

SIMOREG DC-MASTER

Operating Instructions

6RA70 Series

Microprocessor-Based Converters from 6kW to 2500kW
for Variable-Speed DC Drives



These Operating Instructions are available in the following languages:

Language	German	French	Spanish	Italian
Order No.	6RX1700-0AD00	6RX1700-0AD77	6RX1700-0AD78	6RX1700-0AD72

Converter software version:

As these Operating Instructions went to print, SIMOREG DC-MASTER converters were being delivered from the factory with software version **3.1** installed.

These Operating Instructions also apply to other software versions.

Earlier software versions: Some parameters described in this document might not be stored in the software (i.e. the corresponding functionality is not available on the converter) or some parameters will have a restricted setting range. If this is the case, however, appropriate reference to this status will be made in the Parameter List.

Later software versions: Additional parameters might be available on the SIMOREG DC-MASTER (i.e. extra functions might be available which are not described in these Operating Instructions) or some parameters might have an extended setting range. In this case, leave the relevant parameters at their factory setting, or do not set any parameter values which are not described in these Instructions !

The software version of the SIMOREG DC-MASTER can be read in parameters r060 and r065.

The latest software version is available at the following Internet site:

<http://www4.ad.siemens.de/view/cs/en/8479576>

CAUTION

Before updating your software, find out the product state of your SIMOREG device. You will find this on the rating plate (field on the bottom left-hand side "Prod. State").

Prod. State = A1,A2 (devices with the CUD1 electronics board, version C98043-A7001-L1-xx):
It is only permissible to load software versions 1.xx and 2.xx.

Prod. State = A3 (devices with the CUD1 electronics board, version C98043-A7001-L2-xx):
It is only permissible to load software versions 3.xx.

The reproduction, transmission or use of this document or contents is not permitted without express written authority. Offenders will be liable for damages. All rights, including rights created by patent grant or registration of a utility model or design, are reserved.

We have checked that the contents of this publication agree with the hardware and software described herein. Nonetheless, differences might exist and therefore we cannot guarantee that they are completely identical. The information given in this publication is reviewed at regular intervals and any corrections that might be necessary are made in the subsequent printings. Suggestions for improvement are welcome at all times.

SIMOREG ® is a registered trademark of Siemens

3.6 Certification

ISO 9001:

The products referred to in this document are manufactured and operated in accordance with DIN ISO 9001 (Certificate Register No.: 257-0).

UL:

Certificate No. E203250

All devices with a rated supply voltage of ≤ 575 V have been certified, except for order number 6RA7096-4GS22-5.

Ship-building:

	Certificate No.
Germanischer Lloyd	26 071 - 05 HH
Lloyd's Register	06 / 20053
American Bureau of Shipping	06HG196689-PDA
Det Norske Veritas	E-7925

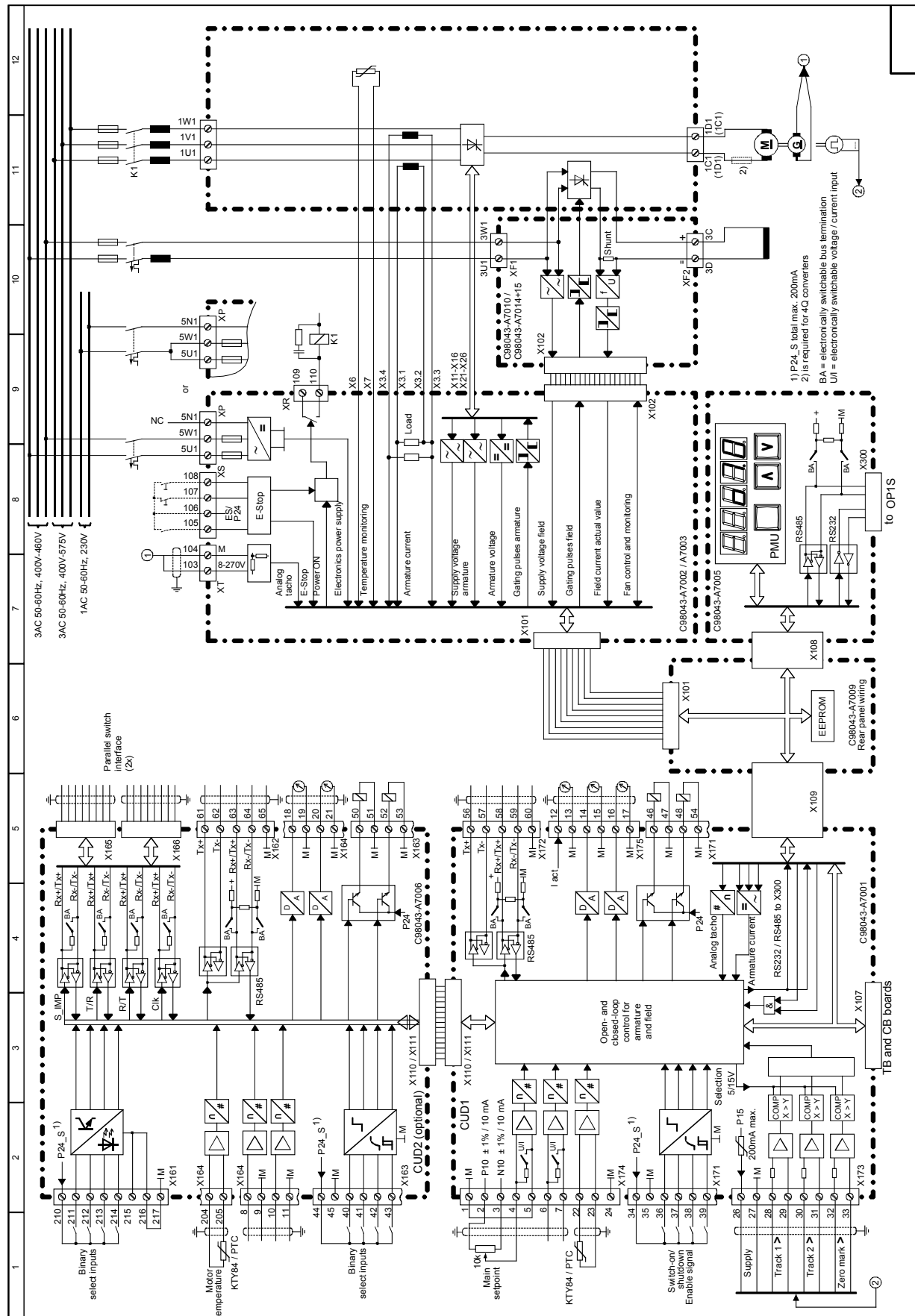
Information on the necessary measures can be found in the CD-ROM package "SIMOREG DC-MASTER documentation" – order number 6RX1700-0D64 (CD1 from issue 24 onwards) or in the Internet at <http://support.automation.siemens.com/WW/view/de/24063215>

3.7 Abbreviations

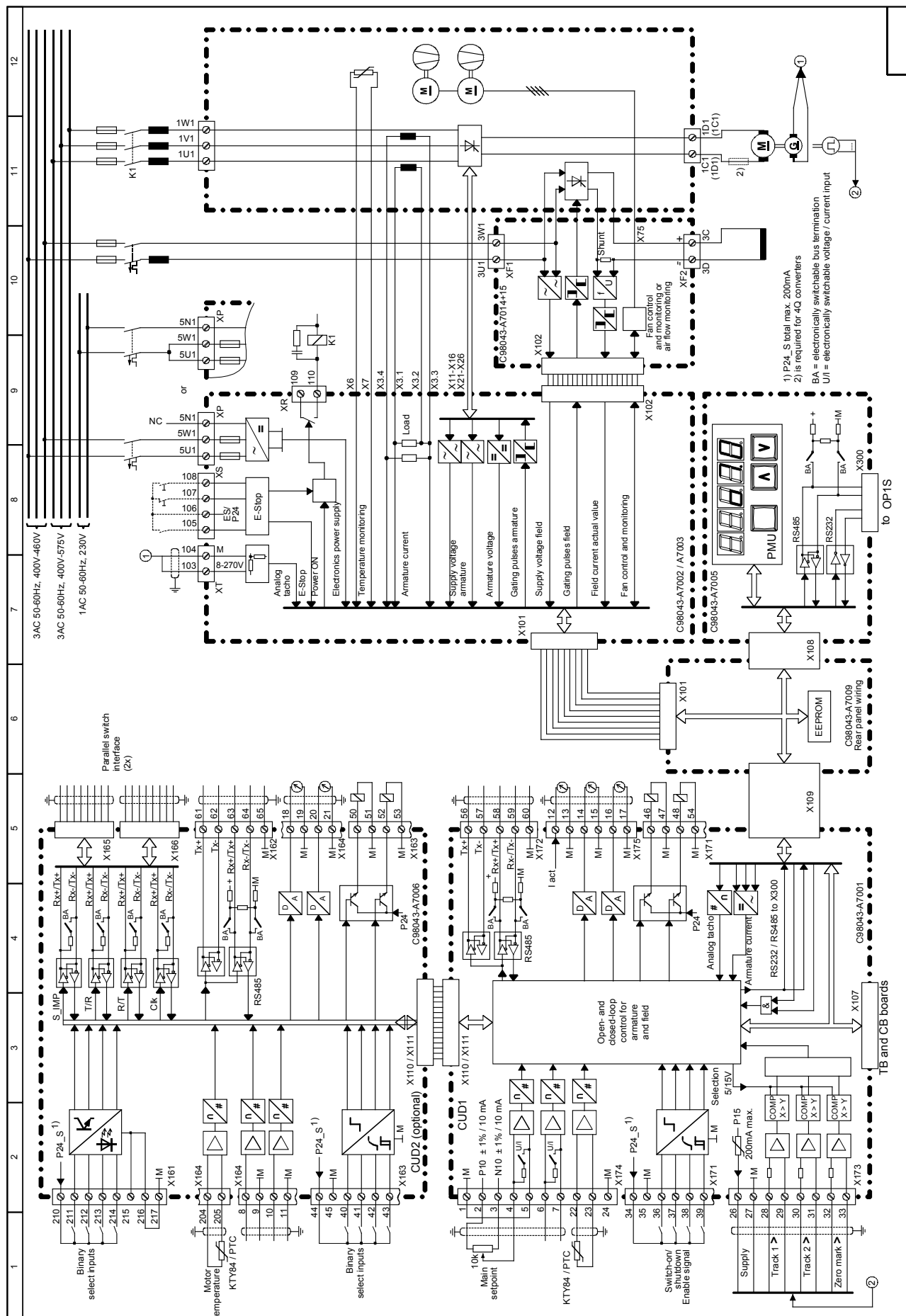
ADB	A dapter B oard, carrier for miniature-format supplementary boards
CAN	Field bus specification of user organization CiA (CAN in Automation) (C ontroller A rea N etwork)
CB	Supplementary C ommunication B oard
CBC	Supplementary board for CAN Bus link (C ommunication B oard C AN Bus)
CBD	Supplementary board for DeviceNet link (C ommunication B oard D eviceNet)
CBP2	Supplementary board for PROFIBUS link (C ommunication B oard P ROFIBUS)
COB	C ommunication O bject for CAN Bus communication
CUD1	Electronics board C98043-A7001 of SIMOREG DC-MASTER (C ontrol U nit / D irect Current)
CUD2	Terminal expansion board C98043-A7006 for CUD1
DeviceNet	Field bus specification of ODVA (Open DeviceNet Vendor Association)
DP	D istributed P eripherals
EB1	Supplementary board with additional inputs/outputs (E xpansion B oard 1)
EB2	Supplementary board with additional inputs/outputs (E xpansion B oard 2)
GSD file	Device master data file defining the communication features of the PROFIBUS communication board
ID	I dentifier for CAN Bus communication
IND	Parameter I ndex
LBA	Connection module for mounting supplementary modules (L ocal B us A dapter)
LWL	Fiber-optic cable
MSAC_C1	Designation of a transmission channel for PROFIBUS (Master Slave Acyclic / Class 1)

6.2 Block diagram with recommended connection

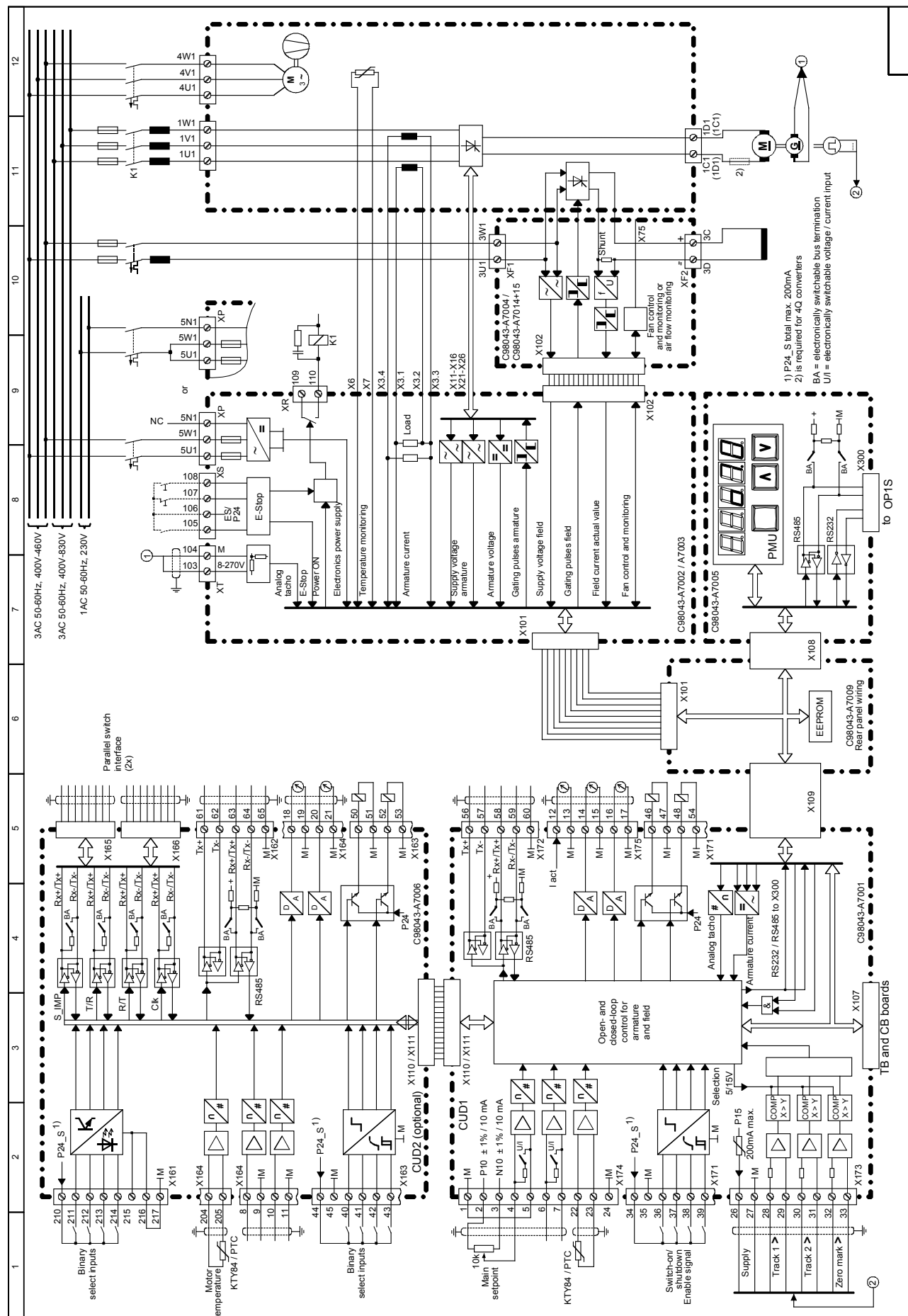
6.2.1 Converters: 15A to 125A



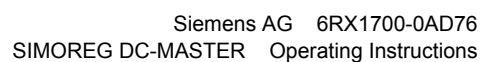
6.2.2 Converters: 210A to 280A



6.2.3 Converters: 400A to 3000A with a 3-phase fan

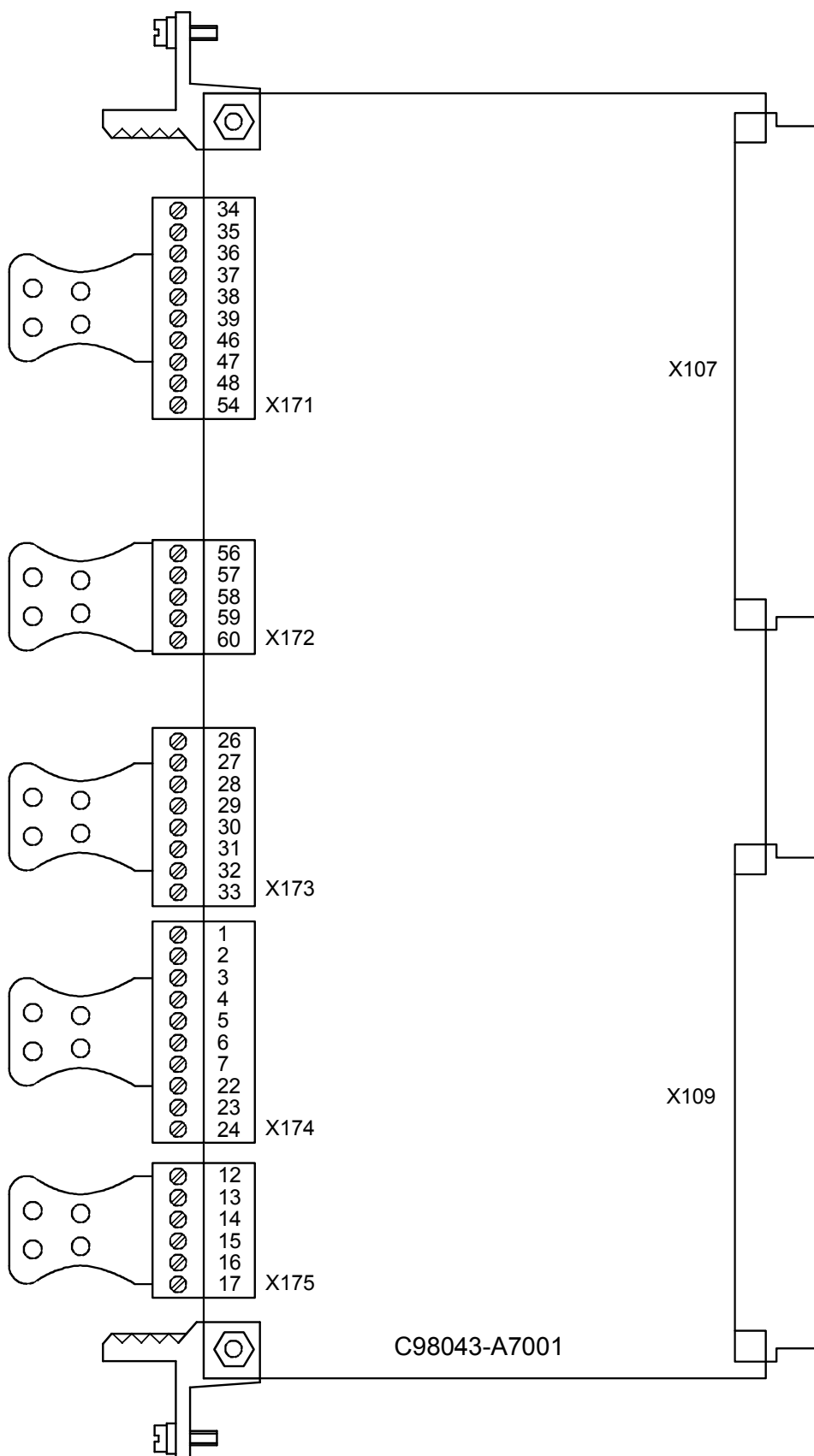


6-20



6.7 Terminal arrangement

Module C98043-A7001 (CUD1)



Open-loop and closed-loop control sectionTerminal type: **X171 to X175**Plug-in terminal (screw-type)
Maximum connection cross-section 1.5mm²**XR, XS, XT**MSTB2.5 plug-in terminal
Maximum connection cross-section 2.5mm²**Analog inputs - setpoint inputs, reference voltage** (see also Section 8, sheet G113)

Module C98043-A7001 (CUD1)

Function		Terminal X174	Connection values/Remarks
Reference	M	1	} $\pm 1\%$ at 25°C (stability 0.1% per 10°K); 10mA short-circuit-proof
	P10	2	
	N10	3	
Select input	main setpoint +	4	Input type (signal type) parameterizable: - Differential input $\pm 10V$; 150k Ω - Current input 0 - 20mA; 300 Ω or 4 - 20mA; 300 Ω Resolution can be parameterized up to approx. 555 μV (± 14 bit) Common mode suppression: $\pm 15V$
	main setpoint -	5	
Select input	analog 1 +	6	
	analog 1 -	7	

Analog inputs - actual speed inputs, tacho inputs (see also Section 8, sheet G113)

Module C98043-A7002 or A7003 power interface

Function	Terminal XT	Connection values/Remarks
Tacho connection 8V to 270V	103	$\pm 270V$; >143k Ω
Ground analog M	104	

Pulse encoder input (see also Section 8, sheet G145)

Module C98043-A7001 (CUD1)

Function	Terminal X173	Connection values/Remarks
Supply (+13,7V to +15,2V)	26	200mA; short-circuit-proof (electronic protection) Overload response: Fault message F018 Warning signal A018
Ground pulse encoder M	27	
Track 1 Positive terminal	28	Load: $\leq 5.25\text{mA}$ at 15V
Track 1 Negative terminal	29	(w/o switching losses, see below for cable, cable length, shield connection)
Track 2 Positive terminal	30	Switching hysteresis: See below
Track 2 Negative terminal	31	Pulse/pause ratio: 1:1
Zero marker Positive terminal	32	Level of input pulses: See below
Zero marker Negative terminal	33	Track offset: Table 1 see below Pulse frequency: Table 2 see below Cable length: See below

Characteristic data of pulse tacho evaluation electronics**Level of input pulses:**

Encoder signals (symmetrical and asymmetrical) up to a max. 27V differential voltage can be processed by the evaluated electronics.

Electronic adaptation of evaluation electronics to signal voltage of encoder:

- Rated input voltage range **5V** P142=0:
 Low level: Differential voltage $< 0.8\text{V}$
 High level: Differential voltage $> 2.0\text{V}$
 Hysteresis: $> 0.2\text{V}$
 Common-mode control range: $\pm 10\text{V}$
- Rated input voltage range **15V** P142=1:
 Low level: Differential voltage $< 5.0\text{V}$
 High level: Differential voltage $> 8.0\text{V}$ Restriction: See switching frequency
 Hysteresis: $> 1\text{V}$
 Common-mode control range: $\pm 10\text{V}$

If the pulse encoder does not supply symmetrical encoder signals, then its ground must be routed as a twisted-pair lead with every signal cable and connected to the negative terminals of track 1, track 2 and the zero marker.

Switching frequency:

The maximum frequency of the encoder pulses is 300kHz. To ensure correct evaluation of the encoder pulses, the minimum distance $T_{\min}$ between two encoder signal edges (tracks 1 and 2) specified in the table must be observed:

Table 1:

	Rated input voltage 5V		Rated input voltage 15V		
Differential voltage ¹⁾	2V	$> 2.5\text{V}$	8V	10V	$> 14\text{V}$
$T_{\min}$ ²⁾	630ns	380ns	630ns	430ns	380ns

1) Differential voltage at terminals of evaluation electronics

2) The phase error L_G (deviating from 90°), which may occur as the result of encoder and cable, can be calculated from $T_{\min}$:

$$L_G = \pm (90^\circ - f_p \cdot T_{\min} \cdot 360^\circ)$$

L_G = phase error

f_p = pulse frequency

$T_{\min}$ = minimum distance between edges

This formula applies only if the encoder pulse ratio is 1:1.

If the pulse encoder is incorrectly matched to the encoder cable, disturbing cable reflections will be produced at the receive end. These reflections must be damped so that the encoder pulses can be correctly evaluated. The limit values listed in the table below must be maintained to ensure that the resultant power loss in the adapting element of the evaluation electronics is not exceeded.

Table 2:

$f_{\max}$	50kHz	100kHz	150kHz	200kHz	300kHz
Differential voltage ³⁾	Up to 27V	Up to 22V	Up to 18V	Up to 16V	Up to 14V

3) Differential voltage of encoder pulses at no load
(approximate encoder power supply voltage)

Cable, cable length, shield connection:

The encoder cable capacitance must be recharged at each encoder edge change. The RMS value of this current is proportional to the cable length and the pulse frequency and must exceed the current specified by the encoder manufacturer. A suitable cable as recommended by the encoder manufacturer must be used. The maximum cable length must not be exceeded. Generally, a twisted cable pair with common pair shield is sufficient for each track. Crosstalk between the cables is thus reduced. The shielding of all pairs protects against noise pulses. The shield must be connected to the shield bar of the SIMOREG converter over the largest possible surface area.

Temperature sensor inputs (motor interface 1) (see also Section 8, sheet G185)

Module C98043-A7001 (CUD1)

Function	Terminal X174	Connection values/Remarks
Motor temperature	22	Sensor acc. to P490 index 1
Connection of the temperature sensor	23	The cable to the temperature sensor on the motor must be shielded and connected to ground at both ends.
Ground analog M	24	

Analog outputs (see also Section 8, sheet G115)

Module C98043-A7001 (CUD1)

Function	Terminal X175	Connection values/Remarks
Actual current	12	0. . . ±10V corresponds to 0. . . ±200%
Ground analog M	13	Converter rated DC current (r072.002) Max. load 2mA, short-circuit-proof
Select output analog 1	14	0. . . ±10V, max. 2mA
Ground analog M	15	short-circuit-proof
Select output analog 2	16	Resolution ±11bits
Ground analog M	17	

Binary control inputs (see also Section 8, sheet G110)

Module C98043-A7001 (CUD1)

Function	Terminal X171	Connection values/Remarks
Supply (output)	34	24V DC, short circuit proof max. load 200mA (terminals 34, 44, and 210 combined), internal supply with respect to internal ground
Ground digital M	35	Overload response: Error signal F018 Warning signal A018
Select input binary 1	36	H signal: +13V to +33V L signal: – 33V to +3V or terminal open 8.5mA at 24V
Power On / Shutdown H signal: Power ON Line contactor CLOSED + (with H signal at terminal 38), acceleration along ramp- function generator ramp to operating speed. L signal: Shutdown Deceleration along ramp- function generator ramp to $n < n_{\min}$ (P370) + , controller disable + line contactor OPEN. See Section 9.3 for exact function description.	37	
Enable operation H signal: Controller enabled L signal: Controller disabled See Section 9.3.4 for exact function description	38	
Select input binary 2	39	

Safety shutdown (E-STOP) (see also Section 9.8 and Section 8, sheet G117)

Module C98043-A7002 or A7003 power interface

Function	Terminal XS	Connection values/Remarks
Supply for safety shutdown (output)	106	24V DC, max. load 50mA, short-circuit-proof Overload response: Error signal F018 Warning signal A018
Safety shutdown switch	105	$I_e = 20\text{mA}$
Safety shutdown pushbutton	107	NC contact $I_e = 30\text{mA}$
Safety shutdown Reset	108	NO contact $I_e = 10\text{mA}$

NOTICE

Both 105 + 106 terminals or 106, 107 + 108 terminals can be used! Combined use of terminals 105 – 108 will result in a malfunction.

Terminal 105 is connected to terminal 106 in the state as delivered.

Binary control outputs (see also Section 8, sheet G112)

Module C98043-A7001 (CUD1)

Function	Terminal X171	Connection values/Remarks
Select output binary 1 Ground M	46 47	H signal: +20V to +26V L signal: 0 to +2V Short-circuit-proof 100mA
Select output binary 2 Ground M	48 54	Internal snubber circuit (free-wheeling diode) Overload response: Error signal F018 Warning signal A018

Binary control outputs (isolated relay outputs)

Module C98043-A7002 or A7003 power interface

Function	Terminal XR	Connection values/Remarks
Relay for line contactor	109 110	Load capability: ≤250V AC, 4A; cosΦ=1 ≤250V AC, 2A; cosΦ=0,4 ≤30V DC, 2A External fuse protection max. 4A, characteristic C recommended

Serial interface 1 RS232 (9-pin SUBMIN D socket connector) (G-SST1)**X300****Use a shielded connecting cable! Ground shield at both ends!**

Module C98043-A7005 PMU

Con. pin X300	Function
1	Housing earth
2	Receive cable to RS232 (V.24) standard
3	Send and receive cables to RS485, two-wire, positive differential input/output
4	Input: Reserved for later use
5	Ground
6	5 V voltage supply for OP1S
7	Send cable to RS232 (V.24) standard
8	Send and receive cables to RS485, two-wire, positive differential input/output
9	Ground

Cable length: Up to 15m according to EIA Standard RS232C
Up to 30 m capacitive load, max. 2.5nF (cable and receiver)

A serial connection to a PLC or PC can be made using connector X300 on the PMU, allowing the converter to be controlled and operated from a central control center or room.

Serial interface 2 RS485 (G-SST2)

Module C98043-A7001 (CUD1)

Function	Terminal X172	Connection values/Remarks
TX+	56	RS485, 4-wire send cable, positive differential output
TX-	57	RS485, 4-wire send cable, negative differential output
RX+/TX+	58	RS485, 4-wire receive cable, positive differential input, 2-wire send/receive cable, positive differential input
RX-/TX-	59	RS485, 4-wire receive cable, negative differential input, 2-wire send/receive cable, negative differential input
M	60	Ground

Cable length: For transmission rate =187.5kBd $\Rightarrow$ 600m
 For transmission rate $\leq$ 93.75kBd $\Rightarrow$ 1200m

The following must be observed: DIN 19245 Part 1

The potential difference between the data reference potentials M of all interfaces must not exceed -7V / +12V. If this cannot be guaranteed, then equipotential bonding must be provided.

Activation of interface 1 or 2:

- Set the baud rate in parameter P783 or P793.
- Set the protocol in parameter P780 or P790.

7 Start-Up

7.1 General safety information for start-up



DANGER

Before commencing with start-up on the converters (90A to 600A), make sure that the transparent terminal cover is mounted in the correct position (see Section 5.1).

CAUTION

Before handling any boards (in particular, the A7001 electronics board), please make sure that your body is electrostatically discharged to protect electronic components against high voltages caused by electrostatic charges. The simplest way of doing this is to touch a conductive, grounded object (e.g. bare metal cabinet component immediately beforehand).

PCBs must not be allowed to come into contact with highly insulating materials (e.g. plastic foil, insulating table tops or clothing made of synthetic fibers).

PCBs may only be set down on electrically conducting surfaces.

Fault No.	Description	
	Cause as a function of fault value (r047.001, r949.001 or r949.009 with acknowledged error)	Further information (r047.002 to r047.016)
	Fault value:	
	1 Defective thyristor (short circuit in module V1, on 15A and 30 converters: V1 or V4)	
	2 Defective thyristor (short circuit in module V2, on 15A and 30 converters: V2 or V5)	
	3 Defective thyristor (short circuit in module V3, on 15A and 30 converters: V3 or V6)	
	4 Defective thyristor (short circuit in module V4, on 15A and 30 converters: V4 or V1)	
	5 Defective thyristor (short circuit in module V5, on 15A and 30 converters: V5 or V2)	
	6 Defective thyristor (short circuit in module V6, on 15A and 30 converters: V6 or V3)	
	8 Fault to ground in armature circuit	
	9 I=0 message defective Possible fault cause • Defective A7001 electronics board	
	11 Thyristor cannot be fired (X11)	
	12 Thyristor cannot be fired (X12)	
	13 Thyristor cannot be fired (X13)	
	14 Thyristor cannot be fired (X14)	
	15 Thyristor cannot be fired (X15)	
	16 Thyristor cannot be fired (X16)	
	17 2 or more thyristors (MI) cannot be fired Possible fault cause • Armature circuit interrupted	
	21 Thyristor cannot be fired (X21)	
	22 Thyristor cannot be fired (X22)	
	23 Thyristor cannot be fired (X23)	
	24 Thyristor cannot be fired (X24)	
	25 Thyristor cannot be fired (X25)	
	26 Thyristor cannot be fired (X26)	
	27 2 or more thyristors (MII) cannot be fired	
	31 Thyristor unable to block (X11 or X21)	
	32 Thyristor unable to block (X12 or X22)	
	33 Thyristor unable to block (X13 or X23)	
	34 Thyristor unable to block (X14 or X24)	
	35 Thyristor unable to block (X15 or X25)	
	36 Thyristor unable to block (X16 or X26)	

10.1.2.12 Internal faults

F062	Fault in parameter memory (active in all operating states) Software monitoring of correct functioning of the EEPROM module (non-volatile memory) on the A7009 board. The EEPROM values contains all data which must be protected in the case of a power failure (i.e. parameter values and process data which must remain stored during power failures). The following are monitored: ◆ Connection between the A7001 electronics board and the EEPROM on the A7009 backplane wiring assembly ◆ Whether the parameter values stored on the EEPROM are within the permissible value range ◆ Whether data are being correctly stored on the EEPROM. For this purpose, values are read and checked for correctness after they are transferred to the module ◆ Whether the checksum of the non-volatile process data in the EEPROM is correct Possible causes for all fault types: Excessive EMC-related interference is present (e.g. due to unprotected contactors, unscreened cables, loose shield connections)
-------------	---

Fault No.	Description	
	Cause as a function of fault value (r047.001, r949.001 or r949.009 with acknowledged error)	Further information (r047.002 to r047.016)
	Fault value:	r047 Index 002 to 016:
	1 Connection to EEPROM is faulty Possible fault causes • A7001 electronics board is defective • A7009 backplane wiring assembly is defective • Plug-in connection X109 is defective	
	2 Parameter value is outside permissible value range Possible fault causes • "Restore to default value" has never been executed with this software (e.g. after software replacement) • A7009 backplane wiring assembly is defective Possible remedy: • Acknowledge fault, execute "Restore to default value" and start up the drive again	i002 Number of faulty parameter i003 Index of faulty parameter i004 Faulty parameter value
	3 Parameter value cannot be stored on EEPROM Possible fault causes • A7001 electronics board is defective • A7009 backplane wiring assembly is defective • Plug-in connection X109 is defective	i002 Address of fault memory location i003 Faulty value in EEPROM i004 Correct parameter value
	11 Checksum of non-volatile data (part 1) is not correct 12 Checksum of non-volatile data (part 2) is not correct 13 Checksum of non-volatile data (part 3) is not correct 20 Checksum of configuring table of parameter values is not correct Possible fault causes • Defective EEPROM • "Restore to default value" has never been executed with this software (e.g. after software replacement) Possible remedy: • Acknowledge fault, execute "Restore to default value" and start up the drive again! Check interference suppression measures and improve if necessary. In the case of fault value 20, the factory setting is restored automatically	i002 Calculate checksum i003 Checksum found in EEPROM
F063	Errors in compensation data of analog inputs and outputs (active in all operating states)	
	This function monitors whether the factory-set compensation data for the analog inputs and outputs are plausible	
	Possible fault cause: ♦ Defective A7001 or A7006 electronics board	
	Fault value:	r047 Index 002 to 016:
	11 Incorrect number of words in compensation values for analog inputs and outputs of A7001	i002 Incorrect number of words
	12 Checksum error in compensation values for analog inputs and outputs of A7001	i002 Calculated checksum i003 Errored checksum
	13 Incorrect value among compensation values for analog inputs and outputs of A7001	i002 Incorrect value
	23 Incorrect value among compensation values for analog inputs and outputs of A7006	i002 Incorrect value

Fault No.	Description	
	Cause as a function of fault value (r047.001, r949.001 or r949.009 with acknowledged error)	Further information (r047.002 to r047.016)
F064	Watchdog timer has initiated a reset (active in all operating states) An internal microprocessor hardware counter monitors whether the program for calculating the firing pulses runs at least once every 14 ms (program is executed on average every 2.7 to 3.3 ms). If this is not the case, the counter initiates a reset, F064 is then displayed. Possible fault causes ◆ A7001 electronics board is defective ◆ Excessive EMC-related interference is present (e.g. due to unprotected contactors, unscreened cables, loose shield connections)	
F065	Illegal microprocessor status (active in all operating states) An internal microprocessor hardware function monitors the microprocessor for illegal operating states. Possible fault causes ◆ A7001 electronics board is defective ◆ Excessive EMC-related interference is present (e.g. due to unprotected contactors, unscreened cables, loose shield connections)	
F067	Converter cooling faulty (active in operating states of ≤ 013) The heatsink temperature monitoring function is activated 6s after connection of the electronics supply. (The current heat sink temperature is indicated at parameter r013 and on connector K050) Fault value:	
	1	Heatsink temperature > permissible heatsink temperature (depending on the MLFB)
	2	Heatsink temperature sensor is defective
	3	Converter fan is defective
	r047 Index 002 to 016: i002 Measured heatsink temperature (16384 .. 100°C) i003 Measured ADC value	
F068	Analog measuring channel faulty (main setpoint, main actual value or analog select input) (active in all operating states) Hardware monitoring of measuring circuits Possible fault causes • A7001 module defective • Measuring circuit saturated (input voltage at terminals 4 and 5 or 6 and 7 higher than approx. 11.3V)	
	Fault value:	
	1	Measuring channel for main setpoint / analog select input 1 faulty (terminals 4 and 5)
	2	Measuring channel for main actual value faulty (terminals 103 and 104)
	3	Measuring channel for analog select input 1 faulty (terminals 6 and 7)
F069	MLFB data are faulty (active in all operating states) Possible fault causes ◆ Excessive EMC-related interference is present (e.g. due to unprotected contactors, unscreened cables, loose shield connections) ◆ A7009 backplane wiring assembly is defective	
	Fault value:	
	1	MLFB code number (r070) = MLFB code number (r070) is illegal
	2	MLFB data checksum error
	3	Works number checksum error
	4	Number of words of MLFB data is incorrect

10.1.2.13 Communication errors with supplementary boards

F070	SCB1: Serious initialization error (active in all operating states) SCB1 and SCI cannot power up correctly (see diagnostic parameter n697 for details)
-------------	---

PNU	Description	Value range [Unit] Steps	No. indices Factory setting Type	See Change (Access / Status)
P826 (G163)	Correction of natural commutation timing If there is a variation in the armature current peak value (in spite of a constant firing angle), it can be corrected by offsetting the firing angle reference time of the appropriate line phase in parameter P826. One line phase (UV, UW, VW, VU, WU, WV) is assigned to each parameter index (i001 to i006). Increasing the parameter setting by a value of 1 corresponds to an increase of 1.333 µs in the firing angle (0.024 degrees at 50Hz line frequency), consequently reducing the armature current peak in the appropriate line phase. P826 is automatically set during the optimization run for precontrol and current controller (armature and field) (P051=25) (only when U800=0; when U800=1 or 2, parameters P826.001 to 006 are set to 0). Caution: Even an asymmetrical system causes variations in the magnitude of armature current peaks. However, the system asymmetry may also change.	-100 to 100 * 1.333 [µs] 1.333µs	Ind: 6 FS=0 Type: I2	P052 = 3 P051 = 40 Online
r827	Internal diagnosis i001: Number of write access operations to EEPROM i002: Number of Page-Write access operations to EEPROM i003: Counter for DUAL-PORT RAM timeouts	0 to 65535 1	Ind: 3 Type: O2	P052 = 3
r828	MLFB data These data contain details about the power section design (model)	0 to 65535 1	Ind: 16 Type: O2	P052 = 3
r829	A7001 compensation values These data contain compensation values for the analog section of electronics board A7001	0 to 65535 1	Ind: 68 Type: O2	P052 = 3

11.44 Thyristor diagnosis

P830 *	Control word for thyristor diagnosis 0 Thyristor check function deactivated 1 Thyristors are checked on initial SWITCH-ON or INCHING command after connection of the electronics supply voltage. 2 Thyristors are checked on every SWITCH-ON or INCHING command. 3 Thyristors will be checked on the next SWITCH-ON or INCHING command. Parameter P830 is set to 0 if no fault is detected. Note: The thyristor check function may not be activated (setting P830=0 must be selected) – when the "Enable a torque direction for torque direction change by parallel drive" function is in use (see also parameter P165) or – when the converter is used to supply large inductances (e.g. field supply from armature terminals, supply of lifting solenoids, etc.).	0 to 3 1	Ind: None FS=0 Type: O2	P052 = 3 P051 = 40 Offline
------------------	--	-------------	-------------------------------	----------------------------------

11.45 Parameters for DriveMonitor and OP1S

P831 to r849	Parameters for the Trace function of DriveMonitor These parameters are settings for the data exchange between DriveMonitor and the SIMOREG converter. They must <u>not</u> be changed!			P052 = 3
r850 to P899	Parameters for the OP1S These parameters are settings for the data exchange between OP1S and the SIMOREG converter. They must <u>not</u> be changed!			P052 = 3

13 Maintenance



WARNING

Hazardous voltage are present in this electrical equipment during operation.

A hazardous voltage may be present at the signaling relays in the customer installation.

Non-observance of the safety instructions can result in death, severe personal injury or substantial property damage.

When carrying out maintenance work on this converter, please read all safety instructions included in this section and attached to the product itself.



- Maintenance work on the converter may be carried out only by qualified personnel who are thoroughly familiar with all safety notices in this manual and with the installation, operating and maintenance instructions.
- Before carrying out visual checks and maintenance work, ensure that the AC power supply is disconnected and locked out and that the converter is grounded. Before the AC supply is disconnected, both converters and motors are at hazardous voltage levels. Even when the converter contactor is open, hazardous voltages are still present.
- The snubber capacitors might still be carrying hazardous voltage after isolation from the supply. For this reason, the converter must not be opened for at least two minutes after switch-off.

Only spare parts authorized by the manufacturer may be used.

The converter must be thoroughly protected against the ingress of dirt so as to prevent voltage flashovers and this irreparable damage. Dust and foreign bodies, and especially contamination drawn in through the cooling air flow, must be carefully removed at regular intervals depending on the degree of pollution, but at least once every 12 months. The converter must be cleaned with dry, compressed air, max. 1 bar, or with a vacuum cleaner.

Please note the following with respect to converters with forced air cooling:

The fan bearings are designed for a service lifetime of 30000 hours. The fans should be replaced in plenty of time in order to maintain the availability of the thyristor sets.

13.1 Procedure for updating software

CAUTION

Before updating your software, find out the product state of your SIMOREG device. You will find this on the rating plate (field on the bottom left-hand side "Prod. State").

Prod. State = A1,A2 (devices with the CUD1 electronics board, version C98043-A7001-L1-xx):
It is only permissible to load software versions 1.xx and 2.xx.

Prod. State = A3 (devices with the CUD1 electronics board, version C98043-A7001-L2-xx):
It is only permissible to load software versions 3.xx.

In the Internet at <http://support.automation.siemens.com/WW/view/de/10804957/133100>

a WINDOWS-based version of the loading program is available (HEXLOAD_WIN.EXE). This program is started by double clicking on it in step 5 of the procedure described below for updating software.

USB-RS232 interface converters are supported.