SIEMENS

DC DRIVES

SIMOREG DC MASTER 6RM70
Digital Converter Cabinet Units

Catalog DA 22 · 2002

Catalogs for “Large Drives”

DC Motors — DA 12

Order No.:
German: E20002-K4012-A101-A2
English: E20002-K4012-A101-A2-7600

DC Motors
1GG7, 1GH7, 1HS7 and 1HQ7 — DA 12 Supplement May 2001

Order No.:
German: E86060-K5112-E101-A1
English: E86060-K5112-E101-A1-7600

DC Drives
Preferred Series up to 500 kW — DA 12.1

Order No.:
German: E20002-K4012-A111-A2
English: E20002-K4012-A111-A2-7600

DC Drives
Preferred Series 215 kW to 1500 kW — DA 12.2

Order No.:
German: E20002-K4012-A121-A1
English: E20002-K4012-A121-A1-7600

SIMOREG DC MASTER 6RA70
Digital Chassis Converters — DA 21.1

Order No.:
German: E86060-K5121-A111-A1
English: E86060-K5121-A111-A1-7600
French: E86060-K5121-A111-A1-7700

SIMOREG K 6RA22
Analog Chassis Converters — DA 21.2

Order No.:
German: E86060-K4021-A121-A1
English: E86060-K4021-A121-A1-7600

Spare Parts for SIMOREG
Converters (Chassis Units) — DA 21 E

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SIMOREG DC MASTER 6RM70
Digital Converter Cabinet Units — **DA 22**

Order No.:
German: E86060-K5122-A101-A1
English: E86060-K5122-A101-A1-7600

Automation
and Drives — CA 01

Order No.:
German: E86060-D4001-A100-B6
English: E86060-D4001-A110-B4-7600

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SIEMENS

SIMOREG DC MASTER 6RM70

Digital Converter Cabinet Units

Catalog DA 22 · 2002

Supersedes: Catalog DA 22 · 2000

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Please note:

The technical data is intended for general information.
Please observe the Operating Instructions and the references indicated on the products for installation, operation and maintenance.

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- The technical data, selection and ordering data (Order Nos.), accessories and availability are subject to alteration.
- All dimensions in this catalog are stated in mm.

Applications

SIMOREG® converter cabinet units are tested drive converter units, which are ready to connect-up to supply variable-speed DC motors. All of the open-loop and closed-loop control functions as well as the monitoring- and auxiliary functions are handled by two microprocessors in the SIMOREG. The cabinet units include all of the components which are required to operate a variable-speed DC motor.

The cabinet units can be directly connected to 3-phase line supplies with rated voltages of 3-ph. 400 V AC, 500 V, 690 V, 830 V AC, 50 Hz and 3-ph. 460 V AC, 60 Hz.

Other supply voltages between 3-ph. 90 V AC and 830 V AC as well as 60 Hz or 50 Hz line frequencies, refer to the options.

Cabinet units are available for:

- Single-quadrant/two-quadrant operation with a fully-controlled six-pulse bridge circuit B6C (rated DC currents 30 A to 2000 A)
- Four-quadrant operation with an antiparallel circuit with two fully-controlled six-pulse bridge circuits (B6)A(B6)C (rated DC currents 15 A to 2000 A)
- Special versions for parallel connection, 12-pulse operation and field supply on request.

Design

The cabinet units contain the following components:

- SIMOREG DC MASTER 6RA70 drive converters with microprocessor-based digital closed-loop control for the armature- and field circuits
- Main switch (=D3-Q11)
- Main contactor (=D3-K11)
- Field contactor (=G1-K11)
- Circuit-breaker
- Motor protection circuit-breaker
- Fuses
- Commutating reactors
- Control voltage transformers
- Display- and operator control elements
- Terminals.

The components are mounted in a cabinet, and are ready to be connected-up (cabinet system: Rittal TS8). All of the components are accessible from the front of the cabinet, i.e. the cabinet units can be mounted with their rear panels to walls. For units up to 60 A, the main switch is mounted on the side.

Examples of SIMOREG converter cabinet units

Description

Mode of operation and functions

Also refer to the block diagram.

Line supply

Cabinet units can be directly connected to three-phase line supplies (refer to Technical Data for the nominal data). The feeder cables to the drive converter must be protected against short-circuit and overload (DIN VDE 0160/ DIN VDE 0100, Part 540). The cable is entered at the bottom side.

Main switch

For cabinet units from 15 to 1200 A, the three-phase line supply is connected to the unit via the main switch =D3-Q11. Cabinet units larger than 1200 A have an electrically-actuated circuit-breaker =D3-Q11 and a control voltage main switch =D3-S11.

Main contactor/ circuit-breaker

The main contactor =D3-K11 or the circuit-breaker =D3-Q11 can be switched-in or -out using a relay, mounted in the cabinet unit via the field contactor =G1-K11. A microprocessor in the drive converter automatically controls the relay at the correct instant within the power-up or power-down routine.

Miniature circuit-breaker and motor protection circuit-breaker

Miniature circuit-breaker and motor protection circuit-breaker protect the electronics power supply, as well as the auxiliary circuits and the motor fan and the fan against short-circuit and overload.

Fuses

SITOR® or SILIZED® fuse links protect the thyristors and the field rectifier of the cabinet unit.

Commutating reactors

Commutating reactors for the armature- and field circuit limit the commutating dips in the line supply voltage in accordance with DIN VDE 0160. They are designed for operation with 100 % rated current.

Control voltage transformers

A control voltage transformer 400/230 V is used for the electronics power supply and the open-loop control. For drive converter input voltages greater than 3-ph. 400 V AC, an additional auxiliary voltage supply 3-ph. 400 V AC is required on the part of the customer. Control voltage transformers can also be supplied if requested, see page 33.

Display- and operator control elements

The following equipment is mounted in the cabinet doors:

- Mushroom-head pushbutton switch E-Stop, black, latching. No EMERGENCY-OFF acc. to EN 60 204-1.
- 10-turn setpoint potentiometer
- Mode selector switch, INTERNAL-EXTERNAL
- OP1S operator control panel.

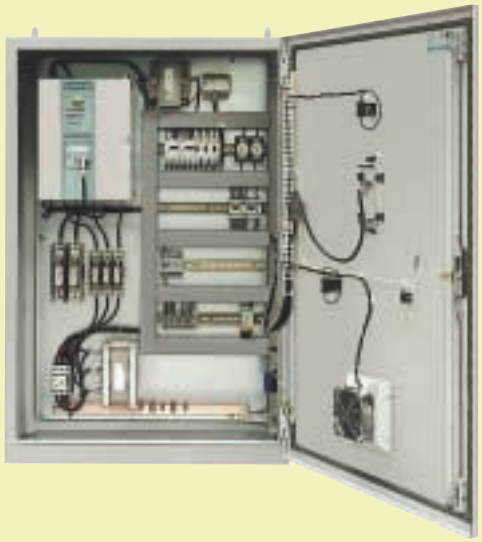
The operator control panel is used to

- Set the cabinet unit parameters
- Display measured values
- The open-loop control is executed in the INTERNAL mode:
  - setpoint input via motorized potentiometer
  - power-on (I)
  - power-down (O)
  - jogging
  - reversing.
- Display and acknowledge error messages.

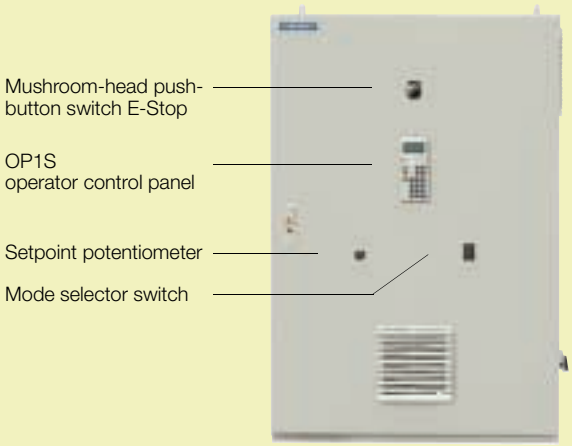
'External" operating mode

In this mode, the setpoint is entered and the equipment controlled via the terminals of the unit or via serial interfaces or optional bus connection to automation systems.

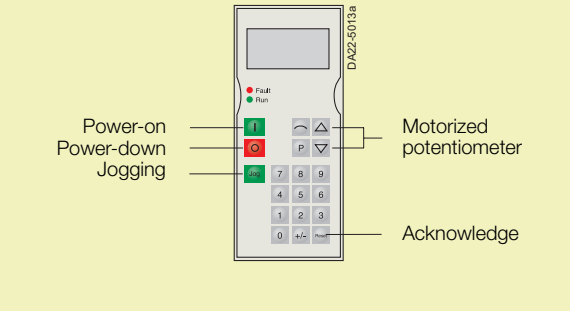
Example
SIMOREG converter cabinet unit, 30 A, open



Display- and operator control elements



OP1S operator control panel



Mode of operation and functions

Drive converters

The following drive converters are used:

- for single-/two-quadrant operation, the SIMOREG DC MASTER 6RA70..-..S22-0.
- for four-quadrant operation, the SIMOREG DC MASTER 6RA70..-..V62-0.

The equipment options **K00** (terminal expansion) and **D64** (Operating Instructions, multilingual, as well as the operator control program DriveMonitor on CD-ROM), are included in the scope of supply.

SIMOREG DC MASTER 6RA70 are fully-digital, line-commutated drive converters which are connected to three-phase line supplies. They are used to control the armature- and field circuits of variable-speed DC motors. The rated DC current, specified on the equipment rating plate (= maximum permissible continuous DC current) can be exceeded up to 1.8 times in operation. The maximum overload time depends on the overload current characteristics and the preload condition of the drive converter and is drive-converter specific. The overload capacity is configured using Catalog DA 21.1.

As a result of an integrated parameterizing device, the drive units are autonomous and no additional programming- or measuring equipment is required to parameterize them. All of the functions of the open-loop and closed-loop control for the armature- and field circuits are realized in two high-performance 16-bit microprocessors.

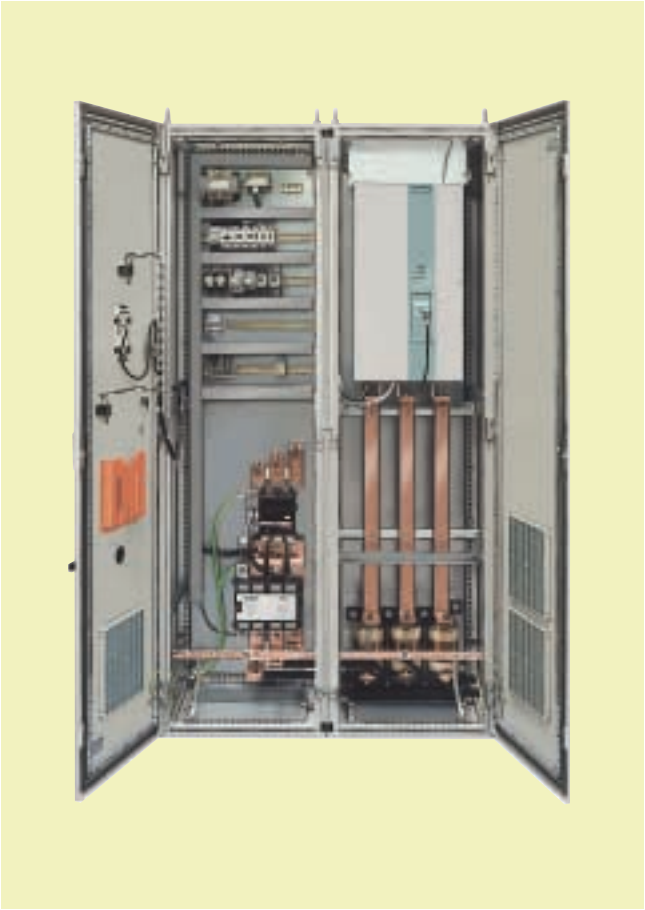
The closed-loop control functions are implemented as program modules in the software, which can be linked using parameters. The drive converters have an additional series of technological functions with the software option (code **S00**). These include, for example, higher-level technology controllers, freely-assignable adders, multipliers and dividers, logical blocks, timers, limit value monitors, etc.

The T400 technology module can be used for additional technological functions, for example, winders or synchronous controls (codes **D30** to **D32**). The cabinet units have three serial interfaces. One is used to couple the unit to the operator panel OP1S. Two additional interfaces can be freely used, e.g. to establish a unit-unit link via the peer-to-peer protocol, couple to a PC or to an automation system via the USS protocol.

The cabinet units can be connected to PROFIBUS via the CBP2 interface module (code **D36**).

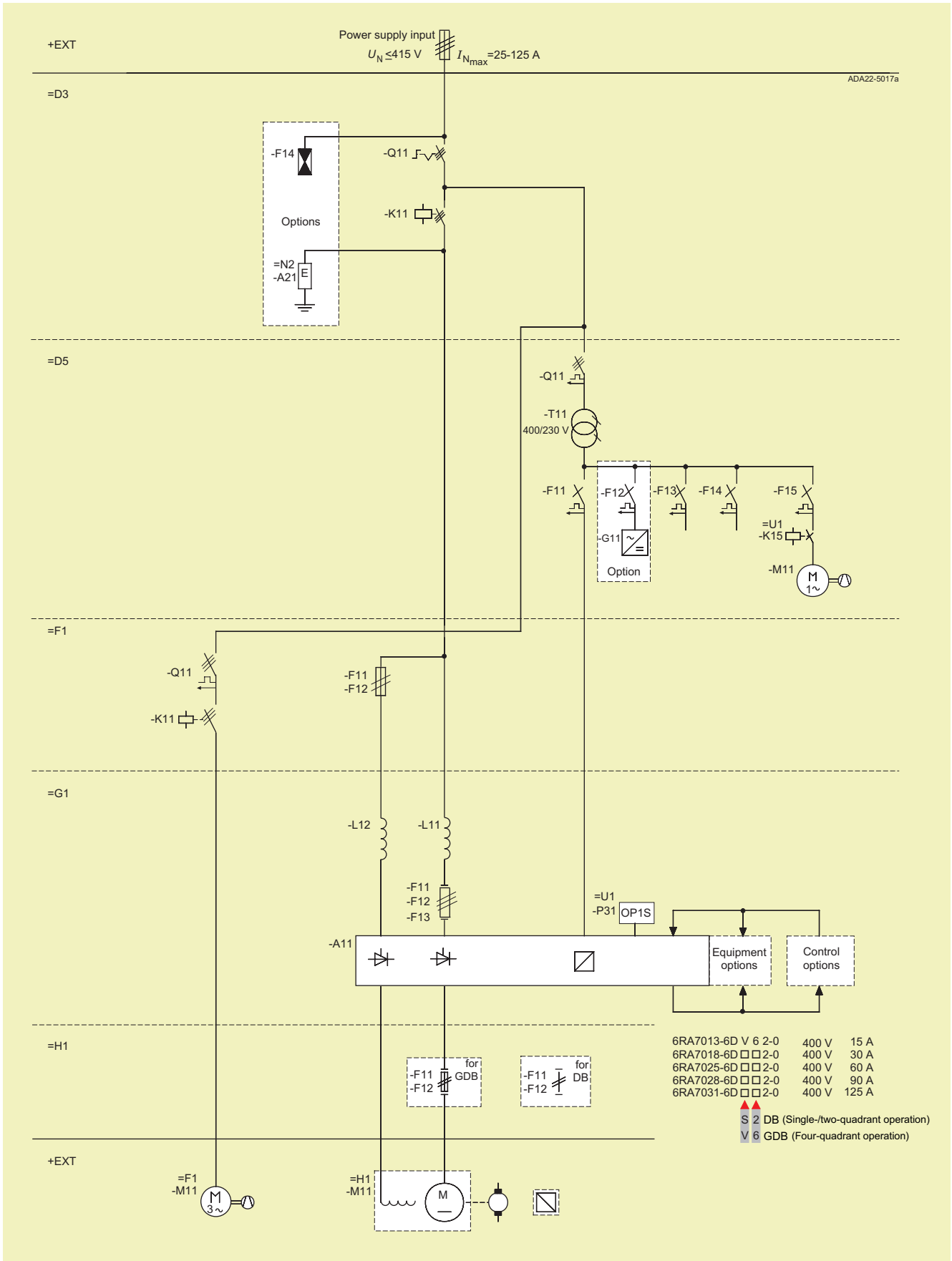
Additional information is provided in Catalog DA 21.1.

Example
SIMOREG converter cabinet unit, 1200 A, open

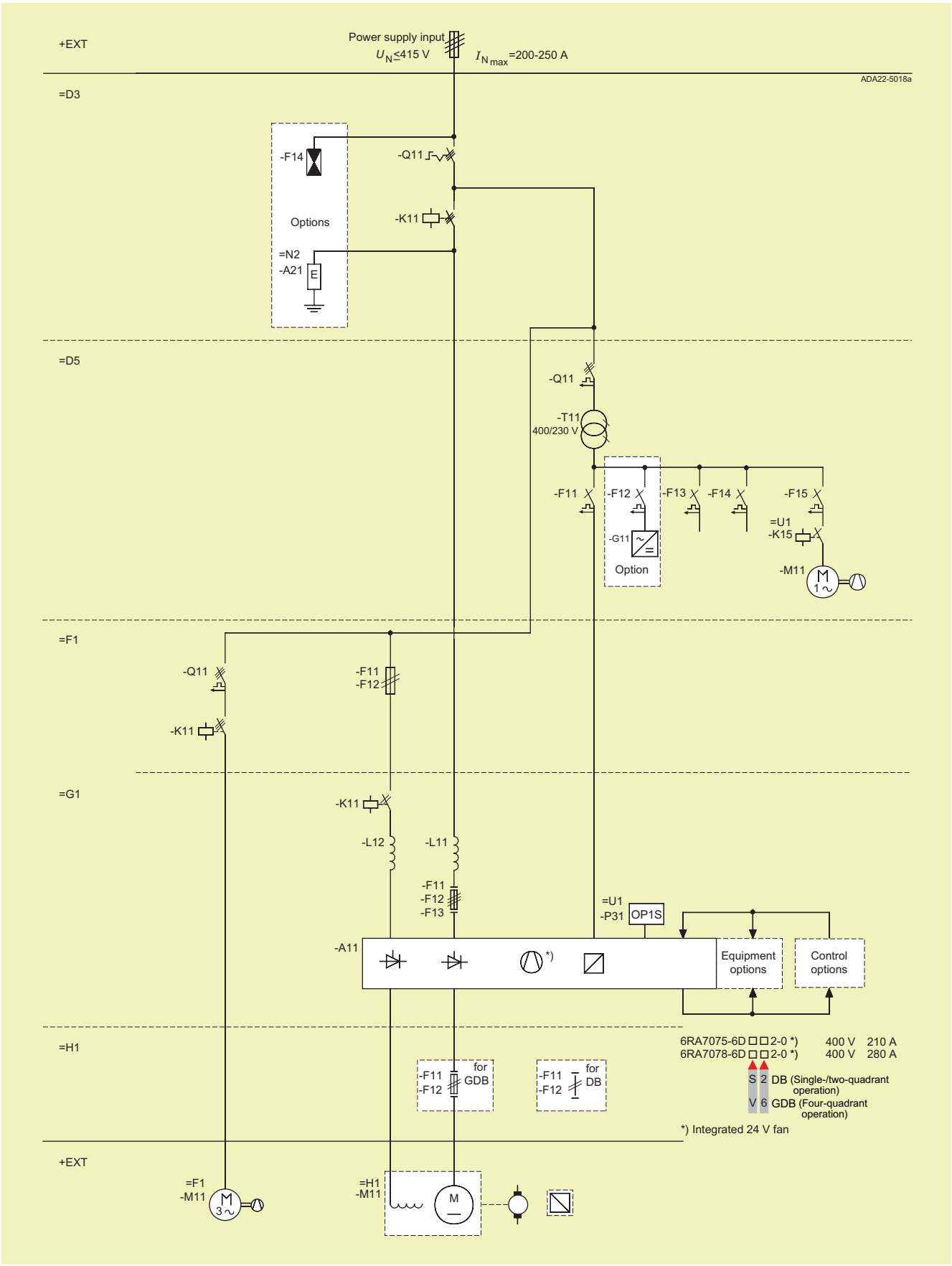


Block Diagram

With SIMOREG DC MASTER 15 A to 125 A, 400 V

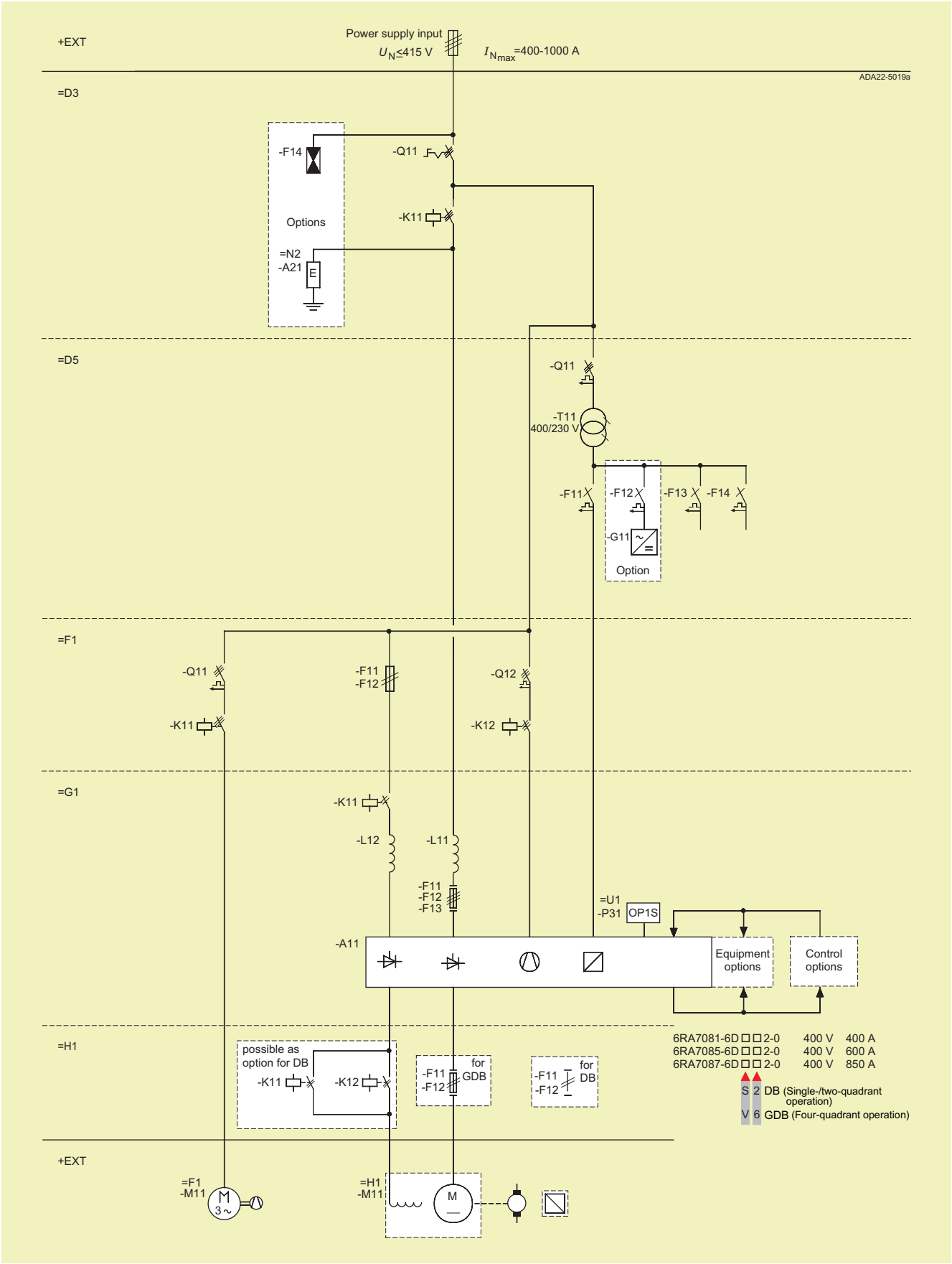


With SIMOREG DC MASTER 210 A and 280 A, 400 V

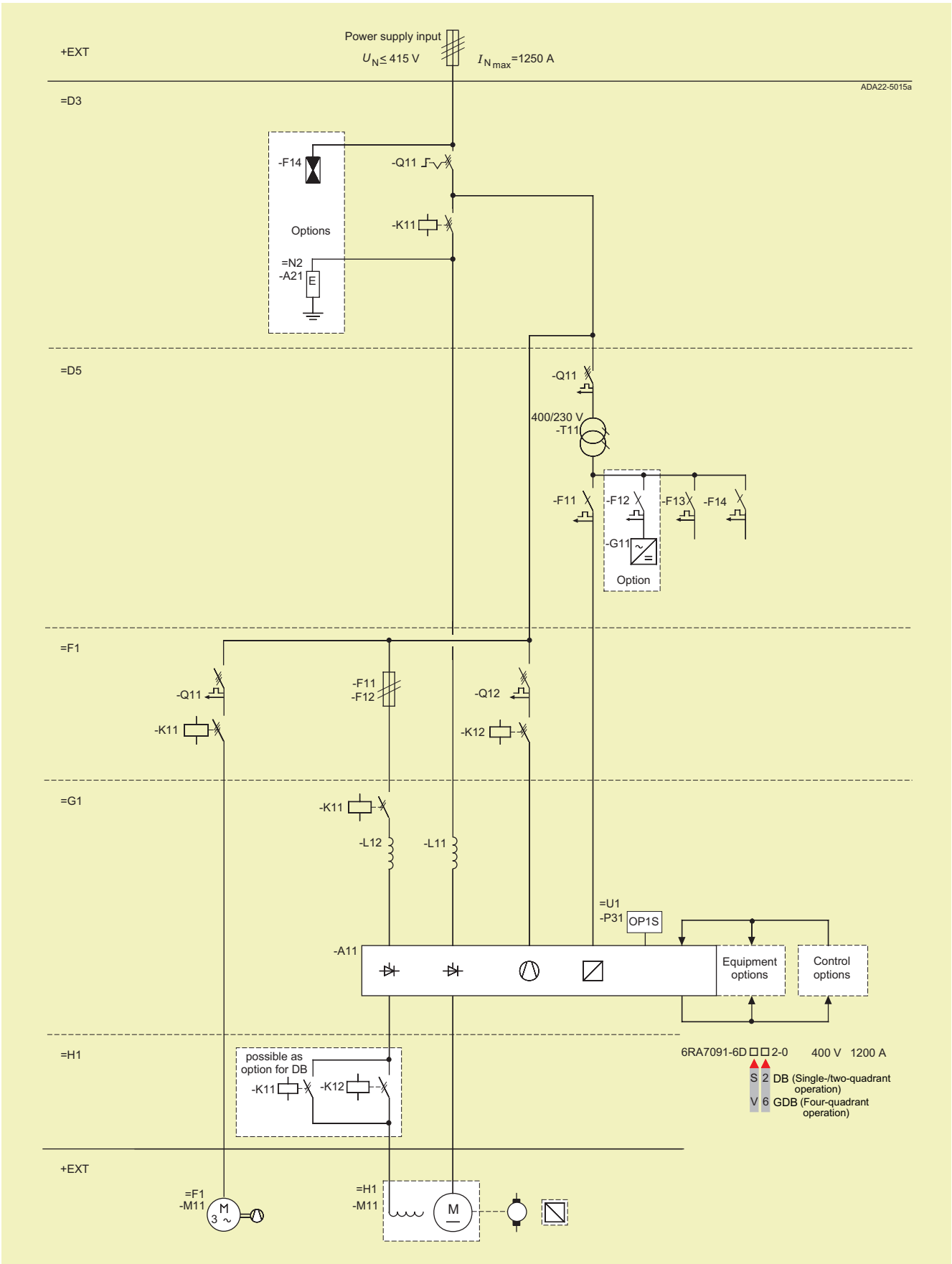


Block Diagram

With SIMOREG DC MASTER 400 A to 850 A, 400 V

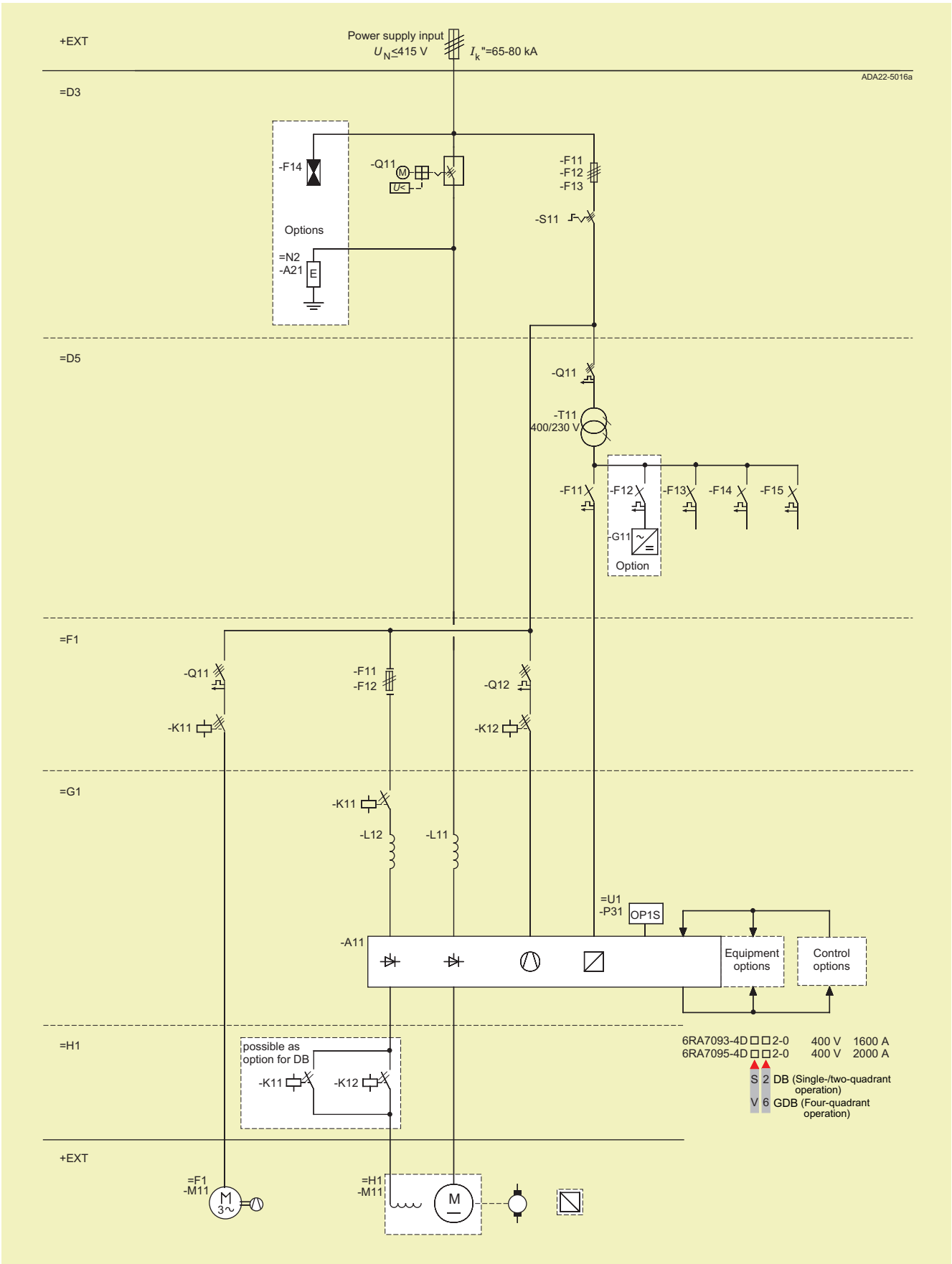


With SIMOREG DC MASTER 1200 A, 400 V

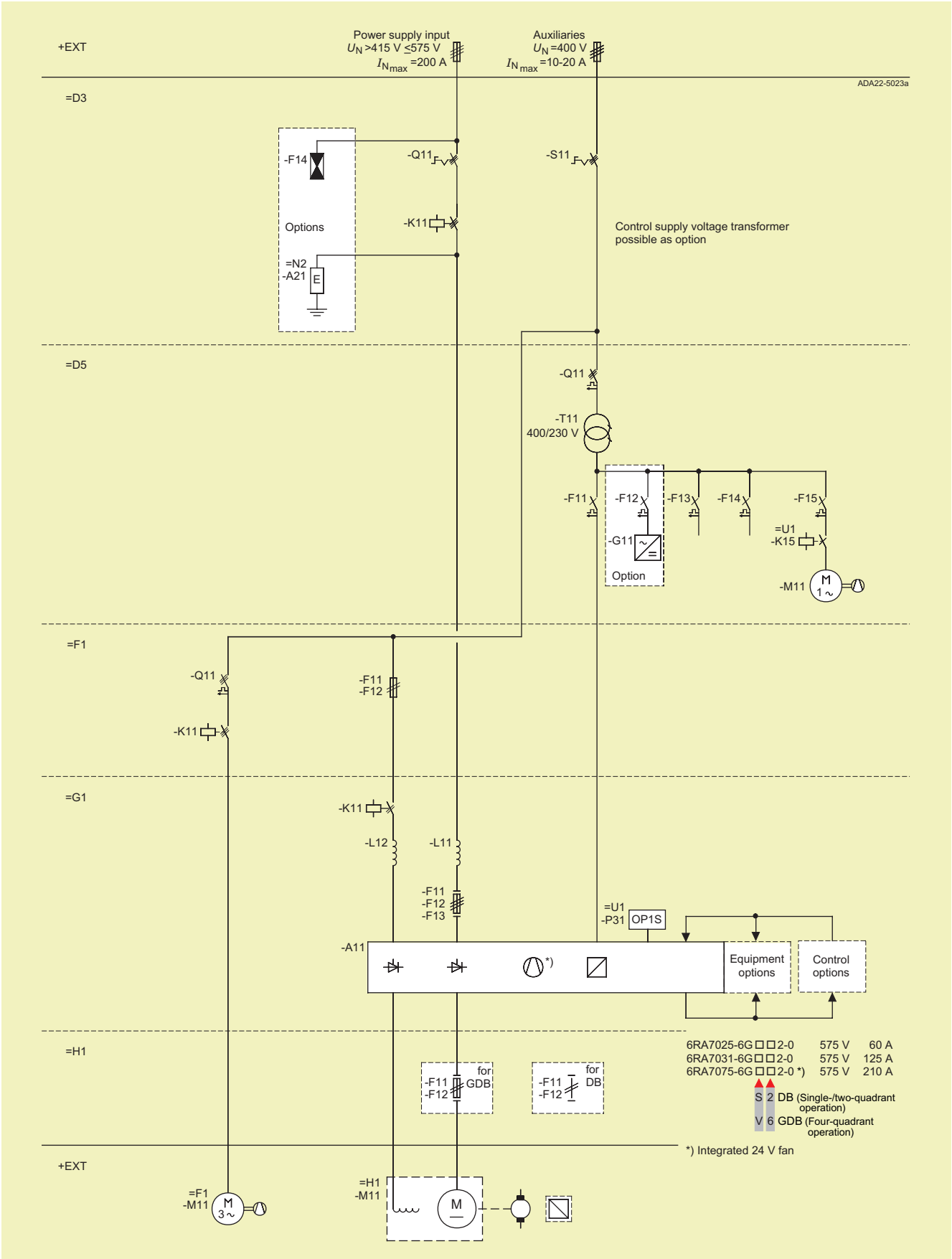


Block Diagram

With SIMOREG DC MASTER 1600 A and 2000 A, 400 V

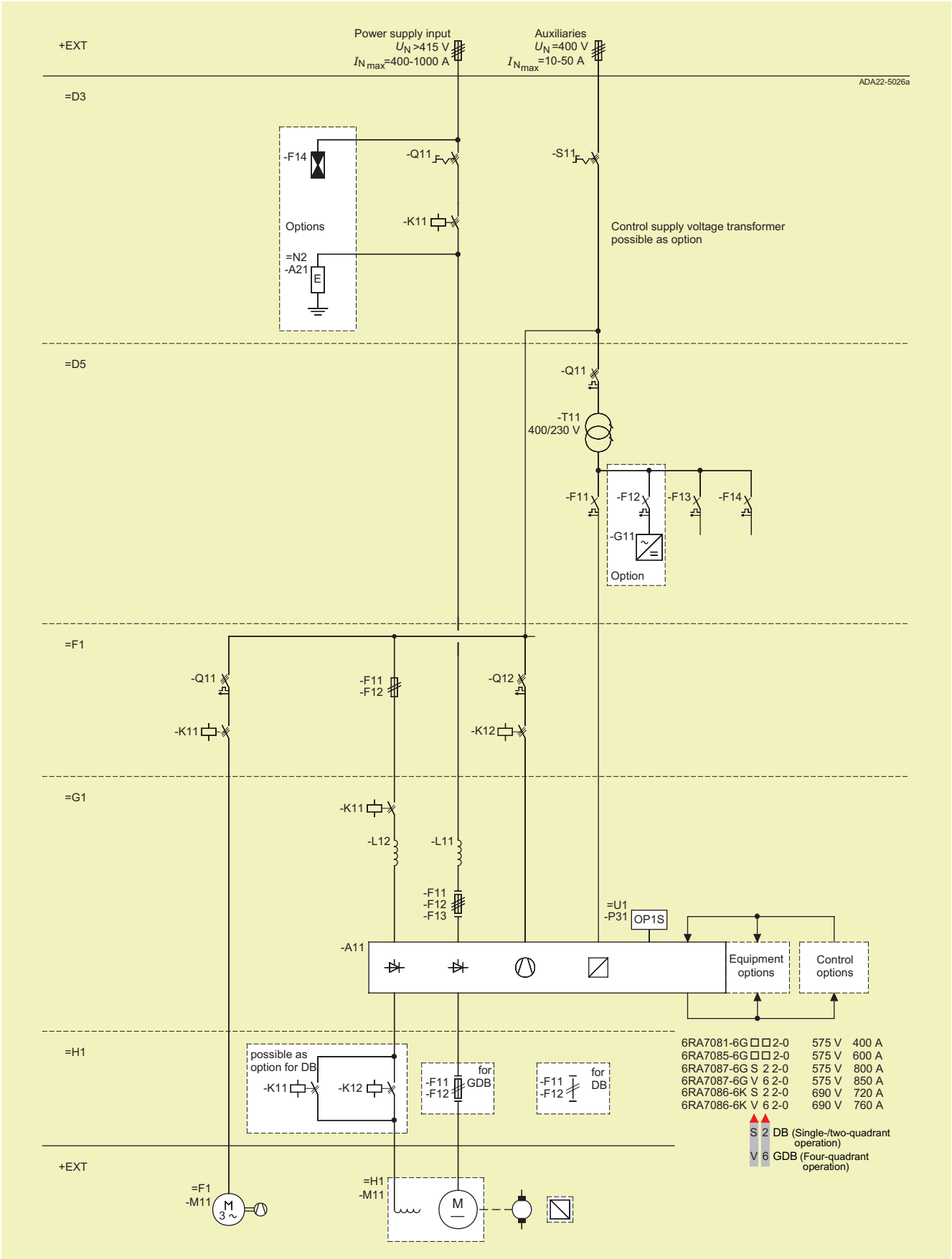


With SIMOREG DC MASTER 60 A to 210 A, 575 V

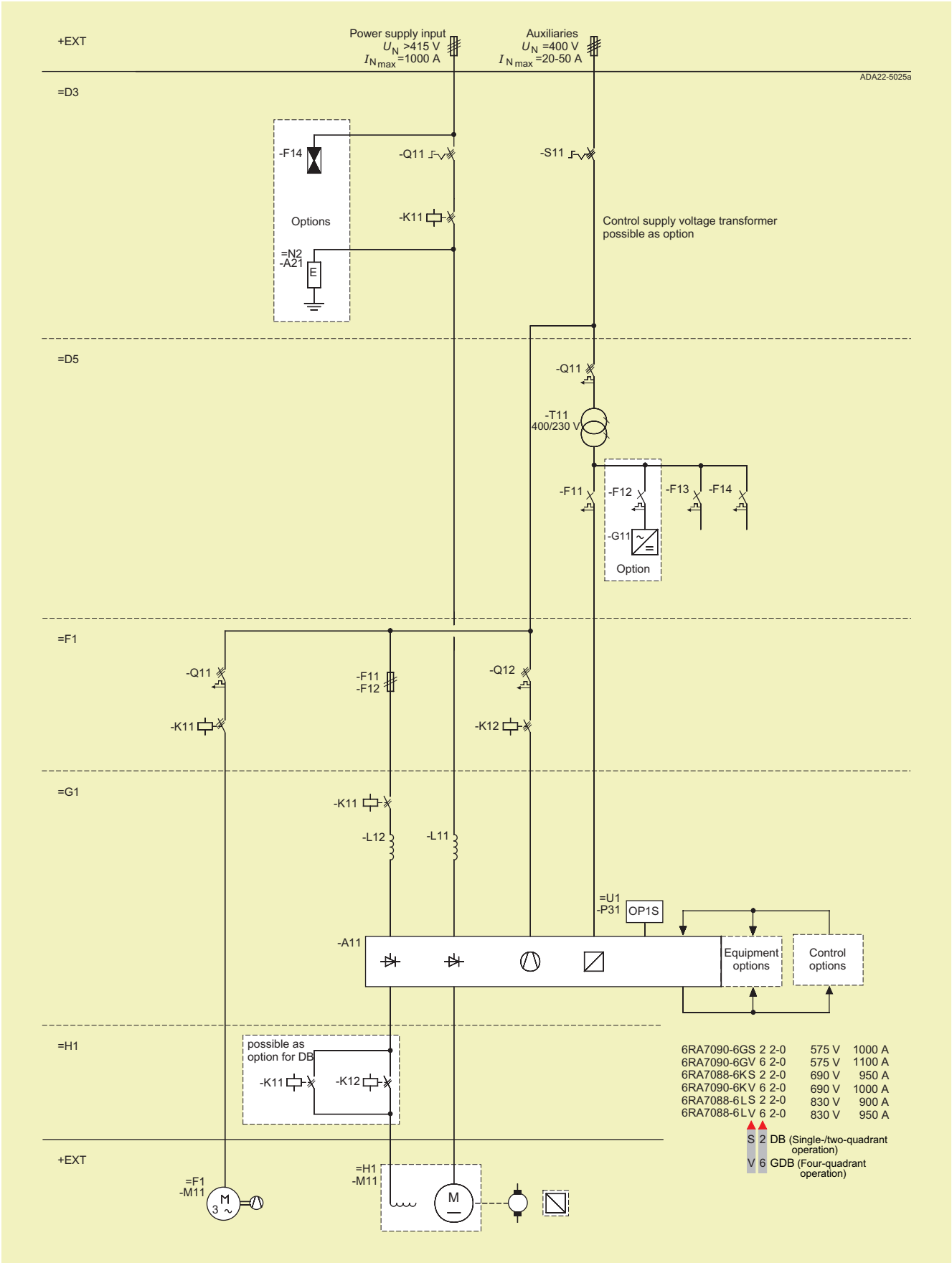


Block Diagram

With SIMOREG DC MASTER 400 A to 850 A, 575 V; 720 A and 760 A, 690 V

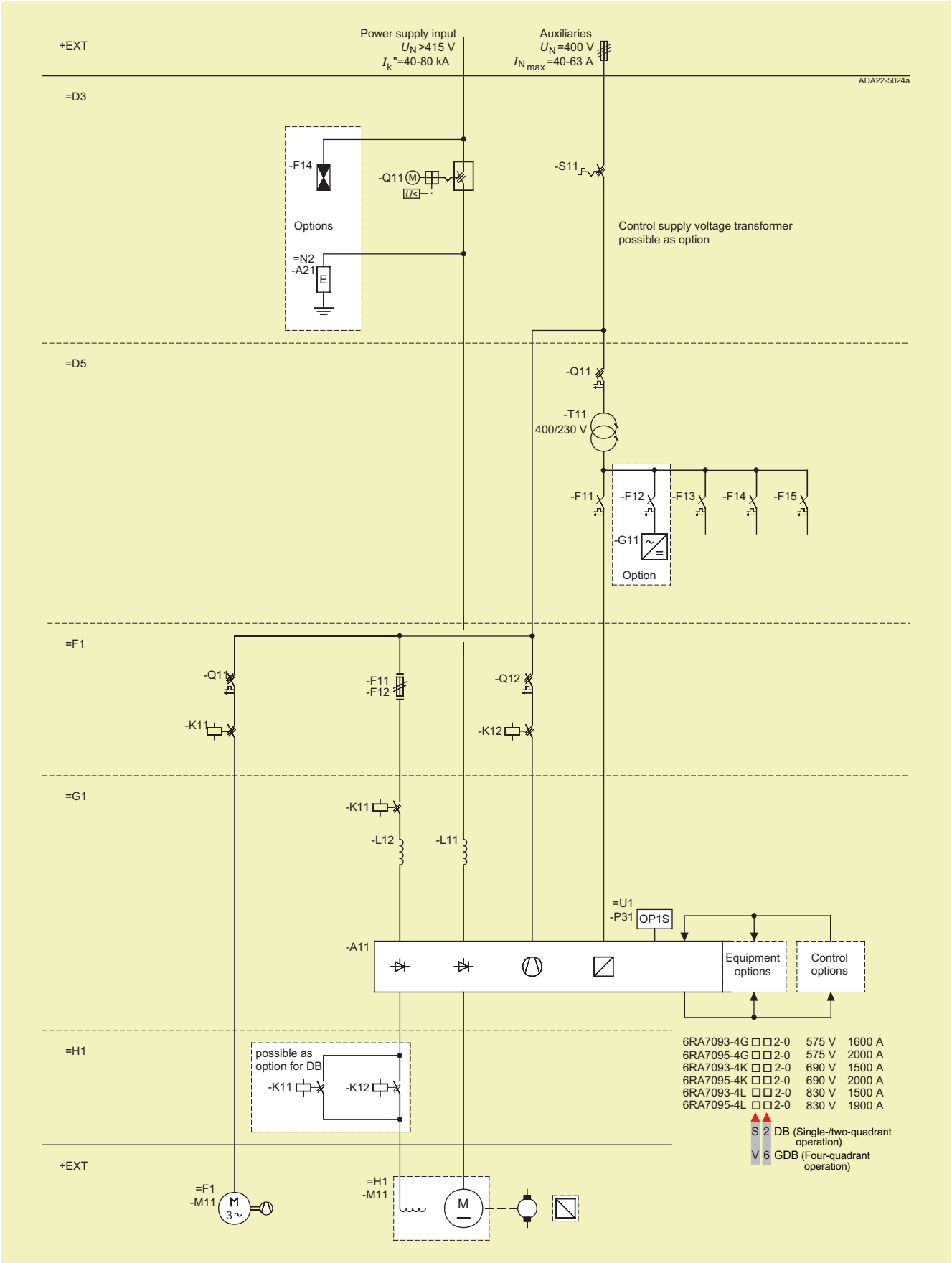


With SIMOREG DC MASTER 1000 A and 1100 A, 575 V; 950 A and 1000 A, 690 V; 900 A and 950 A, 830 V

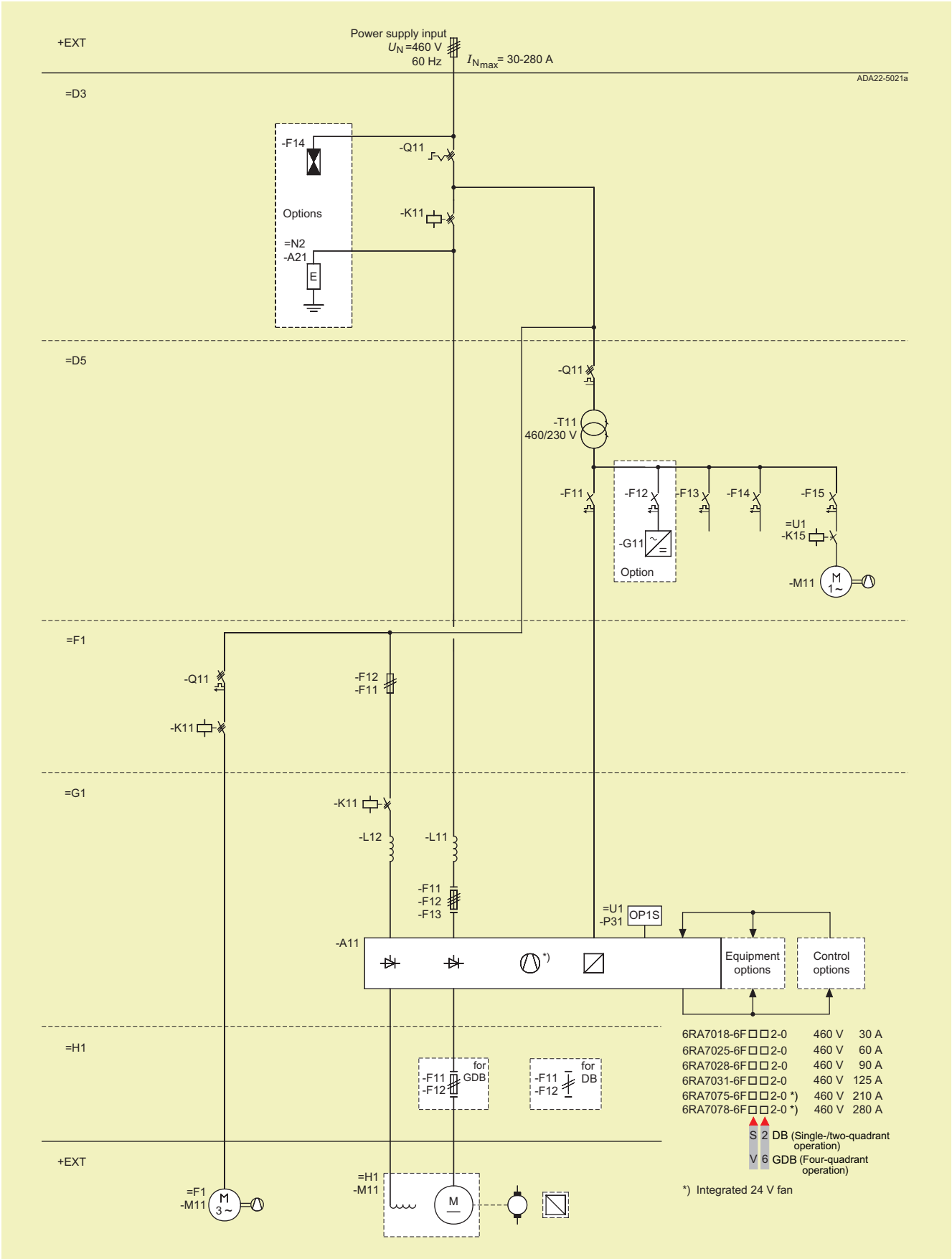


Block Diagram

With SIMOREG DC MASTER 1600 A and 2000 A, 575 V; 1500 A and 2000 A, 690 V; 1500 A and 1900 A, 830 V

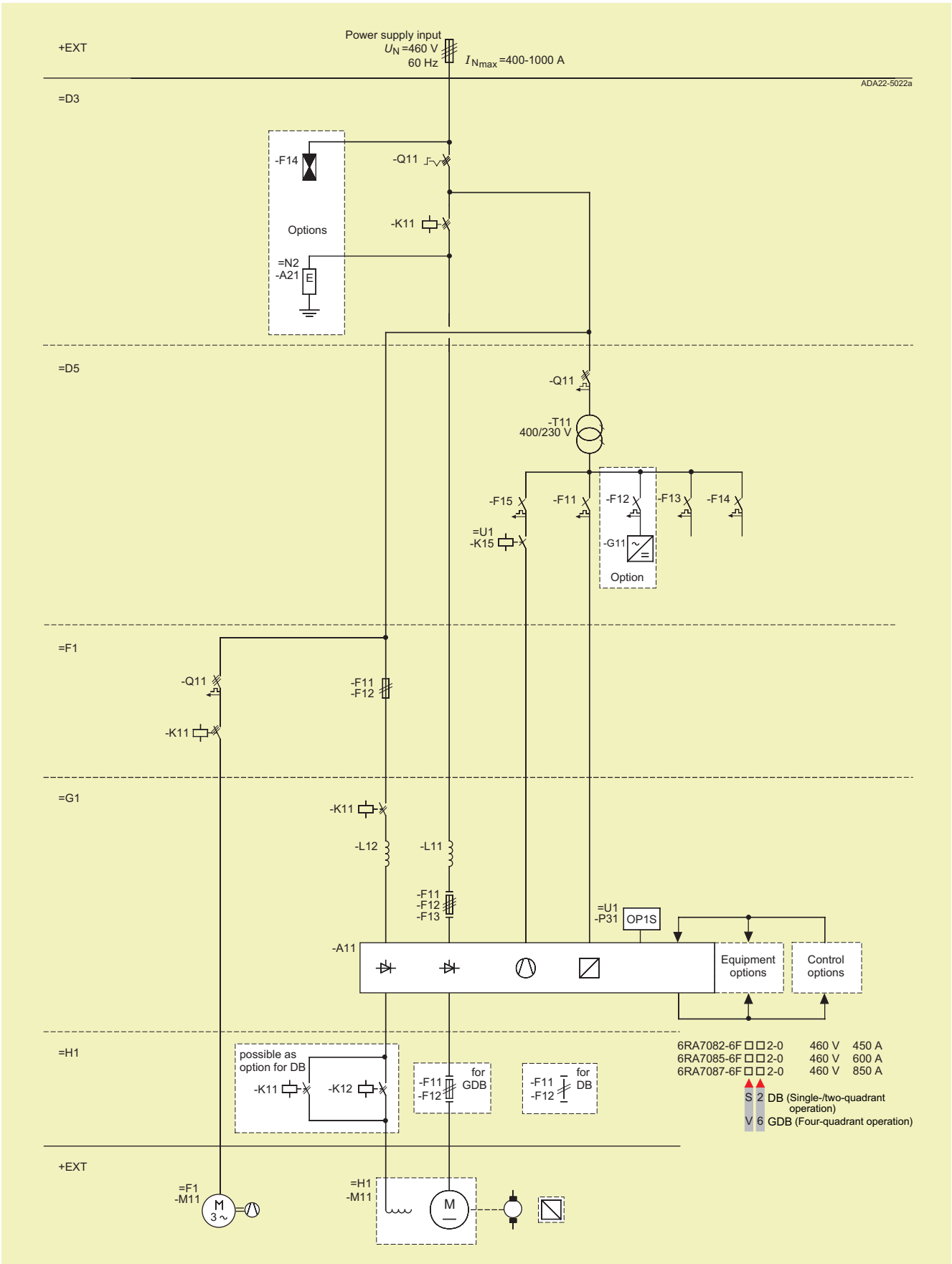


With SIMOREG DC MASTER 30 A to 280 A, 460 V

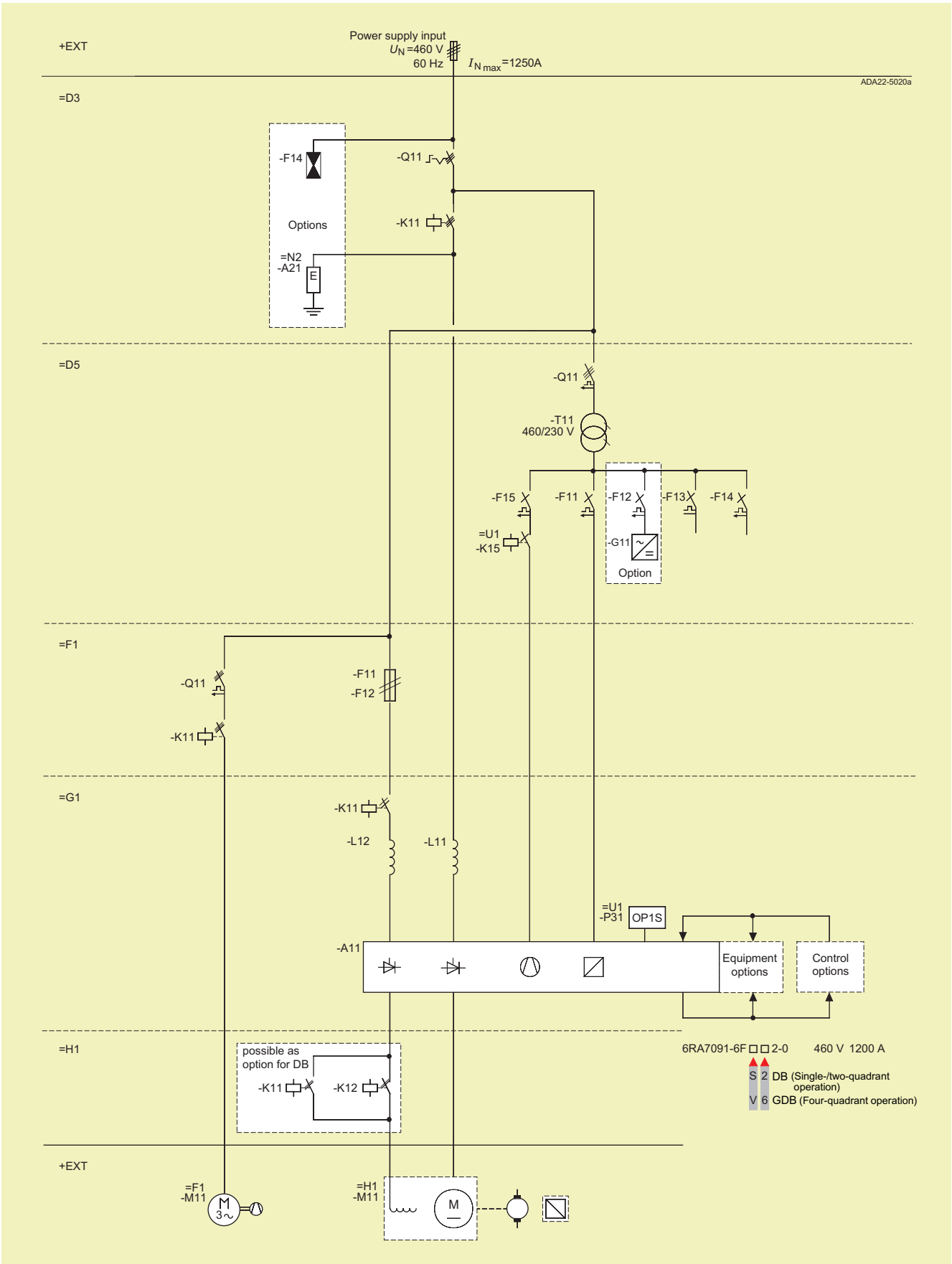


Block Diagram

With SIMOREG DC MASTER 450 A to 850 A, 460 V



With SIMOREG DC MASTER 1200 A, 460 V



Technical data

		Single-/two-quadrant operation				
Power section						
Rated input voltage[1] Armature power section	V	3-ph. 400[5] +15 %/–20 %[4]	3-ph. 460[5] +15 %/–20 %	3-ph. 500[5] +10 %/–20 %	3-ph. 690 +10 %/–20 %	3-ph. 830 +10 %/–20 %
Rated input voltage Auxiliaries	V	–	–	3-ph. 400 V +15%/–15%[4]		
Rated frequency[1]	Hz	50	60	50	50	50
Rated input current	A	25 to 1658	25 to 995	25 to 1658	(refer to selection and ordering data)	
Power loss		refer to selection and ordering data				
DC connection, armature						
Converter circuit		B6C				
Rated DC voltage	V	485	550	600	830	1000
Rated DC current	A	30 to 2000	30 to 1200	60 to 2000	720 to 2000	900 to 1900
Rated output	kW	14.5 to 970	16.5 to 660	36 to 1200	598 to 1660	900 to 1900
Closed-loop control stability[2]		Δ_n 0.006 % of the rated speed when using pulse encoders and digital setpoint. Δ_n 0.1 % of the rated speed when using an analog tachometer and/or analog setpoint.				
Field current connection						
Field rectifier circuit		B2HZ				
Rated DC field voltage	V/DC	325	373	325		
DC field current (max., controlled)	A	5 to 40	5 to 30	10 to 40	30 to 40	
Motor fan						
Rated supply voltage[3]		3-ph. 50 Hz 400 V	3-ph. 60 Hz 460 V	3-ph. 50 Hz 400 V		
Setting range of the motor protection circuit-breaker at the rated unit DC current 15 A	A	–				
30 A to 60 A	A	0.35 to 0.5			–	
90 A to 280 A	A	0.9 to 1.25			–	
400 A to 450 A	A	2.8 to 4			–	
600 A to 850 A	A	7 to 10				–
950 A to 1200 A	A	11 to 16				
1500 A to 2000 A	A	2 x (11 to 16)	–	2 x (11 to 16)		
Cabinet unit cooling						
Cooling type		Forced air cooling using a cabinet fan or equipment fan				
Cooling airflow requirement at the rated DC current 15 A to 60 A	m^3/h	120				
90 A to 280 A	m^3/h	360				
400 A to 850 A	m^3/h	650				
900 A to 2000 A	m^3/h	1600				

1) Refer to the options for other voltages (between 90 V and 830 V) as well as line supply frequencies of 60 Hz.

2) Conditions:
The stability of the closed-loop control (PI control) is referred to the rated motor speed and is valid when the SIMOREG unit is in the warm operating condition. This is based on the following prerequisites:
- Temperature changes of max. ±10 °K
- Line supply voltage changes of max. +10 %/–5 % of the rated supply voltage
- Temperature coefficient of the temperature-compensated tachometer ≤ 0.15 ‰ each 10 °K (only for analog tachometers)
- Constant setpoint (14-bit resolution).

3) Rated motor fan voltages other than 400 V or different motor protection circuit-breaker setting ranges or versions with more than 1 motor fan, refer to options.

4) Tolerance restriction possible using a motor fan.

5) Units up to 280 A +10 %/–10 %.

		Four-quadrant operation				
Power section						
Rated input voltage[1] Armature power section	V	3-ph. 400[5] +15 %/–20 %[4]	3-ph. 460[5] +15 %/–20 %	3-ph. 500[5] +10 %/–15 %	3-ph. 690 +10 %/–15 %	3-ph. 830 +10 %/–15 %
Rated input voltage Auxiliaries	V	–	–	3-ph. 400 V +15%/–15%[4]		
Rated frequency[1]	Hz	50	60	50		
Rated input current	A	13 to 1658	25 to 995	13 to 1658	(refer to selection and ordering data)	
Power loss		refer to selection and ordering data				
DC connection, armature						
Converter circuit		(B6)A (B6)C				
Rated DC voltage	V	420	480	520	725	875
Rated DC current	A	15 to 2000	30 to 1200	60 to 2000	760 to 2000	950 to 1900
Rated output	kW	6.3 to 840	14.4 to 576	31 to 1040	551 to 1450	831 to 1663
Closed-loop control stability[2]		Δ_n 0.006 % of the rated speed when using pulse encoders and digital setpoint. Δ_n 0.1 % of the rated speed when using an analog tachometer and/or analog setpoint.				
Field current connection						
Field rectifier circuit		B2HZ				
Rated DC field voltage	V/DC	325	373	325		
DC field current (max., controlled)	A	5 to 40	5 to 30	10 to 40	30 to 40	
Motor fan						
Rated supply voltage[3]		3-ph. 50 Hz 400 V	3-ph. 60 Hz 460 V	3-ph. 50 Hz 400 V		
Setting range of the motor protection circuit-breaker at the rated unit DC current 15 A	A	0.14 to 0.2				
30 A to 60 A	A	0.35 to 0.5			–	
90 A to 280 A	A	0.9 to 1.25			–	
400 A to 450 A	A	2.8 to 4			–	
600 A to 850 A	A	7 to 10				–
950 A to 1200 A	A	11 to 16				
1500 A to 2000 A	A	2 x (11 to 16)	–	2 x (11 to 16)		
Cabinet unit cooling						
Cooling type		Forced air cooling using a cabinet fan or equipment fan				
Cooling airflow requirement at the rated DC current 15 A to 60 A	m^3/h	120				
90 A to 280 A	m^3/h	360				
400 A to 850 A	m^3/h	650				
900 A to 2000 A	m^3/h	1600				

1) Refer to the options for other voltages (between 90 V and 830 V) as well as line supply frequencies of 60 Hz.

2) Conditions:
The stability of the closed-loop control (PI control) is referred to the rated motor speed and is valid when the SIMOREG unit is in the warm operating condition. This is based on the following prerequisites:
- Temperature changes of max. ±10 °K
- Line supply voltage changes of max. +10 %/–5 % of the rated supply voltage
- Temperature coefficient of the temperature-compensated tachometer ≤ 0.15 ‰ each 10 °K (only for analog tachometers)
- Constant setpoint (14-bit resolution).

3) Rated motor fan voltages other than 400 V or different motor protection circuit-breaker setting ranges or versions with more than 1 motor fan, refer to options.

4) Tolerance restriction possible using a motor fan.

5) Units up to 280 A +10 %/–10 %.

Technical data

		Single-/two-quadrant operation	Four-quadrant operation
Permissible ambient conditions			
Ambient temperature for operation[1]), at rated DC current			
15 A to 125 A	°C	0 to +40	0 to +40
210 A to 2000 A	°C	0 to +35	0 to +35
Ambient temperature during store and transport	°C	–25 to +70	–25 to +70
Installation altitude[2]) above sea level		<1000 m	<1000 m
Environmental class acc. to DIN IEC 60 721-3-3		3K3	3K3
Degree of protection (with respect to the cable/installation room) acc. to EN 60 529/IEC 60 529			
At the rated DC unit current			
15 A to 60 A		IP 43/IP 43 (Opt. IP 54/IP 54)	IP 43/IP 43 (Opt. IP 54/IP 54)
90 A to 280 A		IP 00/IP 33	IP 00/IP 33
400 A to 2000 A		IP 00/IP 20	IP 00/IP 20
Standards			
Cabinet unit		DIN VDE 0660 Part 500 EN 60 439-1 DIN IEC 60 439-1	DIN VDE 0660 Part 500 EN 60 439-1 DIN IEC 60 439-1
Converter		EN 50 178 EN 60 204 Part 1 VDE 0113 Part 1 if relevant VDE 0160 Paragraph 5.3.1.1.2 and 5.3.1.1.3 EN 61 000-4-2 and EN 61 000-4-4 DIN IEC 60 068-2-6 acc. to severity level 12	EN 50 178 EN 60 204 Part 1 VDE 0113 Part 1 if relevant VDE 0160 Paragraph 5.3.1.1.2 and 5.3.1.1.3 EN 61 000-4-2 and EN 61 000-4-4 DIN IEC 60 068-2-6 acc. to severity level 12
Connection cross-sections		Refer to selection and ordering data	
Surface			
Panels		Dip primed and powder-coated, RAL 7032 structure	Dip primed and powder-coated, RAL 7032 structure
Frame		Dip primed, RAL 7032	Dip primed, RAL 7032
Mounting panel		Galvanized	Galvanized
Dimensions and weight		Refer to selection and ordering data	

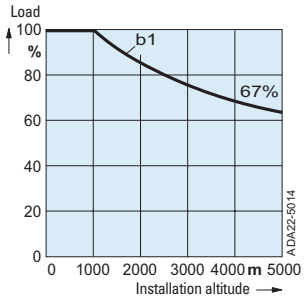
1) Load factor K1 (DC current) as a function of the coolant temperature (see P077 Operating Instructions, Section 11).
K1 > 1 only permissible where K1 * K2 ≥ 1st. overall reduction factor K = K1 * K2 (for K2 see Footnote 2).

a) In spite of derating, converters of ≥ 400 A with enhanced cooling may be operated at an ambient or coolant temperature of 45 °C only if the rated supply voltage of the converter fan is safely within the limited tolerance range of 400 V +10 % –15 %.

b) Not permissible when T400 are used.

Ambient or coolant temperature	Load factor K1	
	In devices with self-cooling	In devices with enhanced cooling
≤ + 25 °C	1.18	1.10
+ 30 °C	1.12	1.05
+ 35 °C	1.06	1.00
+ 40 °C	1.00	0.95
+ 45 °C	0.94	0.90 [a])
+ 50 °C	0.88	
+ 55 °C	0.82 [b])	

2) Load values K2 as a function of the installation altitude (see P077 Operating Instructions, Section 11).
Overall reduction factor K = K1 * K2 (for K1 see Footnote 1).



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

Installation altitude m	Reduction factor K2
1000	1.0
2000	0.835
3000	0.74
4000	0.71
5000	0.67

The supply voltages for all electric circuits are possible for site altitudes up to 5000 m with basic insulation, with the exception of converters for 830 V rated supply voltage:
up to 4000 m: 830 V
up to 4500 m: 795 V
up to 5000 m: 727 V

Power section

Designation	Function	Assignment
1U1, 1V1, 1W1	Input, armature current	Internally wired
1C1, 1D1	Output, armature current	Internally wired up to 850 A for greater rated currents customer connection
3U1, 3W1	Input, field	Internally wired
3C, 3D	Output, field	Internally wired
4U1, 4V1, 4W1	Supply, equipment fan	Internally wired
5U1, 5W1, 5N1	Controller power supply 230 V/400 V	Internally wired

Open-loop and closed-loop control

Designation	Function		Use	Assignment
Connector -X300	Serial interface GSST1 RS232/RS485		Operator Panel OP1S	Internally used
Terminal -X171:34	P24_S			Internal control
:35	M			
:36	Digital input, via relay terminal	Function can be parameterized		Control, customer
:37	Digital input, via relay terminal		ON/STOP	Control, customer
:38	Digital input, via relay terminal		CONTROLLER ENABLE	Control, customer
:39	Digital input, via relay terminal	Function can be parameterized		Control, customer
:46	Digital input, via relay terminal	Function can be parameterized	Motor fan on Equipment fan on	Internal control
:47	M			
:48	Digital output, via relay terminal	Function can be parameterized	Fault	Customer connection
:54	M			Internal control
Terminal -X172:56	Serial interface GSST2 RS485	USS® or peer-to-peer		Customer connection
:57	Serial interface GSST2 RS485	USS or peer-to-peer		Customer connection
:58	Serial interface GSST2 RS485	USS or peer-to-peer		Customer connection
:59	Serial interface GSST2 RS485	USS or peer-to-peer		Customer connection
:60	Serial interface GSST2 RS485	USS or peer-to-peer		Customer connection
Terminal -X173:26	Supply P15	Digital tach. connection		Customer connection
:27	M	Digital tach. connection		Customer connection
:28	Track 1 +	Digital tach. connection		Customer connection
:29	Track 1 –	Digital tach. connection		Customer connection
:30	Track 2 +	Digital tach. connection		Customer connection
:31	Track 2 –	Digital tach. connection		Customer connection
:32	Zero mark +	Digital tach. connection		Customer connection
:33	Zero mark –	Digital tach. connection		Customer connection
Terminal -X174:1	M	M for setpoint potentiometer		Internal wiring
:2	P10	P10 for setpoint potentiometer		Internal wiring
:3	N10	N10 for setpoint potentiometer		Free
:4	Main setpoint + external	Function can be parameterized		Customer connection
:5	Main setpoint – internal	Function can be parameterized		Customer connection
:6	Analog input 1 +	Function can be parameterized		Customer connection
:7	Analog input 1 –	Function can be parameterized		Customer connection
:22	Motor temperature, positive connection	Sensor according to the Operating Instructions		Customer connection
:23	Motor temperature, negative connection	Sensor according to the Operating Instructions		Customer connection
:24	M			Customer connection

Terminal assignment of the installed SIMOREG unit

Open-loop and closed-loop control

Designation	Function		Use	Assignment
Terminal -X175:12	Analog output	I_act_unit		Customer connection
:13	M			Customer connection
:14	Analog output	Function can be parameterized		Customer connection
:15	M			Customer connection
:16	Analog output	Function can be parameterized		Customer connection
:17	M			Customer connection
:210	P24_S			Customer connection
:211	Digital input	Function can be parameterized		Customer connection
:212	Digital input	Function can be parameterized		Customer connection
:213	Digital input	Function can be parameterized		Customer connection
:214	Digital input	Function can be parameterized		Customer connection
:215	M_GT			Customer connection
:216	M_GT			Customer connection
:217	M			Customer connection
Terminal -X162:61	Serial interface GSST3 RS485	USS or peer-to-peer		Customer connection
:62	Serial interface GSST3 RS485	USS or peer-to-peer		Customer connection
:63	Serial interface GSST3 RS485	USS or peer-to-peer		Customer connection
:64	Serial interface GSST3 RS485	USS or peer-to-peer		Customer connection
:65	Serial interface GSST3 RS485	USS or peer-to-peer		Customer connection
Terminal -X163:44	P24_S			Internal control
:45	M			
:40	Digital input	Function can be parameterized	internal/external operator control	Internal control
:41	Digital input	Function can be parameterized		Customer connection
:42	Digital input	Function can be parameterized		Customer connection
:43	Digital input	Function can be parameterized		Customer connection
:50	Digital output	Function can be parameterized		Customer connection
:51	M			Customer connection
:52	Digital output	Function can be parameterized		Customer connection
:53	M			Customer connection
Terminal -X164:8	Analog input 2	Function can be parameterized	setpoint poten-tiometers	Internal wiring
:9	M			
:10	Analog input 3	Function can be parameterized		Customer connection
:11	M			Customer connection
:18	Analog output 3	Function can be parameterized		Customer connection
:19	M			Customer connection
:20	Analog output 4	Function can be parameterized		Customer connection
:21	M			Customer connection
:204	Motor temperature, positive connection	Sensor according to the Operating Instructions		Customer connection
:205	Motor temperature, negative connection	Sensor according to the Operating Instructions		Customer connection
Connector -X165:1 to 8	Parallel interface			
Connector -X166:1 to 8	Parallel interface			
Terminal -XT:103	Input 8 V to 270 V	Analog tach. connection		Customer connection
:104	M	Analog tach. connection		Customer connection
:105	Input	Emergency stop		Internal control
:106	Output	P24 for Emergency stop		Internal control
:107	Input	Emergency stop, pushbutton operation		Not used
:108	Input	Emergency stop, pushbutton operation		Not used
Terminal -XR:109	Relay output	Main contactor on		Internal control
:110	Relay output	Main contactor on		Internal control

Caution! Assignment is valid for cabinet without options.

Ordering guidelines

Standard cabinet

Observe the following points when ordering a cabinet without options:

- See pages 37 and 38 for cabinet sizes and views of the doors.
- Every standard cabinet has a setpoint potentiometer fitted in the door as well as a switch with which the setpoint input can be selected between this potentiometer and another input.
- An outgoing circuit with a motor circuit-breaker is provided for each of the fan motors of the DC motor, as listed on pages 31 and 32. In the case of fan motors with a voltage other than 400 V, it is essential to specify the fan voltage (option **Y01**), otherwise 400 V will be assumed as standard.
- When using cabinet units with a mains voltage greater than 415 V, a control voltage of 3-ph. 400 V must be provided for excitation, motor fan and internal cabinet control. The current rating required for this supply is listed on pages 18 and 19 for the various types. When using cabinets for voltages up to and including 415 V, this voltage is derived from the mains supply.
- In addition to the switching devices for setpoint input, the door also includes an E-STOP button and the OP1S control panel for parameterization and local control of the converter. Furthermore, the door includes a switch for the control voltage in the case of units of 1500 A and above, or those with mains voltages greater than 415 V.
- The “E-STOP” button fitted as standard is not an EMERGENCY OFF function. Only the supply (armature and field) is disconnected from the mains, and the drive coasts. The control voltage circuit is still live.
- The converter unit has 4 digital inputs with relay couplers which are designed as standard by the customer with a 230 V coil (specify option **C51** for 24 V coil).
- Please note with standard cabinets that it is assumed that the mains voltage is the same as the rated unit voltage, i.e. 400 V, 460 V, 500 V, 690 V, 830 V. Please specify other mains voltages and frequencies using option **V48**.

Ordering

Always pass on as much information as possible when ordering cabinet units 6RM70. When ordering cabinets for mains voltages greater than 400 V, and if a 3-ph. 400 V control voltage is not available, it is advantageous to know all data of the outgoing circuits to be supplied (field, motor fan). The matching transformers can then be designed according to the drive. The following data are generally important:

- Contact partner for any queries.
- Motor data (armature, field, cooling, pick-up) or, if a Siemens motor is used, its Order No. including all options.
- Power/current/voltage of the fan motor or, if none is present (external ventilation using pipe system), option **W15**.
- Specify different degrees of protection or regulations together with the order.
- If available, specify duty cycle.

Notes

- An additional cabinet may be necessary when combining certain options, e.g. A45 “Overvoltage protection”, W10 “Radio interference suppression filter”, mains voltage greater than 400 V without the availability of a 400 V control voltage supply with relatively large control voltage transformers.
- The set values for the motor circuit-breakers must be checked during commissioning.
- The scope of delivery includes the hardware, but not parameterization and commissioning.
- With a mains voltage less than or equal to 415 V/50 Hz, the motor fan and the internal cabinet supplies are derived from the primary current path and also supplied with this voltage. With mains voltages greater than 415 V/50 Hz, an external supply provided by the customer is expected for the motor fan and auxiliaries. This must be 3-ph. 400 V. When specifying the option V60 (60-Hz frequency), the control voltage provided by the customer must be 3-ph. 460 V/60 Hz.

Digital Converter Cabinet Units

Selection and ordering data

Three-phase connection		DC connection, armature circuit			Field current connection		SIMOREG cabinet unit	
Rated input voltage	Rated input current	Rated DC voltage	Rated DC current	Rated output	DC field voltage	DC field current	Order No.	Weight ca.
V	A	V	A	kW		A		kg
SIMOREG cabinet units for single-/two-quadrant operation B6C								
3-ph. 400	25	485	30	14.5	325	5	**6RM7018-6DS02**	120
	50		60	29		10	**6RM7025-6DS02**	125
	75		90	44		10	**6RM7028-6DS02**	185
	104		125	61		10	**6RM7031-6DS02**	200
	175		210	102		15	**6RM7075-6DS02**	205
	233		280	136		15	**6RM7078-6DS02**	220
	332		400	194		25	**6RM7081-6DS02**	270
	498		600	291		25	**6RM7085-6DS02**	290
	705		850	412		30	**6RM7087-6DS02**	455
	995		1200	582		30	**6RM7091-6DS02**	495
	1326		1600	776		40	**6RM7093-4DS02**	620
	1658		2000	970		40	**6RM7095-4DS02**	685
3-ph. 460	25	550	30	16.5	373	5	**6RM7018-6FS02**	120
	50		60	33		10	**6RM7025-6FS02**	125
	75		90	49.5		10	**6RM7028-6FS02**	185
	104		125	68.7		10	**6RM7031-6FS02**	200
	175		210	115		15	**6RM7075-6FS02**	205
	233		280	154		15	**6RM7078-6FS02**	220
	375		450	247		25	**6RM7082-6FS02**	270
	498		600	330		25	**6RM7085-6FS02**	290
	705		850	467		30	**6RM7087-6FS02**	455
	995		1200	660		30	**6RM7091-6FS02**	495
3-ph. 500 [1]	50	600	60	36		10	**6RM7025-6GS02**	185
	104		125	75		10	**6RM7031-6GS02**	275
	175		210	126		15	**6RM7075-6GS02**	305
	332		400	240		25	**6RM7081-6GS02**	415
	498		600	360		25	**6RM7085-6GS02**	480
	663		800	480		30	**6RM7087-6GS02**	650
	829		1000	600		30	**6RM7090-6GS02**	725
	1326		1600	960		40	**6RM7093-4GS02**	860
	1658		2000	1200		40	**6RM7095-4GS02**	870
3-ph. 690	597	830	720	598		30	**6RM7086-6KS02**	670
	788		950	789		30	**6RM7088-6KS02**	725
	1244		1500	1245		40	**6RM7093-4KS02**	855
	1658		2000	1660		40	**6RM7095-4KS02**	870
3-ph. 830	746	1000	900	900		30	**6RM7088-6LS02**	760
	1244		1500	1500		40	**6RM7093-4LS02**	875
	1575		1900	1900		40	**6RM7095-4LS02**	900

1) Optionally, max. 3-ph. 575 V and therefore 690 V DC for B6C and 600 V DC for (B6)A (B6)C possible.

2) With cable lugs acc. to DIN 57 295; greater cable sections optionally possible on request.

3) Max. permissible backup fuse provided by customer or –for data in kA –max. permissible short-circuit current at the incoming circuit-breaker of the cabinet unit. Maximum permissible short-circuit current 50 kA with a 3-ph. 400 V mains voltage and motor fan outputs greater than 12.5 A.

4) For option V47 (supply voltage 575 V) max. permissible short-circuit current 50 kA.

Max. possible connection cross-section for				Max. permissible fusing on the part of the customer (l.v.h.b.c. fuse gL/gG)		Power loss (at the rated DC current)
Three-phase connection[2]	DC connection[2]	DC field current connection	Voltage connection auxiliaries	Three-phase connection[3]	Voltage connection auxiliaries	
mm^2	mm^2	mm^2	mm^2	A	A	kW
1 x 6	1 x 95	1 x 4	–	32	–	0.30
1 x 25	1 x 95	1 x 4	–	63	–	0.35
1 x 35	1 x 95	1 x 4	–	125	–	0.50
1 x 120	1 x 95	1 x 4	–	160	–	0.60
1 x 150	1 x 150	1 x 4	–	250	–	0.90
1 x 150	1 x 240	1 x 4	–	350	–	1.10
2 x 185	2 x 240	1 x 6	–	400	–	1.65
2 x 185	2 x 240	1 x 6	–	630	–	2.10
2 x 240	4 x 185	1 x 10	–	1000	–	2.95
4 x 240	4 x 185	1 x 10	–	1000	–	5.20
4 x 240	8 x 185	1 x 10	–	65 kA	–	6.55
6 x 240	8 x 185	1 x 10	–	80 kA	–	7.90
1 x 6	1 x 95	1 x 4	–	32	–	0.30
1 x 25	1 x 95	1 x 4	–	63	–	0.35
1 x 35	1 x 95	1 x 4	–	125	–	0.50
1 x 120	1 x 95	1 x 4	–	160	–	0.60
1 x 150	1 x 150	1 x 4	–	250	–	0.90
1 x 150	1 x 240	1 x 4	–	350	–	1.10
2 x 185	2 x 240	1 x 6	–	400	–	1.65
2 x 185	2 x 240	1 x 6	–	630	–	2.10
2 x 240	4 x 185	1 x 10	–	1000	–	2.95
4 x 240	4 x 185	1 x 10	–	1000	–	5.20
1 x 25	1 x 95	1 x 4	4	63	16	0.75
1 x 120	1 x 95	1 x 4	4	160	16	1.05
1 x 150	1 x 150	1 x 4	4	250	20	1.45
2 x 185	2 x 240	1 x 6	16	400	35	2.40
2 x 185	2 x 240	1 x 6	16	630	50	2.95
2 x 240	4 x 185	1 x 10	16	1000	50	3.80
4 x 240	4 x 185	1 x 10	16	1000	50	5.65
4 x 240	8 x 185	1 x 10	16	65 kA	63	7.85
6 x 240	8 x 185	1 x 10	16	80 kA[4]	63	9.40
2 x 240	4 x 185	1 x 10	16	630	50	3.90
4 x 240	4 x 185	1 x 10	16	1000	50	5.90
4 x 240	8 x 185	1 x 10	16	50 kA	63	8.75
6 x 240	8 x 185	1 x 10	16	50 kA	63	10.40
4 x 240	4 x 185	1 x 10	16	800	50	6.35
4 x 240	8 x 185	1 x 10	16	40 kA	63	8.95
6 x 240	8 x 185	1 x 10	16	40 kA	63	11.10

Digital Converter Cabinet Units

Selection and ordering data

Three-phase connection		DC connection, armature circuit			Field current connection		SIMOREG cabinet unit	
Rated input voltage	Rated input current	Rated DC voltage	Rated DC current	Rated output	DC field voltage	DC field current	Order No.	Weight ca.
V	A	V	A	kW		A		kg
SIMOREG cabinet units for four-quadrant operation (B6)A (B6)C								
3-ph. 400	13	420	15	6.3	325	3	**6RM7013-6DV02**	110
	25		30	12.6		5	**6RM7018-6DV02**	120
	50		60	25		10	**6RM7025-6DV02**	125
	75		90	38		10	**6RM7028-6DV02**	185
	104		125	52.5		10	**6RM7031-6DV02**	200
	175		210	88		15	**6RM7075-6DV02**	205
	233		280	118		15	**6RM7078-6DV02**	215
	332		400	168		25	**6RM7081-6DV02**	270
	498		600	252		25	**6RM7085-6DV02**	290
	705		850	357		30	**6RM7087-6DV02**	455
	998		1200	504		30	**6RM7091-6DV02**	525
	1326		1600	672		40	**6RM7093-4DV02**	640
	1658		2000	840		40	**6RM7095-4DV02**	695
3-ph. 460	25	480	30	14.4	373	5	**6RM7018-6FV02**	120
	50		60	28.8		10	**6RM7025-6FV02**	125
	75		90	43		10	**6RM7028-6FV02**	185
	104		125	60		10	**6RM7031-6FV02**	200
	175		210	100		15	**6RM7075-6FV02**	205
	233		280	134		15	**6RM7078-6FV02**	220
	375		450	216		25	**6RM7082-6FV02**	270
	498		600	288		25	**6RM7085-6FV02**	290
	705		850	408		30	**6RM7087-6FV02**	455
	995		1200	576		30	**6RM7091-6FV02**	495
3-ph. 500 [1]	50	520	60	31		10	**6RM7025-6GV02**	185
	104		125	65		10	**6RM7031-6GV02**	275
	175		210	109		15	**6RM7075-6GV02**	295
	332		400	208		25	**6RM7081-6GV02**	415
	498		600	312		25	**6RM7085-6GV02**	480
	705		850	442		30	**6RM7087-6GV02**	655
	912		1100	572		30	**6RM7090-6GV02**	730
	1326		1600	832		40	**6RM7093-4GV02**	870
	1658		2000	1040		40	**6RM7095-4GV02**	890
3-ph. 690	630	725	760	551		30	**6RM7086-6KV02**	685
	1000		1000	725		30	**6RM7090-6KV02**	730
	1244		1500	1088		40	**6RM7093-4KV02**	870
	1658		2000	1450		40	**6RM7095-4KV02**	915
3-ph. 830	788	875	950	831		30	**6RM7088-6LV02**	765
	1244		1500	1313		40	**6RM7093-4LV02**	895
	1575		1900	1663		40	**6RM7095-4LV02**	925

1) Optionally, max. 3-ph. 575 V and therefore 690 V DC for B6C and 600 V DC for (B6)A (B6)C possible.

2) With cable lugs acc. to DIN 57 295; greater cable sections optionally possible on request.

3) Max. permissible backup fuse provided by customer or – for data in kA – max. permissible short-circuit current at the incoming circuit-breaker of the cabinet unit. Maximum permissible short-circuit current 50 kA with a 3-ph. 400 V mains voltage and motor fan outputs greater than 12.5 A.

4) For option V47 (supply voltage 575 V) max. permissible short-circuit current 50 kA.

Max. possible connection cross-section for				Max. permissible fusing on the part of the customer (l.v.h.b.c. fuse gL/gG)		Power loss (at the rated DC current)
Three-phase connection[2]	DC connection[2]	DC field current connection	Voltage connection auxiliaries	Three-phase connection[3]	Voltage connection auxiliaries	
mm^2	mm^2	mm^2	mm^2	A	A	kW
1 x 6	1 x 95	1 x 4	–	25	–	0.25
1 x 6	1 x 95	1 x 4	–	32	–	0.30
1 x 25	1 x 95	1 x 4	–	63	–	0.35
1 x 35	1 x 95	1 x 4	–	125	–	0.50
1 x 120	1 x 95	1 x 4	–	160	–	0.60
1 x 150	1 x 150	1 x 4	–	250	–	0.90
1 x 150	1 x 240	1 x 4	–	350	–	1.10
2 x 185	2 x 240	1 x 6	–	400	–	1.65
2 x 185	2 x 240	1 x 6	–	630	–	2.10
2 x 240	4 x 185	1 x 10	–	1000	–	2.95
4 x 240	4 x 185	1 x 10	–	1000	–	5.20
4 x 240	8 x 185	1 x 10	–	65 kA	–	6.60
6 x 240	8 x 185	1 x 10	–	80 kA	–	7.90
1 x 6	1 x 95	1 x 4	–	32	–	0.30
1 x 25	1 x 95	1 x 4	–	63	–	0.35
1 x 35	1 x 95	1 x 4	–	125	–	0.50
1 x 120	1 x 95	1 x 4	–	160	–	0.60
1 x 150	1 x 150	1 x 4	–	250	–	0.90
1 x 150	1 x 240	1 x 4	–	350	–	1.10
2 x 185	2 x 240	1 x 6	–	400	–	1.65
2 x 185	2 x 240	1 x 6	–	630	–	2.10
2 x 240	4 x 185	1 x 10	–	1000	–	2.95
4 x 240	4 x 185	1 x 10	–	1000	–	5.20
1 x 25	1 x 95	1 x 4	4	63	16	0.75
1 x 120	1 x 95	1 x 4	4	160	16	1.05
1 x 150	1 x 150	1 x 4	4	250	20	1.45
2 x 185	2 x 240	1 x 6	16	400	35	2.40
2 x 185	2 x 240	1 x 6	16	630	50	2.90
2 x 240	4 x 185	1 x 10	16	1000	50	3.85
4 x 240	4 x 185	1 x 10	16	1000	50	6.00
4 x 240	8 x 185	1 x 10	16	65 kA	63	7.85
6 x 240	8 x 185	1 x 10	16	80 kA[4]	63	9.40
2 x 240	4 x 185	1 x 10	16	1000	50	4.10
4 x 240	4 x 185	1 x 10	16	1000	50	6.10
4 x 240	8 x 185	1 x 10	16	50 kA	63	8.80
6 x 240	8 x 185	1 x 10	16	50 kA	63	10.40
4 x 240	4 x 185	1 x 10	16	800	50	6.55
4 x 240	8 x 185	1 x 10	16	40 kA	63	9.35
6 x 240	8 x 185	1 x 10	16	40 kA	63	11.10

Options

SIMOREG cabinet units can be assembled in a modular fashion using standardized open-loop control and function options. This allows them to be adapted to technological as well as to user-specific applications.

When ordering a SIMOREG cabinet unit with integrated circuit options, the Order No. of the associated unit must be supplemented with a "**-Z**" and the appropriate Order Codes should be specified for the required options (several Order Codes can be specified in any sequence).

In addition to the options with codes, SIMOREG cabinet units can be equipped with additional options, e.g. drive converters can be connected in parallel to increase the output (max. 6), 12-pulse versions, the commutating reactors and/or switchgear can be adapted to the motor data, output smoothing reactors, adaptation to plants and systems with drive converter transformers, devices for field supply, different degrees of protection.

The Order No. must be supplemented with a "**-Z**" and the required option specified in plain text.

Ordering example:
Drive converter cabinet for single-/two-quadrant operation, rated input voltage 3-ph. 500 V 50 Hz, rated input current 663 A, PTC thermistor evaluation for alarm and fault, anti-condensation heating, output smoothing reactors, degree of protection IP 23.

When ordering, specify:
6RM7087-6GS02-0-Z
A12 + E22
Degree of protection IP 23
Output smoothing reactor

I_{th} = 780 A
L_{01} = 0.4 mH at I_1 = 370 A
L_{02} = 0.2 mH at I_2 = 800 A

Certain circuit options require additional equipment (e.g. temperature sensor, motor fan, motor brake, motor anti-condensation heating, horn, pushbutton, etc.). These are not part of the scope of the supply of the cabinet unit. External devices can be connected to the terminal strip in the SIMOREG cabinet unit. Display and operator control elements which are internally required (e.g. pushbutton, signaling lamps, measuring instruments), are mounted in the door of the SIMOREG cabinet unit.

	Code	Description
Monitoring functions		
Evaluation of brush length monitoring, digital, non-floating	**A00**	Non-floating brush length monitoring with use of KM01 brush wear monitor from Schunk GmbH. The KM01 is fitted in an IP 65 insulating box mounted close to the motor. The KM01 must be connected to the motor using short-circuit-proof cables, and the cables for the power supply and for signals to the cabinet units must be made in the plant. The brush wear monitor is not included in the scope of delivery.
Evaluation of brush length monitoring, digital, floating	**A06**	Evaluation is carried out using a floating signalling contact in the motor (code **A06** according to Catalog DA12, Section 1, Protective and monitoring devices).
PTC evaluation for "alarm"	**A10**	If the permissible motor temperature is exceeded, the red LED flashes on the OP1S operator panel and the alarm A029 "motor temperature too high" is displayed. This alarm can be externally evaluated via status word 2 or via the free digital output. No additional evaluation devices are required. However, it is necessary to make an appropriate comment in the circuit manual. The drive converter must be appropriately parameterized on-site. A PTC thermistor for "alarm" must be provided in the motor.
PTC evaluation for "fault"	**A11**	If the permissible motor temperature is exceeded, the red LED is lit on the OP1S operator panel and the fault F029 "motor temperature too high", and the group signal "fault" are displayed. The drive converter is then powered-down. Fault F029 can be additionally evaluated via status word 2 or using a free digital output. No additional evaluation units are required. However, the appropriate comment should be made in the circuit manual. The drive converter must be appropriately parameterized on-site. A PTC thermistor for "power-down" must be provided in the motor.
PTC thermistor evaluation for "alarm and fault"	**A12**	Refer to codes **A10** and **A11** A PTC thermistor for "alarm" and a PTC thermistor for "power-down" must be provided in the motor.
NTC thermistor evaluation unit for "alarm" and/or "power-down"	**A20**	If the motor alarm temperature, set at the evaluation unit, is exceeded, the red LED on the OP1S operator panel flashes and alarm A029 "motor temperature too high" is displayed. This alarm can be externally evaluated via status word 2 or via a free digital output. If the motor trip-down temperature, set at the evaluation unit, is exceeded, the red LED on the OP1S operator panel is lit and fault F029 "motor temperature too high" is output and the "fault" group message displayed. The drive converter is simultaneously powered-down (tripped). Fault F029 can be additionally evaluated via status word 2 or using a free digital output. The units must be adjusted and appropriately parameterized on-site. 3UP7 004 thermistor motor protection device for NTC thermistor temperature sensors (includes two evaluation circuits which are independent of one another for a maximum of three temperature sensors). NTC thermistors for alarm and/or power-down must be provided in the DC motor. It is possible to use a sensor to initiate an "alarm" as well as "power-down" (status when supplied, jumper B inserted). The operating temperature of the evaluation unit must be adjusted on-site.
KTY84-130 evaluation for "alarm" and/or "fault"	**A23**	Refer to codes **A10** and **A11** The motor must be provided with a KTY84 temperature sensor. Using a sensor, it is possible to initiate both an "alarm" as well as "trip".
2 x KTY84-130 evaluation for "alarm" and/or "fault"	**A24**	Refer to codes **A10** and **A11** The motor must be provided with two KTY84 temperature sensors. It is possible to initiate both an "alarm" as well as "power-down" using one sensor.

	Code	Description
Monitoring of motor temperature using PT100	**A62**	If the motor alarm temperature, set at the evaluation unit, is exceeded, the red LED on the OP1S operator panel flashes and alarm A029 “motor temperature too high” is displayed. This alarm can be externally evaluated via status word 2 or via a free digital output. If the motor trip-down temperature, set at the evaluation unit, is exceeded, the red LED on the OP1S operator panel is lit and fault F029 “motor temperature too high” is output and the “fault” group message displayed. The drive converter is simultaneously powered-down (tripped). Fault F029 can be additionally evaluated via status word 2 or using a free digital output. The units must be adjusted and appropriately parameterized on-site. A PT100 evaluation unit for winding temperature is provided in the converter cabinet. The unit has a temperature range configurable from 0 to 200 °C, and two-wire and three-wire connections for PT100.
Monitoring of bearing temperature using PT100	**A72**	If the motor alarm temperature, set at the evaluation unit, is exceeded, the red LED on the OP1S operator panel flashes and alarm A029 “motor temperature too high” is displayed. This alarm can be externally evaluated via status word 2 or via a free digital output. If the motor trip-down temperature, set at the evaluation unit, is exceeded, the red LED on the OP1S operator panel is lit and fault F029 “motor temperature too high” is output and the “fault” group message displayed. The drive converter is simultaneously powered-down (tripped). Fault F029 can be additionally evaluated via status word 2 or using a free digital output. The units must be adjusted and appropriately parameterized on-site. Two PT100 evaluation units for bearing temperature are provided in the converter cabinet. The unit has a temperature range configurable from 0 to 200 °C, and a two-wire connection for PT100.
Air flow monitoring in the motor	**A97**	A “vent captor” (type: 3201.03) air flow monitor in the motor is used to evaluate the air flow (code **A97**, acc. to Catalog DA 12, Section 1, Protective and monitoring devices and Supplement DA 12, July 2001, Section 3). Depending on the parameterization which was made, when a fault condition occurs, the A027 alarm is output with a (red flashing LED) or F027 (red LED which is lit). When parameterized for “fault”, the “fault” group message is displayed and the drive converter is powered-down. The “alarm” and “fault” messages can be additionally evaluated via status word 1. The drive converter must be appropriately parameterized on-site. No additional evaluation devices are required but an appropriate comment must be made in the circuit manual.
Motor overtemperature, digital	**A31**	Evaluation is carried out using a floating signalling contact in the motor (code **A31** according to Catalog DA 12, Section 1, Special designs, and Supplement DA 12, July 2001, Section 3).
Ground fault monitoring in grounded supplies (TN or TT network)	**A40**	An electronic differential relay monitors the fault current to ground (PE). If a ground fault occurs, then the “ground fault” signal is displayed using the indicator light (red). The drive is simultaneously powered-down. Note: For protection, where the unit is powered-down via the ground fault monitor, the protective conductor or PEN conductor of the cable for the cabinet supply and motor armature circuit can be dimensioned in accordance with DIN VDE 0100, Part 540. Outer conductor cross-section according to DIN VDE 0160. The release of the circuit-breaker must be adjusted on-site.
Ground fault monitoring in non-grounded line supplies (IT network)	**A41**	An insulation monitor monitors the condition of the insulation with respect to ground in the drive converter system (AC and DC connection). If a ground fault occurs, the “ground fault” signal is output at a terminal and the indicating lamp is lit (yellow). An additional coupling device is used for rated supply voltages above 3-ph. 690 V. Note: For protection using a signal from an insulation monitor, in non-grounded supply networks, additional local potential bonding is required for the cabinet and motor and for the other conductive components which can be simultaneously touched. Protective conductor cross-section: according to DIN VDE 0100, Part 540. Outer conductor cross-section: acc. to DIN VDE 0160. External ground faults, which occur in the line supply, external to the drive converter system, are also detected by the ground fault monitoring in the cabinet unit if the main switch/circuit-breaker is switched on. The insulation monitor must be adjusted on-site.
Overvoltage protection module	**A45**	7VV3002-3..20 depending on the rated drive converter voltage. Attention! Delay in the time of delivery! (for unit, see Catalog DA 94.2)

Options

	Code	Description
OFF function		
EMERGENCY OFF	**B20**	2-channel, with 3TK2827-1AL20 and mushroom-head pushbutton switch (red) with lock RONIS (code SB30) plus one illuminated pushbutton (red) for acknowledgement and signaling in the cabinet doors. Single-quadrant operation: If the "EMERGENCY OFF" command is issued, the drive is immediately powered-down and coasts down corresponding to the moments of inertia. Four-quadrant operation: When the "EMERGENCY OFF" command is issued, the drive is braked regeneratively down to standstill via the "fast stop" function (drive converter must be appropriately parameterized on-site) along the current limit by reversing the torque. The drive is powered-down at n = 0. With the "EMERGENCY OFF" command, the disconnection of the drive is initiated with a delay (redundancy). The delay time must be set on the contactor safety combination and matched in the system to the OFF3 times (OFF3 is one of the OFF functions supported by the SIMOREG DC MASTER). EMERGENCY OFF devices in accordance with EN 60204-1. A mushroom-head pushbutton switch is built in the cabinet door; external "EMERGENCY OFF" control devices can be additionally connected to the cabinet terminal strip. As for version B20, the mushroom-head pushbutton switch "E-Stop", which is built in the cabinet door as standard, is not installed. If additional accident prevention regulations have to be observed in addition to the VDE regulations, then the user must specifically specify these. Special versions on request.
Access facility for locking the incoming circuit-breaker	**B30**	External access facility (terminals) provided so that the incoming circuit-breaker or the main contactor can be switched off externally. This could be, for example, by a leading auxiliary switch of a circuit-breaker on the high-voltage side in order to prevent the overvoltage resulting from switching off on the primary side of the transformer from reaching the SIMOREG device. In this case, an E-STOP must be defined at the same time, and terminals are provided as standard for this.
Actual speed sensing		
Representation in the documentation of the connection for actual speed sensing. There is no extra charge for this option.	**G01** **G02**	Sensing of actual speed using pulse encoder Sensing of actual speed using analog tacho-generator
Setpoints		
Input isolating amplifier, input: 0 mA to 20 mA	**Y40** [1]	Universal DC isolating amplifier with electrical isolation, to connect an analog external setpoint. Already preset to the required input/output configuration and the input/output configuration can be changed on-site. However, in this case, it is necessary to re-adjust the drive; instructions are attached. When ordering, for the appropriate comments and changes to be made in the circuit manual, the input quantity to be transferred must be specified in plain text. If several input isolating amplifiers are needed, the option must be indicated several times. The drive converter must be appropriately parameterized on-site.
Input isolating amplifier, input: 4 mA to 20 mA	**Y41** [1]	Version; refer to Code **Y40**
Input isolating amplifier, input: 0 V to +10 V	**Y42** [1]	Version; refer to Code **Y40**
Input isolating amplifier, input: –20 mA to +20 mA	**Y43** [1]	Version; refer to Code **Y40**
Input isolating amplifier, input: –10 V to +10 V	**Y44** [1]	Version; refer to Code **Y40**
Supplementary circuits		
Coil voltage of coupling relays at the digital inputs	**C51**	The coupling relays at the digital inputs of the SIMOREG device – which are designed as standard with a 230 V AC coil – are delivered with a 24 V DC coil.
Without setpoint potentiometer and mode selector	**C61**	The cabinet is delivered without a setpoint potentiometer and without a mode selector (reduction in price).
Anti-condensation heating for cabinet unit (moisture condensation protection)		The power supply is realized from an external supply (1-ph. 230 V, 50/60 Hz) which must be protected externally with max. 16 A. If options E30 to E34 are ordered at the same time, only one external supply is needed. **E20** For cabinet units up to 60 A rated DC current **E21** For cabinet units, 90 A to 600 A rated DC current **E22** For cabinet units, 720 A to 2000 A rated DC current
Space heater for motor		The power supply is from a separate source (1-ph. 230 V AC, 50/60 Hz), and must be fused at max. 16 A. If the "Operation" status is no longer existent, the space heater for the motor is connected. Only one separate source is required if the options E20 to E22 are ordered simultaneously. **E30** For heaters with max. 100 W output **E31** For heaters with max. 250 W output **E32** For heaters with max. 500 W output **E33** For heaters with max. 800 W output **E34** For heaters with max. 2000 W output

1) Codes with **Y..** require information in plain text.

	Code	Description
Deletion of three-phase commutating reactor	**L01**	Design without three-phase commutating reactor since converter transformer is present (reduction in price). Only the armature circuit may be connected to this transformer. An external supply for excitation and auxiliaries must therefore always be provided by the customer.
Field reversal	**W50**	Reversal of field circuit for DC motor for braking and reversal of direction of rotation with single-quadrant/two-quadrant drive converters and with a rated direct current of 400 A or above. The following information is additionally required in plain text: • Rated field current of motor • Rated field voltage of motor • Energy content or inductance of field winding • Maximum switching frequency per hour Please note: longer delivery time! Field overvoltage protection is determined for the respective application. Price on request.
Motor holding brake	**Y51** [1]	Supply: 1-ph. 230 V, 50/60 Hz The brake is controlled using the SIMOREG cabinet unit. When ordering the drive converter, the rating plate and performance data of the motor holding brake must be additionally specified in plain text.
Output isolating amplifier, output: 0 mA to 20 mA	**Y52** [1]	Universal DC isolating amplifier with electrical isolation, e.g. for externally transferring measured value signals. Already preset to the required input/output configuration; the input/output configuration can be changed on-site. However, in this case, the drive converter must be readjusted; instructions are attached. When ordering, for the appropriate comments and changes to be made in the circuit manual, the input quantity to be transferred must be specified in plain text. If several output isolating amplifiers are needed, the option must be indicated several times. The drive converter must be appropriately parameterized on-site.
Output isolating amplifier, output: 4 mA to 20 mA	**Y53** [1]	Version; refer to Code **Y52**
Output isolating amplifier, output: 0 V to 10 V	**Y54** [1]	Version; refer to Code **Y52**
Output isolating amplifier, output: -20 mA to +20 mA	**Y55** [1]	Version; refer to Code **Y52**
Output isolating amplifier, output: -10 V to +10 V	**Y56** [1]	Version; refer to Code **Y52**
Coupling relay for digital output	**Y60** [1]	Additional relay with a changeover contact on one of the two vacant digital outputs on the CUD2 terminal expansion board (max. 2x). If the relay application is specified in plain text, this will be entered in the documentation. This option is not possible when using option W50 (field reversal).
Other motor fan voltage	**Y01** [1]	Motor fan voltage differing from 3-ph. 400 V. Specify voltage in plain text. Option V40 is required in addition if the voltage is not the same as that for the power circuit, and is not provided by the customer.
Setting range for the motor fan motor protection circuit-breaker		The rated connection voltage for the motor fan is 400 V. See Technical data for standard range of adjustment (table, pages 18 and 19). If none of the options W20 to W41 is specified, the setting range according to the table “Technical data” is implemented.
	W15	No output provided for motor fan. Setting range for the circuit-breaker:
	W20	0.11 A to 0.16 A
	W21	0.14 A to 0.2 A
	W22	0.18 A to 0.25 A
	W23	0.22 A to 0.32 A
	W24	0.28 A to 0.4 A
	W25	0.35 A to 0.5 A
	W26	0.45 A to 0.63 A
	W27	0.55 A to 0.8 A
	W28	0.7 A to 1.0 A
	W29	0.9 A to 1.25 A
	W30	1.1 A to 1.6 A
	W31	1.4 A to 2.0 A
	W32	1.8 A to 2.5 A
	W33	2.2 A to 3.2 A
	W34	2.8 A to 4.0 A
	W35	3.5 A to 5.0 A
	W36	4.5 A to 6.3 A
	W37	5.5 A to 8.0 A
	W38	7.0 A to 10.0 A
	W39	9.0 A to 12.5 A
	W40	11.0 A to 16.0 A
	W41	14.0 A to 20.0 A

1) Codes with **Y..** require information in plain text.

Options

	Code	Description
Second motor fan		This is used, for example, to connect an external fan motor of a 1HQ5 DC motor, which is equipped with a separately-driven fan for the internal and external cooling air circuit. The rated supply voltage for the motor fan is 400 V. Standard setting range, refer to the technical data. Setting range for the circuit-breaker:
	W70	0.11 A to 0.16 A
	W71	0.14 A to 0.2 A
	W72	0.18 A to 0.25 A
	W73	0.22 A to 0.32 A
	W74	0.28 A to 0.4 A
	W75	0.35 A to 0.5 A
	W76	0.45 A to 0.63 A
	W77	0.55 A to 0.8 A
	W78	0.7 A to 1.0 A
	W79	0.9 A to 1.25 A
	W80	1.1 A to 1.6 A
	W81	1.4 A to 2.0 A
	W82	1.8 A to 2.5 A
	W83	2.2 A to 3.2 A
	W84	2.8 A to 4.0 A
	W85	3.5 A to 5.0 A
	W86	4.5 A to 6.3 A
	W87	5.5 A to 8.0 A
	W88	7.0 A to 10.0 A
	W89	9.0 A to 12.5 A
	W90	11.0 A to 16.0 A
	W91	14.0 A to 20.0 A
Paint finish in other RAL colors	**Y90** [1] **Y91** [1]	For cabinet units up to a rated DC current of 600 A For cabinet units, 720 A to 2000 A rated DC current Specify the RAL colors in plain text.
Cabinet lighting and cabinet socket – outlet	**W92**	The lighting is automatically switched on when the cabinet door is opened. The power supply is realized through a separate supply (1-ph. 230 V, 50/60 Hz) which must be externally protected with max. 16 A.
Radio interference suppression filter	**W10**	Radio interference suppression filters are used on the line side. When equipped with radio interference suppression filter, the cabinets correspond to Standard EN 55011, Class A1. This option is provided for operation with grounded line supplies. Depending on the rated current, other cabinet dimensions or an additional cabinet may be required.
Foreign-language documentation	**X10**	Documentation in English
	X11	Standard reference texts in circuit diagram in French, list of units in English.
	X12	Standard reference texts in circuit diagram in Spanish, list of units in English.
	X13	Standard reference texts in circuit diagram in Italian, list of units in English.
Additional delivery of charts in DXF format	**X20**	The charts for the cabinet unit are provided in DXF format. Delivery is by e-mail or on data medium in compressed form (Winzip).
Measuring instruments		
“Speed” instrument	**F20**	Rotary coil instrument, black front frame, 96 mm x 96 mm Scale 0 to 150 % (for four-quadrant drive converters, the scale has a zero center point)
“Armature voltage” instrument	**F30**	Rotary coil instrument, black front frame, 96 mm x 96 mm (for four-quadrant drive converters, the scale has a zero center point)
“Armature current” instrument	**F31**	Rotary coil instrument, black front frame, 96 mm x 96 mm, scale 0 to 200 % rated DC current (for four-quadrant drive converters, the scale has a zero center point)
“Line voltage field” instrument	**F40**	Rotary coil instrument, black front frame, 96 mm x 96 mm, scale 0 V to 540 V
“Field current” instrument	**F50**	Rotary coil instrument, black front frame, 96 mm x 96 mm, scale 0 A to rated field current
“Line voltage armature circuit” instrument	**F60**	Moving iron instrument, black front frame, 96 mm x 96 mm, voltage changeover switch CG8 (L1-L2, L2-L3, L1-L3)
“Line current” instrument		Rotary iron instrument, black front frame, 96 mm x 96 mm
	F70	for line currents for units up to 60 A
	F71	for line currents for units from 90 A to 280 A
	F72	for line currents for units from 400 A to 600 A
	F73	for line currents for units from 720 A to 1200 A
	F74	for line currents for units from 1500 A to 2000 A

1) Codes with **Y..** require information in plain text.

	Code	Description
Other voltages, frequencies		
Control option for a rated input voltage of 3-ph. 415 V 50 Hz	**F41**	SIMOREG cabinet units with drive converters for a rated input voltage of 400 V are used. Rated DC voltage: For cabinet units, single-/two-quadrant operation, 500 V For cabinet units, four-quadrant operation, 440 V
Control option for a rated input voltage of 3-ph. 440 V 50 Hz	**F44** [1]	SIMOREG cabinet units with drive converters for a rated input voltage of 575 V are used. Rated DC voltage: For SIMOREG cabinet units, single-/two-quadrant operation, 520 V For SIMOREG cabinet units, four-quadrant operation, 460 V
Control voltage transformer for field supply	**V30**	A control voltage transformer must be supplied for the field supply since the customer cannot provide a 3-ph. 400 V auxiliary supply. The probability is very high with this option that an additional cabinet will be necessary. With a system voltage of 830 V and a direct current of 1500 A or 1900 A, exact adaptation to the customer data is essential.
Control voltage transformer for motor fan supply	**V40**	A control voltage transformer must be supplied for the motor fan since the customer cannot provide a 3-ph. 400 V control voltage. The probability is very high with this option that an additional cabinet will be necessary. With a system voltage of 830 V and a direct current of 1500 A or 1900 A, exact adaptation to the customer data is essential.
Control option for a rated input voltage of 3-ph. 460 V 50 Hz	**V46** [1]	SIMOREG cabinet units with drive converters for a rated input voltage of 575 V are used. Rated DC voltage: For SIMOREG cabinet units, single-/two-quadrant operation, 550 V For SIMOREG cabinet units, four-quadrant operation, 480 V
Control option for a rated input voltage of 3-ph. 575 V 50 Hz	**V47**	SIMOREG cabinets with drive converters for a rated input voltage of 575 V are used. Rated DC voltage: For SIMOREG cabinet units, single-/two-quadrant operation, 690 V For SIMOREG cabinet units, four-quadrant operation, 600 V
Control option for a rated input voltage as specified in plain text (including the tolerance range) in the range between 3-ph. 90 V and 830 V 50 Hz ±10 %	**V48**	SIMOREG cabinet units with drive converters for the next higher rated input voltage are used. Rated DC voltage: For SIMOREG cabinet units, for single-/two-quadrant operation Rated unit input voltage x 1.35 x cos 5° x 0.9 For SIMOREG cabinet units for four-quadrant operation Rated unit input voltage x 1.35 x cos 30° x 0.9 Rated unit input voltage = phase-to-phase rated line supply voltage
Control option for a rated line supply frequency of 60 Hz	**V60**	

1) Retained for compatibility reasons.
A SIMOREG cabinet unit 6RM70..-6F.02-0 should be selected.
These units are designed for operation with 460 V/60 Hz.

Options

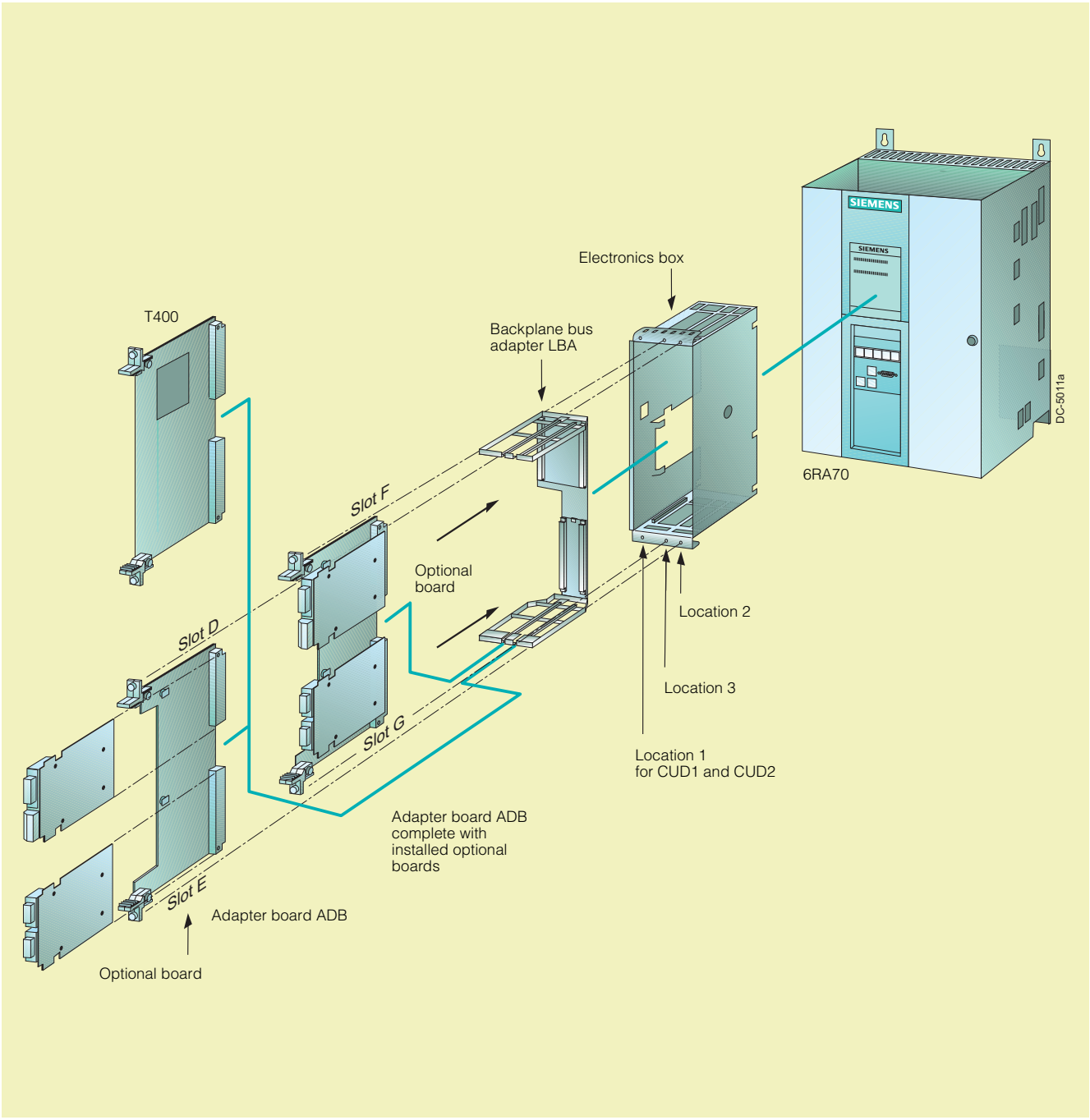
	Code	Description
Freely-assignable function blocks		
	S00	PIN code to enable freely-assignable function blocks in accordance with the Operating Instructions (refer to Catalog DA 21.1).
Supplementary modules		
T400 technology module 6DD1606-0AD0	**D30** **D31** **D32** **D45**	Technology module T400 installed. 1x local bus adapter LBA is also required in the drive converter. Without software, can be configured by the customer under SIMADYN® D with CFC With standard "axial winder" software [1]) With standard "angular synchronous control" software [1]) With standard "cross-cutter/shearing control" software See also Catalogs DA 99 and DA 21.1 for further information on the T400 technology board.
Technology module T300	**D33**	T300 technology module installed. 1x local bus adapter LBA is also required in the drive converter (refer to Catalog DA 21.1).
Technology module T100 + MS100	**D35**	Technology module T100 installed, including hardware description, EPROM MS100 including Manual in German is included in the scope of supply. 1x local bus adapter LBA is additionally required in the drive converter Manual is available in English/French/Italian/Spanish. (also refer to Catalog DA 21.1).
PROFIBUS interface (max. 2 per unit) [2])	**D36**	CBP2 module for PROFIBUS installed, one PROFIBUS connector is included in the scope of supply. 1x local bus adapter LBA and adapter board ADB also required in the drive converter (also refer to Catalog DA 21.1).
CAN bus interface (max. 2 per unit) [2])	**D37**	CBC board for CAN bus installed. 1x local bus adapter LBA and adapter board ADB additionally required (also refer to Catalog DA 21.1).
DeviceNet interface (max. 2 per unit) [2])	**D38**	CBD board for DeviceNet installed. 1x local bus adapter LBA and adapter board ADB additionally required in the drive converter.
SIMOLINK® interface	**D39**	SLB board for SIMOLINK installed. 1x local bus adapter LBA and adapter board ADB additionally required in the drive converter (also refer to Catalog DA 21.1) [3]).
EB1 terminal expansion module (max. 2 per unit) [2])	**D40**	Expansion module EB1 for additional digital and analog inputs and outputs installed. 1x local bus adapter LBA and adapter board ADB additionally required in the drive converter (refer to Catalog DA 21.1) [3]).
EB2 terminal expansion module (max. 2 per unit) [2])	**D41**	Expansion module EB2 for additional digital and analog inputs and outputs installed. 1x local bus adapter LBA and adapter board ADB additionally required in the drive converter (refer to Catalog DA 21.1) [3]).
LBA local bus adapter	**D42**	Backplane bus for the electronics bus installed. 1x required if the technology, communications or expansion modules are used (refer to Catalog DA 21.1).
ADB adapter board	**D43**	Adapter board to accept max. two communications and expansion modules installed (refer to Catalog DA 21.1).
SBP board	**D44**	SBP board for evaluation of a second pulse encoder installed. 1x local bus adapter LBA and adapter board ADB additionally required in the drive converter (also refer to Catalog DA 21.1) [3]).
Included in the scope of supply		
K00	**–**	CUD2 terminal expansion board
D64	**–**	CD-ROM with Operating Instructions and DriveMonitor program in German, English, French, Italian, Spanish
OP1S	**–**	Operator panel mounted in cabinet door

1) Manual in line with the defined language option X.. In the case of Spanish and Italian, the English manual is supplied.

2) Only one terminal expansion board can be used when using a technology board.

3) Cannot be used when using a technology board (T100, T300, T400).

Overview



Integration/fitting of the optional boards

In the electronics box of the SIMOREG 6RA70 converter, up to four slots are available for fitting optional boards. The slots are identified by characters D to G.

If slots D to G are required, the LBA (**L**ocal **B**us **A**dapter) must be installed first.

One adapter board is required for slot D and slot E and one for slots F and G when half-size optional boards are used.

Integration of the electronics options

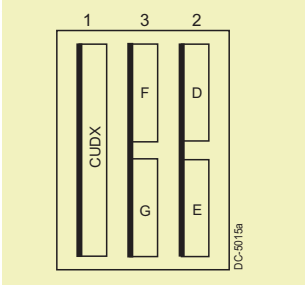
Installation of the electronics options

The optional boards are installed in the slots of the electronics box. The LBA (**L**ocal **B**us **A**dapter, backplane wiring) must be installed before additional optional boards can be fitted. The designations of the mounting locations and the slots are shown in the adjacent Figure.

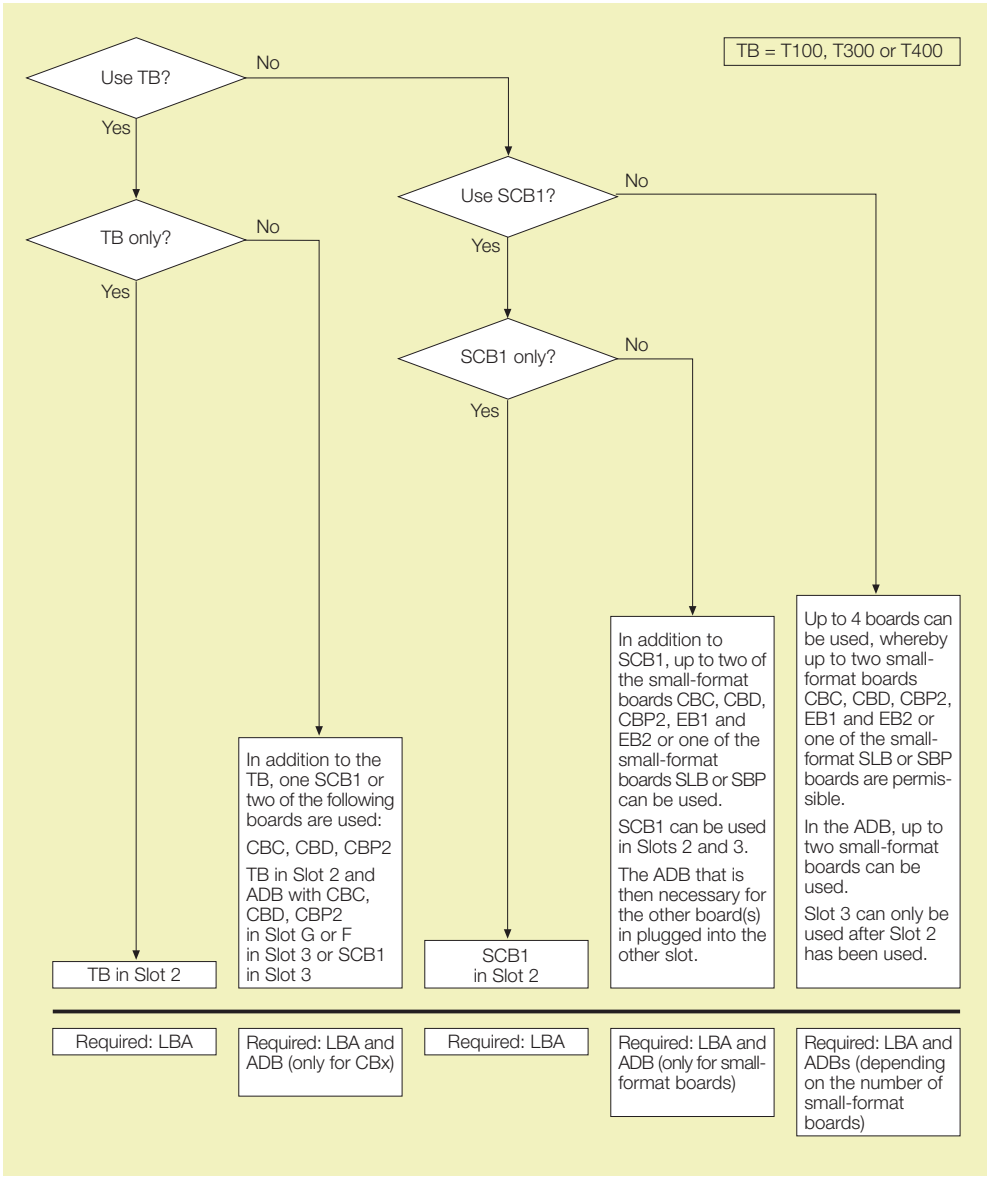
Optional boards can be inserted into any slots; the only rule is that slot 2 must be occupied before slot 3.

Note

- A technology board must always be inserted in location 2 of the electronics box.
- If a technology board is used in conjunction with a communication board, the first communication board must be installed in slot G. In this configuration, the communication data is exchanged directly between the communication board and technology board T400.
- Boards EB1, EB2, SLB and SBP cannot be used in conjunction with a technology board.
- Data from large-format boards are always output from slot E or slot G. The software version of a technology board is indicated, for example, in r060.003.
- In addition to the Local Bus Adapter, an adapter board (ADB) is required for the mini boards (CBP2, SLB, EB1 etc.) because the mini boards have to be inserted in the adapter board before they can be installed in the electronics box due to their extremely small size.
- It is not possible to install two optional boards of the same type in a converter (e.g. 2 x EB1).



Position of mounting slots 1 to 3 and slots D to G in the electronics box

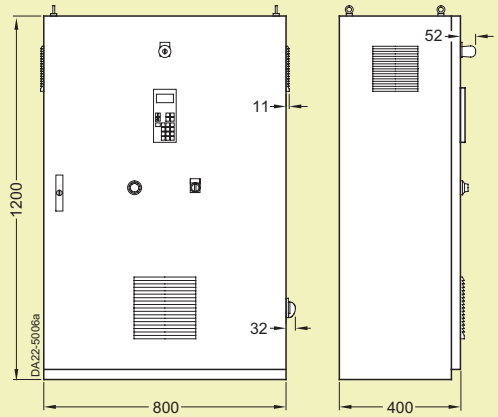


Possible locations or slots for supplementary boards as well as their possible combinations

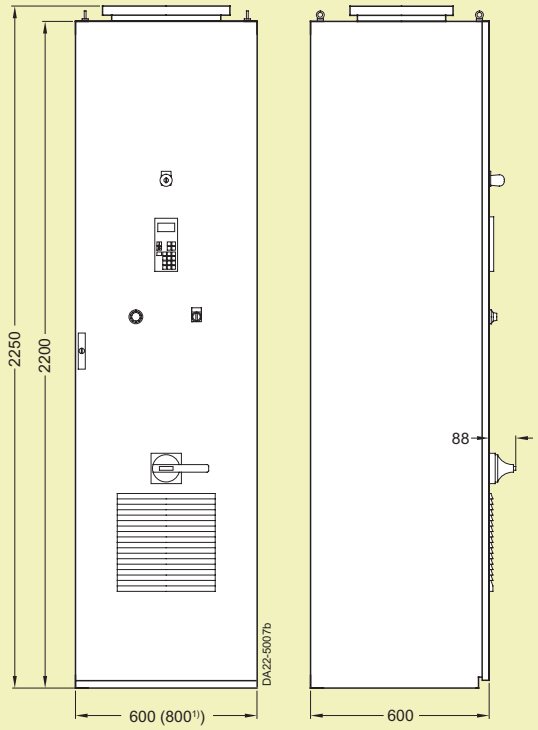
Installation possibilities in the electronics box

Board	LBA required	ADB required	Slot 1	Slot 2 D	Slot 2 E	Slot 3 F	Slot 3 G
CUD1	No	No	Yes	No	No	No	No
CUD2	No	No	Yes	No	No	No	No
CBP2	Yes	Yes	No	Yes	Yes	Yes	Yes
CBC	Yes	Yes	No	Yes	Yes	Yes	Yes
CBD	Yes	Yes	No	Yes	Yes	Yes	Yes
SLB	Yes	Yes	No	Yes	Yes	Yes	Yes
SBP	Yes	Yes	No	Yes	Yes	Yes	Yes
SCB1	Yes	No	No		Yes		Yes
T100	Yes	No	No		Yes		No
T300	Yes	No	No		Yes		No
T400	Yes	No	No		Yes		No
EB1	Yes	Yes	No	Yes	Yes	Yes	Yes
EB2	Yes	Yes	No	Yes	Yes	Yes	Yes

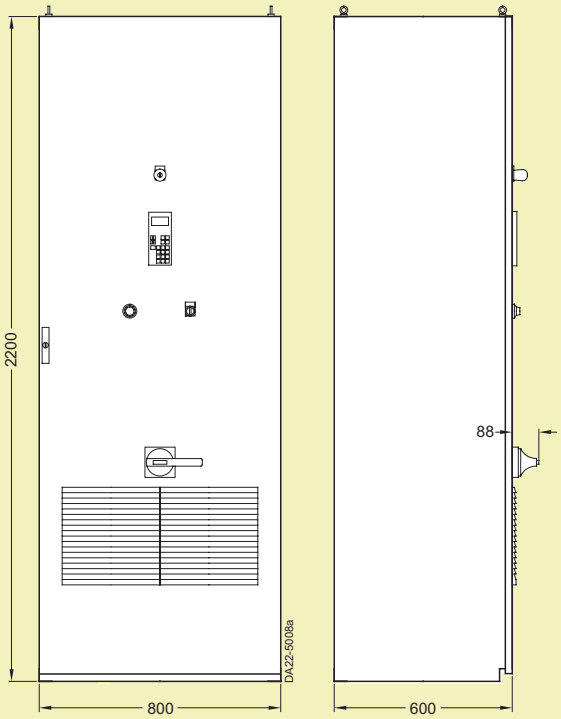
AC 400 V/15 A, 30 A, 60 A
AC 500 V/60 A



AC 400 V/90 A, 125 A, 210 A, 280 A
AC 500 V/125 A, 210 A



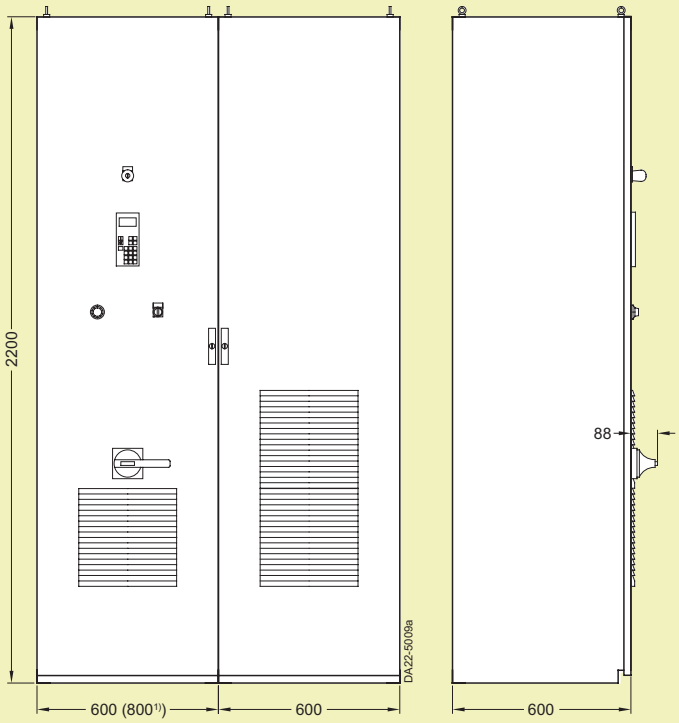
AC 400 V/400 A, 600 A
AC 500 V/400 A, 600 A



1) For option W10, network filters

Dimension drawings

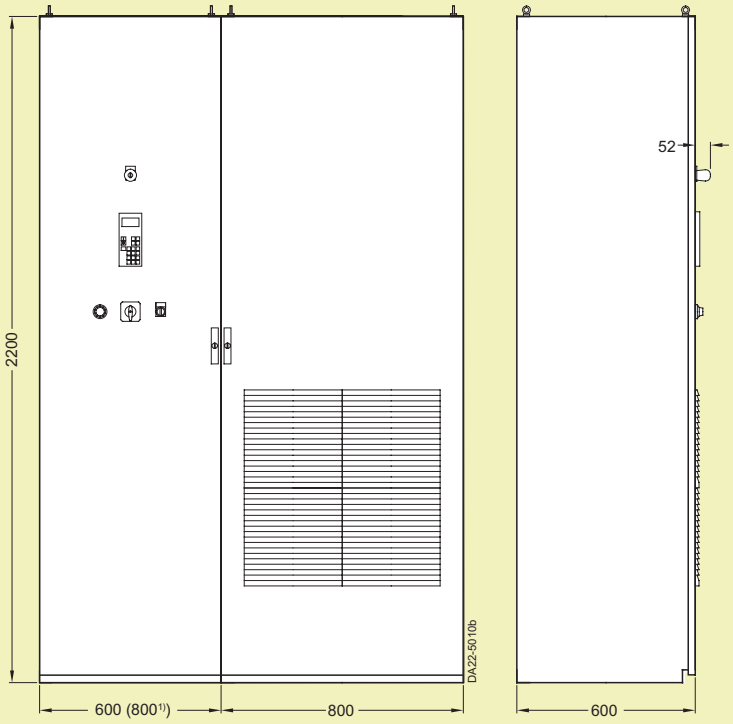
400 V AC/850 A, 1200 A
500 V AC/800 A, 1100 A
690 V AC/720 A, 1000 A
830 V AC/900 A, 950 A



Note

For the combination of certain options, e.g. W10 and A45, an additional cabinet could be necessary.

400 V AC/1600 A, 2000 A
500 V AC/1600 A, 2000 A
690 V AC/1500 A, 2000 A
830 V AC/1500 A, 1900 A



1) For option W10, network filters

Environment, resources and recycling

Siemens AG has committed itself to protecting the environment and conserving valuable natural resources. This applies both to production and to the products we sell.

As early as the development phase, the possible impact of future products and systems on the environment is taken into consideration. Our aim is to prevent environmental pollution or, at least, reduce it to a minimum and, in doing so, look beyond existing regulations and legislation.

Environmental aspects of development

The use of dangerous substances (such as arsenic, asbestos, beryllium, cadmium, CFC, halogens and many others) has already been avoided in the development stage.

Easily dismantled joints have been designed and attention has been paid to increased uniformity of types and grades of materials.

Furthermore, recyclable materials have been given priority, or materials which can be disposed of without any problems.

The number of components has been significantly reduced by using large-scale integrated components and due to the modular design of the complete converter range. This reduces the energy consumed during production.

Particular attention is paid to reducing the volume, mass and range of types of the metal and plastic components.

Flame resistant materials containing halogen and insulation materials containing silicone have been replaced in all the main components with neutral materials.

Environmental aspects were an important criteria in selecting the supplied components.

Front components	PC + ABS ABS	Cycoloy Novodur	GE Plastics Bayer
Plastic components in the unit	PC PA 6.6 SE1-GFN1	Lexan 141-R Noryl	
Insulation	PC (FR) fl	Makrolon or Lexan	
Keypad membrane	Polyester film 0.15 mm		
Rating plate	Polyester film		

Environmental aspects of manufacturing

The supplied components are mainly transported in reusable packaging. The packaging material itself is reusable, mainly comprising cardboard.

With the exception of the housing, surface coatings are not used.

The manufacturing facility produces no emissions.

Materials for manufacturing purposes are identified in accordance with their recyclability. This applies, in particular, to components which contain unavoidable, hazardous materials. These components are installed or mounted in such a way that they can be easily separated, thus facilitating disposal in an environmentally-friendly manner. Wherever possible, recycled components are used.

Despatch

Environmentally-compatible packaging materials are used for shipping and storage. If possible we pack our products in reusable packaging.

Environmental aspects of disposal

The unit can be disassembled into recyclable mechanical components by means of easily removed screw and snap-on fixings.

The boards can be sent for thermal recycling. The proportion of components that contain dangerous substances is minimal.

We have already made preparations to enable the converters to be disposed of after use in accordance with the regulations governing the disposal of electronic equipment (not yet in force).

This catalog is printed on chlorine-free bleached paper.

Appendix

Certificates

Siemens companies and representatives inside Europe

Albania
BINDI sh. p. k.
Tirana

Armenia
Representative of Siemens AG
Yerevan

Austria
Siemens AG Österreich
Vienna
Bregenz
Deutschlandsberg
Eisenstadt
Graz
Innsbruck
Klagenfurt
Klosterneuburg
Linz
Salzburg
St. Pölten
Villach

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Baku

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Representative of Siemens AG
Minsk

Belgium
Siemens S. A.
Brussels
Antwerpen
Boussu
Colfontaine
Dilsen-Stokkem
Gent
Haasrode
Herentals
Huizingen
Liège
Namur
Oostkamp
Zaventem

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Siemens AG Representative in Bulgaria
Sofia

Croatia
Siemens d.d.
Zagreb

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GEVO Ltd.
Nicosia

Czech Republic
Siemens s.r.o.
Prague
Brno
Děčín
Stříbro
Trutnov

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Siemens A/S
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Alborg
Brønshøj
Esbjerg
Hedensted
Højbjerg
Odense
Skensved
Tåstrup
Vejle

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Siemens Ltd.
Dublin

Estonia
AS Siemens
Tallinn

Finland
Siemens
Osakeyhtiö
Espoo
Helsinki

France
Siemens S. A. S.
Saint-Denis
Bihorel
Caluire-et-Cuire
Cesson Sévigné
Dijon
Haguenau
La Garenne Colombes
La-Suze-sur-Sarthe
Lesquin
Les Ulis
Lissess
Lormont
Marseille
Mérignac
Metz
Montrouge
Molsheim
Nanterre
Nantes
Nice
Pantin
Paris La Défense
Reims
Saint-Denis
Saint-Quentin
Strasbourg
Toulouse

Georgia
Representative of Siemens AG
Tbilisi

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Siemens plc
Bracknell
Beeston
Belfast
Bellshill
Birmingham
Bristol
Camberley
Cambridge
Chessington
Christchurch
Clevedon
Corby
Congleton
Crawley
Cumbernauld
East Kilbridge
Fareham
Glasgow
Hemel Hempstead
Hounslow
Ilford
Isle of Wight
London
Luton
Manchester
Milton Keynes
Newcastle-upon-Tyne
Oldham
Oxford
Poole
Purley
Romsey
Telford
Wellingborough
Wembley

Greece
Siemens A. E.
Athen, Amaroussio
Acharnes
Thessaloniki
Vassiliko Evias

Hungary
Siemens Rt.
Budapest
Bicske
Cegled
Szombathely

Iceland
Smith & Nordland HF
Reykjavik

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Milano
Bari
Bologna
Brescia
Cagliari
Casoria
Cassina de Pecchi
Fanglia
Firenze
Genova
Napoli
Padova
Palermo
Pescara
Roma
Torino
Verona

Latvia
Siemens S/A
Riga

Lithuania
Lietuvos ELTIKA
Vilnius
Klaipeda

Luxembourg
Siemens S. A.
Luxembourg-Hamm

Macedonia
SITAI d.o.o.
Skopje

Malta
J.R.D. SYSTEMS Ltd.
Harun

Moldavia
Siemens s.r.l.
Chisinau

Netherlands
Siemens Nederland N. V.
Den Haag
Alphen a/d Rijn
Zoetermeer

Norway
Siemens A/S
Oslo
Fyllingsdalen
Trondheim

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Siemens Sp.z.o.o.
Warsaw
Gdañsk-Wrzeszcz
Katowice
Kratów
Poznań
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Lisbon
Amadora
Albufeira
Carnaxide
Coimbra
Evora
Loures
Matosinhos Codex
Mem Martins
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Kaluga
Krasnodar
Novosibirsk
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Tbilissi
Tjumen
Tomsk
Ufa
Vladivostok

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Dolný Kubin
Horná Streda
Michalovce
Nitra
Nové Zámky
Trnava

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Palma de Mallorca
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Valencia
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Zaragoza

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Göteborg
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Kista
Malmö
Solna
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Siemens Schweiz AG
Zürich
Adliswil
Basel
Bioggio
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Fahrweid
Winterthur-Töss

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Alsancak-Izmir
Ayazag-Istanbul
Beşiktaş-Istanbul
Bursa
Cerkezköy-Tekikdag
Kartal-Istanbul
Kavaklidere-Ankara
Mecidiyeköy-Istanbul
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Samsun

Ukraine
Representative of Siemens AG
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Charkiw
Odessa
Wischgorod

Yugoslavia
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Beograd

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Siemens companies and representatives outside Europe

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Escritório de Representacão da Siemens em Angola
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Gaborone
Iwaneng

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Kinshasa

Côte d'Ivoire
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Siemens Limited
Cairo-Mohandessin
Smouha Alexandria

Centech
Cairo-Zamalek

Ethiopia
Siemens (Pvt)
Addis Abeba

Ghana
Impromex ACCRA
Accra

Guinea
André & Cie. S. A.
Lausanne

Kenya
Siemens Communications Ltd.
Nairobi

Lesotho
Range Telecommunication Systems (Pty) Ltd
Maseru

Libya
Siemens A. G. Branch Libya
Tripoli

Malawi
Ecolectric Ltd.
Blantyre

Mauritius
Ireland Blyth Ltd
Port Louis

Morocco
SETEL
Société Electrotechnique
et de Télécommunication S. A.
Casablanca

Mosambique
Siemens Limitada
Maputo

Namibia
Siemens (Pty.) Ltd.
Windhoek

Nigeria
Siemens Limited
Lagos
Abuja
Kaduna

Republic of South Africa
Siemens Ltd.
Halfway House
Centurion
Isando
Pretoria
Springs
Woodmead

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National Electrical
Commercial Co.
Khartoum

Swaziland
Siemens (Pty) Ltd
Matsapha

Tansania
Tanzania Electrical Services Ltd.
Dar-es-Salaam

Tunesia
Siemens Bureau de Liaison
Tunis

Zambia
Siemens (Z) Ltd.
Kitwe
Lusaka

Zimbabwe
Siemens (Pvt.) Ltd.
Harare
Alexandra Park

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San Martin
Bahia Blanca
Córdoba
Las Heras
Mar del Plata
Rosario
Boulogne sur Mer

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Sociedad Comercial é Industrial Hansa Ltda.
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Curitiba
Florianópolis
Fortaleza
Fravatai
Jaboatao dos Guararapes
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Pôrto Alegre
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Rio de Janeiro
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Dartmouth
Drummondville
Edmonton
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Mount Pearl
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Saçkatoon
Sherbrooke
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Quito
Guayaquil

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Siemens S. A.
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Managua

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Siemens S. A.
Panama

Paraguay
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Maracaibo
Perto Ordaz
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Gurgaon
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Nashik
Navi Mumbai
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Iraq
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Siemens S.S.K.
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Amman

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Almaty

Kirghizstan
Representative of Siemens AG
Bischkek

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Seoul
Changwon
Kyungki-Do

Kuwait
National & German Electrical and
Electronic Services Co.
(NGEECO)
Kuwait

Lebanon
Siemens AG Lebanon Branch
Beyrouth

Malaysia
Siemens Electrical
Engineering Sdn. Bhd.
Petaling Jaya
Kuala Lumpur
Kajang

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Siemens Ltd.
Yangon

Nepal
Amatya Enterprises (Pvt.) Ltd.
Kathmandu

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Muscat Branch
Ruwi
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Quetta

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Chuzhou
Dalian
Fuqing
Fuzhou
Guangzhou
Hangzhou
Jilin
Jinan
Nanhai
Nanjing
Panyu
Rizhao
Shanghai
Shenyang
Shenzhen
Suzhou
Tianjin
Wuhan
Wuxi
Xi'an
Xiaogan City
Zibo

Philippines
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Makati City
Pasig City
Cebu
Davao City

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Arabian Construction
Engineering Company
Doha

Saudi Arabia
Arabia Electric Ltd. (Equipement)
Jeddah
Al Khobar
Riyadh

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Singapore

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Dimo Limited
Colombo

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Damascus Branch
Dasmascus

Taiwan
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Taipei
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Kaohsiung
Taoyuan Hsien

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Siemens Limited
Bangkok
Rayong

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Representative of Siemens AG
Aschgabad

Uzbekistan
Representative of Siemens AG
Taschkent

United Arab Emirates
Siemens Resident Engineers
Dubai
Abu Dhabi

Vietnam
Siemens AG Representation
Hanoi
Ho Chi Minh City

Yemen
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Sanaa
Aden

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Siemens Ltd.
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Adelaide
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Brisbane
Gladesville
Milton
Pennant Hills
Perth
Silverwater
St. Leonards
Sydney

New Zealand
Siemens (NZ) Limited
Auckland
Wellington

A&D in the WWW

A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

The Siemens Automation and Drives Group (A&D) has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

http://www.siemens.de/automation

you will find everything you need to know about products, systems and services.

Product Selection Using the Interactive Catalogs

Detailed information together with convenient interactive functions:
The interactive catalogs CA 01 and ET 01 cover more than 80,000 products and thus provide a full summary of the Siemens Automation and Drives product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives. All information is linked into a user interface which is easy to work with and intuitive.

After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the interactive catalogs can be found in the Internet under

http://www.siemens.de/automation/ca01

or on CD-ROM.

Automation and Drives, CA 01
Order No.:
E86060-D4001-A110-B4-7600

Electrical installation technology, ET 01
Order No.:
E86060-D8200-A107-A2-7600

Easy Shopping with the Siemens Mall

The Siemens Mall is the virtual department store of Siemens AG in the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

Please visit the Siemens Mall on the Internet under:

http://www.siemens.de/automation/mall

Customer Support Automation and Drives

Whether you need a service expert or a spare part, a product specialist for advice, or if you just have a query, then the Customer Support is the address for you –the team that meets all your needs!

Helpline for Service and Support

You need help but do not know who to address. We take care that help is on the way quickly.

The helplines ensure that the right specialist in your vicinity will be of skilled assistance to you. The Helpline e.g. for Germany helps in German and English 24 hours/day, 365 days/year.

Tel.: 0180 50 50 111

Online Support

Our Online Support guarantees quick and efficient assistance – around the clock, worldwide and in five languages.

The Online Support offers all technical information:

- FAQs, tips & tricks, downloads and news
- Free manuals
- Useful programs and software – payment through SIMATIC Card

http://www.siemens.de/automation/service&support

Field Service

Your system is installed and now you need quick on-site help. We have the specialists with the know-how you require, worldwide and at hand.

Thanks to our comprehensive service network, we are able to realize short response times – with competence, reliability, and speed.

You can request an expert in Germany 24 hours/day and 365 days/year.

Tel.: 0180 50 50 444 [1])

Of course we offer also service contracts customized to your requirements. Your Siemens Office is always at your disposal.

Spare Parts and Repairs

Our worldwide network of local spare parts stocks and repair centers react with speed and reliable logistics.

For requests about repairs or spare parts please call the following telephone number (in Germany):

Tel.: 0180 50 50 446 [1])

Outside the office hours and on weekends, dial this number for our spare parts stand-by service.

Technical Support

Technical support with using our products, systems and solutions in the field of automation and drives is available in English and German. Capable, trained and experienced specialists also offer Teleservice and Video Conferencing for particularly difficult problems.

FreeContact – the route to technical support free of charge:

- European and African time zones

Tel.: +49 (0)180 50 50 222
Fax: +49 (0)180 50 50 223
E-mail: techsupport@ad.siemens.de
Mo.-Fr.: 7:00 to 17:00 (CET)

- USA time zones

24h hotline toll-free: +1 (0)800 241-4453
Tel.: +1 (0)770 740-3505
Fax: +1 (0)770 740-3396
E-mail: drives.support@sea.siemens.com
Mo.-Fr.: 8:00 to 20:00
(local time: Eastern Time)

- Asian/Australian time zones

Tel.: +65 (0)740-7000
Fax: +65 (0)740-7001
E-mail: drives.support@sae.siemens.com.sg
Mo.-Fr.: 8:30 to 17:30
(local time: Singapore)

1) Germany only, for local "Länder" telephone numbers visit: http://www.siemens.de/automation/service&support

Knowledge base on CD-ROM

A copy of the free-of-charge information sector is available on CD-ROM (Service & Support Knowledge Base) for applications without an online connection to the Internet. This CD-ROM contains all current product information at the time of production (FAQs, downloads, tips & tricks, updates) as well as general information on service and technical support.

The CD-ROM also contains a full-text search and our Knowledge Manager to permit specific searching for solutions. The CD-ROM is updated every 4 months.

Just like our online offer on the Internet, the CD-ROM with the Service & Support Knowledge Base is completely available in 5 languages (German, English, French, Italian, Spanish).

You can order the CD-ROM **Service and Support Knowledge Base** from your Siemens partner.

Order No.
6ZB5310-0EP30-0BA1

Ordering on the Internet (using SIMATIC Card or credit card) at:

http://www.siemens.de/automation/service&support

in the Shop sector.

SIMATIC Card

You can use the SIMATIC Card to purchase a service credit. With this credit you are able to use the charged technical support services (FastContact, ServiceLine), or purchase software products and example applications on the Internet.

The SIMATIC Card basically functions like a telephone card.

You can access your credit using the SIMATIC Card number and the SIMATIC Card PIN (both numbers are present on the rear of your SIMATIC Card or are sent to you by e-mail in advance when you purchase the CARD on the Internet).

You can view your SIMATIC Card account statement on the Internet at:

http://www.siemens.de/automation/simatic-card

You can order the **SIMATIC Card** in the following manners:

From your Siemens partner

SIMATIC Card	
Units	Order No.
200	**6ES7 997-0AA00-0XA0**
500	**6ES7 997-0AB00-0XA0**
1000	**6ES7 997-0AC00-0XA0**

Validity: 2 years from date of purchase

On the Internet

In conjunction with a credit card, it is possible to use the SIMATIC Card immediately:

http://www.siemens.de/automation/simatic-card

Appendix

Conditions of sales and delivery, export regulations

In Germany

Subject to the General Conditions of Sale as well as the General Conditions of Supply and Delivery for Products and Services of the Electrical and Electronics Industry.

For Export

Subject to the General Conditions of Supply and Delivery for Products and Services of the Electrical and Electronics Industry and to any other conditions agreed upon with the recipients of catalogs/ price lists.

■

Software products are subject to the General Licence Conditions for Software Products for Automation and Drives.

■

Prices are listed in € (Euro) ex delivery point, excluding packaging.

Turnover tax (VAT) is not included in the prices. It will be added according to legal provisions at the applicable rate.

We reserve the right to adjust prices and shall charge the prices applying on the date of delivery.

Notes

All dimensions in this catalog/price list are in mm. The illustrations are for reference only.

We reserve the right to make changes, in particular to the specified values, dimensions and weights, unless specified otherwise on the individual pages of this catalog/price list.

Export regulations

The products listed in this catalog/price list may be subject to European/German and/or US export provisions.

Any export requiring approval is therefore subject to authorization by the relevant authorities.

For the products listed in this catalog/price list, the following export regulations must be adhered to in accordance with currently valid regulations.

AL	Number of the German export list Products with a code other than “N” must be approved for export. The export codes of the respective data medium must also be adhered to for software products. Goods labeled with “AL not equal to N” are subject to European or German export authorization when being exported out of the EU.
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The AL and ECCN export codes specified in our confirmations, delivery notes and invoices apply.

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Siemens AG
Automation & Drives, Large Drives
Postfach 4743
D-90025 Nürnberg
Germany
http://www.siemens.de/automation/ld

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Catalogs of the Automation and Drives Group (A&D)

Further information can be obtained from our branch offices listed in the appendix of this catalog

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Components for Sample Preparation	PA 11
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SIMATIC PCS Process Control System	ST 45
SIMATIC S5/PC/505 Automation Systems	ST 50
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Siemens AG
Automation and Drives, Large Drives
Postfach 47 43
D-90025 Nürnberg
Germany

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