Motion Control
Selection and ordering data

3

SIMOVERT MASTERDRIVES Motion Control
Selection and ordering data

Converters and inverters

Order number examples

Compact PLUS, compact and chassis units

e.g. **6 S E 7 0 3 1 – 0 E E 5 0 – Z**

SIMOVERT MASTERDRIVES 6SE7 series

Compact PLUS units, compact units, chassis units

Multiplier for output current
e.g.: 2 ≙ × 1
3 ≙ × 10
4 ≙ × 100

Example:

Multiplier = 10
First two positions of output current: 10

First two positions for output current
Output current rounded off = 100 A

Supply voltage code e.g. **E** ≙ 3-ph. 400 – 480 V AC

Size e.g. chassis size **E** (**P** for Compact PLUS units, **A** to **D** for compact units, **E** to **K** for chassis units)

Control version 5 ≙ SIMOVERT MASTERDRIVES Motion Control
7 ≙ SIMOVERT MASTERDRIVES Motion Control Performance 2

Function release

Supplementary order codes for options

Basic units

Nominal power rating[1] kW (HP)	Selection data				Converter units	Inverter units	Total power loss at 5 kHz/ 10 kHz[2]		Dimensions W x H x D	For dimension drawing, see Section 7	Weight	Cooling-air requirement
	Rated output current $I_{n\,conv}$ A	Short-time current/ Overload current[3] $I_{max.}$ A	Rated DC link current $I_{DCrated}$ A	Line current (only for converters) A	Order No.	Order No.	Conv. kW	Inv. kW	mm x mm x mm (in x in x in)	No.	kg (lb)	m³/s (ft³/s)

Supply voltage 3-ph. 380 V to 480 V AC and DC voltage 510 V to 650 V DC

Compact PLUS units

0.55 (0.75)	1.5	4.5/2.4	–	1.7	▲ 6SE7011–5EP☐0[4)6]		0.070		45 x 360 x 260 (1.8 x 14.2 x 10.2)	2	3.4 (7.5)	0.002 (0.071)
1.1 (1.5)	3.0	9.0/4.8	–	3.3	▲ 6SE7013–0EP☐0[4)6]		0.104		67.5 x 360 x 260 (2.7 x 14.2 x 10.2)	2	3.9 (8.6)	0.009 (0.318)
1.5 (2)	5.0	15/8	–	5.5	▲ 6SE7015–0EP☐0[4)6]		0.150		67.5 x 360 x 260 (2.7 x 14.2 x 10.2)	2	4.1 (9)	0.009 (0.318)
3 (4)	8.0	24/12.8	–	8.8	▲ 6SE7018–0EP☐0[4)6]		0.216		90 x 360 x 260 (3.5 x 14.2 x 10.2)	2	4.5 (9.9)	0.018 (0.636)
4 (5)	10	30/16	–	9.7	▲ 6SE7021–0EP☐0[4)6]		0.240		90 x 360 x 260 (3.5 x 14.2 x 10.2)	2	4.5 (9.9)	0.018 (0.636)
5.5 (7.5)	14	42/22.4	–	12.6	▲ 6SE7021–4EP☐0[4]		0.270		135 x 360 x 260 (5.3 x 14.2 x 10.2)	2	10.8 (23.8)	0.042 (1.483)
7.5 (10)	20.5	61.5/32.8	–	16.7	▲ 6SE7022–1EP☐0[4]		0.340		135 x 360 x 260 (5.3 x 14.2 x 10.2)	2	10.9 (24)	0.042 (1.483)
11 (15)	27	81/43.2	–	23.2	▲ 6SE7022–7EP☐0[4]		0.470		180 x 360 x 260 (7.1 x 14.2 x 10.2)	2	14.7 (32.4)	0.061 (2.154)
15 (20)	34	102/54.4	–	31.7	▲ 6SE7023–4EP☐0[4]		0.630		180 x 360 x 260 (7.1 x 14.2 x 10.2)	2	14.9 (32.9)	0.061 (2.154)
0.75 (1)	2.0	6.0/3.2	2.5	–		▲ 6SE7012–0TP☐0		0.066	45 x 360 x 260 (1.8 x 14.2 x 10.2)	2	3.0 (6.6)	0.002 (0.071)
1.5 (2)	4.0	12/6.4	5.0	–		▲ 6SE7014–0TP☐0		0.086	67.5 x 360 x 260 (2.7 x 14.2 x 10.2)	2	3.4 (7.5)	0.009 (0.318)
2.2 (3)	6.1	18.3/9.6	7.3	–		▲ 6SE7016–0TP☐0		0.116	67.5 x 360 x 260 (2.7 x 14.2 x 10.2)	2	3.4 (7.5)	0.009 (0.318)
4 (5)	10.2	30.6/16.3	12.1	–		▲ 6SE7021–0TP☐0		0.156	90 x 360 x 260 (3.5 x 14.2 x 10.2)	2	3.8 (8.4)	0.018 (0.636)
5.5 (7.5)	13.2	39.6/21.1	15.7	–		▲ 6SE7021–3TP☐0		0.240	135 x 360 x 260 (5.3 x 14.2 x 10.2)	2	8.8 (19.4)	0.042 (1.483)
7.5 (10)	17.5	52.5/28	20.8	–		▲ 6SE7021–8TP☐0		0.300	135 x 360 x 260 (5.3 x 14.2 x 10.2)	2	8.9 (19.6)	0.042 (1.483)
11 (15)	25.5	76.5/40.8	30.4	–		▲ 6SE7022–6TP☐0		0.410	135 x 360 x 260 (5.3 x 14.2 x 10.2)	2	9.0 (19.8)	0.042 (1.483)
15 (20)	34	102/54.4	40.5	–		▲ 6SE7023–4TP☐0		0.560	180 x 360 x 260 (7.1 x 14.2 x 10.2)	2	12.7 (28)	0.061 (2.154)
18.5 (25)	37.5	112.5/60	44.6	–		▲ 6SE7023–8TP☐0		0.660	180 x 360 x 260 (7.1 x 14.2 x 10.2)	2	12.9 (28.4)	0.061 (2.154)

▲ "Safe Stop" option possible with code **K80**

	5	5
SIMOVERT MASTERDRIVES Motion Control	5	5
SIMOVERT MASTERDRIVES Motion Control Performance 2[5]	7	7

Power ratings over 250 kW (335 HP) to 710 kW (951 HP) possible on request for Performance 2 units.

Conv. = Converters (AC – AC)
Inv. = Inverters (DC – AC)

1) The quoted nominal power ratings for SIMOVERT MASTERDRIVES serve only as a guide for the selection of other components. The exact drive output depends on the motors connected, and this should be taken into account when planning.

2) 10 kHz with Compact PLUS units, 5 kHz with compact and chassis units. 2.5 kHz for power ratings over 250 kW (335 HP) only possible on request with Performance 2.

3) Short time current: $3 \times I_{n\,conv}$ for 250 ms (only for Compact PLUS units)/Overload current: $1.6 \times I_{n\,conv}$ for 30 s. For the 200 kW (268 HP) and 250 kW (335 HP) units, this is 1.36 x the rated output current for 60 s.

4) In the Compact PLUS converters, the brake chopper is integrated.
The braking resistor should be selected accordingly and must be mounted externally (see Page 3/18).

5) Performance 2 stands for a performance increase by a factor of 2. Doubling of computing power and consequently halving of computing times for all functions.

6) A firmware version ≥ 1.63 is an absolute prerequisite for standard units ("5" in digit 11 of the order no.) with option K80.
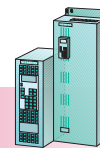
Converters and inverters

New Performance 2

Compact and chassis units

Basic units (continued)

Nominal power rating[1]	Selection data				Converter units	Inverter units	Total power loss at 5 kHz/ 10 kHz[2]		Dimensions W x H x D	For dimension drawing, see Section 7	Weight	Cooling-air requirement
	Rated output current	Short-time current/ Overload current [3]	Rated DC link current	Line current (only for converters)			Conv.	Inv.				
	$I_{n\,conv}$	$I_{max.}$	$I_{DCrated}$									
kW (HP)	A	A	A	A	Order No.	Order No.	kW	kW	mm x mm x mm (in x in x in)	No.	kg (lb)	m³/s (ft³/s)
Supply voltage 3-ph. 380 V to 480 V AC and DC voltage 510 V to 650 V DC												
Compact units												
2.2 (3)	6.1	9.8	7.3	6.7	■ 6SE7016–1EA☐1	● 6SE7016–1TA☐1	0.15	0.13	90 x 425 x 350 (3.5 x 16.7 x 13.8)	5	8.5 (18.7)	0.009 (0.318)
3 (4)	8.0	12.8	9.5	8.8	■ 6SE7018–0EA☐1	● 6SE7018–0TA☐1	0.17	0.15	90 x 425 x 350 (3.5 x 16.7 x 13.8)	5	8.5 (18.7)	0.009 (0.318)
4 (5)	10.2	16.3	12.1	11.2	■ 6SE7021–0EA☐1	● 6SE7021–0TA☐1	0.21	0.17	90 x 425 x 350 (3.5 x 16.7 x 13.8)	5	8.5 (18.7)	0.009 (0.318)
5.5 (7.5)	13.2	21.1	15.7	14.5	■ 6SE7021–3EB☐1	● 6SE7021–3TB☐1	0.23	0.20	135 x 425 x 350 (5.3 x 16.7 x 13.8)	5	12.5 (27.6)	0.022 (0.777)
7.5 (10)	17.5	28	20.8	19.3	■ 6SE7021–8EB☐1	● 6SE7021–8TB☐1	0.30	0.25	135 x 425 x 350 (5.3 x 16.7 x 13.8)	5	12.5 (27.6)	0.022 (0.777)
11 (15)	25.5	40.8	30.4	28.1	■ 6SE7022–6EC☐1	● 6SE7022–6TC☐1	0.43	0.36	180 x 600 x 350 (7.1 x 23.6 x 13.8)	5	21 (46.3)	0.028 (0.989)
15 (20)	34	54.4	40.5	37.4	■ 6SE7023–4EC☐1	● 6SE7023–4TC☐1	0.59	0.49	180 x 600 x 350 (7.1 x 23.6 x 13.8)	5	21 (46.3)	0.028 (0.989)
18.5 (25)	37.5	60	44.6	41.3	▲ 6SE7023–8ED☐1	● 6SE7023–8TD☐1	0.70	0.60	270 x 600 x 350 (10.6 x 23.6 x 13.8)	5	32 (70.5)	0.054 (1.907)
22 (30)	47	75.2	55.9	51.7	▲ 6SE7024–7ED☐1	● 6SE7024–7TD☐1	0.87	0.74	270 x 600 x 350 (10.6 x 23.6 x 13.8)	5	32 (70.5)	0.054 (1.907)
30 (40)	59	94.4	70.2	64.9	▲ 6SE7026–0ED☐1	● 6SE7026–0TD☐1	1.02	0.86	270 x 600 x 350 (10.6 x 23.6 x 13.8)	5	32 (70.5)	0.054 (1.907)
37 (50)	72	115.2	85.7	79.2	▲ 6SE7027–2ED☐1	● 6SE7027–2TD☐1	1.27	1.06	270 x 600 x 350 (10.6 x 23.6 x 13.8)	5	32 (70.5)	0.054 (1.907)

● "Safe Stop" option provided as standard
▲ "Safe Stop" option possible with code **K80**
■ "Safe Stop" option not possible

SIMOVERT MASTERDRIVES Motion Control	5	5
SIMOVERT MASTERDRIVES Motion Control Performance 2[4]	7	7

Power ratings over 250 kW (335 HP) to 710 kW (951 HP) possible on request for Performance 2 units.

Conv. = Converters (AC – AC)
Inv. = Inverters (DC – AC)

1) The quoted nominal power ratings for SIMOVERT MASTERDRIVES serve only as a guide for the selection of other components. The exact drive output depends on the motors connected, and this should be taken into account when planning.

2) 10 kHz with Compact PLUS units, 5 kHz with compact and chassis units. 2.5 kHz for power ratings over 250 kW (335 HP) only possible on request with Performance 2 units.

3) Short time current: 3 x $I_{n\,conv}$ for 250 ms (only for Compact PLUS units)/Overload current: 1.6 x $I_{n\,conv}$ for 30 s. For the 200 kW (268 HP) and 250 kW (335 HP) units, this is 1.36 x the rated output current for 60 s.

4) Performance 2 stands for a performance increase by a factor of 2. Doubling of computing power and consequently halving of computing times for all functions.

Basic units (continued)

Nominal power rating[1]	Selection data				Converter units	Inverter units	Total power loss at 5 kHz/ 10 kHz[2]		Dimensions W x H x D	For dimension drawing, see Section 7	Weight	Cooling-air requirement
	Rated output current	Short-time current/ Overload current [3]	Rated DC link current	Line current (only for converters)			Conv.	Inv.				
	$I_{n\,conv}$	$I_{max.}$	$I_{DCrated}$									
kW (HP)	A	A	A	A	Order No.	Order No.	kW	kW	mm x mm x mm (in x in x in)	No.	kg (lb)	m³/s (ft³/s)
Supply voltage 3-ph. 380 V to 480 V AC and DC voltage 510 V to 650 V DC												
Chassis units												
45 (60)	92	147	110	101	▲ 6SE7031–0EE☐0	▲ 6SE7031–0TE☐0	1.38	1.25	270 x 1050 x 365 (10.6 x 41.3 x 14.3)	7	65 (143.3)	0.10 (3.531)
55 (75)	124	198	148	136	▲ 6SE7031–2EF☐0	▲ 6SE7031–2TF☐0	1.83	1.51	360 x 1050 x 365 (14.1 x 41.3 x 14.3)	7	75 (165.4)	0.14 (4.943)
75 (100)	155	248	184	171	▲ 6SE7031–8EF☐0	▲ 6SE7031–8TF☐0	2.43	2.04	360 x 1050 x 365 (14.1 x 41.3 x 14.3)	7	75 (165.4)	0.14 (4.943)
90 (120)	175	280	208	192	▲ 6SE7032–1EG☐0	▲ 6SE7032–1TG☐0	2.77	2.30	508 x 1450 x 465 (20 x 57.1 x 18.3)	7	160 (352.8)	0.31 (0.946)
110 (150)	218	345	254	238	▲ 6SE7032–6EG☐0	▲ 6SE7032–6TG☐0	3.45	3.00	508 x 1450 x 465 (20 x 57.1 x 18.3)	7	160 (352.8)	0.31 (10.946)
132 (175)	262	419	312	288	▲ 6SE7033–2EG☐0	▲ 6SE7033–2TG☐0	4.25	3.60	508 x 1450 x 465 (20 x 57.1 x 18.3)	7	180 (396.8)	0.41 (14.477)
160 (215)	308	493	367	339	▲ 6SE7033–7EG☐0	▲ 6SE7033–7TG☐0	5.30	4.50	508 x 1450 x 465 (20 x 57.1 x 18.3)	7	180 (396.8)	0.41 (14.477)
200 (270)	423	575	–	465	▲ 6SE7035–1EK☐0	–	6.30	–	800 x 1750 x 565 (31.5 x 68.9 x 22.2)	9	400 (881.8)	0.46 (16.243)
200 (270)	423	575	504	–	–	▲ 6SE7035–1TJ☐0	–	5.20	800 x 1400 x 565 (31.5 x 55.1 x 22.2)	8	350 (771.8)	0.46 (16.243)
250 (335)	491	667	–	539	▲ 6SE7036–0EK☐0	–	8.9	–	800 x 1750 x 565 (31.5 x 68.9 x 22.2)	9	400 (881.8)	0.46 (16.243)
250 (335)	491	667	584	–	–	▲ 6SE7036–0TJ☐0	–	7.6	800 x 1400 x 565 (31.5 x 55.1 x 22.2)	8	350 (771.8)	0.46 (16.243)

▲ "Safe Stop" option possible with code **K80**

SIMOVERT MASTERDRIVES Motion Control	5	5
SIMOVERT MASTERDRIVES Motion Control Performance 2[4]	7	7

Power ratings over 250 kW (335 HP) to 710 kW (951 HP) possible on request for Performance 2 units.
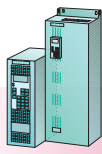
Conv. = Converters (AC – AC)
Inv. = Inverters (DC – AC)

1) The quoted nominal power ratings for SIMOVERT MASTERDRIVES serve only as a guide for the selection of other components. The exact drive output depends on the motors connected, and this should be taken into account when planning.

2) 10 kHz with Compact PLUS units, 5 kHz with compact and chassis units. 2.5 kHz for power ratings over 250 kW (335 HP) only possible on request with Performance 2 units.

3) Short time current: 3 x $I_{n\,conv}$ for 250 ms (only for Compact PLUS units)/Overload current: 1.6 x $I_{n\,conv}$ for 30 s. For the 200 kW (268 HP) and 250 kW (335 HP) units, this is 1.36 x the rated output current for 60 s.

4) Performance 2 stands for a performance increase by a factor of 2. Doubling of computing power and consequently halving of computing times for all functions.

Converters and inverters

Compact PLUS units	Compact and chassis units

3

Electronics options · Board/slot preconfiguration[1]

Designation		Order No.	Supplementary order code[6]	Weight, approx. kg (lb)	Dimensions W x H x D mm x mm x mm (in x in x in)
Encoder boards (An encoder board must always be ordered. Exception: *V/f* control)					
SBP	Incremental-encoder evaluation				
	Spare part[2]	6SE7090–0XX84–0FA0		0.3 (0.7)	20 x 90 x 95 (0.8 x 3.5 x 3.7)
	Retrofit kit[3]	6SX7010–0FA00			
	Plugged into slot A[4]		C11		
	Plugged into slot B[4] **(only for Compact PLUS units!)**		C12		
	Plugged into slot C[4] (motor encoder)		C13		
	Plugged into slot D[4] (only for compact		C14		
	Plugged into slot E[4] and chassis units)		C15		
	Plugged into slot F[4]		C16		
	Plugged into slot G[4]		C17		
SBR1	Resolver evaluation without incremental-encoder simulation				
	Spare part[2]	6SE7090–0XX84–0FB0		0.3 (0.7)	20 x 90 x 95 (0.8 x 3.5 x 3.7)
	Retrofit kit[3]	6SX7010–0FB00			
	Plugged into slot C[4]		C23		
SBR2	Resolver evaluation with incremental-encoder simulation				
	Spare part[2]	6SE7090–0XX84–0FC0		0.3 (0.7)	20 x 90 x 95 (0.8 x 3.5 x 3.7)
	Retrofit kit[3]	6SX7010–0FC00			
	Plugged into slot C[4]		C33		
SBM	Absolute-value encoder evaluation/incremental-encoder evaluation (only as spare part for existing systems)				
	Spare part[2]	6SE7090–0XX84–0FD0		0.3 (0.7)	20 x 90 x 95 (0.8 x 3.5 x 3.7)
SBM2	Absolute-value encoder evaluation/incremental-encoder evaluation (MC firmware versions ≥ 1.3)				
	Spare part[2]	6SE7090–0XX84–0FE0		0.3 (0.7)	20 x 90 x 95 (0.8 x 3.5 x 3.7)
	Retrofit kit[3]	6SX7010–0FE00			
	Plugged into slot C[4] (motor encoder)		C43		
	Plugged into slots A, B, D, E, F, G[4] (machine encoder)		C41/C42/C44 to C47		
Expansion boards					
EB1	Expansion board				
	Spare part[2]	6SE7090–0XX84–0KB0		0.3 (0.7)	20 x 90 x 95 (0.8 x 3.5 x 3.7)
	Retrofit kit[3]	6SX7010–0KB00			
	Plugged into slots A to G[4]		G61 to G67		
EB2	Expansion board				
	Spare part[2]	6SE7090–0XX84–0KC0		0.3 (0.7)	20 x 90 x 95 (0.8 x 3.5 x 3.7)
	Retrofit kit[3]	6SX7010–0KC00			
	Plugged into slots A to G		G71 to G77		
Drive coupling (rapid data exchange via fiber-optic cable)					
SLB	for SIMOLINK				
	Spare part[2]	6SE7090–0XX84–0FJ0		0.3 (0.7)	20 x 90 x 95 (0.8 x 3.5 x 3.7)
	Retrofit kit[3][5]	6SX7010–0FJ00			
	Plugged into slots A to G[4][5]		G41 to G47		
Communication boards (for slot location, see page 6/60)					
CBP2	for PROFIBUS DP				
	Spare part[2]	6SE7090–0XX84–0FF5		0.3 (0.7)	20 x 90 x 95 (0.8 x 3.5 x 3.7)
	Retrofit kit[3]	6SX7010–0FF05			
	Plugged into slots A, B, C, E, G		G91/G92/G93/G95/G97		
CBC	for CAN				
	Spare part[2]	6SE7090–0XX84–0FG0		0.3 (0.7)	20 x 90 x 95 (0.8 x 3.5 x 3.7)
	Retrofit kit[3]	6SX7010–0FG00			
	Plugged into slots A, B, C, E, G		G21/G22/G23/G25/G27		
CBD	**C**ommunication **B**oard **D**eviceNet for DeviceNet	6SX7010–0FK00		0.3 (0.7)	20 x 90 x 95 (0.8 x 3.5 x 3.7)

1) The Compact PLUS units have three slots A, B and C. Compact and chassis units can be expanded to have up to 6 slots, A, C, D, E, F and G. For the various possible configurations, see Page 6/61.

2) Excluding connector, excluding documentation.

3) For retrospective mounting. The retrofit kit usually contains a board, plug-in connector and documentation but not adapter boards or LBA (see Page 3/8).

4) With appropriate connector.

5) With 2 FOC connectors, 1 connector for X470 and 5 m all-plastic FOC (fiber-optic cable).

6) When ordering the board, **"–Z"** and the corresponding code for direct mounting in the corresponding slot must be appended to the converter/inverter order no.
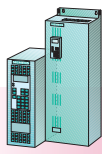
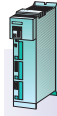## Electronics options · Boards for direct mounting in the electronics box[1]

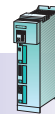| Designation		Order No.	Weight, approx. kg (lb)	Dimensions W x H x D mm x mm x mm (in x in x in)
Interface boards (only for compact and chassis units)[2]				
SCB1	Interface board with FOC (fiber-optic cable) connection. For a more detailed description of the SCB1 interface board and how it is integrated, see Engineering Information, Section 6. Supplied loose, including 10 m (33 ft) fiber-optic cable.	6SE7090–0XX84–0BC0	0.5 (1.1)	25 x 235 x 125 (1.0 x 9.3 x 4.9)
SCB2	Interface board with floating RS485 interface. For a more detailed description of the SCB2 interface board and how it is integrated, see Engineering Information, Section 6. Supplied loose.	6SE7090–0XX84–0BD1	0.5 (1.1)	25 x 235 x 125 (1.0 x 9.3 x 4.9)
Technology boards (only for compact and chassis units)[3]				
T100	T100 technology board for drive-related technology functions. For a more detailed description of the T100 board accessories and how they are integrated, see Catalog DA 65,10. SIMOVERT MASTERDRIVES Vector Control or the North American version. Supplied loose without software module.	6SE7090–0XX87–0BB0	0.5 (1.1)	25 x 235 x 125 (1.0 x 9.3 x 4.9)
T300	T300 technology board hardware package for standard planning, (T300 with two connecting cables SC58 and SC60. SE300 terminal block and hardware instruction manual in German/English) For a more detailed description of the T300 board and accessories and how they are integrated, see Catalog DA 65,10. SIMOVERT MASTERDRIVES Vector Control or the North American version. Supplied loose without manual.	6SE7090–0XX87–4AH0	2 (4.4)	300 x 400 x 300 (11.8 x 15.7 x 11.8))
	T300 technology board as spare part	6SE7090–0XX84–0AH2		
T400	T400 technology board. For a more detailed description of the T400 board and accessories and how they are integrated, see Catalog DA 65,10. SIMOVERT MASTERDRIVES Vector Control or contact your local Siemens office. Supplied loose without configuration.	6DD1606–0AD0	0.5 (1.1)	25 x 235 x 125 (1.0 x 9.3 x 4.9)

3

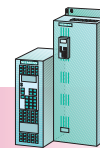1) See "Integration of the electronics options", page 6/60.

2) In mounting position 2 or 3.

3) In mounting position 2.

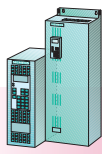| Compact PLUS units	Compact and chassis units

Converters and inverters

Electronics options · Additional boards and options

Designation		Order No.	Code[1]	Weight, approx. kg (lb)	Dimensions W x H x D mm x mm x mm (in x in x in)
Accessories for compact and chassis units for expanding the electronic slots					
ADB	Adapter board	6SE7090–0XX84–0KA0			
	Adapter board, plugged into mounting position 2 (slots D and E)		K01		
	Adapter board, plugged into mounting position 3 (slots F and G)		K02		
LBA	Bus adapter for electronics box	6SE7090–0XX84–4HA0			
	Bus adapter for electronics box, integrated		K11		
Accessories for SIMOLINK					
SLP	SIMOLINK pulse generator An incremental-encoder signal proportional to the speed is generated from a setpoint in the SIMOLINK telegram; RS422, track A, B	6SX7005–0AD00		0.3 (0.7)	35 x 118 x 88 (1.4 x 4.6 x 3.5)
SLE-DP	SIMOLINK incremental encoder With PROFIBUS DP station at SIMOLINK, generates pulse series and zero pulse from position setpoint telegram acc. to an RS422 incremental encoder with either 1024, 2048, 4096 or 8192 S/R	6SX7005–0AG01		0.4 (0.9)	52 x 118 x 88 (2.0 x 4.6 x 3.5)
SLS	SIMOLINK switch Changeover switch for SIMOLINK fiber-optic cables, 4 inputs/outputs to 4 outputs/inputs, 12 different switching positions	6SX7005–0AE00		0.3 (0.7)	35 x 118 x 88 (1.4 x 4.6 x 3.5)
SLM	SIMOLINK monitor Diagnostics box for monitoring the SIMOLINK telegrams, connection to a measuring PC, evaluation of the data with diagnostic/analysis software (PC software items are to be ordered separately)	6SX7005–0AF00		0.8 (1.8)	54 x 194 x 155 (2.1 x 7.6 x 6.1)
	Extra package for SLB board 5 m/16.4 ft plastic FOC cable, 2 FOC plug-in connectors, 1 plug-in connector for the terminal strip, supplied with rough and fine glass paper (comes together with the SLB board).	6SY7000–0AD15			
	System package for SLB board 100 m/328 ft all-plastic FOC cable, 40 x FOC plug-in connectors, 20 x plug-in connectors for the terminal strip	6SX7010–0FJ50			
	Glass fiber-optic cable (PCF = Polymer Cladding Fiber), up to a max. of 300 m/984.25 ft between two SLB boards. The following fiber-optic cable modules from Hewlett Packard are on the SLB board Transmitter: HFBR 1528 Receiver: HFBR 2528	on request			
	PROFIBUS plastic fiber optic, duplex-core Plastic FOC with 2 cores, PVC sheath, without connector for use in environments with low mechanical stress 50 m (164 ft) ring	6XV1 821–2AN50			
	PROFIBUS plastic fiber optic, simplex connector/polishing set 100 simplex connectors and 5 polishing sets for assembling PROFIBUS plastic fiber-optic cables for the optical PROFIBUS DP	6GK1 901–0FB00–0AA0			
Additional options					
OP1S	Comfort operator control panel	6SE7090–0XX84–2FK0			
	OP1S cable (3 m/10 ft)	6SX7010–0AB03			
	OP1S cable (5 m/16.4 ft)	6SX7010–0AB05			
	PC cable (3 m/10 ft) for DriveMonitor and software/firmware downloading	9AK1012–1AA00			

1) When ordering the board, **"–Z"** and the corresponding code for direct mounting in the relevant slot must be appended to the inverters/converters order no.

3

Control board for compact and chassis units

Designation	Order No.	Weight, approx. kg (lb)	Dimensions W x H x D mm x mm x mm (in x in x in)
CUMC control board			
CUMC (60 MHz) (standard board of the basic unit) Board, single	6SE7090–0XX84–0AD1	0.5 (1.1)	25 x 235 x 125 (1.0 x 9.3 x 4.9)
CUPM control board			
CUPM – Performance 2 (standard board of the basic unit) Board, single	6SE7090–0XX84–0AD5	0.5 (1.1)	25 x 235 x 125 (1.0 x 9.3 x 4.9)

Plugs/Terminal blocks

Designation	Order No.
Plugs/Terminal blocks	
MC plug set/terminal block set	
for Compact PLUS units	6SY7000–0AE51
for compact units	6SY7000–0AD38
for chassis units (E to G type of construction)	6SY7000–0AD26

## Technology software

Designation	Order No.	Code
Technology software		
Positioning, angular synchronism with cam disc, electronic coupling and more Supplied factory enabled		F01
Enabled later using a 2 x 4 digit PIN Number	6SW1700–5AD00–1XX0	
The board-FID (Product Identification, 2 x 4-digit number) <u>must</u> be stated. The FID can be read out from the parameters U976.1 and U976.2.		
Documentation · Compendium for MASTERDRIVES Motion Control		
Description, function diagrams and parameter list. Compendium in English (for other languages, see Section 5). Supplied as a manual	6SE7087–6QX50	

3
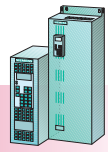
Rectifier units

Compact PLUS units

Compact and chassis units

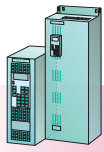| Nominal power rating[1]	Selection data					Rectifier unit	Total power loss	Dimensions W x H x D	For dimension drawing, see Section 7	Weight, approx.	Cooling air require-ment
	Rated DC link current	DC link base load current	Short-time current of DC link	Max. DC link inverter current[2]	Input current[3]						
	$I_{DCrated}$	I_{DCG}	$I_{DCmax.}$								
kW	A	A	A	A	A	Order No.	kW	mm x mm x mm (in x in x in)	No.	kg (lb)	m³/s (ft³/s)
Supply voltage 3-ph. 380 V to 480 V AC											
Compact PLUS units with integrated brake chopper											
15	41	37	123/65[4]	80	36	**6SE7024–1EP85–0AA0**[6]	0.13	90 x 360 x 260 (3.5 x 14.2 x 10.2)	1	3.9 (8.6)	0.018 (0.636)
50	120	109	360/192[4]	[5]	108	**6SE7031–2EP85–0AA0**[6]	0.27	135 x 360 x 260 (5.3 x 14.2 x 10.2)	1	8.3 (18.3)	0.041 (1.448)
100	230	209	690/368[4]	[5]	207	**6SE7032–3EP85–0AA0**[6]	0.60	180 x 360 x 260 (7.1 x 14.2 x 10.2)	1	13.3 (29.3)	0.053 (1.871)
Compact units											
15	41	37	56	45	36	**6SE7024–1EB85–0AA0**	0.12	135 x 425 x 350 (5.3 x 16.7 x 13.8)	4	12 (26.5)	0.022 (0.777)
37	86	78	117	95	75	**6SE7028–6EC85–0AA0**	0.26	180 x 600 x 350 (7.1 x 23.6 x 13.8)	4	18 (39.7)	0.028 (0.989)
Chassis units											
75	173	157	235	[5]	149	**6SE7031–7EE85–0AA0**	0.62	270 x 1050 x 365 (10.6 x 41.3 x 14.4)	6	45 (99.2)	0.2 (7.1)
110	270	246	367	[5]	233	**6SE7032–7EE85–0AA0**	0.86	270 x 1050 x 365 (10.6 x 41.3 x 14.4)	6	45 (99.2)	0.2 (7.1)
160	375	341	510	[5]	326	**6SE7033–8EE85–0AA0**	1.07	270 x 1050 x 365 (10.6 x 41.3 x 14.4)	6	45 (99.2)	0.2 (7.1)
200	463	421	630	[5]	403	**6SE7034–6EE85–0AA0**	1.32	270 x 1050 x 365 (10.6 x 41.3 x 14.4)	6	45 (99.2)	0.2 (7.1)
250	605	551	823	[5]	526	**6SE7036–1EE85–0AA0**	1.67	270 x 1050 x 365 (10.6 x 41.3 x 14.4)	6	45 (99.2)	0.2 (7.1)

1) The quoted nominal power ratings serve only as a guide for the selection of other components. The exact drive output depends on the connected inverters and this should be taken into account when planning.

2) The connected inverter units must not exceed the specified total DC link current.

3) The currents are based on a line inductance of **3 %** in relation to the equipment impedance **Z**, i.e. the ratio of the line short-circuit power to the converter power **S** is **33 : 1** or 100 : 1 if a 2 % line reactor is used as well.

Equipment impedance: $Z = \dfrac{V_{Line}}{\sqrt{3} \cdot I_{V_{Line}}}$

4) 3 x I_{DC} for 250 ms (only for Compact PLUS rectifier units)/1.6 x I_{DC} for 30 s.

5) No limitation due to precharging via controlled thyristor bridge. For maximum dimensioning, see Section 6, "Dimensioning of the system components for multi-axis drives".

6) The brake chopper is built into the Compact PLUS rectifier unit. The brake resistor (see Page 3/18) is to be selected accordingly and mounted externally. The 24 V current requirement is approx. 0.5 A per rectifier unit at 15 kW, 0.7 A at 50 kW and 100 kW.

Compact and chassis units

Compact PLUS units

| Sound pressure level with standard protection degree IP20/IP00	Power connections – Terminals for sizes B, C and P – Lugs for size E – Location: at top for DC, at bottom for AC			Auxiliary current requirement			
50 Hz	Finely stranded	Single- and multi-stranded	Retaining bolt	DC 24 V Standard version max. at 20 V	DC 24 V Max. version max. at 20 V	1-ph. or 2-ph. 230 V AC fan 50 Hz	60 Hz
dB (A)	mm² (AWG)	mm² (AWG)		A	A	A	A
60	max. 10 (8)	max. 10 (8)	–	0.5	–	none	none
68	max. 50 (1/0)	max. 50 (1/0)	–	0.7	–	none	none
65	max. 95 (4/0)	max. 95 (4/0)	–	0.7	–	none	none
60	2.5 to 10 (12 – 8)	2.5 to 16 (12 – 4)		0.5	–	none	none
60	2.5 to 35 (12 – 2)	10 to 50 (6 – 1/0)		0.5	–	none	none
75		2 x 300 (2 x 600)	M 12	0.3	–	0.6	0.75
75		2 x 300 (2 x 600)	M 12	0.3	–	0.6	0.75
75		2 x 300 (2 x 600)	M 12	0.3	–	0.6	0.75
75		2 x 300 (2 x 600)	M 12	0.3	–	0.6	0.75
75		2 x 300 (2 x 600)	M 16	0.3	–	0.6	0.75

3

Self-commutating, pulsed rectifier/regenerative units Active Front End AFE

Compact and chassis units
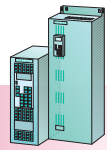
Rated rectifier/ regenerative output at $\cos\varphi = 1$ and 400 V supply voltage	Selection data Short-time rectifier/ regenerative output at $\cos\varphi = 1$ and 400 V supply voltage	Rated input current 3 AC from/to line	Base load input current 3 AC from/to line	Short-time input current 3 AC from/to line	AFE inverters with CUSA control board 6SE7090-0XX84-0BJ0	Power loss	Spare part from VC inverter of nominal power rating	Framework dimensions W x H x D	For dimension drawing, see Section 7	Weight, approx.	Cooling air require-ment
P_{rated}	$P_{max.}$	$I_{n\,conv}$	I_G	$I_{max.}$		P_v	P_{type}				
kW	kW	A	A	A	Order No.	kW	kW	mm x mm x mm (in x in x in)	No.	kg (lb)	m³/s (ft³/s)
Supply voltage 3-ph. 380 V AC –20 % to 460 V +5 %											
Compact units											
6.8	11	10.2	9.2	16.3	**6SE7021–0EA81**	0.14	4	90 x 425 x 350 (3.5 x 16.7 x 13.8)	5	8 (17.4)	0.009 (0.318)
9	14	13.2	11.9	21.1	**6SE7021–3EB81**	0.18	5.5	135 x 425 x 350 (5.3 x 16.7 x 13.8)	5	12 (26.5)	0.022 (0.777)
12	19	17.5	15.8	28.0	**6SE7021–8EB81**	0.24	7.5	135 x 425 x 350 (5.3 x 16.7 x 13.8)	5	12 (26.5)	0.022 (0.777)
17	27	25.5	23.0	40.8	**6SE7022–6EC81**	0.34	11	180 x 600 x 350 (7.1 x 23.6 x 13.8)	5	24 (52.9)	0.028 (0.989)
23	37	34	31	54	**6SE7023–4EC81**	0.46	15	180 x 600 x 350 (7.1 x 23.6 x 13.8)	5	24 (52.9)	0.028 (0.989)
32	51	47	42	75	**6SE7024–7ED81**	0.63	22	270 x 600 x 350 (10.6 x 23.6 x 13.8)	5	35 (77.2)	0.054 (1.907)
40	63	59	53	94	**6SE7026–0ED81**	0.79	30	270 x 600 x 350 (10.6 x 23.6 x 13.8)	5	35 (77.2)	0.054 (1.907)
49	78	72	65	115	**6SE7027–2ED81**	0.98	37	270 x 600 x 350 (10.6 x 23.6 x 13.8)	5	35 (77.2)	0.054 (1.907)
Chassis units											
63	100	92	83	147	**6SE7031–0EE80**	1.06	45	270 x 1050 x 365 (10.6 x 41.3 x 14.4)	7	55 (121.3)	0.11 (3.885)
85	135	124	112	198	**6SE7031–2EF80**	1.44	55	360 x 1050 x 365 (14.3 x 41.3 x 14.4)	7	65 (143.3)	0.15 (5.297)
100	159	146	131	234	**6SE7031–5EF80**	1.69	75	360 x 1050 x 365 (14.3 x 41.3 x 14.4)	7	65 (143.3)	0.15 (5.297)
125	200	186	167	298	**6SE7031–8EF80**	2.00	90	360 x 1050 x 365 (14.3 x 41.3 x 14.4)	7	65 (143.3)	0.15 (5.297)
143	228	210	189	336	**6SE7032–1EG80**	2.42	110	508 x 1450 x 465 (20 x 57.1 x 18.3)	7	155 (341.8)	0.33 (11.654)
177	282	260	234	416	**6SE7032–6EG80**	3.00	132	508 x 1450 x 465 (20 x 57.1 x 18.3)	7	155 (341.8)	0.33 (11.654)
214	342	315	284	504	**6SE7033–2EG80**	3.64	160	508 x 1450 x 465 (20 x 57.1 x 18.3)	7	165 (363.8)	0.44 (15.539)
250	400	370	333	592	**6SE7033–7EG80**	4.25	200	508 x 1450 x 465 (20 x 57.1 x 18.3)	7	180 (396.9)	0.44 (15.539)

1) The quoted nominal power ratings serve only as a guide for the selection of other components. The exact drive output depends on the motor connected and this should be taken into account when planning.

Compact and chassis units

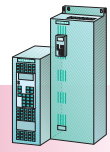| Sound pressure level with standard protection degree IP20/IP00	Power connections – Terminals for sizes A to D – Lugs for sizes E to G – Location: at bottom for AFE reactor, at top for DC link connection			Auxiliary current requirement		
50 Hz	Finely stranded	Single- and multi-stranded	Retaining bolt	DC 24 V Standard version max. at 20 V	DC 24 V Max. version max. at 20 V	2-ph. 230 V AC fan at AFE inverters 50 Hz/60 Hz[1])
dB (A)	mm² (AWG)	mm² (AWG)		A	A	W
60	2.5 to 10 (12 – 8)	2.5 to 16 (12 – 6)		2	3	none
60	2.5 to 10 (12 – 8)	2.5 to 16 (12 – 6)		2	3	none
60	2.5 to 10 (12 – 8)	2.5 to 16 (12 – 6)		2	3	none
60	2.5 to 16 (12 – 6)	10 to 25 (6 – 4)		2	3	none
60	2.5 to 16 (12 – 6)	10 to 25 (6 – 4)		2	3	none
65	2.5 to 35 (12 – 2)	10 to 50 (6 – 1/0)		2	3	0.43/0.49
65	2.5 to 35 (12 – 2)	10 to 50 (6 – 1/0)		2	3	0.43/0.49
65	2.5 to 35 (12 – 2)	10 to 50 (6 – 1/0)		2	3	0.43/0.49
69		max. 2 x 70 (2 x 2/0)	M 10	The AFE chassis units are supplied only with the line connection module (cf. system components) as standard. The 24 V DC and 230 V AC auxiliary power supply and its fusing is integrated in the related line connection module.		
70		max. 2 x 70 (2 x 2/0)	M 10			
70		max. 2 x 70 (2 x 2/0)	M 10			
70		max. 2 x 70 (2 x 2/0)	M 10			
81		max. 2 x 150 (2 x 300)	M 12			
81		max. 2 x 150 (2 x 300)	M 12			
83		max. 2 x 150 (2 x 300)	M 12			
83		max. 2 x 150 (2 x 300)	M 12			

3

Compact and chassis units

Rectifier/regenerative units[1])

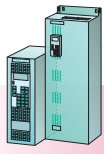| Nominal power rating[2])	Selection data				Rectifier/ regenerative unit	Total power loss	Dimensions W x H x D	For dimension drawing, see Section 7	Weight, approx.	Cooling air require- ment
	Rated DC link current	DC link base load current	DC link short- time current	Input current[3])						
	$I_{DCrated}$	I_{DCG}	$I_{DCmax.}$							
kW	A	A	A	A	Order No.	kW	mm x mm x mm (in x in x in)	No.	kg (lb)	m³/s (ft³/s)
Supply voltage 3-ph. 380 V to 480 V AC										
Compact units										
7.5	21	19	29	18	**6SE7022–1EC85–1AA0**	0.15	180 x 600 x 350 (7.1 x 23.6 x 13.8)	4	23 (50.7)	0.028 (0.989)
15	41	37	56	35	**6SE7024–1EC85–1AA0**	0.20	180 x 600 x 350 (7.1 x 23.6 x 13.8)	4	23 (50.7)	0.028 (0.989)
37	86	78	117	74	**6SE7028–6EC85–1AA0**	0.31	180 x 600 x 350 (7.1 x 23.6 x 13.8)	4	23 (50.7)	0.028 (0.989)
Chassis units										
75	173	157	235	149	**6SE7031–7EE85–1AA0**	0.69	270 x 1050 x 365 (10.6 x 41.3 x 14.4)	6	45 (99.2)	0.2 (7.1)
90	222	202	302	192	**6SE7032–2EE85–1AA0**	0.97	270 x 1050 x 365 (10.6 x 41.3 x 14.4)	6	45 (99.2)	0.2 (7.1)
132	310	282	422	269	**6SE7033–1EE85–1AA0**	1.07	270 x 1050 x 365 (10.6 x 41.3 x 14.4)	6	45 (99.2)	0.2 (7.1)
160	375	341	510	326	**6SE7033–8EE85–1AA0**	1.16	270 x 1050 x 365 (10.6 x 41.3 x 14.4)	6	52 (114.6)	0.2 (7.1)
200	463	421	630	403	**6SE7034–6EE85–1AA0**	1.43	270 x 1050 x 365 (10.6 x 41.3 x 14.4)	6	52 (114.6)	0.2 (7.1)
250	605	551	823	526	**6SE7036–1EE85–1AA0**	1.77	270 x 1050 x 365 (10.6 x 41.3 x 14.4)	6	65 (114.6)	0.2 (7.1)

3

1) In the case of rapid changeover from supply to regenerative feedback, a dead time of 15 ms must be taken into account. For high dynamic response, AFE rectifier/regenerative units are to be used.

2) The quoted nominal power ratings serve only as a guide for the selection of other components. The exact drive output depends on the connected inverters and this should be taken into account when planning.

3) The currents are based on a line inductance of **3 %** in relation to the equipment impedance Z, i.e. the ratio of the line short-circuit power to the converter power S is **33 : 1** or 100 : 1 if a 2 % line reactor is used as well.

Equipment impedance: $Z = \dfrac{V_{Line}}{\sqrt{3} \cdot I_{V_{Line}}}$

3

Sound pressure level with standard protection degree IP20/IP00	Power connections – Terminals for size C – Lugs for size E – Location: <u>AC motorized</u> top for frame size C bottom for frame size E <u>DC</u> top for frame sizes C and E <u>AC regenerative</u> for frame sizes C and E			Auxiliary current requirement			
	Finely stranded	Single- and multi-stranded	Retaining bolt	DC 24 V Standard version max. at 20 V	DC 24 V Max. version max. at 20 V	1-ph. or 2-ph. 230 V AC fan	
50 Hz						50 Hz	60 Hz
	mm² (AWG)	mm² (AWG)					A
dB (A)				A	A	A	
60	2.5 to 35 (12 – 2)	10 to 50 (6 –1/0)		0.9	2.0	none	none
60	2.5 to 35 (12 – 2)	10 to 50 (6 –1/0)		0.9	2.0	none	none
60	2.5 to 35 (12 – 2)	10 to 50 (6 –1/0)		0.9	2.0	none	none
75		2 x 300 (2 x 600)	M 12	0.7	2.0	0.60	0.75
75		2 x 300 (2 x 600)	M 12	0.7	2.0	0.60	0.75
75		2 x 300 (2 x 600)	M 12	0.7	2.0	0.60	0.75
75		2 x 300 (2 x 600)	M 12	0.7	2.0	0.60	0.75
75		2 x 300 (2 x 600)	M 12	0.7	2.0	0.60	0.75
75		2 x 300 (2 x 600)	M 16	0.7	2.0	0.60	0.75

Options

Compact PLUS units

Compact and chassis units

Codes

Code	Description	Converter				Inverter				Rectifier unit			AFE	Rectifier/rege-nerative unit	
Size	MC+ = Motion Control Compact PLUS. ■ Standard. ● Option available. – Not available.	MC+	A–D	E–G	K	MC+	A–D	E–G	J	MC+	B–C	E		C	E
Line-side radio-interference suppression and protective devices															
L03	Basic interference suppression when radio-interference suppression filters are used	■	■	■	●	■	–	–	●	–	–	–	–	–	–
L20	Operation of the converters with an IT supply system	●	●	●	■	■	■	■	■	■	■	■	–	■	■
L30	Inverter fuses integrated, fuse type for DIN/IEC approval and ⊕	–	–	–	–	■	■	●	■	–	–	–	–	–	–
L33	Compact inverters without fuses	–	–	–	–	–	●	■	–	–	–	–	–	–	–
Electrical options															
K80	Safe Stop	●	–	●	●	●	■	●	●	–	–	–	–	–	–
K91	DC link current measuring unit	–	–	–	–	–	–	–	–	–	●	●	–	■	■
Mechanical options															
M20	Enclosure[1] for increasing the degree of protection to IP20	■	■	●	–	■	■	●	–	■	■	●		■	●
Documentation															
D72	Documentation in Italian/English	●	●	●	●	●	●	●	●	●	●	●	–	●	●
D77	Documentation in French/English	●	●	●	●	●	●	●	●	●	●	●	–	●	●
D78	Documentation in Spanish/English	●	●	●	●	●	●	●	●	●	●	●	–	●	●
D99[2]	Supplied without documentation	●	●	●	●	●	●	●	●	●	●	●	–	●	●

Brief description of the options

L03 Basic interference suppression when radio-interference suppression filters are used with TT and TN systems
With the L03 option, unit sizes J to X are fitted with discharge capacitors in the DC link.

L20 Operation with an IT system
See description in Section 4. With the L20 option, operation with non-earthed systems (IT systems), the basic interference capacitors built in as standard are removed.

L30 Integrated inverter fuses, fuse type for DIN/IEC approval and ⊕
Option L30 can only be used for inverter sizes E to G. Inverter fuses are for protecting inverters connected to a DC bus. Inverter fuses must always be provided when at least 2 inverters are operated on this bus. The inverters do not have to be protected when a single inverter of a rectifier

unit or a rectifier/regenerative unit is supplied with matched power. The same conditions apply to a converter.
For option L30, the inverter fuses indicated are integrated in the inverter.

L33 Compact inverters without fuses
For a description, see L30. With the L33 option, which can be used for compact inverters sizes A to D, the inverter fuses are not built into the inverter and are not supplied with the drive unit. The inverter fuses must be ordered separately and mounted externally (for types, see page 3/23).

K80 Safe Stop
The function "Safe Stop" is a "device for the prevention of an unexpected start-up" to EN 60 204-1, section 5.4. It is realized in connection with an external circuit.
The "Safe Stop" function can be retrofitted by Siemens personnel only with converters and inverters of frame sizes E to K.

K91 DC link current measurement
In the rectifier unit sizes B, C and E, the DC link current is measured indirectly via the line-side current transformers.

M20 IP20 panels
With the M20 option, unit sizes E to G are provided with an IP20 enclosure (wall mounting possible). Control is via a PMU built into the front panel.

D72 Documentation in Italian/English
Operating instructions are supplied in Italian/English.

D77 Documentation in French/English
Operating instructions are supplied in French/English.

D78 Documentation in Spanish/English
Operating instructions are supplied in Spanish/English.

D99[2] Supplied without operating instructions and without DriveMonitor
If this option is chosen, no operating instructions or tools in the form of paper or software (no CD-ROM) are enclosed.

1) The enclosures can also be supplied separately. See "Selection and ordering data – Mechanical components".

2) In accordance with EU guidelines, the orderer of this option must ensure that the documentation is made available to the end user in the context of the machine and equipment documentation.
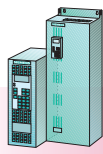
Isolation amplifier boards for the mounting of DIN rails

The isolation amplifier boards can be used for isolating the analog input and output signals from the supply.

Isolation amplifiers in modular housings from Knick are recommended.
For further information, please visit the Internet at:
http://www.knick.de

SCI1 and SCI2 interface boards (for compact and chassis units only)

A serial I/O system using fiber-optic cables can be established with the SCI1 and SCI2 interface boards and the SCB1 interface board. This allows the binary and analog inputs and outputs to be considerably expanded. For a more detailed description of the SCI1 and SCI2, see Engineering Information, Section 6.

Designation	Order No.
Interface boards for establishing an I/O system via fiber-optic cables	
SCI1	Interface board for binary and analog inputs/outputs. Supplied loose with 10 m/32.8 ft of fiber-optic cable	**6SE7090–0XX84–3EA0**
SCI2	Interface board for binary inputs/outputs. Supplied loose with 10 m/32.8 ft of fiber-optic cable.	**6SE7090–0XX84–3EF0**

Rectifier units for supplying 24 V DC

Power supply		Dimensions W x H x D	
A	Order No.	mm	(in)
24 V DC rectifier units, single-phase 230 V AC and 400 V AC, can be used with +6 % and –10 % line-voltage tolerance[1]			
1 (230 V)	**4AV21 02–2EB00–0A**	45 x 135 x 111	(1.8 x 5.3 x 4.4)
1 (400 V)	**4AV21 06–2EB00–0A**	45 x 135 x 111	(1.8 x 5.3 x 4.4)
3.5 (230 V)	**4AV23 02–2EB00–0A**	72 x 135 x 111	(2.8 x 5.3 x 4.4)
2.5 (230/400 V)	**4AV20 00–2EB00–0A**	85 x 137 x 98	(3.3 x 5.4 x 3.9)
5 (230/400 V)	**4AV22 00–2EB00–0A**	106 x 160 x 113	(4.2 x 6.3 x 4.5)
10 (230/400 V)	**4AV24 00–2EB00–0A**	121 x 170 x 128	(4.8 x 6.7 x 5.0)
15 (230/400 V)	**4AV26 00–2EB00–0A**	151 x 200 x 145	(5.9 x 7.9 x 5.7)
24 V DC rectifier units, for 3-ph. 400 V DC, can be used with +6 % and –10 % line-voltage tolerance[1]			
10	**4AV30 00–2EB00–0A**	164 x 190 x 115	(6.4 x 7.5 x 4.5)
15	**4AV31 00–2EB00–0A**	164 x 190 x 115	(6.4 x 7.5 x 4.5)
20	**4AV32 00–2EB00–0A**	216 x 220 x 115	(8.5 x 8.7 x 4.5)
30	**4AV33 00–2EB00–0A**	216 x 220 x 158	(8.5 x 8.7 x 6.2)
40	**4AV34 00–2FB00–0A**	266 x 260 x 165	(10.4 x 10.2 x 6.5)
50	**4AV35 00–2FB00–0A**	266 x 260 x 190	(10.4 x 10.2 x 7.5)
24 V DC power supply units, can be used with ±15 % line-voltage tolerance[2]			
2.5 (230 V)	**6EP1 332–1SH41**	126 x 90 x 55	(5.0 x 3.5 x 2.2)
5 (230 V)	**6EP1 333–3BA00**	75 x 125 x 125	(3.0 x 4.9 x 4.9)
10 (230 V)	**6EP1 334–3BA00**	100 x 125 x 135	(3.9 x 4.9 x 5.3)
20 (400 V)	**6EP1 336–3BA00**	280 x 125 x 92	(11.0 x 4.9 x 3.6)

A Compact PLUS unit with 3 electronic components has a maximum current requirement of approximately 1.5 A (up to 4 kW) or of approximately 2 A (4 to 18.5 kW) from a 24 V DC power supply.

Coupling relay

The coupling relay enables isolated energizing of a load. Additionally, it is possible to switch loads requiring increased power which cannot be supplied directly by the digital output.

Type	typ. power requirement for 24 V DC mA	Switching capacity, output	Supplier
Coupling relay for connection to digital outputs of control board			
3TX70 02–3AB01	< 7	60 V DC/1.5 A	Siemens
3TX70 02–3AB00	< 20	48 V AC to 264 V AC/1.8 A	Siemens
PLC-RSC-24DC/21	9	250 V AC/6 A	Phoenix Contact
PLC-RSP-24DC/21	9	250 V AC/6 A	Phoenix Contact

1) For technical data, see Catalog "Switchgear and Systems".

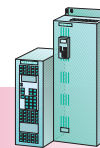2) For technical data, see Catalog KT01.

Recommended DC link system components

Compact PLUS units

Compact and chassis units

Braking units and braking resistors

| Braking power				Braking unit				Braking resistor, external				
Rated braking power	Short-time braking power	Continuous braking power with external braking resistor	Continuous braking power with internal braking resistor		Dimensions W x H x D	For dimension drawing, see Section 7	Weight, approx.		Resistance[7]	Dimensions W x H x D	For dimension drawing, see Section 7	Weight, approx.
P_{20}	P_3	P_{DZ}	P_{DB}									
kW	kW	kW	kW	Order No.	mm x mm x mm (in x in x in)	No.	kg (lb)	Order No.	Ω	mm x mm x mm (in x in x in)	No.	kg (lb)
DC link voltage 510 V to 650 V DC												
For Compact PLUS converter												
2	3	–	0.15					6SE7013–2ES87–2DC0	200	44 x 250 x 120 (1.73 x 9.84 x 4.72)	10a	1.4 (3.1)
4	6	–	0.3[8]					6SE7016–3ES87–2DC0	100	44 x 250 x 120 (1.73 x 9.84 x 4.72)	10a	1.9 (4.2)
5	7.5	1.25	–	–[1]				6SE7018–0ES87–2DC0[2]	80	145 x 180 x 540 (5.7 x 7.1 x 21.3)	11	6 (13.2)
10	15	2.5	–	–[1]				6SE7021–6ES87–2DC0[2]	40	145 x 360 x 540 (5.7 x 14.2 x 21.3)	11	11.5 (25.4)
12	18	–	0.9[9]					6SE7022–0ES87–2DC0	33.3	134 x 350 x 203 (5.28 x 13.78 x 7.99)	11a	6.8 (15)
20	30	5	–	–[1]				6SE7023–2ES87–2DC0[3]	20	430 x 302 x 485 (16.9 x 11.9 x 19.1)	12	17 (37.5)
For Compact PLUS rectifier units												
2	3	–	0.15					6SE7013–2ES87–2DC0	200	44 x 250 x 120 (1.73 x 9.84 x 4.72)	10a	1.4 (3.1)
4	6	–	0.3[8]					6SE7016–3ES87–2DC0	100	44 x 250 x 120 (1.73 x 9.84 x 4.72)	10a	1.9 (4.2)
5	7.5	1.25	–	–[1]				6SE7018–0ES87–2DC0[4]	80	145 x 180 x 540 (5.7 x 7.1 x 21.3)	11	6 (13.2)
10	15	2.5	–	–[1]				6SE7021–6ES87–2DC0[4]	40	145 x 360 x 540 (5.7 x 14.2 x 21.3)	11	11.5 (25.4)
12	18	–	0.9[9]					6SE7022–0ES87–2DC0	33.3	134 x 350 x 203 (5.28 x 13.78 x 7.99)	11a	6.8 (15)
20	30	5	–	–[1]				6SE7023–2ES87–2DC0[4]	20	435 x 305 x 485 (17.1 x 11.9 x 19.1)	12	17 (37.5)
50	75	12.5	–	–[1]				6SE7028–0ES87–2DC0[5]	8	745 x 305 x 485 (29.3 x 11.9 x 19.1)	12	27 (59.5)
100	150	25	–	–[1]				6SE7031–6ES87–2DC0[6]	4	745 x 605 x 485 (29.3 x 23.8 x 19.1)	13	47 (103.6)
For compact and chassis units												
2	3	–	0.15					6SE7013–2ES87–2DC0	200	44 x 250 x 120 (1.73 x 9.84 x 4.72)	10a	1.4 (3.1)
4	6	–	0.3[8]					6SE7016–3ES87–2DC0	100	44 x 250 x 120 (1.73 x 9.84 x 4.72)	10a	1.9 (4.2)
5	7.5	1.25	0.16	6SE7018–0ES87–2DA0	45 x 425 x 350 (1.8 x 16.7 x 13.8)	10	6 (13.2)	6SE7018–0ES87–2DC0	80	145 x 180 x 540 (5.7 x 7.1 x 21.3)	11	6 (13.2)
10	15	2.5	0.32	6SE7021–6ES87–2DA0	45 x 425 x 350 (1.8 x 16.7 x 13.8)	10	6 (13.2)	6SE7021–6ES87–2DC0	40	145 x 360 x 540 (5.7 x 14.2 x 21.3)	11	11.5 (25.4)
12	18	–	0.9[9]					6SE7022–0ES87–2DC0	33.3	134 x 350 x 203 (5.28 x 13.78 x 7.99)	11a	6.8 (15)
20	30	5	0.63	6SE7023–2EA87–2DA0	90 x 425 x 350 (3.5 x 16.7 x 13.8)	10	11 (24.3)	6SE7023–2ES87–2DC0	20	430 x 302 x 485 (16.9 x 11.9 x 19.1)	12	17 (37.5)
50	75	12.5	–	6SE7028–0EA87–2DA0	90 x 425 x 350 (3.5 x 16.7 x 13.8)	10	11 (24.3)	6SE7028–0ES87–2DC0	8	740 x 302 x 485 (29.1 x 11.9 x 19.1)	12	27 (59.5)
100	150	25	–	6SE7031–6EB87–2DA0	135 x 425 x 350 (5.3 x 16.7 x 13.8)	10	18 (39.7)	6SE7031–6ES87–2DC0	4	740 x 605 x 485 (29.1 x 23.8 x 19.1)	13	47 (103.6)
170	255	42.5	–	6SE7032–7EB87–2DA0	135 x 425 x 350 (5.3 x 16.7 x 13.8)	10	18 (39.7)	6SE7032–7ES87–2DC0	2.35	740 x 1325 x 485 (29.1 x 52.0 x 19.1)	14	103 (227.1)

1) With Compact PLUS rectifier units and Compact PLUS converters, the brake choppers are included as standard features. The external braking resistor should be dimensioned accordingly.

2) Can be used for all Compact PLUS converters.

3) For Compact PLUS converters from 5.5 kW to 15 kW.

4) Can be used for all Compact PLUS rectifier units.

5) Can be used for Compact PLUS 50 kW and 100 kW rectifier units.

6) Can be used for Compact PLUS 100 kW rectifier units.

7) Allows the braking power at $V_d = 774$ V.

8) CSA rating: 240 W.

9) CSA rating: 720 W.
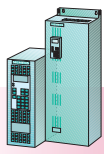
3

Capacitor module[1])

Voltage range	Storage capacity at V_{DC} constant/stable		Order No.	Dimensions W x H x D	Weight, approx.
	510 V	650 V			
	W_s	W_s		mm x mm x mm (in x in x in)	kg (lb)
510 V DC (–15 %) to 650 V DC (+10 %)	720	500	**6SE7025–0TP87–2DD0**	90 x 360 x 260 (3.54 x 14.1 x 10.2)	6 (13.2)

DC link module

Voltage range	Continuous current[2])	Auxiliary current requirement	Order No.	Dimensions W x H x D	Weight, approx.
	A	A		mm x mm x mm (in x in x in)	kg (lb)
510 V DC (–15 %) to 650 V DC (+10 %)	120	–	**6SE7090–0XP87–3CR0**	90 x 360 x 260 (3.54 x 14.1 x 10.2)	2.7 (5.95)

DC link rail with Compact PLUS

If DC rails are required, tinned standard copper rails E-Cu 3 x 10 tinned and rounded acc. to DIN 46 433 must be used.

Designation	Rated continous current	Order No.	Dimensions W x H x D
	A		mm x mm x mm (in x in x in)
Standard busbar, tinned	135	**8WA2842**	3 x 10 x 1000 (0.1 x 0.4 x 39.4)

This rail can also be ordered by the meter from Phoenix Contact under the designation NSL-CU 3/10.

Phoenix Contact GmbH & Co,
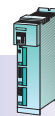Flachsmarktstr. 8 – 28,
32825 Blomberg

Tel.: 0 52 35 – 31 04 40,
Fax: 0 52 35 – 31 04 99,
Internet: www.phoenixcontact.com

1) Up to four capacitor modules can be connected to the Compact PLUS 15 kW rectifier unit and up to eight capacitor modules to the 50 kW and 100 kW units. Only one capacitor module can be connected to Compact PLUS converters.

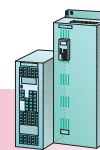2) Short-time current for 250 ms: 360 A.

Recommended line-side power options

Converters

Nominal power rating		Converter	Main circuit-breaker and EMERGENCY OFF switch		Switch disconnector[2])		Switch disconnector with fuse holder[2])			Fuse switch-disconnector[1])[2])		
				Rated current		Rated current		Rated current	Max. fuse size		Rated current	Size
kW	(HP)	Order No.	Order No.	A	Order No.	A	Order No.	A		Order No.	A	
Supply voltage 3-ph. 380 V to 480 V AC												
Compact PLUS units[3])												
0.55	(0.75)	**6SE7011–5EP□0**	3LD11	25	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
1.1	(1.5)	**6SE7013–0EP□0**	3LD11	25	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
1.5	(2)	**6SE7015–0EP□0**	3LD11	25	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
3	(4)	**6SE7018–0EP□0**	3LD11	25	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
4	(5)	**6SE7021–0EP□0**	3LD11	25	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
5.5	(7.5)	**6SE7021–4EP□0**	3LD11	25	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
7.5	(10)	**6SE7022–1EP□0**	3LD11	25	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
11	(15)	**6SE7022–7EP□0**	3LD12	32	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
15	(20)	**6SE7023–4EP□0**	3LD15	63	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
Compact units												
2.2	(3)	**6SE7016–1EA□1**	3LD11	25	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
3	(4)	**6SE7018–0EA□1**	3LD11	25	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
4	(5)	**6SE7021–0EA□1**	3LD11	25	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
5.5	(7.4)	**6SE7021–3EB□1**	3LD11	25	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
7.5	(10)	**6SE7021–8EB□1**	3LD11	25	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
11	(15)	**6SE7022–6EC□1**	3LD12	32	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
15	(20)	**6SE7023–4EC□1**	3LD15	63	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
18.5	(25)	**6SE7023–8ED□1**	3LD15	63	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
22	(30)	**6SE7024–7ED□1**	3LD15	63	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	160	000
30	(40)	**6SE7026–0ED□1**	3LD17	100	3KA51 30–1EE01	80	3KL52 30–1EB01	125	00	3NP40 10–0CH01	160	000
37	(50)	**6SE7027–2ED□1**	3LD17	100	3KA51 30–1EE01	80	3KL52 30–1EB01	125	00	3NP40 10–0CH01	160	000
Chassis units												
45	(60)	**6SE7031–0EE□0**	–	–	3KA53 30–1EE01	160	3KL52 30–1EB01	125	00	3NP40 70–0CA01	160	000
55	(75)	**6SE7031–2EF□0**	–	–	3KA53 30–1EE01	160	3KL55 30–1EB01	250	0; 1; 2	3NP42 70–0CA01	250	0; 1
75	(100)	**6SE7031–8EF□0**	–	–	3KA53 30–1EE01	160	3KL55 30–1EB01	250	0; 1; 2	3NP42 70–0CA01	250	0; 1
90	(120)	**6SE7032–1EG□0**	–	–	3KA55 30–1EE01	250	3KL55 30–1EB01	250	0; 1; 2	3NP42 70–0CA01	250	0; 1
110	(150)	**6SE7032–6EG□0**	–	–	3KA55 30–1EE01	250	3KL55 30–1EB01	250	0; 1; 2	3NP42 70–0CA01	250	0; 1
132	(175)	**6SE7033–2EG□0**	–	–	3KA57 30–1EE01	400	3KL57 30–1EB01	400	1; 2	3NP43 70–0CA01	400	1; 2
160	(215)	**6SE7033–7EG□0**	–	–	3KA57 30–1EE01	400	3KL57 30–1EB01	400	1; 2	3NP43 70–0CA01	400	1; 2
200	(270)	**6SE7035–1EK□0**	–	–	3KA57 30–1EE01	400	3KL57 30–1EB01	400	1; 2	3NP43 70–0CA01	400	1; 2
250	(335)	**6SE7036–0EK□0**	–	–	3KA58 30–1EE01	630	3KL61 30–1AB0	630	3	3NP44 70–0CA01	630	2; 3

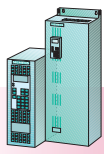| **5**	SIMOVERT MASTERDRIVES Motion Control
7	SIMOVERT MASTERDRIVES Motion Control Performance 2

1) Fuse switch-disconnectors: Please take into account the size of the cable-protection fuses and semiconductor protection fuses.

2) Can be optionally used, depending on your requirements. For further information, refer to Catalog NS K.

3) For single-axis applications. For multi-axis applications, see Section 6.

Nominal power rating		Converter	Circuit-breaker for system and motor protection to IEC 60 947-4[1])		Cable-protection fuses Duty class gL[2])[3])			Semiconductor-protection fuses Duty class gR[3]) (incl. cable protection)		
				Rated current		Rated current	Size		Rated current	Size
kW	(HP)	Order No.	Order No.	A	Order No.	A		Order No.	A	
Supply voltage 3-ph. 380 V to 480 V AC										
Compact PLUS units[5])										
0.55	(0.75)	6SE7011–5EP□0[4])	3RV10 21–1CA10	1.8 – 2.5	3NA3 803	10	00	3NE1 813–0	16	000
1.1	(1.5)	6SE7013–0EP□0[4])	3RV10 21–1FA10	3.5 – 5.0	3NA3 803	10	00	3NE1 813–0	16	000
1.5	(2)	6SE7015–0EP□0[4])	3RV10 21–1HA10	5.5 – 8.0	3NA3 803	10	00	3NE1 813–0	16	000
3	(4)	6SE7018–0EP□0[4])	3RV10 21–1KA10	9.0 – 12.5	3NA3 805	16	00	3NE1 813–0	16	000
4	(5)	6SE7021–0EP□0	3RV10 21–1KA10	9.0 – 12.5	3NA3 805	16	00	3NE1 813–0	16	000
5.5	(7.5)	6SE7021–4EP□0	3RV10 21–4AA10	11 – 16	3NA3 810	25	00	3NE1 814–0	20	000
7.5	(10)	6SE7022–1EP□0	3RV10 21–4BA10	14 – 20	3NA3 810	25	00	3NE1 815–0	25	000
11	(15)	6SE7022–7EP□0	3RV10 31–4EA10	22 – 32	3NA3 814	35	00	3NE1 803–0	35	000
15	(20)	6SE7023–4EP□0	3RV10 31–4FA10	28 – 40	3NA3 817	40	00	3NE1 802–0	40	000
Compact units										
2.2	(3)	6SE7016–1EA□1	3RV10 21–1HA10	5.5 – 8.0	3NA3 803	10	00	3NE1 813–0	16	000
3	(4)	6SE7018–0EA□1	3RV10 21–1KA10	9.0 – 12.5	3NA3 805	16	00	3NE1 813–0	16	000
4	(5)	6SE7021–0EA□1	3RV10 21–1KA10	9.0 – 12.5	3NA3 805	16	00	3NE1 813–0	16	000
5.5	(7.4)	6SE7021–3EB□1	3RV10 21–4AA10	11 – 16	3NA3 810	25	00	3NE1 814–0	20	000
7.5	(10)	6SE7021–8EB□1	3RV10 21–4BA10	14 – 20	3NA3 810	25	00	3NE1 815–0	25	000
11	(15)	6SE7022–6EC□1	3RV10 31–4EA10	22 – 32	3NA3 814	35	00	3NE1 803–0	35	000
15	(20)	6SE7023–4EC□1	3RV10 31–4FA10	28 – 40	3NA3 817	50	00	3NE1 802–0	40	000
18.5	(25)	6SE7023–8ED□1	3RV10 31–4HA10	40 – 50	3NA3 820	63	00	3NE1 817–0	50	000
22	(30)	6SE7024–7ED□1	3RV10 41–4JA10	45 – 63	3NA3 822	63	00	3NE1 818–0	63	000
30	(40)	6SE7026–0ED□1	3RV10 41–4KA10	57 – 75	3NA3 824	100	00	3NE1 820–0	80	000
37	(50)	6SE7027–2ED□1	3RV10 41–4LA10	70 – 90	3NA3 830	100	00	3NE1 021–0	100	00
Chassis units										
45	(60)	6SE7031–0EE□0	3VF32 11–1BU41–0AA0	100 – 125	3NA3 032	125	0	3NE1 021–0	100	00
55	(75)	6SE7031–2EF□0	3VF33 11–1BX41–0AA0	160 – 200	3NA3 036	160	0	3NE1 224–0	160	1
75	(100)	6SE7031–8EF□0	3VF33 11–1BX41–0AA0	160 – 200	3NA3 140	200	1	3NE1 225–0	200	1
90	(120)	6SE7032–1EG□0	3VF42 11–1BM41–0AA0	200 – 250	3NA3 144	250	1	3NE1 227–0	250	1
110	(150)	6SE7032–6EG□0	3VF52 11–1BK41–0AA0	250 – 315	3NA3 144	315	2	3NE1 227–0	250	1
132	(175)	6SE7033–2EG□0	3VF52 11–1BK41–0AA0	250 – 315	3NA3 252	315	2	3NE1 230–0	315	1
160	(215)	6SE7033–7EG□0	3VF52 11–1BM41–0AA0	315 – 400	3NA3 260	400	2	3NE1 332–0	400	2
200	(270)	6SE7035–1EK□0	3VF62 11–1BK44–0AA0	400 – 500	3NA3 365	500	3	3NE1 333–0	450	2
250	(335)	6SE7036–0EK□0	3VF62 11–1BM44–0AA0	500 – 600	3NA3 372	630	3	3NE1 435–0	560	3

5	SIMOVERT MASTERDRIVES Motion Control
7	SIMOVERT MASTERDRIVES Motion Control Performance 2

1) Refer to catalog NS K.
Use together for drive converters with a line inductance of ≥ **3 %** referred to the drive converter impedance **Z**, i.e. when the ratio of the line short-circuit power to the converter output is **33 : 1** or 100 : 1 and an additional 2 % line reactor is used. For the 100 kA short-circuit rating, it may be necessary to use a fuse as listed in the NS K Catalog.

Unit impedance: $Z = \dfrac{V_{Line}}{\sqrt{3} \cdot I_{V_{Line}}}$

2) Does not ensure total protection for the input rectifier of the unit.

3) The cable cross-sections must be dimensioned according to DIN VDE 0100, VDE 0298, Part 4, and as a function of the rated fuse currents.

4) Maximum possible protection permissible up to 25 A, i.e. gL 3NA3810 and gR 3NE 1815-0 with corresponding cable cross-section.

5) For single-axis applications. For multi-axis applications, see Section 6.

Recommended line-side power options

3

Converters (continued)

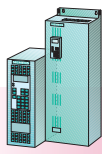| Nominal power rating		Converter	Main contactor/ AC contactor[1]		Commutating reactor[2] $V_D = 2\%$			Radio-interference suppression filter[2]		
			AC1 duty min. 40 °C (min. 104 °F)	Rated current		P_v 50/60 Hz	Rated current		Class	Rated current
kW	(HP)	Order No.	Order No.	A	Order No.	W	A	Order No.		A
Supply voltage 3-ph. 380 V to 480 V AC										
Compact PLUS units[4]										
0.55	(0.75)	**6SE7011–5EP☐0**	3RT10 15	16	4EP32 00–4US00	8/10	1.5	6SE7012–0EP87–0FB1[3]	B1	2
1.1	(1.5)	**6SE7013–0EP☐0**	3RT10 15	16	4EP32 00–5US00	12/18	3.0	6SE7016–0EP87–0FB1[3]	B1	6
1.5	(2)	**6SE7015–0EP☐0**	3RT10 15	16	4EP32 00–2US00	23/35	5.0	6SE7016–0EP87–0FB1[3]	B1	6
3	(4)	**6SE7018–0EP☐0**	3RT10 15	16	4EP34 00–2US00	35/38	9.1	6SE7021–2EP87–0FB1[3]	B1	12
4	(5)	**6SE7021–0EP☐0**	3RT10 15	16	4EP34 00–1US00	35/38	11.2	6SE7021–2EP87–0FB1[3]	B1	12
5.5	(7.5)	**6SE7021–4EP☐0**	3RT10 16	20	4EP35 00–0US00	45/48	16	6SE7021–8EP87–0FB1[3]	B1	18
7.5	(10)	**6SE7022–1EP☐0**	3RT10 16	20	4EP36 00–4US00	52/57	18	6SE7021–8EP87–0FB1[3]	B1	18
11	(15)	**6SE7022–7EP☐0**	3RT10 25	35	4EP36 00–5US00	52/57	28	6SE7023–4ES87–0FB1	B1	36
15	(20)	**6SE7023–4EP☐0**	3RT10 34	45	4EP37 00–2US00	57/60	35.5	6SE7023–4ES87–0FB1	B1	36
Compact units										
2.2	(3)	**6SE7016–1EA☐1**	3RT10 15	16	4EP32 00–1US00	23/35	6.3	6SE7021–0ES87–0FB1	B1	12
3	(4)	**6SE7018–0EA☐1**	3RT10 15	16	4EP34 00–2US00	35/38	9.1	6SE7021–0ES87–0FB1	B1	12
4	(5)	**6SE7021–0EA☐1**	3RT10 15	16	4EP34 00–1US00	35/38	11.2	6SE7021–0ES87–0FB1	B1	12
5.5	(7.4)	**6SE7021–3EB☐1**	3RT10 16	20	4EP35 00–0US00	45/48	16	6SE7021–8ES87–0FB1	B1	18
7.5	(10)	**6SE7021–8EB☐1**	3RT10 16	20	4EP36 00–4US00	52/57	18	6SE7021–8ES87–0FB1	B1	18
11	(15)	**6SE7022–6EC☐1**	3RT10 25	35	4EP36 00–5US00	52/57	28	6SE7023–4ES87–0FB1	B1	36
15	(20)	**6SE7023–4EC☐1**	3RT10 34	45	4EP37 00–2US00	57/60	35.5	6SE7023–4ES87–0FB1	B1	36
18.5	(25)	**6SE7023–8ED☐1**	3RT10 34	45	4EP37 00–5US00	57/60	40	6SE7027–2ES87–0FB1	B1	80
22	(30)	**6SE7024–7ED☐1**	3RT10 35	55	4EP38 00–2US00	67/71	50	6SE7027–2ES87–0FB1	B1	80
30	(40)	**6SE7026–0ED☐1**	3RT10 44	90	4EP38 00–7US00	67/71	63	6SE7027–2ES87–0FB1	B1	80
37	(50)	**6SE7027–2ED☐1**	3RT10 44	90	4EP39 00–2US00	82/87	80	6SE7027–2ES87–0FB1	B1	80
Chassis units										
45	(60)	**6SE7031–0EE☐0**	3RT10 45	100	4EP40 00–2US00	96/103	100	6SE7031–2ES87–0FA1	A1	120
55	(75)	**6SE7031–2EF☐0**	3RT14 46	135	4EP40 00–6US00	96/103	125	6SE7031–8ES87–0FA1	A1	190
75	(100)	**6SE7031–8EF☐0**	3RT10 55	185	4EU25 52–4UA00–0AA0	187/201	200	6SE7031–8ES87–0FA1	A1	190
90	(120)	**6SE7032–1EG☐0**	3RT10 56	215	4EU25 52–4UA00–0AA0	187/201	200	6SE7031–8ES87–0FA1	A1	190
110	(150)	**6SE7032–6EG☐0**	3RT14 56	275	4EU25 52–8UA00–0AA0	187/201	224	6SE7033–6ES87–0FA1	A1	320
132	(175)	**6SE7033–2EG☐0**	3RT10 65	330	4EU27 52–0UB00–0AA0	253/275	280	6SE7033–2ES87–0FA1	A1	320
160	(215)	**6SE7033–7EG☐0**	3RT10 65	330	4EU27 52–7UA00–0AA0	253/275	315	6SE7033–2ES87–0FA1	A1	320
200	(270)	**6SE7035–1EK☐0**	3RT10 75	430	4EU30 52–5UA00–0AA0	334/367	560	6SE7036–0ES87–0FA1	A1	600
250	(335)	**6SE7036–0EK☐0**	3RT10 76	610	4EU30 52–5UA00–0AA0	334/367	560	6SE7036–0ES87–0FA1	A1	600

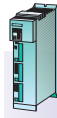| **5**	SIMOVERT MASTERDRIVES Motion Control
7	SIMOVERT MASTERDRIVES Motion Control Performance 2

1) Refer to catalog NS K.

2) Compliance of radio-interference suppression with EN 55 011 is only ensured in combination with the line commutating reactor $V_D = 2\%$. With Compact PLUS filters, the line commutating reactor $V_D = 2\%$ is integrated in the line filter.

3) Radio-interference suppression filters of type of construction Compact PLUS with commutating reactor $V_D = 2\%$ are integrated into the filter. No additional inverters for the converter have been taken into account.

4) For single-axis applications. For multi-axis applications, see Section 6.

Compact and chassis units | **Compact PLUS units** | **Recommended line-side power options**

Rectifier units

Nominal power rating	Rectifier unit	Switch disconnector[2]	Rated current	Switch disconnector with fuse holders[1][2]	Rated current	Max. fuse size	Fuse switch disconnectors[1][2]	Rated current	Max. fuse size
kW	Order No.	Order No.	A	Order No.	A		Order No.	A	
Supply voltage 3-ph. 380 V to 480 V AC									
Compact PLUS units									
15	6SE7024–1EP85–0AA0	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
50	6SE7031–2EP85–0AA0	3KA53 30–1EE01	160	3KL53 30–1EB01	160	0; 1; 2	3NP42 70–0CA01	250	0; 1
100	6SE7032–3EP85–0AA0	3KA55 30–1EE01	250[8]	3KL55 30–1EB01	250	0; 1; 2	3NP42 70–0CA01	250	0; 1
Compact and chassis units									
15	6SE7024–1EB85–0AA0	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000
37	6SE7028–6EC85–0AA0	3KA51 30–1EE01	80	3KL52 30–1EB01	125	00	3NP40 10–0CH01	100	000
75	6SE7031–7EE85–0AA0	3KA53 30–1EE01	160	3KL55 30–1EB01	250	0; 1; 2	3NP42 70–0CA01	250	0; 1
110	6SE7032–7EE85–0AA0	3KA55 30–1EE01	250	3KL55 30–1EB01	250	0; 1; 2	3NP42 70–0CA01	250	0; 1
160	6SE7033–8EE85–0AA0	3KA57 30–1EE01	400	3KL57 30–1EB01	400	1; 2	3NP53 60–0CA00	400	1; 2
200	6SE7034–6EE85–0AA0	3KA57 30–1EE01	400	3KL57 30–1EB01	400	1; 2	3NP53 60–0CA00	400	1; 2
250	6SE7036–1EE85–0AA0	3KA58 30–1EE00	630	3KL61 30–1AB0	630	3	3NP54 60–0CA00	630	2; 3

Nominal power rating	Rectifier unit	Cable-protection fuses Duty class gL[3][4]	Rated current	Size	Semiconductor-protection fuses Duty class gR[3] (incl. cable protection)	Rated current	Size	Main contactor/ AC contactor[5] AC1 duty 55 °C	Rated current
kW	Order No.	Order No.	A		Order No.	A		Order No.	A
Supply voltage 3-ph. 380 V to 480 V AC									
Compact PLUS units									
15	6SE7024–1EP85–0AA0	3NA3 817	40	00	3NE1 802-0	40	000	3RT10 34	45
50	6SE7031–2EP85–0AA0	3NA3 032	125	1	3NE1 022-0	125	1	3RT10 54	160
100	6SE7032–3EP85–0AA0	3NA3 142	224	2	3NE1 227-0	250	1	3RT10 64	275
Compact and chassis units									
15	6SE7024–1EB85–0AA0	3NA3 820	50	00	3NE1 802-0	40	000	3RT10 34	45
37	6SE7028–6EC85–0AA0	3NA3 830	100	00	3NE1 820-0	80	000	3RT10 44	90
75	6SE7031–7EE85–0AA0	3NA3 140	200	1	3NE1 224-0	160	1	3TK50	190
110	6SE7032–7EE85–0AA0	3NA3 252	315	2	3NE1 227-0	250	1	3TK52	315
160	6SE7033–8EE85–0AA0	3NA3 260	400	2	3NE1 331-0	350	2	3TK54	380
200	6SE7034–6EE85–0AA0	3NA3 365	500	3	3NE1 332-0	400	2	3TK56	500
250	6SE7036–1EE85–0AA0	3NA3 372	630	3	3NE1 435-0	560	3	2 x 3TK52	567

| Nominal power rating	Rectifier unit	Commutating reactor $V_D = 2\%$ 400/460 V 50/60 Hz	P_v 50/60 Hz	Rated current	Commutating reactor $V_D = 4\%$ 400/460 V 50/60 Hz	P_v 50/60 Hz	Rated current	Radio-interference suppression filter[6][7]	Class
kW	Order No.	Order No.	W	A	Order No.	W	A	Order No.	
Supply voltage 3-ph. 380 V to 480 V AC									
Compact PLUS units									
15	6SE7024–1EP85–0AA0	4EP37 00–2US00	57/60	35.5	4EP39 00–5US00	82/87	35.5	6SE7023–4ES87–0FB1	B1
50	6SE7031–2EP85–0AA0	4EU24 52–2UA00–0AA0	154/163	160	4EU27 52–1UB00–0AA0	253/275	160	6SE7031–8ES87–0FA1	A1
100	6SE7032–3EP85–0AA0	4EU25 52–5UA00–0AA0	187/201	250	4EU30 52–7UA00–0AA0	334/367	280	6SE7033–2ES87–0FA1	A1
Compact and chassis units									
15	6SE7024–1EB85–0AA0	4EP37 00–2US00	57/60	35.5	4EP39 00–5US00	82/87	35.5	6SE7023–4ES87–0FB1	B1
37	6SE7028–6EC85–0AA0	4EP39 00–2US00	82/87	80	4EU24 52–4UA00–0AA0	154/163	80	6SE7027–2ES87–0FB1	B1
75	6SE7031–7EE85–0AA0	4EU24 52–2UA00–0AA0	154/163	160	4EU27 52–1UB00–0AA0	253/275	160	6SE7031–8ES87–0FA1	A1
110	6SE7032–7EE85–0AA0	4EU25 52–5UA00–0AA0	187/201	250	4EU30 52–7UA00–0AA0	334/367	280	6SE7033–2ES87–0FA1	A1
160	6SE7033–8EE85–0AA0	4EU27 52–7UA00–0AA0	253/275	315	4EU30 52–8UA00–0AA0	334/367	355	6SE7033–2ES87–0FA1	A1
200	6SE7034–6EE85–0AA0	4EU27 52–8UA00–0AA0	253/275	400	4EU36 52–3UB00–0AA0	450/495	400	6SE7036–0ES87–0FA1	A1
250	6SE7036–1EE85–0AA0	4EU30 52–5UA00–0AA0	334/367	560	4EU36 52–4UB00–0AA0	450/495	560	6SE7036–0ES87–0FA1	A1

1) Switch disconnectors: Please take into account the size of the cable-protection and semiconductor-protection fuses!

2) Can be optionally used, depending on requirements. For further information refer to Catalog NS K.

3) The cable cross-sections must be dimensioned according to DIN VDE 0100, VDE 0298, Part 4 and as a function of the rated fuse currents.

4) Does not ensure total protection for the input rectifier of the unit.

5) Refer to Catalog NS K.

6) Line supply suppression according to EN 61 800-3 can only be ensured with the line commutating reactor $V_D = 2\%$.

7) Can only be used with TT and TN systems (earthed systems).

8) Output current via a two-busbar connection with 120 A per outgoing circuit.

SIMOVERT MASTERDRIVES Motion Control
Selection and ordering data
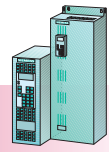
Necessary/recommended line-side power options

3

AFE rectifier/regenerative units

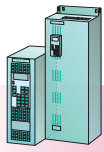| Rated rectifier/ regen- erative output at $\cos\varphi = 1$ and 400 V supply voltage P_{rated}	AFE inverter with CUSA closed-loop control board 6SE7090-0XX84-0BJ0	AFE reactor	Supply connection module	Rated current	Power loss	Weight, approx.	Dimensions supply connection module W x H x D	Dimensions AFE reactor W x H x D
					P_v			
kW	Order No.	Order No.	Order No.	A	W	kg (lb)	mm x mm x mm (in x in x in)	mm x mm x mm (in x in x in)
Supply voltage 3-ph. 380 V AC –20 % to 460 V +5 %								
Compact units								
6.8	6SE7021–0EA81	6SE7021–3ES87–1FG0[1)	–	13	17	8 (17.6)	–	270 x 250 x 196 (10.6 x 9.8 x 7.7)
9	6SE7021–3EB81	6SE7021–3ES87–1FG0[1)	–	13	23	8 (17.6)	–	270 x 250 x 196 (10.6 x 9.8 x 7.7)
12	6SE7021–8EB81	6SE7022–6ES87–1FG0[1)	–	26	30	12 (26.5)	–	300 x 250 x 185 (11.8 x 9.8 x 7.3)
17	6SE7022–6EC81	6SE7022–6ES87–1FG0[1)	–	26	43	12 (26.5)	–	300 x 250 x 185 (11.8 x 9.8 x 7.3)
23	6SE7023–4EC81	6SE7024–7ES87–1FG0[1)	–	47	58	20 (44.1)	–	360 x 300 x 185 (14.2 x 11.8 x 7.3)
32	6SE7024–7ED81	6SE7024–7ES87–1FG0[1)	–	47	80	20 (44.1)	–	360 x 300 x 185 (14.2 x 11.8 x 7.3)
40	6SE7026–0ED81	6SE7027–2ES87–1FG0[1)	–	72	100	32 (70.6)	–	380 x 300 x 196 (15.0 x 11.8 x 7.7)
49	6SE7027–2ED81	6SE7027–2ES87–1FG0[1)	–	72	123	32 (70.6)	–	380 x 300 x 196 (15.0 x 11.8 x 7.7)
Chassis units								
63	6SE7031–0EE80	–	6SE7131–0EE83–2NA0	92	500	110 (242.6)	274 x 1310 x 408 (10.8 x 51.6 x 16.1)	300 x 267 x 212 (11.8 x 10.5 x 8.3)
85	6SE7031–2EF80	–	6SE7131–2EF83–2NA0	124	630	160 (352.8)	440 x 1310 x 470 (17.3 x 51.6 x 18.5)	355 x 340 x 212 (14.0 x 13.4 x 8.3)
100	6SE7031–5EF80	–	6SE7131–5EF83–2NA0	146	710	165 (363.8)	440 x 1310 x 470 (17.3 x 51.6 x 18.5)	355 x 340 x 272 (14.0 x 13.4 x 10.7)
125	6SE7031–8EF80	–	6SE7131–8EF83–2NA0	186	860	170 (374.6)	440 x 1310 x 470 (17.3 x 51.6 x 18.5)	355 x 340 x 278 (14.0 x 13.4 x 10.9)
143	6SE7032–1EG80	–	6SE7132–1EG83–2NA0	210	1100	235 (518.2)	580 x 1339 x 459 (22.8 x 52.7 x 18.1)	420 x 389 x 312 (16.5 x 15.3 x 12.3)
177	6SE7032–6EG80	–	6SE7132–6EG83–2NA0	260	1300	240 (529.2)	580 x 1339 x 459 (22.8 x 52.7 x 18.1)	420 x 389 x 312 (16.5 x 15.3 x 12.3)
214	6SE7033–2EG80	–	6SE7133–2EG83–2NA0	315	1500	295 (650.5)	580 x 1339 x 459 (22.8 x 52.7 x 18.1)	480 x 380 x 376 (18.9 x 15.0 x 14.8)
250	6SE7033–7EG80	–	6SE7133–7EG83–2NA0	370	1820	305 (672.5)	580 x 1339 x 459 (22.8 x 52.7 x 18.1)	480 x 380 x 376 (18.9 x 15.0 x 14.8)

Required components for compact units, description see Section 6.

1) Caution!
For compact units, the required system components must be ordered separately (see Section 6).

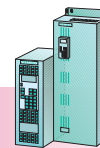| Rated rectifier/ regen- erative output at $\cos\varphi = 1$ and 400 V supply voltage P_{rated}	AFE inverter with CUSA closed-loop control board 6SE7090-0XX84-0BJ0	Main contactor/ AC contactor[1] 230 V control		Precharging		Precharging		Supply voltage detection VSB
			Rated current	Precharging contactor[1] with Compact AFE 24 V	Rated current	Resistor 3 required	Rated value	For DIN rail mounting with enclosure
kW	Order No.	Order No.	A	Order No.	A	Order No.	Ω	Order No.
Supply voltage 3-ph. 380 V AC –20 % to 460 V +5 %								
Compact units								
6.8	6SE7021–0EA81	3RT10 15	16	3RT10 16–.BB4.	20	6SX7010–0AC81	22	6SX7010–0EJ00
9	6SE7021–3EB81	3RT10 16	20	3RT10 16–.BB4.	20	6SX7010–0AC81	22	6SX7010–0EJ00
12	6SE7021–8EB81	3RT10 16	20	3RT10 16–.BB4.	20	6SX7010–0AC81	22	6SX7010–0EJ00
17	6SE7022–6EC81	3RT10 25	35	3RT10 16–.BB4.	20	6SX7010–0AC80	10	6SX7010–0EJ00
23	6SE7023–4EC81	3RT10 34	45	3RT10 16–.BB4.	20	6SX7010–0AC80	10	6SX7010–0EJ00
32	6SE7024–7ED81	3RT10 35	55	3RT10 16–.BB4.	20	6SX7010–0AC80	10	6SX7010–0EJ00
40	6SE7026–0ED81	3RT10 44	90	3RT10 16–.BB4.	20	6SX7010–0AC80	10	6SX7010–0EJ00
49	6SE7027–2ED81	3RT10 44	90	3RT10 16–.BB4.	20	6SX7010–0AC80	10	6SX7010–0EJ00
Chassis units								
63	6SE7031–0EE80			Integrated into the supply connection module				
85	6SE7031–2EF80			Integrated into the supply connection module				
100	6SE7031–5EF80			Integrated into the supply connection module				
125	6SE7031–8EF80			Integrated into the supply connection module				
143	6SE7032–1EG80			Integrated into the supply connection module				
177	6SE7032–6EG80			Integrated into the supply connection module				
214	6SE7033–2EG80			Integrated into the supply connection module				
250	6SE7033–7EG80			Integrated into the supply connection module				

Required components for compact units, description see Section 6.

1) Refer to Catalog NS K.

Compact and chassis units

Recommended line-side power options

AFE rectifier/regenerative units (continued)

Rated rectifier/regen-erative output at $\cos\varphi = 1$ and 400 V supply voltage P_{rated}	AFE inverter with CUSA closed-loop control board 6SE7090-0XX84-0BJ0	Load switch disconnector[2]		Load switch disconnector with fuse fittings[2]			Fuse load switch disconnector[1][2]			Semiconductor protection fuses opteration class gR[3] incl. cable protection		
			Rated cur-rent		Rated cur-rent	Max. fuse size		Rated cur-rent	Max. fuse size		Rated cur-rent	Max. fuse size
kW	Order No.	Order No.	A	Order No.	A	Size	Order No.	A	Size	Order No.	A	Size
Supply voltage 3-ph. 380 V AC –20 % to 460 V +5 %												
Compact units												
6.8	6SE7021–0EA81	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000	3NE1 813–0	16	000
9	6SE7021–3EB81	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000	3NE1 814–0	20	000
12	6SE7021–8EB81	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000	3NE1 815–0	25	000
17	6SE7022–6EC81	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000	3NE1 803–0	35	000
23	6SE7023–4EC81	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000	3NE1 802–0	40	000
32	6SE7024–7ED81	3KA50 30–1EE01	63	3KL50 30–1EB01	63	00	3NP40 10–0CH01	100	000	3NE1 818–0	63	000
40	6SE7026–0ED81	3KA51 30–1EE01	80	3KL52 30–1EB01	125	00	3NP40 10–0CH01	100	000	3NE1 820–0	80	000
49	6SE7027–2ED81	3KA51 30–1EE01	80	3KL52 30–1EB01	125	00	3NP40 10–0CH01	100	000	3NE1 820–0	80	000
Chassis units												
63	6SE7031–0EE80	Integrated into the supply connection module										
85	6SE7031–2EF80	Integrated into the supply connection module										
100	6SE7031–5EF80	Integrated into the supply connection module										
125	6SE7031–8EF80	Integrated into the supply connection module										
143	6SE7032–1EG80	Integrated into the supply connection module										
177	6SE7032–6EG80	Integrated into the supply connection module										
214	6SE7033–2EG80	Integrated into the supply connection module										
250	6SE7033–7EG80	Integrated into the supply connection module										

| Rated rectifier/regen-erative output at $\cos\varphi = 1$ and 400 V supply voltage P_{rated}	AFE inverter with CUSA closed-loop control board 6SE7090-0XX84-0BJ0	Radio-interference suppression filter		Clean Power Filter		
			Class		Power loss	Base radio-interference suppression
kW	Order No.	Order No.		Order No.	W	Order No.
Supply voltage 3-ph. 380 V AC –20 % to 460 V +5 %						
Compact units						
6.8	6SE7021–0EA81	6SE7021–0ES87–0FB1	A1	6SE7021–0EB87–1FC0	200	6SX7010–0FB10
9	6SE7021–3EB81	6SE7021–8ES87–0FB1	A1	6SE7021–8EB87–1FC0	250	6SX7010–0FB10
12	6SE7021–8EB81	6SE7021–8ES87–0FB1	A1	6SE7021–8EB87–1FC0	250	6SX7010–0FB10
17	6SE7022–6EC81	6SE7023–4ES87–0FB1	A1	6SE7022–6EC87–1FC0	300	6SX7010–0FB10
23	6SE7023–4EC81	6SE7023–4ES87–0FB1	A1	6SE7023–4EC87–1FC0	400	6SX7010–0FB10
32	6SE7024–7ED81	6SE7027–2ES87–0FB1	A1	6SE7024–7ED87–1FC0	500	6SX7010–0FB10
40	6SE7026–0ED81	6SE7027–2ES87–0FB1	A1	6SE7027–2ED87–1FC0	600	6SX7010–0FB10
49	6SE7027–2ED81	6SE7027–2ES87–0FB1	A1	6SE7027–2ED87–1FC0	600	6SX7010–0FB10
Chassis units						
63	6SE7031–0EE80	Option L00 for supply connection module	A1	Integrated into the supply connection module		
85	6SE7031–2EF80	Option L00 for supply connection module	A1	Integrated into the supply connection module		
100	6SE7031–5EF80	Option L00 for supply connection module	A1	Integrated into the supply connection module		
125	6SE7031–8EF80	Option L00 for supply connection module	A1	Integrated into the supply connection module		
143	6SE7032–1EG80	Option L00 for supply connection module	A1	Integrated into the supply connection module		
177	6SE7032–6EG80	Option L00 for supply connection module	A1	Integrated into the supply connection module		
214	6SE7033–2EG80	Option L00 for supply connection module	A1	Integrated into the supply connection module		
250	6SE7033–7EG80	Option L00 for supply connection module	A1	Integrated into the supply connection module		

1) Fuse switch-disconnectors: Please take into account the size of the cable-protection fuses and semiconductor protection fuses.

2) Can be optionally used, depending on your requirements. For further information, refer to Catalog NS K.

3) The cable cross-sections must be dimensioned acc. to DIN VDE 0100, VDE 0298, Part 4, and as a function of the rated fuse currents.
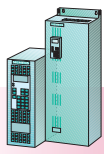
Compact and chassis units
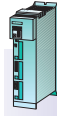
Compact PLUS units

Rectifier/regenerative units, 25 % power-on duration in generating mode

Nominal power rating	Rectifier/ regenerative unit	Switch disconnector[2]	Rated current	Switch disconnectors with fuse holders[1][2]	Rated current	Max. fuse size	Fuse switch-disconnectors[1][2]	Rated current	Max. fuse size
kW	Order No.	Order No.	A	Order No.	A		Order No.	A	
Supply voltage 3-ph. 380 V to 480 V AC									
7.5	6SE7022–1EC85–1AA0	3KA50 30–1EE01	63	3KL55 30–1EB01	250	0; 1; 2	3NP42 70–0CA01	250	0; 1
15	6SE7024–1EC85–1AA0	3KA50 30–1EE01	63	3KL55 30–1EB01	250	0; 1; 2	3NP42 70–0CA01	250	0; 1
37	6SE7028–6EC85–1AA0	3KA51 30–1EE01	80	3KL55 30–1EB01	250	0; 1; 2	3NP42 70–0CA01	250	0; 1
75	6SE7031–7EE85–1AA0	3KA53 30–1EE01	160	3KL55 30–1EB01	250	0; 1; 2	3NP42 70–0CA01	250	0; 1
90	6SE7032–2EE85–1AA0	3KA55 30–1EE01	250	3KL55 30–1EB01	250	0; 1; 2	3NP42 70–0CA01	250	0; 1
132	6SE7033–1EE85–1AA0	3KA57 30–1EE01	400	3KL57 30–1EB01	400	1; 2	3NP53 60–0CA00	400	1; 2
160	6SE7033–8EE85–1AA0	3KA57 30–1EE01	400	3KL57 30–1EB01	400	1; 2	3NP53 60–0CA00	400	1; 2
200	6SE7034–6EE85–1AA0	3KA57 30–1EE01	400	3KL61 30–1AB0	630	2; 3	3NP54 60–0CA00	630	2; 3
250	6SE7036–1EE85–1AA0	3KA58 30–1EE01	630	3KL61 30–1AB0	630	2; 3	3NP54 60–0CA00	630	2; 3

Nominal power rating	Rectifier/ regenerative unit	Cable-protection fuses Duty class gL[3][4]	Rated current	Size	Semiconductor-protection fuses Duty class aR[4] (incl. cable protection)	Rated current	Size	Main contactor/ AC contactor[5]	AC1 duty 55 °C	Rated current
kW	Order No.	Order No.	A		Order No.	A		Order No.		A
Supply voltage 3-ph. 380 V to 480 V AC										
7.5	6SE7022–1EC85–1AA0	3NA3 810	25	00	3NE4 101	32	0	3RT10 25		35
15	6SE7024–1EC85–1AA0	3NA3 820	50	00	3NE4 118	63	0	3RT10 34		45
37	6SE7028–6EC85–1AA0	3NA3 830	100	00	3NE4 122	125	0	3RT10 44		90
75	6SE7031–7EE85–1AA0	3NA3 140	200	1	3NE3 227	250	1	3TK50		190
90	6SE7032–2EE85–1AA0	3NA3 144	250	1	3NE3 230–0B	315	1	3TK52		315
132	6SE7033–1EE85–1AA0	3NA3 252	315	2	3NE3 233	450	1	3TK52		315
160	6SE7033–8EE85–1AA0	3NA3 260	400	2	3NE3 333	450	2	3TK54		380
200	6SE7034–6EE85–1AA0	3NA3 365	500	3	3NE3 335	560	2	3TK56		500
250	6SE7036–1EE85–1AA0	3NA3 372	630	3	3NE3 338–8	800	2	2 x 3TK52		567

3

1) Switch disconnectors: Please take into account the size of the cable-protection and semiconductor-protection fuses!

2) Can be optionally used, depending on requirements. For further information refer to Catalog NS K.

3) Does not ensure total protection for the input rectifier of the unit.

4) The cable cross-sections must be dimensioned according to DIN VDE 0100, VDE 0298, Part 4 and as a function of the rated fuse currents.
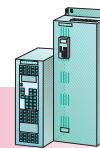
5) Refer to Catalog NS K.

Recommended line-side power options

Rectifier/regenerative units, 25 % power-on duration in generating mode
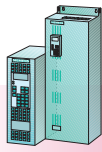
Nominal power rating	Rectifier/ regenerative unit	Commutating reactor V_D = 2 %			Commutating reactor V_D = 4 %			Radio-interference suppression filter[1][2]	
		400/480 V 50/60 Hz	P_v 50/60 Hz	Rated current	400/480 V 50/60 Hz	P_v 50/60 Hz	Rated current		Class
kW	Order No.	Order No.	W	A	Order No.	W	A	Order No.	
Supply voltage 3-ph. 380 V to 480 V AC									
7.5	6SE7022–1EC85–1AA0	4EP36 00–4US00	52/ 57	18	4EP37 00–7US00	57/ 60	18	6SE7023–4ES87–0FB1	B1
15	6SE7024–1EC85–1AA0	4EP37 00–2US00	57/ 60	35.5	4EP39 00–5US00	82/ 87	35.5	6SE7023–4ES87–0FB1	B1
37	6SE7028–6EC85–1AA0	4EP39 00–2US00	82/ 87	80	4EU24 52–4UA00–0AA0	154/163	80	6SE7027–2ES87–0FB1	B1
75	6SE7031–7EE85–1AA0	4EU24 52–2UA00–0AA0	154/163	160	4EU27 52–1UB00–0AA0	253/275	160	6SE7031–8ES87–0FA1	A1
90	6SE7032–2EE85–1AA0	4EU25 52–4UA00–0AA0	187/201	200	4EU27 52–2UB00–0AA0	253/275	200	6SE7031–8ES87–0FA1	A1
132	6SE7033–1EE85–1AA0	4EU27 52–0UB00–0AA0	253/275	280	4EU30 52–7UA00–0AA0	334/367	280	6SE7033–2ES87–0FA1	A1
160	6SE7033–8EE85–1AA0	4EU27 52–7UA00–0AA0	253/275	315	4EU30 52–8UA00–0AA0	334/367	355	6SE7033–2ES87–0FA1	A1
200	6SE7034–6EE85–1AA0	4EU27 52–8UA00–0AA0	253/275	400	4EU36 52–3UB00–0AA0	450/495	400	6SE7036–0ES87–0FA1	A1
250	6SE7036–1EE85–1AA0	4EU30 52–5UA00–0AA0	334/367	560	4EU36 52–4UB00–0AA0	450/495	560	6SE7036–0ES87–0FA1	A1

Nominal power rating	Rectifier/ regenerative unit	Regenerative autotransformer[3]				Free-wheeling diode on the DC bus[4]	Clamping cap
		25 % power-on duration 380 V to 415 V 50/60 Hz	P_v 50/60 Hz	25 % power-on duration 440 V to 480 V 60 Hz	P_v 50/60 Hz	Diode	
kW	Order No.	Order No.	kW	Order No.	kW	Order No.	Order No.
Supply voltage 3-ph. 380 V to 480 V AC							
7.5	6SE7022–1EC85–1AA0	4AP25 95–0UA11–8AN2	0.35	4AP25 95–0UA21–8AN2	0.35	SKR 3 F 20/12	
15	6SE7024–1EC85–1AA0	4AP27 95–0UA01–8AN2	0.45	4AP27 95–0UA51–8AN2	0.45	SKR 3 F 20/12	
37	6SE7028–6EC85–1AA0	4AP30 95–0UA01–8AN2	0.65	4AP30 95–0UA71–8AN2	0.65	SKR 60 F 12	
75	6SE7031–7EE85–1AA0	4AU39 95–0UA51–8AN2	2.20	4AU36 95–0UA21–8AN2	1.70	SKR 60 F 12	
90	6SE7032–2EE85–1AA0	4AU39 95–0UA61–8AN2	2.20	4AU39 95–0UB01–8AN2	2.20	SKR 60 F 12	
132	6SE7033–1EE85–1AA0	4BU43 95–0UA41–8A	2.70	4BU43 95–0UA51–8A	2.70	2 x SKR 141 F 15	
160	6SE7033–8EE85–1AA0	4BU45 95–0UA61–8A	2.80	4BU45 95–0UA71–8A	2.80	2 x SKR 141 F 15	
200	6SE7034–6EE85–1AA0	4BU47 95–0UA61–8A	3.00	4BU47 95–0UA71–8A	3.00	2 x SKR 141 F 15	
250	6SE7036–1EE85–1AA0	4BU51 95–0UA31–8A	6.00	4BU51 95–0UA41–8A	6.00	D 689S 20[5][6]	V 72–26.120M[5][6]

1) Compliance with radio-interference suppression to EN 61 800-3 can only be ensured in conjunction with a line commutating reactor of V_D = 2 % .

2) Can only be used with TT and TN systems (earthed systems).

3) Transformer: Cycle duration of 22 min, i.e. with 25 % power-on duration, maximum 5.5 min in regenerating mode, 16.5 min in rectifying mode.

4) See Engineering Information, Section 6. The diodes referred to are from the range of products supplied by SEMIKRON GmbH u. Co. KG, Sigmundstr. 200, D-90431 Nuremberg, Germany. Internet: www.semikron.com

5) Diode supplied as a disc diode with a clamping cap for mounting on a copper plate or copper rail.

6) See Engineering Information, Section 6. The diodes referred to are from the product range supplied by EUPEC GmbH u. Co. KG, Max-Planck-Str. 5, D-59581 Warstein, Germany. Internet: www.eupec.com

Compact and chassis units

Inverter

Nominal power rating		Inverter	Fuse switch-disconnector for DC coupling[1][2]			Inverter protection fuse Duty class gR[2]			Inverter protection fuse Duty class aR[2]		
				I_{rated}	Max. fuse size		I_{rated}	Size		I_{rated}	Size
kW	(HP)	Order No.	Order No.	A		Order No.	A		Order No.	A	
Compact units											
2.2	(3)	6SE7016–1TA51[3]	3NP40 10–0CH01	100	000	2 x 3NE1 814–0[4]	20	000	2 x 3NE8 015[4]	25	00
3	(4)	6SE7018–0TA51[3]	3NP40 10–0CH01	100	000	2 x 3NE1 815–0[4]	25	000	2 x 3NE8 015[4]	25	00
4	(5)	6SE7021–0TA51[3]	3NP40 10–0CH01	100	000	2 x 3NE1 815–0[4]	25	000	2 x 3NE8 015[4]	25	00
5.5	(7.5)	6SE7021–3TB51[3]	3NP40 10–0CH01	100	000	2 x 3NE1 803–0[4]	35	000	2 x 3NE8 017[4]	50	00
7.5	(10)	6SE7021–8TB51[3]	3NP40 10–0CH01	100	000	2 x 3NE1 817–0[4]	50	000	2 x 3NE8 017[4]	50	00
11	(15)	6SE7022–6TC51[3]	3NP40 10–0CH01	100	000	2 x 3NE1 818–0[4]	63	000	2 x 3NE8 020[4]	80	00
15	(20)	6SE7023–4TC51[3]	3NP40 10–0CH01	100	000	2 x 3NE1 820–0[4]	80	000	2 x 3NE8 020[4]	80	00
18.5	(25)	6SE7023–8TD51[3]	3NP40 70–0CA01	160	00	2 x 3NE1 021–0[4]	100	00	2 x 3NE8 022[4]	125	00
22	(30)	6SE7024–7TD51[3]	3NP40 70–0CA01	160	00	2 x 3NE1 022–0[4]	125	00	2 x 3NE8 022[4]	125	00
30	(40)	6SE7026–0TD51[3]	3NP42 70–0CA01	250	0; 1	2 x 3NE1 224–0[4]	160	0	2 x 3NE8 024[4]	160	00
37	(50)	6SE7027–2TD51[3]	3NP42 70–0CA01	250	0; 1	2 x 3NE1 224–0[4]	160	0	2 x 3NE8 024[4]	160	00
Chassis units											
45	(60)	6SE7031–0TE50	3NP42 70–0CA01	250	0; 1	–			2 x 3NE3 224	160	1
55	(75)	6SE7031–2TF50	3NP42 70–0CA01	250	0; 1	–			2 x 3NE3 227	250	1
75	(100)	6SE7031–8TF50	3NP42 70–0CA01	250	0; 1	–			2 x 3NE3 227	250	1
90	(120)	6SE7032–1TG50	3NP43 70–0CA01	400	1; 2	–			2 x 3NE3 230–0B	315	1
110	(150)	6SE7032–6TG50	3NP44 70–0CA01	630	2; 3	–			2 x 3NE3 233	450	1
132	(175)	6SE7033–2TG50	3NP44 70–0CA01	630	2; 3	–			2 x 3NE3 233	450	1
160	(215)	6SE7033–7TG50	3NP44 70–0CA01	630	2; 3	–			2 x 3NE3 334–0B	500	2
200	(270)	6SE7035–1TJ50	3NP44 70–0CA01	630	2; 3	–			2 x 3NE3 336	630	2
250	(335)	6SE7036–0TJ50	2 x 3NP53 60–0CA00	400	1; 2	–			2 x 2 x 3NE3 233[3]	450	1

1) See Catalog "Low-Voltage Switchgear". The rated insulation voltage is valid for pollution degree 3 according to DIN VDE 0110, Part 1. The conditions of use, however, are according to pollution degree 2. The rated insulation voltage is therefore ≥ 1000 V.

2) Bear in mind the size of the fuses when selecting the fuse disconnector.

3) DC fuses contained in the inverter unit as standard features.

4) The fuses are necessary only if separate protection of the inverters is required. In that case, the inverters should be ordered with option L33.

5) The Compact PLUS inverters can be connected to the DC link via a coupling module. The power options for the DC link are to be dimensioned according to the total inverter output.

Recommended DC link power options[1]

3

Inverter

Nominal power rating		Inverter	Contactor for disconnecting the inverter from the DC bus[1]		Precharging resistors			Free-wheeling diode on the DC bus	Clamping cap
				I_{rated}		Quantity per inv.	R_{rated}	Diode	
kW	(HP)	Order No.	Order No.	A	Order No.		W	Order No.	Order No.
Compact units									
2.2	(3)	6SE7016–1TA51	3RT13 25	1 x 30	6SX7010–0AC06	2	27	SKR 3 F 20/12[2]	
3	(4)	6SE7018–0TA51	3RT13 25	1 x 30	6SX7010–0AC06	2	27	SKR 3 F 20/12[2]	
4	(5)	6SE7021–0TA51	3RT13 25	1 x 30	6SX7010–0AC06	2	27	SKR 3 F 20/12[2]	
5.5	(7.5)	6SE7021–3TB51	3RT13 25	1 x 30	6SX7010–0AC06	2	27	SKR 3 F 20/12[2]	
7.5	(10)	6SE7021–8TB51	3RT13 25	2 x 27	6SX7010–0AC06	2	27	SKR 3 F 20/12[2]	
11	(15)	6SE7022–6TC51	3RT13 25	2 x 27	6SX7010–0AC06	2	27	SKR 60 F 12[2]	
15	(20)	6SE7023–4TC51	3RT13 25	2 x 27	6SX7010–0AC06	2	27	SKR 60 F 12[2]	
18.5	(25)	6SE7023–8TD51	3RT13 25	2 x 27	6SX7010–0AC06	2	27	SKR 60 F 12[2]	
22	(30)	6SE7024–7TD51	3RT13 36	2 x 50	6SX7010–0AC06	2	27	SKR 60 F 12[2]	
30	(40)	6SE7026–0TD51	3RT13 44	2 x 81	6SX7010–0AC07	2	27	SKR 141 F 15[2]	
37	(50)	6SE7027–2TD51	3RT13 44	2 x 81	6SX7010–0AC07	2	27	SKR 141 F 15[2]	
Chassis units									
45	(60)	6SE7031–0TE50	3RT13 44	2 x 81	6SX7010–0AC08	2	15	SKR 141 F 15[2]	
55	(75)	6SE7031–2TF50	3RT13 46	2 x 108	6SX7010–0AC08	2	15	SKR 141 F 15[2]	
75	(100)	6SE7031–8TF50	3TK10	2 x 162	6SX7010–0AC08	2	15	SKR 141 F 15[2]	
90	(120)	6SE7032–1TG50	3TK10	2 x 162	6SX7010–0AC10	2	10	SKR 141 F 15[2]	
110	(150)	6SE7032–6TG50	3TK10	2 x 162	6SX7010–0AC10	2	10	2 x SKR 141 F 15[2]	
132	(175)	6SE7033–2TG50	3TK11	2 x 207	6SX7010–0AC10	2	10	2 x SKR 141 F 15[2]	
160	(215)	6SE7033–7TG50	3TK12	2 x 243	6SX7010–0AC10	2	10	2 x SKR 141 F 15[2]	
200	(270)	6SE7035–1TJ50	3TK13	2 x 279	6SX7010–0AC10	2	10	2 x SKR 141 F 15[2]	
250	(335)	6SE7036–0TJ50	3TK14	2 x 423	6SX7010–0AC10	2	10	D 689S 20[3][4]	V 72–26.120M[3][4]

## Recommended power options for braking units and braking resistors

Components for braking units

| Nominal power rating P_{20}	Components for braking units[5]	Fuse switch-disconnector for DC coupling			Fuses for braking units		
			Rated current	Max. fuse size		Rated current	Size
kW	Order No.	Order No.	A		Order No.	A	
DC link voltage 510 V DC to 650 V DC							
5	6SE7018–0ES87–2DA0	3NP42 70–0CA01	250	0; 1	2 x 3NE4 101	32	0
10	6SE7021–6ES87–2DA0	3NP42 70–0CA01	250	0; 1	2 x 3NE4 101	32	0
20	6SE7023–2EA87–2DA0	3NP42 70–0CA01	250	0; 1	2 x 3NE4 102	40	0
50	6SE7028–0EA87–2DA0	3NP42 70–0CA01	250	0; 1	2 x 3NE4 121	100	0
100	6SE7031–6EB87–2DA0	3NP42 70–0CA01	250	0; 1	2 x 3NE3 225	200	1
170	6SE7032–7EB87–2DA0	3NP53 60–0CA00	400	0; 1	2 x 3NE3 230–0B	315	1

1) Refer to Catalog "Switchgear and Systems". Rated insulation voltage with pollution degree 2 according to DIN VDE 0110, Part 1, 1000 V.

2) See Engineering Information, Section 6. The diodes referred to are from the range of products supplied by SEMIKRON GmbH u. Co. KG, Sigmundstr. 200, D-90431 Nuremberg, Germany. Internet: www.semikron.com

3) Diode supplied as a disc diode with a clamping cap for mounting on a copper plate or copper rail.

4) See Engineering Information, Section 6. The diodes referred to are from the product range supplied by EUPEC GmbH u. Co. KG, Max-Planck-Str. 5, D-59581 Warstein, Germany. Internet: www.eupec.com

5) The braking units connected in parallel to a DC voltage busbar or several converters are to be protected with the fuses indicated.
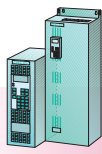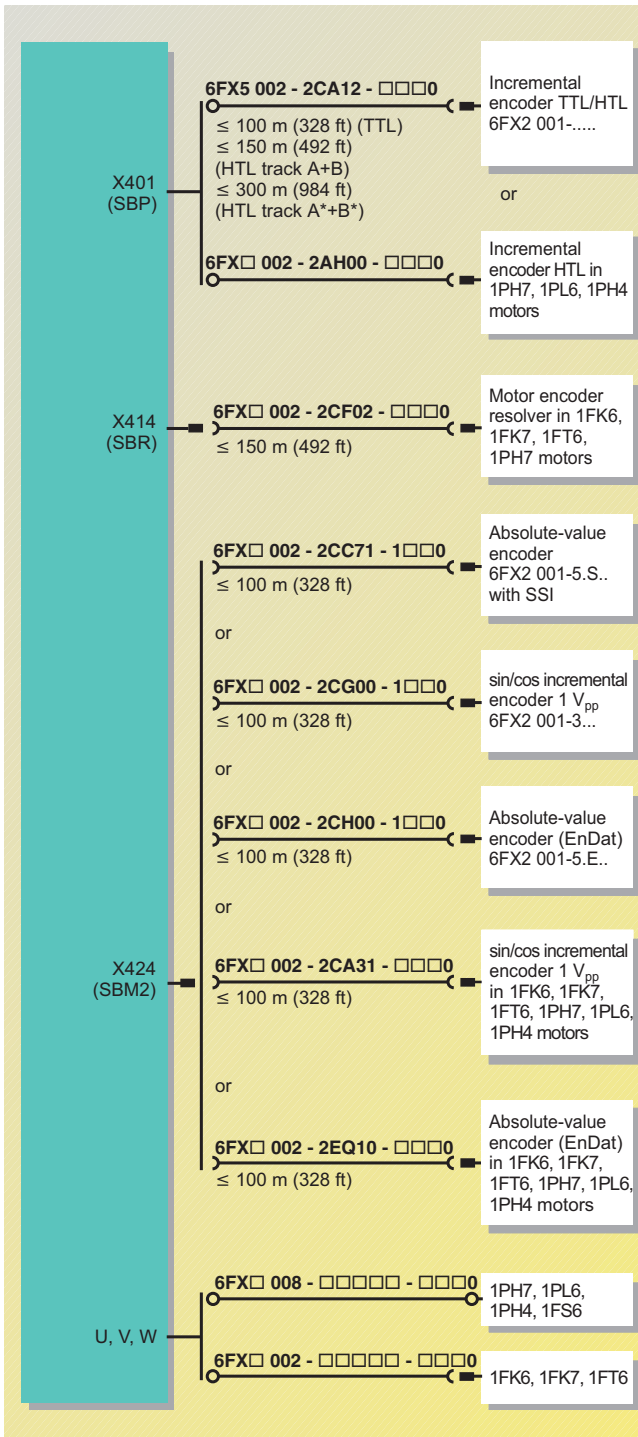
Compact and chassis units	Compact PLUS units
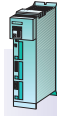
Connecting systems

Connection overview

Current carrying capacity (I_z) of PVC-insulated copper conductors acc. to IEC 60 204-1: 1997 ++ Corrigendum 1998

Cross-section	Current carrying capacity I_z (A) with installation types (see C 1.2)			
mm²	B1	B2	C	E
0.75	7.6	–	–	–
1.0	10.4	9.6	11.7	11.5
1.5	13.5	12.2	15.2	16.1
2.5	18.3	16.5	21	22
4	25	23	28	30
6	32	29	36	37
10	44	40	50	52
16	60	53	66	70
25	77	67	84	88
35	97	83	104	114
50	–	–	123	123
70	–	–	155	155
95	–	–	192	192
120	–	–	221	221
Electronics (pairs)				
0.2	–	–	4.0	4.0
0.3	–	–	5.0	5.0
0.5	–	–	7.1	7.1
0.75	–	–	9.1	9.1

Correction factors

Ambient air temperature		Correction factor
°C	(°F)	
30	(86)	1.15
35	(95)	1.08
40	(104)	1.00
45	(113)	0.91
50	(122)	0.82
55	(131)	0.71
60	(140)	0.58

Note: The correction factors are taken from IEC 60 364-5-523, table 52-D1.

The current carrying capacity I_z of PVC-insulated conductors is specified in the table above for an ambient air temperature of +40 °C (104 °F). For other ambient temperatures, the values must be corrected with the correction factors from the table above.

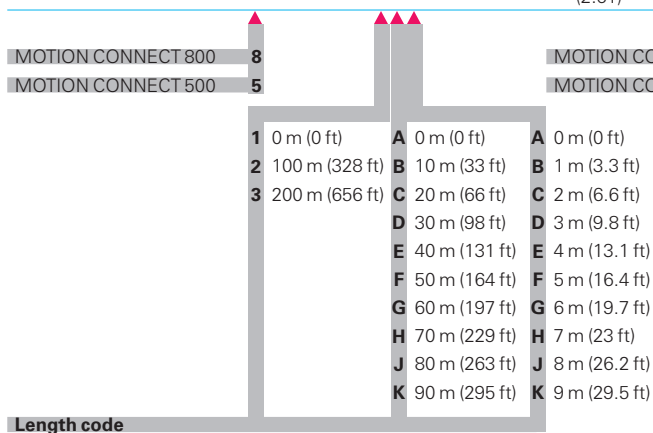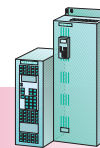**This standard applies also to PUR cables.**

Connecting systems

Power cables for 1FK., 1FT6, 1PH.

6FX☐ 002–5CA . .
without braking cable, with shield

6FX☐ 008–1BB . .
without braking cable, with shield

mm²	Connector size	Prefabricated cables Order No.	D_{max} 6FX8 mm (in)	6FX5 mm (in)	Cable by the meter Order No.	Weight[1] 6FX8 kg/m (lb/ft)	6FX5 kg/m (lb/ft)	Smallest permissible bending radius 6FX8 mm (in)	6FX5 mm (in)
4 x 1.5	1 1.5	6FX☐ 002–5CA01–☐☐☐0 6FX☐ 002–5CA21–☐☐☐0	10.4 (0.41)	10.1 (0.4)	6FX☐ 008–1BB11–☐☐A0	0.16 (0.11)	0.18 (0.12)	100 (3.94)	185 (7.28)
4 x 2.5	1 1.5	6FX☐ 002–5CA11–☐☐☐0 6FX☐ 002–5CA31–☐☐☐0	12.1 0.48)	11.5 (0.45)	6FX☐ 008–1BB21–☐☐A0	0.24 (0.16)	0.24 (0.16)	120 (4.72)	210 (8.27)
4 x 4	1.5	6FX☐ 002–5CA41–☐☐☐0	13.2 (0.52)	13.3 (0.52)	6FX☐ 008–1BB31–☐☐A0	0.31 (0.21)	0.32 (0.22)	130 (5.12)	240 (9.45)
4 x 6	1.5	6FX☐ 002–5CA51–☐☐☐0	16 (0.63)	15.6 (0.61)	6FX☐ 008–1BB41–☐☐A0	0.43 (0.29)	0.46 (0.31)	170 (6.69)	285 (11.22)
4 x 10	3 1.5	6FX☐ 002–5CA13–☐☐☐0 6FX☐ 002–5CA61–☐☐☐0	19.4 (0.76)	20.0 (0.79)	6FX☐ 008–1BB51–☐☐A0	0.63 (0.42)	0.73 (0.49)	210 (8.27)	360 (14.17)
4 x 16	3	6FX☐ 002–5CA23–☐☐☐0	23.6 (0.93)	24.2 (0.96)	6FX☐ 008–1BB61–☐☐A0	0.95 (0.64)	1.1 (0.74)	260 (10.24)	440 (17.32)
4 x 25	–	–	–	28.0 (1.1)	6FX 5 008–1BB25–☐☐A0	–	1.42 (0.95)	–	505 (19.88)
4 x 35	–	–	–	31.5 (1.24)	6FX 5 008–1BB35–☐☐A0	–	1.87 (1.26)	–	570 (22.44)
4 x 50	–	–	–	38.0 (1.5)	6FX 5 008–1BB50–☐☐A0[2]	–	3.42 (2.3)	–	685 (26.97)
4 x 70	–	–	–	42.6 (1.68)	6FX 5 008–1BB70–☐☐A0[2]	–	4.12 (2.77)	–	770 (30.31)
4 x 95	–	–	–	51.7 (2.04)	6FX 5 008–1BB05–☐☐A0[2]	–	4.78 (3.21)	–	935 (36.81)
4 x 120	–	–	–	56.0 (2.2)	6FX 5 008–1BB12–☐☐A0[2]	–	6.11 (4.11)	–	1010 (39.76)
4 x 150	–	–	–	63.0 (2.48)	6FX 5 008–1BB15–☐☐A0[2]	–	7.75 (5.21)	–	1135 (44.69)
4 x 185	–	–	–	66.2 (2.61)	6FX 5 008–1BB18–☐☐A0[2]	–	9.45 (6.35)	–	1195 (47.05)

MOTION CONNECT 800 **8**
MOTION CONNECT 500 **5**

MOTION CONNECT 800 **8**
MOTION CONNECT 500 **5**

1 0 m (0 ft)
2 100 m (328 ft)
3 200 m (656 ft)

A 0 m (0 ft)
B 10 m (33 ft)
C 20 m (66 ft)
D 30 m (98 ft)
E 40 m (131 ft)
F 50 m (164 ft)
G 60 m (197 ft)
H 70 m (229 ft)
J 80 m (263 ft)
K 90 m (295 ft)

A 0 m (0 ft)
B 1 m (3.3 ft)
C 2 m (6.6 ft)
D 3 m (9.8 ft)
E 4 m (13.1 ft)
F 5 m (16.4 ft)
G 6 m (19.7 ft)
H 7 m (23 ft)
J 8 m (26.2 ft)
K 9 m (29.5 ft)

1 B 10 m (33 ft) — Rings (25, 35, 50 mm²)
1 F 50 m (164 ft) — Rings (for deviations, see table)
2 A 100 m (328 ft) — Rings (for deviations, see table)
3 A 200 m (656 ft) — Disposable drum (not for cables > 10 mm²)
6 A 500 m (1640 ft) — Disposable drum (not for cables > 10 mm²)

Length code

Form of delivery

Example:

1 m (3.3 ft):	. . .	–	1	A	B	0
8 m (26.2 ft):	. . .	–	1	A	J	0
17 m (55.8 ft):	. . .	–	1	B	H	0
59 m (193.5 ft):	. . .	–	1	F	K	0
111 m (364.2 ft):	. . .	–	2	B	B	0
262 m (859.8 ft):	. . .	–	3	G	C	0

Deviations from form of delivery

6FX . 008–	50 m (164 ft) (–1FA0)	100 m (328 ft) (–2AA0)
–1BA25	Disposable drum	Disposable drum
–1BA35	Disposable drum	Disposable drum
–1BA50	Disposable drum	Disposable drum
–1BA51 / –1BB51		Disposable drum
–1BA61 / –1BB61		Disposable drum

The cross-sections 25, 35 and 50 mm² can also be ordered and delivered by the meter from 10 m (33 ft) to 49 m (161 ft) (according to the length code of the prefabricated cables) and in 10 m (33 ft) rings.

1) Weight of cables sold by the meter excluding connector.

2) For a cable cross-section ≥ 50 mm² and a cable length of 50 m (164 ft), 100 m (328 ft) and 200 m (656 ft), the cables are supplied on drums.

6FX☐ 002–5DA . .
with braking cable, with shield

mm²	Connector size	Prefabricated cables Order No.	D_{max} 6FX8 mm (in)	6FX5 mm (in)
4 x 1.5 + 2 x 1.5	1 1.5	**6FX☐ 002–5DA01–☐☐☐0** **6FX☐ 002–5DA21–☐☐☐0**	12.9 (0.51)	13.1 (0.52)
4 x 2.5 + 2 x 1.5	1 1.5	**6FX☐ 002–5DA11–☐☐☐0** **6FX☐ 002–5DA31–☐☐☐0**	14.2 (0.56)	14.2 (0.56)
4 x 4 + 2 x 1.5	1.5	**6FX☐ 002–5DA41–☐☐☐0**	15.3 (0.6)	15.9 (0.63)
4 x 6 + 2 x 1.5	1.5	**6FX☐ 002–5DA51–☐☐☐0**	17.8 (0.7)	16.9 (0.67)
4 x 10 + 2 x 1.5	3 1.5	**6FX☐ 002–5DA13–☐☐☐0** **6FX☐ 002–5DA61–☐☐☐0**	20.8 (0.82)	21.7 (0.85)
4 x 16 + 2 x 1.5	3	**6FX☐ 002–5DA23–☐☐☐0**	24.7 (0.97)	24.2 (0.95)
4 x 25 + 2 x 1.5	3	**6FX☐ 002–5DA33–☐☐☐0**	27.9 (1.1)	29.4 (1.16)
4 x 35 + 2 x 1.5	3	**6FX☐ 002–5DA43–☐☐☐0**	32 (1.26)	32.6 (1.28)
4 x 50 + 2 x 1.5	3	**6FX☐ 002–5DA53–☐☐☐0**	35.8 (1.41)	38.0 (1.5)

6FX☐ 008–1BA . .
with braking cable, with shield

Cable by the meter Order No.	Weight[1] 6FX8 kg/m (lb/ft)	6FX5 kg/m (lb/ft)	Smallest permissible bending radius 6FX8 mm (in)	6FX5 mm (in)
6FX☐ 008–1BA11–☐☐A0	0.25 (0.17)	0.22 (0.15)	125 (4.92)	240 (9.45)
6FX☐ 008–1BA21–☐☐A0	0.31 (0.21)	0.28 (0.19)	140 (5.51)	260 (10.24)
6FX☐ 008–1BA31–☐☐A0	0.4 (0.27)	0.36 (0.24)	150 (5.91)	290 (11.42)
6FX☐ 008–1BA41–☐☐A0	0.53 (0.36)	0.54 (0.36)	195 (7.68)	305 (12.01)
6FX☐ 008–1BA51–☐☐A0	0.74 (0.5)	0.75 (0.5)	230 (9.06)	395 15.55
6FX☐ 008–1BA61–☐☐A0	1.10 (0.74)	1.10 (0.74)	275 (10.83)	440 (17.32)
6FX☐ 008–1BA25–☐☐A0	1.46 (0.98)	1.56 (1.05)	325 (12.8)	530 (20.87)
6FX☐ 008–1BA35–☐☐A0	2.10 (1.41)	2.01 (1.35)	380 (14.96)	590 (23.23)
6FX☐ 008–1BA50–☐☐A0	2.75 (1.85)	3.30 (2.22)	420 (16.54)	685 (26.97)

MOTION CONNECT 800	**8**	
MOTION CONNECT 500	**5**	

MOTION CONNECT 800	**8**	
MOTION CONNECT 500	**5**	

1	0 m (0 ft)
2	100 m (328 ft)
3	200 m (656 ft)

A	0 m (0 ft)
B	10 m (33 ft)
C	20 m (66 ft)
D	30 m (98 ft)
E	40 m (131 ft)
F	50 m (164 ft)
G	60 m (197 ft)
H	70 m (229 ft)
J	80 m (263 ft)
K	90 m (295 ft)

A	0 m (0 ft)
B	1 m (3.3 ft)
C	2 m (6.6 ft)
D	3 m (9.8 ft)
E	4 m (13.1 ft)
F	5 m (16.4 ft)
G	6 m (19.7 ft)
H	7 m (23 ft)
J	8 m (26.2 ft)
K	9 m (29.5 ft)

1 B	10 m (33 ft)	Rings (25, 35, 50 mm²)
1 F	50 m (164 ft)	Rings (for deviations, see table)
2 A	100 m (328 ft)	Rings (for deviations, see table)
3 A	200 m (656 ft)	Disposable drum (not for cables > 10 mm²)
6 A	500 m (1640 ft)	Disposable drum (not for cables > 10 mm²)

Length code

Form of delivery

Example:

1 m (3.3 ft):	. . .	– 1 A B 0
8 m (26.2 ft):	. . .	– 1 A J 0
17 m (55.8 ft):	. . .	– 1 B H 0
59 m (193.5 ft):	. . .	– 1 F K 0
111 m (364.2 ft):	. . .	– 2 B B 0
262 m (859.8 ft):	. . .	– 3 G C 0

Deviations from form of delivery

6FX . 008–	50 m (164 ft)(–1FA0)	100 m (328 ft) (–2AA0)
–1BA25	Disposable drum	Disposable drum
–1BA35	Disposable drum	Disposable drum
–1BA50	Disposable drum	Disposable drum
–1BA51 / –1BB51		Disposable drum
–1BA61 / –1BB61		Disposable drum

The cross-sections 25, 35 and 50 mm² can also be ordered and delivered by the meter from 10 m (33 ft) to 49 m (161 ft) (according to the length code of the prefabricated cables) and in 10 m (33 ft) rings.
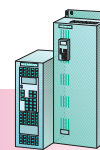
1) Weight of cables sold by the meter excluding connector.

Compact PLUS units

Compact and chassis units

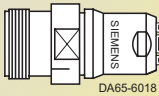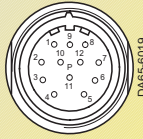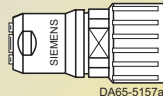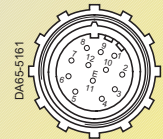**Connecting systems**

Encoder cables for connecting to motors with HTL incremental encoder (1024 p/r and 2048 p/r)[1]

Cable design and pin assignment

Base cable type 6FX . 002–2AH00– . . . .

Converter side	Motion Control	Vector Control	Cable by the meter 6FX . 008–1BD21			Measurement system side
	PIN	PIN	Signal name	Signal name	PIN	
Cable end cut off	71		* B	* B	1	**Plug type: 6FX2 003–0CE12**
	63	30	KTY84 +	KTY84 +	2	
	72	26	ZERO TRACK	ZERO TRACK	3	
	73		* ZERO TRACK	* ZERO TRACK	4	
	68	24	A	A	5	
	69		* A	* A	6	
	74	27	CTRL TACHO	CTRL TACHO	7	
	70	25	B	B	8	
	61	23	0 V	0 V	10	
	62	29	KTY84 –	KTY84 –	11	
	60	28	15 V	15 V	12	
				Outer shield on plug housing	yes	

Cable extension type 6FX . 002–2AH04– . . . 0

Plug type: 6FX2 003–1CF12	PIN assignment of the cable extension corresponding to the base cable	**Plug type: 6FX2 003–0CE12**

Selection and ordering data

Cable	Order No.
Prefabricated cables	
Encoder cables for connection to motors with HTL incremental encoder	**6FX☐002–2AH00–☐☐☐0**

MOTION CONNECT 800	**8**	
MOTION CONNECT 500	**5**	

1 0 m (0 ft)	**A** 0 m (0 ft)	**A** 0 m (0 ft)
2 100 m (328 ft)	**B** 10 m (33 ft)	**B** 1 m (3.3 ft)
3 200 m (656 ft)	**C** 20 m (66 ft)	**C** 2 m (6.6 ft)
4 300 m (984 ft)	**D** 30 m (98 ft)	**D** 3 m (9.8 ft)
	E 40 m (131 ft)	**E** 4 m (13.1 ft)
	F 50 m (164 ft)	**F** 5 m (16.4 ft)
	G 60 m (197 ft)	**G** 6 m (19.7 ft)
	H 70 m (229 ft)	**H** 7 m (23 ft)
	J 80 m (263 ft)	**J** 8 m (26.2 ft)
	K 90 m (295 ft)	**K** 9 m (29.5 ft)

Length code

Example: 1 m (3.3 ft): . . . – 1 A B 0   59 m (193.5 ft): . . . – 1 F K 0
8 m (26.2 ft): . . . – 1 A J 0   111 m (364.2 ft): . . . – 2 B B 0
17 m (55.8 ft): . . . – 1 B H 0   262 m (859.8 ft): . . . – 3 G C 0

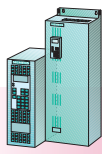| Cable	Length m (ft)	Order No.
Cable, sold by the meter		
Encoder cables for connection to motors with HTL incremental encoder No. of cores x cross-section [mm²] 4 x 2 x 0.34 + 4 x 0.5	50 (164)	**6FX☐008–1BD21–1FA0**
	100 (328)	**6FX☐008–1BD21–2AA0**
	200 (656)	**6FX☐008–1BD21–3AA0**
	500 (1640)	**6FX☐008–1BD21–6AA0**

Outer diameter of cable for 6FX8: 9.3 mm (0.37 in)	**8**
Outer diameter of cable for 6FX5: 9.3 mm (0.37 in)	**5**

[1] Cable length ≤ 150 m (492 ft) without transmission of the inverted signals and cable length   150 m (492 ft) to 300 m (984 ft) with transmission of the inverted signals and use of the DTI unit.

Compact and chassis units

Compact PLUS units

Encoder cables for connection to motors with a 2-pole/multi-pole resolver

Cable design and pin assignment

Base cable type 6FX . 002–2CF02– . . . .

| Converter side	Cable by the meter 6FX . 008–1BD41			Measurement system side

Plug type: 6FC9 348–7HP00
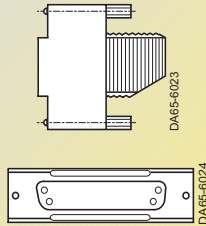
PIN	Signal name	Signal name	PIN
3	SIN	SIN	1
4	* SIN	* SIN	2
5	Inner shield		3
6	COS	COS	11
7	* COS	* COS	12
8	Inner shield		5
13	+ TEMP	+ TEMP	8
25	– TEMP	– TEMP	9
24	Inner shield		4
9	+ V_{pp}	+ V_{pp}	10
11	– V_{pp}	– V_{pp}	7
yes	Outer shield on plug housing		yes

Plug type: 6FX2 003–0CE12

DA65-6023

DA65-6024

DA65-5157a

DA65-5161
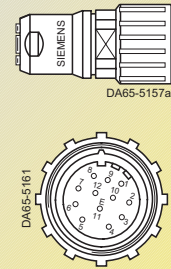
Cable extension type 6FX . 002–2CF04– . . . .

Plug type: 6FX2 003–1CF12
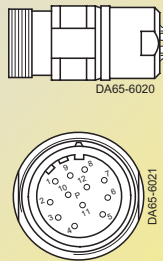
PIN assignment of the cable extension corresponding to the base cable

Plug type: 6FX2 003–0CE12

DA65-6020

DA65-6021

DA65-5157a

DA65-5161
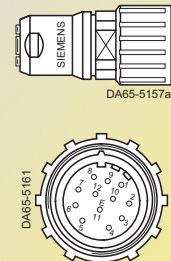
Selection and ordering data

Cable	Order No.

Prefabricated cables (length < 150 m (492 ft))

Encoder cables for connection to motors which are fitted with a resolver (detection of rotor position and speed build-up) prefabricated

6FX☐002–2CF02–☐☐☐0

MOTION CONNECT 800		**8**
MOTION CONNECT 500		**5**

1	0 m (0 ft)	**A**	0 m (0 ft)	**A**	0 m (0 ft)
2	100 m (328 ft)	**B**	10 m (33 ft)	**B**	1 m (3.3 ft)
		C	20 m (66 ft)	**C**	2 m (6.6 ft)
		D	30 m (98 ft)	**D**	3 m (9.8 ft)
		E	40 m (131 ft)	**E**	4 m (13.1 ft)
		F	50 m (164 ft)	**F**	5 m (16.4 ft)
		G	60 m (197 ft)	**G**	6 m (19.7 ft)
		H	70 m (229 ft)	**H**	7 m (23 ft)
		J	80 m (263 ft)	**J**	8 m (26.2 ft)
		K	90 m (295 ft)	**K**	9 m (29.5 ft)

Length code

Example:
1 m (3.3 ft): . . . – 1 A B 0
8 m (26.2 ft): . . . – 1 A J 0
17 m (55.8 ft): . . . – 1 B H 0
59 m (193.5 ft): . . . – 1 F K 0
111 m (364.2 ft): . . . – 2 B B 0

Cable	Length m (ft)	Order No.

Cable, sold by the meter[1]

Encoder cables for connection to motors which are fitted with a resolver (detection of rotor position and speed build-up)
No. of cores x cross-section [mm²]
3 x 2 x 0.14 + 4 x 0.14 + 2 x 0.5

	Length m (ft)	Order No.
	50 (164)	**6FX☐008–1BD41–1FA0**
	100 (328)	**6FX☐008–1BD41–2AA0**
	200 (656)	**6FX☐008–1BD41–3AA0**
	500 (1640)	**6FX☐008–1BD41–6AA0**

Outer diameter of cable for 6FX8: 9.2 mm (0.37 in)	**8**
Outer diameter of cable for 6FX5: 9.3 mm (0.37 in)	**5**

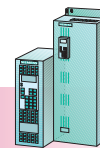1) Maximum permissible length of the prefabricated cables for the resolvers: 150 m (492 ft).

Compact PLUS units

Compact and chassis units

3

Connecting systems

Encoder cables for connection to motors with a sin/cos incremental encoder 1 V_pp

Cable design and pin assignment

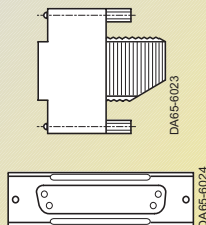**Base cable type 6FX . 002–2CA31– . . . . / 6FX . 002–2YS01– . . . .**

Converter side		Cable by the meter 6FX . 008–1BD51			Measurement system side

Plug type: 6FC9 348–7HP00

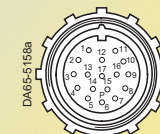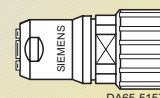| PIN	Signal name	Signal name	PIN
3	A	Ua1	1
4	* A	* Ua1	2
5		Inner shield	17
6	B	Ua2	11
7	* B	* Ua2	12
8		Inner shield	17
17	R	Ua0	3
18	* R	* Ua0	13
24		Inner shield	17
19	C	Ua3	5
20	* C	* Ua3	6
21	D	Ua4	14
22	* D	* Ua4	4
13	+ Temp	+ Temp	8
25	– Temp	– Temp	9
1	P encoder	P encoder	10
14	5 V sense	5 V sense	16
2	M encoder	M encoder	7
16	0 V sense	0 V sense	15
yes	Outer shield on plug housing		yes

6FX . 002–2CA31– . . . .
Cable outlet at the bottom

6FX . 002–2YS01– . . . .
Cable outlet at the top

Plug type: 6FX2 003–0CE17
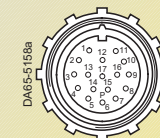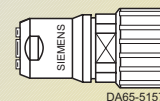
Cable extension type 6FX . 002–2CA34– . . . .

Plug type: 6FX2 003–1CF12	PIN assignment of the cable extension corresponding to the base cable	Plug type: 6FX2 003–0CE17

Selection and ordering data

Cable	Order No.

Prefabricated cables (length < 100 m (328 ft))

Encoder cables for connection to motors which are fitted with a sin/cos incremental encoder 1 V_pp (detection of rotor position and speed build-up)

prefabricated   **6FX☐002–2CA31–☐☐☐0**

MOTION CONNECT 800	**8**
MOTION CONNECT 500	**5**

|					
1	0 m (0 ft)	**A**	0 m (0 ft)	**A**	0 m (0 ft)
2	100 m (328 ft)	**B**	10 m (33 ft)	**B**	1 m (3.3 ft)
		C	20 m (66 ft)	**C**	2 m (6.6 ft)
		D	30 m (98 ft)	**D**	3 m (9.8 ft)
		E	40 m (131 ft)	**E**	4 m (13.1 ft)
		F	50 m (164 ft)	**F**	5 m (16.4 ft)
		G	60 m (197 ft)	**G**	6 m (19.7 ft)
		H	70 m (229 ft)	**H**	7 m (23 ft)
		J	80 m (263 ft)	**J**	8 m (26.2 ft)
		K	90 m (295 ft)	**K**	9 m (29.5 ft)

Length code

Cable	Length m (ft)	Order No.

Cable, sold by the meter[1]

Encoder cables for connection to motors which are fitted with a sin/cos incremental encoder 1 V_pp (detection of rotor position and speed build-up) No. of cores x cross-section [mm^2] 3 x 2 x 0.14 + 4 x 0.14 + 2 x 0.5 + 4 x 0.23

	50 (164)	**6FX☐008–1BD51–1FA0**
	100 (328)	**6FX☐008–1BD51–2AA0**
	200 (656)	**6FX☐008–1BD51–3AA0**
	500 (1640)	**6FX☐008–1BD51–6AA0**

Outer diameter of cable for 6FX8: 9.9 mm (0.39 in)	**8**
Outer diameter of cable for 6FX5: 9.9 mm (0.39 in)	**5**

Example: 1 m (3.3 ft): . . . – 1 A B 0   17 m (55.8 ft): . . . – 1 B H 0
8 m (26.2 ft): . . . – 1 A J 0   59 m (193.5 ft): . . . – 1 F K 0

1) Maximum permissible length of the prefabricated cables for the sin/cos incremental encoder 1 V_pp: 100 m (328 ft).
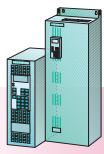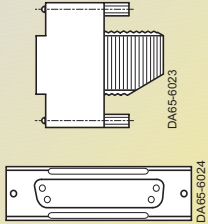
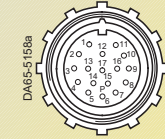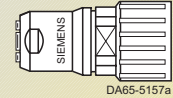**Encoder cables for connection to motors with an absolute-value encoder (EnDat)**
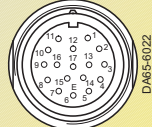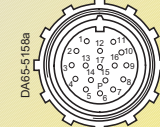
Cable design and pin assignment
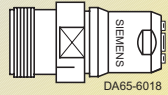
Base cable type 6FX . 002–2EQ10– . . . .

Converter side		Cable by the meter 6FX . 008–1BD51		Measurement system side

Plug type: 6FC9 348–7HP00

Plug type: 6FX2 003–0CE17

PIN	Signal name	Signal name	PIN
3	A	Ua1	1
4	* A	* Ua1	2
5	Inner shield		17
6	B	Ua2	11
7	* B	* Ua2	12
8	Inner shield		17
15	Data	Data	3
23	* Data	*Data	13
24	Inner shield		17
10	Clock	Clock	5
12	* Clock	* Clock	14
13	+ Temp	+ Temp	8
25	– Temp	– Temp	9
1	P encoder	P encoder	10
14	5 V sense	5 V sense	16
2	M encoder	M encoder	7
16	0 V sense	0 V sense	15
yes	Outer shield on plug housing		yes

Cable extension type 6FX . 002–2EQ14– . . . .

Plug type: 6FX2 003–1CF17

PIN assignment of the cable extension corresponding to the base cable

Plug type: 6FX2 003–0CE17

Selection and ordering data

Cable	Order No.

Prefabricated cables (length < 100 m (328 ft))

Encoder cables for connection to motors which are fitted with an absolute-value encoder (EnDat) (detection of absolute position and speed build-up)

prefabricated **6FX☐002–2EQ10–☐☐☐0**

| MOTION CONNECT 800 | **8** |
| MOTION CONNECT 500 | **5** |

1	0 m (0 ft)	**A**	0 m (0 ft)	**A**	0 m (0 ft)
2	100 m (328 ft)	**B**	10 m (33 ft)	**B**	1 m (3.3 ft)
		C	20 m (66 ft)	**C**	2 m (6.6 ft)
		D	30 m (98 ft)	**D**	3 m (9.8 ft)
		E	40 m (131 ft)	**E**	4 m (13.1 ft)
		F	50 m (164 ft)	**F**	5 m (16.4 ft)
		G	60 m (197 ft)	**G**	6 m (19.7 ft)
		H	70 m (229 ft)	**H**	7 m (23 ft)
		J	80 m (263 ft)	**J**	8 m (26.2 ft)
		K	90 m (295 ft)	**K**	9 m (29.5 ft)

Length code

Cable	Length m (ft)	Order No.

Cable, sold by the meter [1]

Encoder cables for connection to motors which are fitted with an absolute-value encoder (EnDat) (detection of absolute position and speed build-up)
No. of cores x cross-section [mm²]
3 x 2 x 0.14 + 4 x 0.14 + 2 x 0.5 + 4 x 0.23

50 (164)	**6FX☐008–1BD51–1FA0**
100 (328)	**6FX☐008–1BD51–2AA0**
200 (656)	**6FX☐008–1BD51–3AA0**
500 (1640)	**6FX☐008–1BD51–6AA0**

| Outer diameter of cable for 6FX8: 9.9 mm (0.39 in) | **8** |
| Outer diameter of cable for 6FX5: 9.9 mm (0.39 in) | **5** |

Example: 1 m (3.3 ft): . . . – 1 A B 0   17 m (55.8 ft): . . . – 1 B H 0
8 m (26.2 ft): . . . – 1 A J 0   59 m (193.5 ft): . . . – 1 F K 0

1) Maximum permissible length of the prefabricated cables for the absolute-value encoders (EnDat): 100 m (328 ft).

Mechanical system components

Enclosures for increasing the degree of protection of chassis units

The units can also be supplied with fitted enclosures.

See Section "Other options."

Description	Size	Order No.	Dimensions W x H x D mm (in)	Weight kg (lb)
IP20 enclosures (retrofit kit)				
For converters and inverters without PMU[1]	E	6SE7090–0XE87–3AC0	270 x 1050 x 370 (10.6 x 41.3 x 14.6)	15 (33.1)
	F	6SE7090–0XF87–3AC0	360 x 1050 x 370 (14.2 x 41.3 x 14.6)	17 (37.5)
	G	6SE7090–0XG87–3AC0	508 x 1450 x 480 (20 x 57.1 x 18.9)	25 (55.1)
For rectifier units	E	6SE7090–0XE85–0TC0	270 x 1050 x 370 (10.6 x 41.3 x 14.6)	15 (33.1)
For rectifier/regenerative units without PMU[1]	E	6SE7090–0XE85–1TC0	270 x 1050 x 370 (10.6 x 41.3 x 14.6)	15 (33.1)

G-rail for mounting the compact units

| Supplier[2]	Length	Order No.
G-rail to EN 50 035, steel		
Phönix Contact, Blomberg	2 m (6.6 ft)	12 01 002
Wieland, Bamberg	2 m (6.6 ft)	98.190.0000.0
Weidmüller GmbH u. Co., Paderborn	5 x 2 m (16.4 x 6.6 ft)	05 1440
Weidmüller GmbH u. Co., Paderborn	10 x 1 m (32.8 x 3.3 ft)	05 1441

DIN rail 35 mm for mounting the interface modules e.g.: ATI, DTI, SCI

Supplier[2]	Length	Order No.
DIN rail acc. to EN 50 022		
Siemens AG	0.5 m (1.6 ft)	8GR4 926
Siemens AG	1 m (3.3 ft)	8GR4 928

Bus retaining system

The following standard components are designed to provide a DC bus system up to 1800 A. The DC bus can either be mounted in or on top of the cabinet.

The bus bar retaining elements are designed to hold copper bus bars with dimensions from 10 mm x 30 mm (0.4 in x 1.2 in) up to 10 mm x 60 mm (0.4 in x 2.4 in).
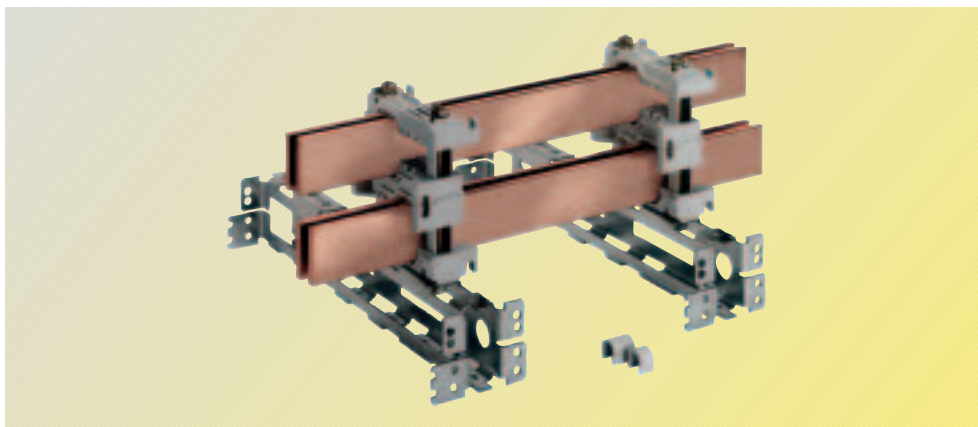
Cabinet width	Number of retaining elements
600 mm (23.6 in)	2
900 mm (35.4 in)	3
1200 mm (47.2 in)	4

Designation	Order No.
Bus retaining system	
Bus retaining elements for 30 and 40 mm (1.2 and 1.6 in) buses	6SE7090–0XX87–3CB0
Bus retaining elements for 50 and 60 mm (2.0 and 2.4 in) buses	6SE7090–0XX87–3CD0
Bus retaining elements for 8MF and 8MC cabinets	6SE7090–0XX87–3CC0

Connecting adapter for cable shields – for compact units

The shield of the load-side cable and the shields of an additional 8 control cables can be connected here. Radio-interference suppression to EN 61 800-3 can thus be maintained with noise-suppression filter and line commutating reactor.
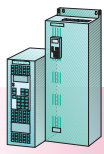
Size	Order No.
Connecting adapter for cable shields incl. shield clamp for power lines	
6SE70..–..A..	6SE7090–0XA87–3CA1
6SE70..–..B..	6SE7090–0XB87–3CA1
6SE70..–..C..	6SE7090–0XC87–3CA1
6SE70..–..D..	6SE7090–0XD87–3CA1

Shield clamps to connect control-cable shields

Designation	Order No.
Shield clamps	
Shield clamps, quantity = 15	6SY7000–0AD60

1) The retrofit kit contains all the mechanical components and cables. The PMU of the basic unit is to be built into the front door.

2) Located in Germany.

3

The OP1S comfort operator control panel

The OP1S operator control panel is an optional input/output unit which can be used for parameterizing the drive units. Plain text displays greatly facilitate parameterization.

For a more detailed description of the OP1S operator control panel, see Section 6 "Operator control and visualization".

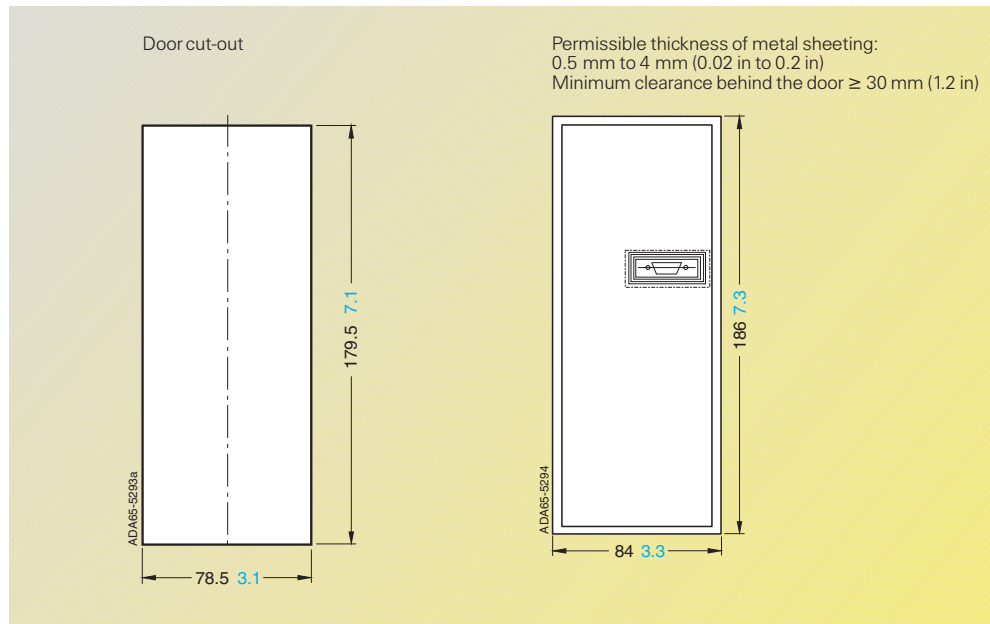| Designation		Order No.
OP1S control panel		**6SE7090–0XX84–2FK0**
AOP1S adapter for cabinet-door mounting incl. 5 m (16.4 ft) connecting cable		**6SX7010–0AA00**
Connecting cable PMU-OP1S	3 m (9.8 ft)	**6SX7010–0AB03**
Connecting cable PMU-OP1S	5 m (16.4 ft)	**6SX7010–0AB05**

APMU adapter for cabinet-door mounting

The PMU parameterizing unit included in the standard version of all drive units can also be built into a cabinet door using an APMU adapter.

For dimensions and door cut-out, see below.

Note:
The OP1S operator control panel can also be plugged onto the APMU.

Designation	Order No.
APMU adapter for cabinet-door mounting incl. 2 m (6.6 ft) cable	**6SX7010–0AA10**

Door cut-out

Permissible thickness of metal sheeting:
0.5 mm to 4 mm (0.02 in to 0.2 in)
Minimum clearance behind the door ≥ 30 mm (1.2 in)

179.5 7.1

186 7.3

ADA65-5293a

ADA65-5294

78.5 3.1

84 3.3

AOP1S/APMU adapter and door cut-out

Dimensions in mm
Dimensions in inches

3
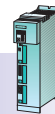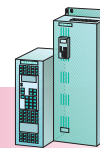
Communication package for SIMATIC S5

The SIMATIC optional software package "DVA_S5" is available for integrating variable-speed drives such as SIMOREG and SIMOVERT into the higher-level control system STEP 5 (version ≥ 6.0) of SIMATIC S5.

This software supports communication between SIMATIC and Siemens drive units (SIMOVERT MASTER-DRIVES) via PROFIBUS DP and the USS protocol. It enables the SIMATIC programmer to integrate communication with the drives into his control program without the need for detailed knowledge of the indicated communication systems, SIMATIC communication and the mechanisms of drive-related user data transfer. The user thus reduces programming time and costs.

Example programs are available for demonstrating the required configuration steps and can also be directly adopted by the user in his application.

For a detailed description, see Section 6 "SIMOVERT MASTERDRIVES in the world of automation."

Detailed documentation on every software component is included in the scope of supply.

Scope of supply		Order No.	Supplied as	Documentation
"DVA_S5" option software for SIMATIC S5 (STEP 5 > V 6.0)				
● **"PROFIBUS DP" communication software** for S5-95U/DP-Master S5-115 ... 155U with IM308-B/C		**6DD1800–0SW0**	3.5" floppy disk	German/English
● **"USS Protocol" communication software** for S5-95/S5-100 with CP 521Si S5-115 to S5-155U with CP 524				

Example of the user interface for a drive using PPO type 1 (SIMATIC S5, PROFIBUS DP communication)

DBW n	Communication control word (KSTW)		Communication control
DBW n + 2	Internal		
DBW n + 4	Communication indicator word		Communication tracking
DBW n + 6	Internal		PKW attempt counter
DBW n + 8	Pafe 1-byte, Pafe 2-byte		Parameter error
DBW n + 10	Parameter ID	PKE	
DBW n + 12	Index	IND	Intermediate memory for current PKW task
DBW n + 14	Parameter value 1	PWE1	
DBW n + 16	Parameter value 2	PWE2	
DBW n + 18	Parameter ID	PKE	
DBW n + 20	Index	IND	PKW area
DBW n + 22	Parameter value 1	PWE1	
DBW n + 24	Parameter value 2	PWE2	transmit mailbox
DBW n + 26	Control word (STW)	PZD1	PZD area
DBW n + 28	Main setpoint (HSW)	PZD2	
DBW n + 30	Parameter ID	PKE	
DBW n + 32	Index	IND	PKW area
DBW n + 34	Parameter value 1	PWE1	
DBW n + 36	Parameter value 2	PWE2	receive mailbox
DBW n + 38	Status word (ZSW)	PZD1	PZD area
DBW n + 40	Main actual value (HIW)	PZD2	
(n = 2, 4, 6 ...)			

Software requirements

• STEP 5 – from version 6.x (DVA_S5).

Software functions

One or more data blocks form the user interface (see overview above) for the transfer of user data between the SIMATIC program and the drives.

Two function blocks are available for transmitting and receiving these user data.

A further function block supports generation and presetting of the data blocks necessary for communication.

The performance characteristics are as follows:

• Generation of data blocks for communication depending on the configured bus configuration

• Presetting of these data blocks

• Cyclic user data transfer

• Execution and monitoring of parameter tasks.
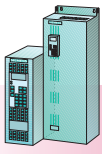
Compact and chassis units	Compact PLUS units	Operator control, visualization and communication with SIMATIC

Start-up, parameterization and diagnostics with DriveMonitor

The DriveMonitor computer program can be used for control and visualization of SIMOVERT MASTERDRIVES by means of a graphic user interface.

For a more detailed description of DriveMonitor, see Section 6 "Operator control and visualization."

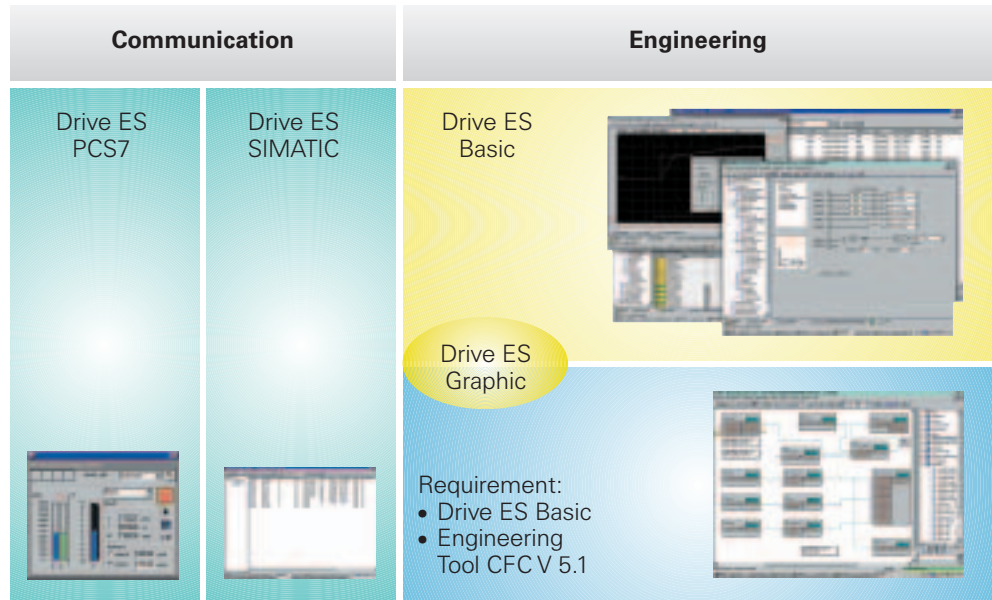| Designation	Order No.	Supplied as
DriveMonitor Version ≥ 5.1 for SIMOVERT MASTERDRIVES with documentation (operating instructions, Compendium, 5 languages)		
Supplied separately	**6SX7010–0FA10**	CD-ROM
Interface converter SU1 RS 232 C – RS 485, incl. mounting accessories; Power supply: 115/230 V AC	**6SX7005–0AA00**	–
Combination cable for the firmware boot function and DriveMonitor (RS 232 C). Pre-assembled signal cables with a boot switch integrated in the cable connector housing for boating firmware. In addition, the cable can be used for DriveMonitor (RS 232 C). Length 3 m (9.8 ft).	**9AK1012–1AA00**	–

3

Engineering system Drive ES
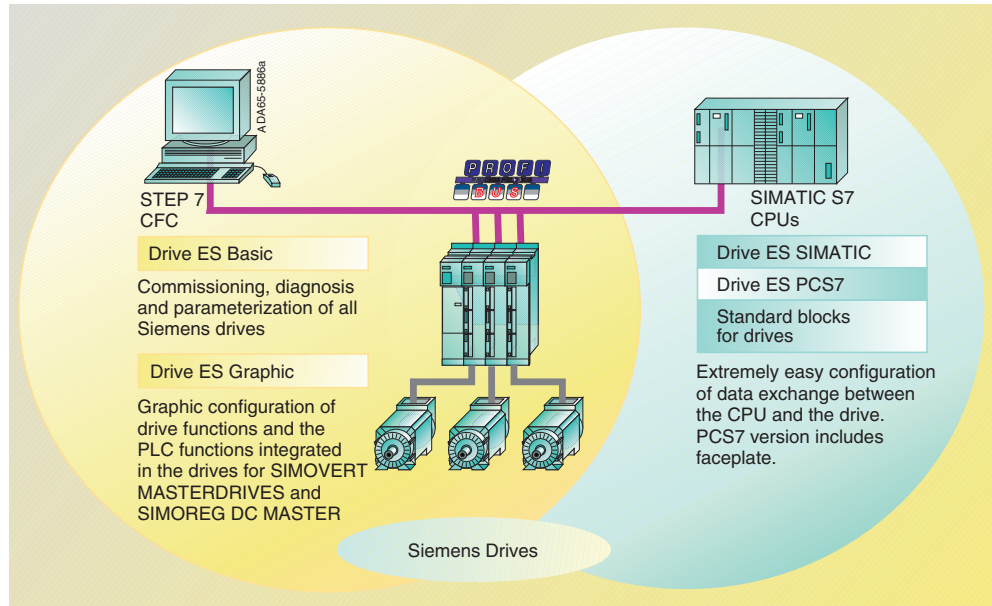
3
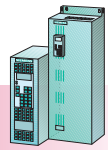
Engineering package Drive ES

With Drive ES (*D*rive *E*ngineering *S*ystem) the SIMOVERT MASTERDRIVES series can be fully integrated into the SIMATIC automation world with regard to communication, configuring and data management.

Drive ES consists of four individually available software packages: Drive ES Basic, Drive ES Graphic, Drive ES SIMATIC and Drive ES PCS7.

- Drive ES Basic is the basic software for assigning parameters to all drives online and offline, and the basis for the Drive ES Graphic software.

- Drive ES Graphic is the software for the graphic online and offline configuring of BICO function blocks. Requirements are an installed Drive ES Basic and an installed SIMATIC CFC ≥ V 5.1 (graphic programming tool, see Catalog ST 70, Industrial software).

- Drive ES SIMATIC requires an installed STEP 7. It provides its own SIMATIC library, allowing simple and reliable programming of the PROFIBUS DP interface in the SIMATIC CPU for the drives.

- Drive ES PCS7 requires an installed SIMATIC PCS7, version 5.0 or greater. Drive ES PCS7 provides a library with function blocks for the drives and the associated faceplates for the operator station. It is therefore possible for an operator to control the drives from the PCS7 process control system.

Communication		Engineering	
Drive ES PCS7	Drive ES SIMATIC	Drive ES Basic	
		Drive ES Graphic	
		Requirement: • Drive ES Basic • Engineering Tool CFC V 5.1	

Product structure Drive ES

STEP 7 CFC

Drive ES Basic

Commissioning, diagnosis and parameterization of all Siemens drives

Drive ES Graphic

Graphic configuration of drive functions and the PLC functions integrated in the drives for SIMOVERT MASTERDRIVES and SIMOREG DC MASTER

SIMATIC S7 CPUs

Drive ES SIMATIC

Drive ES PCS7

Standard blocks for drives

Extremely easy configuration of data exchange between the CPU and the drive. PCS7 version includes faceplate.

Siemens Drives

Distribution of tasks for the Drive ES packages

Compact and chassis units	Compact PLUS units	Engineering system Drive ES

3

Drive ES Basic

- Drive ES is based on the user interface of the STEP 7 manager.

- Parameters and charts of drives are available in the STEP 7 manager (system-wide data management).

- Drive ES ensures the unique assignment of parameters and charts to a drive.

- Archiving of a SIMATIC project including drive data

- Facility for using SIMATIC Teleservice (V5)

- Communication via PROFIBUS DP or USS with the drive

Functions

- Trace evaluation for SIMOVERT MASTERDRIVES

- Reading out of the fault memory for SIMOVERT MASTERDRIVES

- Upread and download of parameter sets (as a complete file or as difference file from factory setting)

- Free assembly and editing of parameter sets

- Utilization of script files

- Controlled commissioning for SIMOVERT MASTERDRIVES

Installation with STEP 7

Drive ES Basic can be installed as an option for STEP 7 (≥ V 5.0), becoming homogeneously integrated in the SIMATIC environment.

Installation without STEP 7

Drive ES Basic can also be installed without STEP 7, by providing its own drive manager (based on the SIMATIC manager).

Drive ES Graphic

- Function charts are saved drive-specific in SIMATIC CFC format

- Configuring of drive functions in BICO technology with SIMATIC CFC

- Offline functionality

- Test mode (online functionality) with Change connection, Change value, Activate block

- Readback and reverse documentation

- For SIMOVERT MASTERDRIVES Vector Control software version ≥ 3.2 and Motion Control software version ≥ 1.3.
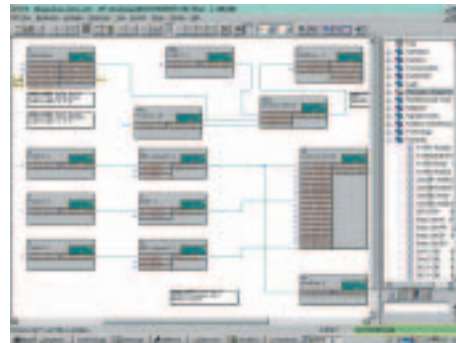
Graphic programming with Drive ES Graphic and CFC

Drive ES SIMATIC

- Provides function blocks and examples of projects for the SIMATIC CPU which handle communication via PROFIBUS DP or USS with Siemens drives.

- Communication set-up via parameters as opposed to programming.

Features

- Blocks in STEP 7 design; symbolic addressing; function blocks with entity data, online help

- Can be used in all SIMATIC programming and configuring environments such as LAD, FBD, STL, SCL, CFC.

- New block structure: modular individual functions for runtime-optimized programming

Block functions

- Writing and reading of process data of freely configurable length and consistency

- Cyclic and acyclic exchange of parameters, monitoring of communication, reading out of fault memory from SIMOVERT MASTERDRIVES

- Parameter download via the CPU to the drive.
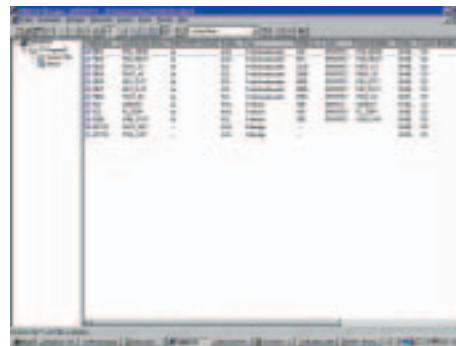
Integration of the drives into the STEP 7 manager

- Complete reparameterization after converter exchange at the push of a button from the CPU.

Drive ES PCS7

- Incorporates the drives with PROFIBUS DP-interface in PCS 7.

- For use with STEP 7 or PCS 7, ≥ V 5.

Block functions

- Image and control blocks for incorporating drives in PCS 7 (SIMOVERT MASTERDRIVES with speed interface).
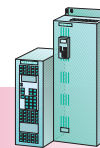
| Compact PLUS units | Compact and chassis units |

Engineering system Drive ES

3

Integration of drives in SIMATIC S7 with Drive ES

Drive ES Basic is used for convenient start-up, servicing and diagnostics of Siemens drives. It can be integrated in STEP 7 or installed on a PC/PG as a stand-alone version.
For the stand-alone version, Drive ES Basic installs a drive manager instead of the SIMATIC manager but the drive manager has the same look and feel. For integrated installation as an option for STEP 7, the basic STEP 7 version as indicated in the ordering data must be used.

In conjunction with the SIMATIC tool CFC (Continuous Function Chart), Drive ES Graphic is an option for Drive ES Basic and used for the graphic configuring of functions provided in SIMOVERT MASTERDRIVES (base unit, free block and technology functions). Prerequisite: A Drive ES Basic V 5 and a CFC > V 5.1 must already have been installed on the computer.

Drive ES SIMATIC makes SIMATIC block libraries available, so that configuring the communication between SIMATIC S7 and Siemens drives (e.g. SIMOVERT MASTERDRIVES) only involves simple parameter assignment. Drive ES SIMATIC replaces the DVA_S7 software package for all STEP 7 versions ≥ V 5.0 and can also be installed and used independently, i.e. without Drive ES Basic.

Drive ES PCS7 provides a block library with image and control blocks with which Siemens drives (e.g. SIMOVERT MASTERDRIVES) can be integrated in the SIMATIC PCS7 process control system on the basics of a speed interface. The drives can then be controlled and visualized from the operator station (OS) via the drive faceplates. The PCS7 library can also be used independently, i.e. without Drive ES Basic, under PCS7 versions V 5.0 and V 5.1.

Scope of supply	Order No.	Supplied as	Documentation
Software packages Drive ES · Installation as integrated option for STEP 7 from version ≥ V 5.0			
Drive ES Basic V 5.0[1] Single license	6SW1700–0JA00–0AA0	1 CD-ROM	five standard languages
Drive ES Graphic V 5.0 Single license	6SW1700–0JB00–0AA0	1 CD-ROM	five standard languages
Drive ES SIMATIC V 5.0 Single license	6SW1700–0JC00–0AA0	1 CD-ROM	five standard languages
Software packages Drive ES · Installation as integrated option for STEP 7 from version ≥ V 5.1			
Drive ES Basic V 5.1[1] Single license	6SW1700–5JA00–1AA0	1 CD-ROM	five standard languages
Drive ES Basic V 5.1[1] copy license (60 installations)	6SW1700–5JA00–1AA1	1 CD-ROM	five standard languages
Drive ES Graphic V 5.1 Single license	6SW1700–5JB00–1AA0	1 CD-ROM	five standard languages
Drive ES SIMATIC V 5.1 Single license	6SW1700–5JC00–1AA0	1 CD-ROM	five standard languages
Drive ES PCS7 V 5.1 Single license	6SW1700–5JD00–1AA0	1 CD-ROM	five standard languages
Software packages Drive ES · Installation as integrated option for STEP 7 from version ≥ V 5.2			
Drive ES Basic V 5.2[1] Single license	6SW1700–5JA00–2AA0	1 CD-ROM	five standard languages
Drive ES Basic Upgrade[1] **V 5.x → V 5.2** Single license	6SW1700–5JA00–2AA4	1 CD-ROM	five standard languages
Drive ES Basic V 5.2[1] copy license (60 installations)	6SW1700–5JA00–2AA1	1 CD-ROM + Copy license contract	five standard languages
Drive ES Graphic V 5.2 Single license	6SW1700–5JB00–2AA0	1 CD-ROM	five standard languages
Drive ES Graphic Upgrade V 5.x → V 5.2 Single license	6SW1700–5JB00–2AA4	1 CD-ROM	five standard languages
Drive ES SIMATIC V 5.3 Single license	6SW1700–5JC00–3AA0	1 CD-ROM	five standard languages
Drive ES SIMATIC Upgrade V 5.x → V 5.3 Single license	6SW1700–5JC00–3AA4	1 CD-ROM	five standard languages
Drive ES SIMATIC V 5.x Copy/runtime license	6SW1700–5JC00–1AC0	Product document only (w/o software and documentation)	five standard languages
Drive ES PCS7 V 5.2 Single license	6SW1700–5JD00–2AA0	1 CD-ROM	five standard languages
Drive ES PCS7 Upgrade V 5.x → V 5.2 Single license	6SW1700–5JD00–2AA4	1 CD-ROM	five standard languages
Drive ES PCS7 V 5.x Copy/runtime license	6SW1700–5JD00–1AC0	Product document only (w/o software and documentation)	five standard languages

Contents of the Drive ES SIMATIC package

- **Communication software "PROFIBUS DP"** for
  S7-300 with CPUs with integrated DP interface (block libraries DRVDPS7, POSMO)
  S7-400 with CPUs with integrated DP interface or with CP443-5 (block libraries DRVDPS7, POSMO)
  S7-300 with CP342-5 (block library DRVDPS7C)

- **Communication software "USS-Protocoll"** for
  S7-200 with CPU 214/CPU 215/CPU 216 (driver program DRVUSS2 for programming tool STEP 7-micro)
  S7-300 with CP 340/341 and S7-400 with CP 411 (block library DRVUSSS7)

- **STEP 7 Slave object manager**
  for convenient configuration of drives as well as for acyclic PROFIBUS DP communication with the drives,
  support for conversion of DVA_S7 for Drive ES projects (only from V 5.1)

- **SET-UP program** for installation of the software in the STEP 7 environment

Contents of the Drive ES PCS7 package (the PCS7 package can be used with the PCS7 versions V 5.0 and V 5.1)

- **Block library for SIMATIC PCS7**
  Image and control blocks for SIMOVERT MASTERDRIVES VC and MC as well as MICRO-/MIDIMASTER 3rd and 4th generation

- **STEP 7 Slave object manager**
  for convenient configuration of drives as well as for acyclic PROFIBUS DP communication with the drives

- **SETUP program** for software installation in the PCS7 environment

1) Drive ES Basic can also be installed stand-alone without STEP 7 (for details see accompanying text).
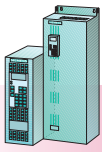
Compact and chassis units

Compact PLUS units

Software update service Drive ES

A software update service can also be purchased for the Drive ES software. The user automatically receives the current software, service packs and complete versions for one year after the date of ordering.

Duration of the update service: 1 year.

6 weeks before expiry, the customer and his Siemens contact will be informed in writing that this period is about to expire. If the customer does not cancel the update service, it is automatically extended by another year.

The update service can only be ordered if the customer already has a complete version of the software.

Scope of supply	
	Order No.
Software update service	
Drive ES Basic	**6SW1700–0JA00–0AB2**
Drive ES Graphic	**6SW1700–0JB00–0AB2**
Drive ES SIMATIC	**6SW1700–0JC00–0AB2**
Drive ES PCS7	**6SW1700–0JD00–0AB2**

3

SIMOVERT MASTERDRIVES Motion Control
Selection and ordering data

Notes

Compact
PLUS units

Compact and
chassis units

3