Faults Indicated on LCU or OCU

General faults

fault	possible reason	measures
Emergency Off	E-STOP condition	Reset E-STOP condition (cf page 47)
Drive power off	Power has not yet been switched on after system power-up or E-stop	Press POWER ON Pushbutton at drive cabinet or send POWER ON command from MCS
	Main contactor fault	Press RESET pushbutton. Try to switch on main power again. Main contactor should react.
	E-STOP condition	Reset E-STOP condition (cf page 47)
Cabinet doors open	doors of drive cabinet open	close doors
24V power supply fault	main 24V supply switched off	Check circuit breaker +PD - 21 OL 02 (drive cabinet 1)
Brake power supply fault	power supply switched off	Check circuit breaker +PD - 21 OL 01 (drive cabinet 1)
PLC power supply fault	circuit breaker for PLC outputs tripped	Check circuit breaker +PD - 26 FU 02 (drive cabinet 3)
Mains over-/undervoltage	mains voltage outside ±10% range	Check mains voltage. **WARNING!** **Overvoltage is dangerous and may cause damage to the equipment. Only some components can (and will) be switched off automatically in case of overvoltage.** **In case of mains overvoltage switch off power to the cabinet immediately by using the main breaker +PD-20CI01 in the leftmost cabinet!**
Drive cabinet overtemp.	cabinet fan not working	Check adjustment of the thermostats. Fan should be switched on at 25°C, overtemperature condition is at 35°C.
	ambient temp. too high	Check ambient temperature in electronics shelter (+5...+30°C).
	heat source inside drive cabinet	Check for any extraordinary heat sources
PCU communication fault	CP 524 initialization fault	Perform warm PLC restart (see page 45)
	communication error CP524 - PCU	Press RESET pushbutton at drive cabinet. If failure is gone, the reason most probably was a data transfer error between PCU and CP524. Should this happen more frequently, check shielding of cable from CP524 to PCU. If failure continues after RESET, the communication is completely down. Continue on page 59.

fault	possible reason	measures
CP581 communication fault	CP 581 initialization fault	Perform warm PLC restart (see page 45) and reset CP581 (see page 52)
	CP581 watchdog failed	Reset CP581 (see page 52)
Network error	LAN interface does not work	Check LAN connection to MCS. MCS must be operational. To resume communication a reset may be required on one or both sides. For CP581 reset see page 52.
Host timeout	MCS is not communicating	same as network error (see above)
Collision switch encountered	Collision protection switch GD-CH hit	Check reason why the softlimit has been passed and the hard limit hit. Move GD or CH out of the limit using the limit override function (see page 42)
Bending Limit (allowable difference in Az encoder readings exceeded)	encoder rack gear not circular	Increase bending limit value inside PLC (DB50, DW103). Measure bending as a function of az angle over 360 degrees. Correct rack gear and/or bending limit value if necessary.
	real bending	"Unbend" feedarm: press "POWER ON", "LAMP TEST" and "FAILURE RESET" pushbuttons at drive cabinet simultaneously. Az axis must be in Stop and "LOCAL ONLY" switch must be in "LOCAL". (Cf. par.).
	one of the Az encoders has "jumped"	Check rack gear for irregularities. Check encoder spring; encoders must be pressed tightly to the rack gear over the full Az range. Move to the encoder reset position and reset encoders.
	encoder failure	Disconnect the faulty encoder. Replace as soon as possible.
Limit override active (status, no fault!)	Limit override function active (see page 42)	Do not leave system in this condition unless required for maintenance or repair purposes!

Axis Related Failures

The failures listed below are indicated for each axis separately. They have to be reset by the related "AXIS RESET" command (by MCS, LCU or OCU) or by pushbutton "RESET" at the drive cabinet.

The label in the table below has to be replaced by either Az, GD or CH. It refers to the equipment labels used in the circuit diagrams in Vol. III, Installation Manual.

fault	possible reason	measures
Amplifier fault/overtemp.	Servo amplifier failure	see page 61
Amplifier not ready	conditions for amplifier operation not fulfilled	see page 61 *Note: A brake failure frequently comes along withan "amplifier not ready" failure, because the brakes will engage immediately by hardware and software interlocks, if an amplifier is not ready.*
Motor overtemperature	motor overtemp.	Check motor temperature. If hot, check reason for overload (mechanical blocking, torque setpoint etc.). Otherwise check wiring.
Power supply fault	circuit breaker tripped	Check circuit breakers + - 1 OL 01 and - 1 OL 02 (Az, CH: drive cabinets 1; GD: drive cabinet 2)
DC bus fault (Bus voltage too high)	DC bus relay misadjusted	Readjust relay (see section 4, "Modifications and Adjustments", par. 8.1.
	Regeneration not working	Check regeneration unit(s) of that particular axis
Brake group # fault	circuit breaker for brake tripped	Check circuit breakers +PD - 27 FU 01 thru 05 (in drive cabinet 3)
Brake failure	Brake not released	Check brake function by watching the brake making "click" when being released. If no sound,.check outgoing voltage from the brake relay in the drive cabinet to the brake itself according to circuit diagram.
	Brakes not closed though supposed to	False feedback from brake current relay. Check wiring and potential outside influences that could trip the brake currrent relays, e.g. radios used inside the electronics shelter with cabinet doors open.
	Brake current relay misadjusted	Readjust relay (see section 4, "Modifications and Adjustments", par. 8.2.

fault	possible reason	measures
Motion failure	No motion after enable	No position change has been registered after drive enable. Make sure that: - drive is not blocked mechanically (try opposite direction!) - amplifier is enabled (ENABLE LED on) - rate setpoint arrives at servo amplifier - motor cables are connected and not interrupted - encoder is connected and operational.
	moving in wrong direction	Movement in wrong direction has been detected. Check wiring of velocity setpoints and feedbacks. Try operation from DCS (cf. par.); if this works, the problem is neither between DCS and motors nor between motors and amplifiers.
	Runaway	Motor movement was too fast. Make sure that: - motor resolver is connected correctly - encoder is connected and operational - rate setpoint is transferred correctly.
Servo failure	various	The "servo failure" is a summary signal. Observe individual failure messages for more details.
Encoder failure	encoder evaluation module WF705 (in PLC) not operational	Check +24V power supply to WF705. Perform a warm PLC restart (see page 45).
	encoder fault	Encoder faulty; cf. page 60.
Pendulum alarm (Az only)	wiring	check wiring
	velocity loop interrupted	Check velocity feedback from amplifiers and torque command to the motors at DCS.
Reset is possible after 60s only to allow oscillations to calm down.	real alarm	Check for any obvious reason. Try Az movement at a different location.

Unit Failures

OCU

fault	possible reason	measures
OCU not operational	PC hardware or software fault	Check hardware and software setups as for a standard PC
Communication fault	wiring interrupted	Check wiring from OCU port COM1 to CP581 / COM2
	power supply for fiber optic converters missing	Check power supply for fiber optic converters at both OCU port COM 1 and CP581 port COM2.

PCU

For servo failures refer to the previous paragraph (axis failures).

A "PCU communication error" reported by the PLC always indicates a general failure somewhere between PCU CPU and PLC. Follow procedure below.

For all tests decribed below the PCU must be connected to one of the PCU connection boxes.

fault	possible reason	measures
24V LED off	PCU power supply missing	Check wiring according to circuit diagram +PLC page 1 thru 5.
no display	no axis selected	Press MODE SELECT pushbutton. If display comes up shortly but does not remain after releasing the pushbutton, continue with #3. If display does not come up at all, continue with #4.
no permanent display after mode select	PLC in STOP mode	Restart PLC (see page 51).
	Current Loop Interrupted	Check TxD and RxD lines. 20mA must be measured on both lines according to circuit diagram +PLC page 1.
	Communication error PLC - PCU	Perform warm PLC restart (see page 45). Red LED at CP524 must be off. Check wiring between PLC and PCU according to circuit diagram +PLC page 1 thru 5.
no display at PCU even when pressing MODE SELECT	PCU internal wiring damaged	Check PCU wiring according to manufacturers documentation
	CPU faulty	Replace CPU of PCU