0	2154,0
460V, 1Q										
6RA7018-6FS22	45	30	25,0	37,5	24,0	36,0	22,4	44,8	15,0	22,5
6RA7025-6FS22	45	60	51,0	76,5	50,0	75,0	46,5	93,0	30,0	45,0
6RA7028-6FS22	45	90	74,0	111,0	72,0	108,0	66,0	132,0	60,0	90,0
6RA7031-6FS22	45	125	105,0	158,0	100,0	150,0	95,0	190,0	100,0	150,0
6RA7075-6FS22	40	210	165,0	247,5	161,0	241,5	137,0	274,0	140,0	210,0
6RA7078-6FS22	40	280	227,0	340,5	218,0	327,0	202,0	404,0	210,0	315,0
6RA7082-6FS22	40	450	320,0	480,0	311,0	466,5	275,0	550,0	255,0	382,5
6RA7085-6FS22	40	600	463,0	694,5	446,0	669,0	415,0	830,0	430,0	645,0
6RA7087-6FS22	40	850	652,0	978,0	622,0	933,0	610,0	1220,0	510,0	765,0
6RA7091-6FS22	40	1200	880,0	1.320,0	850,0	1275,0	790,0	1580,0	850,0	1275,0
575V, 1Q										
6RA7025-6GS22	45	60	51,0	76,5	50,0	75,0	46,5	93,0	51,0	76,5
6RA7031-6GS22	45	125	105,0	158,0	100,0	150,0	95,0	190,0	105,0	158,0
6RA7075-6GS22	40	210	165,0	247,5	161,0	241,5	137,0	274,0	158,0	237,0
6RA7081-6GS22	40	400	290,0	435,0	281,0	421,5	244,0	488,0	276,0	414,0
6RA7085-6GS22	40	600	463,0	694,5	446,0	669,0	415,0	830,0	443,0	664,5
6RA7087-6GS22	40	800	608,0	912,0	582,0	873,0	560,0	1120,0	578,0	867,0
6RA7090-6GS22	40	1000	736,0	1104,0	714,0	1071,0	652,0	1304,0	700,0	1050,0
6RA7093-4GS22	40	1600	1250,0	1875,0	1210,0	1815,0	1140,0	2280,0	1190,0	1785,0
6RA7095-4GS22	40	2000	1660,0	2490,0	1590,0	2385,0	1570,0	3140,0	1660,0	2490,0
690V, 1Q										
6RA7086-6KS22	40	720	552,0	828,0	528,0	792,0	518,0	1036,0	524,0	786,0
6RA7088-6KS22	40	950	710,0	1065,0	686,0	1029,0	635,0	1270,0	667,0	1000,0
6RA7093-4KS22	40	1500	1150,0	1725,0	1110,0	1665,0	1050,0	2100,0	1100,0	1650,0
6RA7095-4KS22	40	2000	1590,0	2385,0	1520,0	2280,0	1510,0	3020,0	1504,0	2256,0

Recommended SIMOREG DC Master	Load cycles									
	Tu	DC I	DC II		DC III		DC IV		US rating Tu=45°C	
		continuous	15min 100%	60sec 150%	15min 100%	120 sec 150%	15min 100%	10sec 200%	15min 100%	60sec 150%
	° C	A	A	A	A	A	A	A	A	A
830V, 1Q										
6RA7088-6LS22	40	900	664,0	996,0	642,0	963,0	595,0	1190,0	632,0	948,0
6RA7093-4LS22	40	1500	1150,0	1725,0	1110,0	1665,0	1040,0	2080,0	1100,0	1650,0
6RA7095-4LS22	40	1900	1486,0	2229,0	1420,0	2130,0	1400,0	2800,0	1412,0	2118,0

3.4.1.2 Load cycles for 4Q applications

Recommended SIMOREG DC Master	Load cycles									
	Tu	DC I	DC II		DC III		DC IV		US rating Tu=45°C	
		continuous	15min 100%	60sec 150%	15min 100%	120 sec 150%	15min 100%	10sec 200%	15min 100%	60sec 150%
	° C	A	A	A	A	A	A	A	A	A
400V, 4Q										
6RA7013-6DV62	45	15	13,8	20,7	13,4	20,1	12,6	25,2	14,0	20,7
6RA7018-6DV62	45	30	25,0	37,5	24,0	36,0	22,4	44,8	25,0	37,5
6RA7025-6DV62	45	60	53,0	79,5	51,0	76,5	47,0	94,0	53,0	79,5
6RA7028-6DV62	45	90	79,0	118,5	76,0	114,0	72,5	145,0	79,0	118,5
6RA7031-6DV62	45	125	107,0	160,5	104,0	156,0	96,0	192,0	107,0	160,5
6RA7075-6DV62	40	210	165,0	247,5	161,0	241,5	137,0	274,0	158,0	237,0
6RA7078-6DV62	40	280	227,0	340,5	218,0	327,0	202	404,0	216,0	324,0
6RA7081-6DV62	40	400	302,0	453,0	294,0	441,0	250,0	500,0	286,0	429,0
6RA7085-6DV62	40	600	470,0	705,0	454,0	681,0	412,0	826,0	450,0	675,0
6RA7087-6DV62	40	850	660,0	990,0	635,0	952,5	580,0	1160,0	628,0	942,0
6RA7091-6DV62	40	1200	885,0	1327,5	858,0	1287,0	772,0	1544,0	850,0	1275,0
6RA7093-4DV62	40	1600	1250,0	1875,0	1210,0	1815,0	1140,0	2280,0	1190,0	1785,0
6RA7095-4DV62	40	2000	1480,0	2220,0	1435,0	2152,0	1332,0	2664,0	1402,0	2103,0
460V, 4Q										
6RA7018-6FV62	45	30	25,0	37,5	24,0	36,0	22,4	44,8	15,0	22,5
6RA7025-6FV62	45	60	53,0	79,5	51,0	76,5	47,0	94,0	30,0	45,0
6RA7028-6FV62	45	90	79,0	118,5	76,0	114,0	72,5	145,0	60,0	90,0
6RA7031-6FV62	45	125	107,0	160,5	104,0	156,0	96,0	192,0	100,0	150,0
6RA7075-6FV62	40	210	165,0	247,5	161,0	241,5	137,0	274,0	140,0	210,0
6RA7078-6FV62	40	280	227,0	340,5	218,0	327,0	202,0	404,0	210,0	315,0
6RA7082-6FV62	40	450	320,0	480	311,0	466,5	275,0	550,0	255,0	382,5
6RA7085-6FV62	40	600	470,0	705	454,0	681,0	412,0	826,0	430,0	645,0
6RA7087-6FV62	40	850	660,0	990	635,0	953,0	580,0	1160,0	510,0	765,0
6RA7091-6FV62	40	1200	885,0	1327,5	858,0	1287,0	772,0	1544,0	850,0	1275,0

Recommended SIMOREG DC Master	Load cycles									
	Tu	DC I	DC II		DC III		DC IV		US rating Tu=45°C	
		continuous	15min 100%	60sec 150%	15min 100%	120 sec 150%	15min 100%	10sec 200%	15min 100%	60sec 150%
	° C	A	A	A	A	A	A	A	A	A
575V, 4Q										
6RA7025-6GV62	45	60	53,0	79,5	51,0	76,5	47,0	94,0	53,0	79,5
6RA7031-6GV62	45	125	107,0	160,5	104,0	156,0	96,0	192,0	107,0	160,5
6RA7075-6GV62	40	210	165,0	247,5	161,0	241,5	137,0	274,0	158,0	237,0
6RA7081-6GV62	40	400	302,0	453,0	294,0	441,0	250,0	500,0	286,0	429,0
6RA7085-6GV62	40	600	470,0	705,0	454,0	681,0	412,0	826,0	450,0	675,0
6RA7087-6GV62	40	850	660,0	990,0	635,0	952,5	580,0	1160,0	628,0	942,0
6RA7090-6GV62	40	1100	806,0	1209,0	782,0	1173,0	693,0	1386,0	765,0	1148,0
6RA7093-4GV62	40	1600	1250,0	1875,0	1210,0	1815,0	1140,0	2280,0	1190,0	1785,0
6RA7095-4GV62	40	2000	1660,0	2490,0	1590,0	2385,0	1570,0	3140,0	1660,0	2490,0
690V, 4Q										
6RA7086-6KV62	40	760	600,0	900,0	576,0	864,0	536,0	1072,0	570,0	855,0
6RA7090-6KV62	40	1000	738,0	1107,0	716,0	1074,0	642,0	1284,0	702,0	1053,0
6RA7093-4KV62	40	1500	1160,0	1740,0	1130,0	1695,0	1040,0	2080,0	1110,0	1665,0
6RA7095-4KV62	40	2000	1480,0	2220,0	1435,0	2152,0	1332,0	2664,0	1402,0	2103,0
830V, 4Q										
6RA7088-6LV62	40	950	700,0	1050,0	680,0	1020,0	610,0	1220,0	667,0	1000,0
6RA7093-4LV62	40	1500	1160,0	1740,0	1130,0	1695,0	1040,0	2080,0	1110,0	1665,0
6RA7095-4LV62	40	1900	1486,0	2229,0	1420,0	2130,0	1400,0	2800,0	1412,0	2118,0

3.4.2 Converters 3AC 400V, 30A to 125A, 1Q

Order No.		6RA70 . . – 6DS22			
		<u>18</u>	<u>25</u>	<u>28</u>	<u>31</u>
Rated supply voltage armature ¹⁾	V	3AC 400 (+15% / – 20%)			
Rated input current armature ²⁾	A	25	50	75	104
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)			
Rated supply voltage field ¹⁾	V	2AC 400 (+15% / – 20%) ⁷⁾			
Rated frequency	Hz	45 to 65			
Rated DC voltage ¹⁾	V	485			
Rated DC current	A	30	60	90	125
Overload capability ⁶⁾		max. 180% of rated DC current			
Rated output	kW	14,5	29	44	61
Power loss at rated DC current (approx.)	W	163	240	347	400
Rated DC voltage field ¹⁾	V	max. 325			
Rated DC current field	A	5	10		
Operational ambient temperature	°C	0 to 45 at I _{rated} ³⁾ self-cooled			
Storage and transport temperature	°C	– 25 to +70			
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾			
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tachometer or analog setpoint ⁵⁾			
Environmental class DIN IEC 721-3-3		3K3			
Degree of protect. DIN 40050 IEC 144		IP00			
Dimensions (HxWxD)	mm	385x265x239	385x265x283		
Weights (approx.)	kg	11	14	16	16

Explanation at end of list of tables

3.4.3 Converters 3AC 400V, 210A to 600A, 1Q

Order No.		6RA70 . . – 6DS22			
		<u>75</u>	<u>78</u>	<u>81</u>	<u>85</u>
Rated supply voltage armature ¹⁾	V	3AC 400 (+15% / – 20%)			
Rated input current armature ²⁾	A	175	233	332	498
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)			
Rated supply voltage fan	V	DC 24V internal		3AC 400 (±15%) 50Hz 3AC 460 (±10%) 60Hz	
Fan rated current	A			0,24	
Air flow rate	m³/h	100		570	
Fan noise level	dBA	40		73	
Rated supply voltage field ¹⁾	V	2AC 400 (+15% / – 20%) ⁷⁾			
Rated frequency	Hz	45 to 65			
Rated DC voltage ¹⁾	V	485			
Rated DC current	A	210	280	400	600
Overload capability ⁶⁾		max. 180% of rated DC current			
Rated output	kW	102	136	194	291
Power loss at rated DC current (approx.)	W	676	800	1328	1798
Rated DC voltage field ¹⁾	V	max. 325			
Rated DC current field	A	15		25	
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled			
Storage and transport temperature	°C	– 25 to +70			
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾			
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tacho or analog setpoint ⁵⁾			
Environmental class	DIN IEC 721-3-3	3K3			
Degree of protect.	DIN 40050 IEC 144	IP00			
Dimensions (HxWxD)	mm	385x265x283		625x268x318	
Weights (approx.)	kg	16	17	30	

Explanation at end of list of tables

3.4.4 Converters 3AC 400V, 850A to 2000A, 1Q

Order No.		6RA70 . . – 6DS22		6RA70 . . – 4DS22		
		<u>87</u>	<u>91</u>	<u>93</u>	<u>95</u>	
Rated supply voltage armature ¹⁾	V	3AC 400 (+15% / – 20%)				
Rated input current armature ²⁾	A	705	995		1326	1658
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)				
Rated supply voltage fan	V	3AC 400 (±15%) 50Hz 3AC 460 (±10%) 60Hz	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz		3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz	
			50Hz	60Hz	50Hz	60Hz
Fan rated current	A	0,24	1,0	1,25	1,0	1,25
Air flow rate	m³/h	570	1300	1300	2400	2400
Fan noise level	dBA	73	83	87	83	87
Rated supply voltage field ¹⁾	V	2AC 400 (+15% / – 20%) ⁷⁾				
Rated frequency	Hz	45 to 65				
Rated DC voltage ¹⁾	V	485				
Rated DC current	A	850	1200		1600	2000
Overload capability ⁶⁾		max. 180% of rated DC current				
Rated output	kW	412	582		776	970
Power loss at rated DC current (approx.)	W	2420	4525		5710	6810
Rated DC voltage field ¹⁾	V	max. 325				
Rated DC current field	A	30		40		
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled				
Storage and transport temperature	°C	– 25 to +70				
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾				
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tachometer or analog setpoint ⁵⁾				
Environmental class	DIN IEC 721-3-3	3K3				
Degree of protect.	DIN 40050 IEC 144	IP00				
Dimensions (HxWxD)	mm	700x268x362	780x410x362		880x450x500	
Weights (approx.)	kg	40	80		125	

Explanation at end of list of tables

3.4.5 Converters 3AC 460V, 30A to 125A, 1Q

Order No.		6RA70 . . – 6FS22			
		<u>18</u>	<u>25</u>	<u>28</u>	<u>31</u>
Rated supply voltage armature ¹⁾	V	3AC 460 (+15% / – 20%)			
Rated input current armature ²⁾	A	25	50	75	104
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)			
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)			
Rated frequency	Hz	45 to 65			
Rated DC voltage ¹⁾	V	550			
Rated DC current	A	30	60	90	125
Overload capability ⁶⁾		max. 180% of rated DC current			
Rated output	kW	16,5	33	49,5	68,7
Power loss at rated DC current (approx.)	W	172	248	363	417
Rated DC voltage field ¹⁾	V	max. 373			
Rated DC current field	A	5	10		
Operational ambient temperature	°C	0 to 45 at I _{rated} ³⁾ self-cooled			
Storage and transport temperature	°C	– 25 to +70			
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾			
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tachometer or analog setpoint ⁵⁾			
Environmental class	DIN IEC 721-3-3	3K3			
Degree of protect.	DIN 40050 IEC 144	IP00			
Dimensions (HxWxD)	mm	385x265x239	385x265x283		
Weights (approx.)	kg	11	15	17	17

Explanation at end of list of tables

3.4.6 Converters 3AC 460V, 210A to 600A, 1Q

Order No.		6RA70 . . – 6FS22			
		<u>75</u>	<u>78</u>	<u>82</u>	<u>85</u>
Rated supply voltage armature ¹⁾	V	3AC 460 (+15% / – 20%)			
Rated input current armature ²⁾	A	175	233	332	498
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)			
Rated supply voltage fan	V	DC 24V internal		1AC 230 (±10%)	
				50Hz	60Hz
Fan rated current	A			0,55	0,55
Air flow rate	m³/h			570	570
Fan noise level	dBA			73	76
		100			
		40			
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)			
Rated frequency	Hz	45 to 65			
Rated DC voltage ¹⁾	V	550			
Rated DC current	A	210	280	450	600
Overload capability ⁶⁾		max. 180% of rated DC current			
Rated output	kW	115	154	247	330
Power loss at rated DC current (approx.)	W	700	792	1519	1845
Rated DC voltage field ¹⁾	V	max. 373			
Rated DC current field	A	15		25	
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled			
Storage and transport temperature	°C	– 25 to +70			
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾			
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tachometer or analog setpoint ⁵⁾			
Environmental class	DIN IEC 721-3-3	3K3			
Degree of protect.	DIN 40050 IEC 144	IP00			
Dimensions (HxWxD)	mm	385x265x313		625x268x318	
Weights (approx.)	kg	17	18	32	

Explanation at end of list of tables

3.4.7 Converters 3AC 460V, 850A to 1200A, 1Q

Order No.	6RA70 . . – 6FS22				
	<u>87</u>		<u>91</u>		
Rated supply voltage armature ¹⁾	V	3AC 460 (+15% / – 20%)			
Rated input current armature ²⁾	A	705		995	
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)			
Rated supply voltage fan	V	1AC 230 (±10%)		1AC 230 (±10%)	
		50Hz	60Hz	50Hz	60Hz
Fan rated current	A	0,55	0,55	2,6	3,3
Air flow rate	m³/h	570	570	1300	1300
Fan noise level	dBA	73	76	88	82
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)			
Rated frequency	Hz	45 to 65			
Rated DC voltage ¹⁾	V	550			
Rated DC current	A	850		1200	
Overload capability ⁶⁾		max. 180% of rated DC current			
Rated output	kW	467		660	
Power loss at rated DC current (approx.)	W	2514		4620	
Rated DC voltage field ¹⁾	V	max. 373			
Rated DC current field	A	30			
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled			
Storage and transport temperature	°C	– 25 to +70			
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾			
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tacho or analog setpoint ⁵⁾			
Environmental class	DIN IEC 721-3-3	3K3			
Degree of protect.	DIN 40050 IEC 144	IP00			
Dimensions (HxWxD)	mm	700x268x362		780x410x362	
Weights (approx.)	kg	42		80	

Explanation at end of list of tables

3.4.8 Converters 3AC 575V, 60A to 600A, 1Q

Order No.		6RA70 . . – 6GS22				
		<u>25</u>	<u>31</u>	<u>75</u>	<u>81</u>	<u>85</u>
Rated supply voltage armature ¹⁾	V	3AC 575 (+10% / – 20%)				
Rated input current armature ²⁾	A	50	104	175	332	498
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _N =1A oder 1AC 190 (– 25%) to 230 (+15%); I _N =2A (– 35% for 1min)				
Rated supply voltage fan	V			DC24V internal	3AC 400 (±15%) 50Hz 3AC 460 (±10%) 60Hz	
Fan rated current	A			0,24		
Air flow rate	m³/h			100	570	
Fan noise level	dBA			40	73	
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)				
Rated frequency	Hz	45 to 65				
Rated DC voltage ¹⁾	V	690				
Rated DC current	A	60	125	210	400	600
Overload capability ⁶⁾		max. 180% of rated DC current				
Rated output	kW	41	86	145	276	414
Power loss at rated DC current (approx.)	W	265	454	730	1550	1955
Rated DC voltage field ¹⁾	V	max. 373				
Rated DC current field	A	10		15	25	
Operational ambient temperature	°C	0 to 45 at I _{rated} ³⁾ self-cooled		0 to 40 at I _{rated} ³⁾ forced-cooled		
Storage and transport temperature	°C	– 25 to +70				
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾				
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tacho or analog setpoint ⁵⁾				
Environmental class DIN IEC 721-3-3		3K3				
Degree of protect. DIN 40050 IEC 144		IP00				
Dimensions (HxWxD)	mm	385x265x283			625x268x318	
Weights (approx.)	kg	14	16		30	

Explanation at end of list of tables

3.4.9 Converters 3AC 575V, 800A to 2000A, 1Q

Order No.		6RA70 . . – 6GS22		6RA70 . . – 4GS22		
		<u>87</u>	<u>90</u>	<u>93</u>	<u>95</u>	
Rated supply voltage armature ¹⁾	V	3AC 575 (+10% / – 20%)				
Rated input current armature ²⁾	A	663	829	1326	1658	
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)				
Rated supply voltage fan	V	3AC 400 (±15%) 50Hz 3AC 460 (±10%) 60Hz 0,24 570 73	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz		
			50Hz	60Hz	50Hz	60Hz
Fan rated current	A		1,0	1,25	1,0	1,25
Air flow rate	m³/h		1300	1300	2400	2400
Fan noise level	dBA		83	87	83	87
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)				
Rated frequency	Hz	45 to 65				
Rated DC voltage ¹⁾	V	690				
Rated DC current	A	800	1000	1600	2000	
Overload capability ⁶⁾		max. 180% of rated DC current				
Rated output	kW	552	690	1104	1380	
Power loss at rated DC current (approx.)	W	2638	4130	5942	7349	
Rated DC voltage field ¹⁾	V	max. 373				
Rated DC current field	A	30		40		
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled				
Storage and transport temperature	°C	– 25 to +70				
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾				
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tacho or analog setpoint ⁵⁾				
Environmental class	DIN IEC 721-3-3	3K3				
Degree of protect.	DIN 40050 IEC 144	IP00				
Dimensions (HxWxD)	mm	700x268x362	780x410x362	880x450x500		
Weights (approx.)	kg	40	80	125		

Explanation at end of list of tables

3.4.10 Converters 3AC 690V, 720A to 2000A, 1Q

Order No.		6RA70 . . – 6KS22		6RA70 . . – 4KS22		
		<u>86</u>	<u>88</u>	<u>93</u>	<u>95</u>	
Rated supply voltage armature ¹⁾	V	3AC 690 (+10% / – 20%)				
Rated input current armature ²⁾	A	597	788	1244	1658	
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)				
Rated supply voltage fan	V	3AC 400 (±15%) 50Hz 3AC 460 (±10%) 60Hz 0,24 570 73	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz		
			50Hz	60Hz	50Hz	60Hz
Fan rated current	A		1,0	1,25	1,0	1,25
Air flow rate	m³/h		1300	1300	2400	2400
Fan noise level	dBA		83	87	83	87
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)				
Rated frequency	Hz	45 to 65				
Rated DC voltage ¹⁾	V	830				
Rated DC current	A	720	950	1500	2000	
Overload capability ⁶⁾		max. 180% of rated DC current				
Rated output	kW	598	789	1245	1660	
Power loss at rated DC current (approx.)	W	2720	4380	6706	8190	
Rated DC voltage field ¹⁾	V	max. 373				
Rated DC current field	A	30		40		
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled				
Storage and transport temperature	°C	– 25 to +70				
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾				
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tachometer or analog setpoint ⁵⁾				
Environmental class	DIN IEC 721-3-3	3K3				
Degree of protect.	DIN 40050 IEC 144	IP00				
Dimensions (HxWxD)	mm	700x268x362	780x410x362	880x450x500		
Weights (approx.)	kg	40	80	125		

Explanation at end of list of tables

3.4.11 Converters 3AC 830V, 900A to 1900A, 1Q

Order No.		6RA70 . . – 6LS22	6RA70 . . – 4LS22	
		<u>88</u>	<u>93</u>	<u>95</u>
Rated supply voltage armature ¹⁾	V	3AC 830 (+10% / – 20%)		
Rated input current armature ²⁾	A	746	1244	1575
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _N =1A oder 1AC 190 (– 25%) to 230 (+15%); I _N =2A (– 35% for 1min)		
Rated supply voltage fan	V	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz	
			50Hz	60Hz
Fan rated current	A		1,0	1,25
Air flow rate	m³/h		2400	2400
Fan noise level	dBA	88	83	87
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)		
Rated frequency	Hz	45 to 65		
Rated DC voltage ¹⁾	V	1000		
Rated DC current	A	900	1500	1900
Overload capability ⁶⁾		max. 180% of rated DC current		
Rated output	kW	900	1500	1900
Power loss at rated DC current (approx.)	W	4638	6778	8700
Rated DC voltage field ¹⁾	V	max. 373		
Rated DC current field	A	30	40	
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled		
Storage and transport temperature	°C	– 25 to +70		
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾		
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tacho or analog setpoint ⁵⁾		
Environmental class	DIN IEC 721-3-3	3K3		
Degree of protect.	DIN 40050 IEC 144	IP00		
Dimensions (HxWxD)	mm	780x410x362	880x450x500	
Weights (approx.)	kg	80	125	

Explanation at end of list of tables

3.4.12 Converters 3AC 400V, 15A to 125A, 4Q

Order No.	6RA70 . . – 6DV62					
	<u>13</u>	<u>18</u>	<u>25</u>	<u>28</u>	<u>31</u>	
Rated supply voltage armature ¹⁾	V	3AC 400 (+15% / – 20%)				
Rated input current armature ²⁾	A	13	25	50	75	104
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)				
Rated supply voltage field ¹⁾	V	2AC 400 (+15% / – 20%) ⁷⁾				
Rated frequency	Hz	45 to 65				
Rated DC voltage ¹⁾	V	420				
Rated DC current	A	15	30	60	90	125
Overload capability ⁶⁾		max. 180% of rated DC current				
Rated output	kW	6,3	12,6	25	38	52,5
Power loss at rated DC current (approx.)	W	117	163	240	312	400
Rated DC voltage field ¹⁾	V	max. 325				
Rated DC current field	A	3	5	10		
Operational ambient temperature	°C	0 to 45 at I _{rated} ³⁾ self-cooled				
Storage and transport temperature	°C	– 25 to +70				
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾				
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tachometer or analog setpoint ⁵⁾				
Environmental class	DIN IEC 721-3-3	3K3				
Degree of protect.	DIN 40050 IEC 144	IP00				
Dimensions (HxWxD)	mm	385x265x239		385x265x283		
Weights (approx.)	kg	11	11	14	14	16

Explanation at end of list of tables

3.4.13 Converters 3AC 400V, 210A to 600A, 4Q

Order No.		6RA70 . . – 6DV62			
		<u>75</u>	<u>78</u>	<u>81</u>	<u>85</u>
Rated supply voltage armature ¹⁾	V	3AC 400 (+15% / – 20%)			
Rated input current armature ²⁾	A	175	233	332	498
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)			
Rated supply voltage fan	V	DC 24V internal		3AC 400 (±15%) 50Hz 3AC 460 (±10%) 60Hz	
Fan rated current	A			0,24	
Air flow rate	m³/h	100		570	
Fan noise level	dBA	40		73	
Rated supply voltage field ¹⁾	V	2AC 400 (+15% / – 20%) ⁷⁾			
Rated frequency	Hz	45 to 65			
Rated DC voltage ¹⁾	V	420			
Rated DC current	A	210	280	400	600
Overload capability ⁶⁾		max. 180% of rated DC current			
Rated output	kW	88	118	168	252
Power loss at rated DC current (approx.)	W	676	800	1328	1800
Rated DC voltage field ¹⁾	V	max. 325			
Rated DC current field	A	15		25	
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled			
Storage and transport temperature	°C	– 25 to +70			
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾			
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tacho or analog setpoint ⁵⁾			
Environmental class	DIN IEC 721-3-3	3K3			
Degree of protect.	DIN 40050 IEC 144	IP00			
Dimensions (HxWxD)	mm	385x265x283		625x268x318	
Weights (approx.)	kg	16	17	30	

Explanation at end of list of tables

3.4.14 Converters 3AC 400V, 850A to 2000A, 4Q

Order No.		6RA70 . . – 6DV62		6RA70 . . – 4DV62		
		87	91	93	95	
Rated supply voltage armature ¹⁾	V	3AC 400 (+15% / – 20%)				
Rated input current armature ²⁾	A	705	995	1326	1658	
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)				
Rated supply voltage fan	V	3AC 400 (±15%) 50Hz 3AC 460 (±10%) 60Hz	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz		3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz	
			50Hz	60Hz	50Hz	60Hz
Fan rated current	A	0,24	1,0	1,25	1,0	1,25
Air flow rate	m³/h	570	1300	1300	2400	2400
Fan noise level	dBA	73	83	87	83	87
Rated supply voltage field ¹⁾	V	2AC 400 (+15% / – 20%) ⁷⁾				
Rated frequency	Hz	45 to 65				
Rated DC voltage ¹⁾	V	420				
Rated DC current	A	850	1200	1600	2000	
Overload capability ⁶⁾		max. 180% of rated DC current				
Rated output	kW	357	504	672	840	
Power loss at rated DC current (approx.)	W	2420	4525	5708	6810	
Rated DC voltage field ¹⁾	V	max. 325				
Rated DC current field	A	30		40		
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled				
Storage and transport temperature	°C	– 25 to +70				
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾				
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tachometer or analog setpoint ⁵⁾				
Environmental class	DIN IEC 721-3-3	3K3				
Degree of protect.	DIN 40050 IEC 144	IP00				
Dimensions (HxWxD)	mm	700x268x362	780x410x362	880x450x500		
Weights (approx.)	kg	45	85	145		

Explanation at end of list of tables

3.4.15 Converters 3AC 460V, 30A to 125A, 4Q

Order No.		6RA70 . . – 6FV62			
		<u>18</u>	<u>25</u>	<u>28</u>	<u>31</u>
Rated supply voltage armature ¹⁾	V	3AC 460 (+15% / – 20%)			
Rated input current armature ²⁾	A	25	50	75	104
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)			
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)			
Rated frequency	Hz	45 to 65			
Rated DC voltage ¹⁾	V	480			
Rated DC current	A	30	60	90	125
Overload capability ⁶⁾		max. 180% of rated DC current			
Rated output	kW	14,4	28,8	43	60
Power loss at rated DC current (approx.)	W	172	248	328	417
Rated DC voltage field ¹⁾	V	max. 373			
Rated DC current field	A	5	10		
Operational ambient temperature	°C	0 to 45 at I _{rated} ³⁾ self-cooled			
Storage and transport temperature	°C	– 25 to +70			
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾			
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tachometer or analog setpoint ⁵⁾			
Environmental class DIN IEC 721-3-3		3K3			
Degree of protect. DIN 40050 IEC 144		IP00			
Dimensions (HxWxD)	mm	385x265x239	385x265x283		
Weights (approx.)	kg	11	15	15	17

Explanation at end of list of tables

3.4.16 Converters 3AC 460V, 210A to 600A, 4Q

Order No.		6RA70 . . – 6FV62			
		<u>75</u>	<u>78</u>	<u>82</u>	<u>85</u>
Rated supply voltage armature ¹⁾	V	3AC 460 (+15% / – 20%)			
Rated input current armature ²⁾	A	175	233	332	498
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)			
Rated supply voltage fan	V	DC 24V internal		1AC 230 (±10%)	
				50Hz	60Hz
Fan rated current	A			0,55	0,55
Air flow rate	m³/h			570	570
Fan noise level	dBA			73	76
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)			
Rated frequency	Hz	45 to 65			
Rated DC voltage ¹⁾	V	480			
Rated DC current	A	210	280	450	600
Overload capability ⁶⁾		max. 180% of rated DC current			
Rated output	kW	100	134	216	288
Power loss at rated DC current (approx.)	W	700	792	1519	1845
Rated DC voltage field ¹⁾	V	max. 373			
Rated DC current field	A	15		25	
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled			
Storage and transport temperature	°C	– 25 to +70			
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾			
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tachometer or analog setpoint ⁵⁾			
Environmental class	DIN IEC 721-3-3	3K3			
Degree of protect.	DIN 40050 IEC 144	IP00			
Dimensions (HxWxD)	mm	385x265x313		625x268x318	
Weights (approx.)	kg	17	18	32	

Explanation at end of list of tables

3.4.17 Converters 3AC 460V, 850A to 1200A, 4Q

Order No.	6RA70 . . – 6FV62				
	<u>87</u>		<u>91</u>		
Rated supply voltage armature ¹⁾	V	3AC 460 (+15% / – 20%)			
Rated input current armature ²⁾	A	705		995	
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)			
Rated supply voltage fan	V	1AC 230 (±10%)		1AC 230 (±10%)	
		50Hz	60Hz	50Hz	60Hz
Fan rated current	A	0,55	0,55	2,6	3,3
Air flow rate	m³/h	570	570	1300	1300
Fan noise level	dBA	73	76	82	85
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)			
Rated frequency	Hz	45 to 65			
Rated DC voltage ¹⁾	V	480			
Rated DC current	A	850		1200	
Overload capability ⁶⁾		max. 180% of rated DC current			
Rated output	kW	408		576	
Power loss at rated DC current (approx.)	W	2514		4620	
Rated DC voltage field ¹⁾	V	max. 373			
Rated DC current field	A	30			
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled			
Storage and transport temperature	°C	– 25 to +70			
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾			
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tacho or analog setpoint ⁵⁾			
Environmental class	DIN IEC 721-3-3	3K3			
Degree of protect.	DIN 40050 IEC 144	IP00			
Dimensions (HxWxD)	mm	700x268x362		780x410x362	
Weights (approx.)	kg	47		85	

Explanation at end of list of tables

3.4.18 Converters 3AC 575V, 60A to 600A, 4Q

Order No.		6RA70 . . – 6GV62				
		<u>25</u>	<u>31</u>	<u>75</u>	<u>81</u>	<u>85</u>
Rated supply voltage armature ¹⁾	V	3AC 575 (+10% / – 20%)				
Rated input current armature ²⁾	A	50	104	175	332	498
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)				
Rated supply voltage fan	V			DC24V internal	3AC 400 (±15%) 50Hz 3AC 460 (±10%) 60Hz	
Fan rated current	A			0,24		
Air flow rate	m³/h			100	570	
Fan noise level	dBA			40	73	
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)				
Rated frequency	Hz	45 to 65				
Rated DC voltage ¹⁾	V	600				
Rated DC current	A	60	125	210	400	600
Overload capability ⁶⁾		max. 180% of rated DC current				
Rated output	kW	36	75	126	240	360
Power loss at rated DC current (approx.)	W	265	455	730	1550	1955
Rated DC voltage field ¹⁾	V	max. 373				
Rated DC current field	A	10		15	25	
Operational ambient temperature	°C	0 to 45 at I _{rated} self-cooled ³⁾		0 to 40 at I _{rated} forced-cooled ³⁾		
Storage and transport temperature	°C	– 25 to +70				
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾				
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tachometer or analog setpoint ⁵⁾				
Environmental class	DIN IEC 721-3-3	3K3				
Degree of protect.	DIN 40050 IEC 144	IP00				
Dimensions (HxWxD)	mm	385x265x283			625x268x318	
Weights (approx.)	kg	14	16		30	

Explanation at end of list of tables

3.4.19 Converters 3AC 575V, 850A to 2000A, 4Q

Order No.		6RA70 . . – 6GV62		6RA70 . . – 4GV62		
		<u>87</u>	<u>90</u>	<u>93</u>	<u>95</u>	
Rated supply voltage armature ¹⁾	V	3AC 575 (+10% / – 20%)				
Rated input current armature ²⁾	A	705	912	1326	1658	
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)				
Rated supply voltage fan	V	3AC 400 (±15%) 50Hz 3AC 460 (±10%) 60Hz 0,24 570 73	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz		
			50Hz	60Hz	50Hz	60Hz
Fan rated current	A		1,0	1,25	1,0	1,25
Air flow rate	m³/h		1300	1300	2400	2400
Fan noise level	dBA		83	87	83	87
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)				
Rated frequency	Hz	45 to 65				
Rated DC voltage ¹⁾	V	600				
Rated DC current	A	850	1100	1600	2000	
Overload capability ⁶⁾		max. 180% of rated DC current				
Rated output	kW	510	660	960	1200	
Power loss at rated DC current (approx.)	W	2780	4515	5942	7349	
Rated DC voltage field ¹⁾	V	max. 373				
Rated DC current field	A	30		40		
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled				
Storage and transport temperature	°C	– 25 to +70				
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾				
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tacho or analog setpoint ⁵⁾				
Environmental class	DIN IEC 721-3-3	3K3				
Degree of protect.	DIN 40050 IEC 144	IP00				
Dimensions (HxWxD)	mm	700x268x362	780x410x362	880x450x500		
Weights (approx.)	kg	45	85	145		

Explanation at end of list of tables

3.4.20 Converters 3AC 690V, 760A to 2000A, 4Q

Order No.		6RA70 . . – 6KV62		6RA70 . . – 4KV62		
		<u>86</u>	<u>90</u>	<u>93</u>	<u>95</u>	
Rated supply voltage armature ¹⁾	V	3AC 690 (+10% / – 20%)				
Rated input current armature ²⁾	A	630	829	1244	1658	
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)				
Rated supply voltage fan	V	3AC 400 (±15%) 50Hz 3AC 460 (±10%) 60Hz 0,24 570 73	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz		
			50Hz	60Hz	50Hz	60Hz
Fan rated current	A		1,0	1,25	1,0	1,25
Air flow rate	m³/h		1300	1300	2400	2400
Fan noise level	dBA		83	87	83	87
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)				
Rated frequency	Hz	45 to 65				
Rated DC voltage ¹⁾	V	725				
Rated DC current	A	760	1000	1500	2000	
Overload capability ⁶⁾		max. 180% of rated DC current				
Rated output	kW	551	725	1088	1450	
Power loss at rated DC current (approx.)	W	2850	4605	6706	8190	
Rated DC voltage field ¹⁾	V	max. 373				
Rated DC current field	A	30		40		
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled				
Storage and transport temperature	°C	– 25 to +70				
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾				
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tachometer or analog setpoint ⁵⁾				
Environmental class	DIN IEC 721-3-3	3K3				
Degree of protect.	DIN 40050 IEC 144	IP00				
Dimensions (HxWxD)	mm	700x268x362	780x410x362	880x450x500		
Weights (approx.)	kg	45	85	145		

Explanation at end of list of tables

3.4.21 Converters 3AC 830V, 950A to 1900A, 4Q

Order No.		6RA70 . . – 6LV62		6RA70 . . – 4LV62	
		<u>88</u>		<u>93</u>	<u>95</u>
Rated supply voltage armature ¹⁾	V	3AC 830 (+10% / – 20%)			
Rated input current armature ²⁾	A	788		1244	1575
Rated supply voltage electronics power supply	V	2AC 380 (– 25%) to 460 (+15%); I _n =1A oder 1AC 190 (– 25%) to 230 (+15%); I _n =2A (– 35% for 1min)			
Rated supply voltage fan	V	3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz		3AC 400 (±10%) 50Hz 3AC 460 (±10%) 60Hz	
		50Hz	60Hz	50Hz	60Hz
Fan rated current	A	1,0	1,25	1,0	1,25
Air flow rate	m ³ /h	1300	1300	2400	2400
Fan noise level	dBA	83	87	83	87
Rated supply voltage field ¹⁾	V	2AC 460 (+10% / – 20%)			
Rated frequency	Hz	45 to 65			
Rated DC voltage ¹⁾	V	875			
Rated DC current	A	950		1500	1900
Overload capability ⁶⁾		max. 180% of rated DC current			
Rated output	kW	831		1313	1663
Power loss at rated DC current (approx.)	W	4870		7153	8700
Rated DC voltage field ¹⁾	V	max. 373			
Rated DC current field	A	30		40	
Operational ambient temperature	°C	0 to 40 at I _{rated} ³⁾ forced-cooled			
Storage and transport temperature	°C	– 25 to +70			
Installation altitude above sea level		≤ 1000 m at rated DC current ⁴⁾			
Control stability		Δn = 0.006% of the rated motor speed, valid for pulse encoder operation <u>and</u> digital setpoint Δn = 0.1% of the rated motor speed, valid for analog tacho or analog setpoint ⁵⁾			
Environmental class	DIN IEC 721-3-3	3K3			
Degree of protect.	DIN 40050 IEC 144	IP00			
Dimensions (HxWxD)	mm	780x410x362		880x450x500	
Weights (approx.)	kg	85		145	

Explanation at end of list of tables

- 1) The armature/field supply voltage can be lower than the rated armature/field voltage (setting in parameter P078, input voltages of up to 85V are permissible for converters with rated supply voltage of 400V). The output voltage is reduced accordingly.

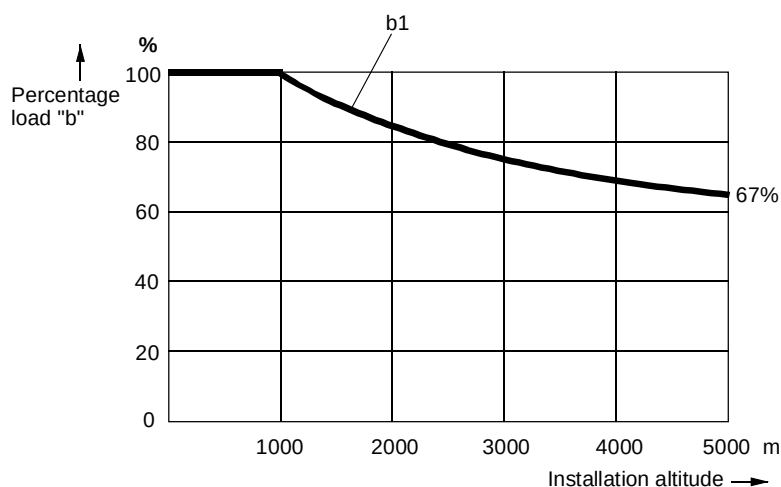
The specified output DC voltage can be guaranteed up to an undervoltage corresponding to 5% of line voltage (rated supply voltage armature/field).

- 2) Values apply to output rated DC current.
- 3) Load values (DC current) as a function of coolant temperature (refer to P077 in Section 11)

Ambient temperature or coolant temperature	Change in load values (percentage reduction "a")	
	in devices with self-cooling	in devices with enhanced air cooling
+40 °C		– 0 %
+45 °C	0 %	– 5 %
+50 °C	– 6 %	(– 10 %) a)
+55 °C	– 11 %	
+60 °C	– 18 %	

- a) In spite of derating, converters of ≥ 400 A with forced air cooling may be operated at an ambient or coolant temperature of 50 °C only if the rated supply voltage of the converter fan is safely within the limited tolerance range of 400V + 10% – 15%.
- b) Only up to 55 °C when configuration includes a T400 or OP1S.

- 4) Load values as a function of installation altitude (refer to P077 in Section 11)



Curve b1: Reduction factor of load values (DC current) at installation altitudes above 1000 m

The supply voltages of all circuits are available up to an installation altitude of 5000 m for basic insulation.

Converters for 830V rated supply voltage are an exception:

- Up to 4000m 830V
- Up to 4500m 795V
- Up to 5000m 727V

5) Requirements:

The control stability (closed-loop PI control) is referred to the rated motor speed and applies when the SIMOREG converter is warm. The following conditions are applicable: -Temperature changes of $\pm 10\text{ }^{\circ}\text{K}$

- Line voltage changes corresponding to $+10\%$ / -5% of the rated input voltage
- Temperature coefficient of temperature-compensated tachogenerators 0.15% per $10\text{ }^{\circ}\text{K}$ (applies only to analog tachogenerator)
- Constant setpoint (14-bit resolution)

6) Also refer to Section 3.3 and 9.

7) Also permissible for 2AC 460 ($+10\%$ / -20%).

3.5 Applicable standards

VDE 0106 Part 100

Arrangement of operator control elements in the vicinity of components/parts at hazardous voltage levels.

VDE 0110 Part 1

Insulation coordination for electrical equipment in low-voltage installations.

Degree of pollution 2 for boards and power section.

Only non-conductive contamination is permissible. Occasional conductivity due to moisture condensation must, however, be expected.

"Moisture condensation is excluded, as the components are only permitted for humidity class F."

EN60146 T1-1 / VDE 0558 T11

Semiconductor converter

General requirements and line-commutated converters

DIN EN50178 / VDE 0160

Regulations for equipping electrical power systems with electronic equipment.

EN61800-3

Variable-speed drives, part 3, EMC Product Standard including special testing procedures

DIN IEC 60068-2-6 acc. to severity grade 12 (SN29010 Part1)

Mechanical stressing

3.6 Abbreviations

CB	Communications board
PKW	Parameter ID value
PZD	Process data
TB	Technology board
ZSW	Status word