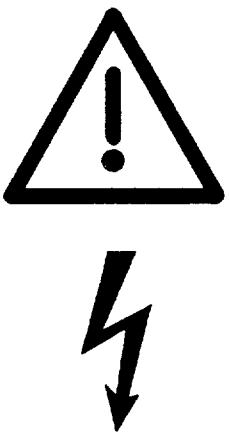
4 Maintenance

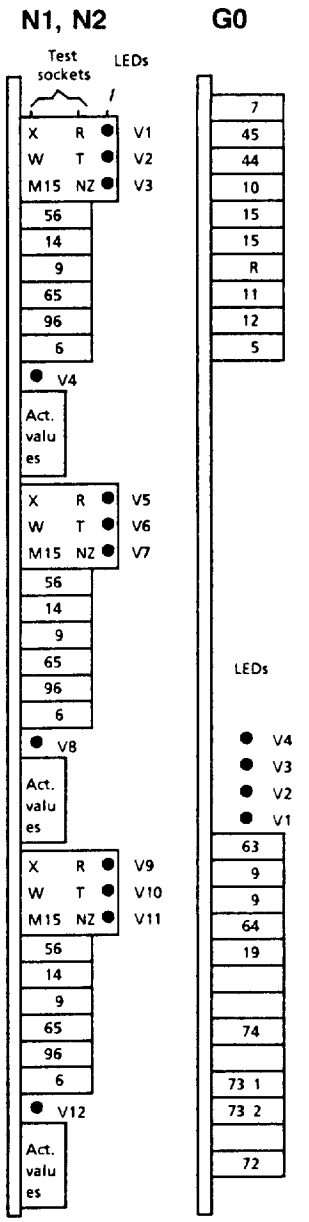


WARNING

Hazardous voltages are present in this electrical equipment during operation. Failure to properly maintain the equipment can result in death, severe personal injury or substantial property damage.

The instructions contained in this chapter and product labels have to be followed.

- Maintenance shall be performed only by qualified personnel.
- Always de-energize and ground the equipment before maintenance. The DC link capacitors cause high voltage to persist for approx. 4 minutes after disconnection from the supply.
  Parts of the equipment may be live even when the motor is stationary.
- Use only authorized spare parts in the repair of the equipment.



Modules for module slots N1, N2 and G0

4.1 Maintenance instructions

The transistor pulse-width-modulated inverter does not require any maintenance.

The bearings of the unit fans are permanently lubricated.

4.2 Faults

Type of fault	Displays	Meaning	Possible causes
Surface finish is poor or inaccurate positioning			Motor defective (e.g does not run smooth with low setpoints), P amplifier of speed controller set too low (potentiometer R125, R225, R325); mutual interference of axes (due to wrong shielding or wrong installation of earth wire)
Fuses blow	F10, F110 or F310 blow		Fault in power section, check motor **Remedial action:** Replace module
	F247 blows		Fault in power supply and monitoring system or in the DC link voltage monitoring circuit 0.3/30 kW (G10) **Remedial action:** Replace both modules

Table 4.1 a

Type of fault	Displays	Meaning	Possible causes
Axis does not move even though the reference value is applied to terminal 56	Green LED + G0-V4 lights up, red LEDs do not light up	No enabling signal at terminals 63 and/or 64	Customer's interlocking circuit activated R20, R21 disconnected
	No LED lights up		External main fuse blown or not inserted or power supply defective
	LED + G0-V1 lights up, red LEDs (N_o) do not light up + G0-V2 lights up	± 15 V out of tolerance or not available	
	+ G0-V3 lights up	Voltage of DC-link circuit too high	Supply voltage too high, load inertia too high, current limit mismatched
	Red LED + G0-V1 lights up Red LED + N_o-V1* lights up	Tacho monitoring circuit responded	Tacho or tacho cable defective
	Red LED + G0-V1 lights up Red LED + N_o-V2* lights up	Controller monitoring circuit responded (speed controller amplifier driven to maximum)	Motor line interrupted, mechanical system blocked, cable between motor and inverter de- fective, power section (A1 to A6) defective, ribbon cable between control and power section defective, motor winding connected in the wrong order
Axis moves, but unit is de-energized again	Red LED + G0-V1 lights up Red LED + G0-V3 lights up	Overvoltage in DC-link circuit during braking	Load inertia too high, current limit not matched to motor, motor speed exceeds rated speed, resistor for voltage limitation overloaded, no loading by frictional forces, vertical axis without weight balance.
	Red LED + G0-V1 lights up Red LED + N_o-V2* lights up	Accelerating or reversing too long (< 200 ms)	Current limitation set too low or load inertia too high
	Red LED + N_o-V3* lights up or Red LED + N_o-V4* lights up	I^2t-monitoring circuit responded Motor overtemperature circuit responded	Effective torque too high, ACC/DEC too often, machining forces too high, motor defective

Table 4.1 b

N_o = N1, N2
+ N_o-V1* ≙ + N_o-V1/-V5/-V9 ≙ Tacho monitoring + G0 - V1 ≙ Σ-fault
+ N_o-V2* ≙ + N_o-V2/-V6/-V10 ≙ Speed controller amplifier + G0 - V2 ≙ ± 15 V
+ N_o-V3* ≙ + N_o-V3/-V7/-V11 ≙ I^2t-monitoring + G0 - V3 ≙ $U_{DC\text{-}link}$ ≫
+ N_o-V4* ≙ + N_o-V4/-V8/-V12 ≙ Motor overtemperature + G0 - V4 ≙ Enablings

4.3 Spare parts

Function			Designation	Order No.
Power supply and monitoring			G0	6SC6100-0GA11
Power supply and monitoring including voltage limitation G10 (0.3/30 kW)			G0	6SC6100-0GB11
DC-link voltage limitation G20 (0.9/90 kW)			A0.2	6SC6100-0AB00
Resistor for G10, G20			-	6SY9058
Controller, analog	1 axis		N1, N2	6SC6100-0NA01
with	2 axes			6SC6100-0NA11
adjustment module	3 axes			6SC6100-0NA21
Adjustment module	1 axis		-	6SC6100-0SA01
separately	2 axes			6SC6100-0SA11
	3 axes			6SC6100-0SA21
Power modules	3 /6 A	1 axis	A1 to A 10	6SC6103-0SE30
	3 /6 A	2 axes		6SC6103-0SG30
	3 /6 A	3 axes		6SC6103-0SN30
	8 /16 A	1 axis		6SC6108-0SE01
	8 /16 A	2 axes		6SC6108-0SG01
	8 /16 A	3 axes		6SC6108-0SN00
	20/40 A	1 axis		6SC6120-0FE00
	30/60 A	1 axis		6SC6130-0FE00
	40/80 A	1 axis		6SC6140-0FE00
	70/140 A	1/2 axis (L1 + L3)		6SC6170-0FC00
	70/140 A	1/2 axis (L2 + L3)		6SC6170-0FC50
	90/180 A	1/3 axis		6SC6190-0FB00
	120/240 A	1/3 axis		6SC6190-0FB60
	200/400 A	1/6 axis L +		6SC6190-0FA01
	200/400 A	1/6 axis L-		6SC6190-0FA51
Pulse distributor for power section 200/400 A			-	6SC6190-0FU00
Rectifier	90 A, 180 A		V0	6SY9056
Capacitor	6000 µF / 350 V		C0.1 to C0.5	6ZY1073-0AA00
Fan	Typ 3314 / 24 V DC	92 x 92 mm	E0.1 to E0.5	6SY9057
		120 x 120 mm		6ZY1073-1AA00
Wiring material	(assembly)		-	6SC6101-0SA00
Wiring accessories	Control for 1 axis		-	6SC6101-0SA03
Ribbon cable (only for 6SC6101-2. to 6SC6101-4.)				
	50-pole to 3 x 16-pole		-	6SC6101-0LA00
	50-pole to 1 x 34-pole + 1 x 16-pole		-	6SC6101-0LA01
	50-pole to 1 x 16-pole + 1 x 34-pole		-	6SC6101-0LA04

Table 4.2 Spare parts